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## Contact List for Bridge Inspections - Alberta Transportation

First Name	Second Name	Phone Number	Title	Area
Alan	Saunders	(780)618-4379	Bridge Manager	Peace Region
Brent	Herrick	(780)305-2419	Acting Bridge Manager	North Central Region
Donald	Saunders	(403)340-5579	Bridge Manager	Central Region
Ralph	Witten	(403)382-4061	Bridge Manager	Southern Region
Bryan	Wai	(780)415-1079	Bridge Management Engineer	Province
Matt	Spratlin	(780)644-5413	Bridge Preservation Specialist	Province

## **BRIDGE INSPECTION AND MAINTENANCE (BIM) SYSTEM INSPECTOR CERTIFICATION PROCESS**

### **Background**

The integrity and effectiveness of the BIM system depends on the quality of inspection provided by the bridge inspector. All inspections entered into the BIM system must be performed and reviewed by certified bridge inspectors. Alberta Transportation maintains a comprehensive bridge inspector certification process that must be successfully completed by each candidate prior to becoming certified. There are two classes of bridge inspectors (Class A and Class B). The roles and qualification requirements for each inspector class are outlined in Alberta Transportation's BIM Inspection Manual.

This document details the requirements for obtaining and maintaining inspector certification status and supersedes any requirements detailed in the BIM Inspection Manual.

### **Class B Certification Process**

To become certified as a Class B bridge inspector, candidates must meet the following requirements:

#### ***Education***

- High School Diploma or an equivalent combination of education and experience acceptable to Alberta Transportation.

#### ***Bridge Inspection Training***

Class B bridge inspection training must be completed in the following stages:

- Stage 1: Alberta Transportation Class B BIM Training Course (5 day course)  
- *Minimum 70% average score required*
- Stage 2: Alberta Transportation Class B BIM Field Training Course (3 day course)  
or Alberta Transportation approved equivalent  
- *Field trainer recommendation required*

- Stage 3: Mentorship program - details of the mentorship program shall be as follows:
  - Candidates shall select a mentor that is a Class A Inspector; or a Class B inspector that has been certified for a minimum of 9 years; or a Class B inspector that has completed greater than 150 inspections over a 6 year period;
  - Candidates that have attended the Alberta Transportation Class B Field Training Course shall complete a minimum of 25 training inspections under the guidance of a mentor. The training inspections shall be completed within two years of completion of the Class B Field Training Course. For every year beyond the two year period an additional 10 training inspections will be required;
  - Candidates that have completed an Alberta Transportation approved equivalent Class B Field Training Course shall complete a minimum of 35 training inspections under the guidance of a mentor. The training inspections shall be completed within two years of completion of the Alberta Transportation approved equivalent Class B Field Training Course. For every year beyond the two year period an additional 10 training inspections will be required;;
  - Selection of all training inspections shall be reviewed and recommended by the mentor. A minimum of 75% of the selected sites for training inspections shall have a maximum structural condition rating of 45% and superstructure/barrel elements must be accessible;
  - To commence the mentorship program a minimum of 5 different types of bridge structures shall be inspected by the candidate and mentor together. The initial 5 inspections completed with the mentor can be included in the total number sites of the mentorship program;
  - Training inspections shall be completed in lots. Lots shall be no greater than 7 sites. Each lot shall be thoroughly reviewed by the mentor and discussed in detail with the candidate prior to commencing with subsequent lots. Mentor inspection review comments shall be documented on inspection forms (including photo reports) and all communication/feedback with the trainee recorded. The trainee may at any time during the mentorship program submit received mentorship documentation to the bridge preservation specialist to confirm its acceptability;

- The number and type of inspection should be consistent with recommendations received from Stage 2 of the certification process, but may be increased if required by the mentor. At a minimum, training inspections shall be completed in the following categories and quantities:
  - Timber Bridges (TT) 2 - 5;
  - Culverts (CUL 1, CULM, CULE) 10- 15;  
(A variety of culvert types is required- i.e. BP/CP, FP/CSP, MP/CSP, RP/SPCSP, SPE/ SPCSP, SP/SPCSP etc.);
  - Standard Precast Bridges (PCS) 10 - 15;  
(A variety concrete girder bridges with the majority having timber substructures is required- HC, PG, VS, PE, SL etc.).
- *Letter of recommendation from mentor stating trainee has completed a mentorship program meeting the above requirements and in his/her opinion is ready to write the certification exam and test sites & electronic PDF scans of original inspection reports with review comments and all other communication/ feedback in PDF format. The submission of inspection reports, including photos, shall be submitted in individual PDF files for each lot as well as an excel spreadsheet summarizing the lot number, BF, span type, structural condition rating, inspection date, mentor review date, mentor comments on acceptability feedback /discussion date).*
- Stage 4\*: Class B certification exam
  - *Minimum 75% score required.*
- Stage 5\*: Test Inspections – three test inspections completed in one day
  - *Scored for acceptability by a Alberta Transportation Class A inspector*

*\* Note: Stage 4 and 5 may be completed in reverse order.*

## **Class A Certification Process**

To become certified as a Class A bridge inspector, candidates must meet the following requirements:

### ***Education***

- Civil Engineering Degree, or Civil Engineering Technical Diploma plus 2 years bridge related experience, or an equivalent combination of education and experience acceptable to Alberta Transportation.

### ***Bridge Inspection Training***

All Class A candidates must have valid Class B certification and completed a minimum of 75 inspections as a Class B inspector. Class A bridge inspection training must be completed in the following stages:

- Stage 1 : Alberta Transportation Class A BIM Training Course (5 day course)  
- *Minimum 70% average score required*
- Stage 2: Mentorship program - details of the mentorship program shall be as follows:
  - Candidates shall select a mentor that has been certified as a Class A Inspector for 6 years or more;
  - Candidates shall complete a minimum of 45 training inspections under the guidance of a mentor;
  - Selection of all training inspections shall be reviewed and recommended by the mentor. A minimum of 60% of the 45 selected sites Selected sites for training inspections shall have a maximum structural condition rating of 45% and superstructure elements must be accessible;
  - To commence the mentorship program a minimum of 10 different types of bridge structures shall be inspected by the candidate and mentor together. The initial 10 inspections completed with the mentor can be included in the total number sites of the mentorship program;
  - Training inspections shall be completed in lots. Lots shall be no greater than 7 sites. Each lot shall be thoroughly reviewed by the mentor and discussed in detail with the candidate prior to commencing with subsequent lots. Mentor inspection review comments shall be documented on inspection forms (including photo reports) and all communication/feedback with the trainee

recorded. The trainee may at any time during the mentorship program submit received mentorship documentation to the bridge preservation specialist to confirm its acceptability;

- At a minimum, training inspections shall be completed in the following categories and quantities: :
  - Steel Truss Bridges (DT, TH, PT) 5- 10;  
(One of each type as a minimum);
  - Steel Girder Bridges (SG) 10 - 20;  
(A variety of types is required- i.e. FR, RB, WG, RG, etc.);
  - Prestressed Concrete Girder Bridges (PSR) 10 - 20;  
(A variety of types is required- i.e. NU, DBT, CBT, PO, FC, RD, etc.);
  - Cast-in-place Concrete Girder Bridges (CON) 2 - 5;
- *Letter of recommendation from mentor stating trainee has completed a mentorship program meeting the above requirements and in his/her opinion is ready to write the certification exam and test sites & electronic PDF scans of original inspection reports with review comments and all other communication/ feedback in PDF format. The submission of inspection reports, including photos, shall be submitted in individual PDF files for each lot as well as an excel spreadsheet summarizing the lot number, BF, span type, structural condition rating, inspection date, mentor review date, mentor comments on acceptability feedback/discussion date).*
- Stage 3\*\*: Class A certification exam
  - *Minimum 75% score required.*
- Stage 4\*\*: Test Inspections – three test inspections completed in one day
  - *Scored for acceptability by a Alberta Transportation Class A inspector*

*\*\* Note: Stage 3 and 4 may be completed in reverse order.*

Class A and B candidates will be certified once all requirements have been met. Certification will remain valid until the next certification renewal date. Candidates that fail any stage have the opportunity to re-try that stage. A second failure at a given stage will require the process to be re-started at Stage 1.

**Re-Certification Process**

Re-certification requires active involvement in the BIM program and acceptable performance. The status of all certified inspectors will be reviewed by Alberta Transportation personnel (Bridge Preservation Specialist and Bridge Management Engineer in Technical Standards Branch) every 3 years. Decisions on re-certification will be rendered and activated prior to the certification renewal date.

The Bridge Engineering Section of Alberta Transportation's Technical Standards Branch Bridge (TSB) will administer the re-certification process with assistance from regional bridge staff. Inspectors that clearly meet re-certification requirements will be re-certified until the next renewal date following formal approval by the Director of Bridge Engineering. Inspectors will be notified by e-mail of re-certification results. Hard-copy certificates will be provided by Alberta Transportation, if requested.

Inspectors that do not meet re-certification criteria may be asked if they intend to maintain their certification. If so, a panel comprised of three members of Alberta Transportation's BIM committee will be convened to review the inspector's status and render recommendation on certification renewal to the Director of Bridge Engineering. If re-certification is approved, the candidate will be informed by e-mail of re-certification results. Hard-copy certificates will be provided from by Alberta Transportation, if requested. If certification is not granted, a remedial plan to renew certification may be developed by the panel. A typical remedial plan would consist of a completion of a written re-certification exam (minimum 75% score required) and 5 test inspections. The test inspections would be reviewed by an Alberta Transportation certified Class A inspector for acceptance. Additional training may also be required if deemed necessary by the panel.

