

# Akaroa Wharf Multi-Criteria Analysis Report

Prepared for Christchurch City Council  
Prepared by Beca Limited

Revised November 2021



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## Revision History

Revision N°	Prepared By	Description	Date
0.1	<b>Mollie Weston</b>	Draft Report	16/03/2020
1.0	<b>Mollie Weston</b>	Final Report	18/03/2020
1.1	<b>Noelle Evans</b>	Updated report based on WTPi Akaroa Wharf Concept Options Estimate Report, Rev 2, dated 23 April 2020.	25/05/2020
2.0	<b>Noelle Evans</b>	Updated report and analysis based on change to MCA heritage assessment and scores. Workshop held 23 June 2020.	01/07/2020
3.0	<b>Noelle Evans</b>	Updated report for April 2021 consultation following comments received from Akaroa Wharf Project Manger, Kristine Bouw.	20/04/2021
4.0	<b>Noelle Evans</b>	Updated report following new information received from Akaroa Wharf Project Manger, Kristine Bouw.	30/11/2021

## Document Acceptance

Action	Name	Signed	Date
Prepared by	<b>Mollie Weston</b>		18/03/2020
Reviewed by	<b>Noelle Evans</b>		30/11/2021
Approved by	<b>Greg Offer</b>		30/11/2021
on behalf of	Beca Limited		

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# Executive Summary

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## Introduction

Christchurch City Council (CCC or Council) engaged Beca to lead a Multi-Criteria Analysis (MCA) to guide decision-making regarding suitable location and high-level structural design options for the Akaroa Wharf renewal project. This report describes the options, engagement with stakeholders, the MCA assessment process and outcomes.

This version of the report, Version 4.0, reports changes in advice about the risks associated with retaining the existing wharf abutment for certain options.

Calibre have carried out further condition assessment relating to the abutment and have highlighted the risks and challenges associated with retaining this as part of the wharf redevelopment for either Option A or B. This is in contrast to the April 2021 assessment, that indicated that the abutment for Option A would likely need to be demolished but for Option B could be retained.

A new bathymetric survey was obtained, incorporated into Version 3.0 of this report, which identified that the potential wharf for Option C, at Church Street, would have to be extended substantially further than previously considered and extensive dredging would potentially be required. This information would likely influence the outcome of the MCA, however was not considered in the original MCA. As the MCA has not been re-run to date the recommendation has not changed.

The preliminary location options assessed are:

- **Baseline Option, Option 0** - Restore existing wharf in its current location, no change to structural form.
- **Option A** - Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. The original abutment would be completely removed, and a new abutment constructed fit for purpose.
- **Option B** - Construct a new wharf along the north side of the existing wharf. The original abutment would be completely removed, and a new abutment constructed fit for purpose.
- **Option C** - Construct a new wharf off Church Street and on the site of the original town wharf. The original abutment would be retained.
- **Option D** - Construct a new wharf from Akaroa Recreation Field/ Childrens Bay. The original abutment would be retained.

The preliminary structural options assessed are:

- **Baseline Option, Option 0** - Restore existing wharf in its current location, no change to structural form.
- **Option 1** - New wharf structure with like-for-like hardwood timber (excluding abutment).
- **Option 2** - New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood.
- **Option 3** – New wharf structure made from concrete (excluding abutment).

## Background

It's important to note as part of the options to construct a new wharf above, it is Council's intention to demolish the existing wharf due to the existing condition of the wharf and as outlined in the Calibre report; *Akaroa Wharf Renewal: Preliminary Rebuild Options, May 2019*.

The most recent inspections were completed in August 2018 and again in July 2021 at which time Calibre assessed the condition of the wharf to be *moderate to poor*. The wharf is over 130 years old and a large amount of the original material has been replaced, but this is now also deteriorating. CCC completed repairs on the existing wharf in 2019/2020 which included the replacement of stringer beams and pile bracing as well as updates to a number of piles. These repairs will provide the necessary improvements to allow the wharf to operate for 3 to 5 years, however in the longer term the wharf is considered uneconomical to repair.

### **The Akaroa Wharf MCA**

The MCA criteria were developed in collaboration with the project team, based on the Waka Kotahi NZ Transport Agency (NZTA) MCA criteria framework, including the Council project leads, Council Heritage and Urban Design, ECan, Planz Consultants, Calibre Group, WT Partnership Infrastructure (WTPi) and refined through the MCA assessment process consistent with NZTA processes.

The NZTA guidelines for MCA scoring were used to score each option, against the chosen criteria and a weighting assigned to each criterion. The assessment and scoring were carried out with the above parties, over two workshops, including Akaroa Community Board members and incorporating inputs from Ōnuku Rūnanga.

The weightings assigned to the criteria were developed in collaboration with CCC project leads. The weightings are ranked 'Very Low', 'Low', 'Medium', 'High' and 'Very High', and are apportioned a value from a nil weighting (i.e. not assessed) to 100, consistent with NZTA processes.

The combination of the weighting and scoring enabled comparison between the options and provided the overall preference for each of the key considerations; both for the location and structural options evaluated.

To improve the robustness of the weighting process, a sensitivity assessment was completed, which involved adjusting a single weighting value by  $\pm 10\%$  and  $\pm 20\%$  of the pre-assigned value. Ultimately the sensitivity assessment showed very little variance from the original weighted values, which indicates the weighting values assigned are suitable in this context.

### **MCA Analysis**

The MCA assessment identified Options A and B are equally preferred for the preliminary location, and Option C is still an option worth consideration. The MCA also identified Options 1 and 2 are equally preferred for the preliminary structural scenarios.

The sensitivity assessment illustrated no change in the order of priority. The difference in MCA scores between Options A and B for location, and Options 1 and 2 for structural material, are within the margin of uncertainty as seen in the original weighted scores and in the sensitivity assessment. In conclusion, there is no clear delineation between Options A and B, and Options 1 and 2 in the MCA assessment.

Whilst Option C is an outlier, it scored reasonably high in the MCA assessment and close to that of Options A and B, so it is recommended this option is further considered in the next phase of the work. Since the MCA was undertaken and analysed in July 2020, a new bathymetric survey has been obtained which has identified that the potential wharf for Option C, at Church Street, would have to be extended substantially further than previously considered and extensive dredging would potentially be required. This new information would likely influence the outcome of the MCA, however as the MCA has not been re-run to date, the recommendation has not changed.

[REDACTED]

**Summary**

The MCA assessment is based on the worst case scenario, where the original abutment has to be completely removed for Options A and B.

This version of the report, Version 4.0, reports changes in advice about the risks associated with retaining the existing wharf abutment for certain options. Calibre have carried out further condition assessment relating to the abutment and have highlighted the risks and challenges associated with retaining this as part of the wharf redevelopment for either Option A or B, refer to Appendix E Calibre advice. This is in contrast to the April 2021 assessment, that indicated that the abutment for Option A would likely need to be demolished but for Option B could be retained.

Additionally, a new bathymetric survey was obtained for Option C, incorporated into Version 3.0 of this report, identifying that for a wharf at Church Street, Option C, would have to be extended substantially further than previously considered and extensive dredging would potentially be required.

The new information that has come to light would likely influence the outcome of the MCA if it were to be re-run, however this information was not considered in the original MCA. As the MCA has not been re-run to date the recommendation has not changed.

It will be critical to investigate the preferred options further, undertake further design and consultation, develop cost estimates to identify and incorporate cost risks for each of the shortlisted options, for Council to determine the preferred location and preferred structural material for the Akaroa Wharf Renewal project.

In summary, we recommend Options A, B and C are taken forward as the preferred preliminary location scenarios, and Option 1 and 2 are taken forward as the preferred preliminary structural scenarios.

#### **Disclaimer**

Beca has prepared the MCA based on reports prepared by third parties acting on behalf of Council. Beca has not been contracted by Council to provide advice or assessment of these reports, and therefore has not undertaken such analysis.

# 1 Introduction

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## 1.1 Background

This report documents an assessment process that was conducted in order to evaluate the shortlisted options for the Akaroa Wharf Rebuild Project.

Four preliminary location options and three preliminary structural options, as well as a baseline option, have been conceptualised for the assessment.

The project scope requires that the options are evaluated using a Multi Criteria Analysis (MCA) framework – a framework belonging to the Multi Criteria Decision Making (MCDM) group of frameworks. MCDM is the umbrella term for “the study of methods and procedures by which concerns about multiple conflicting criteria can be formally incorporated into the management planning process.

## 1.2 Why use MCA?

MCA is suitable when an intuitive approach may not be appropriate, for example because the decision-maker(s) feel the decision is too large and complex to handle intuitively, because it involves several conflicting objectives, or involves multiple stakeholders with diverse views. This process also assists with openness and transparency, so decision makers and the wider community can better understand how options are considered and then developed for consultation and final approval.

It is important to remember MCA is a tool and that people make decisions. The MCA process assists people in making decisions and also gives the wider community understanding of what information was considered in the decision making process. That assistance can take many different forms including; providing structure to discussions, separating fact from judgement, creating shared understanding and gaining a sense of purpose and agreement for the way forward.

## 1.3 The Assessment Process

All option assessments require a clear documented process in order to understand how the decision was made. The key test of an option evaluation process is that other experts in the field should be able to repeat the process and come to the same decision.

The process is:

1. Establish the decision context – the purpose of the MCA, identify the decision maker(s) and other key players, design the assessment system.
2. Identify the options to be assessed to achieve the objectives.
3. Identify the “criteria”.
4. Scoring – describe the consequences of the options, score the options based on the criteria, check the consistency of the scores on each criteria.
5. Weighing – assign weights and scores to each option to reflect their relative importance to the decision.
6. Combine the weights and scores for an overall value.
7. Examine the results.
8. Sensitivity assessment.



## 2 Project Background

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### 2.1 Prior Work

The Christchurch City Council (CCC) is in the early stages of planning the Akaroa Wharf Rebuild Project.

It is Council's intention to demolish the existing wharf due to the existing condition of the wharf as outlined in the Calibre report *Akaroa Wharf Renewal: Preliminary Rebuild Options, May 2019*. The most recent inspection was completed in August 2018 at which time Calibre assessed the condition of the wharf to be *moderate to poor*. The wharf is over 130 years old and a large amount of the original material has been replaced, but this is now also deteriorating. Council completed repairs on the existing wharf in 2019/2020 which included the replacement of stringer beams and pile bracing as well as updates to a number of piles. These repairs will provide the necessary improvements to allow the wharf to operate for 3 to 5 years, however in the longer term the wharf is considered uneconomical to repair.

The options study and report; '*Akaroa Wharf Renewal: Preliminary Rebuild Options*', issued by Calibre May 2019, outlined the initial preliminary location and construction material options as a starting point for the project.

The Calibre report was used as part of the initial public consultation process between 28 May and 26 June 2019 which included two drop in sessions in Akaroa. In response to the consultation, 95 submissions were received from individuals and groups. The '*Akaroa Wharf Consultation Feedback Memo*', dated 21 June 2019, provides a summary on the public feedback from these initial sessions. Refer to <https://www.ccc.govt.nz/assets/Documents/Consultation/2019/8-August/Akaroa-Wharf-Submissions.pdf>

Further to the initial preliminary designs, a Draft Conservation Plan for the Akaroa Main Wharf was prepared by Origin, issued May 2019. The Draft Conservation Plan provides an outline of the significant heritage and cultural significance of the historic Akaroa Main Wharf to the town and the wider district. Jacobs prepared the '*Akaroa Wharf Coastal Hazards Review*', issued September 2019 and Planz Consultants have provided advice on the consenting plans and policies related to the main Akaroa Wharf, including '*The Akaroa Wharf Renewal: Planning Considerations for Proposed Rebuild Options*' memo issued November 2019.

[REDACTED]

[REDACTED]

[REDACTED] The participants rated the location and preliminary structural options against the MCA criteria based on the information available at the time, to guide the decision-making and MCA assessment for the Akaroa Wharf renewal project.

### 2.2 The MCA Participants and Engagement Process

The Council has undertaken stakeholder and community engagement throughout the period of options development, from May 2019 to June 2019, prior to undertaking the MCA assessment of the Akaroa Wharf renewal project.

As part of the first step of the MCA process, a workshop was held to set the MCA criteria on 02 December 2019. Two MCA workshops were held, the first as an assessment of the options against the criteria held on 09 December 2019. The second was to finalise the assessment, held on the 19 December 2019.

Separate meetings were held with Debbie Tikao and Rik Tainui, representing Ōnuku Rūnanga, Planz Consultants, CCC Historic values team members and Calibre Group in January and February of 2020 to finalise the scores and commentary on specific Heritage and Cultural MCA criteria.

Planz Consultants provided indicative scores associated with the ‘Preliminary Structural Options’ across a range of statutory and management plans, refer to the MCA Workshop – Materiality Assessment Statutory and Management Plans Memo.

WTPi provided a Carbon Emissions Estimate for Akaroa Wharf, dated 12 February 2020, providing a comparative analysis of utilising timber or steel and concrete which have been incorporated into the scoring of the final MCA.

A summary of the key meetings and workshops summarised below.

Date	Meeting & Objective	Meeting Time	Attendees	Role	Organisation
<b>02 December 2019</b>	<b>MCA Criteria Setting workshop,</b> agreeing the criteria relevant to the project, based on the NZTA guidelines	1.5hr	Kristine Bouw Sylvia Docherty Paul Rogers Boyd Barber Tom Arthur William Southby Matt Bonis Livi Whyte Ian Fox Luke Donnelly Fiona Wykes Noelle Evans Scott Van Leishout	Project lead Project coordinator Project advisor Urban Designer Structural Engineer Structural Engineer Consultant Planner Consultant Planner Harbourmaster Director, QS Heritage Advisor MCA facilitator MCA facilitator support	CCC CCC CCC CCC Calibre Calibre Planz Planz ECan WTPi CCC Beca Beca
<b>09 December 2019</b>	<b>MCA Workshop 1</b> assessing the different location options against agreed project criteria	3hrs	Jamie Stewart Nigel Harrison Tori Peden Kristine Bouw Sylvia Docherty Paul Rogers Boyd Barber Tom Arthur William Southby Matt Bonis Livi Whyte Ian Fox Luke Donnelly Fiona Wykes Noelle Evans Scott Van Leishout	Community Board Member Community Board Member Community Board Member Project lead Project coordinator Project advisor Urban Designer Structural Engineer Structural Engineer Consultant Planner Consultant Planner Harbourmaster Director, QS Heritage Advisor MCA facilitator MCA facilitator support	CCC CCC CCC CCC CCC CCC CCC Calibre Calibre Planz Planz ECan WTPi CCC Beca Beca
<b>19 December 2019</b>	<b>MCA Workshop 2</b> finalising the assessment of the different location	2.25hrs + 2.25hrs	Jamie Stewart Nigel Harrison Kristine Bouw Sylvia Docherty	Community Board Member Community Board Member Project lead Project coordinator	CCC CCC CCC CCC

Date	Meeting & Objective	Meeting Time	Attendees	Role	Organisation
	and material options against agreed project criteria		Paul Rogers Boyd Barber Tom Arthur William Southby Matt Bonis Livi Whyte Ian Fox Luke Donnelly Amanda Ohms Noelle Evans Scott Van Leishout	Project advisor Urban Designer Structural Engineer Structural Engineer Consultant Planner Consultant Planner Harbourmaster Director, QS Heritage Advisor MCA facilitator MCA facilitator support	CCC CCC Calibre Calibre Planz Planz ECan WTPi CCC Beca Beca
<b>14 January 2020</b>	<b>Meeting</b> to discuss Akaroa Wharf Renewal project and providing input into the MCA assessment, particularly in respect of the cultural and heritage criteria	1hr	Rik Tainui Debbie Tikao Kristine Bouw Sylvia Docherty Noelle Evans	Representative of Ōnuku Rūnanga Representative of Ōnuku Rūnanga Project lead Project coordinator MCA facilitator	Ōnuku Rūnanga CCC CCC Beca
<b>10 February 2020</b>	<b>Meeting</b> to further discuss the cultural criteria and assessment	1hr	Debbie Tikao Kristine Bouw Sylvia Docherty Noelle Evans	Representative of Ōnuku Rūnanga Project lead Project coordinator MCA facilitator	Ōnuku Rūnanga CCC CCC Beca
<b>28 February 2020</b>	<b>Meeting</b> to further discuss, review and confirm the cultural and heritage scores and assessment	0.75hr	Debbie Tikao Kristine Bouw Sylvia Docherty Fiona Wykes Amanda Ohms Matt Bonis Noelle Evans	Representative of Ōnuku Rūnanga Project lead Project coordinator Heritage Advisor Heritage Advisor Consultant Planner MCA facilitator	Ōnuku Rūnanga CCC CCC CCC CCC Planz Beca
<b>18 March 2020</b>	<b>Phone call</b> to confirm final cultural narrative scores		Debbie Tikao Noelle Evans	Representative of Ōnuku Rūnanga MCA facilitator	Ōnuku Rūnanga Beca
<b>27 May 2020</b>	<b>Meeting</b> to discuss the change of the existing abutment and impact on MCA assessment*	1hr	Kristine Bouw Tom Arthur Fiona Wykes Amanda Ohs Noelle Evans	Project lead Structural Engineer Heritage Advisor Heritage Advisor MCA facilitator	CCC Calibre CCC CCC CCC

Date	Meeting & Objective	Meeting Time	Attendees	Role	Organisation
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\* The original MCA assessment was based on the abutment being retained for all options. Through further investigations, it was identified that the abutment was in poor condition and that it was highly unlikely that it could be retained and integrated into the new wharf for locations Options A and B. As the MCA heritage criteria had been evaluated based on the original abutment being retained for Options A and B, it was concluded that the heritage criteria be re-evaluated, based on the worst case scenario i.e. the original abutment would be demolished and a new abutment would be constructed fit for purpose.

<b>23 June 2020</b>	<b>Workshop</b> to review and confirm the heritage scores and assessment based on the abutment being completely removed, and a new abutment would be constructed fit for purpose.	1hr	Kristine Bouw Matt Bonis Fiona Wykes Amanda Ohs Noelle Evans	Project lead Consultant Planner Heritage Advisor Heritage Advisor MCA facilitator	CCC Planz CCC CCC Beca
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### 3 Project Objectives

The objectives of the Akaroa Wharf renewal project, proposed by CCC, are as follows:

- Meet the current and future needs of the community, visitors and commercial operators.
- Develop a functional marine asset to serve the community for the next 100 years.
- Recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa, the wider cultural landscape and Mana Whenua identity and values.
- Meet universal accessibility requirements.
- Provide for wharf services – fuel, power, water and waste.
- Consider operational and maintenance costs.

### 4 Decision Context

The purpose of the MCA is to develop a robust tool to evaluate the preliminary location, and the preliminary structural options listed for the project.

The options that were developed and put forward for the MCA process comprised of the original options from the consultation engineer and options developed as a result of community feedback.

Ultimately, following stakeholder engagement, the Council will be required to make a decision about a preferred wharf location and wharf design. In making this decision the Council will be guided by the requirements of the Local Government Act 2002 (the LGA).

