

BRIDGE INSPECTION

BRIDGE	62 – 039: Cariboo River
NO./NAME	FSR (0.75 KM)

Inspection Date: September 10th 2012

Inspected By: D. Chen, J. Rupar Gilliatt

Year Built: 1976

Number of Spans: 3



Span Lengths: Span 1 – 15,900 mm
Span 2 – 31,400 mm
Span 3 – 31,100 mm

Superstructure Simply supported Acrow 300 Series Panel Bridge:

Type: Span 1: 3 double single non reinforced panels
2 triple single non reinforced panels

Span 2: 10 triple single reinforced panels

Span 3: 10 triple single reinforced panels

The deck ties are supported by longitudinal stringers which bear on transverse transoms that are bolted to the bottom chord of the Acrow panels.

Deck: Wearing planks, untreated timber plank running strips.
Structural planks, creosote treated timber planks placed longitudinally.

Deck Structural: Creosote treated transverse timber ties.

Curb: Timber curbs and risers.

Substructure: Abutments:
Steel I girder cap beam bearing on steel pipe piles. Creosote treated timber breast wall and wing walls supported by steel pipe soldier piles.

Piers:
Creosote treated timber piers. Each pier comprises timber corbels on top of two timber caps, each cap is supported by 6 timber piles. The two sets of piles are connected by log cross bracing and are protected by timber sheathing planks and a dolphin pile at the upstream end.

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GENERAL BRIDGE CONDITION:

Superstructure Condition:	Fair
Substructure Condition:	Fair
Deck Condition:	Fair
Load Posting:	No sign noted.
Date for the Next Close Proximity Inspection:	2013
Projected Replacement Date:	2017

BRIDGE INSPECTION SUMMARY/ RECOMMENDATIONS:

Although the bridge appears to be in fair condition, we observed signs (e.g. loose panel pins) that suggest that the Acrow Panel superstructure is nearing the end of its service life. Since Acrow Panel Bridges typically have a service life of approximately 25 years and are intended to be used as temporary bridges, we recommend that the Ministry replace the bridge (including substructure) within the next 5 years. As an interim measure, we recommend annual close proximity inspections if the bridge is part of an active haul route.

INSPECTION NOTES:

Approaches:

- The approaches are generally in good condition.
- Bridge ahead signs are missing from both approaches.
- Loose gravel was noted on the approaches.
- The concrete approach barriers are slightly misaligned.
- Debris is accumulating against the concrete barriers.
- Minor vegetation overgrowth adjacent to the approaches.
- Delineators are present at all 4 corners.
- The Wells end delineators are slightly loose and the Likely end upstream delineator is damaged.

Deck:

- The deck is generally in fair condition.
- The majority of curb rail sections are loose. Insect decay noted in a number of sections.
- Longitudinal checks in the curb rail with pockets of rot.
- A few risers have rub damage; some are broken.
- Minor wear in the running planks.
- Longitudinal checks and a number of pockets of rot noted in the running planks.
- Coring identified rot in the bottom half of the structural planks, with the initial signs of rot noted at interface between the structural planks and the ties.
- Debris accumulation on bridge deck.

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Abutments:

- The abutments are generally in good condition.
- Debris accumulation on the cap beams at both abutments.
- Minor mill scale on the cap beams.
- The ballast walls at both abutments are sound. Minor erosion at the base of the Wells end abutment.
- The wing walls at both abutments are sound. The Wells end upstream wing wall has a saturated plank with the initial signs of rot. Deterioration does not affect the integrity or performance of the wall.
- Observed displaced lock blocks at base of Likely abutment. Embankment appears stable.
- The embankments are protected by log breakwaters.

