PAD 3/1

TO THE MAYOR AND COUNCILLORS OF THE MACKENZIE DISTRICT COUNCIL

MEMBERSHIP OF THE PROJECTS AND STRATEGIES COMMITTEE

Graeme Page (Chairman)

Claire Barlow (Mayor)	John Bishop
Peter Maxwell	Annette Money
Graham Smith	Evan Williams

Notice is given of a meeting of the Projects and Strategies Committee to be held on Tuesday 11 June 2013 at 9:30am

VENUE: Council Chambers, Fairlie

BUSINESS: As per Agenda attached

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

4 June 2013

PROJECTS AND STRATEGIES COMMITTEE

Agenda for Tuesday 11 June 2013

I APOLOGIES

II DECLARATIONS OF INTEREST

III MINUTES

Confirm and adopt as the correct record the Minutes of the meeting of the Projects and Strategies Committee held on 23 April 2013.

ACTION POINTS

IV REPORTS:

1. Asset Management Monthly Report – May 2013
2. Pioneer Park/Oldfield's Road Bridge Replacement

V PUBLIC EXCLUDED

That the public be excluded from the following part of the proceedings of this meeting namely:

1. Road Maintenance Management Contract
2. Twizel Public Toilets

Reason for passing General subject of each matter to be considered	Ground(s) under this resolution in relation to each matter	Section 48(1) for the passing of this resolution
Road Maintenance Management Contract	Commercial Sensitivity	48(1)(a)(i)
Twizel Public Toilets	Commercial Sensitivity	48(1)(a)(i)

This resolution is made in reliance on Section 48(1)(a)(i) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by Section 6 or Section 7 of that Act, which would be prejudiced by the holding of the whole or the relevant part of the proceedings of the meeting in public are as follows: *Road Maintenance Management Contract and Twizel Public Toilets* section 7(1)(g).

MACKENZIE DISTRICT COUNCIL

MINUTES OF A MEETING OF THE PROJECTS AND STRATEGIES COMMITTEE HELD IN THE COUNCIL CHAMBERS, FAIRLIE, ON TUESDAY 23 APRIL 2013 AT 1:12PM

PRESENT:

Graeme Page (Chairman)
Claire Barlow (Mayor)
Crs John Bishop
Annette Money
Graham Smith
Evan Williams
Peter Maxwell

IN ATTENDANCE:

Bernie Haar (Asset Manager)
Suzy Ratahi (Manager – Roading) (left Meeting at 1:45pm)
John O'Connor (Utilities Engineer)
Angie Taylor (Solid Waste Manager) (left Meeting at 2:37pm)
Keri-Ann Little (Committee Clerk)

I APOLOGY:

Resolved: that an apology be received from Councillor Peter Maxwell.

Mayor Barlow/ John Bishop

II DECLARATIONS OF INTEREST:

There were no Declarations of Interest.

III MINUTES:

Resolved that the Minutes of the meeting of the Projects and Strategies Committee held on 19 March 2013, including such parts as were taken with the Public Excluded, be confirmed and adopted as the correct record of the meeting.

Evan Williams/ Mayor Barlow

ACTION POINTS:

1. *Lilybank realignment is underway today.*
2. *There has not been a meeting with residence of the corner of Strathallan and Hamilton Road – updated in The Roading Manager's report.*

IV REPORTS:

1. ASSET MANAGER'S MONTHLY REPORT:

This report from the Asset Manager referred to Asset Management – Project Progress – Roading, Essential Services and Solid Waste.

Resolved that the report be received.

Claire Barlow/ Evan Williams

Solid Waste:

Angie Taylor, Solid Waste Manager spoke to her report.

Solid Waste sub-committee meeting:

A sub-committee meeting was held on Thursday 4th April 2013. Follows is a brief outline of the issues discussed:

Operational update from ESL:

- Noted that an excellent safety record has been held since the start of the contract.
- Kerbside collection generally working well.
- RRP's have been cleaned up, currently a good team of staff and good staff retention.
- Still a high level of contamination in recycling – work on kerbside bin auditing to be discussed between Council and ESL
- ESL is investigating an upgrade of the recycling line.
- ESL is considering installing a weigh bridge for the Twizel RRP and will provide a proposal.

Roading:

The Roading Manager spoke to her report.

Financial Assistance Rate (FAR) Review:

The Roading Manager spoke to her report accompanied with a draft submission document for Mackenzie District Council regarding the Financial Assistance Rate. The Roading Manager requested a group of Elected Members who can meet with Council Staff to discuss contents of The Council's written submission prior to lodgement on Friday 3rd of May. Meeting date would be Wednesday 1st of May. Meeting is set for 9am on Wednesday 1st of May - Cr Page, Mayor Barlow, Cr Smith and Cr Williams will attend the meeting with Council Staff scheduled above.

Strathallan Road Dust Complaint:

The Roading Manager requested a meeting with the Boulton's and The Roading Committee be arranged to discuss the issues involved with the dust problem on the corner of Strathallan and Hamilton Road's.

Braemar Road:

The Roading Manager reported that the Braemar Road has been hit hard by logging and rock carting operations; this has had a flow on effect on Mount Cook Station Road and Hayman Road respectively. The Roading Manager was happy to report logging operations has now been completed for the season. The repairs to Lake Pukaki Shoreline has ceased for the next 18 months.

Utilities Operation and Maintenance Report to 31 March 2013.

Twizel Water Supply:

Operation and Maintenance expenditure is $28,700 over YTD budget. Most of the over-expenditure is due to repairs/replacement of the secondary pumps. The pumps are past their economic life. We are currently investigating the installation of pressure release valves to reduce water hammer when pumps are cutting in and put. This was successful on the swimming pool pump.

The number of service connection renewals is greater than anticipated. Expenditure to date is $7,200 over YTD budget.

Twizel Water Supply New Source Investigations:

Two 150 mm diameter exploratory bores were sunk in the Ben Ohau Station Homestead area to ascertain if a full investigation is warranted at one or other of the sites.

Site 3

This bore is in "Alluvium in active river bed" beside the Fraser Stream. The alluvium material is entrenched in the Mt John glacial outwash.

The bore log indicates that the alluvium material is 29.4 m deep, which is deeper than I expected. The water quality is good; however the quantity of water is insufficient. At a flow of 16 l/sec, the drawdown was 10.88m.

Site 4

This bore is in the Mt John outwash plain, which is the most recent glacial outwash and the one most likely to yield water. It is in a low area at the junction of the fans from Lake Ohau and Ben Ohau Range directions.

The bore was drilled to 70.8 m deep, where the material changed from sandy gravels to sand. At a pumping rate of 12 l/sec from this depth the drawdown was 21.0 m. The screen was in the sandy gravel which appeared to restrict the flow.

The casing and screen were then pulled up so that the bottom of the screen was at 63.82 m depth. This was in the area of large rounded gravels. When pumped at 23 l/sec from this level (which was at the pump capacity), the drawdown was 3.77 m. There could be sufficient quantity of water at this site.

However, the water has high levels of iron and manganese which would require considerable treatment.

We have gained significant additional information on the groundwater in the area, but we have not found an obvious source which we could pump from to a reservoir that would then supply Twizel by gravity.

Opus International Consultants recommend the following work:-

1. Water levels in the exiting Twizel wells during past high demand durations be checked to ensure that the additional water take can be met from the existing wellfield.
2. Design of water treatment for the existing Twizel water source be commenced.
3. A pilot treatment plant treating for iron and manganese removal be operated on the water from the bore at Site 4.
4. Updated cost estimates be prepared for:
   a) Supply from existing Twizel water source, with treatment and pumped from distribution for existing and future water supply needs.
   b) Supply from Ben Ohau Station water source, with treatment and gravity distribution for existing and future water supply needs.
   c) Twizel water source/treatment/pumped distribution for existing Twizel Township and Ben Ohau Station water source/treatment/gravity distribution for future developed areas of Twizel.

1. TRANSPORTATION ACTIVITY MANAGEMENT PLAN:

To provide and adopt the Transportation Activity Management Plan as the framework for the 2012 to 2022 LTP.

Resolved that the report be received.

Annette Money/ Evan Williams

Mr Haar, Asset Manager spoke to the report.

Resolved:

2. That the Transportation Activity Management Plan be adopted as policy for the future direction of that activity.

Graham Smith/ Mayor Barlow

2. WATER SUPPLY ACTIVITY MANAGEMENT PLAN:

To provide and adopt the Water Supply Activity Management Plan as the framework for the 2012 to 2022 LTP.

Resolved that the report be received.

John Bishop/ Mayor Barlow

Resolved:

1. The Council are committed to investigating the cost of providing a water scheme for Manuka Terrace once costs are known then going back to the affected Community for consultation.

Graham Smith/ Mayor Barlow

Resolved:

2. That the Water Supply Activity Management Plan be adopted as policy for the future direction of that activity.

Graham Smith/ Evan Williams

THERE BEING NO FURTHER BUSINESS THE CHAIRMAN DECLARED THE MEETING CLOSED AT 2:01 PM

_____

CHAIRMAN

_____

DATE

MACKENZIE DISTRICT COUNCIL

REPORT TO: PROJECTS AND STRATEGY COMMITTEE

FROM: ASSET MANAGER

SUBJECT: ASSET MANAGER'S MONTHLY REPORT

MEETING DATE: 11 JUNE 2013

REF: WAS 1/1

ENDORSED BY: CHIEF EXECUTIVE OFFICER

REASON FOR REPORT

To update the Projects and Strategy Committee on the progress on various projects and also the normal operation of the department for the past month.

RECOMMENDATION:

1. That the report be received.

BERNIE HAAR
ASSET MANAGER

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

ASSET MANAGEMENT

Work undertaken this month included the following:

- Various solid waste issues
- Resource consent annual monitoring report – gathering data
- Asset management system review
- Civil Defence Exercise – full day south island wide exercise based on a significant earthquake on the alpine fault.
- Consent monitoring.

The Utilities Engineer and Whitestone have significantlyprogressed the Utilities Services Contract Negotiations.

Whitestone have provided rates to reflect the modified "basis of payment" discussions and staff are finalising the contract documents before bringing a full report to Council.

A solid waste sub committee meeting was held in Twizel and Angie will report fully on this later in her report.

All the Asset team have been extremely busy this month with one staff member left and critical work being shared around to meet statutory timeframes or customer expectations. By the time of the meeting we should have appointed a replacement.

I have also been inspecting the seal preparation on the Lochinver Stage 3 subdivision. There were some issues with the workmanship that I was not happy and the Developer's Engineers were not addressing adequately. If not fixed the project would have had issues when the Council was asked to take it over.

A similar issue with seal preparation on the The Cairns subdivision was noted and despite extending the final date for seal, the work could not be completed. A bond will be taken from the Developer for the balance of the outstanding work to allow titles to be issued for the subdivision.