Under section 14.1 of the LGA:

*(c) when making a decision, a local authority should take account of—*

*(i) the diversity of the community, and the community's interests, within its district or region; and*

*(ii) the interests of future as well as current communities; and*

*(iii) the likely impact of any decision on each aspect of well-being referred to in section 10:*

The well-beings referred to are the social, economic, environmental, and cultural well-being of communities. Section 14.1 of the LGA goes on to say:

*(h) in taking a sustainable development approach, a local authority should take into account—*

*(i) the social, economic, and cultural well-being of people and communities; and*

*(ii) the need to maintain and enhance the quality of the environment; and*

*(iii) the reasonably foreseeable needs of future generations.*

Under Section 77 of the LGA:

*(1) A local authority must, in the course of the decision-making process,—*

*(a) seek to identify all reasonably practicable options for the achievement of the objective of a decision; and*

*(b) assess the options in terms of their advantages and disadvantages; and*

*(c) if any of the options identified under paragraph (a) involves a significant decision in relation to land or a body of water, take into account the relationship of Māori and their culture and traditions with their ancestral land, water, sites, waahi tapu, valued flora and fauna, and other taonga.*

Other parties impacted by the project are:

- Commercial operators/building owners located on the Akaroa Wharf.
- Commercial users of the wharf, such as fishermen, cruise ship operators and tourism operators.
- Akaroa business community, such as store owners in the township.
- Land owners affected by related change.
- Wider Akaroa Community who will be affected by proposed works.
- Local Rūnanga/ Maori Iwi.

The key stakeholders are anyone who can make a useful and significant contribution to the MCA. Key stakeholders are chosen to represent all the important perspectives on the subject of the analysis. The key stakeholders are those who were in attendance at the MCA workshops, as detailed in section 2.

Based on the results of the MCA process, the preferred option(s) will be selected and developed for consultation with key stakeholders and the wider community. A final option will then be developed using consultation feedback, which will be taken to the Council through a hearings panel to make a recommendation to Council for a final decision.

## 5 Options Assessed

The preliminary location options assessed are:

- **Option 0** - Restore existing wharf in its current location, no change to structural form.
- **Option A** - Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. The original abutment would likely be completely removed, and a new abutment constructed fit for purpose.
- **Option B** - Construct a new wharf along the north side of the existing wharf, using the existing abutment. The original abutment would be completely removed, and a new abutment constructed fit for purpose.
- **Option C** - Construct a new wharf off Church Street and on the site of the original town wharf. The original abutment would be retained.
- **Option D** - Construct a new wharf from Akaroa Recreation Field/ Childrens Bay. The original abutment would be retained.



Figure 1: Plan demonstrating location Options A to D

The preliminary structural options assessed are:

- **Option 0** - Restore existing wharf in its current location, no change to structural form.
- **Option 1** - Full restoration of the existing wharf with like-for-like hardwood timber.
- **Option 2** - Full replacement with a mix of concrete and hardwood timber (visible members would be hardwood).
- **Option 3** – Full replacement with modern concrete.

## 6 Criteria

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### 6.1 Background

The purpose of identifying criteria is to develop the means by which the options will be tested and compared. Each criterion must be measurable, that is, it must be possible to assess, at least in a qualitative sense, how well a particular option is expected to perform in relation to the criterion. This means for each criteria, answering the question:

“Is it possible in practice to measure or judge how well an option performs on these criteria?”

### 6.2 Criteria Requirements

Developing criteria requires consideration of:

- Do the criteria capture all key aspects of the objectives that are the point of the MCA?
- Over what timeframe are the criteria assessed?
- It must be possible in practice to measure or judge how well an option performs on the criteria
- The ability to distinguish between a good choice and a bad one
- Independent criteria – can you assign performance scores for the options on one criterion without knowing what the options preference scores are on any other criteria?
- Avoid using two or more criteria that essentially measure the same attribute as this would amount to double counting
- Have we included all the criteria necessary to compare the options performance?

In essence developing criteria is asking “what do we care about” and being able to “describe the consequence (what does it look like)”.

### 6.3 Criteria Developed

The MCA criteria were developed at the MCA Criteria Setting workshop, held 02 December 2019, based on the NZTA Multi Criteria Analysis (MCA) framework guidelines, refer to Appendix A: Akaroa Wharf Renewal MCA Criteria Framework.

The criteria are categorised into the following three key areas:

1. Project Objectives
2. Implementability Objectives – including; feasibility, affordability, public/stakeholders.
3. Assessment of Effects – including; safety, community, economy, cultural, natural environment, built environment.

The following list is the criteria that those at the workshops consider as key for the Akaroa Wharf Renewal project.

#### 1. Project Objectives

- Meet the current and future needs of community, visitors and commercial operators (i.e. functionality; scale and structure)
- Develop a functional marine asset to serve the community for the next 100 years
- Opportunity to recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa, the wider cultural landscape and Mana Whenua identity and values

- Meet universal accessibility requirements (i.e. making the wharf accessible to all people of all ages, size and mobility). Both location and accessibility considered.
- Provide for wharf services – fuel, power, water and waste (commercial use)
- Consider operational and maintenance costs

## 2. Implementability Objectives

### Technical

- Procurement of suitable contractors
- Wharf construction timeframe (strictly period of time taken)
- Constructability (including structural effects, in consideration of proximity to other structures)
- Construction risks - building materials (including procurement)
- Construction set down area (considering marine effects, protected trees etc.)
- Level of amenity during construction; wharf users
- Level of amenity during construction; proximate sensitive users

### Consentability

- Christchurch District Plan requirements
- Canterbury Regional Coastal Plan requirements
- Canterbury Regional Policy Statement
- New Zealand Coastal Policy Statement
- Akaroa Guide Tourism
- Tourism strategy
- Meets change in sea level and king tide requirements
- Privately held property i.e. privately owned wharf buildings (incl. piles)
- Archaeological approval

### Financial & operational maintenance

- Construction cost (build programme)
- Whole of life cost (including maintenance cost over asset lifetime (100 years))
- Maintainability (i.e. accessibility)

### Public/stakeholders

- Community support
- Key stakeholder support (wharf operators)

## 3. Assessment of Effects Objectives

### Safety in construction methodology

- Health and Safety - Construction workers
- Health and Safety - Wharf users (businesses and public; local community and tourists)
- Temporary traffic management, road closures etc. (community, businesses, tourists)



## **Social**

- Recreational and social activities (recreational fishing, boating, walking, local amenity asset)
- Ability to cater for different user groups
- Ability to cater for future community demand
- Enabling public access to all parts of the wharf at all times, and doesn't compromise access to the beach / water.
- Tourist congestion effect
- Impact on connectivity / public open space
- Operational effect (use of larger boats taking refuge)

## **Economy**

- Commercial impact on commercial operators of the wharf
- Commercial impact on the businesses adjacent to existing wharf
- Flexibility to cater for future demand (i.e. cruise ship, tourist & business growth)

## **Cultural values**

- Local Rūnanga/ Maori Iwi cultural values
- Food resources/mahinga kai effect (fishing spots etc.)
- Other local community cultural values

## **Heritage**

- Retain heritage values of existing wharf and Akaroa waterfront
- Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter
- Alignment with Akaroa Heritage Area and Akaroa Historic Area (CCC and HNZPT respectively)
- Heritage and cultural values of adjoining Reserve, buildings and foreshore are maintained

## **Natural Environment**

- Noise and vibration effects (including noise effects on marine mammals i.e. dolphins)
- Air quality effects
- Ecological effects
- Coastal impacts
- Visual / landscape effect on natural environment

## **System Integration**

- Ability to provide infrastructure
- Effect on vehicle movements and active transport to the wharf and along the coastal edge
- Tourist congestion effect
- Urban design and landscape effect

## **Environment**

- Environmental impact over lifetime
- Environmental responsibility and ethics (i.e. sourcing timber, carbon miles, local supply)

## 7 Analysis

The MCA technique used is a numerical analysis in two stages; scoring then weighting.

### 7.1 Scoring

The expected consequence of each option is assigned a numerical score on a strength of preference scale for each option for each criterion. In this way more preferred options score higher on the scale, and less preferred options score lower. The scoring of criteria for this MCA has been based on NZTA guidelines, with a range from -3 to 3. With -3 having a significantly detrimental impact, while 3 having a significantly positive effect on project outcome. Refer to Appendix B, for an outline of the MCA Workshop Package briefing.

Effects criteria	Scoring (score after mitigation)
Significant adverse effect	-3
Moderate / major adverse effect	-2
Minor adverse effect	-1
Neutral / no change	0
Minor positive effect	1
Moderate / major positive effect	2
Significant positive effect	3

The scoring process was complete during the MCA assessment workshops. Discussion, questions and answers, facilitated through the workshops, enabled the attendees to work through the issues and agree a score for each option under each criterion by consensus, reducing the individual bias and making the process transparent. The summary of these discussions and scoring assessment is documented in Appendix C – Final MCA Worksheet.

### 7.2 Weighting

MCA decision preferences are expressed through criteria weights. In doing so the importance of each criteria relative to other criteria is expressed. Weighting of each criterion reflects their relative importance to the decision. The process of deriving weights is fundamental to the effectiveness of an MCA.

The weightings used in this MCA are based on a 'Rating' technique where a 'very low', 'low', 'medium', 'high' or 'very high' ranking is given. To assign a value to these rankings, a range from 0 to 100 has been used, consistent with NZTA processes. The CCC project leads assigned initial, 'high', 'medium' or 'low' weightings, to each criterion and requested Beca to review and assign weightings as an independent advisor.

The following are the suggested weightings for Weighting Options:

- Very Low = nil weighting (not assessed)
- Low = 25
- Medium = 50
- High = 75
- Very High = 100

The purpose of providing two more weighting options was to allow for greater distinction between options. A specific criterion is able to be assigned a greater or lesser weighting that may have otherwise been given a weighting not as representative with only three options.

The below table summarises the weightings assigned to each of the criteria, and rationale for the weightings. In some instances the criteria may only apply to either the preliminary location options, or the preliminary structural options. Weightings are not assigned in these instances.

MCA Topics		MCA Criteria	Preliminary Location Weightings (Options 0, A-D)		Preliminary Structural Weightings (Options 0, 1-3)		Basis for criteria
			Ranking	% Weighting	Ranking	% Weighting	
<b>Project Objectives</b>							
Akaroa Wharf Renewal Project Objectives	Meet the current and future needs of community, visitors and commercial operators (i.e. functionality; scale and structure)		Very High	3%	N/A	0%	Input form key stakeholders is required to drive and asses the functionality.
	Develop a functional marine asset to serve the community for the next 100 years		Very High	3%	N/A	0%	Need robust and resilient asset, to meet long service life as the cost of replacement in the future will be very high.
	Opportunity to recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa, the wider cultural landscape and Mana Whenua identity and values		Medium	1%	N/A	0%	Structure is located in coastal marine area, with high cultural values. Heritage features need to be retained and recognised where possible.
	Meet universal accessibility requirements (i.e. making the wharf accessible to all people of all ages, size and mobility) Both location and accessibility considered		Very high	3%	N/A	0%	Avoiding social impacts, through recognising the needs of the wider community
	Provide for wharf services – fuel, power, water and waste (commercial use)		High	2%	N/A	0%	Wharf serves a commercial purpose, and there are service needs which are must haves.
	Consider operational and maintenance costs		High	2%	N/A	0%	Needs to be affordable for the community.
<i>Project Objectives Total % Weighting</i>				13%		0%	
<b>Implementability Objectives</b>							
Feasibility	Technical	Procurement of suitable contractors	Very High	3%	Very High	4.5%	Specialised work in a marine environment. Need competent and suitably experienced contractors, to manage temporary works effects.
		Wharf construction timeframe (i.e. period of disruption, strictly period of time taken to construct)	Medium	1%	Medium	2.3%	Minimising the impact on local businesses and other wharf users.

		<b>Constructability</b> (including structural effects, in consideration of proximity to other structures)	Medium	1%	Medium	2.3%	Managing the risks of construction and proximity to other structures. Recognising constructability is a driver of the next phase of design.
		<b>Construction risks - building materials</b> (including procurement)	N/A	0%	Very High	4.5%	Managing risks regarding procurement of certain materials e.g. quality, reliability of hardwood versus concrete and steel
		<b>Construction set down area</b> (considering marine effects, protected trees etc.)	High	2%	High	3.4%	Level of amenity on coastal edge, outside the coastal marine area during construction.
		<b>Level of amenity during construction;</b> wharf users	Medium	1%	N/A	0%	Impact of level of amenity during construction a new wharf
		<b>Level of amenity during construction;</b> proximate sensitive users	Low	0.6%	N/A	0%	Impact of disruption due to traffic movements in the local Akaroa township, due to constrained access.
<b>Consentability</b>		<b>Christchurch District Plan requirements</b>	Very High	3%	Very High	4.5%	Ability to consent
		<b>Canterbury Regional Coastal Plan requirements</b> (Based on current Coastal Plan)	Very High	3%	Very High	4.5%	Ability to consent
		<b>Canterbury Regional Policy Statement</b> (Recreational and Social Outcomes)	Very High	3%	Very High	4.5%	Ability to consent
		<b>New Zealand Coastal Policy Statement</b>	Very High	3%	Very High	4.5%	Ability to consent
		<b>Akaroa Guide Tourism</b> (i.e. character and form)	Medium	1%	Medium	2.3%	Contribution of the wharf character to attracting tourists to the Akaroa township
		<b>Tourism strategy</b> (Targeting greater tourism growth, in Akaroa and regionally)	Medium	1%	Medium	2.3%	Capacity limited by factors outside the scope of this project, i.e. SH75
		<b>Meets change in sea level and king tide requirements</b>	Very High	3%	N/A	0%	Ability to meet the design standards for sea level rise and king tides
		<b>Privately held property i.e. privately owned wharf buildings (incl. piles)</b>	Medium	1%	N/A	0%	Impact of new wharf imposed costs on private businesses
		<b>Archaeological approval</b>	High	2%	N/A	0%	Impact on heritage values
	<b>Safety and design consideration</b>	<i>This category is not assessed as there is no difference between the options presented.</i>	N/A	0%	N/A	0%	<i>This category is not assessed as there is no difference between the Preliminary Location Options or Preliminary Structural Options</i>
<b>Affordability</b>	<b>Financial</b>	<b>Construction cost</b> (build programme)	High	2%	High	3.4%	Affordability to the community

	<b>Operational/ Maintenance</b>	<b>Whole of life cost</b> (including maintenance cost over asset lifetime (100 years) Note: locally sourced timbers for Governors bay will approx. 40 yr. life expectancy)	High	2%	High	3.4%	Affordability to the community
		<b>Maintainability</b> (i.e. accessibility)	High	2%	N/A	0%	Affordability to the community
<b>Public/ Stakeholders</b>		<b>Community support</b>	N/A	0%	N/A	0%	Not evaluated. Public consultation is ongoing. Further consultation is planned, following this MCA assessment.
		<b>Key stakeholder support</b> (wharf operators)	High	2%	High	3.4%	Impact on wharf operator needs and preferences i.e.size, aesthetic and proximity to town centre.
<i>Implementability Objectives Total % Weighting</i>				37%		50%	

### Assessment of Effects

<b>Safety</b>	<b>Safety in construction methodology</b>	<b>Health and Safety - Construction workers</b>	Very High	3%	Very High	4.5%	Management of health and safety risks between each location and familiarity with material options during period of construction.
		<b>Health and Safety - Wharf users</b> (businesses and public; local community and tourists)	Very High	3%	N/A	0%	Management of health and safety risks between each location option during period of construction.
		<b>Temporary traffic management, road closures etc.</b> (community, businesses, tourists)	High	2%	High	3.4%	Management of health and safety risks on the wider community, during period of construction, including transport of materials to site.
<b>Community</b>	<b>Social</b>	<b>Recreational and social activities</b> (recreational fishing, boating, walking, local amenity asset)	Medium	1%	N/A	0%	Ability to provide recreational access to all user groups, influenced by location.
		<b>Ability to cater for different user group (functional) requirements</b> (current)	Medium	1%	N/A	0%	Ability to provide functional access to all user groups, influenced by location, i.e. tourism business customers.
		<b>Ability to cater for future community demand</b>	Very High	3%	N/A	0%	Ability to meet increased demand over lifetime.
		<b>Enabling public access to all parts of the wharf at all times, and doesn't compromise access to the beach / water</b>	High	2%	N/A	0%	Impact on recreational users in the coastal marine area/ beach front.
		<b>Tourist congestion effect</b>	High	2%	N/A	0%	Impact on tourist experience and local community
		<b>Impact on connectivity / public open space</b> (local amenity)	Medium	1%	N/A	0%	Impact on existing recreational spaces within the township
		<b>Operational effect</b> (for use of larger boats taking refuge)	Medium	1%	Medium	2.3%	Impact on potential to accommodate larger boats which take refuge, influenced by location and materiality

	<b>Human Health</b>	<i>This category is not assessed as there is no difference between the options presented.</i>	N/A	0%	N/A	0%	<i>This category is not assessed as there is no difference between the Preliminary Location Options or Preliminary Structural Options</i>
<b>Economy</b>		<b>Commercial impact on commercial operators of the wharf</b> (i.e. cruise ship tenders, fishing vessels, sightseeing cruises, interchange of baggage, stores and commercial harvest)	High	2%	High	3.4%	Economic wellbeing of wharf based businesses and community
		<b>Commercial impact on the businesses adjacent to existing wharf</b> (foreshore)	Medium	1%	Medium	2.3%	Economic wellbeing of landside businesses and community
		<b>Flexibility to cater for future demand</b> (i.e. cruise ship, tourist & business growth)	High	2%	High	3.4%	Ability to adapt to a wide range of user requirements
<b>Cultural</b>	<b>Cultural values</b>	<b>Local Runanga/ Maori Iwi cultural values</b> (large significance in beach access)	High	2%	High	3.4%	Impact on cultural wellbeing
		<b>Food resources/mahinga kai effect</b> (fishing spots etc.)	High	2%	N/A	0%	Impact on cultural wellbeing
		<b>Other local community cultural values</b>	Low	0.6%	N/A	0%	Impact on cultural wellbeing
	<b>Heritage</b>	<b>Retain heritage values of existing wharf and Akaroa waterfront</b>  i.e. ability to revitalise the existing wharf, with a high level of authenticity and integrity of the existing wharf - alignment with Conservation Plan/ minimising impact and retaining maximum value. Considering individual heritage values - Historical/Social, Cultural/Spiritual, Architectural/Aesthetic, Technological/Craftsmanship, Contextual, Archaeological.	High	2%	High	3.4%	Impact on social and cultural wellbeing
		<b>Retain any original fabric of the existing wharf, minimizing impact/maximising value</b>  (including existing concrete abutment, which is to be retained in-situ)	High	2%	High	3.4%	Impact on social and cultural wellbeing
		<b>Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter</b> (Ensuring heritage is physical accessibility and providing an understanding of places through storytelling. ICOMOS relates to maintaining materials)  (The ICOMOS New Zealand Charter, The Pumanawa o ICOMOS o Aotearoa Hei Tiaki I Nga Taonga Whenua	High	2%	High	3.4%	Impact on social and cultural wellbeing