Piers:

Pier 1

- Pier 1 is generally in fair condition.
- Debris accumulating on the bearing plates.
- Debris accumulating on the cap beam.
- Wide vertical end splits at the downstream end of both the Likely and Wells end caps; no rot was found.
- Pier tie back cables sagging.
- The piles are sound; a 6 mm wide check was noted at the top of the Wells end Pile 5.
- Coring of the top of Piles 1 and 5 at the Wells end identified no rot.
- Coring of the top of Piles 1 and 5 at the Likely end identified no rot.
- Sway bracing dead man piles at the Likely abutment are collecting water.
- A 1500 mm section of heartwood rot noted in the top of the dolphin pile.
- The upstream log bracing has heartwood rot, 60 mm of shell remains. We do not believe this significantly affects the capacity of the bridge.
- A log breakwater extends from the embankment to the upstream end of the pier, to prevent debris collecting between pier and abutment.

Pier 2

- Pier 2 is generally in fair condition.
- Debris accumulating on the bearing plates.
- Debris accumulating on the cap beam.
- Wide vertical end splits were noted at the downstream end of both the Likely and Wells end caps.
- Moss growth along the mid check on top of the downstream end timber corbel, no rot noted.
- Likely End Cap Beam:
 - Coring identified rot localized to the downstream end split, with 100 mm of shell. No rot was found below the split. The rot is in the end of the cap with no signs of crushing noted; hence we do not believe it significantly affects the capacity of the cap.
 - Cored between Piles 2 and 3, no rot was found.
- Wells End Cap Beam:
 - Coring the downstream end split identified no rot.
 - Coring the cap beam between Piles 1 and 2, identified saturated wood with initial signs of rot near centre of the cap. The decay is not in the bearing area of the cap; hence we believe it does not significantly affect the capacity of the cap.
- Tie back cables are sagging.

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- The piles are sound.
- Coring the top of Pile 1 at the Wells end identified no rot.
- Coring the top of Pile 5 and at the mid height of Pile 3 at the Likely end, identified no rot.
- Two broken dolphin piles were noted.
- The upstream sheathing planks are broken.
- A log jam was noted at the upstream end of the pier.

Girders:

Typical Condition:

- Localized loss of paint and minor surface corrosion on all members, no measurable section loss.
- Localized damage on corners of a number of truss elements.
- A few bolts connecting the transom to the bottom chord of the panels are missing. We do not believe this affects the capacity of the bridge.
- A number of panel pins along the centre panels are missing safety clips; some pins are displaced and are held in place by adjacent pins.
- First and last bays between transoms in each span have two X shaped lateral braces. Remaining bays have chevron shaped lateral bracing.

Span 1:

- 4 small isolated cracks noted on the top bracing frame elements of the upstream and downstream panels; minor impact damage to interior end post at Wells end upstream corner.
- The minor defects noted should not have significant effect on the capacity of the bridge.

Span 2:

- 3 bottom chord reinforcing connection bolts missing in downstream panel 9. We do not believe this significantly affects the capacity of the bridge.

Span 3:

- A minor isolated crack was noted on the end bracing frame of the upstream end panel above Pier 2.
- Minor mechanical damage to bottom chord reinforcing in upstream panel 9.
- Impact damage to end post at Likely end downstream corner.
- The minor defects noted should not have significant effect on the capacity of the bridge.

BRIDGE INSPECTION

LIST OF MAINTENANCE ITEMS TO BE COMPLETED:

Items	Description	Priority
1.	Replace curb rail.	High
2.	Reinstall displaced panel pins and install missing safety clips as required.	Medium
3.	Replace missing panel reinforcing connection bolts in span 2 panel 9.	Medium
4.	Install missing transom bolts.	Medium
5.	Replace damaged sheathing planks on pier 2	Medium
6.	Replace running planks as required.	Medium
7.	Install bridge ahead signs at both approaches.	Medium
8.	Schedule the structural planks and ties for replacement.	Medium
9.	Remove road spill from deck.	Low
10.	Brush approaches.	Low

MONITOR DURING FUTURE INSPECTIONS:

- Monitor the decay of the cap beams at both piers.