PROJECT PROGRESS - COUNCIL PRIORITY LIST

Roading

Activity Management Plan
Plan complete and will be handed out at the meeting for adoption in April.

Sewerage

Twizel Land Purchase
Meeting arranged for early May.

Activity Management Plan
Adopted by Council

Water Supply

Projects Water Supply Programme
A meeting has been arranged for mid June with our consultants to review progress and determine a way forward.

Over Queens Birthday there was an opportunity to observe the proposed water source for Fairlie compared to our current take and the Opihi River as 56mm of rain fell in the region over that week end. Whilst we were not in a position to get accurate turbidity readings the photos clearly show that the proposed site is considerable clearer even though we have not redirected any surface contamination away.

Fairlie - Current well source Queens Birthday weekend

Fairlie - Proposed well source Queens Birthday weekend

Fairlie – Opihi River at Stoneliegh on Queens Birthday weekend

Activity Management Plan
Plan complete and will be handed out at the meeting for adoption in April.

<u>Stormwater</u>

Activity Management Plan
Adopted by Council

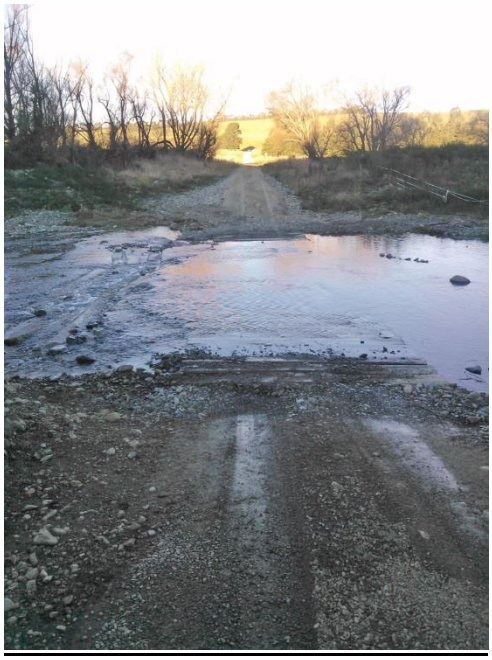
ROADING

Environmental Maintenance

Flooding works are pretty much complete with the finishing touches being made on some unsealed roads. The Raincliff Bridge has been jacked up and re-levelled by Timaru District Councils Maintenance Contractor. This is a boundary bridge so costs are shared (we have allowed for this cost in NZTA Flooding Budget)

Maintenance

At the time of writing this report there has been one snow fall that has closed Burkes Pass for a number of hours, our network has not yet been majorly effected by the cooling season, with just one snow clearance from the Meikleburn Saddle, and through the Rollesby Rd, with about 150-180mm of snow through those roads, there is still available budget in our normal environmental maintenance budget to allow for a small snow fall, and ice gritting.



Askins Road Ford

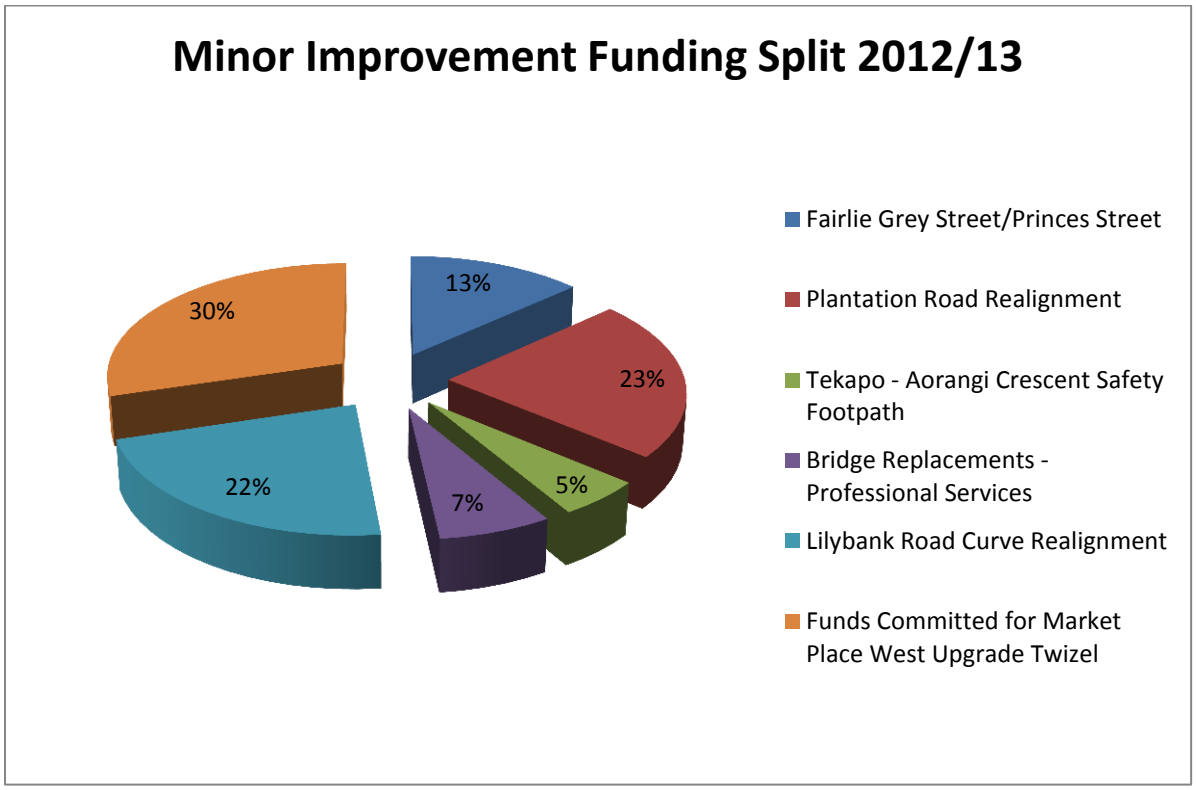
Twizel Sign Installation

Strathallan Road Dust Complaint.

The Roading Committee met with the Boultons on site on the 1st of May. In attendance were The Mayor Clair Barlow, Councillor Graham Page, Opuha Ward Federated Farmers representative Robert Hobson, Gary and Christina Boulton and staff members Bernie Haar and Suzy Ratahi. The issues faced by both the Bolton's and Council were discussed with the Bolton's being re-assured that Council was currently reviewing it's "Sealing Past Houses Policy" and that currently under NZTA's funding rules we were unlikely to ever get funding from central government for seal extensions on low volume roads.

Minor Improvements

We have completed the following projects this year, as detailed in graph below,



Before

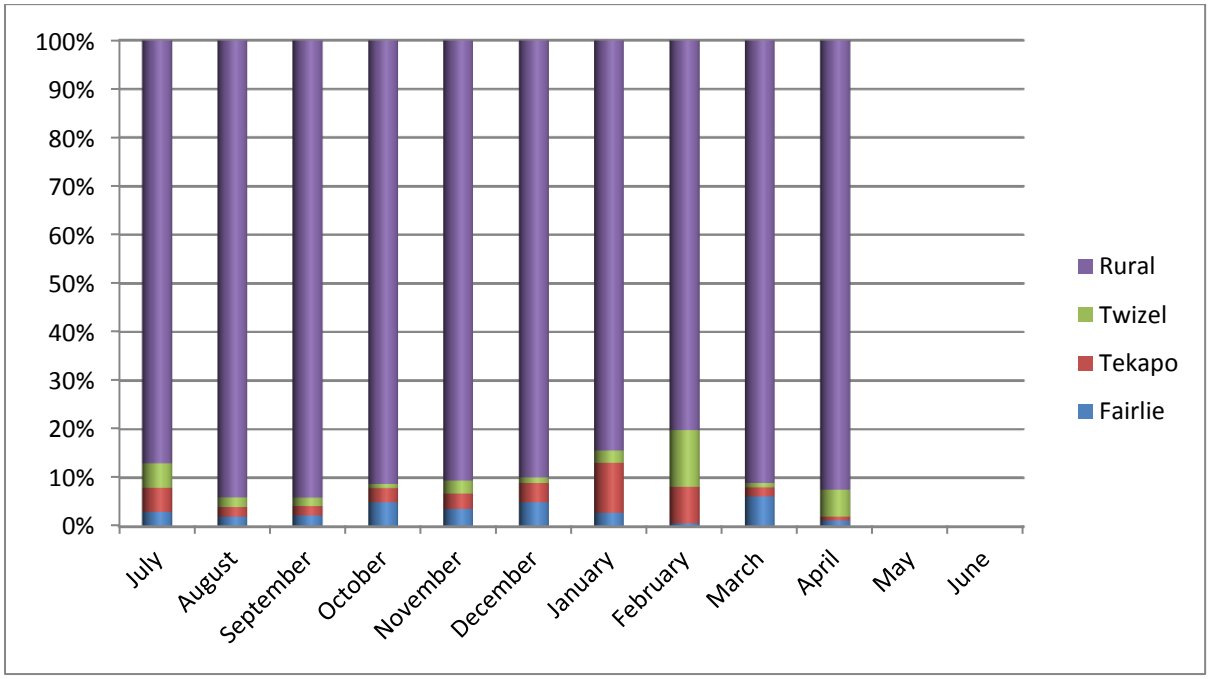
After

Lilybank Road Realignment

In the 2013/14 financial year, it is likely that the three bridges scheduled for replacement in the Long Term Plan (Long Gully, Pioneer Park and Oldfields Road) will be replaced and as such are expected to utilise the majority of the Minor Improvements budget, leaving little or no funds for other projects. However, the Roading Committee did approve the following priority 2 projects at its meeting on the 20th of September last year. If it became obvious that there would be some funding remaining after tenders were received we would look to make a start on this approved list.