		Heke Iho o Nehe is a set of guidelines on cultural heritage conservation, produced by ICOMOS New Zealand)					
		<b>Alignment with Akaroa Heritage Area and Akaroa Historic Area (CCC and HNZPT respectively)</b>  (Heritage New Zealand Pouhere Taonga (HNZPT) is a Crown entity with a membership of around 20,000 people that advocates for the protection of ancestral sites and heritage buildings in New Zealand.)	High	2%	N/A	0%	Impact on social and cultural wellbeing
		<b>Heritage and cultural values of adjoining Reserve, buildings and foreshore are maintained</b>	High	2%	N/A	0%	Impact on social and cultural wellbeing
<b>Natural Environment</b>		<b>Noise and vibration effects</b> (including noise effects on marine mammals i.e. dolphins)	High	2%	High	3.4%	Impact on social and/ or environmental wellbeing
		<b>Air quality effects</b>	N/A	0%	N/A	0%	<i>This category is not assessed as there is no difference between the Preliminary Location Options or Preliminary Structural Options</i>
		<b>Ecological effects</b>  (considering disturbance to biodiversity/ecosystems, disturbance/displacement of marine habitats, spawning areas etc., including excavation/dredging effects (during and post construction), spillage or materials into the CMA)	Medium	1%	Medium	2.3%	Impact on environmental wellbeing
		<b>Coastal impact</b>  (i.e. impact of tidal flows on the seawall and coastal edge)	Medium	1%	Medium	2.3%	Impact on environmental wellbeing
		<b>Visual / landscape effect on natural environment</b> (assumption of view of land from the water)	Low	0.6%	Medium	2.3%	Impact on environmental wellbeing
<b>Built Environment</b>	<b>System Integration</b>	<b>Ability to provide infrastructure</b> (i.e. electricity, water, waste water. Fuel etc.)	High	2%	N/A	0%	Impact on operation, with linkages to social and economic wellbeing
		<b>Effect on active transport to the wharf and along the coastal edge</b> (pedestrian/cycle/mobility devices)	Medium	1%	N/A	0%	Impact on operation, with linkages to social and economic wellbeing



	<b>Tourist congestion effect</b> (of people on wharf)	Medium	1%	N/A	0%	Impact on operation, with linkages to social and economic wellbeing
	<b>Tourist congestion effect</b> (Tourist buses)	Medium	1%	N/A	0%	Impact on operation, with linkages to social and economic wellbeing
	<b>Urban design and landscape effect</b> (i.e. effect of wharf on streetscape setting (existing street trees, furniture, paths) and on nearby landside buildings and urban form)	Low	0.6%	N/A	0%	Managing wider landscape impacts and linkages to social wellbeing
<b>Environment</b>	<b>Environmental impact over lifetime</b> (i.e. Carbon footprint)	N/A	0%	High	3.4%	Managing environmental impact and sustainability
	<b>Environmental responsibility and ethics</b> (i.e. sourcing timber, carbon miles, local supply)	N/A	0%	High	3.4%	Managing environmental impact and sustainability
<i>Assessment of Effects Total % Weighting</i>			<i>50%</i>		<i>50%</i>	
<i>Total % Weighting</i>			<i>100%</i>		<i>100%</i>	

### 7.3 Results

In the MCA workshops, a score was assigned against each criterion under these key areas for each of; the baseline option (Option O), all four preliminary location options (Options A through D), and the three preliminary structural options (Options 1, 2 and 3). The weighting of each criterion is then multiplied by the equivalent score for each option. Finally, the weighted score was summed to provide an overall score for each option.

The result of the MCA assessment is summarised in the table below, showing the weighted scores for each option.

#### Weighted Scores:

Preliminary Location Options				
Option 0	Option A	Option B	Option C	Option D
-2425	2350	1900	1550	-3475

Preliminary Structural Options			
Option 0	Option 1	Option 2	Option 3
-375	1025	775	-1000

The weighted MCA scores identify that Option A and B are the preferred preliminary location options, whilst Option C still scores relatively high. Options 1 and 2 are the preferred structural options.

### 7.4 Sensitivity Assessment

Uncertainty is inherent in the MCA process because the decision makers preferences, expressed as weights, are subjective values. Sensitivity assessment explores the robustness of the results and how sensitive they are in changes to the model. It systematically varies the weights and/or data to see how they affect the results. If a minor variation in one criterion significantly influences the result, that parameter should be subject to further scrutiny.

The sensitivity assessment completed in this MCA involved adjusting a single weighting by +10% and -10% of the pre-assigned value, and +20% and -20% of the pre-assigned values. Refer to Appendix D Sensitivity Assessment Scenarios for a summary table of the scenarios tested, to understand the influence on each criterion.

The following tables illustrate the final sensitivity assessment results for each of the Preliminary location options: 0, A, B, C and D and the Preliminary Structural options: 0, 1, 2 and 3.

- Sensitivity Assessment 1: a single weighting adjusted by +10% or -10% of the pre-assigned value
- Sensitivity Assessment 2: a single weighting adjusted by +20% or -20% of the pre-assigned value

Sensitivity Assessment 1 Results, ± 10% single weighting adjustment

Preliminary Location Options					
	Option 0	Option A	Option B	Option C	Option D
Original	-2425	2350	1900	1550	-3475
VH -10%	-2285	2210	1800	1460	-3385
H +10%	-2505	2440	1970	1540	-3715
H -10%	-2345	2260	1830	1560	-3235
M +10%	-2515	2410	1990	1720	-3585
M -10%	-2335	2290	1810	1380	-3365
L +10%	-2415	2340	1870	1500	-3565
L -10%	-2435	2360	1930	1600	-3385
VL +10%	-2425	2350	1900	1550	-3475
<i>Average</i>	<i>-2409</i>	<i>2334</i>	<i>1889</i>	<i>1540</i>	<i>-3465</i>

Preliminary Structural Options				
	Option 0	Option 1	Option 2	Option 3
Original	-375	1025	775	-1000
VH -10%	-365	1005	735	-990
H +10%	-385	1095	805	-1080
H -10%	-365	955	745	-920
M +10%	-415	1085	805	-1060
M -10%	-335	965	745	-940
L +10%	-375	1025	775	-1000
L -10%	-375	1025	775	-1000
VL +10%	-375	1025	775	-1000
<i>Average</i>	<i>-374</i>	<i>1023</i>	<i>771</i>	<i>-999</i>

Sensitivity Assessment 2 Results, ± 20% single weighting adjustment

Preliminary Location Options					
	Option 0	Option A	Option B	Option C	Option D
Original	-2425	2350	1900	1550	-3475
VH -20%	-2145	2070	1700	1370	-3295
H +20%	-2585	2530	2040	1530	-3955
H -20%	-2265	2170	1760	1570	-2995
M +20%	-2605	2470	2080	1890	-3695
M -20%	-2245	2230	1720	1210	-3255
L +20%	-2405	2330	1840	1450	-3655
L -20%	-2445	2370	1960	1650	-3295
VL +20%	-2425	2350	1900	1550	-3475
<i>Average</i>	<i>-2394</i>	<i>2319</i>	<i>1878</i>	<i>1530</i>	<i>-3455</i>

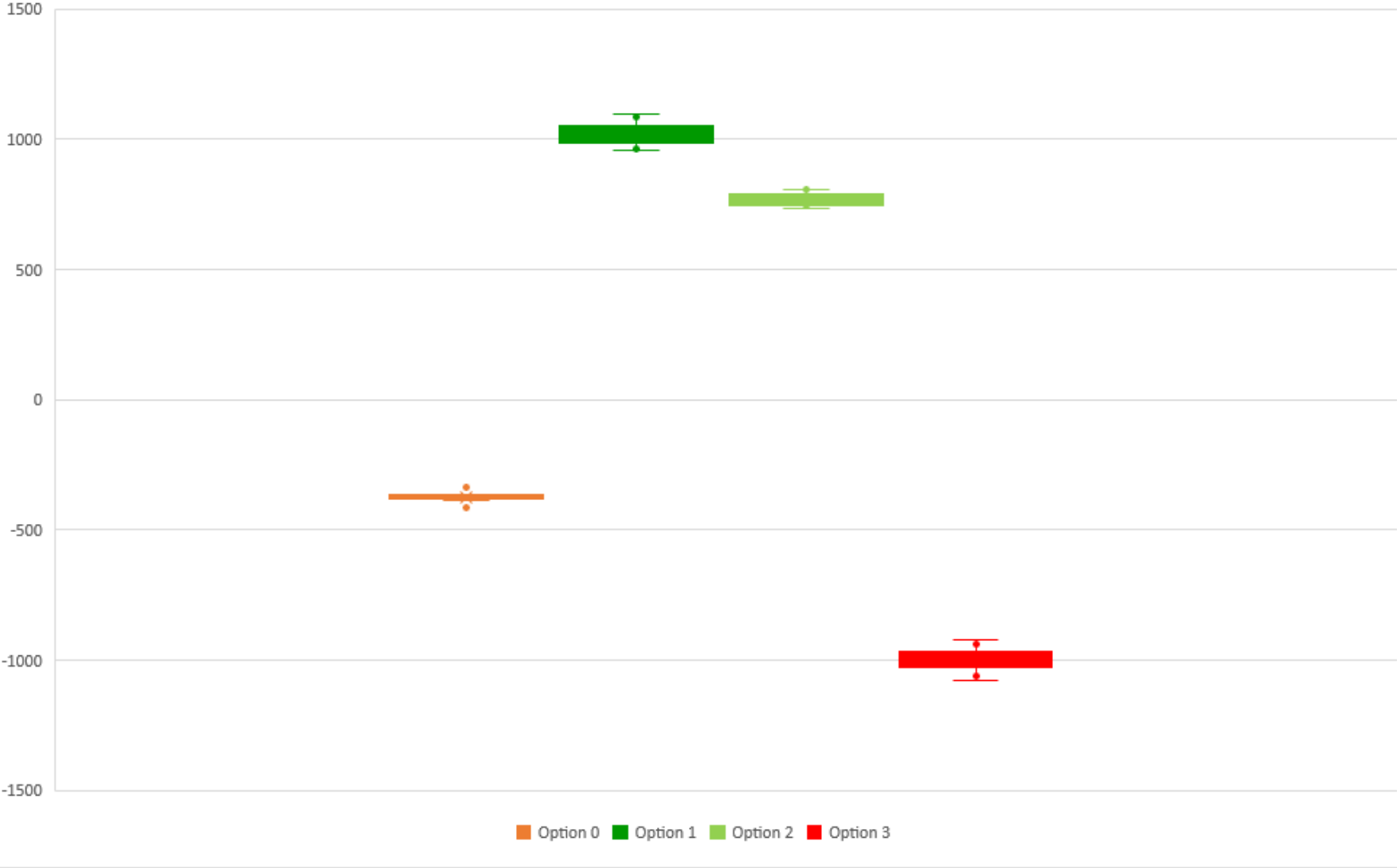
Preliminary Structural Options				
	Option 0	Option 1	Option 2	Option 3
Original	-375	1025	775	-1000
VH -20%	-355	985	695	-980
H +20%	-395	1165	835	-1160
H -20%	-355	885	715	-840
M +20%	-455	1145	835	-1120
M -20%	-295	905	715	-880
M -20%	-375	1025	775	-1000
M -20%	-375	1025	775	-1000
M -20%	-375	1025	775	-1000
<i>Average</i>	<i>-373</i>	<i>1021</i>	<i>766</i>	<i>-998</i>

The sensitivity assessment scenarios tested are illustrated in the Sensitivity graphs overleaf.

### Preliminary Location Options ( $\pm 10\%$ Sensitivity)



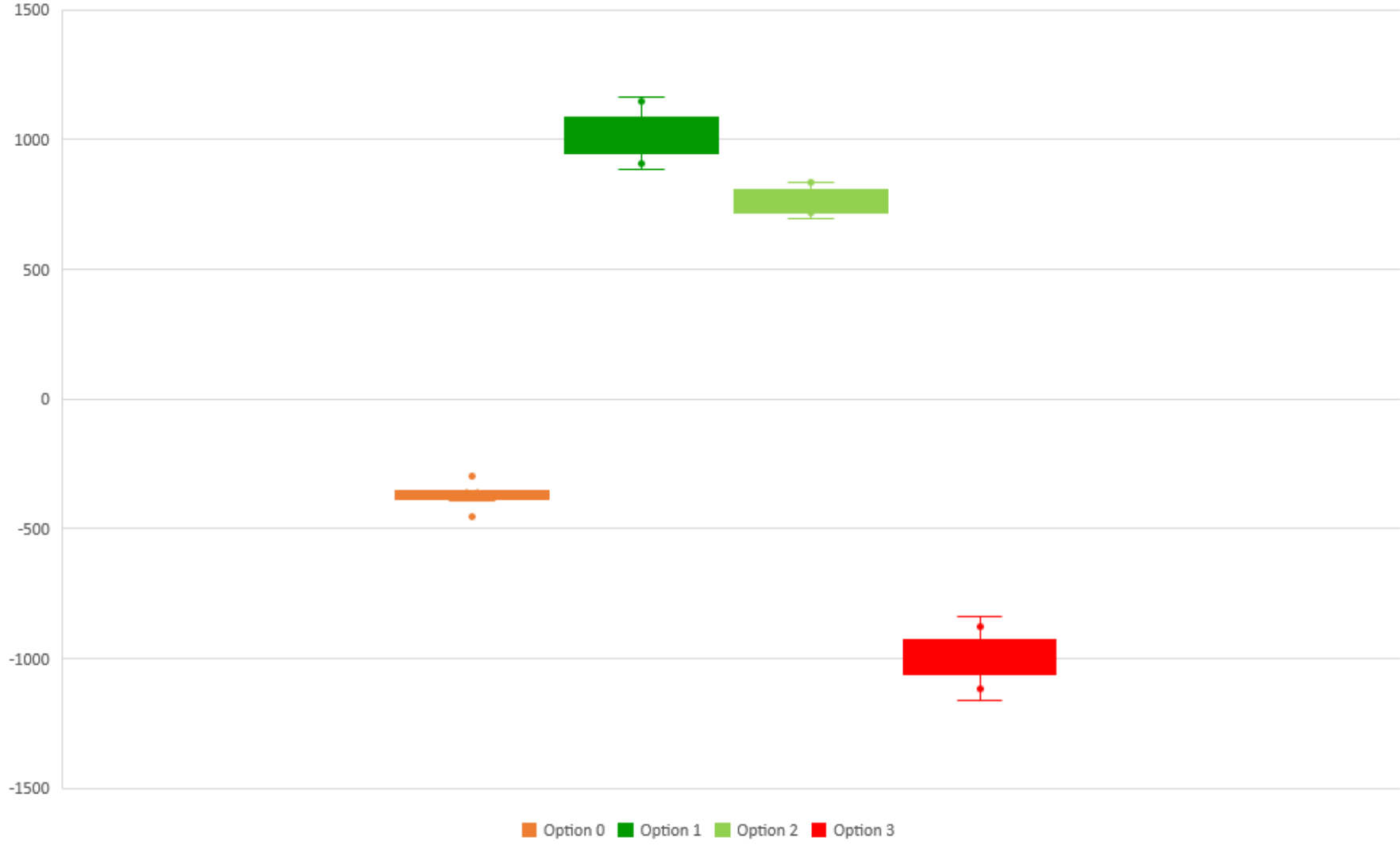
### Preliminary Structural Options ( $\pm 10\%$ Sensitivity)



### Preliminary Location Options ( $\pm 20\%$ Sensitivity)



### Preliminary Structural Options ( $\pm 20\%$ Sensitivity)





## 8 Summary

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Through the MCA assessment the weighted scores show that Option A has the highest weighted score (2350) of the preliminary location options. Option B has a very similar high weighted score (1900), followed by the next closest score, Option C (1400). Options 0 and D score significantly lower than Option A (-2425 and -3475 respectively). The sensitivity assessment illustrates the order of preference is maintained in all 17 scenarios. The sensitivity assessment also illustrates very little variance from the original weighted values, which emphasises that the weighted values assigned are suitable in this context. On average, Option B scored 19% lower than Option A, and Option C scored 34% lower than Option A. Options 0 and D scored greater than 200% lower than Option A. Based on this assessment Options A and B are well within the margin of uncertainty and therefore confirmed as equally preferred. Whilst Option C is an outlier, it scored reasonably high and close to that of Options A and B, so it is recommended this option also be considered going forward. It is recommended Options 0 and D are not taken forward.

The MCA assessment also identified that Option 1 and Option 2 are the preferred preliminary structural options, with weighted scores of 1025 and 775 respectively. Option 0 and 3 score significantly lower (-375 and -1000 respectively) than Option 1. Again the sensitivity assessment shows the same order of preference is maintained for all 17 scenarios. On average Option 2 scored 25% lower than Option 1, the difference between the MCA scores for Option 1 and 2 is within the margin of uncertainty compared with the range of scores, and across all the sensitivity scenarios. Options 0 and 3 scored greater than 137% lower than Option 1. Based on this assessment, Options 1 and 2 are equally preferred and it is recommended Options 0 and 3 are not taken forward.

[REDACTED]

### Location Options, A, B and C

Of the preferred preliminary location solutions identified through the MCA process, Option B: constructing a new wharf along the north side of the existing wharf, whereby the abutment is completely removed, and a new abutment is constructed fit for purpose, offers notably greater cost savings when compared to Option A: constructing a new wharf in the same location as the existing wharf, where the abutment is completely removed, and a new abutment is constructed fit for purpose.

This version of the report, Version 4.0, reports changes in advice about the risks associated with retaining the existing wharf abutment. Calibre have carried out further condition assessment relating to the abutment. One of the main issues with Option B as identified by engineering advice and discussions with marine contractors includes the risks and uncertainties with building parallel to the existing wharf. While Option B would allow much of the existing wharf to remain open during construction, there will be considerable health and safety, staging and construction management issues with this approach. Another consideration is the ability of the existing abutment to remain intact during construction works which will include piling and drilling works and which will have an unpredictable impact on the abutment and main access to the wharf. Given the age of the abutment it would be difficult to ensure that the structural integrity of the heritage concrete structure could sustain direct adjacent ground works.

In consideration, due to the structural and management complexities which need to be addressed to keep the wharf operational, Option B will be more challenging than Option A..

The cost difference between these two locations is [REDACTED] over 20% of the overall CAPEX, for both structural material options; Option 1: new wharf structure with like-for-like hardwood timber (excluding abutment) and Option 2: new wharf structure with a mix of concrete



Whilst the MCA assessment is based on the worst case scenario where the original abutment is completely removed for Options A and B, shortly after the MCA assessment was completed, Council were exploring the possibility of constructing a new abutment north of the original abutment for Option B, i.e. adjacent to the current wharf entrance, between the original abutment and the historical shelter to the North.

This version of the report, Version 4.0, reports changes in advice about the risks associated with retaining the existing wharf abutment for certain options. Calibre have carried out further condition assessment relating to the abutment and have highlighted the risks and challenges associated with retaining this as part of the wharf redevelopment for either Option A or B, refer to Appendix E Calibre advice. This is in contrast to the April 2021 assessment, that indicated that the abutment for Option A would likely need to be demolished but for Option B could be retained.

Additionally, a new bathymetric survey was obtained for Option C, incorporated into Version 3.0 of this report, identifying that a wharf at Church Street (Option C), would have to be extended substantially further than previously considered and extensive dredging would potentially be required.

The new information that has come to light, since the MCA report was issued July 2020, would likely influence the outcome of the MCA if it were to be re-run, however this information was not considered in the original MCA. As the MCA has not been re-run to date the recommendation has not changed.

It will be critical to investigate the preferred options further, undertake further design and consultation, develop cost estimates to identify and incorporate cost risks for each of the shortlisted options, for Council to determine the preferred location and preferred structural material for the Akaroa Wharf Renewal project.