***Re-certification criteria for Class A and Class B bridge inspectors***

In order to be re-certified, inspectors must satisfy one of the following:

- Performed a minimum average rate of 2 BIM inspections (Level 1 or Level 2) per month during previous 3 year period. Class A inspectors must have completed 50% of the inspections for major bridges; or
- Performed a minimum average rate of 1 BIM inspection (Level 1 or Level 2) per month during previous 3 year period and have been active in the management, design, or construction of bridges. Class A inspectors must have completed 50% of the inspections for major bridges; or
- Acted as a reviewer for a minimum average rate of 2.5 inspections per month during the previous 3 year period and have been active in the management, design, or construction of bridges; or



- Acted as Department reviewer for a minimum average rate of 5 inspections per month during the previous 3 year period and have been active in the management, design, or construction of bridges.

In addition, to be re-certified, inspectors must have:

- Attended any formal BIM training sessions deemed mandatory by Alberta Transportation; and
- Completed any improvement plans developed by Alberta Transportation based on observed performance issues.

This process is effective as of **February 17, 2016**



**Dave Besuyen, P. Eng.**

Bridge Preservation Specialist  
Bridge Engineering, Technical Standards Branch  
Alberta Transportation  
Government of Alberta

## BIM Advisory Bulletin #2 – January 08, 2015

Section 2.5 of Bridge Inspection and Maintenance System - Inspection Manual (Version 3.1 - March 2008) will be replaced in its entirety with the following **effective April 1, 2015**.

### 2.5 Frequency of Bridge Inspection

Bridge structures are to be inspected in accordance with the following intervals to ensure an appropriate level of safety and to assist in effective maintenance and management of the bridge inventory:

1. Bridge structures located on roadways that are designated as Level 1 or Level 2 in accordance with the Provincial Highway Service Classification - 21 months.
2. Bridge structures located on roadways that are designated as Level 3 or Level 4 in accordance with the Provincial Highway Service Classification - 39 months.
3. Major Bridges on Local Roads - 39 months.
4. Standard Bridges and Culverts on Local Roads – 57 months.
5. All new bridge structures as part of final construction completion.
6. All bridge structures are to be inspected after significant maintenance (the work affects superstructure or substructure general ratings) or rehabilitation has been completed.

It is intended that these cycles will provide the benefit of inspection under different seasonal conditions. In special circumstances some structures may be exposed to unique conditions or only accessible at specific times of the year (i.e. park roads with summer only access). In special circumstances the Department will modify inspection intervals to suit site specific requirements.

Grade separation and ramp structures that have over and under passing roadways with different Provincial Highway Service Classifications will be assigned the inspection frequency associated with the higher roadway classification/more frequent inspection interval.

The inspector may recommend a shorter or modified inspection interval depending on the age, traffic characteristics, known deficiencies, etc. of the bridge. The Department will review and either accept or reject the recommendation.

If you have any questions on this matter, please contact the Bridge Preservation Specialist.

Des Williamson  
Director, Bridge Engineering  
Technical Standards Branch

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Bridge Inspection						
Bridge File Number	73333 -1 Bridge		Form Type	PCS		
Year Built/Year Supstr	1964/1964		Lot No.			
Bridge or Town Name	CREMONA		Inspector Name	G. Roberts		
Located Over	GRAHAM CREEK, 3.89.22.1, WATERCRS-ST		Inspector Class	Cl. A		
Located On	LOCAL ROAD		Assistant Name	Calvin Roberts		
Water Body Cl./Year			Assistant Class	Cl. B		
Navigabil. Cl./Year			Inspection Date	July 16 2014		
Legal Land Location	SW SEC 15 TWP 30 RGE 5 W5M		Arrive Time	7:40 AM		
Longitude, Latitude	-114:37:59, 51:33:43		Depart Time	10 AM		
Road Authority	MOUNTAIN VIEW COUNTY		Data Entry By			
Contract Main. Area	UNDEFINED CMA		Data Entry Date			
Clear Roadway/Skew	6.4 /		Reviewer Name			
AADT/Year	200 1207 1995 (E) 2014		Review Date			
Road Classification	RLU-207G-60		Dept. Reviewer Name			
Detour Length (km)	7		Dept. Review Date			
Follow-Up By						
Allowable Load (t):	Single	CS1 28 GIRDER	Semi	CS2 49 GIRDER	Train	CS3 65 GIRDER
Design Loading:	HS20					---> On Critical Spans ---> Critical Member ---> Primary Span

Posting Information							
Required Load Posting (t)	Single		Semi		Truck Train		
Posted Loading (t)	Single		Semi		Truck Train		
Posted:	Lane	EB	At Junction (Y/N)	No	In Advance (Y/N)	No	At Bridge (Y/N) No
Posted:	Lane	WB	At Junction (Y/N)	No	In Advance (Y/N)	No	At Bridge (Y/N) No
Remarks	Not required ✓						

Hazard Marker At Bridge (Y/N)	Yes ✓						
Remarks							
Other Sign Types							

Utilities (Located at)			
Utility Attachments	TELEPHONE UTILITIES-PHONE LINE		
Telephone	On 2 cables South curb. end Row		Gas
Power	2 wires North r/w. ✓		Municipal
Others	Problem (Y/N) No ✓		
Remarks			

Approach Road			
	Last	Now	Explanation of Condition
Horizontal Alignment	7	7	Local road intersection 70m West. ✓
Vertical Alignment	7	7	Hill to East.
Roadway Width (m)	6.600 ✓		
Approach Bump	6	5	
Guardrail (Y/N)	No ✓		
Guardrail	X	X	
Length (m)			
Current Standard (Y/N)			
Termination Type			
Drainage	7	7	
Approach Road General Rating	7	7	

⊕ = Inventory Update required  
2 NOTIFICATION

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Superstructure				
Bridge Component	Last	Now	Explanation of Condition	
(Primary Span : HC, 1 Spans, Lengths(m): 6.1, A-Ident Number: )				
<b>Special Features</b>				
Special Feature		X		
(Type : )				
Special Feature		X		
(Type : )				
<b>Wearing Surface/Deck Top Detail Ratings</b>				
	N (%)	1 (%)	2 (%)	3 (%)
Last				
Now	0	0	0	0
Wearing Surface			5	5
(Material Type : ACP)	Chipcoat			
(Thickness(mm) : 50)	15			
Lateral Connection Problem (Y/N)	No	/		Chipcoat
Deck Top	N	N	ACP covered.	
Deck Rideability			6	6
Deck Joints	N	N	90% of buffer angles paved-over. covered	
Bump (Y/N)	No	/		70%
Deck Drainage			7	7
Drains Clogged (Y/N)	No	/		
Curbs/Median			7	6
(Curb Type : Standard)				Minor scuffs
Scaling (Percent Area)	0	/		
Bridge Rail	5	3	Cracked at NE but still functional	
(Type : BRIDGE SOLID BEAM (EX. TIMBER RAILS))			Rot	
Bridge Rail Posts	7	7		
(Type : POST STEEL;POST STEEL)				
Bridge Rail/Posts Coating	4	3	Peeling at timber rail and posts.	
(Type : PAINT)			80% paint loss	
Sidewalk	X	X		
<b>Girder Detail Ratings</b>				
	N (count)	1 (count)	2 (count)	3 (count)
Last				
Now	0	0	0	2
Girders			4	3
Last Complete Inspection Date	15-Jul-2009 2014			
Cracking (Y/N)	Yes /			
Spalling (Percent Area)	2 /			
Lift or Connector Pocket Grouted (Y/N)	No /			
(Number Of Girders : 8)				
<b>Span Alignment Problems</b>				
Vertical (Y/N)	No /			
Horizontal (Y/N)	No /			
<b>Superstructure General Rating</b>			4	3

G1 - W/C SC +1 = 5  
 G2 - Sp = 3  
 G3 - W/C US = 3  
 G4 - W/C SC 1 leg = 5  
 G5 - /  
 G6 - W/C SC = 4  
 G7 - W/C SC = 4  
 G8 - W/C SC +1 = 5

G2 has wide cracks and spall in AZ. G1, G3, G4 & G6 wide crack in AZ of 1 leg only.  
 G2 and G3 have spalls or wide cracks in in-sand concrete in AZ. Rated 3.  
 G6, G7 have wide cracks in sand concrete = 4

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Substructure					
Bridge Component	Last	Now	Explanation of Condition		
<b>Abutments</b>					
(Extended Backwall Piles (Y/N) : Y)					
(Extended Backwall Piles Spacing(mm) : 1500)					
(Total Number of Caps/Corbels : 1:1)					
Bearing Seats/Caps/Corbels Detail Ratings					
N (count)	1 (count)	2 (count)	3 (count)		
Last					
Now	0	0	0	0	
Bearing Seats/Caps/Corbels			5	6	
(Type : TREATED TIMBER)					
(Depth(mm) : 305)					
(Width(mm) : 305)					
Backwalls/Breastwalls	3	3	Undermined at both abutments and <sup>East</sup> East breastwall planks missing and detached.		
Greatest Height (m)	3.10				
Wingwalls	5	5			
(Total Number of Bearing Piles : 6:6)			#4 pile on west abutment split & banded. Piles corod July 16, 2014.		
Piles Detail Ratings			A1 - P1 is bowing and has rot full height. P6 is cracked and bulging at groundline and has rot full height. P3 has rot, P4, P5 beginning rot. A2 - P1, P6 have rot. P4, P5 have beginning rot.		
N (count)	1 (count)	2 (count)	3 (count)		
Last					
Now	0	0	2	3	
Piles			5	2	
Paint/Coating			X	X	
Abutment Stability	5	3	Partial and bulging piles		
Scour/Erosion	3	3	Undermined and eroded at A2		
<b>Piers/Bents</b>					
(Type : )					
(Total Number of Caps/Corbels : )					
Bearing Seats/Caps/Corbels Detail Ratings					
N (count)	1 (count)	2 (count)	3 (count)		
Last					
Now					
Bearing Seats/Caps/Corbels			X	X	
(Type : )					
(Depth(mm) : )					
(Width(mm) : )					
(Total Number of Bearing Piles : )					
Piles Detail Ratings					
N (count)	1 (count)	2 (count)	3 (count)		
Last					
Now					
Pier Shaft/Piles			X	X	
Greatest Height (m)					
Bracing/Struts/Sheathing	6	6	6 struts 200mm x 160 mm.		
Nose Plate	X	X			
Paint/Coating	X	X			
(Colour Description : )					
(Colour Code : )					
Pier Stability	X	X			