Prepared by:



Jamie Rugar Gilliatt M.Eng., EIT.
Project Engineer

Reviewed by:



David Chen, P.Eng.
Project Manager

Attached:

1. CBR Report
2. Annotated Photo Sheets

BRIDGE INSPECTION

NOTES:

Directional & Numbering Conventions Used:

Girders and piles are numbered from upstream to downstream. Left end or right end is determined facing downstream (except for delineators). Spans and piers are numbered from the left end when facing downstream.

Projected Replacement Date:

The projected date for the bridge replacement is based on the remaining service life of the bridge. We estimate the remaining service life as the greater of:

For Glulam Girder Bridges:

1. Original design life, typically 50 years.
2. If a bridge is nearing the end of its estimated service life but is still in fair condition, we recommend that the Ministry assume a remaining service life of five years.

For Steel and Concrete Bridges:

1. Original design life, typically 60 years.
2. If a bridge is nearing the end of its estimated service life but is still in fair condition, we recommend that the Ministry assume a remaining service life of ten years.

Condition Ratings:

Excellent:	New or almost new condition and properly installed
Good:	Structurally sound, in good repair with minimal wear
Fair:	Structurally functional, shows moderate wear or preliminary indications of deterioration
Poor:	Structurally unsound, items typically in need of repair or replacement

Maintenance Priority (Typical Usage):

High:	Critical items that need to be addressed to protect safety of users (curbs, structural decks, delineators, major structural repairs, etc.); schedule work immediately.
Medium:	Items that maintain the service life of the bridge (wearing planks, deck joints, etc.)
Low:	Items that will extend the service life of the structure or general maintenance.

Cost Estimate:

The cost estimate for individual maintenance items, shown in the CBR report, reflects the cost of materials and labour for completing a task; it does not include any costs associated with mobilization, demobilization, engineering or contract administration.



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Permanent Bridge Inspection Report

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Date Printed: 2013/03/27
User Id: BCEID\WRILEY1
Database: PROD
Report Id: CBR001A

Structure #:	62-039	Site #:	62-039	Road Name:	CARIBOO RIVER	Inspection Date:	2012/09/10
KM:	0.75	User km:	0.00	Crossing Name:	Cariboo R	Next Inspection Date:	2014/09/03
Project File ID #:	6142	Br.	01	Forest District:	Central Cariboo Forest District		
Deck Type:	Timber - Untreated			Running Surface:	Timber Planks		
Superstructure	Steel Truss/Bailey/Acrow			Abutments (Left/Right):	Pile -Permanent Materials		
Total Length (metres):	78.4	# Spans:	3	Span Length(s) (metres):	15.9, 31.4, 31.1		
UTM Zone:	10	UTM Easting:	605087	UTM Northing:	5842026		
Inspector Name:	D. Chen, J. Rupar			Year Built:	1976		
Access:							

ABUTMENTS

Bearings	Good	
Bracing	Not Applicable	
Ballast Wall	Good	The ballast walls at both abutments are sound. Minor erosion at the base of the Wells end abutment.
Corrosion Protection	Good	Minor mill scale on the cap beams.
Caps or Sills	Good	Debris accumulation on the cap beams at both abutments.
Fill	Fair	Observed displaced lock blocks at base of Likely abutment. Embankment appears stable.
Hardware	Good	
Piles or Posts	Good	Steel pipe piles.
Riprap	Fair	The embankments are protected by log breakwaters.
Wing Wall	Good	The wing walls at both abutments are sound. The Wells end upstream wing wall has a saturated plank with the initial signs of rot. Deterioration does not affect the integrity or performance of the wall.

APPROACHES

Alignment	Good	
Bridge Ahead Signs Missing	2	
Brushing Required	Yes	Minor vegetation overgrowth adjacent to the approaches.
Delineator Missing Left	0	Likely end: narrow delineator, split. Wells end: narrow delineator slightly loose.
Delineator Missing Right	0	Likely end: narrow delineator. Wells end: narrow delineator slightly loose.
Fender Condition	Good	The concrete approach barriers are slightly misaligned. Debris is accumulating against the concrete barriers.
Road Surface	Good	Loose gravel was noted on the approaches.