If factors influencing the MCA have changed since the original report in July 2020, then it may be advisable for Council to rerun the MCA to confirm prioritisation based on the most up to date information.

In summary, we recommend Options A, B and C are taken forward as the preferred preliminary location scenarios, and Option 1 and 2 are taken forward as the preferred preliminary structural scenarios.

### **Disclaimer**

Beca has prepared the MCA based on reports prepared by third parties acting on behalf of Council. Beca has not been contracted by Council to provide advice or assessment of these reports, and therefore has not undertaken such analysis.



Appendix A – Akaroa Wharf Renewal MCA Criteria Framework

# Akaroa Wharf Renewal Multi Criteria Analysis (MCA) – Criteria Framework

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## Objective

- To develop the Multi Criteria Analysis (MCA) framework “criteria” for Akaroa Wharf renewal, to assess the project delivery options in the MCA workshop.

## Draft Criteria Outline

- Criteria determined by legislative and policy drivers / objectives, project specific aims and key issues.
- Scoring of criteria, based on NZTA guidelines, ranges from -3 to 3

Effects criteria	Scoring (score after mitigation)
Significant adverse effect	-3
Moderate / major adverse effect	-2
Minor adverse effect	-1
Neutral / no change	0
Minor positive effect	1
Moderate / major positive effect	2
Significant positive effect	3

BCR criteria	Scoring (score after mitigation)
$BCR < 1.0$	-3
$1.0 \leq BCR < 1.5$	0
$1.5 \leq BCR$	3

- Importance factor to be applied to each criteria.
- Criteria apply to the delivery of the Akaroa Wharf Renewal project

## Draft Criteria

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### 1 Investment Objectives

Objectives	Performance against investment objective
<p>List each of the investment objectives in summary, together with a target where appropriate.</p> <p>Where appropriate, give details of how the objective is likely to be refined moving into the indicative business case to ensure it meets SMART principles.</p> <p>Akaroa Wharf Renewal Project Brief Objectives:</p> <ul style="list-style-type: none"><li>• To investigate need for and purpose of renewed wharf in consultation with the community</li><li>• To prepare costed concept plan for consultation</li><li>• To prepare developed design</li><li>• To acquire consents</li><li>• To tender the project</li><li>• To renew wharf</li></ul> <p>Suggested Project Objectives i.e. desired outcomes Council want to achieve through the renewal of the Akaroa wharf</p> <ul style="list-style-type: none"><li>• Funding objectives?</li><li>• Benefit Cost Ratio?</li><li>• Timing? i.e. works completed by a particular date?</li></ul>	<p>For each investment objective describe to what extent each delivery option is expected to meet the objective.</p>

<ul style="list-style-type: none"> <li>• Disruption?</li> <li>• Provide public connection to the harbour?</li> </ul>	
<p><b>Rationale for selection or rejection of alternative:</b></p>	<p>State whether the option is being selected for consideration or being rejected. Describe why an option is favoured over the other alternatives or why the any option is being rejected for further consideration.</p>



## 2 Implementability Objectives

Objective	Performance against investment objective	
<b>1. Feasibility</b>	<b>Technical</b>	<p>From a technical standpoint, how straightforward will it be to implement the option? Are any novel / untried / leading edge technologies involved? Might there be any risks involved in developing or implementing the option or significant associated hazards which may pose a health and safety risk in the design, build and final product?</p>
	<b>Consentability</b>	<p>Might there be notable property risks to delivery? Might the option affect other infrastructure providers and in what way? What consenting risks might there be which could affect delivery or cost risk? Are there any factors which might adversely affect the ability to operate or maintain the option over its projected life without major additional costs?</p>
	<b>Safety and Design</b>	<p>How feasible is the Constructability method? Are there resources available for the option? Does the option meet consent requirements? Does the option meet the change in sea level requirements? How disruptive is the delivery option?</p>
<b>2. Affordability</b>	<b>Financial</b>	<p>What are the funding risks of the alternative? Could the alternative be funded under traditional methods or would more novel approaches seem likely? Would there be potential cash flow risks which affect the desired delivery programme? Are their possible ongoing operating cost risks? If operating subsidies are required, how might these be funded?</p>
	<b>Operational/ Maintenance</b>	<p>Does the option meet funding requirements? What impact does the option have on the cost of delivery? Does the option maximise the community benefit? What impact does the option have on operation or maintainability? i.e. is it accessible?</p>

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**3. Public/Stakeholders**

Has the alternative been made public? If so, how acceptable is the alternative? Are there real or anticipated objections from particular sections of the community or from particular stakeholders?

What impact does the option have on the public, local residents and businesses and wharf operators? i.e. accessibility and wharf location

What is the impact on time/ programme?

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### 3 Assessment of Effects Objectives

Objective	Weighting	Performance against investment objective
<p><b>1. Safety</b></p> <p>1.1 Safety in construction delivery methodology</p> <p>1.2 Safety of public users</p>		<p>Explain your assessment. How will the option enhance safety for different types of wharf users? Will it involve gainers and losers in terms of safety? Are there impacts on personal safety / security? What will be the impact on fatal and serious?</p> <p>What H&amp;S impact does the delivery option have on the construction workers? What are the risks?</p>
<p><b>2. Community</b></p>	<p><b>Social</b></p> <p>1.1 Residential amenity</p> <p>1.2 Business amenity</p> <p>1.3 Visual amenity</p> <p>1.4 Severance / Connectivity</p> <p>1.5 Urban Form</p> <p>1.6 Community facilities</p>	<p>Could the option affect accessibility for the public, including access to jobs, communities, shops, services and other facilities?</p> <p>Could the delivery option negatively impact on community fatigue?</p> <p>Could the delivery option negatively impact on businesses? i.e. length of construction programme, restricted waterfront access to businesses due to congestion or construction hoarding</p>
	<p><b>Human Health</b></p>	<p>Could the option result in significant risk to human health related to noise, air quality or contaminated land?</p> <p><i>Is there any difference between the design or location options? If not, suggest this either be removed from the MCA criteria and reported separately, or included in the criteria but given a low weighting. Note, this would likely be scored equally for all options.</i></p>

<p><b>3. System Integration</b></p>		<p>Are there any system effects on infrastructure? Does the option impact on the Urban and Landscape design?</p> <p>How does the delivery option impact on local infrastructure? Will the wharf become more congested during the period of construction, especially in the summer months with increase in tourists?</p>
<p><b>4. Economy</b></p>		<p>How does the option impact economic growth? How well does the delivery option impact the development potential of adjacent land / attract new jobs / help existing businesses? i.e. length of delivery programme</p> <p>How does the option impact: Community growth? Tourist growth? Cruise ship growth? Fishing vessel effects? Retail opportunity? Location benefit (marketing)?</p>
<p><b>5. Cultural</b></p> <p>5.1 Cultural values 5.2 Heritage</p>		<p>Could the option impact on cultural and iwi values?</p> <p>How does the option impact on the existing wharf (historical value)? Will the option meet the architectural and aesthetic values?</p>
<p><b>6. Natural Environment</b></p> <p>6.1 Noise and vibration 6.2 Air quality 6.3 Ecological</p>		<p>To what extent does the option impact on the natural environment? <i>Is there any difference between the design or location options?</i></p>
<p><b>7. Built Environment</b></p>		<p>To what extent does the option impact on the environment? How does the option impact on the built environment once construction has been completed? How does the option impact on the built environment during construction?</p>

# B

Appendix B – MCA Workshop Package – Agenda, Objective and Scoring Guideline, Draft Worksheet, Attendees List

## Agenda

### Akaroa Wharf Renewal Project MCA Workshop Agenda

To be held 09 December 2019 at 1:30pm to 4:00pm

At the BNZ Centre, 120 Hereford Street, Christchurch Central City, Christchurch 8011

**Invitees:** Noelle Evans (Beca) – Chair Boyd Barber (CCC)  
Scott van Lieshout (Beca) Fiona Wykes (CCC)  
Paul Rogers (CCC) Richard Herdman (CCC)  
Kristine Bouw (CCC) Tom Arthur (Calibre Group)  
Paul Devlin (CCC) Matt Bonis (Planz Consultants)  
Kay Holder (CCC) Ian Fox (ECan)  
Luke Donnelly (WT Partnership)

**Apologies** Sylvia Docherty (CCC)

Item	Action
<b>1 Welcome and Introductions</b>	<b>KB</b>
<b>2 Project Recap</b>	<b>KB</b>
<b>3 Akaroa Wharf Renewal Options</b>	
<b>Option Overview and Key Points</b>	<b>NE</b>
<b>4 Option Evaluation</b>	
<b>MCA Criteria Overview</b>	<b>NE</b>
<b>Akaroa Option MCA Evaluation</b>	<b>All</b>
<b>MCA Criteria Importance factor weightings</b>	<b>NE</b>
<b>5 Summary and Next Steps</b>	<b>NE / KB</b>

# Akaroa Wharf Renewal Multi Criteria Analysis (MCA)

## Objective and Scoring Guideline

### Objective

The main Akaroa Wharf has reached the end of its functional and economic life.

The purpose of the Multi Criteria Analysis (MCA) workshop is to provide a robust method to score and rank the Akaroa Wharf Renewal options according to a range of “criteria”, enabling a preferred option to be generated.

The Multi Criteria Analysis (MCA) “criteria” is determined by legislative and policy drivers / objectives, project specific aims and key issues. The MCA criteria established for this workshop has been developed in collaboration with the project team, including key members from Council project team, Planz Consultants, Calibre Group, ECan, Council Heritage and Urban Design.

### Scoring Guideline

- Scoring of criteria, based on NZTA guidelines, ranges from -3 to 3

Effects criteria	Scoring
Significant adverse effect	-3
Moderate / major adverse effect	-2
Minor adverse effect	-1
Neutral / no change	0
Minor positive effect	1
Moderate / major positive effect	2
Significant positive effect	3

Benefit Cost Ratio (BCR) criteria	Scoring
$BCR < 1.0$	-3
$1.0 \leq BCR < 1.5$	0
$1.5 \leq BCR$	3

**AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS**

MCA Criteria enabling a preferred wharf option		Baseline Option	Preliminary Location Options				
MCA Topics	MCA Criteria	Option 0 Restore existing wharf in its current location, no change to structural form.	Option A Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width.	Option B Construct a new wharf along the north side of the existing wharf, and using the existing abutment	Option C Construct a new wharf off Church Street and on the site of the original town wharf	Option D Construct a new wharf from Akaroa Recreation Field/Childrens Bay	
<b>Project Description</b>		To renew the Akaroa Wharf when it reaches the end of its useful life. OPUIS recommendations is that the wharf has another 5-10 years life remaining. Demand and use is to be investigated to ensure fit for purpose design.					
Akaroa Wharf Renewal Project Objectives	Meet the current and future needs of community, visitors and commercial operators						
	Develop a functional marine asset to serve the community for the next 100 years						
	Recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa						
	Meet universal accessibility requirements						
	Provide for wharf services – fuel and waste						
	Consider operational and maintenance costs						
<b>Implementability</b>							
Feasibility	Technical	Procurement of suitable contractors					
		Wharf construction timeframe					
		Constructability (including structural effects, in consideration of proximity to other structures)					
		Construction risks - building materials (including procurement)					
		Construction set down area (considering marine effects, protected trees etc.)					
		Level of amenity during construction (disruption effect)					
	Consentability	Christchurch District Plan requirements					
		Canterbury Regional Coastal Plan requirements					
		Canterbury Regional Policy Statement					
		New Zealand Coastal Policy Statement					
		Akaroa Guide Tourism					
		Tourism strategy					
		CMA consenting requirements (i.e. structures and occupation within the CMA, disturbance and modification and ongoing maintenance requirements)					
		Meets change in sea level and king tide requirements					
		Privately held property i.e. privately owned wharf buildings (incl. piles)					
Archaeological approval							
Safety and design consideration	Are there any significant associated hazards which may pose a HRS risk in the design, build and final product? (not captured under Safety in Construction Methodology)						
Affordability	Financial	Construction cost (build programme)					
	Operational/Maintenance	Whole of life cost (including maintenance cost over asset lifetime (100 years))					
		Operation ease / Maintainability (i.e. accessibility)					
Public/ Stakeholders	Community approval						
	Key Stakeholder approval (wharf operators)						
	Alignment with feedback sought through public consultation						
<b>Assessment of Effects</b>							
Safety	Safety in construction methodology	Health and Safety - Construction workers					
		Health and Safety - Wharf users (businesses and public; local community and tourists)					
		Temporary traffic management, road closures etc. (community, businesses, tourists)					
Community	Social	Recreational and social activities (recreational fishing, boating, walking, local amenity asset)					
		Ability to cater for different usergroup (functional) requirements (current)					
		Ability to cater for future community demand					
		Accessibility					
		Impact on connectivity / public open space (local amenity)					
	Operational effect (for use of larger boats taking refuge)						
Human Health	Could any of the options result in significant risk to human health, related to noise, air quality or contaminated land (separate from Natural Environment below)? If there is no impact or difference between the above options, suggest this category be removed from the MCA criteria.						
Economy		Commercial impact on commercial operators of the wharf (i.e. cruise ship tenders, fishing vessels, sightseeing cruises, interchange of baggage, stores and commercial harvest)					
		Commercial impact on the businesses adjacent to existing wharf					
		Flexibility to cater for future demand (i.e. cruise ship, tourist & business growth)					



**AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS**

MCA Criteria enabling a preferred wharf option		Baseline Option	Preliminary Location Options			
MCA Topics	MCA Criteria	Option 0 Restore existing wharf in its current location, no change to structural form.	Option A Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width.	Option B Construct a new wharf along the north side of the existing wharf, and using the existing abutment	Option C Construct a new wharf off Church Street and on the site of the original town wharf	Option D Construct a new wharf from Akaroa Recreation Field/ Childrens Bay
Cultural	Cultural values	Local Runanga/ Maori Iwi cultural values	Placeholder - to be developed with Oruau Runanga in early 2020			
		Food resources/mahinga kai effect (fishing spots etc.)				
		Other local community cultural values				
	Heritage	Retain heritage values of existing wharf and Akaroa waterfront <small>i.e. ability to revitalise the existing wharf, with a high level of authenticity and integrity of the existing wharf - alignment with Conservation Plan/ minimising impact and retaining maximum value. Considering individual heritage values - Historical/Social, Cultural/Spiritual, Architecture/Aesthetic, Technological/Craftsmanship, Contextual, Archaeological.</small>				
		Retain any original fabric of the existing wharf, minimizing impact/maximising value <small>(including existing concrete abutment, which is to be retained in-situ)</small>				
		Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter <small>(The ICOMOS New Zealand Charter, Te Pumanawa o ICOMOS o Aotearoa Hei Tiaki I Nga Taonga Whenua Heke Iho o Nehe is a set of guidelines on cultural heritage conservation, produced by ICOMOS New Zealand)</small>				
		Alignment with Akaroa Heritage Area and Akaroa Historic Area (CCC and HNZPT respectively) <small>(Heritage New Zealand Pouhere Taonga (HNZPT) is a Crown entity with a membership of around 20,000 people that advocates for the protection of ancestral sites and heritage buildings in New Zealand.)</small>				
		Heritage values of adjoining Reserve, buildings and foreshore are maintained				
		Enabling public access to all parts of the wharf at all times				
Natural Environment	Noise and vibration effects (including noise effects on marine mammals i.e. dolphins)					
	Air quality effects					
	Ecological effects <small>(considering disturbance to biodiversity/ecosystems, disturbance/displacement of marine habitats, spawning areas etc., including excavation/dredging effects (during and post construction), spillage or materials into the CMA )</small>					
	Coastal impacts (i.e. cruise ship effects on Akaroa harbour)	(N.A. - applicable to location options)				
	Visual / landscape effect on natural environment					
Built Environment	System Integration	Local infrastructure effect				
		Tourist congestion effect	(N.A. - applicable to preliminary structural options)			
		Urban design and landscape effect <small>(i.e. on adjacent heritage buildings and businesses) Does Akaroa have a character area/ guidance?</small>				
	Environment	Environmental value (carbon footprint)				
		Environmental impact (i.e. Use of construction materials)				

**AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS**

MCA Criteria enabling a preferred wharf option		Preliminary Structural Options			
MCA Topics	MCA Criteria	Option 1: Full restoration of the existing wharf with like-for-like hardwood timber.	Option 2: Full replacement with a mix of concrete and hardwood timber (visible members would be hardwood).	Option 3: Full replacement with modern concrete.	
<b>Project Description</b>		To renew the Akaroa Wharf when it reaches the end of its useful life. OPUS recomm			
Akaroa Wharf Renewal Project Objectives	Meet the current and future needs of community, visitors and commercial operators				
	Develop a functional marine asset to serve the community for the next 100 years				
	Recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa				
	Meet universal accessibility requirements				
	Provide for wharf services – fuel and waste				
	Consider operational and maintenance costs				
<b>Implementability</b>					
Feasibility	Technical	Procurement of suitable contractors			
		Wharf construction timeframe			
		Constructability (including structural effects, in consideration of proximity to other structures)			
		Construction risks - building materials (including procurement)			
		Construction set down area (considering marine effects, protected trees etc.)			
		Level of amenity during construction (disruption effect)			
	Consentability	Christchurch District Plan requirements			
		Canterbury Regional Coastal Plan requirements			
		Canterbury Regional Policy Statement			
		New Zealand Coastal Policy Statement			
		Akaroa Guide Tourism			
		Tourism strategy			
		CMA consenting requirements (i.e. structures and occupation within the CMA, disturbance and modification and ongoing maintenance requirements)			
		Meets change in sea level and king tide requirements			
		Privately held property i.e. privately owned wharf buildings (incl. piles)			
		Archaeological approval			
	Safety and design consideration				
	Affordability	Financial	Construction cost (build programme)		
Operational/Maintenance		Whole of life cost (including maintenance cost over asset lifetime (100 years))			
		Operation ease / Maintainability (i.e. accessibility)			
Public/ Stakeholders	Community approval				
	Key Stakeholder approval (wharf operators)				
	Alignment with feedback sought through public consultation				
<b>Assessment of Effects</b>					
Safety	Safety in construction methodology	Health and Safety - Construction workers			
		Health and Safety - Wharf users (businesses and public; local community and tourists)			
		Temporary traffic management, road closures etc. (community, businesses, tourists)			
Community	Social	Recreational and social activities (recreational fishing, boating, walking, local amenity asset)			
		Ability to cater for different usergroup (functional) requirements (current)			
		Ability to cater for future community demand			
		Accessibility			
		Impact on connectivity / public open space (local amenity)			
		Operational effect (for use of larger boats taking refuge)			
	Human Health				
Economy		Commercial impact on commercial operators of the wharf (i.e. cruise ship tenders, fishing vessels, sightseeing cruises, interchange of baggage, stores and commercial harvest)			
		Commercial impact on the businesses adjacent to existing wharf			
		Flexibility to cater for future demand (i.e. cruise ship, tourist & business growth)			

**AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS**

MCA Criteria enabling a preferred wharf option		Preliminary Structural Options			
MCA Topics	MCA Criteria	Option 1: Full restoration of the existing wharf with like-for-like hardwood timber.	Option 2: Full replacement with a mix of concrete and hardwood timber (visible members would be hardwood).	Option 3: Full replacement with modern concrete.	
Cultural	Cultural values	Local Runanga/ Maori Iwi cultural values			
		Food resources/mahinga kai effect (fishing spots etc.)			
		Other local community cultural values			
	Heritage	Retain heritage values of existing wharf and Akaroa waterfront <small>i.e. ability to revitalise the existing wharf, with a high level of authenticity and integrity of the existing wharf - alignment with Conservation Plan/ minimising impact and retaining maximum value. Considering individual heritage values - Historical/Social, Cultural/Spiritual, Architecture/Aesthetic, Technological/Craftsmanship, Contextual, Archaeological.</small>			
		Retain any original fabric of the existing wharf, minimizing impact/maximising value <small>(including existing concrete abutment, which is to be retained in-situ)</small>			
		Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter <small>(The ICOMOS New Zealand Charter, Te Pumanawa o ICOMOS o Aotearoa Hei Tiaki   Nga Taonga Whenua Heke Iho o Nehe is a set of guidelines on cultural heritage conservation, produced by ICOMOS New Zealand)</small>			
		Alignment with Akaroa Heritage Area and Akaroa Historic Area (CCC and HNZPT respectively) <small>(Heritage New Zealand Pouhere Taonga (HNZPT) is a Crown entity with a membership of around 20,000 people that advocates for the protection of ancestral sites and heritage buildings in New Zealand.)</small>			
		Heritage values of adjoining Reserve, buildings and foreshore are maintained			
		Enabling public access to all parts of the wharf at all times			
Natural Environment	Noise and vibration effects (including noise effects on marine mammals i.e. dolphins)				
	Air quality effects				
	Ecological effects <small>(considering disturbance to biodiversity/ecosystems, disturbance/displacement of marine habitats, spawning areas etc., including excavation/dredging effects (during and post construction), spillage or materials into the CMA )</small>				
	Coastal impacts (i.e. cruise ship effects on Akaroa harbour)	(N/A - applicable to location options)			
	Visual / landscape effect on natural environment				
Built Environment	System Integration	Local infrastructure effect			
		Tourist congestion effect			
		Urban design and landscape effect <small>(i.e. on adjacent heritage buildings and businesses) Does Akaroa have a character area/ guidance?</small>			
	Environment	Environmental value (carbon footprint)			
		Environmental impact (i.e. Use of construction materials)			

## Akaroa Wharf Replacement – Multi Criteria Analysis Workshop

Monday 9<sup>th</sup> December

Rapaki Room, BNZ Business Partners Centre, Cashel Street, Christchurch 8011 [link to map](#)

### Attendees

	Name	Organisation	Role	Email
1	Noelle Evans	Beca	Workshop Facilitator	<a href="mailto:Noelle.Evans@beca.com">Noelle.Evans@beca.com</a>
2	Paul Devlin	Christchurch City Council	Project Sponsor	<a href="mailto:Paul.Devlin@ccc.govt.nz">Paul.Devlin@ccc.govt.nz</a>
3	Kay Holder	Christchurch City Council	Project Sponsor	<a href="mailto:Kay.Holder@ccc.govt.nz">Kay.Holder@ccc.govt.nz</a>
4	Kristine Bouw	Christchurch City Council	Project Manager	<a href="mailto:Kristine.Bouw@ccc.govt.nz">Kristine.Bouw@ccc.govt.nz</a>
5	Paul Rogers	Christchurch City Council	Project Advisor	<a href="mailto:paul.rogers@spireconsulting.co.nz">paul.rogers@spireconsulting.co.nz</a>
6	Tom Arthur	Calibre	Structural Engineer	<a href="mailto:Tom.Arthur@calibregroup.com">Tom.Arthur@calibregroup.com</a>
7	William Southby	Calibre	Structural Engineer	<a href="mailto:William.Southby@calibregroup.com">William.Southby@calibregroup.com</a>
8	Boyd Barber	Christchurch City Council	Urban Design	<a href="mailto:Boyd.Barber@ccc.govt.nz">Boyd.Barber@ccc.govt.nz</a>
9	Matt Bonis	Planz	Planning/Consent	<a href="mailto:matt@planzconsultants.co.nz">matt@planzconsultants.co.nz</a>
10	Livi Whyte	Planz	Planning/Consent	<a href="mailto:livi@planzconsultants.co.nz">livi@planzconsultants.co.nz</a>
11	Ian Fox	3Can	Harbourmaster	<a href="mailto:Ian.Fox@ecan.govt.nz">Ian.Fox@ecan.govt.nz</a>
12	Luke Donnelly	WT Partnership	Director, QS	<a href="mailto:luke.donnelly@wtpartnership.co.nz">luke.donnelly@wtpartnership.co.nz</a>
13	Fiona Wykes	Christchurch City Council	Heritage	<a href="mailto:Fiona.Wykes@ccc.govt.nz">Fiona.Wykes@ccc.govt.nz</a>
14	Richard Herdman	Christchurch City Council	Heritage	<a href="mailto:Richard.Herdman@ccc.govt.nz">Richard.Herdman@ccc.govt.nz</a>
15	Jamie Stewart	Christchurch City Council	Community Board member	<a href="mailto:Jamie.Stewart@ccc.govt.nz">Jamie.Stewart@ccc.govt.nz</a>
16	Nigel Harrison	Christchurch City Council	Community Board member	<a href="mailto:Nigel.Harrison@ccc.govt.nz">Nigel.Harrison@ccc.govt.nz</a>
17	Tori Peden	Christchurch City Council	Community Board Chair	<a href="mailto:Tori.Peden@ccc.govt.nz">Tori.Peden@ccc.govt.nz</a>
18	Scott Van Lieshout	Beca	Workshop Facilitator Support	<a href="mailto:Scott.vanLieshout@beca.com">Scott.vanLieshout@beca.com</a>

# C

Appendix C – Final MCA Worksheet

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AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS								
MCA Criteria enabling a preferred wharf option								
MCA Topics	MCA Criteria	% Weighting	% Weighting	Baseline Option Option 0	Option A	Preliminary Location Options Option B	Option C	Option D
Project Description	To renew the Akaroa Wharf when it reaches the end of its useful life. OPUS recommendations is that the wharf has another 5-10 years life remaining. Demand and use is to be investigated to ensure fit for purpose design.							
Project Objectives								
Akaroa Wharf Renewal Project Objectives	Meet the current and future needs of community, visitors and commercial operators (i.e. functionality, scale and structure)	VH	100.00	-3	3	3	3	3
	Comments			It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, structural form, rising sea levels and degradation.	A new wharf will be designed to the latest design standards, taking into consideration the changing sea level, and to meet the current and future functional requirements.	A new wharf will be designed to the latest design standards, taking into consideration the changing sea level, and to meet the current and future functional requirements.	A new wharf will be designed to the latest design standards, taking into consideration the changing sea level, and to meet the current and future functional requirements.	A new wharf will be designed to the latest design standards, taking into consideration the changing sea level, and to meet the current and future functional requirements.
	Develop a functional marine asset to serve the community for the next 100 years	VH	100.00	-2	3	3	3	-1
	Comments			The existing wharf is currently reaching maximum capacity at peak tourist (cruise boat visitor) times. It is close to the end of its design life, and the expectation is that it will not last another 100 years.	A new wharf will be designed for a life span of 100 years.	A new wharf will be designed for a life span of 100 years.	A new wharf will be designed for a life span of 100 years.	A new wharf will be designed for a life span of 100 years, however dredging will be required over the lifetime of the wharf at this location. Dredging shifts the activity centre, and is prone to sea level rise. The wharf will be less resilient.
	Opportunity to recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa, the wider cultural landscape and Mana Whenua identity and values	M	50.00	2	1	1	0	-1
	Comments			A substantial amount of new timber will be required to restore the original wharf. As the original species cannot be sourced, the timber will be replaced with timber that closely resembles the original. It will look similar, and meet other heritage criteria, but the materiality heritage will be lost.	The look and feel of the wharf will be retained, by maintaining the wharf in the same location and alignment. Heritage relating to the original materials will be lost.	The look and feel of the wharf will be retained, by maintaining the wharf in a similar position and alignment. Heritage relating to the original materials will be lost.	The heritage relationship would be lost, as the new site is not on or adjacent to the original site.	The heritage relationship would be lost, as the new site is not on or adjacent to the original site. Would have the largest negative impact.
	Meet universal accessibility requirements (i.e. making the wharf accessible to all people of all ages, size and mobility)	VH	100.00	-2	3	3	3	-1
	Comments			The existing wharf is narrow, and extremely congested at peak tourist (cruise boat visitor) times. The timber deck surface is uneven, a number of boards are a tripping hazard.	A new wharf will be designed to meet universal accessibility requirements.	A new wharf will be designed to meet universal accessibility requirements.	A new wharf will be designed to meet universal accessibility requirements.	A new wharf will be designed to meet universal accessibility requirements. This location is more remote/ not as well connected to the town centre compared to the other location options.
	Provide for wharf services – fuel, power, water and waste (commercial use)	H	75.00	-1	3	3	3	3
	Comments			Currently failing with some ferries. High cost to rectify / maintain.	A new structure will allow for new service connections, to meet current wharf requirements and with built-in flexibility.	A new structure will allow for new service connections, to meet current wharf requirements.	A new structure will allow for new service connections, to meet current wharf requirements.	A new structure will allow for new service connections, to meet current wharf requirements.
Consider operational and maintenance costs	H	75.00	-3	3	3	3	-3	
Comments			Exponential cost associated with maintaining the existing wharf for the next 100 years. It is close to the end of its design life and it is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, structural form, rising sea levels and degradation.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected.	A new wharf will be designed for a life span of 100 years. Ongoing dredging throughout the wharf lifespan will cause significant maintenance costs.	
Project Objectives Score	NZTA Base Score & Weighting			-900	1400	1400	1350	50
Implementability Objectives								
Technical	Procurement of suitable contractors	VH	100.00	0	1	1	1	1
	Comments			Less businesses available with capability to build traditional wharfs.	Scarcity of wharf construction contractors available in New Zealand market.	Scarcity of wharf construction contractors available in New Zealand market.	Scarcity of wharf construction contractors available in New Zealand market.	Scarcity of wharf construction contractors available in New Zealand market.
	Wharf construction timeframe (i.e. period of disruption, strictly period of time taken to construct)	M	50.00	-1	0	0	1	1
	Comments			Large disruption expected, over a substantial period of time due to the complexity of restoring the existing wharf.	Large disruption expected, over a substantial period of time due to the complexity of constructing atop of the existing wharf. Not anticipated to be as complex as restoring the existing wharf.	Large disruption expected, over a substantial period of time due to the complexity of constructing North and alongside the existing wharf. Not anticipated to be as complex as restoring the existing wharf. Expect duration would be similar to constructing atop of the existing wharf.	No connection to existing wharf. Less complexity/ staging involved. Shorter construction period anticipated. Existing wharf would be kept operational until new wharf is available.	No connection to existing wharf. Less complexity/ staging involved. Shorter construction period anticipated. Dredging would not have a major impact on timeframe. Existing wharf would be kept operational until new wharf is available.
	Constructability (including structural effects, in consideration of proximity to other structures)	M	50.00	-2	-2	-1	1	-1
Comments			Major challenges in structure and management, to keep wharf operational during construction.	Major challenges in structure and management, to keep wharf operational during construction.	Less challenging than building atop of existing wharf, however will still have construction management challenges around abutment, small proximity for construction.	Note there will be seawall and landside buildings challenges.	Anticipate challenges relating to the finger jetty structure.	
Construction risks - building materials (including procurement)								
Comments								
This category is not assessed as there is no difference between the above options, in assessing Construction risks with respect to building materials.								

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS								
MCA Criteria enabling a preferred wharf option								
MCA Topics	MCA Criteria	H Weighting	% Weighting	Baseline Option	Option A	Preliminary Location Options	Option D	
				Option 0	Option A	Option B	Option C	Option D
				Restore existing wharf in its current location, no change to structural form.	Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf along the north side of the existing wharf, using the existing abutment. Existing wharf will be demolished. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf off Church Street and on the site of the original town wharf. Existing wharf will be demolished. Abutment would be retained.	Construct a new wharf from Akaroa Recreation Field/ Children's Bay. Existing wharf will be demolished. Abutment would be retained.
Feasibility	Construction set down area (considering marine effects, protected trees etc.)	H	75.00	-2	-2	-2	-2	-1
		Comments		Challenging, as potential nearby set down areas are protected Heritage sites.	Challenging, as potential nearby set down areas are protected Heritage sites.	Challenging, as potential nearby set down areas are protected Heritage sites.	Challenging due to heritage and proximity.	Easiest of all options, with larger, more open spaces.
	Level of amenity during construction; wharf users	M	50.00	-3	-3	-1	3	3
		Comments		Construction will constrain functionality of existing wharf. Temporary walkway structure is likely to be required to maintain access to outer end of wharf during construction	Construction will constrain functionality of existing wharf. Temporary walkway structure is likely to be required to maintain access to outer end of wharf during construction	Construction will constrain wharf access and functionality of existing wharf, especially around the abutment. This will be felt to a lesser extent when compared to constructing atop of the existing wharf.	As the new wharf will not be close to commercial operators, the existing wharf will remain fully operational during construction, providing full amenities. May need to move existing moorings at the site of the new wharf.	As the new wharf will not be close to commercial operators, the existing wharf will remain fully operational during construction, providing full amenities. May need to move existing moorings at the site of the new wharf.
	Level of amenity during construction; proximate sensitive users	L	25.00	-1	-2	-2	-3	-2
		Comments		Some disruption will be felt.	A greater level of disruption will be felt, due to constructing a higher platform atop of the existing wharf.	A greater level of disruption will be felt, as access to the existing wharf will be restricted	Challenging as the area is likely to be highly congested, and therefore will cause the largest amount of disruption of the options presented.	Impacts recreational boat launch. There is limited access at high tide.
	Christchurch District Plan requirements	VH	100.00	1	1	0	-1	-3
		Comments		Hazards challenging to manage. Great from a heritage perspective.	Hazards challenging to manage. Great from a heritage perspective.	Proximity issues.	Urban design issues.	A lot of challenges with location.
	Canterbury Regional Coastal Plan requirements (Based on current Coastal Plan)	VH	100.00	0	1	-1	-1	-3
		Comments		The coastal plan will be unaffected, as no changes or modifications required to coastal environment.		Dredging required.	A new structure in the CMA, and associated dredging.	More significant impact on coastal environment. Ongoing requirement for dredging.
	Canterbury Regional Policy Statement (Recreational and Social Outcomes)	VH	100.00	2	2	0	-1	-2
		Comments		Balances recreational and social.	Balances recreational and social.		Minor modification of natural heritage environment	Significant change in natural heritage environment
New Zealand Coastal Policy Statement	VH	100.00	0	0	0	-1	-2	
	Comments		No change in Akaroa coastline.	No change in Akaroa coastline.	Minor change in Akaroa coastline.	New infrastructure on coastline.	New infrastructure on coastline, and ongoing effects of dredging.	
Akaroa Guide Tourism (i.e. character and form)	M	50.00	0	2	2	2	-2	
	Comments		Doesn't allow for future growth for the community. Noting that this could be both positive or negative impact, dependent on community aspirations.	Allowance for growth within the township setting.	Allowance for growth within the township setting.	Allowance for growth within the township setting.	This new location would have a negative effect on local form and growth of the township	
Tourism strategy (Targeting greater tourism growth, in Akaroa and regionally)	M	50.00	0	0	0	0	0	
	Comments		All options allow for inbound tourist and business growth. The main road into Akaroa, SH75, is considered the single most major choke point restricting growth for the local region.	All options allow for inbound tourist and business growth. The main road into Akaroa, SH75, is considered the single most major choke point restricting growth for the local region.	All options allow for inbound tourist and business growth. The main road into Akaroa, SH75, is considered the single most major choke point restricting growth for the local region.	All options allow for inbound tourist and business growth. The main road into Akaroa, SH75, is considered the single most major choke point restricting growth for the local region.	All options allow for inbound tourist and business growth. The main road into Akaroa, SH75, is considered the single most major choke point restricting growth for the local region.	
Meets change in sea level and king tide requirements	VH	100.00	-3	2	2	2	-1	
	Comments		The existing wharf platform will fail to meet the required design standards for sea level rise and king tides.	A new wharf will be designed to suit level of risk, per council regulations.	A new wharf will be designed to suit level of risk, per council regulations.	A new wharf will be designed to suit level of risk, per council regulations.	A new wharf will be designed to suit level of risk, per council regulations however the location has known resilience issues, and is more prone to king tides and landside flooding.	
Privately held property i.e. privately owned wharf buildings (incl. piles)	M	50.00	0	-3	-3	-3	-3	
	Comments		No effect on dwellings/ buildings or license holders, atop of existing wharf.	Privately owned premises are reliant on Council owned piles. It is envisaged that it will stay the same. The perception is that the privately owned businesses and license holders may assume they can relocate in the same place after the new wharf is constructed.	Consideration needed for privately owned premises.	Consideration needed for privately owned premises.	Consideration needed for privately owned premises.	
Archaeological approval	H	75.00	-2	-2	-2	-2	-3	
	Comments		Replacing virtually all materials.	No original materials will remain. Opportunity to repurpose existing materials in new construction, for visual effect.	No original materials will remain. Opportunity to repurpose existing materials in new construction, for visual effect.	No original materials will remain. Opportunity to repurpose existing materials in new construction, for visual effect.	No original materials will remain. Opportunity to repurpose existing materials in new construction, for visual effect.	
Safety and design consideration	This category is not assessed as there is no difference between the options presented.			This category is not assessed as there is no difference between the above options, in assessing Safety and Design considerations, in the design, build and final product. Safety in Construction Methodology is considered below.				

