

TASMAN DISTRICT COUNCIL CONTRACT NO 682 - PROFESSIONAL SERVICES

REPORT FOR TRANSPORTATION MANAGER

Date: 26 January 2011
To: Tasman District Council
Attention: Gary Clark
Copy to: Peter Thomson / Philip Drummond
Reference: Z1448915
Subject: Options for Access at James Road – Golden Bay
Status: Final

Introduction

- This report is a summary of the options being investigated to date to provide access at James Road in Golden Bay after the existing James Road Bridge was washed away by the flood event on the 28 December 2010
- The bridge was constructed in the late 1960's and upgraded in the 1990's to allow for milk tankers, but without trailers, to access the property which was being run as a dairy farm.

Options

Footbridge – we have engaged Downers to construct a footbridge to provide temporary access across the Aorere River at James Road. Downers have been sourcing all the missing components of the bridge and intend to start on site on Monday. DOC is also providing a person on site to assist with the installation. This bridge is similar to the Dart Ford Bridge in the photo below. The bridge will have signage installed limiting the usage to one person at a time. This installation is now in progress and expected to take approximately a week. It should be noted that this bridge is on loan from DOC for six months which can be extended but it is not on permanent loan.

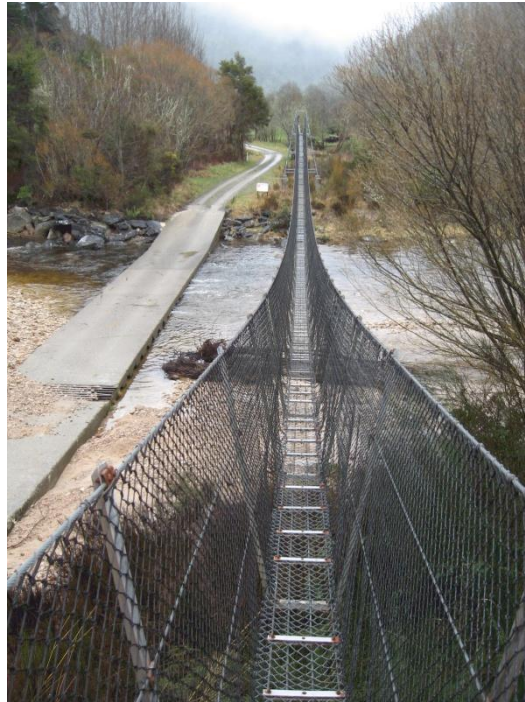


Photo of Dart Ford Footbridge

Low level bridge using second hand trusses.

Nigel Beatson has measured up one of the available trusses, one of which is currently being used as a bungee platform and the other being used as a farm bridge. The length of the two trusses is 25m and 20m. Analysis has not yet been carried out on the trusses but based on the depth of the truss the initial thought is that if they were joined to a single 45m span they would not be able to take full Class 1 loading. The trusses could probably be used as shorter spans with concrete piers built to support the bridge off the large rock that is on the proposed alignment. The steel trusses themselves are in reasonable condition but the timber decks are in poor condition. The deck will need to be rebuilt. The issue with timber decks is with the current timber code bending strengths the transverse timbers need to be supported at close centres to meet all possible configurations of Class 1 vehicles. The layout of the steel truss does not really provide this support to the transverse timbers so an additional layer of bearers will need to be run longitudinally along the bridge. The full width of the river is wider than these two trusses combined, so the shortfall will need to be built up to road level or an additional bridge structure constructed. It is likely this option would be cheaper than a new bridge on the alignment of the previous James Road Bridge. However as this bridge will be installed at a lower level than the previous bridge there is a very high risk of it being damage during future floods, even during a moderate flood. Although the 28 December 2010 flood was an extreme event, it has shown the destructive force of the water that occurs in the Aorere River. It is unlikely that a bridge built below the flood level would survive a similar event.



Photo of existing bungee platform

New Bridge - The following options are being pursued.