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Substructure				
Bridge Component		Last	Now	Explanation of Condition
Scour		X	X	
Debris (Y/N)	No ✓			
Substructure General Rating		5	2	
Structure Usage				
		Last	Now	Explanation of Condition
<b>Channel</b>				
(U/S Direction : N)	✓			
(D/S Direction : S)	✓			
Alignment		6	6	
Bank Stability		6	7	Shallow banks
HWM (m below Top of Curb)				No visible HWM.
Drift (Y/N)	No			
Slope Protection		5	5	
(Type : NATURAL; NATURAL)	✓			
Guidebank/Spurs		X	X	
Adequacy of Opening		6	6	
(Fish Compensation Measure 1 : NONE)				
(Fish Compensation Measure 2 : NONE)				
Channel General Rating		5	5	

Maintenance Recommendations										
Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cat #				
REPAIR/REPLACE BRIDGE RAIL	2014	Replace rails with CCA plank	if bridge is not replaced							
SEAL CURBS										
PATCH DECK	2010	Grout in 13 mm connector pockets (9 on deck)								
OVERLAY DECK										
STRAIGHTEN/REPLACE MEMBERS	2014	Pile splices at A1-P1, S2, S4, P3, P6 and A2-P1, P4, P5, P6								
WASHING										
SHOTCRETE REPAIRS										
CORE TIMBER CAPS/CORBELS										
REPAIR/REPLACE TIMBER CAPS										
REPAIR ABUTMENT SCOUR/EROSION	2010	Reinstall East breastwall planks, add 2.0m additional planks, attach with lag screws. 1E bridge is not replaced								
PLACE ADDITIONAL RIP RAP	2011	10 m <sup>3</sup> CI at A2								
REMOVE DRIFT ACCUMULATION										
INSTALL STRUTS										
OTHER ACTION	2010	Install breastwall planks at West abutment - 8 rows x 10m of 75 x 305 plank								
OTHER ACTION										
OTHER ACTION										
OTHER ACTION										
Structural Condition Rating (Last/Now) (%)	50.0/	Sufficiency Rating (Last/Now) (%)	60.1/	Est. Repl. Yr	2020	2015	Maint. Req. (Y/N)			Yes
Special Comments for Next Inspection	Caps and piles covered July 15, 2016. See carry report for details. 2 Notification for piles with bulging, and bearing seat to MVC Ryan Morrison and AT Donald Saunders July 16, 2014 - copy attached									
Maintenance Reviewed By	No action at present for girders noted 3									
Proposed Long-Term Strategy										
On 3-Year Program (Y/N)										
Proposed Action										
Previous Inspector's Name	Gary Roberts			Previous Assistant's Name						
Next Inspection Date	15-Apr-2014			Previous Inspection Date	15-Jul-2009					
Inspection Cycle (Default) (months)	57									
Comment										
Estimated Total	0									



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## BIM Inspection Contract - Notification of Structural Element Rated 2

<b>Date:</b>	July 16, 2014	<b>Bridge File No.:</b>	73333
<b>Legal Land Loc.:</b>	SW Sec15 Twp30 Rge 5 W5M	<b>Road Name:</b>	Local Road
		<b>Stream:</b>	Graham Ck.
		<b>Town:</b>	Cremona
<b>Subject:</b>	Rotted and Bulging/Bowing Abutment Piles		

Structure Information: 1 – 6.1 M Type HC Girder Span Bridge on TT Substructure  
Construction Date: 1964

The July 16, 2014 Level 1 and Level 2 timber coring inspection completed by Bow Valley Bridge Services Ltd. found two (2) abutment piles with bulging, bowing and rot as follows:

- A1-P1 is bowing and has rot in the bottom approx. 1.5 m section.
- A1 – P6 is bulging at the ground-line with 15 mm vertical displacement and rot full height.

Both piles are located under the curb units.

This deficiency resulted in a 2 rating of the abutment piles and bridge Substructure General Rating, as per Alberta Transportation's Bridge Inspection and Maintenance (BIM) Manual.

To note; A1-P3, A2-P1, P6 also have rot and A1-P4,P5 and A2-P4, P5 have beginning rot.

It is recommended to either repair the piles, or schedule bridge replacement in the near future (within 2-3 years) due to the overall poor condition and age. In the interim, the bridge should be inspected annually until repaired or replaced.

The BIM inspection report and photos will be forwarded in the near future.

Inspected By:

Garry Roberts  
Bow Valley Bridge Services Ltd.

Sent to: Ryan Morrison, Mountain View County  
Donald Saunders, AT Red Deer



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Bridge Inspection									
Bridge File Number	01275 -1 Bridge ✓				Form Type	TT			
Year Built/Year Supstr	1978/1978 ✓				Lot No.	3			
Bridge or Town Name	TORRINGTON ✓				Inspector Name	Calvin Roberts			
Located Over	SPRUCE CREEK, 3.46.24, WATERCRS-ST ✓				Inspector Class	A			
Located On	LOCAL ROAD ✓				Assistant Name				
Water Body Cl./Year					Assistant Class				
Navigabil. Cl./Year					Inspection Date	May 4/15			
Legal Land Location	NW SEC 26 TWP 32 RGE 27 W4M ✓				Arrive Time	9:50 AM			
Longitude, Latitude	-113:44:14, 51:46:41 ✓				Depart Time	11:00 AM			
Road Authority	KNEEHILL COUNTY ✓				Data Entry By	G. Roberts			
Contract Main. Area	UNDEFINED CMA				Data Entry Date	May 22/15			
Clear Roadway/Skew	7.3 / 0 deg.				Reviewer Name	G. Roberts			
AADT/Year	10 / 2010 (E) 2015				Review Date	May 8/15			
Road Classification	RLU-207G-60				Dept. Reviewer Name				
Detour Length (km)	3				Dept. Review Date				
Follow-Up By									
Allowable Load (t):	Single	CS1 33 STRINGER	Semi	CS2 58 STRINGER	Train	CS3 84 STRINGER	--> On Critical Spans --> Critical Member --> Primary Span		
Posting Information									
Required Load Posting (t)	Single		Semi		Truck Train				
Posted Loading (t)	Single		Semi		Truck Train				
Posted:	Lane	NB	At Junction (Y/N)	No	In Advance (Y/N)	No	At Bridge (Y/N)	No	
Posted:	Lane	SB	At Junction (Y/N)	No	In Advance (Y/N)	No	At Bridge (Y/N)	No	
Remarks	No posted loading. ✓								
Hazard Marker At Bridge (Y/N)	Yes ✓								
Remarks	<del>SE set too low.</del>								
Other Sign Types									
Utilities (Located at)									
Utility Attachments									
Telephone					Gas				
Power					Municipal				
Others					Problem (Y/N)	No			
Remarks									
Approach Road									
			Last	Now	Explanation of Condition				
Horizontal Alignment			5	5	Sharp curves & steep hills 200mm from bridge going North & South. ✓				
Vertical Alignment			5	5	Dirt trail to N. ✓				
Roadway Width (m)	5.000	✓			pathole forming at NE approach				
Approach Bump			6	4					
Guardrail (Y/N)	No	✓							
Guardrail Length (m)			X	X					
Current Standard (Y/N)	No								
Termination Type	None								
Drainage			7	7					
Approach Road General Rating			5	5					

⊗ INV update slabs

(Maintenance)

Superstructure					
Bridge Component	Last	Now	Explanation of Condition		
(Primary Span : TT, 1 Spans, Lengths(m): 8.5, A-Ident Number: )					
<b>Special Features</b>					
Special Feature		X			
(Type : )					
Special Feature		X			
(Type : )					
<b>Wearing Surface/Deck Top Detail Ratings</b>					
	N (%)	1 (%)	2 (%)	3 (%)	
Last	0	0	0	0	
Now	30	0	0	0	
Wearing Surface/Deck Top		6	5	CCA treated. ✓ Strip deck widths vary. Centre running boards are 300mm wide. Both shoulders are 200mm. ✓	
(Material Type : TREATED TIMBER) ✓					
(Plank Thickness(mm) : 75) ✓					
(Plank Width(mm) : 200) ✓					
Deck Rideability		7	7		
Wheel Guards		6	5	On 150mm blocks. ✓ Split block at NE - still functional	
(Curb Type : Standard) ✓					
(Type : TREATED TIMBER) ✓					
(Thickness(mm) : 100) ✓					
(Width(mm) : 300) ✓					
Bridge Rail		6	6	150 x 200mm treated posts installed on flat. ✓	
(Type : GALVANIZED STEEL FLEX BEAM) ✓					
Bridge Rail Posts		6	6		
(Type : TREATED TIMBER; TREATED TIMBER) ✓					
Bridge Rail/Posts Coating		7	7	500mm long	
(Type : GALVANIZED) ✓					
(No. of Stringers : 13)					
<b>Stringer Detail Ratings</b>					
	N (count)	1 (count)	2 (count)	3 (count)	
Last	0	0	0	0	
Now	0	0	0	2	S6 and S8 both cracked for 500mm extending out from A1 cap. S6 also has large splinter missing out of it in same location S10 has splinter in base near A2. S9 has reduced bearing on cap of 150mm
Stringers			5	3	
(Type : TREATED TIMBER) ✓					
(Width(mm) : 200) ✓					
(Depth(mm) : 500) ✓					
(Spacing(mm) : 600) ✓					
Sub Deck/Deck Underside		5	5	Tongue and groove. ✓	
(Material Type : TREATED TIMBER) ✓					
(Plank Thickness(mm) : 100) ✓					
(Plank Width(mm) : 250) ✓					
Defects (Percent Area)		1			
<b>Span Alignment Problems</b>					
Vertical (Y/N)		No	✓		
Horizontal (Y/N)		No	✓		
<b>Superstructure General Rating</b>		5	3		
Substructure					
Bridge Component	Last	Now	Explanation of Condition		
<b>Abutments</b>					
(Extended Backwall Piles (Y/N) : Y) ✓					
(Extended Backwall Piles Spacing(mm) : 1800) ✓					