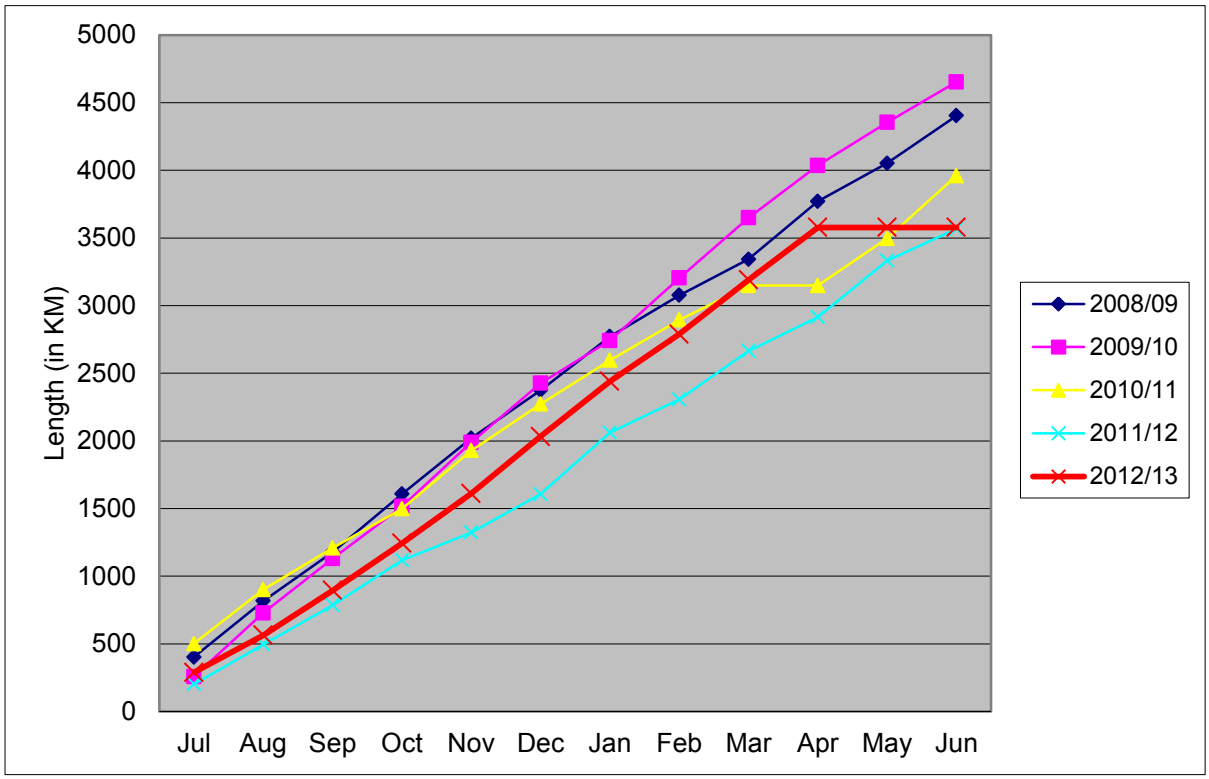
- Lakeside Drive safety footpath, Lake Tekapo
- Talbot Road, Fairlie – Sealing of gravel berm
- Lilybank Road – sealed linkages
- Seal-widening on Clayton Road.
- Traffic improvements on Mackenzie Drive, Twizel.

Amaglamated Roading Budgets Graph Showing Percentage Share



Note: Graph includes reseals/footpath surfacing completed this financial year but not Minor Improvements. A further graph will be presented at completion of minor improvements projects this financial year.

Unsealed Road Grading (Cumulative)



Reiterating from last month;

Grading is tracking higher than last year due to the July/August Flooding, and using a slow repair mode to see what gravels we can win back from the shoulders at a lower cost for repair.

Also contributing to an increase is the fortnightly grading of Braemar Road when logging operations are carried out, this helps to protect the areas that only have a small amount of insitu base material.

ESSENTIAL SERVICES

John O'Connor has been on annual leave so the report will be a little less detailed than usual.

FAIRLIE

Fairlie Water Supply

Staff have been investigating a joint venture with a developer in the Eversley Reserve to provide an on demand water supply for his project. The water supply has to cross the state highway and the plan is to take a 100mm pipe across so that it can be used to upgrade the service to the Reserve. The cost will be shared by the Community Board and the developer. Staff also assisting by getting approvals required by NZTA.

The water replacement contract in Fairlie has been going well with very few issues. Despite the weather conditions the contractor continues to have a very tidy site. By the meeting date they should have completed most of the pipe laying with only clean up and reinstatement to be completed.

Fairlie Waste Water

Annual consent monitoring report being prepared for Environment Canterbury

TEKAPO

Tekapo Water Supply

All works are virtually complete on the UV upgrade to the Tekapo water supply. The plant hasn't been switched on just yet as we are just sorting alarms.

Tekapo UV Plant

Tekapo UV Plant Building

Tekapo Waste Water

There have been no issues lately.
Annual consent monitoring report being prepared for Environment Canterbury

TWIZEL

Twizel Water Supply

A soft starter has been installed to reduce the water hammer on the pumps at start up and we have received details on an option to reduce pressure on the foot valves. Staff are investigating how this could be implemented.

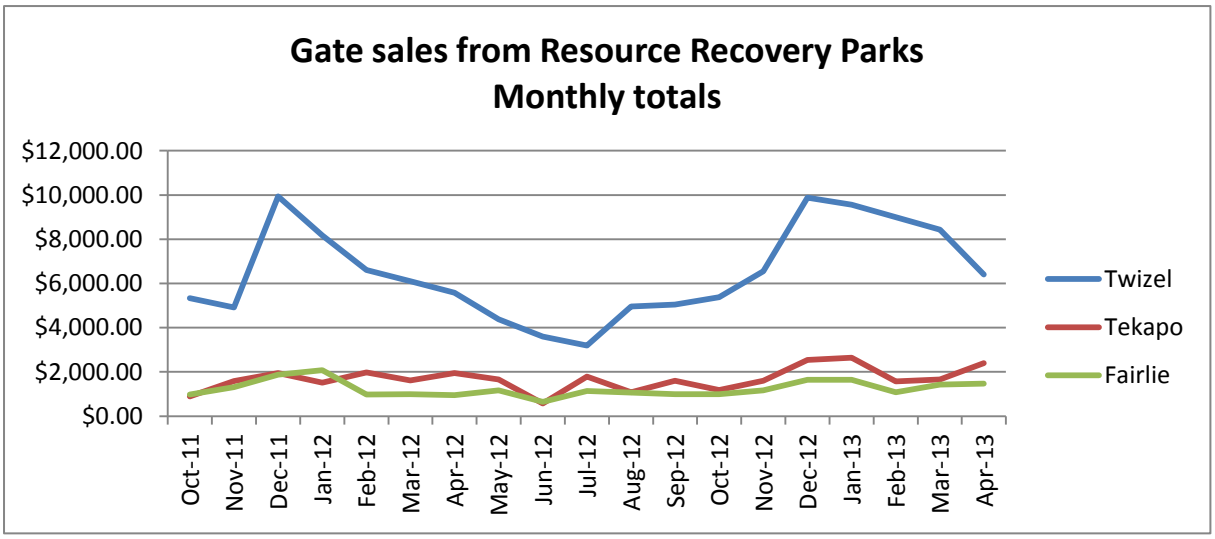
Twizel Waste Water

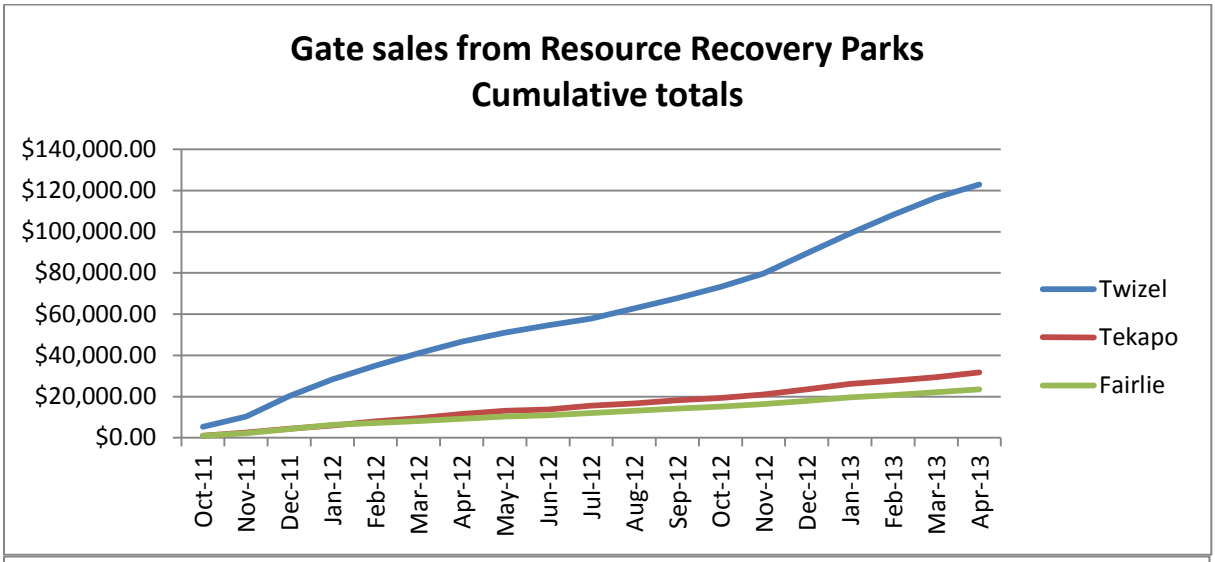
We have received some complaints about odour coming from the manhole vents where the step sewerage systems discharge into the gravity network. Staff in Twizel are monitoring the situation to determine its extent before reviewing options to rectify the situation.

Twizel Storm Water

The fence around the stormwater outlet in Glen Lyon Road has been replaced and the out let cleaned out. At the same time a new gate has been installed to get better access to the site. The property owner is planning on building in the near future and asked Council to review its maintenance methods so that it did not interfere with their proposals.

SOLID WASTE




Gate sales from Resource Recovery Parks
Cumulative totals
$140,000.00
$120,000.00
$100,000.00
$80,000.00
$60,000.00
$40,000.00
$20,000.00
$0.00
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
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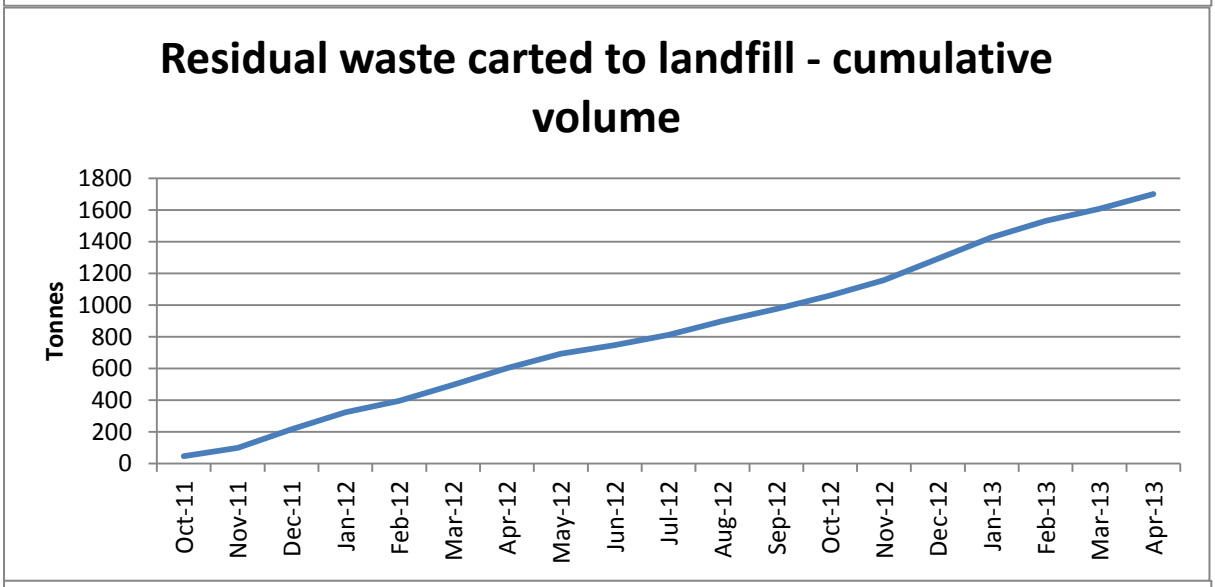
Feb-13
Mar-13
Apr-13
Twizel
Tekapo
Fairlie