DECK

Span 1



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Structure #:	62-039	Site #:	62-039	Road Name:	CARIBOO RIVER	Inspection Date:	2012/09/10
Curb Rail/Blocks/Posts	Poor	The majority of curb rail sections are loose. Insect decay noted in a number of sections. Longitudinal checks in the curb rail with pockets of rot. A few risers have rub damage; some are broken.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Not Applicable						
Nails	Good						
Overall Deck Condition	Fair	Debris accumulation on bridge deck.					
Running Planks	Fair	Minor wear in the running planks. Longitudinal checks and a number of pockets of rot noted in the running planks.					
Sub Deck	Fair	Coring identified rot in the bottom half of the structural planks, with the initial signs of rot noted at interface with the ties.					
Ties	Fair	Coring identified the initial signs of rot at interface with structural plank.					
Span 2							
Curb Rail/Blocks/Posts	Poor	The majority of curb rail sections are loose. Insect decay noted in a number of sections. Longitudinal checks in the curb rail with pockets of rot. A few risers have rub damage; some are broken.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Not Applicable						
Nails	Good						
Overall Deck Condition	Fair	Debris accumulation on bridge deck.					
Running Planks	Fair	Minor wear in the running planks. Longitudinal checks and a number of pockets of rot noted in the running planks.					
Sub Deck	Fair	Coring identified rot in the bottom half of the structural planks, with the initial signs of rot noted at interface with the ties.					
Ties	Fair	Coring identified the initial signs of rot at interface with structural plank.					
Span 3							
Curb Rail/Blocks/Posts	Poor	The majority of curb rail sections are loose. Insect decay noted in a number of sections. Longitudinal checks in the curb rail with pockets of rot. A few risers have rub damage; some are broken.					
Deck to Girder Bolts	Good						
Hardware	Good						
Hand Rails/Walkouts	Not Applicable						
Nails	Good						
Overall Deck Condition	Fair	Debris accumulation on bridge deck.					
Running Planks	Fair	Minor wear in the running planks. Longitudinal checks and a number of pockets of rot noted in the running planks.					
Sub Deck	Fair	Coring identified rot in the bottom half of the structural planks, with the initial signs of rot noted at interface with the ties.					

Corporate Bridge Register (CBR)



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Structure #:	62-039	Site #:	62-039	Road Name:	CARIBOO RIVER	Inspection Date:	2012/09/10
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Ties	Fair	Coring identified the initial signs of rot at interface with structural plank.
PIERS		
Pier 1		
Bearings	Good	Debris accumulating on the bearing plates.
Bracing or Sheathing	Fair	Bracing: fair, upstream log bracing has heartwood rot, 60 mm of shell remains. Sheathing: good. Longitudinal cable sway braces are sagging.
Caps	Fair	See additional note for more details
Cribs	Not Applicable	
Dolphins	Fair	A 1500 mm section of heartwood rot was noted in the top of the dolphin pile.
Hardware	Good	
Overall	Fair	
Piles or Posts	Good	See additional notes for more details. Pier tie back dead man piles at the Likely abutment are collecting water.
Riprap	Fair	A log breakwater extends from the embankment to the upstream end of the pier.
Wall	Not Applicable	
Pier 2		
Bearings	Good	Debris accumulating on the bearing plates.
Bracing or Sheathing	Fair	Bracing: good. Sheathing: poor, upstream sheathing planks broken. Tie back cables are sagging.
Caps	Fair	See additional notes for more details.
Cribs	Not Applicable	
Dolphins	Fair	A log jam was noted at the upstream end of the pier. Two broken dolphin piles were noted.
Hardware	Good	
Overall	Fair	
Piles or Posts	Fair	See additional notes for more details.
Riprap	Not Applicable	
Wall	Not Applicable	
SUPERSTRUCTURE		
Span 1		
Bracing	Good	First and last bays between transoms have two X shaped lateral braces. Remaining bays have chevron shaped lateral bracing.
Girders	Fair	4 small isolated cracks noted on the top bracing frame elements of the upstream and downstream panels; minor impact damage to interior end post at Wells end upstream corner. The minor defect noted should not have significant effect on the capacity of the bridge. Localized loss of paint and minor surface corrosion on all members, no measurable section loss. Localized damage on corners of a number of truss elements. A few bolts connecting the transom to the bottom chord of the panels are missing. We do not believe this affects the capacity of the bridge.