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS								
MCA Criteria enabling a preferred wharf option								
MCA Topics	MCA Criteria	% Weighting	% Weighting	Baseline Option	Option A	Preliminary Location Options	Option D	
				Option 0	Option B	Option C		
Affordability	Financial	Construction cost (build programme)	H 75.00	-2	-1	0	1	1
		Comments		Challenge managing interface between construction and public users, will drive up cost. Increased legal risks.	Challenge managing interface between construction and public users, will drive up cost. Increased legal risks.	Need to manage interface at entry point/ the abutment.	Completely removed from existing wharf, less complex to manage.	Completely removed from existing wharf, less complex to manage.
	Operational/ Maintenance	Whole of life cost (including maintenance cost over asset lifetime (100 years) Note: locally sourced timbers for Governors bay will approx. 40 yr. life expectancy)	H 75.00	-1	1	1	1	-1
		Comments		The existing wharf is close to the end of its design life, and the expectation is that it will not last another 100 years. Due to the current degradation of the structural form, platform level and sea level rise, it would be very costly to maintain over another 100 years at it would need to be extensively rebuilt.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected. Whole of life cost for new build would be less costly than restoring the existing wharf near it's end of life.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected. Whole of life cost for new build would be less costly than restoring the existing wharf near it's end of life.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected. Whole of life cost for new build would be less costly than restoring the existing wharf near it's end of life.	A new wharf will be designed for a life span of 100 years. General maintenance will be expected. The requirement of ongoing dredging significantly increases maintenance costs.
		Maintainability (i.e. accessibility)	H 75.00	-2	-1	0	0	0
		Comments		Due to the current platform level and sea level rise, access will be more and more difficult.	Access will have some limitations, due to being located above the existing wharf and reuse of existing piles.	Clear delineation from existing wharf and piles.	Clear delineation from existing wharf and piles.	Clear delineation from existing wharf and piles.
Public/ Stakeholders	Community support							
	Comments		Based on community feedback and Council led public consultation, this option is regarded favourably by the community. No score is given, as public consultation is ongoing. Further consultation is planned, following this MCA assessment.	Based on community feedback and Council led public consultation, this option is regarded favourably by the community. No score is given, as public consultation is ongoing. Further consultation is planned, following this MCA assessment.	Based on community feedback and Council led public consultation, this option is regarded favourably by the community, but majority of opinion is in support of maintaining the wharf in the same location as the existing wharf. No score is given, as public consultation is ongoing. Further consultation is planned, following this MCA assessment.	Based on community feedback and Council led public consultation, this option is not regarded as a good option by the community. No score is given, as public consultation is ongoing. Further consultation is planned, following this MCA assessment.	Based on community feedback and Council led public consultation, this option is the least favourable option by the community. No score is given, as public consultation is ongoing. Further consultation is planned, following this MCA assessment.	
	Key stakeholder support (wharf operators)	H 75.00	-1	2	2	2	-1	
	Comments		Based on community feedback, wharf operators are insistent on better recreational access and a wharf designed to meet business/ operator needs.	Based on community feedback, wharf operators are insistent on better recreational access and a wharf designed to meet business/ operator needs.	Based on community feedback, wharf operators are insistent on better recreational access and a wharf designed to meet business/ operator needs.	Based on community feedback, wharf operators are insistent on better recreational access and a wharf designed to meet business/ operator needs.	Based on feedback from the wharf operators, this option would take operations too far away from the town centre.	
Implementability Objectives Score		NZTA Base Score & Weighting		-1075	200	0	100	-1525
Assessment of Effects								
Safety	Safety in construction methodology	Health and Safety - Construction workers	VH 100.00	-1	-1	-1	0	0
		Comments		Considered higher comparative risk for construction workers. Safety risks arise due to proximity to public wharf users, especially at peak tourist times. Risks associated in working with old materials, additional complexity, staging required on existing wharf and resulting in a longer construction period.	Considered higher comparative risk for construction workers. Safety risks arise due to proximity to public wharf users, especially at peak tourist times, additional complexity, staging required and longer construction period due to restricted access on southern side causing congestion with public users.	Considered higher comparative risk for construction workers. Safety risks arise due to proximity to public wharf users, especially at peak tourist times, additional complexity, staging required and longer construction period due to restricted access on southern side causing congestion with public users.	Typical risks associated with construction. Ease of separate site, removed from existing wharf, providing a large uninterrupted site and shorter construction timeframe.	Typical risks associated with construction. Ease of separate site, removed from existing wharf, providing a large uninterrupted site and shorter construction timeframe.
		Health and Safety - Wharf users (businesses and public; local community and tourists)	VH 100.00	-3	-3	-2	-1	-1
		Comments		Large amount of congestion causing increase in hazards for public wharf users, especially at peak tourist (cruise ship) times.	Large amount of congestion causing increase in hazards for public wharf users, especially at peak tourist (cruise ship) times.	Brief period of congestion at abutment which interfaces with existing wharf.	Negative impact on public wharf users and local businesses.	Negative impact on slipway and recreational users.
		Temporary traffic management, road closures etc. (community, businesses, tourists)	H 75.00	-1	-1	-2	-3	-3
		Comments		Minor negative effects due to complexity of site and potential for congestion. Assuming materials and plant will be barged in from seaside.	Minor negative effects due to complexity of site and potential for congestion. Assuming materials and plant will be barged in from seaside.	Moderate negative effects due to complexity of site and potential for congestion. Assuming materials and plant will be barged in from seaside.	Signification negative effects as there is no flexibility in space. High potential for congestion at intersection. There will be reduced traffic connectivity with that specific area being congested. Assuming materials and plant will be barged in from seaside.	Signification negative effects as there is no flexibility in space. Negative impact on slipway and recreational users, access is limited at high tide. Assuming materials and plant will be barged in from seaside.
	Recreational and social activities (recreational fishing, boating, walking, local amenity asset)	M 50.00	-2	2	2	2	1	
	Comments		Constrained final form, does not allow for future growth.	Opportunity to provide for all recreational and social activities.	Opportunity to provide for all recreational and social activities.	Opportunity to provide for all recreational and social activities.	Opportunity to provide for all recreational and social activities. Location removed from Akaroa township.	
	Ability to cater for different user group (functional) requirements (current)	M 50.00	-1	2	2	2	1	
	Comments		Doesn't cater for all user groups.	Ability to cater for all user groups wharf functional requirements, subject to budget.	Ability to cater for all user groups wharf functional requirements, subject to budget.	Ability to cater for all user groups wharf functional requirements, subject to budget.	Ability to cater for all user groups wharf functional requirements, subject to budget. Location/proximity to town centre and water-side access is challenging.	



AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS									
MCA Criteria enabling a preferred wharf option									
MCA Topics	MCA Criteria	% Weighting	% Weighting	Baseline Option	Preliminary Location Options				
				Option 0	Option A	Option B	Option C	Option D	
				Restore existing wharf in its current location, no change to structural form.	Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf along the north side of the existing wharf, using the existing abutment. Existing wharf will be demolished. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf off Church Street and on the site of the original town wharf. Existing wharf will be demolished. Abutment would be retained.	Construct a new wharf from Akaroa Recreation Field/ Children's Bay. Existing wharf would be demolished. Abutment would be retained.	
Community	Social	Ability to cater for future community demand	VH	100.00	-3	2	2	2	1
			Comments	Existing wharf has reached maximum capacity, unable to meet future demand.	A new wharf will be designed to cater for future community demand.	A new wharf will be designed to cater for future community demand.	A new wharf will be designed to cater for future community demand.	A new wharf will be designed to cater for future community demand. Extent of effects from dredging are unknown, i.e. impact on marine life, local eco system, resilience to flooding. Less desirable impact than alternative new wharf locations.	
		Enabling public access to all parts of the wharf at all times, and doesn't compromise access to the beach / water	H	75.00	-2	2	2	2	2
	Tourist congestion effect	Comments	Constrained in it's current form.	Dependent on design.	Dependent on design.	Dependent on design.	Dependent on design.		
		H	75.00	-2	2	2	2	2	
		Comments	Existing wharf is currently at capacity at peak tourist (cruise ship) times.	Addressed in design, through use of traffic modelling and forecasting. New wharf will be an improvement, but won't be able to eliminate all concerns. Historic buildings on the waterfront will still cause congestion.	Addressed in design, through use of traffic modelling and forecasting. New wharf will be an improvement, but won't be able to eliminate all concerns. Historic buildings on the waterfront will still cause congestion.	Addressed in design, through use of traffic modelling and forecasting. New wharf will be an improvement, but won't be able to eliminate all concerns. It was noted efficiencies can be achieved in network, through use of a 4-way connection, not a T-intersection.	Addressed in design, through use of traffic modelling and forecasting. New wharf will be an improvement, but won't be able to eliminate all concerns.		
Impact on connectivity / public open space (local amenity)	M	50.00	0	0	0	2	-1		
	Comments	No change, as no change in location.	No change, as in the same location as the existing wharf.	No change, as same connection to land, via abutment. Very similar location	Increase area of open space	Negative impact on recreational ground use, tarparking and slipway.			
Operational effect (for use of larger boats taking refuge)	M	50.00	1	3	3	3	1		
	Comments	Can be improved, to a lesser extent.	A new wharf will have the ability to cater for larger vessels.	A new wharf will have the ability to cater for larger vessels.	A new wharf will have the ability to cater for larger vessels.	A new wharf will have the ability to cater for larger vessels. Shallow water restricts access, especially for larger vessels.			
Human Health	This category is not assessed as there is no difference between the options presented.			This category is not assessed as there is no difference between the above options, in assessing effects on Human Health (i.e. noise, air quality or contaminated land). The effects on Natural Environment are considered below.					
Economy	Commercial impact on commercial operators of the wharf (i.e. cruise ship tenders, fishing vessels, sightseeing cruises, interchange of baggage, stores and commercial harvest)	H	75.00	-1	2	2	2	2	
		Comments	It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, sea level rise and flooding. Deterioration will accelerate over time.	A new wharf will be able to provide for all the functional requirements of the commercial operators.	A new wharf will be able to provide for all the functional requirements of the commercial operators.	A new wharf will be able to provide for all the functional requirements of the commercial operators.	A new wharf will be able to provide for all the functional requirements of the commercial operators.		
	Commercial impact on the businesses adjacent to existing wharf (foreshore)	M	50.00	-2	2	2	2	-3	
Flexibility to cater for future demand (i.e. cruise ship, tourist & business growth)	Comments	It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, sea level rise and flooding. Deterioration will accelerate over time. Functionality of wharf is key to tourist industry, needs to be kept viable.	Close proximity to businesses adjacent to existing wharf.	Close proximity to businesses adjacent to existing wharf.	Close proximity to businesses adjacent to existing wharf.	Location relative to the town centre will have a significant negative impact on the businesses adjacent to the existing wharf.			
	H	75.00	-3	0	0	0	-1		
	Comments	It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, sea level rise and flooding. Deterioration will accelerate over time. Functionality of wharf is key to tourist industry, needs to be kept viable.	Dealt with in design. This location does not impact on flexibility.	Dealt with in design. This location does not impact on flexibility.	Dealt with in design. This location does not impact on flexibility.	The ongoing requirement for dredging limits flexibility.			
Cultural values	Local Runanga/ Maori Iwi cultural values (large significance in beach access)	H	75.00	1	3	3	2	3	
		Comments	No change Acknowledge there is some, but limited opportunity to integrate mana whenua identity and values into restoring the existing wharf. There is greater opportunity to integrate these values into a new wharf.	Provides an opportunity to integrate mana whenua identity and values into the design of the wharf and acknowledge the significance of the foreshore location, and connection to Britomart reserve. The existing location is important. The opportunity to tie the Taipure history, identity and values all together would be very powerful. Note, this is not a wahi tapu site, and there is no issue with continuing use and activities of the wharf, such as use of toilets contained on the wharf.	Provides an opportunity to integrate mana whenua identity and values into the design of the wharf, and acknowledge the significance of the connection of the foreshore location to Britomart reserve.	Provides an opportunity to integrate mana whenua identity and values into the design of the wharf. This location does not provide the opportunity to acknowledge the significance of Britomart reserve to Taipure.	Provides an opportunity to integrate mana whenua identity and values into the design of the wharf. This location does not provide the opportunity to acknowledge the significance of Britomart reserve to Taipure.		
Food resources/mahinga kai effect (fishing spots etc.)	Comments	H	75.00	3	0	0	0	-3	
		Comments	No change	Considered to have a minor adverse environmental impact on mahinga kai, extent of impact unknown. <b>Advice to be sought from the Taipure Committee</b>	Considered to have a minor adverse environmental impact on mahinga kai, extent of impact unknown. <b>Advice to be sought from the Taipure Committee</b>	Considered to have a minor adverse environmental impact on mahinga kai, extent of impact unknown. <b>Advice to be sought from the Taipure Committee</b>	Significant adverse effect on mahinga kai values, this option is not supported by Onuku Runanga. <b>Advice to be sought from the Taipure Committee</b>		

**AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS**

MCA Criteria enabling a preferred wharf option									
MCA Topics	MCA Criteria	% Weighting	Baseline Option	Option 0	Option A	Option B	Option C	Option D	
		L 25.00		Restore existing wharf in its current location, no change to structural form.	Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf along the north side of the existing wharf, using the existing abutment. Existing wharf will be demolished. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf off Church Street and on the site of the original town wharf. Existing wharf will be demolished. Abutment would be retained.	Construct a new wharf from Akaroa Recreation Field/Children's Bay. Existing wharf will be demolished. Abutment would be retained.	
	Other local community cultural values		Comments	No change.	Same location as existing wharf, with improvements made to better accommodate users. Same level of amenity for a new wharf, in any location.	Same connection to land, via abutment. Similar location, with improvements made to better accommodate users. Same level of amenity for a new wharf, in any location.	Positive for local businesses. Minor impact on recreational fishing, some moorings would need to be moved for safety/ navigation purposes. Same level of amenity for a new wharf, in any location.	Significant impact on sports field and recreational fishing. Approximately 15-20 consented moorings would need to be moved for safety/ navigation purposes. This would be at no cost to owner. Opportunity to redesign moorings, creating more space for boat access. Same level of amenity for a new wharf, in any location.	
Cultural	Retain heritage values of existing wharf and Akaroa waterfront  i.e. ability to revitalise the existing wharf, with a high level of authenticity and integrity of the existing wharf - alignment with Conservation Plan/ minimising impact and retaining maximum value. Considering individual heritage values - Historical/Social, Cultural/Spiritual, Architectural/Aesthetic, Technological/Craftsmanship, Contextual, Archaeological.	H 75.00	Comments	A large extent of the heritage values would be retained through restoring the existing wharf, and there is the ability to achieve a high level of authenticity. This option would provide the closest resemblance to the original wharf.	Due to the condition of the existing abutment and the requirement to meet sea level rise and king tide design requirements, replacement of the original abutment would be required. The integrity of the heritage context and form and placement is degraded to a modest degree.	Due to the condition of the existing abutment and the requirement to meet sea level rise and king tide design requirements, replacement of the original abutment would be required. The integrity of the heritage context and form and placement is degraded to a material degree, due to realignment.	Heritage value would be retained through maintaining the existing abutment. Heritage values would largely be lost, with change in wharf alignment and the new location, noting that it is still in close proximity to the town centre. Narrative in terms of original location is very limited.	Heritage value would be retained through maintaining the existing abutment. Heritage values would largely be lost with change in wharf alignment, new location, and severed connection with the town centre.	
	Retain any original fabric of the existing wharf, minimizing impact/maximising value  (including existing concrete abutment, which is to be retained in-situ)	H 75.00	Comments	Restoration will be with new materials, however the original materials will be retained and reused or repurposed in the restoration where possible, providing links to the heritage values.	The new wharf will be constructed largely of new materials and will have the form, i.e. look and feel of a new structure. Existing piles may be reused depending on condition. The original abutment would be removed, and a new abutment would be required to meet the higher platform level. Wholesale loss of fabric.	The new wharf will be constructed largely of new materials and will have the form, i.e. look and feel of a new structure. Existing piles may be reused depending on condition. The original abutment would be removed, and a new abutment would be required to meet the higher platform level. Wholesale loss of fabric.	The new wharf will be constructed from new materials and will have the form, i.e. look and feel of a new structure. The original abutment would be retained, with no modifications made.	The new wharf will be constructed from new materials and will have the form, i.e. look and feel of a new structure. The original abutment would be retained, with no modifications made.	
	Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter (Ensuring heritage is physical accessibility and providing an understanding of places through storytelling, ICOMOS relates to maintaining materials)  (The ICOMOS New Zealand Charter, The Pumanawa o ICOMOS o Aotearoa Hei Tiaki I Nga Taonga Whenua Heke Iho o Nehe is a set of guidelines on cultural heritage conservation, produced by ICOMOS New Zealand)	H 75.00	Comments	New materials would be used. Considered neutral. Dependent on how matapere design and ICOMOS are used to restore i.e. contrast, cultural narrative vs retaining existing heritage character based on function over form.	The abutment would need to be replaced, which would negatively impact the authenticity and integrity and therefore reduce the heritage value. New materials would be used, negatively impacting the heritage connection and values. Keeps form and alignment retaining some intangible heritage values and associations. Dependent on how cultural narrative design and ICOMOS are used to rebuild i.e. cultural narrative vs retaining existing heritage character based on function over form.	The abutment would need to be replaced, which would negatively impact the authenticity and integrity and therefore reduce the heritage value. New materials would be used, negatively impacting the heritage connection and values. Complete loss of form and alignment, and the intangible heritage values and associations. Dependent on how cultural narrative design and ICOMOS are used to rebuild i.e. cultural narrative vs retaining existing heritage character based on function over form.	This option provides the ability to maintain abutment, however new materials would be used, the connection to historical wharf would be lost, and the intergenerational connection would be broken having a significant negative impact on the heritage connection and values. Reduced ability to accommodate ICOMOS.	This option provides the ability to maintain abutment, however new materials would be used, the connection to historical wharf would be lost, and the intergenerational connection would be broken having a significant negative impact on the heritage connection and values. Reduced ability to accommodate ICOMOS.	
	Alignment with Akaroa Heritage Area and Akaroa Historic Area (CCC and HNZPT respectively)  (Heritage New Zealand Pouhere Taonga (HNZPT) is a Crown entity with a membership of around 20,000 people that advocates for the protection of ancestral sites and heritage buildings in New Zealand.)	H 75.00	Comments	It retains the wharf in the existing location and the same heritage values.	As the wharf is positioned in the same location it retains the majority of the heritage values for the wider area. Character remains the same, the difference in location between Options A & B is considered negligible.	As the wharf is positioned in the same location it retains the majority of the heritage values for the wider area. Character remains the same, the difference in location between Options A & B is considered negligible.	Ability to retain the existing abutment with no modification for heritage value. The location of the wharf is considered a focal point, moving the wharf would change the social and commercial function of the waterfront, impacting the community. There are substantial implications in terms of having the structure located in an area currently unmodified - i.e. adjoining broodways will raise issues in terms of loss of connections and impediment in terms of views within waterfront.	Ability to retain the existing abutment with no modification for heritage value. The location of the wharf is considered a focal point, there has never been anything of this scale in the area, no logical context moving the wharf would change the social and commercial function of the waterfront, impacting the community. It removes the substantial heritage item (and space) from its waterfront context and relocates the wharf to an area that has never had those connections.	
	Heritage and cultural values of adjoining Reserve, buildings and foreshore are maintained	H 75.00	Comments	Situation as is/ no change.	Retains the wharf placement and alignment as the focal point in connection with the reserve. The historical context is largely retained. Onuku Runanga preference for this location as it acknowledges the significance of Britomart reserve. Although there is a distinction between Options A & B, where Option B proposes a change in alignment to the existing wharf and associated loss of the existing footprint, it is considered to not have a material impact. There is still the opportunity to capture and tell the story of the Onuku Runanga.	Retains the wharf connection with the reserve, however does not retain the alignment. The historical context is somewhat retained. Onuku Runanga preference for this location as it acknowledges the significance of Britomart reserve. Although there is a distinction between Options A & B, where Option B proposes a change in alignment to the existing wharf and associated loss of the existing footprint, it is considered to not have a material impact. There is still the opportunity to capture and tell the story of the Onuku Runanga.	Retains the wharf connection with the reserve, however does not retain the alignment. The historical context is somewhat retained. Onuku Runanga preference for this location as it acknowledges the significance of Britomart reserve. Although there is a distinction between Options A & B, where Option B proposes a change in alignment to the existing wharf and associated loss of the existing footprint, it is considered to not have a material impact. There is still the opportunity to capture and tell the story of the Onuku Runanga.	Loose the focal point of the Britomart reserve, as it was originally designed.	Complete separation of the wharf away from the Britomart reserve. Removing individual element away from the Britomart reserve area, devalues the overall heritage purpose. Value in maintaining them in the same area.