Residual waste carted to landfill - cumulative volume
Tonnes
1800
1600
1400
1200
1000
800
600
400
200
0
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
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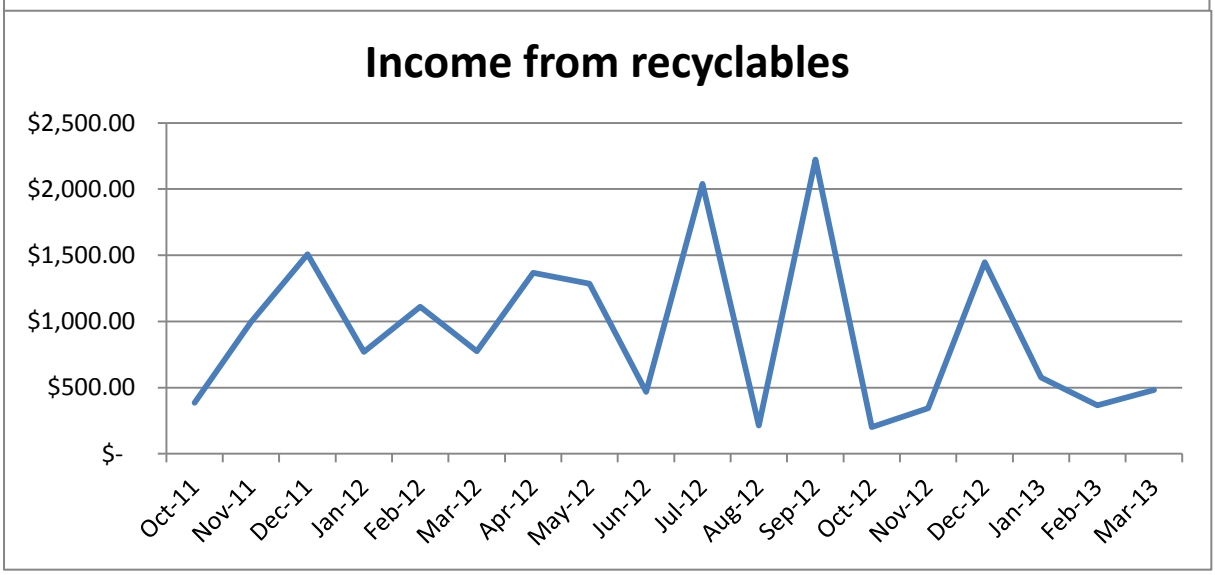
Apr-13


Income from recyclables
$2,500.00
$2,000.00
$1,500.00
$1,000.00
$500.00
$-
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
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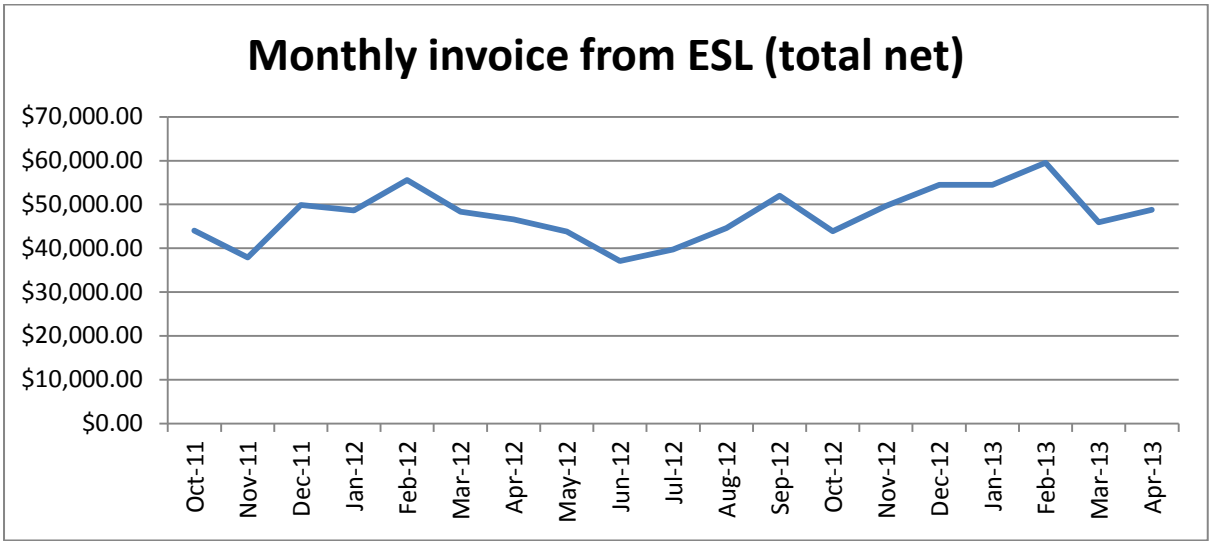
Mar-13



Processing of recycling
ESL is reviewing the current method of processing recycling; this is due to the high costs involved with the existing system. ESL is putting together information on alternative processing options and we will arrange a Solid Waste Sub-Committee meeting to discuss these.

Paper 4 Trees
The Council is continuing to support the Paper 4 Trees programme, which is a school based recycling project. There are currently 8 schools in the Mackenzie taking part in the programme, which involves providing trees to schools based on the volume of their recycling. So, the more recycling each school can divert from landfill, the more trees they earn.

TV TakeBack
A steady number of TV's have been coming in through the TV TakeBack project, with approximately 130 TV's collected so far. The project can continue to run until we reach our cap of 180 TV's (set by MfE), or until the cut off date in October.

MACKENZIE DISTRICT COUNCIL

REPORT TO: PROJECTS AND STRATEGIES COMMITTEE

SUBJECT: PIONEER PARK/OLDFIELDS ROAD BRIDGE REPLACEMENT

MEETING DATE: 11th JUNE 2013

REF: 2/2

FROM: MANAGER – ROADING

ENDORSED BY: CHIEF EXECUTIVE OFFICER

PURPOSE OF REPORT:

To present to the Projects and Strategies Committee the Pioneer Park and Oldfields Road – Options Report as prepared by OPUS.

STAFF RECOMMENDATIONS:

1. That the report be received.
2. Oldfields Road Bridge Renewal - Council accept option B and proceed with the tendering process which is to be administered by OPUS
3. Pioneer Park Bridge Renewal - Council accept option A and proceed with the tendering process which is to be administered by OPUS

SUZY RATAHI
MANAGER – ROADING

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

ATTACHMENTS:

OPUS Report

BACKGROUND:

Council has adopted the Bridge Replacement Strategy, and the current LTP, in which the replacement of Long Gully Bridge, Pioneer Park and Oldifields Road Bridges are recommended for replacement in the 2012-2015 period. Funding was secured from NZTA for these three bridge replacements under our increased Minor Improvements funding.

FINANCIAL CONSIDERATIONS:

The replacement can be funded out of 2013/14 year's Minor Improvements budget of $250,000. Structure replacement has first call on funding as agreed by the newly formed Roading Committee.
The replacement of the three bridges is estimated to cost $292,000. By combining the 3 replacements in one contract, we would expect some cost savings as a result of bulk buying.

CONSIDERATION OF OPTIONS:

After recent flooding events it became obvious that replacement of the bridges, with some above stream structure, is required to retain a resilient network. If wash over fords had been in place at the time of flooding, access to properties would have been cut off for a considerable period of time on two occasions. Therefore in both, Pioneer Park and Oldfields Road Replacements, we have discounted the use of a wash over ford as a viable option leaving either bridge replacement or boxed culvert installation.

Oldfield Road - Options

Option	Advantages	Disadvantages	Construction Cost
A. New Narrow (3.0m) Bridge (retain ford)	☐ HN-72 loading ☐ Lowest cost ☐ Simple consenting (if any) ☐ No works in flowing water ☐ Minimal dewatering required ☐ Scour resilient	☐ On-going ford maintenance costs ☐ More approach retention required ☐ Legal boundary issue to be resolved	$102,000
B. New Wider (4.1m) Bridge (remove ford)	☐ HN-72 loading ☐ Lower cost ☐ Simple consenting (if any) ☐ No works in flowing water	☐ Slightly more costly than narrow replacement bridge ☐ More approach earthworks required	$103,000

	☐ Minimal dewatering required ☐ Scour resilient ☐ Wider carriageway ☐ Better bridge alignment ☐ No legal boundary issues		
C. New Box Culvert (remove ford)	☐ HN-HO-72 loading ☐ Wider carriageway ☐ Better bridge alignment	☐ Consent required for finished structure as well as any construction effects ☐ Highest establishment costs ☐ Works in waterway and dewatering required OR a severely restricted construction period. ☐ More approach works required ☐ More susceptible to scour	$122,000

Pioneer Park (Middle Valley Road)

Option	Advantages	Disadvantages	Construction Cost
A. New Bridge	☐ HN-72 loading ☐ Lower establishment cost ☐ Permitted activity not requiring resource consent ☐ No works in flowing water ☐ Minimal dewatering required ☐ Scour resilient	☐ Raising of approaches required	$104,000
B. Box Culvert	☐ HN-HO-72 loading ☐ Slender deck gives greater freeboard for given deck height	☐ Consent required for finished structure as well as any construction effects ☐ Higher establishment costs ☐ Works in waterway ☐ Works in waterway and dewatering required OR a severely restricted construction period. ☐ More susceptible to scour ☐ Raising of approaches required	$126,000

CONCLUSION:

Oldfields Road – Option B

The disadvantages associated with option A (ongoing ford maintenance, legal boundary issues, approach retention) could be avoided with modest extra cost(approximately $1000). This option would comprise the construction of a 'full width' single lane bridge (4.1 m wide between kerbs) catering for all legal width vehicles. The ford would be redundant and the footprint of the bridge moved slightly downstream to align more appropriately with the approaches and within the legal road reserve boundary. The redundant concrete bund at the downstream edge of the ford would be removed and the bed level allowed to degrade to a natural level. This will provide greater waterway area under the bridge and therefore the new deck level can be lowered 150 mm from existing (275 mm lower than option A). This reduces approach fill
requirements, improves sight distance across the bridge, and achieves the desirable freeboard with the same span as option A.