Substructure				
Bridge Component	Last	Now	Explanation of Condition	
(Total Number of Caps/Corbels : 3:3) ✓			Caps are 300Dx350W. ✓	
Bearing Seats/Caps/Corbels Detail Ratings				
	N (count)	1 (count)	2 (count)	3 (count)
Last	0	0	0	0
Now	0	0	0	0
Bearing Seats/Caps/Corbels			5	5
(Type : TREATED TIMBER) ✓				
(Depth(mm) : 300) ✓				
(Width(mm) : 350) ✓				
Backwalls/Breastwalls			3	3
Greatest Height (m)	1.80 ✓			
Wingwalls			6	5
(Total Number of Bearing Piles : 5:5) ✓				Wide check in P2 A2, runs full height. ✓
Piles Detail Ratings				
	N (count)	1 (count)	2 (count)	3 (count)
Last	0	0	0	0
Now	0	0	0	0
Piles			5	5
Paint/Coating			X	X
Abutment Stability			6	6
Scour/Erosion			5	5
Piers/Bents				
(Type : )				
(Total Number of Caps/Corbels : )				
Bearing Seats/Caps/Corbels Detail Ratings				
	N (count)	1 (count)	2 (count)	3 (count)
Last				
Now				
Bearing Seats/Caps/Corbels			X	X
(Type : )				
(Depth(mm) : )				
(Width(mm) : )				
(Total Number of Bearing Piles : )				
Piles Detail Ratings				
	N (count)	1 (count)	2 (count)	3 (count)
Last				
Now				
Pier Shaft/Piles			X	X
Greatest Height (m)				
Bracing/Struts/Sheathing			6	6
Nose Plate			X	X
Paint/Coating			X	X
(Colour Description : )				
(Colour Code : )				
Pier Stability			X	X
Scour			X	X

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Substructure				
Bridge Component		Last	Now	Explanation of Condition
Debris (Y/N)	No ✓			
<b>Substructure General Rating</b>		5	5	
Structure Usage				
Channel		Last	Now	Explanation of Condition
(U/S Direction : W) ✓				
(D/S Direction : E) ✓				
Alignment		6	6	
Bank Stability		7	7	
HWM (m below Top of Curb)				(HWM 0.8m. 20Jul2005).
Drift (Y/N)	No ✓			HWM not visible. ✓
Slope Protection (Type : NONE; NONE) ✓		4	4	Stream degraded below sheathing at N abut. ✓
Guidebank/Spurs		X	X	
Adequacy of Opening		5	5	
(Fish Compensation Measure 1 : NONE) ✓				
(Fish Compensation Measure 2 : NONE) ✓				
<b>Channel General Rating</b>		4	4	

Maintenance Recommendations										
Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cat #	Structural Condition Rating (Last/Now)	Sufficiency Rating (Last/Now)	Est. Repl. Yr	Maint. Reqd. (Y/N)
REPAIR/REPLACE BRIDGE RAIL										
PATCH DECK										
REPLACE STRIP DECK										
REPLACE SUB DECK										
STRAIGHTEN/REPLACE MEMBERS	2015	Replace cracked stringers - High Priority								
WASHING										
CORE TIMBER CAPS/CORBELS										
REPAIR/REPLACE TIMBER CAPS										
REPAIR ABUTMENT SCOUR/EROSION										
PLACE ADDITIONAL RIP RAP										
REMOVE DRIFT ACCUMULATION										
INSTALL STRUTS										
OTHER ACTION	2015	Lower sheathing at N abut. - Approx 8-10 LM of sheathing required - fasten to front of piles								
OTHER ACTION	2011	Reset SE HM to std.								
OTHER ACTION										
OTHER ACTION										
<b>Structural Condition Rating (Last/Now)</b>	<b>55.6/</b>								2025	✓
<b>Sufficiency Rating (Last/Now)</b>							74.3/			
<b>Estimated Total</b>										0
Special Comments for Next Inspection			Department Comments							
Maintenance Reviewed By			Date							
Proposed Long-Term Strategy										
On 3-Year Program (Y/N)										
Proposed Action										
Previous Inspector's Name	Claude Jutras		Previous Assistant's Name							
Next Inspection Date	01-Jun-2015		Previous Inspection Date	01-Sep-2010						
Inspection Cycle (Default) (months)	57									
Comment										

Bridge Culvert Inspection			
Bridge File Number	70576 -1 Bridge Culvert ✓	Form Type	CUL1
Year Built	1953 ✓	Lot No.	
Bridge or Town Name	THREE HILLS ✓	Inspector Name	G. Roberts
Located Over	TRIBUTARY TO THREEHILLS CREEK, 3.50.2.14, WATERCRS-ST	Inspector Class	CL. A
Located On	LOCAL ROAD ✓	Assistant Name	
Water Body Cl./Year		Assistant Class	
Navigabil. Cl./Year		Inspection Date	Oct 6/14
Legal Land Location	SW SEC 25 TWP 32 RGE 25 W4M ✓	Arrive Time	5:15 PM
Longitude, Latitude	-113:25:48, 51:46:11 ✓	Depart Time	6:30 PM
Road Authority	KNEEHILL COUNTY ✓	Data Entry By	
Contract Main. Area	UNDEFINED CMA ✓	Data Entry Date	
Clear Roadway/Skew	9.6 / 20 deg. (RHF) ✓	Reviewer Name	
AADT/Year	250 / 2009 (E) 2014	Review Date	
Road Classification	RLU-208-100 ✓	Dept. Reviewer Name	
Detour Length (km)	3 ✓	Dept. Review Date	
		Follow-Up By	

Bridge Culvert Information								
Number of Culverts		1 ✓						
Pipe #	Barrel	Span	Rise (or Dia.)	Type	Length	Corr. Profile	PI./Slab Thickness	Shape
1	MAIN	2973 ✓	2007 ✓	RPP	25.2	152X51 ✓	4.0	PIPE ARCH ✓
Special Features		VERT TIMBER STRUTS ✓						
Special Features Comment								

Utilities (Located at)			
Utility Attachments			
Telephone		Gas	
Power	East Row	Municipal	
Others		Problem (Y/N)	No
Remarks			

Approach Road / Embankment				
		Last	Now	Explanation of Condition.
Horizontal Alignment		8	7	
Vertical Alignment		9	8	
Roadway Width (m)	9.600 ✓			
Embankment		6	6	
Sideslope ( :1)	1.9 ✓			
(Height of Cover(m) : 2.4) ✓				
Guardrail (Y/N)	No ✓			
<b>Approach Road / Embankment General Rating</b>		<b>8</b>	<b>7</b>	

Upstream End				
<b>Culvert Component</b>		Last	Now	Explanation of Condition
Direction		W ✓		
End Treatment (Concrete, Steel, Others, None)	STEEL ✓			
Headwall		X	X	
Collar		X	X	
Wingwalls		X	X	
(Shape : )				
Cutoff Wall		X	X	

(\*) = Inventory Update required

Upstream End				
Culvert Component		Last	Now	Explanation of Condition
Bevel End		6	7	
Heaving (mm)	150			
Invert Above/Below Stream Bed	BELOW			
Above/Below (mm)	300			
Scour Protection		7	7	
(Type : RIP RAP)				
(Avg. Rock Size(mm) : 200)				
Scour/Erosion		7	7	
Beavers (Y/N)	No			
<b>Upstream End General Rating</b>		<b>6</b>	<b>7</b>	
Bridge Culvert Barrel				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 1, Primary Span, Location Code: MAIN, Span (mm): 2973, Rise (mm): 2007, Type: RPP)				
Barrel Last Accessible Date	25 Aug 2009 Oct 6/14			
<b>Special Features</b>				
Special Feature		7	6	
(Type : VERT TIMBER STRUTS)				
Special Feature			X	
(Type : )				
<b>Roof</b>		4	4	
Measured Rise (mm)	1858 1840			
Measured At Ring No.	3			
Sag (mm)	149 167			
Percent Sag	7 8			2.4%
<b>Sidewall</b>		3	3	
Measured Span (mm)	3005 3050			R1 and R2 have cracks on seam with 55mm of steel remaining. Cracks have changed since last inspection.
Measured At Ring No.	3			Cracked seams
Deflection (mm)	92 77			2 isolated corrosion spots at south side of R4 could become perforations.
Percent Deflection	4 3			1.4%
<b>Floor</b>		5	6	
Bulge (mm)	0			
Measured At Ring No.	3			
Abrasion (Y/N)	No			
<b>Circumferential Seams</b>		6	7	
Separation (mm)	0			
<b>Longitudinal Seams</b>		3	3	
Total No. of Cracked Rings	2			R1 has 8 of 22 cracked valley bolts with 78mm steel remaining. R2 has 18 of 24 valley bolts cracked with 55mm steel remaining. All cracks on south wall. Report of 28 Sep 2004 showed 84mm as worst case.
Total No. of Rings with Two Cracked Seams	0			Cracks in R1 and R2 with 70mm remaining in R2. Appears previous measurements may have been crack length rather than remaining steel
Min. Remaining Steel Between Cracks (mm)	55 70			
Proper Lap (Y/N)	No			
Longitudinal Stagger (Y/N)	Yes			
<b>Coating</b>		5	5	
Corrosion By Soil (Y/N)	No Yes			Superficial corrosion. at isolated upper seams and at floor
Corrosion By Water (Y/N)	Yes			
Camber POS/ZERO/NEG	ZERO Neg			
Ponding (Y/N)	No			

