

## 8. CARR'S ROAD PEDESTRIAN AND CYCLE BRIDGE

<b>General Manager responsible:</b>	General Manager City Environment Group, DDI 941- 8608
<b>Officer responsible:</b>	Unit Manager, Asset and Network Planning
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### PURPOSE OF REPORT

1. The purpose of this report is to outline to the Board the concept design options for the pedestrian/cycleway bridge at Carr's Road and seek the Board's recommendation to the Council.

### EXECUTIVE SUMMARY

2. The Christchurch Southern Motorway Stage 1 (CSM1) is currently well under construction, and bisects the existing Carr's Road corridor.
3. The South West Area Plan (SWAP) identified this crossing as an important link for cyclists and pedestrians and a project was included in the Council's 2009/19 LTCCP. This crossing will link the communities planned for the area either side of the motorway as described in the Outline Development Plan for Awatea. The South West Area Plan showed this linkage but did not provide any details as to the appropriate design. The location of the proposed over bridge is shown on **Attachment 1**.
4. The bridge was initially to be constructed as part of the Southern Motorway contract, however during the planning work associated with SWAP there was a desire to create a 'land mark/gateway bridge' which required a more detailed and prolonged design and consultation period and it was therefore agreed with the New Zealand Transport Agency (NZTA) that the bridge would be progressed separately from the main motorway contract. The 'land mark/gateway bridge' concept was particularly relevant during the planning phase for the first stage of the Southern Motorway project as this location would have provided the first overbridge structure as travellers entered the City. However, NZTA are now actively working on the planning stage for the second stage of the motorway that will incorporate additional bridge structures more closely located to the City boundary, and therefore there may be a more relevant location for a land mark structure to be located.
5. The funding included in the Council's 2009/19 LTCCP only provided for a standard/simple over bridge and as more detailed concept designs were worked up it became clear that the costs of constructing a more enhanced 'land mark/gateway' bridge would require additional funding.
6. This report presents three possible concept options for the bridge design, together with an initial estimate of the costs.

### FINANCIAL IMPLICATIONS

7. Variations to the LTCCP Budget of \$2.8 million for each option are shown below.

Option	Estimated Cost	Variation to Budget
Option 1 - Landmark Bridge	\$4,683,621	\$1,889,621
Option 2 - Feature Bridge	\$4,258,523	\$1,464,523
Option 3 - Basic Bridge	\$3,333,523	\$539,523

The scheduled construction year for the project is 2013/14. Any change to the project costs can be identified and included in the 2013/22 Long Term Plan (LTP) review.

8. The project has the potential for NZTA funding up to a maximum of 54 percent of the project costs, however this is subject to:
  - (a) funding being available within the National Land Transport Programme activity class for the period 2012/15; and
  - (b) the project satisfying a number of assessment criteria to qualify for funding support from NZTA, through its normal funding application process.

9. The project was identified in the 2009 Regional Land Transport Programme but was identified as “uncommitted” by NZTA at that time. In preparing the 2012/15 Regional Land Transport Programme, the Council has included this project within its ‘place holder’ funding request.
10. NZTA have already communicated that the National Land Transport Programme has limited funding and this project will be considered for funding alongside other cycling projects across New Zealand.

#### **LEGAL CONSIDERATIONS**

11. The Council has purchased land needed for the bridge from NZTA.
12. As provided for in the Outline Development Plan for Awatea, a resource consent will be required, which unless it includes a Cultural Assessment, will be considered a discretionary activity.

#### **ALIGNMENT WITH LTCCP AND ACTIVITY MANAGEMENT PLANS**

13. This project is identified on page 247, Volume 1 of the existing LTCCP 2009-2019 under the Streets and Transport section of the Planned Capital Programme.

#### **ALIGNMENT WITH STRATEGIES**

14. This bridge forms part of the walking and cycleway network as proposed in the South West Area plan, which supports the wider Greater Christchurch Urban Development Strategy and is aligned with the draft Christchurch Transport Plan.