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS								
MCA Criteria enabling a preferred wharf option								
MCA Topics	MCA Criteria	% Weighting	% Weighting	Baseline Option	Option A	Preliminary Location Options		
				Option 0	Option A	Option B	Option C	Option D
				Restore existing wharf in its current location, no change to structural form.	Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf along the north side of the existing wharf, using the existing abutment. Existing wharf will be demolished. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf off Church Street and on the site of the original town wharf. Existing wharf will be demolished. Abutment would be retained.	Construct a new wharf from Akaroa Recreation Field/Children's Bay. Existing wharf will be demolished. Abutment would be retained.
Natural Environment	Noise and vibration effects (including noise effects on marine mammals i.e. dolphins)	H	75.00	0	-1	-1	-1	-1
		Comments		Reusing existing piles, assuming piles will be adequate below the sea bed. To be determined on inspection.	Potential to reuse existing piles, assuming piles will be adequate below the sea bed. To be determined on inspection.	Pile driving will have a negative impact. Public perception is that all pile driving impacts on marine life. Driving piles 900mm or greater are known to impact on marine life, i.e. dolphins. Assume minimal large pile driving. Pile driving considered to have a greater effect on people.	Pile driving will have a negative impact. Public perception is that all pile driving impacts on marine life. Driving piles 900mm or greater are known to impact on marine life, i.e. dolphins. Assume minimal large pile driving. Pile driving considered to have a greater effect on people.	Pile driving will have a negative impact. Public perception is that all pile driving impacts on marine life. Driving piles 900mm or greater are known to impact on marine life, i.e. dolphins. Assume minimal large pile driving. Pile driving considered to have a greater effect on people.
	Air quality effects			This category is not assessed as there is no difference between the above options, in assessing Air Quality effects.				
	Ecological effects (considering disturbance to biodiversity/ecosystems, disturbance/displacement of marine habitats, spawning areas etc., including excavation/dredging effects (during and post construction), spillage or materials into the CMA )	M	50.00	0	-1	-1	-1	-3
		Comments		No impact.	Some disturbance caused by construction of new wharf and installing piles, required for wider platform. Potential to reuse existing piles, assuming piles will be adequate below the sea bed. To be determined on inspection. Assumed no dredging required, would need to confirm.	Some disturbance caused by construction of new wharf and installing piles. Assumed no dredging required, would need to confirm.	Some disturbance caused by construction of new wharf and installing piles. Assumed no dredging required, would need to confirm.	Dredging required to prepare area for construction. Ongoing dredging required to maintain access to wharf, causing continual disturbance and negative ecological effects on a presently untouched area. Some disturbance caused by construction of new wharf and installing piles.
Coastal impact (i.e. impact of tidal flows on the seawall and coastal edge)	M	50.00	0	0	0	-1	-3	
	Comments		No change in vessel movement. No impact.	No change in vessel movement. No impact.	No change in vessel movement. No impact.	Change in vessel movements/ route to wharf. Will have some impact, impact unknown. May be lessened by the presence of the existing abutment nearby. Would need further investigation/ expertise advice.	Change in vessel movement, and dredging will have a significant negative impact on the coastal edge in this location.	
Built Environment	Visual / landscape effect on natural environment (assumption of view of land from the water)	L	25.00	0	-1	-2	-3	-3
		Comments		No change.	Minor negative impact on natural landscape, due to the introduction of new infrastructure and new form.	Moderate negative impact on natural landscape due to new form and change in location, to north of existing wharf, however still in close proximity.	The change in location has a significant negative impact on the natural landscape.	The change in location has a significant negative impact on the natural landscape.
	Ability to provide infrastructure (i.e. electricity, water, waste water. Fuel etc.)	H	75.00	-1	0	0	0	-1
		Comments		The existing infrastructure is operating at capacity, services are difficult to renew or extend. Significant maintenance works would be necessary to extend the life of the existing wharf for an additional 100 years.	New wharf would allow for adequate services.	New wharf would allow for adequate services.	New wharf would allow for adequate services.	Location more challenging, due to proximity. New services would be required landside, up to the water edge, in order to provide services to the wharf and it's operators.
	Effect on active transport to the wharf and along the coastal edge (pedestrian/cycle/mobility devices)	M	50.00	0	1	1	2	-1
		Comments		No change.	New construction will be more accessible by design, and will naturally be in a better state of condition than the original wharf, making it suitable for all; pedestrians, cyclists and mobility devices.	New construction will be more accessible by design, and will naturally be in a better state of condition than the original wharf, making it suitable for all; pedestrians, cyclists and mobility devices.	New construction will be more accessible by design, and will naturally be in a better state of condition than the original wharf, making it suitable for all; pedestrians, cyclists and mobility devices. Potential to solve traffic flow through existing T-intersection at Church St and improve overall access.	Less accessible for mobility and wheelchair users as further away from town centre.
	Tourist congestion effect (of people on wharf)	M	50.00	0	2	2	2	-2
Comments			No change to current congestion issues.	The new wharf will be designed to have greater capacity, for peak tourist (cruise ship) times.	The new wharf will be designed to have greater capacity, for peak tourist (cruise ship) times.	The new wharf will be designed to have greater capacity, for peak tourist (cruise ship) times.	Would conflict with boat ramp, and have a significant negative impact on recreational users. Would require cruise ship tourists to be bused back into township. It was noted that a number of the tourists visiting by cruise ship had limited mobility.	
Tourist congestion effect (Tourist buses)	M	50.00	-1	-1	-1	-1	2	
	Comments		No change to current congestion issues, relating to cruise ship tourist buses.	No change to current congestion issues, relating to cruise ship tourist buses.	No change to current congestion issues, relating to cruise ship tourist buses. Pick up point would be the same.	No change to current congestion issues, relating to cruise ship tourist buses. Pick up point would be very similar.	New location would remove congestion from the centre of town. More space available for buses near the sports recreational fields.	
Urban design and landscape effect (i.e. effect of wharf on streetscape setting (existing street trees, furniture, paths) and on nearby landside buildings and urban form)	L	25.00	2	1	0	0	-1	
	Comments		Some minor impact on urban design and landscape, but mostly no impact.	The change in form and use of new materials would have an impact on urban design of the township, but as it is in the original location it is considered to have a minor landscape effect.	Change in form and new location will alter the urban design of the township. Particularly, if there were a change in wharf alignment.	Change in form and new location will alter the urban design of the township. Particularly, if there were a change in wharf alignment.	Would lose all connection between buildings and the wharf.	

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS								
MCA Criteria enabling a preferred wharf option				Baseline Option	Preliminary Location Options			
MCA Topics	MCA Criteria	% Weighting	% Weighting	Option 0	Option A	Option B	Option C	Option D
				Restore existing wharf in its current location, no change to structural form.	Construct a new wharf in the same location as the existing wharf. Increase in deck height and investigate increase in width. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf along the north side of the existing wharf, using the existing abutment. Existing wharf will be demolished. Abutment completely removed, and new abutment constructed fit for purpose.	Construct a new wharf off Church Street and on the site of the original town wharf. Existing wharf will be demolished. Abutment would be retained.	Construct a new wharf from Akaroa Recreation Field/Children's Bay. Existing wharf will be demolished. Abutment would be retained.
Environment	Environmental impact over lifetime (i.e. Carbon footprint)	Comments			This category is not assessed as there is no difference between the above options, in assessing Environmental impact over lifetime (carbon footprint).			
	Environmental responsibility and ethics (i.e. sourcing timber, carbon miles, local)	Comments			This category is not assessed as there is no difference between the above options, in assessing Environmental responsibility and ethics (i.e. sourcing timber, carbon miles, local)			
Assessment of Effects Objectives Score		NZTA Base Score & Weighting		-450	750	500	100	-2000
Weighted Score Base				-2425	2350	1900	1550	-3475

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS									
MCA Criteria enabling a preferred wharf option				Preliminary Structural Options					
MCA Topics	MCA Criteria	% Weighting	% Weighting	Option 0	Option 1: New wharf structure with like-for-like hardwood timber (excluding abutment).	Option 2: New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	Option 3: New wharf structure made from concrete (excluding abutment).		
Project Description	To renew the Akaroa Wharf when it reaches the end of its useful life. OPUS recommendations is that the wharf has another 5-10 years life remaining. Dema								
Project Objectives									
Akaroa Wharf Renewal Project Objectives	Meet the current and future needs of community, visitors and commercial operators (i.e. functionality, scale and structure)	VH	100.00						
	Comments			Comments					
	This is assessed under the Preliminary Location Options. The Structural Options (i.e. materiality) are a sub-option, to the Preliminary Location Options.								
	Develop a functional marine asset to serve the community for the next 100 years	VH	100.00						
	Comments			Comments					
	This is assessed under the Preliminary Location Options. The Structural Options (i.e. materiality) are a sub-option, to the Preliminary Location Options.								
	Opportunity to recognise the cultural and heritage significance of the wharf (circa 1887) in the context of the heritage setting of Akaroa, the wider cultural landscape and Mana Whenua identity and values	M	50.00						
Comments			Comments						
This is assessed under the Preliminary Location Options. The Structural Options (i.e. materiality) are a sub-option, to the Preliminary Location Options.									
Meet universal accessibility requirements (i.e. making the wharf accessible to all people of all ages, size and mobility)	VH	100.00							
Both location and accessibility considered	Comments			Comments					
This is assessed under the Preliminary Location Options. The Structural Options (i.e. materiality) are a sub-option, to the Preliminary Location Options.									
Provide for wharf services – fuel, power, water and waste (commercial use)	H	75.00							
Comments			Comments						
This is assessed under the Preliminary Location Options. The Structural Options (i.e. materiality) are a sub-option, to the Preliminary Location Options.									
Consider operational and maintenance costs	H	75.00							
Comments			Comments						
This is assessed under the Preliminary Location Options. The Structural Options (i.e. materiality) are a sub-option, to the Preliminary Location Options.									
Project Objectives Score	NZTA Base Score & Weighting								
Implementability Objectives									
Technical	Procurement of suitable contractors	VH	100.00	VH	100.00	0	-1	0	0
	Comments			Comments		Less businesses available with capability to build traditional wharfs.	Fewer contractors available with skills and experience in timber wharf construction.	Easier with more wharfs being constructed from concrete and steel. Contractors are experienced.	Easier with more wharfs being constructed from concrete and steel. Contractors are experienced.
	Wharf construction timeframe (i.e. period of disruption, strictly period of time taken to construct)	M	50.00	M	50.00	-1	0	0	1
	Comments			Comments		Large disruption expected, over a substantial period of time due to the complexity of restoring the existing wharf.	Time to construct the wharf would be similar for all structural material options, excluding procurement of material.	Time to construct the wharf would be similar for all structural material options, excluding procurement of material.	Time to construct the wharf would be similar for all structural material options, excluding procurement of material. There is greater flexibility with concrete to maximise efficiencies, i.e. installing larger piles, minimising the total number of piles required, which would positively impact construction timeframe. Note, this would be at a cost to culture and heritage.
	Constructability (including structural effects, in consideration of proximity to other structures)	M	50.00	M	50.00	-2	0	0	0
Comments			Comments		Major challenges in structure and management, to keep wharf operational during construction.	Marine work predominantly over water. No difference between structural material options.	Marine work predominantly over water. No difference between structural material options. No additional risk in concrete and steel construction.	Marine work predominantly over water. No difference between structural material options. No additional risk in concrete and steel construction.	
Construction risks - building materials (including procurement)			VH	100.00	-3	-3	-1	1	
Comments			Comments		Sources of hardwood timber is limited and unreliable	There are significant challenges sourcing the long sections of hardwood timber required for the structure. The sources are unreliable, with respect to quality, volume and timeframe. Contractors are quick to promise and late to advise of delays. There are risks associated with storing large timber sections, logs splitting etc.  Note, timber is more flexible than concrete/ steel under seismic load.	Smaller sections of timber required for this option. Will still require marine grade timber for stringers and bracing elements. There are challenges sourcing the hardwood timber. Sources are unreliable, with respect to quality, volume and timeframe. Contractors are quick to promise and late to advise of delays. Timber is more flexible than concrete/ steel under lateral load.	Material easier to source, and more reliable in comparison. Note, concrete dries out faster. More suitable for a lower platform, less susceptible to cracking.	

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS									
MCA Criteria enabling a preferred wharf option				Preliminary Structural Options					
MCA Topics	MCA Criteria	H Weighting	M Weighting	H Weighting	M Weighting	Option 0 Restore existing wharf in its current location, no change to structural form.	Option 1: New wharf structure with like-for-like hardwood timber (excluding abutment).	Option 2: New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	Option 3: New wharf structure made from concrete (excluding abutment).
Feasibility	Construction set down area (considering marine effects, protected trees etc.)	H	75.00	H	75.00	-2	0	1	1
		Comments		Comments		Challenging, as potential nearby set down areas are protected Heritage sites.	Need storage for large sections of hardwood timber. May need to buy timber 6 months in advance.	Smaller storage requirements, due to smaller sections of timber required for this option.	Trucks will provide concrete as required. Storage required for steel etc.
	Level of amenity during construction; wharf users	M	50.00						
		Comments		Comments		This category is not assessed as there is no difference between the above options, in assessing the Level of amenity during construction (disruption effect).			
	Level of amenity during construction; proximate sensitive users	L	25.00						
		Comments		Comments		This category is not assessed as there is no difference between the above options, in assessing the Level of amenity during construction (disruption effect).			
	Christchurch District Plan requirements	VH	100.00	VH	100.00	1	2	1	-2
		Comments		Comments		Hazards challenging to manage. Great from a heritage perspective.	The relevant provisions of the District Plan (Chapter 9 and 15) require (re)development to maintain or enhance existing character, materiality and heritage aesthetic.	Assuming that utilitarian elements are largely visually shrouded, form and design would be maintained. Changes in heritage fabric results in score of 1.	A concrete wharf will substantially alter the current heritage values and character of the waterfront in Akaroa. These would be inconsistent with provisions seeking compatible form, character and materiality. Could be reduced (-1) with substantial design input (i.e. motifs).
	Canterbury Regional Coastal Plan requirements (Based on current Coastal Plan)	VH	100.00	VH	100.00	0	1	2	-1
		Comments		Comments		The coastal plan will be unaffected, as no changes or modifications required to coastal environment.	Retains heritage fabric and character and hence maintains amenity – would require increased future maintenance or additional protection works to maintain integrity of materials.	This option maintains retaining current amenity values (note character is less of an issue in the Coastal Plan) and ensures integrity of materiality over the longer term without additional protection / replacement works.	This option would contrast with current amenity values and built form character as associated with public access to the coast / waterfront. Integrity of materiality would be provided.
Canterbury Regional Policy Statement (Recreational and Social Outcomes)	VH	100.00	VH	100.00	2	2	2	1	
	Comments		Comments		Balances recreational and social.	Restores and enhances amenity, recreational and (as appropriate) historic heritage values. Enhances public access	Restores and enhances amenity, recreational and (as appropriate) historic heritage values. Enhances public access	Degrades existing amenity and historic heritage values. Materiality would provide longevity in terms of recreational values (and access)	
New Zealand Coastal Policy Statement	VH	100.00	VH	100.00	0	2	1	-1	
	Comments		Comments		No change in Akaroa coastline.	Maintains character of the existing built environment, and (more appropriate) management of historic heritage (through like for like materiality). Provides appropriate public access.	Maintains character of the existing built environment, management of historic heritage (but not in a way that utilises consistent fabric). Provides appropriate public access.	Contrasts more severely with provisions relating to the 'natural environment' but not definitive given modified environment. Degrades character of the existing built environment / historic heritage, but maintains public access and long term structural integrity reducing need for further protection works.	
Akaroa Guide Tourism (i.e. character and form)	M	50.00	M	50.00	0	2	1	-2	
	Comments		Comments		Doesn't allow for future growth for the community. Noting that this could be both positive or negative impact, dependent on community aspirations.	Heritage fabric, structural form and design would be consistent with Akaroa aesthetic and character.	Visually would be consistent with Akaroa aesthetic and character.	A concrete wharf will likely appear as a more utilitarian structure, which would contrast and degrade the aesthetic and character of Akaroa. Whilst these plan(s) have less statutory weight their localised application and the (community) optics of an inconsistency would be severe.	
Tourism strategy (Targeting greater tourism growth, in Akaroa and regionally)	M	50.00	M	50.00	0	1	1	-2	
	Comments		Comments		All options allow for inbound tourist and business growth. The main road into Akaroa, SH75, is considered the single most major choke point restricting growth for the local region.	This option will closely resemble the existing wharf, in form, structure and heritage features and therefore will maintain the values seen as critical for maintained tourism within Akaroa.	This option will closely resemble the existing wharf, in form, structure and heritage features and therefore will maintain the values seen as critical for maintained tourism within Akaroa.	Utilitarian structure would contrast and degrade visual character and potentially visitor experience associated with Akaroa.	
Meets change in sea level and king tide requirements	VH	100.00							
	Comments		Comments		This category is not assessed as there is no difference between the above options, in assessing Sea level change and king tide requirements. All of the options should address these issues despite the materiality of the structure.				
Privately held property i.e. privately owned wharf buildings (incl. piles)	M	50.00							
	Comments		Comments		This category is not assessed as there is no a statutory issue. No scoring given				
Archaeological approval	H	75.00							
	Comments		Comments		This category is not assessed, assuming that the existing wharf will be demolished in accordance with any Archaeological Authority there should be no difference in scoring. Authority may specify specific aspects of fabric (i.e. abutment) that require specific treatment or retention.				
Safety and design consideration	This category is not assessed as there is no difference between the options presented.								
					This category is not assessed as there is no difference between the above options, in assessing Safety and Design considerations, in the design, build and final product. Safety in Construction Methodology is considered below.				