Bridge Culvert Barrel				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 1, Primary Span, Location Code: MAIN, Span (mm): 2973, Rise (mm): 2007, Type: RPP)				
Fish Passage Adequacy		5	5	
Baffle		X	X	
(Type : )				
Waterway Adequacy		8	4	Gross to near top of struts
Icing (Y/N)	No ✓			
Siltting (Y/N)	No ✓			
Drift (Y/N)	No ✓			
<b>Barrel General Rating</b>		<b>3</b>	<b>4</b>	Increase for struts
Downstream End				
Culvert Component		Last	Now	Explanation of Condition
Direction		E	✓	
End Treatment (Concrete, Steel, Others, None)	STEEL ✓			
Headwall		X	X	
Collar		X	X	
Wingwalls		X	X	
(Shape : )				
Cutoff Wall		X	X	
Bevel End		5	6	
Heaving (mm)	70 ✓			
Invert Above/Below Stream Bed	BELOW ✓			
Above/Below (mm)	200 ✓			
Scour Protection		6	6	
(Type : RIP RAP) ✓				
(Avg. Rock Size(mm) : 200) ✓				
Scour/Erosion		6	6	Scour hole 10m D/S. not affecting pipe
Beavers (Y/N)	No ✓			
<b>Downstream End General Rating</b>		<b>5</b>	<b>6</b>	
Structure Usage				
		Last	Now	Explanation of Condition
<b>Channel (U/S and D/S)</b>				
Alignment		7	7	
Bank Stability		7	7	
HWM (m below Top of Culvert)				HWM not visible. ✓
Drift (Y/N)	No ✓			
Channel Bottom Degrading/Aggrading	<del>DEGRADING</del> None			
Beavers (Y/N)	No ✓			
(Fish Compensation Measure 1 : NONE)				
(Fish Compensation Measure 2 : NONE)				
<b>Channel General Rating</b>		<b>7</b>	<b>7</b>	



Maintenance Recommendations											
Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cat #	Structural Condition Rating (Last/Now)	Sufficiency Rating (Last/Now)	Est. Repl. Yr	Maint. Req. (Y/N)	
SHOTCRETE REPAIRS											
PLACE ADDITIONAL RIP RAP											
REMOVE DRIFT ACCUMULATION											
INSTALL CONCRETE/STEEL LINING											
INSTALL STRUTS											
INSTALL CONCRETE COLLAR/CUTOFF											
REPAIR SEAMS											
OTHER ACTION											
OTHER ACTION											
OTHER ACTION											
OTHER ACTION											
<b>Structural Condition Rating (Last/Now)</b>	<b>33.3/</b>						<b>57.8/</b>		<del>2019</del> <b>2025</b>		
Special Comments for Next Inspection	Reduce inspection cycle to 24 months <del>are stable</del>										
Maintenance Reviewed By	Date										
Proposed Long-Term Strategy	Estimated Total 0										
On 3-Year Program (Y/N)											
Proposed Action											
Previous Inspector's Name	Claude Jutras		Previous Assistant's Name								
Next Inspection Date	25-May-2014		Previous Inspection Date		25-Aug-2009						
Inspection Cycle (Default) (months)	57										
Comment											

Bridge Culvert Inspection

Bridge File Number	13476 -1 Bridge Culvert ✓	Form Type	CULM
Year Built	1952 ✓	Lot No.	
Bridge or Town Name	TROCHU ✓	Inspector Name	G. Roberts
Located Over	TRIBUTARY TO GHOSTPINE CREEK, 3.50.11, WATERCRS-ST ✓	Inspector Class	CL-A
Located On	LOCAL ROAD ✓	Assistant Name	
Water Body Cl./Year		Assistant Class	
Navigabil. Cl./Year		Inspection Date	Oct 10, 2014
Legal Land Location	SW SEC 28 TWP 32 RGE 23 W4M ✓	Arrive Time	2:35 PM
Longitude, Latitude	-113:13:03, 51:45:59 ✓	Depart Time	3:50 PM
Road Authority	KNEEHILL COUNTY ✓	Data Entry By	
Contract Main. Area	UNDEFINED CMA ✓	Data Entry Date	
Clear Roadway/Skew	7.6 / ✓	Reviewer Name	
AADT/Year	60 100/2007 (E) 2014	Review Date	
Road Classification	RLU-208G-60 ✓	Dept. Reviewer Name	
Detour Length (km)	3 ✓	Dept. Review Date	
		Follow-Up By	

Bridge Culvert Information

Number of Culverts	2 ✓							
Pipe #	Barrel	Span	Rise (or Dia.)	Type	Length	Corr. Profile	PI./Slab Thickness	Shape
1	MAIN	-	1810 ✓	SP	21.1	152X51 ✓	3.0	ROUND ✓
2	MAIN	-	1219 ✓	MP	20.5	68X13 ✓	3.0	ROUND ✓
Special Features								
Special Features Comment								

Utilities (Located at)

Utility Attachments			
Telephone	West r/w. ✓	Gas	
Power	East <del>2 wire OH</del> Row and crosses South	Municipal	
Others		Problem (Y/N)	No ✓
Remarks			

Approach Road / Embankment

	Last	Now	Explanation of Condition
Horizontal Alignment	7	6	Located 100 m north of local road intersection
Vertical Alignment	6	6	Grade to north
Roadway Width (m)	7.600 ✓		
Embankment	5	5	
Sideslope ( :1)	2.0 ✓ <del>Very</del> sharp shoulder. ✓		
(Height of Cover(m) : 2.1) ✓	1.7 m HOC at 1200 pipe		
Guardrail (Y/N)	No ✓		
Approach Road / Embankment General Rating	6	6	

Upstream End

Culvert Component	Last	Now	Explanation of Condition
(Pipe # : 1, Span Type: Primary Span)			
Direction	W ✓		S pipe. - 1810 SPCSP
End Treatment (Concrete, Steel, Others, None)	STEEL ✓		
Headwall	X	X	
Collar	X	X	
Wingwalls	X	X	
(Shape : )			

1219 or 1200?

Upstream End				
Culvert Component		Last	Now	Explanation of Condition
<b>(Pipe # : 1, Span Type: Primary Span)</b>				
Cutoff Wall		X	X	
Bevel End		4	4	Rust, abrasion, <del>silts</del> deposits & <i>Minor damage at holes inside (North) invert and minor hole north side and floor</i>
Heaving (mm)	<del>0</del> 100			
Invert Above/Below Stream Bed	BELOW			
Above/Below (mm)	350			
Scour Protection		3	3	No protection both sides
(Type : NONE) ✓				
(Avg. Rock Size(mm) : )				
Scour/Erosion		3	3	<i>Scour</i> Embankment erosion on each side of bevel, 1.8m <del>(width)</del> with potential for piping
Beavers (Y/N)	No ✓			
<b>Upstream End General Rating</b>		<b>3</b>	<b>3</b>	
Bridge Culvert Barrel				
Culvert Component		Last	Now	Explanation of Condition
<b>(Pipe # : 1, Primary Span, Location Code: MAIN, Span (mm): , Rise (mm): 1810, Type: SP)</b>				
Barrel Last Accessible Date	<del>14 Feb 2012</del> Oct 10, 2014			S pipe. ✓
<b>Special Features</b>				
Special Feature			X	
(Type : )				
Special Feature			X	
(Type : )				
Roof		N	3	Bulges in roof, sagging & wavy. <i>Deflections</i> Unusual to have rise & span measurements vary this much in a round pipe with no round shape issues. Adjust sag to 1940 dia. <del>(11.3%, 262mm deflection, 20 Aug 2007)</del> Unable to confirm due to ice
Measured Rise (mm)	<del>1566</del> 1570			
Measured At Ring No.	5 ✓			
Sag (mm)	<del>244</del> 240			
Percent Sag	<del>14</del> 13			
Sidewall		3	3	Holes in sidewalls & dents throughout; holes in plate 4 & 5. <i>from construction</i> Adjust deflection for 1810mm dia. <del>11.9%</del> <i>Deflections</i>
Measured Span (mm)	<del>2007</del> 2030			
Measured At Ring No.	5 ✓			
Deflection (mm)	<del>187</del> 220			
Percent Deflection	<del>11</del> 12			
Floor		N	5	700mm of ice.
Bulge (mm)	0 ✓			
Measured At Ring No.				
Abrasion (Y/N)	No ✓			
Circumferential Seams		6	6	<i>Isolated</i>
Separation (mm)	0 ✓			
Longitudinal Seams		6	6	<del>Some</del> some bolts missing. ✓
Total No. of Cracked Rings	0 ✓			
Total No. of Rings with Two Cracked Seams	0 ✓			
Min. Remaining Steel Between Cracks (mm)				
Proper Lap (Y/N)	No ✓			
Longitudinal Stagger (Y/N)	Yes ✓			
Coating		5	4	Soil staining at upper seams Corrosion with pitting on floor
Corrosion By Soil (Y/N)	No <i>Yes</i>			
Corrosion By Water (Y/N)	Yes ✓			