#### **CONSULTATION FULFILMENT**

15. Early consultation with Ngai Tahu has been initiated through Mahaanui Kurataiao Limited (MKT). Formal public and stakeholder consultation will be carried forward following selection of the preferred option by the Council, and approval to consult from the Riccarton/Wigram Community Board.

#### **STAFF RECOMMENDATION**

It is recommended that the Board recommend to the Council that the Council:

- (a) Endorses the preferred Option 3 – a “Basic Bridge”;
- (b) Recommends to the Council that Option 3 should be taken forward to detailed design;
- (c) Requests staff to ensure that the draft 2013/22 Long Term Plan (LTP) reflects the updated costs of the project.

## **BACKGROUND (THE ISSUES)**

16. The Christchurch Southern Motorway Stage 1 (CSM1) is currently under construction and due to be completed in June 2013. This bisects Carr's Rd near the Carr's Road Reserve.
17. The South West Area Plan (SWAP) identified this part of the city as a major new development area (and this is now likely to be accelerated since the earthquakes). In SWAP, and in the Outline Development Plan (ODP) for Awatea, the Carr's Road Pedestrian/Cycle over bridge is seen as part of a key recreational route which provides connectivity across CSM1 between the proposed residential areas.
18. SWAP also proposed a 'southern gateway' across the motorway in this vicinity and the Carr's Road crossing is the first bridge travellers will experience as they head towards the City along the Southern Motorway, and it was envisaged that this pedestrian/cycleway bridge provided this landmark/gateway. However, NZTA have now accelerated its planning for Stage 2 of this motorway and the second stage will provide additional bridges (**Attachment 2**) over the motorway closer to the city boundary.
19. Originally a specimen design for the bridge was prepared for construction as part of CSM1. This was removed from the scope as the Council believed there was need to design and construct a landmark/gateway structure that was distinct from standard structures being proposed for the project.

## **THE OBJECTIVES**

20. The project has the following objectives:

To design and construct:

- (a) A pedestrian and cycle bridge providing connectivity across the CSM which achieves the following:
  - (i) meets the design parameters for safety, vertical clearance and span as specified by NZTA as controlling road authority;
  - (ii) meets appropriate design codes and standards including Internal Design Standards (IDS), Construction Specification Standard (CSS), City Plan and NZTA Bridge Manual should the bridge provide a 'landmark/gateway' entry symbol for the City or is this best achieved at a different location;
  - (iii) achieves the best value for money;
  - (iv) incorporates, where appropriate, tangata whenua values within the surrounding area;
  - (v) gives consideration in design to future proposed developments as identified in SWAP and relevant city plan changes; and
  - (vi) makes appropriate provision for user safety and level of service.

## **THE OPTIONS**

### **Option 1 – Landmark/Gateway Bridge**

#### **Option 1 - Description.**

21. This form is literally a gateway, with a sculptural arch spanning the motorway, visually reaching out from the south mound face to hook the landform to the north. The form is structurally expressive with two components balanced in tension by a threaded web of rods, conceived much as a two piece composite, traditional trolling lure.

22. The arch is a white sculptural hook (Pa Kahawai or trolling lure), formed in the visual aesthetic of a bone sculpture. The deck is a structurally ribbed backbone”.
23. Materials are to be entirely steel, painted white to stand out from the changing hues of the landscaped backdrop. The deck would be formed from precast concrete panels, bolted onto the ribbed framework substrate.