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Structure #:	62-039	Site #:	62-039	Road Name:	CARIBOO RIVER	Inspection Date:	2012/09/10
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Hardware	Fair	A number of panel pins along the centre panels are missing safety clips; some pins are displaced and are held in place by adjacent pins.
Under Trussing	Not Applicable	
Span 2		
Bracing	Good	First and last bays between transoms have two X shaped lateral braces. Remaining bays have chevron shaped lateral bracing.
Girders	Fair	3 bottom chord reinforcing connection bolts missing in downstream panel 9. Localized loss of paint and minor surface corrosion on all members, no measurable section loss. Localized damage on corners of a number of truss elements. A few bolts connecting the transom to the bottom chord of the panels are missing. We do not believe this significantly affects the capacity of the bridge.
Hardware	Fair	A number of panel pins along the centre panels are missing safety clips; some pins are displaced and are held in place by adjacent pins.
Under Trussing	Not Applicable	
Span 3		
Bracing	Good	First and last bays between transoms have two X shaped lateral braces. Remaining bays have chevron shaped lateral bracing.
Girders	Fair	A minor isolated crack was noted on the end bracing frame of the upstream end panel above Pier 2. Minor mechanical damage to bottom chord reinforcing in upstream panel 9. Impact damage to end post at Likely end downstream corner. The minor defect noted should not have significant effect on the capacity of the bridge. Localised loss of paint and minor surface corrosion on all members, no measurable section loss. Localized damage on corners of a number of truss elements. A few bolts connecting the transom to the bottom chord of the panels are missing. We do not believe this affects the capacity of the bridge.
Hardware	Fair	A number of panel pins along the centre panels are missing safety clips; some pins are displaced and are held in place by adjacent pins.
Under Trussing	Not Applicable	

CHANNEL	Estimated Present Water Level Depth:	1.5	Estimated Present Water Level Width:	56.0
	Estimated High Water Level Clearance:	5.0		

HAZARDS	High Water:	No	Scour:	No	Ice:	No	Debris:	No	Aggradation:	No
	Comment:									



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REPAIRS	#	Status	Priority	Estimate	Description			
	1	Recommended	High	\$9,500.00	Replace curb rail.			
	2	Recommended	Medium	\$0.00	Reinstall displaced panel pins and install missing safety clips as required. Associated cost is unknown.			
	3	Recommended	Medium	\$350.00	Replace missing panel reinforcing connection bolts in span 2 panel 9.			
	4	Recommended	Medium	\$1,300.00	Install missing transom bolts.			
	5	Recommended	Medium	\$1,600.00	Replace damaged sheathing planks on pier 2.			
	6	Recommended	Medium	\$2,200.00	Replace running planks as required.			
	7	Recommended	Medium	\$1,000.00	Install bridge ahead signs at both approaches.			
	8	Recommended	Medium	\$28,000.00	Schedule the structural planks and ties for replacement.			
	9	Recommended	Low	\$300.00	Debris accumulation from deck.			
	10	Recommended	Low	\$600.00	Brush approaches.			
MONITORS	#	Description						
	1	Monitor the decay of the cap beams at both piers.						
GENERAL	Professional Inspection Required?		No	Regional Review Date:		P. Eng Reviewer Name:		
	Replacement Date for full log haul traffic (year):			2017	Replacement Date for light vehicle traffic (year):			2017
	Current Load Rating GVW (tonnes):		91	Design Load GVW (tonnes):		91	Design Vehicle Config.:	L100
	Inspector's Estimated Full Log Haul Replacement (year):			2017				
	Inspector's Comment:	Although the bridge appears to be in fair condition, we observed signs (e.g. loose panel pins) that suggest that the Acrow Panel superstructure is nearing the end of its service life. Since Acrow Panel Bridges typically have a service life of approximately 25 years and are intended to be used as temporary bridges, we recommend that the Ministry replace the bridge (including substructure) within the next 5 years. As an interim measure, we recommend annual close proximity inspections if the bridge is part of an active haul route.						
	PEng Reviewer's Comment:							
	District Staff Comment:							