Option B provides the best outcome in terms of level of service and future proofing, and the cost of the wider bridge is offset by a reduction in the amount of retaining walls required under option A.
Option B resolves the road reserve boundary and scour issues existing at the site. Taking into account the cost of on-going maintenance of the ford, option B is likely to have the lowest whole of life cost.

Pioneer Park – Option A

A reinforced concrete bridge is the preferred option for the replacement of Pioneer Park Bridge, as it will provide a relatively low cost, robust, environmentally appropriate crossing for this site.
Resource consent requirements are minimised, and the reduced extent of site works for bridge construction compared to a box culvert minimises construction cost.

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20 Moorhouse Avenue
PO Box 1482, Christchurch Mail Centre, Christchurch 8140
New Zealand

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f: +64 3 365 7858
w: www.opus.co.nz

27 February 2013

Suzy Ratahi
Mackenzie District Council
PO Box 52
Fairlie

6-DK456.00 / 35sc

Dear Suzy

OLDFIELDS ROAD AND PIONEER PARK BRIDGES – OPTIONS ASSESSMENT FOR RENEWAL

1. Scope

Opus was commissioned by Mackenzie District Council (MDC) to undertake an options assessment for the replacement of Oldfields Road Bridge (Bridge #28) and Pioneer Park Bridge (Bridge #19). This options assessment included a brief site visit/measure up, waterway assessment, option assessment and costing, and concept design. This letter outlines the findings from the options assessment and provides recommendations for the renewal of these bridges.

2. Oldfields Road Bridge #28

2.1. Site Description

Oldfields Road Bridge is a single lane, single span bridge with timber superstructure, consisting of transverse plank deck and hardwood beams seated on hardwood bearers supported on rail iron piles. The bridge is 7.5 m long (6.6 m clear span), and has a 2.7 m carriageway width (between kerb faces), with timber kerbs and handrails.

Photo 1: General view of bridge and ford, looking north towards SH8

Photo 2: Elevation looking upstream

The bridge is located Oldfields Road, 550m from SH8, and approximately 4km northwest of Fairlie; refer to locality plan in Appendix A, (figure 1).

Oldfields Road provides access to Closeburn as well as 10 or so other smaller parcels of land. There is no alternative route to these properties and it appears active land development is occurring in this area.

The existing downstream cobble/concrete ford is aligned with the northern approach and the bridge provides an offline bypass, however the bridge appears to be used more than the ford. The bridge is currently posted with a 90% Class 1 maximum gross vehicle restriction, and a maximum speed limit of 30km/h.

The road, bridge and ford appear to be well used although inventory data records traffic demand as less than 50 vehicles per day. The ford is roughly formed with a concrete bund acting as a weir at the downstream edge to retain the bed, but is in good serviceable condition. At the south end, the approach to the ford is relatively steep and a sharp turn is required to access properties to the west; this combination may be problematic for overweight and oversize vehicles to negotiate.

The bridge crosses the north branch of Wellshot Stream which at the bridge site is well confined between stable and well-vegetated banks with rank grass lining the channel margins. The catchment is 100% vegetated, mostly by pasture on the river flats and unimproved grassland in the hills. In contrast to upstream, the bed downstream of the bridge site is devoid of fine gravels (refer photos 3 and 4), indicative of moderately active degradation.

Photo 3: Waterway downstream of bridge (concrete weir in foreground)

Photo 4: Waterway upstream of bridge

2.2. Design Criteria

The NZTA Bridge Manual considers this site to be Importance Level 1, i.e. a bridge on a no-exit rural road, not serving a through-road function, and serving a population less than 50.

A Level 1 bridge should have a design working life of 100 years, and should be designed to remain functional during a 25 year ARI (average recurrence interval) flood event and to withstand the effects of this event without sustaining damage.

The catchment is sparsely vegetated and the probability of a flood flow containing large debris is low, therefore a freeboard allowance for debris passage at the lower bound of the range recommended by the Bridge Manual would be considered appropriate, i.e. 0.6 m from high water to bridge soffit.

Generally, single lane rural bridges are designed to HN-72 loading, with a carriageway width of at least 4.1 m, to cater for agricultural vehicles which may use a public road without an oversize permit up to 3.7 m width. However given there is an adjacent ford that can be used by oversize vehicles, the bridge could have a narrower 3.0 m carriageway if desired (meeting the standard of Bridge Manual Appendix D - Lightly Trafficked Rural Bridges).

The development of the adjacent land and the close proximity of the bridge to Fairlie increases the likelihood of heavy vehicle loading. HN-72 design loading encompasses all legal vehicles including high productivity motor vehicles (HPMV) and provides a degree of future proofing.

With regard to bridge side protection, Bridge Manual guidance suggests handrails are required if pedestrians are likely to frequent the bridge. Again given the proximity of the bridge to Fairlie and active land development (subdivision), the provision of handrails would be recommended in this instance. The existing bridge has handrails therefore the existing level of service would be maintained.

2.3. Catchment / Waterway Assessment

The catchment area draining to the bridge location is approximately 17 km^2 and rises from 340m above sea level (ASL) at the bridge site to approximately 900 m ASL. The catchment is vegetated almost entirely with pasture or unimproved grasses with very little scrubland and few large trees.

The 25 year ARI design flood flow calculated using the Rational Method is around 23 m^3/s (cumecs). It is noted that the waterway channel can only contain a 24.5 cumec flow (approx.) indicating that a rainfall event larger than a 1 in 25 year event will overtop the channel before it reaches the bridge and cause localised flooding of the surrounding flood plain.

A 25 year ARI flood will pass under the current bridge with around 300 mm freeboard, indicating that the structure is appropriately sized and that a replacement structure should be of a similar scale in terms of waterway capacity.

There is a modest drop in the streambed beyond the ford and a lack of fines in the downstream bed, indicating that degradation is active at this site. Bed levels measured 25 m upstream and downstream indicate that the ford is perched up to a metre above the natural channel gradient. At present, the ford/weir is retaining gravels under the bridge and protecting the piles from degradation, however unless it is maintained the downstream edge of the ford is likely to become undermined over time, compromising the performance of the ford and exposing the bridge abutments to scour. The foundations for a replacement bridge should be designed to accommodate this potential for scour/degradation.

2.4. Geometric Assessment

The southern abutment of the existing bridge is approximately 15 m from the end of the road reserve, where a stacked stone wall marks the boundary. The main traffic flows turn to the right immediately after the bridge (refer photo 5). The utility of the ford appears to be limited with the current layout as an overweight or oversize vehicle must turn hard right as it is climbing out of the ford in order to make the turn, effectively sidling up the side of the bridge approach while turning. The replacement bridge will likely require walls to more positively retain the bridge approaches (currently un-retained over-steep batters), which may further restrict the right turning movement of vehicles using the ford. It is recommended that the space occupied by the downstream ford is utilised to widen the bridge, thus catering for all vehicles on the bridge and improving the geometrics of the site. If the replacement is located downstream, the northern approach will also line up with the bridge rather than offset as exists currently (refer photo 1).

In addition, aerial photographs of the bridge site from the MDC online mapping service (refer photo 6) indicate that the existing bridge may be constructed on or very near to the road reserve boundary. Ideally a replacement structure should be built entirely on road reserve, i.e. slightly downstream of the existing.

Photo 5: Southern approach to bridge
(main traffic flow continues to the right)

Photo 6: Aerial view of bridge

2.5. Repair & Renewal Options

A. Replace Bridge / Retain Ford

If the ford is to remain in service, a replacement reinforced concrete bridge of a similar scale to existing would be a suitable replacement solution.

This option would comprise an 7.8 m long by 3.3 m wide by 375 mm thick pre-stressed concrete slab deck. The deck units will be placed on cast insitu concrete abutments formed around driven H-piles. The abutments will be spill-through and will require scour protection with rock rip rap. The bridge can be constructed on a similar footprint to the existing bridge to avoid extensive approach works. A sketch of this option is shown in Appendix B. The existing over-steep batters supporting the downstream side of the approach fill will be retained by gabion baskets or similar.

This option provides a 3.0 m carriageway width that maintains the existing level of service and meets minimum Appendix D requirements with regard to trafficable width, and provides HN-72 loading capacity.

A 7.8 m long bridge reproduces the existing 6.6 m clear span. In order to achieve the desired 600 mm freeboard the running surface will need to be raised 125 mm higher than the existing timber deck and the approaches raised locally to match. The existing bridge deck is currently 0.7 m above the approach pavement therefore this option will further reduce the sight distance across the bridge.

Advantages of this option include:

- straight forward resource consenting (if any); erection of a bridge of this scale is a permitted activity however consent for construction activity such as earthworks may be required;
- minimal establishment cost (precast components could be placed by Hiab);

- only minor works are required to be undertaken in the waterway, therefore minimal dewatering is required, if any, and therefore there is minimal restriction on construction period;
- a piled structure provides good resistance to scour; and,
- the ford is retained for overweight/oversize vehicles.

The disadvantages of this option are that the finished bridge is narrow and the proximity of the ford will require significant vertical retention of the approaches (up to 2.5m high). In addition, the southern approach to the ford is steep and tight, and therefore the usefulness of the ford for large vehicles is questionable. The road reserve boundary issue should also be investigated prior to pursuing this option; a legal survey has been allowed for in the rough order cost estimate.

B. Replace Bridge / Remove Ford

The disadvantages associated with option A could be avoided with modest extra cost. This option would comprise the construction of a 'full width' single lane bridge (4.1 m wide between kerbs) catering for all legal width vehicles. The ford would be redundant and the footprint of the bridge moved slightly downstream to align more appropriately with the approaches and within the road reserve boundary. The deck thickness can be reduced to 350 mm due to improved load spreading, but the bridge length and foundations of option B would be the same as for option A. The redundant concrete bund at the downstream edge of the ford would be removed and the bed level allowed to degrade to a natural level. This will provide greater waterway area under the bridge and therefore the new deck level can be lowered 150 mm from existing (275 mm lower than option A). This reduces approach fill requirements, improves sight distance across the bridge, and achieves the desirable freeboard with the same span as option A.

This option retains all the advantages of option A, provides a higher level of service in terms of width, and better road alignment. With the ford removed, retaining walls to support the approach fill are not necessary and can be replaced with 1.5:1 grassed battered slopes. The road reserve boundary issue does not exist for option B.

The disadvantages of option B are marginally increased cost for the construction of the wider superstructure and wider approaches.

C. Replace Bridge with Culvert

Given the relatively large waterway requirements and low soffit height available, a box culvert replacement is the only feasible culvert solution at this site.

Two cells of 3.5 x 2 m boxes (7 x 2 m total waterway area) would provide waterway capacity suitable for the design flood flow event. Precast box units are manufactured to HN-HO-72 loading and come in 1.55 m unit widths; therefore the available carriageway widths are 2.7 m between kerbs (for two units) and 4.25 m between kerbs (for three units). A 4.25 m wide structure located slightly downstream of existing would be the most appropriate solution (for reasons described under option B).