Figure 2 : Option 1 - Perspective

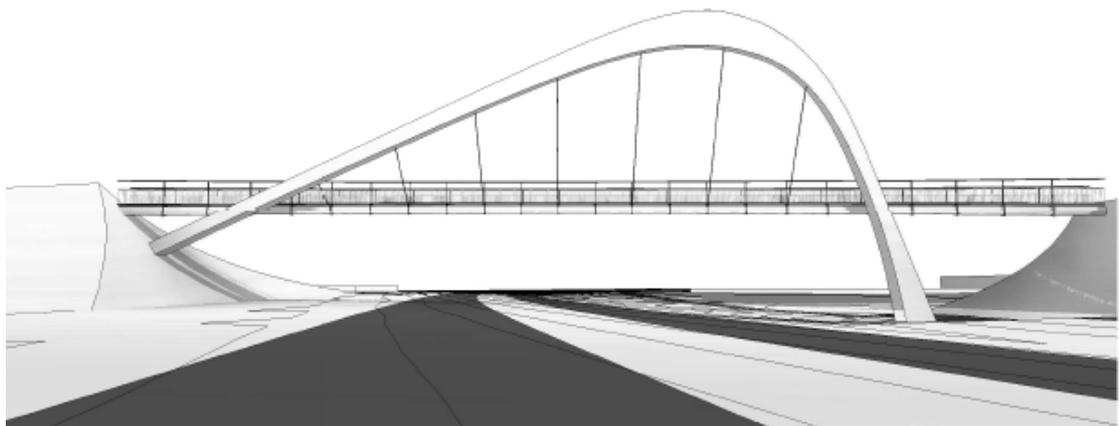


Figure 3 : Option 1 - Elevation from East

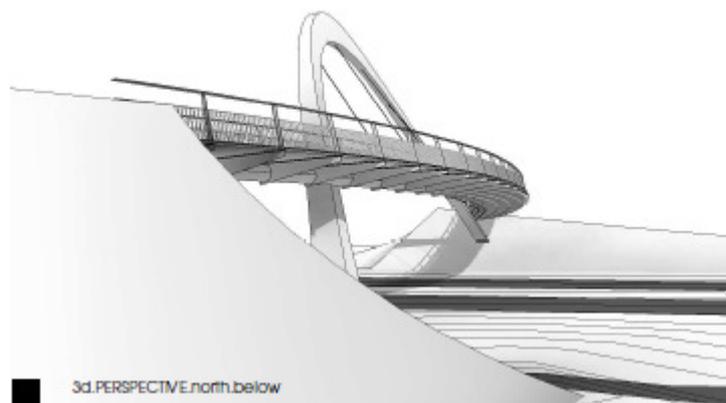


Figure 4 : Option 1 - View to North

**Option 1: Cost Estimates**

CPG Fees	267,000
Concept Feasibility	30,000
Geotechnical Testing	42,000
Estimating	4,000
	<b>343,000</b>
Davis Langdon Estimates	
Construction	
Bridge	1,461,597
Lighting	194,000
Embankments	873,500
Traffic Management & Sundry	128,903
Preliminary & General & Margin	522,621
	<b>3,180,621</b>
Professional Fees (incl Detailed Design)	510,000
Consents	50,000
Contingency	600,000
	<b>1,160,000</b>
Project Total	<b>4,683,623</b>

**Option 2 - 'Simplified' Feature Bridge**

- 24. Option 2 is intended to be a simpler design but with some aesthetic appeal.
- 25. The superstructure consists of a comparatively standard super-tee core (although with a curving deck) and three spans. The interest feature is the spiralling net around the deck, reflecting elements of a Hinaki (Maori fishing net).