Bridge Culvert Barrel				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 1, Primary Span, Location Code: MAIN, Span (mm): , Rise (mm): 1810, Type: SP)				
Camber POS/ZERO/NEG	ZERO Neg			
Ponding (Y/N)	No			
Fish Passage Adequacy		7	4	Hanging bevel D/S
Baffle		X	X	
(Type : )				
Waterway Adequacy		4	5	Pipe appears to run full.
Icing (Y/N)	No			
Siltting (Y/N)	No			
Drift (Y/N)	No			
<b>Barrel General Rating</b>		<b>3</b>	<b>3</b>	
Downstream End				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 1, Span Type: Primary Span)				
Direction		E		S pipe.
End Treatment (Concrete, Steel, Others, None)	STEEL			
Headwall		X	X	
Collar		X	X	
Wingwalls		X	X	
(Shape : )				
Cutoff Wall		X	X	
Bevel End		4	5	Isolated & Damaged rust & abrasion present. Bolts missing bevel end is filled underneath with rock. Narrow plate cut north side
Heaving (mm)	200			
Invert Above/Below Stream Bed	ABOVE			
Above/Below (mm)	300			Shallow rock filled
Scour Protection		N	4	Large scour hole present; (does not appear to be growing, filled with rock. 29 Aug 2007). Scour hole appears shallow. Partial erosion due to cattle action.
(Type : RIP RAP)				
(Avg. Rock Size(mm) : 400)				
Scour/Erosion		N	4	
Beavers (Y/N)	No			
<b>Downstream End General Rating</b>		<b>4</b>	<b>4</b>	
Upstream End				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 2, Span Type: Secondary Span)				
Direction		W		N pipe. Located 20 m North of Primary
End Treatment (Concrete, Steel, Others, None)	STEEL			
Headwall		X	X	
Collar		X	X	
Wingwalls		X	X	
(Shape : )				
Cutoff Wall		X	X	

Upstream End				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 2, Span Type: Secondary Span)				
Bevel End		5	5	
Heaving (mm)	100 ✓			
Invert Above/Below Stream Bed				At streambed. ✓
Above/Below (mm)	0 ✓			
Scour Protection		5	5	
(Type : <del>NONE</del> <i>Natural</i> )				
(Avg. Rock Size(mm) : )				
Scour/Erosion		5	5	
Beavers (Y/N)	No ✓			
<b>Upstream End General Rating</b>		<b>5</b>	<b>5</b>	
Bridge Culvert Barrel				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 2, Secondary Span, Location Code: MAIN, Span (mm): , Rise (mm): 1219, Type: MP) ✓				
Barrel Last Accessible Date	14-Feb-2012 <i>OCT 10, 2014</i>			N pipe. ✓
<b>Special Features</b>				
Special Feature			X	
(Type : )				
Special Feature			X	
(Type : )				<i>Isolated</i>
Roof		2	3	Bulges in roof, sagging & wavy. <del>At barrel section 2 from u/s (photo).</del>
Measured Rise (mm)	<del>1025</del> <i>1030</i>			
Measured At Ring No.	<i>4</i>			
Sag (mm)	<del>184</del> <i>159</i>			
Percent Sag	<del>18</del> <i>13</i>			<i>Deflections</i>
Sidewall		3	3	Damaged sidewall at barrel section 4 - repaired. ✓ <del>At barrel section 3 from u/s.</del>
Measured Span (mm)	<del>1380</del> <i>1375</i>			
Measured At Ring No.	<i>4</i>			
Deflection (mm)	<del>167</del> <i>156</i>			
Percent Deflection	<del>13</del> ✓			<i>Deflections</i>
Floor		4	4	<i>Isolated perforation at R2 coupler.</i> <i>Remainder of floor is adequate</i>
Bulge (mm)	0 ✓			
Measured At Ring No.				
Abrasion (Y/N)	No ✓			
Circumferential Seams		4	4	Coupler corroded through at floor at seam 2 from u/s <del>(photo)</del> Floor has pitting.
Separation (mm)	160 ✓			
Longitudinal Seams		6	6	Riveted seams. ✓
Total No. of Cracked Rings	0 ✓			
Total No. of Rings with Two Cracked Seams	0 ✓			
Min. Remaining Steel Between Cracks (mm)				
Proper Lap (Y/N)	No ✓			
Longitudinal Stagger (Y/N)	Yes ✓			<i>Isolated</i>
Coating		4	3	Rust with pitting. <i>Perforated coupler at R2</i>
Corrosion By Soil (Y/N)	No ✓			
Corrosion By Water (Y/N)	Yes ✓			
Camber POS/ZERO/NEG	ZERO ✓			

R 1100  
L 1210 R2

1090  
1030 R3

R 1030  
L 1000 R4

Bridge Culvert Barrel				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 2, Secondary Span, Location Code: MAIN, Span (mm): , Rise (mm): 1219, Type: MP)				
Ponding (Y/N)	No			
Fish Passage Adequacy		4	4	D/S invert 700mm above ice level. <i>localized scour hole</i>
Baffle		X	X	
(Type : )				
Waterway Adequacy		5	5	<i>dry this inspection. Pipe serves as overflow</i>
Icing (Y/N)	No ✓			
Siltng (Y/N)	No ✓			
Drift (Y/N)	No ✓			
Barrel General Rating		2	3	<del>"2" rating notification sent to LRA &amp; AT.</del>

Downstream End				
Culvert Component		Last	Now	Explanation of Condition
(Pipe # : 2, Span Type: Secondary Span)				
Direction		E	✓	N pipe. ✓
End Treatment (Concrete, Steel, Others, None)	STEEL ✓			
Headwall		X	X	
Collar		X	X	
Wingwalls		X	X	
(Shape : )				
Cutoff Wall		X	X	
Bevel End		4	5	Bevel end replaced - poor install & has settled. <i>minor settlement</i>
Heaving (mm)	0 ✓			
Invert Above/Below Stream Bed	<del>ABOVE</del> AT			At SB
Above/Below (mm)	<del>500</del> 0			
Scour Protection		3	4	Protection around pipe is adequate. <i>Minor scour. D/S, minor localized. Not affecting pipe</i>
(Type : RIP RAP) ✓				
(Avg. Rock Size(mm) : 400) ✓				
Scour/Erosion		3	4	Large scour hole, measures 15m dia., depth 700mm (depth to ice from invert) - photo
Beavers (Y/N)	No ✓			
Downstream End General Rating		3	4	

Structure Usage				
		Last	Now	Explanation of Condition
Channel (U/S and D/S)				
Alignment		4	5	SPCSP structure <i>has</i> straight alignment, however MP outlet makes a 90 deg. bend to the N.
Bank Stability		5	4	<i>Sluffing bank at u/s of SPCSP</i>
HWM (m below Top of Culvert)				HWM not visible. ✓
Drift (Y/N)	No ✓			
Channel Bottom Degrading/Aggrading	DEGRADING ✓			D/S of both pipes. ✓
Beavers (Y/N)	No ✓			
(Fish Compensation Measure 1 : NONE)				
(Fish Compensation Measure 2 : NONE)				

Structure Usage				
		Last	Now	Explanation of Condition
Channel General Rating		4	4	

Maintenance Recommendations										
Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cat #	Structural Condition Rating (Last/Now) (%)	Sufficiency Rating (Last/Now) (%)	Est. Repl. Yr	Maint. Req. (Y/N)
SHOTCRETE REPAIRS	2012	Place <del>1600</del> <sup>approx 5m<sup>3</sup> clay and 5m<sup>3</sup> C.I.</sup> at both <del>dis-ends</del> <sup>at u/s bevel of main span &amp; primary pipe</sup> <del>High priority due to piping potential</del>								
REMOVE DRIFT ACCUMULATION	2015	Seal floor perforation in R2 of 1200 pipe with galv. plate section.								
INSTALL CONCRETE/STEEL LINING										
INSTALL STRUTS										
INSTALL CONCRETE COLLAR/CUTOFF										
REPAIR SEAMS										
OTHER ACTION	2017	Consider replacing pipes in 5 yrs.								
OTHER ACTION										
OTHER ACTION										
OTHER ACTION										
Special Comments for Next Inspection	22.2/	<p>Replace in conjunction with LRA road program. Monitor &amp; replace when condition warrants action; no action recommended for next cycle. <b>Monitor deflectors at current 27 month cycle</b> (Revise inspection cycle to 27mths. CB 2002/08/06) - Next inspection should take place in summer/fall to confirm rise measurement in main span; place on 27mth cycle. <b>2" Notification sent to LRA &amp; AT on 17 Feb 2012; contacted Brad Buchart at the County &amp; Donald Saunders at AT.</b></p>		28.0/			2017 2023		Yes	
Maintenance Reviewed By	Darron Ahlstedt		Department Comments	Date	Inspection Cycle changed to 27mths as per contractor inspection		Estimated Total	0		
Proposed Long-Term Strategy										
On 3-Year Program (Y/N)										
Proposed Action										
Previous Inspector's Name	Glen Mikesch		Previous Assistant's Name							
Next Inspection Date	14-May-2014		Previous Inspection Date	14-Feb-2012						
Inspection Cycle (Modified) (months)	27		Inspection Cycle changed to 27mths as per contractor inspection							
Comment										

*High Priority*



AADT HOURLY CONVERSION FACTORS FOR LOCAL ROADS - 1988

		HOUR ENDING										
		9	10	11	12	13	14	15	16	17		
JANUARY		21.81	20.42	19.20	18.46	19.59	16.84	18.11	15.00	14.33		
FEBRUARY		21.79	20.24	16.66	17.34	18.88	16.66	16.03	13.49	13.28		
MARCH		20.24	18.47	17.34	17.34	18.08	15.45	15.45	13.93	12.68		
APRIL		19.31	17.34	16.34	17.00	17.34	15.17	15.17	13.70	12.88		
MAY		15.45	16.03	15.45	16.03	16.03	14.40	13.93	12.32	12.14		
JUNE		16.34	15.74	14.65	14.65	16.03	13.93	14.16	12.50	11.97		
JULY		20.73	17.34	16.03	16.03	17.00	14.91	14.65	14.40	13.07		
AUGUST		20.73	17.34	14.91	14.91	16.03	13.28	13.28	13.07	11.97		
SEPTEMBER		19.31	18.47	16.66	16.66	17.34	15.17	14.65	13.93	13.07		
OCTOBER		15.33	13.80	15.33	14.68	15.00	13.52	13.26	11.69	11.50		
NOVEMBER		20.29	18.15	16.04	16.42	16.82	15.33	14.68	13.52	12.77		
DECEMBER		23.79	19.71	15.68	15.68	16.82	14.37	14.37	14.08	13.26		

$$\text{ESTIMATED AADT} = \text{NO. OF VEHICLES THAT CROSS BRIDGE STRUCTURE IN ONE HOUR} \times \text{CONVERSION FACTOR}$$