The advantages of the box culvert option are simplified (relatively) construction technique and simplified design. Box culverts can lead to significant cost savings at smaller scales, however for larger scale structures cost savings are offset by the physical disadvantages.

Option C has considerable construction disadvantages including the requirement for resource consent for the finished structure (due to bed disturbance and other undesirable waterway

effects generated by a culvert); the requirement for dewatering or stream diversion for construction (or alternatively the construction period will be restricted to when the waterway is dry); increased costs for establishment (transportation of large culvert units, and the requirement for craneage to handle the units on site); more complex site concrete works (cut-off walls & aprons); and marginally increased approach works for the wider structure (similar to option B).

Other disadvantages of the finished structure are that a culvert may be more prone to scour effects than a piled bridge. Given the existing ford is already perched due to degradation action, a box culvert would have to be buried up to a metre deep and will require cut-off walls to prevent further undermining.

2.6. Summary of Options

The preliminary assessed cost for all options and their advantages and disadvantages are summarised below (for a detailed breakdown of cost refer Appendix C):

Option	Advantages	Disadvantages	Construction Cost
A. New Narrow Bridge (retain ford)	• HN-72 loading • Lowest cost • Simple consenting (if any) • No works in flowing water • Minimal dewatering required • Scour resilient	• On-going ford maintenance costs • More approach retention required • Legal boundary issue to be resolved	$102,000
B. New Wider Bridge (remove ford)	• HN-72 loading • Lower cost • Simple consenting (if any) • No works in flowing water • Minimal dewatering required • Scour resilient • Wider carriageway • Better bridge alignment • No legal boundary issues	• Slightly more costly than narrow replacement bridge • More approach earthworks required	$103,000
C. New Box Culvert (remove ford)	• HN-HO-72 loading • Wider carriageway • Better bridge alignment	• Consent required for finished structure as well as any construction effects • Highest establishment costs • Works in waterway and dewatering required OR a severely restricted construction period. • More approach works required • More susceptible to scour	$122,000

2.7. Funding

The economic evaluation required to justify funding through the bridge replacement category (W/C 322) is driven by HCV traffic volumes. The amount of HCV traffic at this site has not been assessed, however given that there is no alternative route and there is potential for increasing

traffic volumes from development, funding of the replacement via the 322 category is likely justifiable.

2.8. Recommendation

A reinforced concrete bridge is the preferred option for the replacement of Oldfields Road Bridge, as it will provide a relatively low cost, robust, environmentally appropriate crossing for this site. Resource consent requirements are minimised, and the reduced extent of site works for bridge construction compared to a box culvert minimises construction cost.

Option B provides the best outcome in terms of level of service and future proofing, and the cost of the wider bridge is offset by a reduction in the amount of retaining walls required under option A. Option B resolves the road reserve boundary and scour issues existing at the site. Taking into account the cost of on-going maintenance of the ford, option B is likely to have the lowest whole of life cost.

3. Pioneer Park Bridge #19

3.1. Site Description

Pioneer Park Bridge is a single lane, single-span bridge with timber superstructure, consisting of transverse plank deck with longitudinal running planks and hardwood beams seated on hardwood bearers supported on rail iron piles. The bridge is 9 m long (8.1 m clear span), and has a 3.9 m carriageway width (between kerb faces), with timber kerbs and handrails.

Photo 7: General view of site looking south (downstream ford to left, secondary flow path and Homebush Road in background).

Photo 8: Bridge elevation (looking downstream)

The bridge is located on Middle Valley Road just north of the intersection with Homebush Road, to the east of Pioneer Park. Refer to locality plan in Appendix A, (figure 2). The road is a through-road from SH79 to Raincliff Bridge and also provides access to Raincliff Forest.

The bridge is currently posted with a 70% Class 1 maximum gross vehicle weight restriction and a speed restriction of 10 km/h. The road appears well used although the bridge inventory records traffic demand as less than 50 vehicles per day. A gravel ford downstream provides an offline bypass for overweight vehicles and although it is serviceable it appears to be rarely used.

The waterway is an unnamed tributary of Raincliff Stream. The catchment is mostly vegetated by pasture and but with a significant area of exotic forest in the middle reaches. The bridge is sited on a relatively flat gravel fan approximately 300m upstream of the junction with the main waterway. The waterway channel at the bridge site is shallow. The banks are currently stable and vegetated with grass, shrubs and willows. The bridge provides minimal waterway area and there is a secondary flow path 25m to the south (true right). It appears that due to the shallow channel and minimal river training that a significant flood event would inundate the entire area with overland flow.

Photo 9: View over bridge looking north

Photo 10: Waterway downstream of ford

3.2. Design Criteria

The NZTA Bridge Manual considers this site to be Importance Level 2, as Middle Valley Road is a through road; however given the low traffic volumes and sparse population that the road serves, Importance Level 1 design criteria is considered to be more appropriate for this bridge.

A Level 2 bridge should have a design working life of 100 years, and should be designed to remain functional during a 50 year ARI (average recurrence interval) flood event and to withstand the effects of this event without sustaining damage. The design flood event for a Level 1 bridge is 25 years ARI.

Production forest makes up a portion of the catchment area therefore a flood flow could contain large debris. However given the small size of the catchment and flood plain location, the risk of large debris being trapped by the bridge and blocking the waterway is considered low. Therefore a freeboard allowance for debris passage at the lower bound of the range recommended by the Bridge Manual would be considered appropriate, i.e. 0.6 m from high water to bridge soffit. In addition, a lesser freeboard (i.e. similar to existing) could also be acceptable if the historical frequency and extent of flooding is considered acceptable by MDC.

As Middle Valley Road is a through-road and forestry and other heavy traffic is likely to use the road, a single lane bridge to HN-72 loading, with a carriageway width of at least 4.1 m is recommended.

With regard to bridge side protection, at this site the existing handrail provides useful delineation of the single lane bridge in an otherwise featureless section of the road, and therefore installation of handrails to maintain the existing level of service would be recommended.

3.3. Catchment / Waterway Assessment

The catchment area draining to the bridge location is approximately 8.3 km^2 and rises from around 160m above sea level (ASL) at the bridge site to 560 m ASL. The catchment is vegetated by production forestry and pasture or unimproved grasses.

The 50 year ARI design flood flow calculated using the Rational Method is around 24.5 m^3/s (cumecs); while the 25 year ARI design flood flow is around 19.5 cumecs.

The current bridge provides a waterway capacity of around 20 cumecs with no freeboard to the bridge beams during a 25 year ARI event. The water level during a 50 year ARI event will be around 100 mm higher than the existing beam soffit. In order to achieve 600 mm freeboard, the bridge soffit would need to be raised 600-700 mm from existing depending on the design event used.

No scour around the bridge is evident at present, however the stream bed material appears to be highly mobile and likely to experience aggradation/degradation cycles over time.

3.4. Repair & Renewal Options

There are no physical constraints to retaining the existing downstream ford so for all options the ford may remain in service.

A. Replace Bridge

A replacement reinforced concrete bridge of a similar scale to the existing would be a suitable replacement solution. A 9 m long bridge is around the maximum length that could be contemplated using a low cost solid concrete slab deck. The use of a longer bridge to increase waterway area and freeboard would require the use of much larger and more expensive hollow core beams.

A 9.2 m long by 4.5 m wide by 350 mm thick pre-stressed concrete slab deck will provide a 4.1 m carriageway width between kerbs, maintaining the existing level of service and meeting the width and loading capacity requirements of the Bridge Manual. The deck units will be placed on cast insitu concrete abutments formed around driven H-piles. The abutments will be spill-through; however given the current low soffit height scour protection is not likely to be necessary (but may be in future if significant degradation occurs). The bridge can be constructed on a similar footprint to the existing bridge with minimal approach works, with the ford used by traffic during construction. A sketch of this option is shown in Appendix D.

A 9.2 m long bridge produces an 8.0 m clear span. Raising the deck running surface by 500 mm provides 600 mm freeboard meeting the minimum requirement of the Bridge Manual for a 50 year ARI flood event. At this height, the soffit is raised slightly above the level of the surrounding land, ensuring that the ultimate channel capacity is not restricted by the bridge as would be the case with the current bridge.

Advantages of this option include:

- straight forward resource consenting (if any); erection of a bridge of this scale is a permitted activity however consent for construction activity such as earthworks may be required;
- minimal establishment cost (precast components could be placed by Hiab);
- only minor works are required to be undertaken in the waterway, therefore minimal dewatering is required; and,
- a piled structure provides good resistance to scour.

The disadvantage of this option is that to obtain the desirable freeboard as described above the approach pavement surface is raised by 0.5 m, increasing construction cost and slightly hindering sight-distance over the bridge. The rough order cost estimate assumes the maximum approach works, however the consequences of a lower freeboard can be reassessed during detailed design and if determined to be acceptable to MDC cost could be reduced by up to $4,000.

B. Replace Bridge with Culvert

Given the relatively large waterway requirements and low available soffit height, a box culvert replacement is the only feasible culvert solution at this site.

Two cells of 4 x 2.0 m boxes (8 m combined clear span) with soffits set at a similar level as a replacement bridge would provide a waterway capacity comparable to option A.

An advantage of a box culvert is that the deck thickness is 200 mm which increases the freeboard of the structure by 150 mm compared to option A for a fixed deck height.

The disadvantages are similar to Oldfields Road in that a culvert of this scale will require resource consent for the finished structure (due to bed disturbance and other undesirable waterway effects generated by a culvert) in addition to any consent for construction effects. And again dewatering or stream diversion for construction would be required (or alternatively the construction period restricted to when the waterway is dry); and the culvert will incur increased costs for establishment and more complex site concrete works (cut-off walls & aprons).

The finished structure is more prone to scour effects than a piled bridge and the box units will need to be buried deep to combat these effects.

3.5. Summary of Options

The preliminary assessed cost for all options and their advantages and disadvantages are summarised below (for a detailed breakdown of cost refer Appendix E):

Option	Advantages	Disadvantages	Construction Cost
A. New Bridge	• HN-72 loading • Lower establishment cost • Permitted activity not requiring resource consent • No works in flowing water • Minimal dewatering required • Scour resilient	• Raising of approaches required	$104,000
B. Box Culvert	• HN-HO-72 loading • Slender deck gives greater freeboard for given deck height	• Consent required for finished structure as well as any construction effects • Higher establishment costs • Works in waterway • Works in waterway and dewatering required OR a severely restricted construction period. • More susceptible to scour • Raising of approaches required	$126,000

3.6. Funding

The HCV traffic volumes for this road have not been assessed. However given that Gudex Road provides a relatively parallel alternative route from Raincliff to SH79 it may be difficult to justify

funding via the 322 category. An assessment of traffic composition and the additional travel time via the alternative route would be required to confirm.