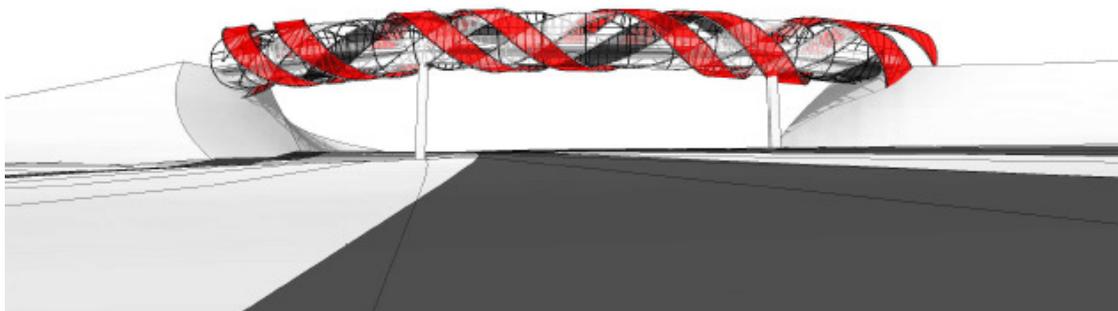


Figure 5 : Option 2 - View West

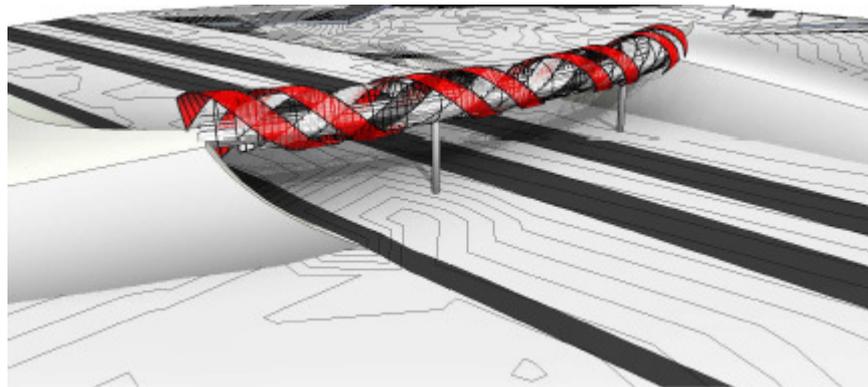


Figure 6 : Option 2 - Aerial

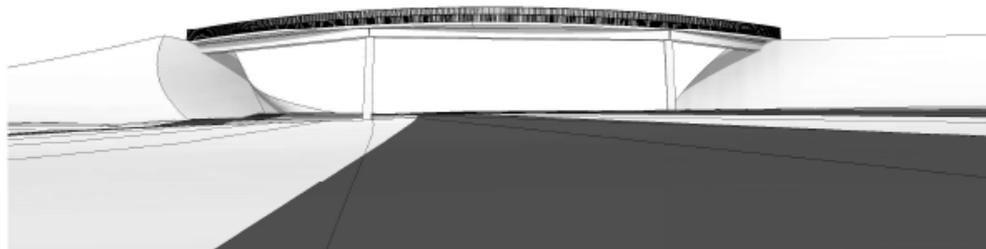
**Option 2: Cost Estimates**

CPG Fees	267,000
Concept Feasibility	0
Geotechnical Testing	42,000
Estimating	4,000
	313,000
<b>Davis Langdon Estimates</b>	
Construction	
Bridge	1,236,552
Lighting	194,000
Embankments	873,500
Traffic Management & Sundry	123,948
Preliminary & General & Margin	477,523
	2,905,523
Professional Fees (incl Detailed Design)	470,000
Consents	30,000
Contingency	540,000
	1,040,000
<b>Project Total</b>	<b>4,258,523</b>

**Option 3 - Basic Bridge**

26. The third option is for a basic bridge design. The design is the same as for Option 2, but without the feature net around it.