# BIM

Bridge Inspection and Maintenance

## BIM RATING SYSTEM

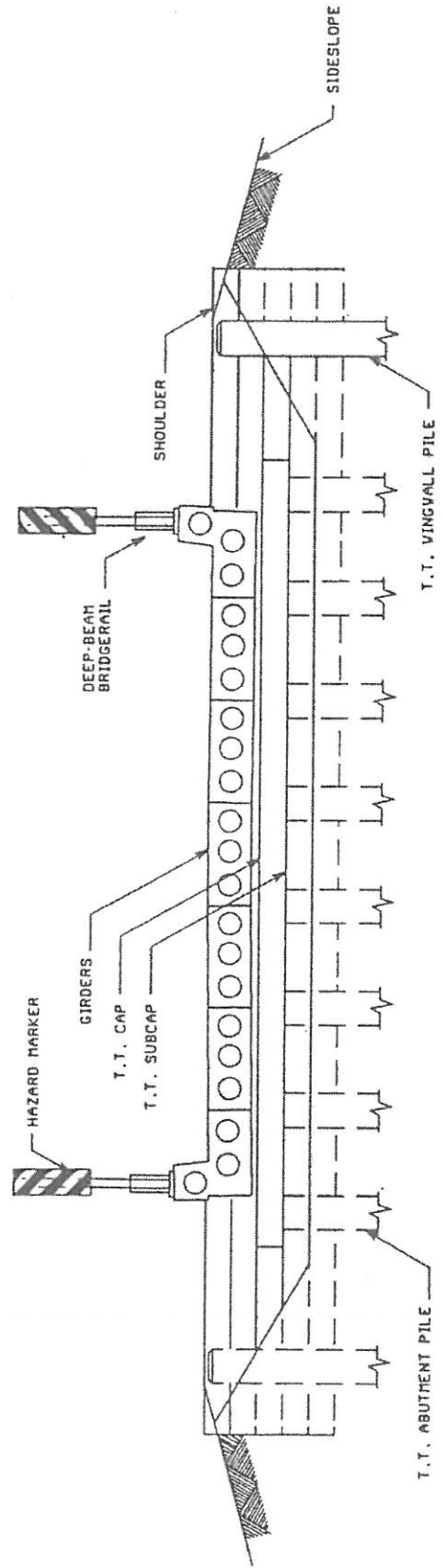
BIM RATING	CONDITION/ FUNCTIONALITY	MAINTENANCE PRIORITY
9	NEW CONDITION	NOT APPLICABLE
8	ALMOST NEW	NOT APPLICABLE
7	LITTLE EFFORT TO UPGRADE TO NEW CONDITION	NOT REQUIRED
6	NO DISTRESS OR DETERIORATION CAUSING LOSS OF FUNCTIONALITY	NOT REQUIRED
5	ACCEPTABLE CONDITION AND FUNCTIONING AS INTENDED	NONE REQUIRED TO MAINTAIN FUNCTIONALITY
4	BELOW MINIMUM DESIRABLE CONDITION	LOW PRIORITY – NOT LIKELY BEFORE NEXT INSPECTION
3	DISTRESS/DETERIORATION SIGNIFICANTLY AFFECTING FUNCTIONALITY	MEDIUM PRIORITY – REPAIR/REPLACE/ SIGN IN NEAR FUTURE, BEFORE NEXT INSPECTION
2	MAJOR DETERIORATION AND/OR DISTRESS ENDANGERING FUNCTIONALITY	HIGH PRIORITY – FOR REPALCE/REPAIR/SIGN, CONTINUED OBSERVATION REAUUED UNTIL WORK DONE
1	COLLAPSE IMMINENT/DANGER TO USERS	CLOSE/SIGN AND/OR REPLACE AS SOON AS POSSIBLE IMMEDIATE ACTION REQUIRED

## Legal Loads

Highway Type	CS1 Truck Single Unit	CS2 Truck Semi-Trailer	CS3 Truck Truck-Trains
Primary	28	49	63.5
Secondary	28	49	63.5
Local	28	49	54

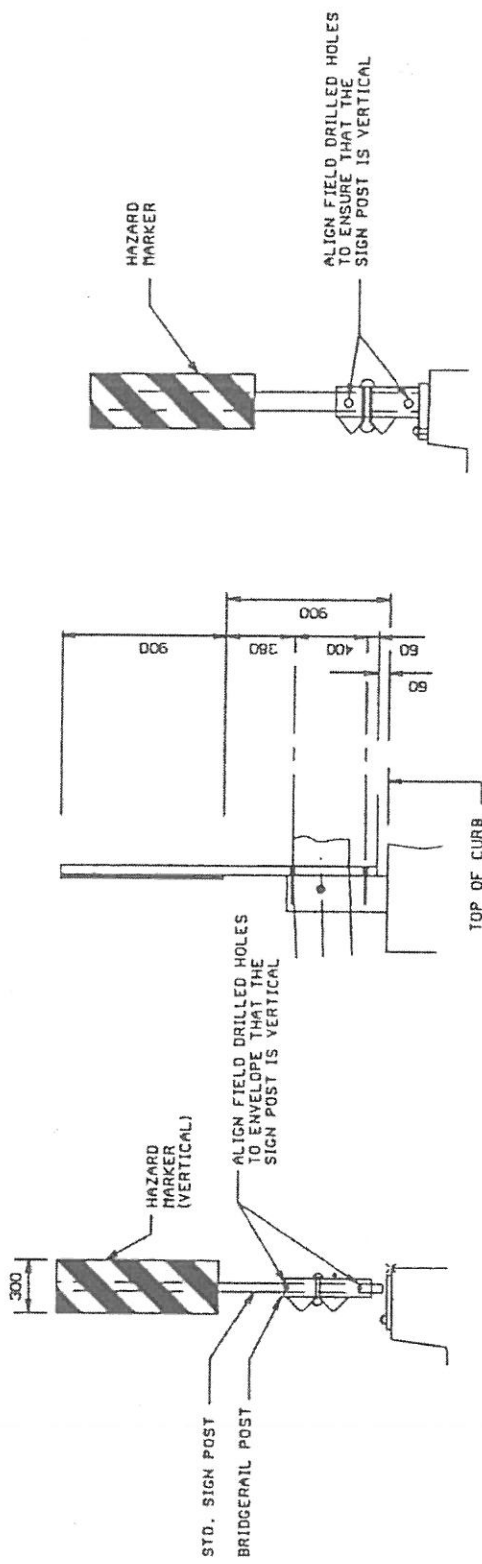
**Note: Loads are expressed in tonnes**

H02ABRS



SECTION  
N.T.S.

CONCRETE GIRDERS AND TREATED TIMBER (T.T.) SUBSTRUCTURE  
SPILL THROUGH TYPE ABUTMENT (LESS THAN 1.0 m HIGH)