3.7. Recommendation

A reinforced concrete bridge is the preferred option for the replacement of Pioneer Park Bridge, as it will provide a relatively low cost, robust, environmentally appropriate crossing for this site. Resource consent requirements are minimised, and the reduced extent of site works for bridge construction compared to a box culvert minimises construction cost.

4. Resource Consents

Resource consent requirements have not been specifically scoped for either of these sites, but a provisional sum has been allowed for a resource consent application in all estimates. For both sites, the scale of renewal means a culvert option will require resource consent for the finished structure while a bridge option does not.

With regard to consent for construction activity, the consent scoping for Long Gully Bridge (refer to memo dated 14 November 2012) identified that bridge replacement works were permitted except for earthworks in the riparian margin. The earthworks were thought to contravene the same rule in both the operational Natural Resources Regional Plan (NRRP) and the then newly proposed Land and Water Regional Plan (pLWRP). The extent of earthworks for the Oldfields Road and Pioneer Park Bridges are similar to Long Gully Bridge in that they require reinstatement or raising of the approach fill. Therefore based on this previous advice resource consent would be required for all three sites.

Since the Long Gully scoping exercise, it has since become apparent (and confirmed by ECan staff) that there is an exception provided in the pLWRP whereby the limits on the extent of earthworks in the riparian margin do not apply to network utilities, which includes Road Controlling Authorities. Therefore it now appears none of the proposed bridge replacements will require resource consent under the proposed plan (if a bridge option is used, not a culvert). However, resource consent will still be required under the NRRP, up until the date when the NRRP is withdrawn and the pLWRP becomes operational.

For your information, the rule concerned (WQL30) has two maximum limits on excavation area; the lesser of 10% of the river setback or 500 m^2 is to be used. It is clearly illustrated by the 500 m^2 limit that the intent of this rule is to control the excavation of large tracts of riparian margin. We consider these bridge renewal works to be insignificant in comparison (up to 10 m^2 maximum), and that the effects of the proposed excavation will be “no more than minor”. It appears that the regional council agrees, as demonstrated by the inclusion of an exception for RCA’s in the new proposed plan.

To conclude, before MDC progresses with any resource consent application, we recommend that a discussion is held with the local ECan representative with a view to gaining agreement to not enforce the NRRP rule, but to rely on the pLWRP version of the rule to control this aspect of all three replacement projects.

5. Conclusion

Reinforced concrete bridges are the preferred option for the replacement of both Oldfields Road Bridge and Pioneer Park Bridge, as they will provide a relatively low cost, robust, environmentally appropriate crossing for these sites.

At Oldfields Road, option B provides the best outcome in terms of level of service and future proofing, and the cost of the wider bridge is offset by the reduction in the amount of retaining walls required under option A. Option B also resolves the road reserve boundary and scour issues existing at the site.

At Pioneer Park, a piled bridge structure provides more scour resistance and is a more economical solution than a box culvert alternative.

I trust that the above evaluation and discussion of options meets your requirements. Please contact me if you wish to discuss or clarify any of the content above.

Regards

Frank Westergard
Senior Civil Structures Engineer

Appendix A - Locality Plans

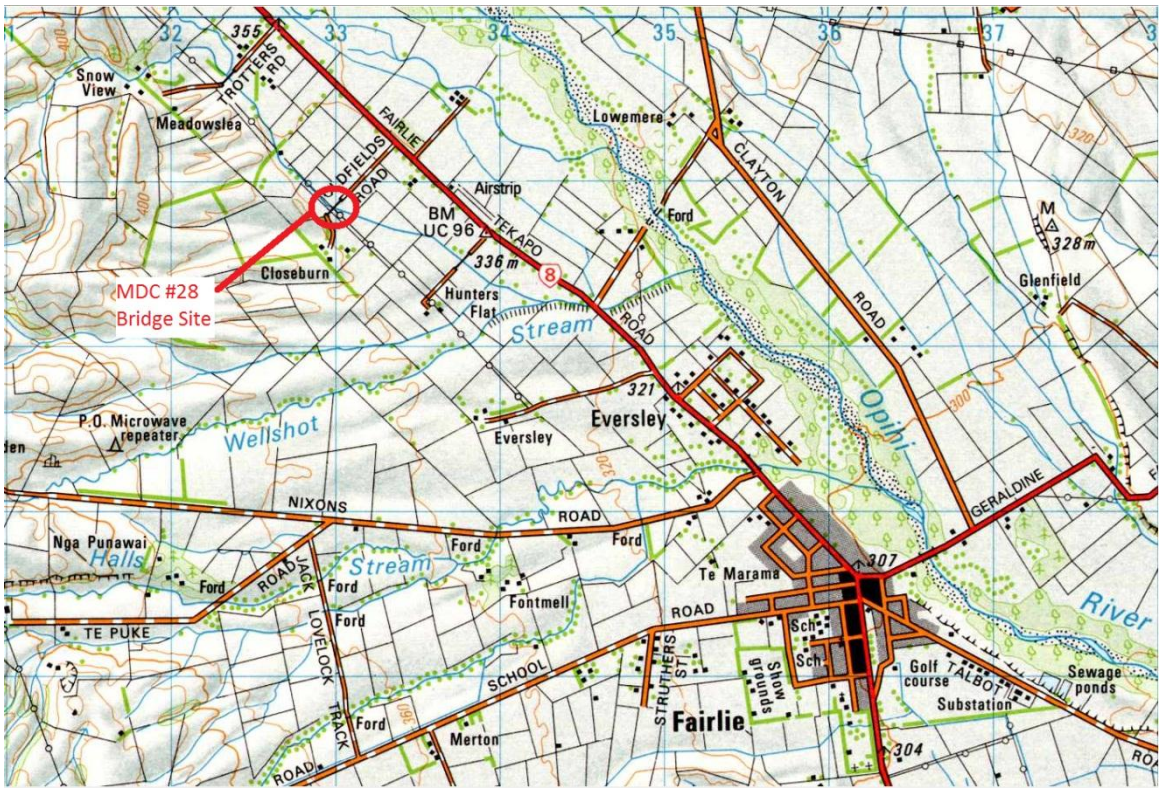


Figure 1: Oldfield Road Bridge site map

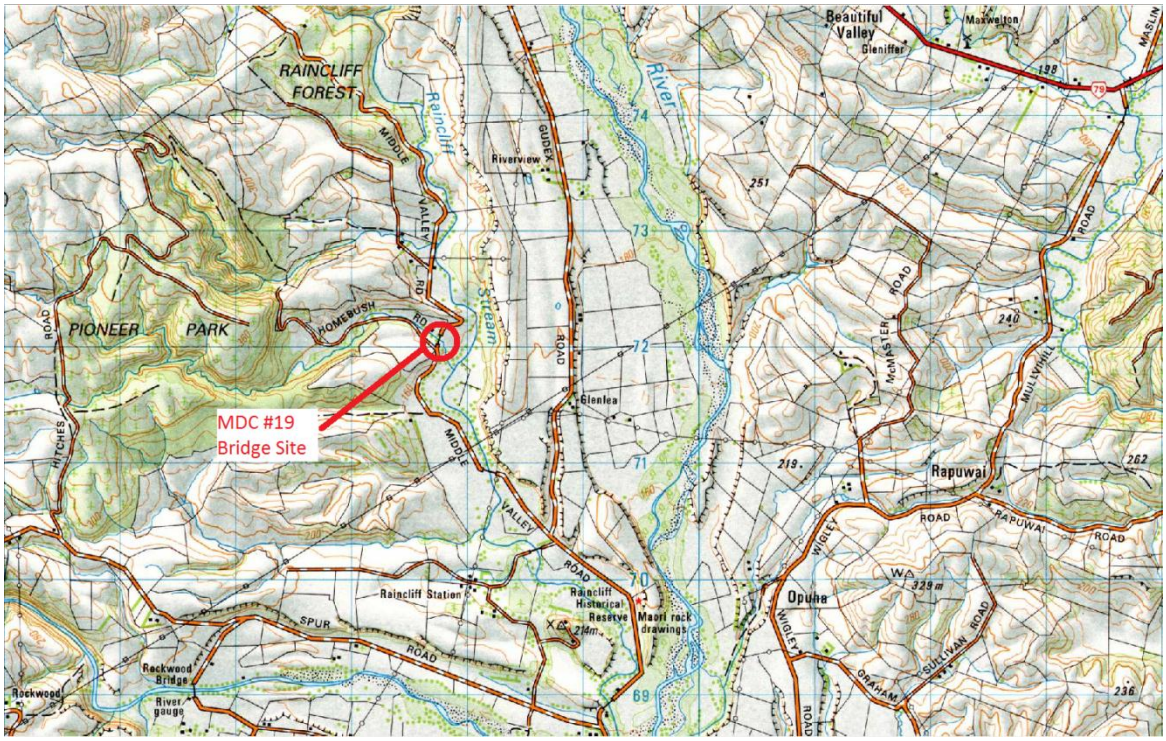
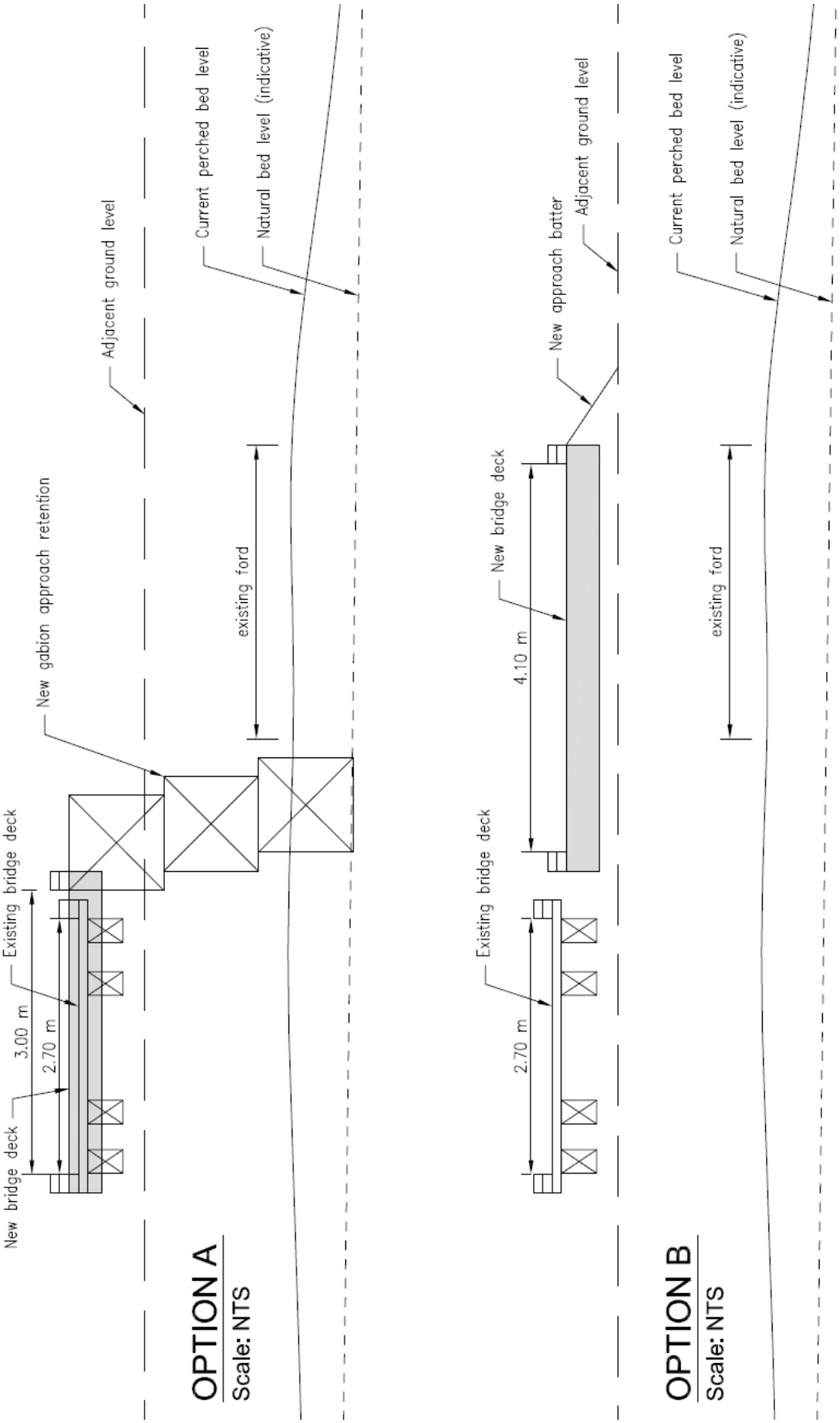