- Network Arch Truss. Wanganui District Council has recently built a Network Arch Truss on their roading network. This style of truss is seen as a very economical way of spanning large distances. The rough order cost of the design and construction of this style of bridge to span 60-65m is \$1.5million. Homes Consulting who were the designers of this bridge have indicated that a design for a new James Road Bridge could be started within a month. It would take 6 weeks to carry out the design and then 2 weeks of drafting. After a tender period it would take 3 months to fabricate the steelwork and precast concrete deck, and then 2 months on site for construction.



Photo of Network Arch Bridge (span 85m) in Wanganui District

- Through Truss – A through truss uses more steel than a network arch truss; however the fabrication is more straightforward, which may make the cost comparable to a Network Arch truss. We have had some indicative pricing from Eastbridge in Napier who specialise in this type of structure just today.

Their price of \$750,000 excludes foundations, installation and handrails/guardrails. We are following up with them to get a complete price to install the trusses and foundations, .

We have had further pricing information from Eastbridge on the installation of this bridge. Their submitted price using a launching nose method is \$260,000. There are two other possible methods to launch the bridge across the river, which if they are feasible, both would be cheaper than the submitted price. One option is if they are able to get a 200t crane to the other side of the river, and the other is using a flying fox system across the river to launch it off the old suspension bridge anchor blocks. Both of these options have not yet been investigated sufficiently to determine if they are feasible.

This style of bridge is not as aesthetically pleasing as the Network Arch style of bridge, however it is looking as though the thru truss will be cheaper than a Network Arch. Please note that the pricing submitted by Eastbridge excludes any foundation works and also excludes handrails and guardrails on the bridge. Also note that this bridge has a steel deck.

Eastbridge have provided the following programme for the design, fabrication and installation of a thru truss at James Road:

Design	6 Weeks	Week 0 to 6
Material Procurement	6 Weeks	Week 2 to 8
Shopdrawings	2 Weeks	Week 6 to 8
Fabrication of Truss Structure	8 Weeks	Week 8 to 16
Fabrication of Deck Structure	8 Weeks	Week 10 to 18
Galvanize	6 Weeks	Week 14 to 20
Site Assembly	6 Weeks	Week 14 to 20
Launch	2 Weeks	Week 20 to 22
Fit for purpose/ Complete		Estimate 20 to 26 Weeks from date of Order.

The estimate as at 26 January is now \$1.1-\$1.2m for a completed bridge including supply, installation and an allowance for site works.



Photo of a Similar Thru Truss (this example had a span of 74m) This photo shows footpaths and handrails which have not been included in the Eastbridge estimate.

Ford Option

There is currently a very rough ford across the Aorere River a few km's upstream of James Road. Options to upgrade this ford are being looked at. One possibility is to use a number of precast concrete box culverts across the ford. An estimate to supply these culverts has been based on two recent box culverts that have been constructed for Tasman District Council. The cost to supply the box culverts has been estimated at \$300,000. In addition to this the culverts will need to be fixed rigidly to the riverbed to prevent them being washed downstream during high river flows. The total cost has therefore been estimated at \$500,000 plus any upgrade to farm tracks on either side of the river. There is a risk that these box culverts could get damaged on a regular basis due to the force of water and large rock debris that is sometimes in the Aorere River. There would also be a high level of maintenance required in keeping the culverts free of logs, debris and rock material. There is some risk with this option in obtaining a resource consent.



Photo showing ford location

Subsidised Funding from the New Zealand Transport Agency, NZTA

NZTA have advised that funding assistance will require Council to provide not less than a Class 1 structure. This assumes the proposed bridge would meet the requirements for a remote rural bridge replacement as defined in the Bridge Manual. There may be a case for constructing a new bridge that had the same weight restricted capacity as the old bridge (22 T), this should provide a reduction in cost, estimated at \$50,000 giving a revised price of \$1.05 - \$1.15 M at 50% capacity. The option of providing a bridge less than Class I is not recommended.

The low level bridge structure would need to withstand full flood conditions and meet class one loading. Overtopping of the structure is acceptable provided that the bridge can withstand the required loading.

Council would need to consider the whole of life costs for the ford structure because of the likely high maintenance costs.

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Prepared by: Nigel Beatson Date: 26 / 1 / 2011	Reviewed by: Ray Firth / Geoff Ward Date: 26 / 1 / 2011
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Yours faithfully

Nigel Beatson

MWH NEW ZEALAND LTD