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
62-039	Cariboo River	Cariboo River	0.0	0.8		



Figure 1-1: Upstream elevation.



Figure 1-2: Downstream elevation.



Figure 1-3: Looking towards Likely end.



Figure 1-4: Looking towards Wells end.



Figure 1-5: Looking upstream.



Figure 1-6: Looking downstream.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
62-039	Cariboo River	Cariboo River	0.0	0.8		



Figure 1-7: Likely end abutment deck end.



Figure 1-8: Wells end abutment deck end.



Figure 1-9: Pocket of rot on curb rail, upstream shown.

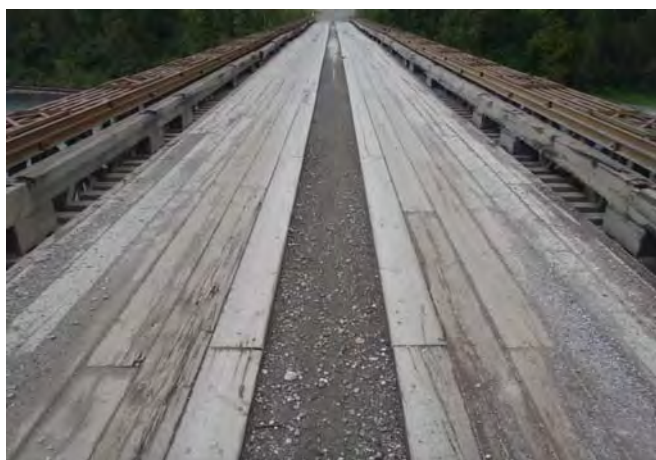


Figure 1-10: Typical deck condition.



Figure 1-11: Pocket of rot in running strip.



Figure 1-12: Typical panel condition, span 3 downstream shown.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
62-039	Cariboo River	Cariboo River	0.0	0.8		



Figure 1-13: Typical impact damage to bracing frame.



Figure 1-14: Typical crack in span 1 bracing frame, upstream panel 4 shown.



Figure 1-15: Typical impact damage to end post, Wells end upstream shown.



Figure 1-16: Typical missing transom bolts, span 3 panel 1 shown.



Figure 1-17: Typical missing reinforcing connection bolt in span 2 downstream panel 9.



Figure 1-18: Typical peeling paint and minor surface corrosion of panel.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
62-039	Cariboo River	Cariboo River	0.0	0.8		



Figure 1-19: Minor damage to bottom chord reinforcing in span 3 panel 9 upstream.



Figure 1-20: Typical protruding panel pin due to missing safety clip.



Figure 1-21: Span 3 pier 2 upstream panel, crack in end post.



Figure 1-22: Likely end abutment, note over turned lock blocks.



Figure 1-23: Typical abutment bearing condition debris accumulation Likely end upstream shown.



Figure 1-24: Pier 2 Likely end dead man piles, full of water.

Structure #	Crossing Name	Forest Service Road	User km	CBR km		
62-039	Cariboo River	Cariboo River	0.0	0.8		



Figure 1-25: Pier 1 Likely face.



Figure 1-26: Pier 1 dolphin pile, heartwood rot.



Figure 1-27: Typical loose cable sway brace, Pier 1 downstream shown.



Figure 1-28: Pier 2 Wells end face, log jam and missing sheathing panels.



Figure 1-29: Typical pier bearing condition, Pier 2 downstream shown, note debris accumulation.



Figure 1-30: Typical end check in cap, Pier 2 likely end downstream shown.