Figure 2: Pioneer Park Bridge site map

Appendix B – Oldfields Road Bridge Replacement Concept Designs



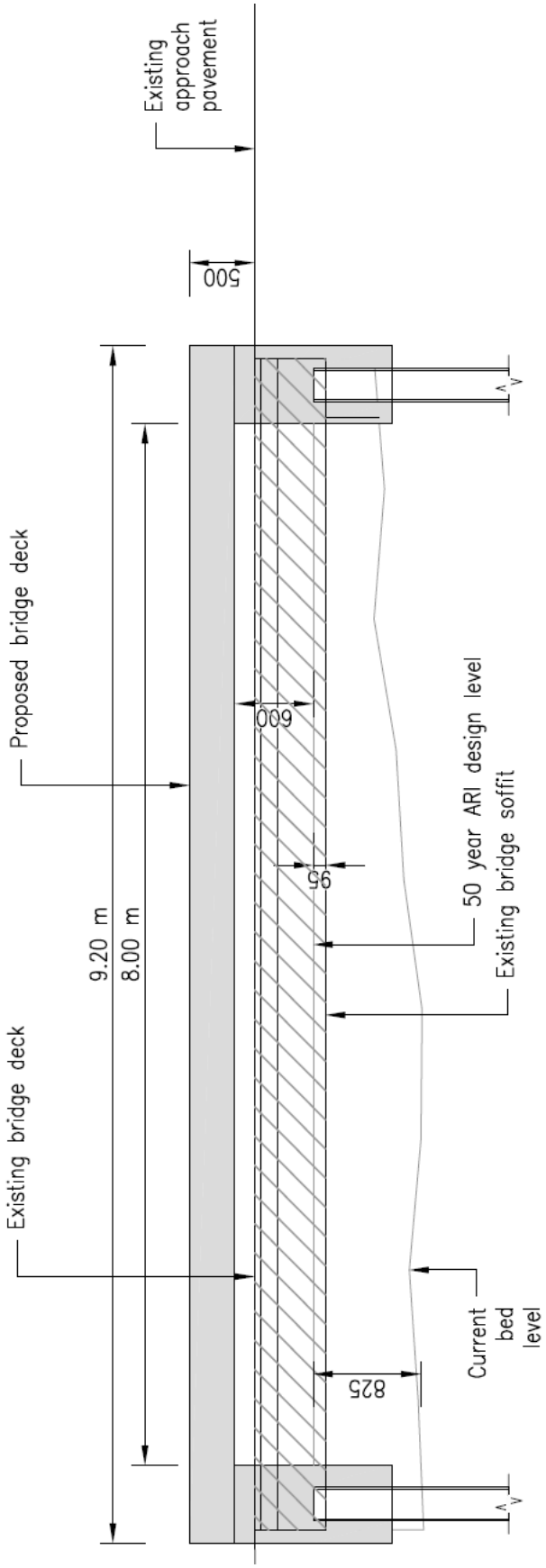
OLDFIELDS ROAD BRIDGE REPLACEMENT (MDC 28) Bridge ROC				3.3m Wide		4.5m Wide	
Item	Description	Unit	Qty	Rate	$	Rate	$
1	ESTABLISHMENT	LS	100%		10000		10000
2	TEMPORARY TRAFFIC MANAGEMENT	LS	100%		750		750
3	BRIDGE CONSTRUCTION						
3.1	Precast concrete deck unit supply	LS	100%		15000		20000
3.2	Site clearance & removal of existing structure	LS	100%		2500		2500
3.3	Dewatering & sediment controls	LS	100%		750		750
3.4	Excavation	LS	100%		1500		250
3.5	Pile supply and installation	ea	4	2500	10000	2500	10000
3.6	Pile cap construction	LS	100%		6000		8000
3.7	Installation of deck units	LS	100%		6000		7000
3.8	Gabion wingwalls and rock armouring	LS	100%		12000		6500
3.9	Backfill and approach reinstatement	LS	100%		3500		5000
4	MISCELLANEOUS						
4.1	Location, temporary support, protection, & reinstatment of utility services	PS	100%		750		750
4.2	Supply & install timber kerb & handrails	LS	100%		4500		4500
4.3	Bridge width markers	LS	100%		600		600
4.4	Legal survey	PS	100%		1500		0
5	RESOURCE CONSENT (incl. ECan fees)	PS	100%		9500		9500
Base Estimate					$ 85,000		$ 86,000
Contingency			20%		$ 17,000		$ 17,000
Expected Estimate					$ 102,000		$ 103,000

OLDFIELDS ROAD BRIDGE REPLACEMENT (MDC 28) 2No. 3.5x2 Box Culvert ROC					
Item	Description	Unit	Qty	Rate	$
1	ESTABLISHMENT	LS	100%		12000
2	TEMPORARY TRAFFIC MANAGEMENT	LS	100%		1000
3	CULVERT CONSTRUCTION				
3.1	Precast concrete culvert supply	LS	100%		30000
3.2	Precast concrete cutoff wall supply	LS	100%		12000
3.3	Site clearance & removal of existing structure	LS	100%		2500
3.4	Dewatering & sediment controls	PS	100%		2000
3.5	Excavation	LS	100%		3500
3.6	Undercut and reinstatement of unsuitable subgrade	PS	100%		500
3.7	Installation of culverts	LS	100%		12000
3.8	Gabion wingwalls and rock armouring	LS	100%		3500
3.9	Backfill and approach reinstatement	LS	100%		8000
4	MISCELLANEOUS				
4.1	Location, temporary support, protection, & reinstatment of utility services	PS	100%		750
4.2	Supply & install timber kerb & handrails	LS	100%		4500
4.3	Bridge width markers	LS	100%		600
5	RESOURCE CONSENT (incl. ECan fees)	PS	100%		9500
Base Estimate					$ 102,000
Contingency			20%		$ 20,000
Expected Estimate					$ 122,000

Date of Estimate	26 February 2013
Estimate prepared by	F Westergard
Estimate review by	M Cowan

Note: Except where noted, these estimates are exclusive of contingency, funding risk, escalation and GST.

Appendix D – Pioneer Park Bridge Replacement Concept Designs



PIONEER PARK BRIDGE REPLACEMENT (MDC 19) 4.5m Wide Bridge ROC						PIONEER PARK BRIDGE REPLACEMENT (MDC 19) 2No. 4x2 Box Culvert ROC					
Item	Description	Unit	Qty	Rate	$	Item	Description	Unit	Qty	Rate	$
1	ESTABLISHMENT	LS	100%		10000	1	ESTABLISHMENT	LS	100%		12000
2	TEMPORARY TRAFFIC MANAGEMENT	LS	100%		750	2	TEMPORARY TRAFFIC MANAGEMENT	LS	100%		1000
3	BRIDGE CONSTRUCTION					3	CULVERT CONSTRUCTION				
3.1	Precast concrete deck unit supply	LS	100%		23500	3.1	Precast concrete culvert supply	LS	100%		35000
3.2	Site clearance & removal of existing structure	LS	100%		2500	3.2	Precast concrete cutoff wall supply	LS	100%		12000
3.3	Dewatering & sediment controls	LS	100%		750	3.3	Site clearance & removal of existing structure	LS	100%		2500
3.4	Excavation	LS	100%		250	3.4	Dewatering & sediment controls	PS	100%		2000
3.5	Pile supply and installation	ea	4	2500	10000	3.5	Excavation	LS	100%		4000
3.6	Pile cap construction	LS	100%		8000	3.6	Installation of culverts	LS	100%		12000
3.7	Installation of abutments and deck units	LS	100%		7000	3.7	Gabion wingwalls and rock armouring	LS	100%		3500
3.8	Gabion wingwalls and rock armouring	LS	100%		3500	3.8	Backfill and approach reinstatement	LS	100%		6000
3.9	Backfill and approach reinstatement	LS	100%		5000						
4	MISCELLANEOUS					4	MISCELLANEOUS				
4.1	Location, temporary support, protection, & reinstatment of utility services	PS	100%		750	4.1	Location, temporary support, protection, & reinstatment of utility services	PS	100%		750
4.2	Supply & install timber kerb & handrails	LS	100%		4500	4.2	Supply & install timber kerb & handrails	LS	100%		4500
4.3	Bridge width markers	LS	100%		600	4.3	Bridge width markers	LS	100%		600
5	RESOURCE CONSENT (incl. ECan fees)	PS	100%		9500	5	RESOURCE CONSENT (incl. ECan fees)	PS	100%		9500
Base Estimate					$ 87,000	Base Estimate					$ 105,000
Contingency			20%		$ 17,000	Contingency			20%		$ 21,000
Expected Estimate					$ 104,000	Expected Estimate					$ 126,000

Date of Estimate	26 February 2013
Estimate prepared by	F Westergard
Estimate review by	M Cowan

Note: Except where noted, these estimates are exclusive of contingency, funding risk, escalation and GST.