

**From:** s 9(2)(a)  
**To:** Colin Hey; Samuel Grave  
**Cc:** Jessica McFarlane; s 9(2)(a)  
**Subject:** RE: Permanent Waiho Bridge Replacement - suggestion  
**Date:** Wednesday, 27 March 2019 11:38:51 AM  
**Attachments:** [image003.jpg](#)  
[image004.jpg](#)  
[image005.jpg](#)  
[image006.jpg](#)  
[image007.jpg](#)

Colin/Sam do you need any help with immediate resources to install the temporary baily bridge solution?

s 9(2)(a)

**Group Managing Director**

s 9(2)(a)

s 9(2)(a)

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**From:** s 9(2)(a)

**Sent:** Wednesday, 27 March 2019 8:33 AM

**To:** Colin Hey <Colin.Hey@nzta.govt.nz>

**Cc:** Jessica McFarlane <Jessica.McFarlane@nzta.govt.nz>; s 9(2)(a) <@universalcranes.com>; Samuel Grave <Samuel.Grave@nzta.govt.nz>

**Subject:** RE: Permanent Waiho Bridge Replacement - suggestion

Hi Colin,

Following on from s 9(2)(a) email to you a few minutes ago.

OK on a later meeting for a permanent solution but s 9(2)(a) will be in Christchurch for 1<sup>st</sup> to 3<sup>rd</sup> April anyway so it maybe opportune to meet for an hour on one of those days in your office?

Your NZTA colleague Samuel Grave can vouch for my abilities as a bridge designer and for s 9(2)(a) as a bridge builder.

It would be good if the NZTA could ascertain from the evidence what the scour depth was. From the video it was the upstream pile of the first intermediate pier from the Franz Josef end scoured out. The flow speed as at the top end of about 4m per second but the level was not particularly high. If this pile can be recovered you will find surface wear will indicate the depth of scour. Can you send the pier drawings and driving records to me. The NZTA may find other piers had been close to scouring out then the water level drops.

I have experience in dealing with scour around small diameter piles. Generally the solution is larger diameter piles with fixity and resistance below the scour depth and less constriction across the river. The proposed Smithbridge delivers this.

Kind Regards,

s 9(2)(a)

**Design & Methods Engineer**

s 9(2)(a)

s 9(2)(a)

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**From:** Colin Hey <Colin.Hey@nzta.govt.nz>

**Sent:** Wednesday, 27 March 2019 8:09 AM

**To:** s 9(2)(a) <@universalcranes.com>

**Cc:** Jessica McFarlane <Jessica.McFarlane@nzta.govt.nz>

**Subject:** RE: Permanent Waiho Bridge Replacement - suggestion

Thanks s 9(2)(a)

It's just a bit early to be thinking about permanent replacements at the moment, as all of our focus is on reinstating the bailey.

Could you touch base with us again in two month's time?

The big issue is aggradation of the river bed – any permanent solution needs to be just that – permanent, and we don't really know what that looks like at the moment.

Thanks

Colin Hey

Colin Hey / Senior Network Manager  
Highways & Network Operations

s 9(2)(a)

Email [Colin.Hey@nzta.govt.nz](mailto:Colin.Hey@nzta.govt.nz)

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**From** s 9(2)(a) <[s 9\(2\)\(a\)@universalcranes.com](mailto:s 9(2)(a)@universalcranes.com)>

**Sent:** Wednesday, 27 March 2019 10:52 AM

**To:** Colin Hey <[Colin.Hey@nzta.govt.nz](mailto:Colin.Hey@nzta.govt.nz)>

**Cc:** s 9(2)(a) <[s 9\(2\)\(a\)@universalcranes.com](mailto:s 9(2)(a)@universalcranes.com)>

**Subject:** Permanent Waiho Bridge Replacement - suggestion

Dear Colin

s 9(2)(a)

and I wanted to know if the NZTA were interested in a Smithbridge presentation regards a permanent Waiho Bridge replacement?

Smithbridge Australia have recently developed a kitset permanent bridge solution for Papua New Guinea. These bridges feature two traffic lanes and an overall deck width of 10m; 40m continuous spans; twin pile piers.

Importantly our construction methodology does not require river work. We build the bridge in a 'span over span' manner above the river bed. This is very safe, methodical and economic.

For the Waiho Bridge we would use shell piles. If we could not achieve both fixity and resistance below scour level (from the recent failure of the upstream pile of the first intermediate pier from the Franz Josef end) then we would drive the shell piles to resistance, and then drive a heavy Universal Bearing Pile out the bottom of the shell pile to ensure fixity and resistance below scour level. Once the piles are driven on a 7.2m x 40m grid then we place out kitset headstocks, superstructure, and deck as we progress across the river.

The Waiho Bridge washed out appeared to have been about 150m long. We would replace this with 15m + 40m + 40m + 40m + 15m (=150m) configuration. We guess the NZTA will move quickly to replace on this alignment with another temporary bailey bridge.

Given the nature of the pier failure within the flood channel constriction we would recommend a 212m permanent bridge replacement about 40m downstream of the washed out bridge. Its kitset span configuration would be 26m + 40m + 40m + 40m + 40m + 26m (= 212m). This will allow some of the channel constriction to be removed and slowing the flow and reducing the scour risk.

Given the strategic nature of the Waiho Bridge, and that the West Coast is a surge region for the PGF, then Smithbridge will be a collaborative partner with the NZTA to develop the right long-term bridge solution for this vulnerable site before the beginning of the next tourist season.

If the NZTA wish a Smithbridge presentation please advise a potential time and date to meet.

Kind Regards,

s 9(2)(a)

**Design & Methods Engineer**

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