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS										
MCA Criteria enabling a preferred wharf option					Preliminary Structural Options					
MCA Topics	MCA Criteria	H	M Weighting	H	M Weighting	Option 0 Restore existing wharf in its current location, no change to structural form.	Option 1: New wharf structure with like-for-like hardwood timber (excluding abutment).	Option 2: New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	Option 3: New wharf structure made from concrete (excluding abutment).	
Affordability	Financial	Construction cost (build programme)	H	75.00	H	75.00	-2	-1	-1	0
			Comments	Comments	Challenge managing interface between construction and public users, will drive up cost. Increased legal risks.	Iron bark (historical material) hardwood timber is very expensive. Estimated at \$6,000 per unit cost versus \$3,500 for other hardwood timbers. Anticipate 12 month minimum procurement period, with high level of uncertainty of availability of this material in large volume. Potential to cause significant delays to programme. Need to seek advice from Heritage NZ on what they consider to be 'like-for-like' and which timbers they would consider.	Extra complexity relating to detailing concrete and timber connections.	Can maximise efficiencies, with use of larger, fewer piles.		
	Operational/Maintenance	Whole of life cost (including maintenance cost over asset lifetime (100 years) Note: locally sourced timbers for Governors bay will approx. 40 yr. life expectancy)	H	75.00	H	75.00	-1	-1	0	1
			Comments	Comments	The existing wharf is close to the end of its design life, and the expectation is that it will not last another 100 years. Due to the current degradation of the structural form, platform level and sea level rise, it would be very costly to maintain over another 100 years at would need to be extensively rebuilt.	Iron bark (historical material) hardwood timber is very expensive. It doesn't have the same resistance to marine degradation. Need to seek advice from Heritage NZ on what they consider to be 'like-for-like' and which timbers they would consider.	Concrete will be used in areas that make direct sustained contact with marine environment, i.e. piles. Timber used to achieve desired aesthetic look.	Concrete structure will resist marine degradation. Additives used to improve life of steel and concrete in marine environment i.e. galvanised steel.		
	Maintainability (i.e. accessibility)	H	75.00	This category is not assessed as there is no difference between the above options, in assessing Operation ease/ maintainability (i.e. accessibility). Maintenance costs are considered above. Whole of life cost.						
Public/Stakeholders	Community support			Comments	Based on community feedback and Council led public consultation, this option is regarded favourably by the community.	No score is given, as public consultation is ongoing. Further consultation is planned, following this MCA assessment.	Majority are in strong support for similar aesthetic structure. Keeping form and character, retaining some heritage value. To be confirmed at next round of public consultation.	Community open to low cost, low maintenance option this provides whilst retaining some heritage value. To be confirmed at next round of public consultation.	Community open to low cost, low maintenance option. To be confirmed at next round of public consultation.	
	Key stakeholder support (wharf operators)	H	75.00	H	75.00	-1	2	2	1	
		Comments	Comments	Based on community feedback, wharf operators are insistent on better recreational access and a wharf designed to meet business/operator needs.	Strong support for similar aesthetic structure. Keeping form and character, retaining some heritage value (as above). To be confirmed at next round of public consultation.	Strong support for similar aesthetic structure. Keeping form and character, retaining some heritage value (as above). To be confirmed at next round of public consultation.	Strong support for similar aesthetic structure. Keeping form and character, retaining some heritage value (as above). To be confirmed at next round of public consultation.	Majority accept quicker to build, and most pragmatic option, although heritage value not retained. To be confirmed at next round of public consultation.		
Implementability Objectives Score	NZTA Base Score & Weighting					-600	450	750	-125	
Assessment of Effects										
Safety	Safety in construction methodology	Health and Safety - Construction workers	VH	100.00	VH	100.00	-1	-1	-1	1
			Comments	Comments	Considered higher comparative risk for construction workers. Safety risks arise due to proximity to public wharf users, especially at peak tourist times. Risks associated in working with old materials, additional complexity, staging required on existing wharf and resulting in a longer construction period.	Timber construction is more complex and hazardous, in comparison to concrete and steel. Dive work and more work below deck required. Re-use of existing timber also risky.	Timber construction is more complex and hazardous, in comparison to concrete and steel. Dive work and more work below deck required. Re-use of existing timber also risky.	Contractors more familiar with concrete and steel construction process. General risks associated with constructing a wharf.		
	Health and Safety - Wharf users (businesses and public; local community and tourists)	VH	100.00	This category is not assessed as there is no difference between the above options, in assessing the Health and Safety of Wharf users (businesses and public; local community and tourists).						
	Temporary traffic management, road closures etc. (community, businesses, tourists)	H	75.00	H	75.00	-1	-1	-1	-1	
		Comments	Comments	Minor negative effects due to complexity of site and potential for congestion. Assuming materials and plant will be barged in from seaside.	Similar challenges between options. Assuming plant and materials will be transported over water.	Similar challenges between options. Assuming plant and materials will be transported over water.	Similar challenges between options. Assuming plant and materials will be transported over water. Concrete will be transported via truck, on the road, not considered to cause a significant impact.			
	Recreational and social activities (recreational fishing, boating, walking, local amenity asset)	M	50.00	This category is not assessed as there is no difference between the above options, in assessing Recreational and social activities (recreational fishing, boating, walking, local amenity asset)						
	Ability to cater for different user group (functional) requirements (current)	M	50.00	This category is not assessed as there is no difference between the above options, in assessing ability to cater for different user group (functional) requirements (current)						

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS									
MCA Criteria enabling a preferred wharf option				Preliminary Structural Options					
MCA Topics	MCA Criteria	% Weighting	% Weighting	Option 0	Option 1:	Option 2:	Option 3:		
				Restore existing wharf in its current location, no change to structural form.	New wharf structure with like-for-like hardwood timber (excluding abutment).	New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	New wharf structure made from concrete (excluding abutment).		
Community	Social	VH	100.00						
		Comments		Comments					
		Ability to cater for future community demand			This category is not assessed as there is no difference between the above options, in assessing ability to cater for future community demand.				
		Enabling public access to all parts of the wharf at all times, and doesn't compromise access to the beach / water	H	75.00					
		Comments		Comments	This category is not assessed as there is no difference between the above options, in assessing the ability to enable public access to all parts of the wharf at all times, and access to the beach / water.				
		Tourist congestion effect	H	75.00					
	Comments		Comments	This category is not assessed as there is no difference between the above options, in assessing the Tourist congestion effect.					
Human Health	Impact on connectivity / public open space (local amenity)	M	50.00						
	Comments		Comments	This category is not assessed as there is no difference between the above options, in assessing the impact on connectivity / public open space (local amenity).					
	Operational effect (for use of larger boats taking refuge)	M	50.00	M	50.00	1	0	0	1
Comments		Comments	Can be improved, to a lesser extent.				Easier to accommodate larger boats with a wharf constructed from modern materials.		
This category is not assessed as there is no difference between the options presented.				This category is not assessed as there is no difference between the above options, in assessing effects on Human Health (i.e. noise, air quality or contaminated land). The effects on Natural Environment are considered below:					
Economy	Commercial impact on commercial operators of the wharf (i.e. cruise ship tenders, fishing vessels, sightseeing cruises, interchange of baggage, stores and commercial harvest)	H	75.00	H	75.00	-1	1	0	-1
		Comments		Comments	It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, sea level rise and flooding. Deterioration will accelerate over time.				
	Commercial impact on the businesses adjacent to existing wharf (foreshore)	M	50.00	M	50.00	-2	1	0	-1
		Comments		Comments	It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, sea level rise and flooding. Deterioration will accelerate over time. Functionality of wharf is key to tourist industry, needs to be kept viable.				
Flexibility to cater for future demand (i.e. cruise ship, tourist & business growth)	H	75.00	H	75.00	-3	1	0	0	
	Comments		Comments	It is anticipated that in 20 to 30 years the wharf will not adequately meet the user functionality requirements, due to the current platform level, sea level rise and flooding. Deterioration will accelerate over time. Functionality of wharf is key to tourist industry, needs to be kept viable.					
Cultural values	Local Runanga/ Maori Iwi cultural values (large significance in beach access)	H	75.00	H	75.00	1	3	2	1
		Comments		Comments	Preference is for use of natural materials where practicable, and to recycle as much of the existing wharf as possible, to retain character. Acknowledge there is some, but limited opportunity to integrate mana whenua identity and values into restoring the existing wharf. There is greater opportunity to integrate these values into a new wharf.				
Food resources/mahinga kai effect (fishing spots etc.)		H	75.00						
		Comments		Comments	This category is not assessed as there is no difference between the above options, in assessing the impact on mahinga kai.				



AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS									
MCA Criteria enabling a preferred wharf option				Preliminary Structural Options					
MCA Topics	MCA Criteria	% Weighting	% Weighting	% Weighting	% Weighting	Option 0 Restore existing wharf in its current location, no change to structural form.	Option 1: New wharf structure with like-for-like hardwood timber (excluding abutment).	Option 2: New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	Option 3: New wharf structure made from concrete (excluding abutment).
Cultural	Other local community cultural values	L	25.00			This category is not assessed as the difference between the above options, on the local community cultural values, is considered to be minor. Note the options are assessed under the criteria: 'Retain heritage values of existing wharf and Akaroa waterfront'.			
	Retain heritage values of existing wharf and Akaroa waterfront <small>i.e. ability to revitalise the existing wharf, with a high level of authenticity and integrity of the existing wharf - alignment with Conservation Plan/ minimising impact and retaining maximum value. Considering individual heritage values - Historical/Social, Cultural/Spiritual, Architectural/Aesthetic, Technological/Craftsmanship, Contextual, Archaeological.</small>	H	75.00	H	75.00	3	3	1	-3
	Retain any original fabric of the existing wharf, minimizing impact/maximising value <small>(including existing concrete abutment, which is to be retained in-situ)</small>	H	75.00	H	75.00	3	3	1	-3
	Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter (Ensuring heritage is physical accessibility and providing an understanding of places through storytelling. ICOMOS relates to maintaining materials) <small>(The ICOMOS New Zealand Charter, The Pumanawa o ICOMOS o Aotearoa Hei Tiaki I Nga Taonga Whenua Heke Iho o Nehe is a set of guidelines on cultural heritage conservation, produced by ICOMOS New Zealand)</small>	H	75.00	H	75.00	3	3	1	-3
	Alignment with Akaroa Heritage Area and Akaroa Historic Area (CCC and HNZPT respectively) <small>(Heritage New Zealand Pouhere Taonga (HNZPT) is a Crown entity with a membership of around 20,000 people that advocates for the protection of ancestral sites and heritage buildings in New Zealand.)</small>	H	75.00			For the sake of not duplicating or double counting, the impact of materiality is assessed under the criteria: 'Alignment with Heritage Strategy, local rūnanga values, and ICOMOS Charter'.			
	Heritage and cultural values of adjoining Reserve, buildings and foreshore are maintained	H	75.00			For the sake of not duplicating or double counting, the impact of materiality is assessed under the criteria: 'Retain heritage values of existing wharf and Akaroa waterfront'.			

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS									
MCA Criteria enabling a preferred wharf option				Preliminary Structural Options					
MCA Topics	MCA Criteria	H Weighting	M Weighting	H Weighting	M Weighting	Option 0 Restore existing wharf in its current location, no change to structural form.	Option 1: New wharf structure with like-for-like hardwood timber (excluding abutment).	Option 2: New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	Option 3: New wharf structure made from concrete (excluding abutment).
Natural Environment		H	75.00	H	75.00	0	0	0	1
	Noise and vibration effects (including noise effects on marine mammals i.e. dolphins)	Comments		Comments		Reusing existing piles, assuming piles will be adequate below the sea bed. To be determined on inspection.			Could potentially minimise noise and vibration effects, due to flexibility to minimise size and number with concrete construction. Need confirmation, specialist advice (i.e. Assessment of Effects).
	Air quality effects	Comments		Comments		This category is not assessed as there is no difference between the above options, in assessing Air Quality effects.			
	Ecological effects (considering disturbance to biodiversity/ecosystems, disturbance/displacement of marine habitats, spawning areas etc., including excavation/dredging effects (during and post construction), spillage or materials into the CMA )	M	50.00	M	50.00	0	0	0	0
	Comments			Comments		No impact.	Minimal impact.	Minimal impact. No much concrete will be poured in-situ.	Minimal impact. No much concrete will be poured in-situ.
Built Environment	Coastal impact (i.e. impact of tidal flows on the seawall and coastal edge)	M	50.00	M	50.00	0	0	0	0
	Comments			Comments		No change in vessel movement. No impact.	Due to early stage of conception, number of piles unknown. Unclear on impacts. Would need to confirm through design process.	Due to early stage of conception, number of piles unknown. Unclear on impacts. Would need to confirm through design process.	Due to early stage of conception, number of piles unknown. Unclear on impacts. Would need to confirm through design process.
	Visual / landscape effect on natural environment (assumption of view of land from the water)	L	25.00	M	50.00	0	2	1	3
	Comments			Comments		No change.	This option will most closely resemble the existing wharf, in form, structure and heritage features.	Some character and heritage features will be retained.	Will look very different. Will lose all original form, structure and heritage features.
	Ability to provide infrastructure (i.e. electricity, water, waste water. Fuel etc.)	H	75.00			This category is not assessed as there is no difference between the above options, in assessing ability to provide infrastructure.			
System Integration	Effect on active transport to the wharf and along the costal edge (pedestrian/cycle/mobility devices)	M	50.00			This category is not assessed as there is no difference between the above options, in assessing the effect on active transport to the wharf and along the costal edge (pedestrian/cycle/mobility devices)			
	Comments								
	Tourist congestion effect (of people on wharf)	M	50.00			This category is not assessed as there is no difference between the above options, in assessing the tourist congestion effect (of people on wharf)			
	Comments								
	Tourist congestion effect (Tourist buses)	M	50.00			This category is not assessed as there is no difference between the above options, in assessing the tourist congestion effect (tourist buses)			
Comments									
Urban design and landscape effect (i.e. effect of wharf on streetscape setting (existing street trees, furniture, paths) and on nearby landside buildings and urban form)	L	25.00			This category is not assessed as there is no difference between the above options, in assessing the urban design and landscape effect. It will be the same size and scale, the materiality doesn't effect the streetscape. (i.e. effect of wharf on streetscape setting (existing street trees, furniture, paths) and on nearby landside buildings and urban form)				
Comments									

AKAROA WHARF RENEWAL MULTI CRITERIA ANALYSIS							
MCA Criteria enabling a preferred wharf option				Preliminary Structural Options			
MCA Topics	MCA Criteria	% Weighting	% Weighting	Option 0	Option 1:	Option 2:	Option 3:
				Restore existing wharf in its current location, no change to structural form.	New wharf structure with like-for-like hardwood timber (excluding abutment).	New wharf structure with a mix of concrete and hardwood timber (excluding abutment). Visible members would be hardwood	New wharf structure made from concrete (excluding abutment).
Environment	Environmental impact over lifetime (i.e. Carbon footprint)		H 75.00	3	3	0	-3
	Comments		Comments	WTP Akaroa Wharf: Carbon Emissions Estimate for CCC, February 2020 report outlines there is a clear benefit of utilising timber over steel and concrete, even when excluding sequestered carbon, and when accounting for shipping of materials from as far afield as South America.	WTP Akaroa Wharf: Carbon Emissions Estimate for CCC, February 2020 report outlines there is a clear benefit of utilising timber over steel and concrete, even when excluding sequestered carbon, and when accounting for shipping of materials from as far afield as South America.	WTP Akaroa Wharf: Carbon Emissions Estimate for CCC, February 2020 report outlines there is a clear benefit of utilising timber over steel and concrete, even when excluding sequestered carbon, and when accounting for shipping of materials from as far afield as South America.	WTP Akaroa Wharf: Carbon Emissions Estimate for CCC, February 2020 report outlines there is a clear benefit of utilising timber over steel and concrete, even when excluding sequestered carbon, and when accounting for shipping of materials from as far afield as South America.
Environment	Environmental responsibility and ethics (i.e. sourcing timber, carbon miles, local)		H 75.00	-3	-3	-1	-3
	Comments		Comments	Long term, it is anticipated that the large sections of hardwood timber, i.e. 400 x 400, will be very difficult to source in 50 years time. Not sustainable. Note, CCC would require contractors to demonstrate the process of sourcing timber is in alignment with Council policy.	Long term, it is anticipated that the large sections of hardwood timber, i.e. 400 x 400, will be very difficult to source in 50 years time. Not sustainable. Note, CCC would require contractors to demonstrate the process of sourcing timber is in alignment with Council policy.	More sustainable options available as smaller volumes and smaller sized hardwood timber required for this option. Note, CCC would require contractors to demonstrate the process of sourcing timber is in alignment with Council policy.	Challenges with sourcing concrete, i.e. China, and Human Rights violations. Other sources available, i.e. South Korea, Australia. Note, CCC would require contractors to demonstrate the process of sourcing timber is in alignment with Council policy.
Assessment of Effects Objectives Score		NZTA Base Score & Weighting		225	575	25	875
Weighted Score Base				-375	1025	775	-1000

# D

## Appendix D – Sensitivity Assessment Scenarios

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Sensitivity Assessment 1			Sensitivity Assessment 2		
Sensitivity Assessment Scenarios	Weighting Rank	Weighting Rank Value	Sensitivity Assessment Scenarios	Weighting Rank	Weighting Rank Value
<b>Original</b>	VH	100.00	<b>Original</b>	VH	100.00
	H	75.00		H	75.00
	M	50.00		M	50.00
	L	25.00		L	25.00
	VL	0.00		VL	0.00
<b>VH -10%</b>	VH	90.00	<b>VH -20%</b>	VH	80.00
	H	75.00		H	75.00
	M	50.00		M	50.00
	L	25.00		L	25.00
	VL	0.00		VL	0.00
<b>H +10%</b>	VH	100.00	<b>H +20%</b>	VH	100.00
	H	85.00		H	95.00
	M	50.00		M	50.00
	L	25.00		L	25.00
	VL	0.00		VL	0.00
<b>H -10%</b>	VH	100.00	<b>H -20%</b>	VH	100.00
	H	65.00		H	55.00
	M	50.00		M	50.00
	L	25.00		L	25.00
	VL	0.00		VL	0.00
<b>M +10%</b>	VH	100.00	<b>M +20%</b>	VH	100.00
	H	75.00		H	75.00
	M	60.00		M	70.00
	L	25.00		L	25.00
	VL	0.00		VL	0.00
<b>M -10%</b>	VH	100.00	<b>M -20%</b>	VH	100.00
	H	75.00		H	75.00
	M	40.00		M	30.00

	L	25.00		L	25.00
	VL	0.00		VL	0.00
<b>L +10%</b>	VH	100.00	<b>L +20%</b>	VH	100.00
	H	75.00		H	75.00
	M	50.00		M	50.00
	L	35.00		L	55.00
	VL	0.00		VL	0.00
<b>L -10%</b>	VH	100.00	<b>L -20%</b>	VH	100.00
	H	75.00		H	75.00
	M	50.00		M	50.00
	L	15.00		L	5.00
	VL	0.00		VL	0.00
<b>VL +10%</b>	VH	100.00	<b>VL +20%</b>	VH	100.00
	H	75.00		H	75.00
	M	50.00		M	50.00
	L	25.00		L	25.00
	VL	10.00		VL	20.00

# E

## Appendix E – Calibre Advice on Akaroa Wharf Abutment Retention

## Noelle Evans

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**To:** Bouw, Kristine  
**Cc:** Tom Arthur ([REDACTED])  
**Subject:** RE: Akaroa Wharf Abutment Retention.

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**From:** Bouw, Kristine ([REDACTED])  
**Sent:** Wednesday, 17 November 2021 3:42 pm  
**To:** Noelle Evans ([REDACTED])  
**Cc:** Tom Arthur ([REDACTED])  
**Subject:** FW: Akaroa Wharf Abutment Retention.

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**From:** Tom Arthur <[REDACTED]>  
**Sent:** Wednesday, 17 November 2021 11:13 am  
**To:** Bouw, Kristine <[REDACTED]>  
**Subject:** Akaroa Wharf Abutment Retention.

Hi Kristine,

As discussed, I've summarised some of the risks and challenges associated with retaining the abutment.

- The condition of the abutment is moderate – poor. There is cracking throughout the abutment walls and the condition of the inner structure is unknown.
- The abutment was damaged in the Canterbury earthquake sequence. For the structure to be retained, CCC would need to accept the risk of damage from moderate earthquakes in the future.
- The proposed wharf deck is 500mm higher than the existing abutment, a sloping section would need to be created over the abutment or at the start of the main wharf. Modification of the abutment will be needed in the medium term
- The condition of the existing abutment is such that strengthening / modifying the structure would present programme and cost risk

Happy to elaborate on any of the above should you require.

Regards,

Tom



**Tom Arthur**  
Associate Engineer - Buildings & Structures

[REDACTED]  
Level 13, Kordia House, 109-125 Willis Street, Wellington 6011

[View the legal disclaimer.](#)



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