Figure 7 : Option 3 - View West



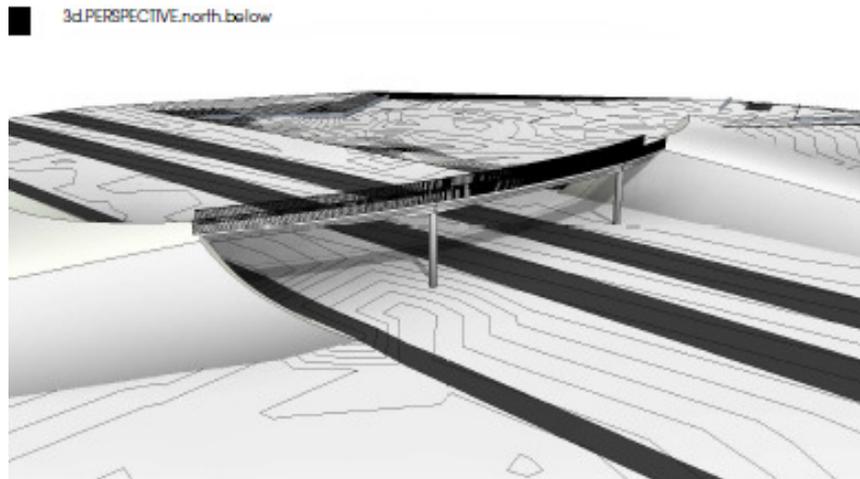


Figure 8 : Option 3 - Aerial

### Option 3: Cost Estimates

CPG Fees	267,000
Concept Feasibility	0
Geotechnical Testing	42,000
Estimating	4,000
	313,000
Davis Langdon Estimates	
Construction	
Bridge	666,552
Lighting	194,000
Embankments	873,500
Traffic Management & Sundry	123,948
Preliminary & General & Margin	357,523
	2,215,523
Professional Fees (incl Detailed Design)	365,000
Consents	20,000
Contingency	420,000
	805,000
Project Total	<b>3,333,523</b>

### Issues

#### Embankments

27. A risk was identified in February 2012, that the requirement for a maximum cycle gradient 1:20, may increase costs beyond the existing budget.
28. The Scheme Plan for embankments to meet the above requirements is shown below. This is the plan for all of the options further below. The cycle gradient would require ramps some 150 metres in length. It was considered that framed structures would be unsightly, and that planted embankments are needed to remain in keeping with the aims of the SWAP.

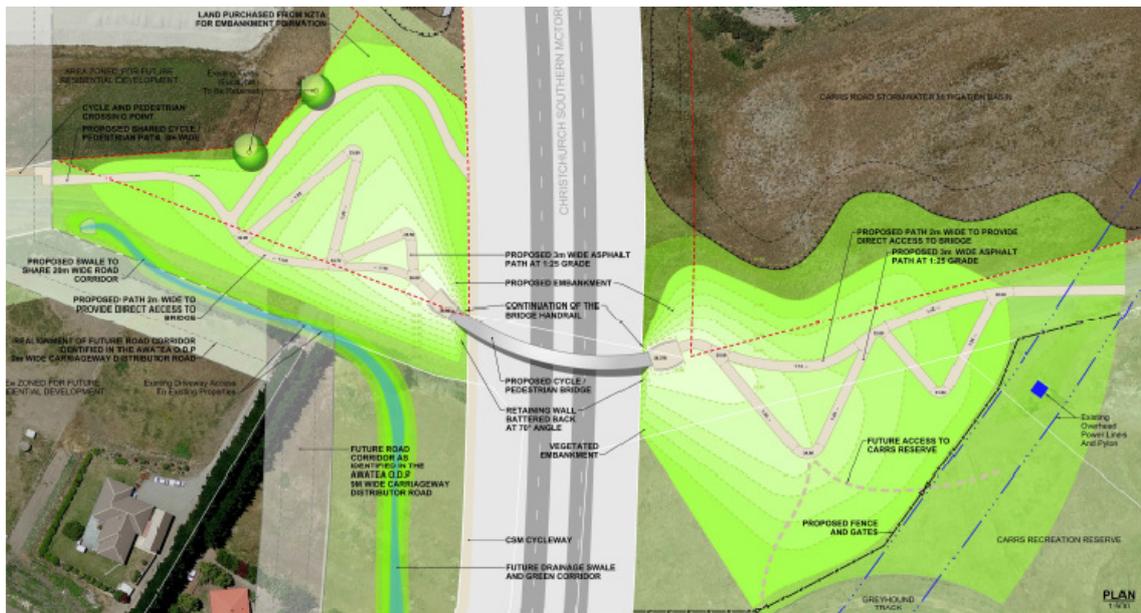


Figure 1 : Embankments

29. Detailed preliminary cost estimates have been prepared by Davis Langdon, and are shown in their report, received 19 April 2012. This indicates that with the above requirement the estimated cost of the embankments is \$873,500.

### Traffic Management

30. The bridge will be constructed after the opening of CSM1 in June 2013. Managing the impact of bridge construction on motorway traffic is estimated to add approximately \$100,000 to the cost of the project.
31. The following three options have been developed for comparison:
- (a) A landmark bridge;
  - (b) A simplified feature bridge;
  - (c) A basic bridge.

### THE PREFERRED OPTION

32. Given that there is now the potential for a landmark structure to be located in a suitable position closer to the City boundary within the planned stage 2 of the motorway and in order to minimise the impact on Council funding, Option 3, the Basic Bridge, is the preferred option.

### ASSESSMENT OF OPTIONS

#### The Preferred Option

#### Option 3 - Basic Pedestrian/Cycle Bridge

Project Objectives	Met or not	Description
1 Landmark	N	
2 NZTA	P	Pier construction will have greater impact on motorway
3 Standards	Y	
4 Budget	N	Requires a further \$540K of budget
5 Iwi	N	Reflects little of Tangata Whenua values
6 SWAP	N	Not a gateway
7 Safety	P	Piers are within motorway corridor

	<b>Benefits (current and future)</b>	<b>Costs (current and future)</b>
<b>Social</b>	Links planned communities Provides the pedestrian and cycle routes as planned in SWAP and the ODP for Awatea	Does not meet SWAP gateway objective.
<b>Cultural</b>	May be consistent with historic Ngai Tahu pathways somewhere in the vicinity (although their precise locations are not clear)	Little identification of Tangata Whenua values.
<b>Environmental</b>	Grassed and planted approach embankments will reduce potential structural impacts	The Basic Bridge structure may be considered to have less environmental integration than the Landmark structure.
<b>Economic</b>	Minimises budget overspend.	Total cost \$3.3M or \$540K of further funding.

**Extent to which community outcomes are achieved:**

Linkage is provided between future planned communities separated by the Christchurch Southern Motorway.

A gateway to Christchurch for Southern Motorway traffic as proposed in the South West Area Plan (SWAP) is not achieved.

**Impact on the Council's capacity and responsibilities:**

Option 3 has the least impact on budget requirements

**Effects on Maori:**

To date, the Ngai Tahu liaison representative has indicated preferences for options 1 and 2.

**Consistency with existing Council policies:**

Closest consistency with the LTCCP budget. Least consistency with SWAP. City Plan rules for the area mean that consent could be declined if the option is not acceptable to Ngai Tahu.

**Views and preferences of persons affected or likely to have an interest:**

Public consultation has yet to be undertaken. This is normally carried out once the preferred option is selected. To date, the Ngai Tahu liaison representative has indicated preferences for options 1 and 2.

**Option 3: Conclusion**

33. This option meets the critical objective of providing connectivity and linkage but less in the way of "landmark/gateway" feature, it also has the lowest cost.

**Other Options**

Option 1 – Landmark/Gateway Bridge

Project Objectives	Met or not	Description
1 Landmark	Y	Innovative design
2 NZTA	Y	Single span with piers at greatest distance from motorway.
3 Standards	Y	
4 Budget	N	Requires a further \$1.89M of budget
5 Iwi	Y	MKT are supportive
6 SWAP	Y	Gateway and community connection
7 Safety	Y	Piers are at greatest distance from motorway

	<b>Benefits (current and future)</b>	<b>Costs (current and future)</b>
<b>Social</b>	Links planned communities. Provides the southern gateway to Christchurch as envisaged in SWAP and the ODP for Awatea. Provides the pedestrian and cycle routes as planned in SWAP and the ODP for Awatea.	
<b>Cultural</b>	May be consistent with historic Ngai Tahu pathways somewhere in the vicinity (although their precise locations are not clear). The arch attempts to incorporate some of the form of a Maori bone fishing hook.	
<b>Environmental</b>	Grassed and planted approach embankments will reduce potential structural impacts. The arch provides an aesthetic slender feature linking the raised land either side of the motorway.	
<b>Economic</b>		Total cost \$4.68M, requiring further funding of \$1.89M.
<p><b>Extent to which community outcomes are achieved:</b></p> <p>Provides:</p> <ul style="list-style-type: none"> <li>- linkage between future planned communities separated by the Christchurch Southern Motorway,</li> <li>- a landmark / gateway to Christchurch for Southern Motorway traffic as proposed in the South West Area Plan (SWAP),</li> <li>- The cycle and pedestrian routes planned in SWAP and the Outline Development Plan for Awatea.</li> </ul> <p><b>Impact on the Council's capacity and responsibilities:</b></p> <p>Delivery against approved plans (SWAP and ODP for Awatea). Further funding of \$1.89M required.</p> <p><b>Effects on Maori:</b></p> <p>Reflects traditional pathways believed to have existed in the area. Incorporates some of the form of a traditional bone fishing hook.</p> <p><b>Consistency with existing Council policies:</b></p> <p>Delivery against approved plans (SWAP and ODP for Awatea).</p> <p><b>Views and preferences of persons affected or likely to have an interest:</b></p> <p>Public consultation has yet to be undertaken. This is normally carried out once the preferred option is selected. To date, the Ngai Tahu liaison representative has indicated this is likely to be one of Iwi's preferred options.</p>		

### **Option 1: Conclusion**

34. Option 1 meets the highest number of project objectives, and best meets the desire for a landmark/gateway bridge. However this option has the highest cost.

## Option 2 - Simplified Feature Bridge

Project Objectives	Met or not	Description
1 Landmark	P <sup>1</sup>	Lower impact design
2 NZTA	P	Pier construction will have greater impact on motorway
3 Standards	Y	
4 Budget	N	Requires a further \$1.46M of budget
5 Iwi	Y	MKT are happy with this
6 SWAP	P	Not as effective as a gateway
7 Safety	P	Piers are close to motorway

	<b>Benefits (current and future)</b>	<b>Costs (current and future)</b>
<b>Social</b>	Links planned communities. Provides the pedestrian and cycle routes as planned in SWAP and the ODP for Awatea.	Does not have the impact of option 1 in providing the gateway to Christchurch as planned in SWAP and the ODP for Awatea.
<b>Cultural</b>	Styled on a Maori fishing net or Hinaki. May be consistent with historic Ngai Tahu pathways somewhere in the vicinity (although their precise locations are not clear).	
<b>Environmental</b>	Grassed and planted approach embankments will reduce potential structural impacts.	The bridge structure is more intrusive on the environment than option 1.
<b>Economic</b>		\$4.26M, requiring further funding of \$1.46M.
<p><b>Extent to which community outcomes are achieved:</b></p> <p>Provides linkage between future planned communities separated by the Christchurch Southern Motorway, and the cycle and pedestrian routes planned in SWAP and the Outline Development Plan for Awatea.</p> <p><b>Impact on the Council's capacity and responsibilities:</b></p> <p>Less effective in delivering the gateway feature identified in SWAP. Further funding of \$1.46M required.</p> <p><b>Effects on Maori:</b></p> <p>Incorporates the form of a Maori fishing net or hinaki. Reflects traditional pathways believed to have existed in the area.</p> <p><b>Consistency with existing Council policies:</b></p> <p>Less effective in delivering the gateway feature identified in SWAP.</p> <p><b>Views and preferences of persons affected or likely to have an interest:</b></p> <p>To date, the Ngai Tahu liaison representative has indicated this is likely to be one of Iwi's preferred options. Public consultation has yet to be undertaken. This is normally carried out once the preferred option is selected.</p>		

**Option 2: Conclusion**

35. Option 2 aims to provide a balance between some of the aesthetic value of the landmark bridge, whilst reducing the cost.