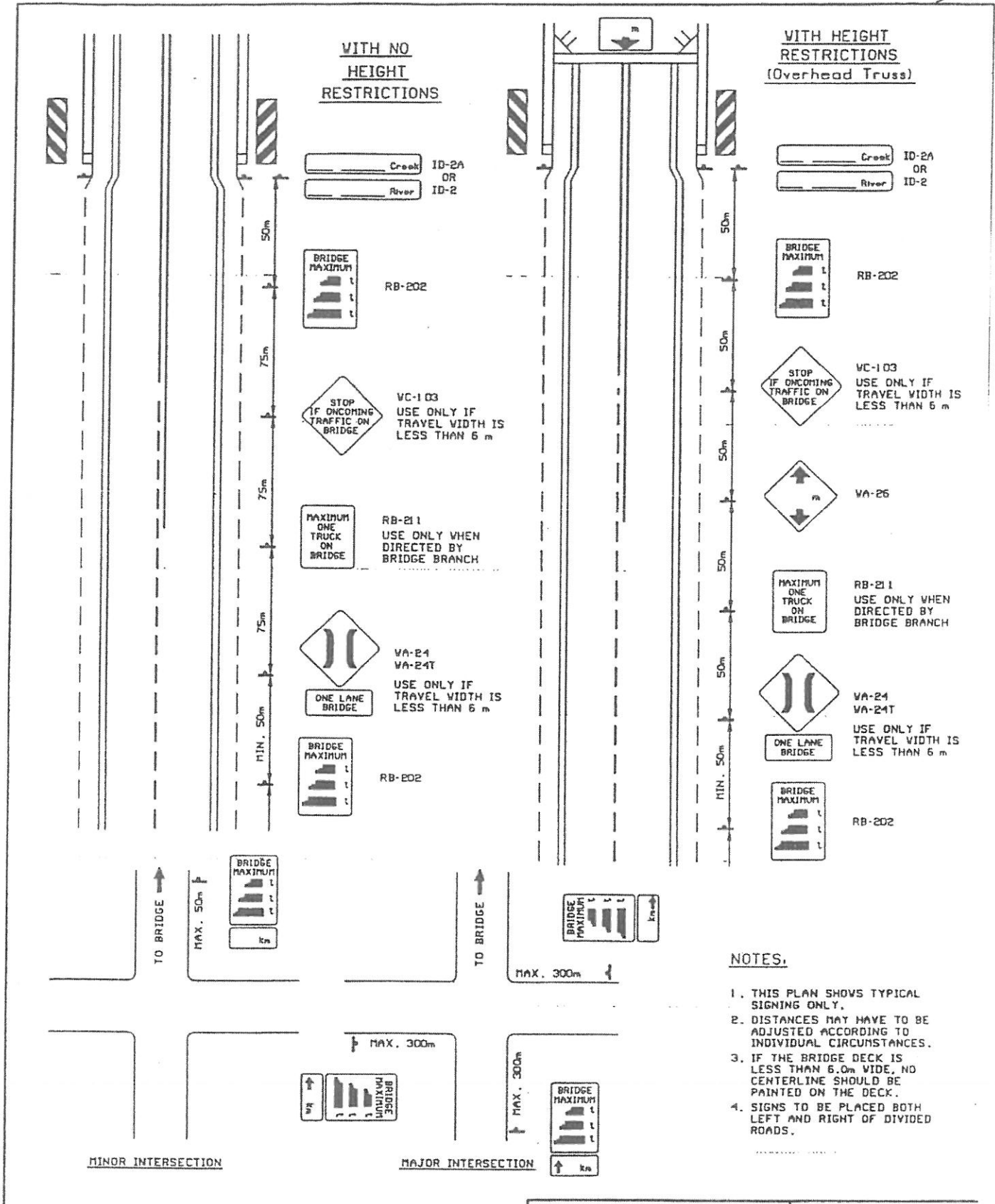


HAZARD MARKER

HAZARD MARKER DETAILS  
(SHOWN AS FOR DEEP-BEAM BRIDGERAIL)  
2 REQUIRED - RIGHT HAND  
2 REQUIRED - LEFT HAND

NOTE.  
HAZARD MARKERS ARE REQUIRED  
AT EVERY CORNER OF BRIDGE.  
2 RIGHT HAND  
2 LEFT HAND

ALBERTA TRANSPORTATION BRIDGE ENGINEERING BRANCH	HAZARD MARKER LAYOUT AND DETAILS	
	SHEET 1 OF 1	FIGURE 2



**WITH NO HEIGHT RESTRICTIONS**

**WITH HEIGHT RESTRICTIONS (Overhead Truss)**

Creek ID-2A OR River ID-2

Creek ID-2A OR River ID-2

BRIDGE MAXIMUM RB-202

BRIDGE MAXIMUM RB-202

STOP IF ONCOMING TRAFFIC ON BRIDGE VC-103 USE ONLY IF TRAVEL WIDTH IS LESS THAN 6 m

STOP IF ONCOMING TRAFFIC ON BRIDGE VC-103 USE ONLY IF TRAVEL WIDTH IS LESS THAN 6 m

MAXIMUM ONE TRUCK ON BRIDGE RB-211 USE ONLY WHEN DIRECTED BY BRIDGE BRANCH

VA-26

ONE LANE BRIDGE VA-24 VA-24T USE ONLY IF TRAVEL WIDTH IS LESS THAN 6 m

MAXIMUM ONE TRUCK ON BRIDGE RB-211 USE ONLY WHEN DIRECTED BY BRIDGE BRANCH

ONE LANE BRIDGE VA-24 VA-24T USE ONLY IF TRAVEL WIDTH IS LESS THAN 6 m

BRIDGE MAXIMUM RB-202

BRIDGE MAXIMUM RB-202

↑ TO BRIDGE

↑ TO BRIDGE

BRIDGE MAXIMUM RB-202  
MAX. 50m

BRIDGE MAXIMUM RB-202  
MAX. 300m

↑ MAX. 300m

BRIDGE MAXIMUM RB-202  
↑ MAX. 300m

MINOR INTERSECTION

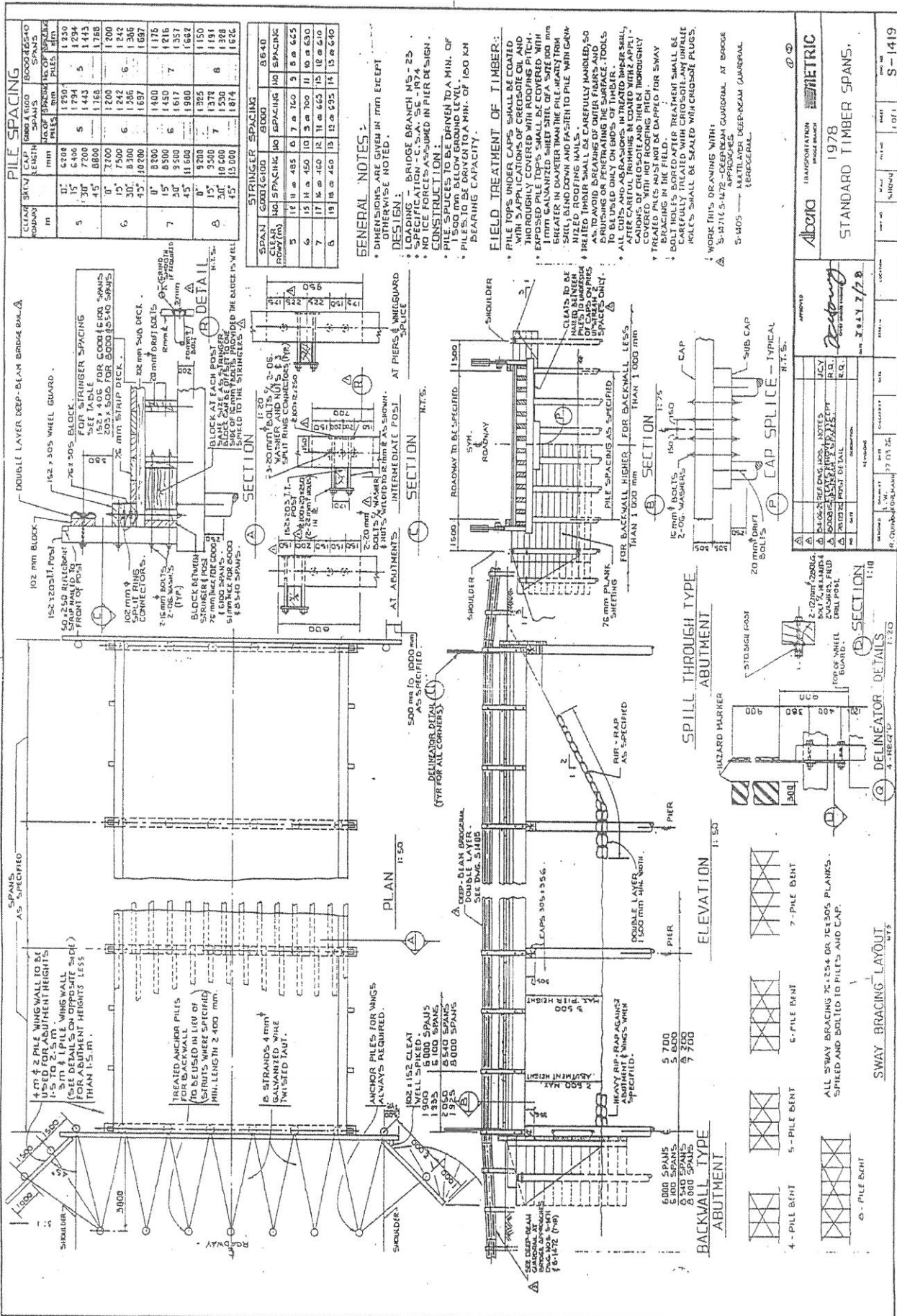
MAJOR INTERSECTION

**NOTES:**

1. THIS PLAN SHOWS TYPICAL SIGNING ONLY.
2. DISTANCES MAY HAVE TO BE ADJUSTED ACCORDING TO INDIVIDUAL CIRCUMSTANCES.
3. IF THE BRIDGE DECK IS LESS THAN 6.0m WIDE, NO CENTERLINE SHOULD BE PAINTED ON THE DECK.
4. SIGNS TO BE PLACED BOTH LEFT AND RIGHT OF DIVIDED ROADS.

SIGNING DETAIL FOR LAST INTERSECTION IN ADVANCE OF BRIDGE

ALBERTA TRANSPORTATION TRAFFIC OPERATIONS ENGINEERING BRANCH	TYPICAL SIGNING FOR BRIDGE APPROACHES	
	SHEET 1 OF 1	TEB-1.28



**PILE SPACING**

CLAS	STRN	NO OF PILES	NO OF SPACINGS	NO OF STRINGS	NO OF SPACINGS	NO OF STRINGS
1	15	5	4	5	4	5
2	15	5	4	5	4	5
3	15	5	4	5	4	5
4	15	5	4	5	4	5
5	15	5	4	5	4	5
6	15	5	4	5	4	5
7	15	5	4	5	4	5
8	15	5	4	5	4	5

**STRINGER SPACING**

SPAN	NO OF SPACINGS	NO OF SPACINGS	NO OF SPACINGS	NO OF SPACINGS
3	4	4	4	4
4	4	4	4	4
5	4	4	4	4
6	4	4	4	4
7	4	4	4	4
8	4	4	4	4

**GENERAL NOTES**

- 1. DIMENSIONS ARE GIVEN IN MM EXCEPT OTHERWISE NOTED.
- 2. DESIGN - BRIDGE BRANCH NO. 25
- 3. BRIDGE BRANCH NO. 25
- 4. BRIDGE BRANCH NO. 25
- 5. BRIDGE BRANCH NO. 25

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

BY: \_\_\_\_\_

PROJECT: \_\_\_\_\_

DATE: \_\_\_\_\_

SCALE: \_\_\_\_\_

PROJECT NO.: \_\_\_\_\_

REVISIONS: \_\_\_\_\_

**ABERTA TRANSPORTATION**

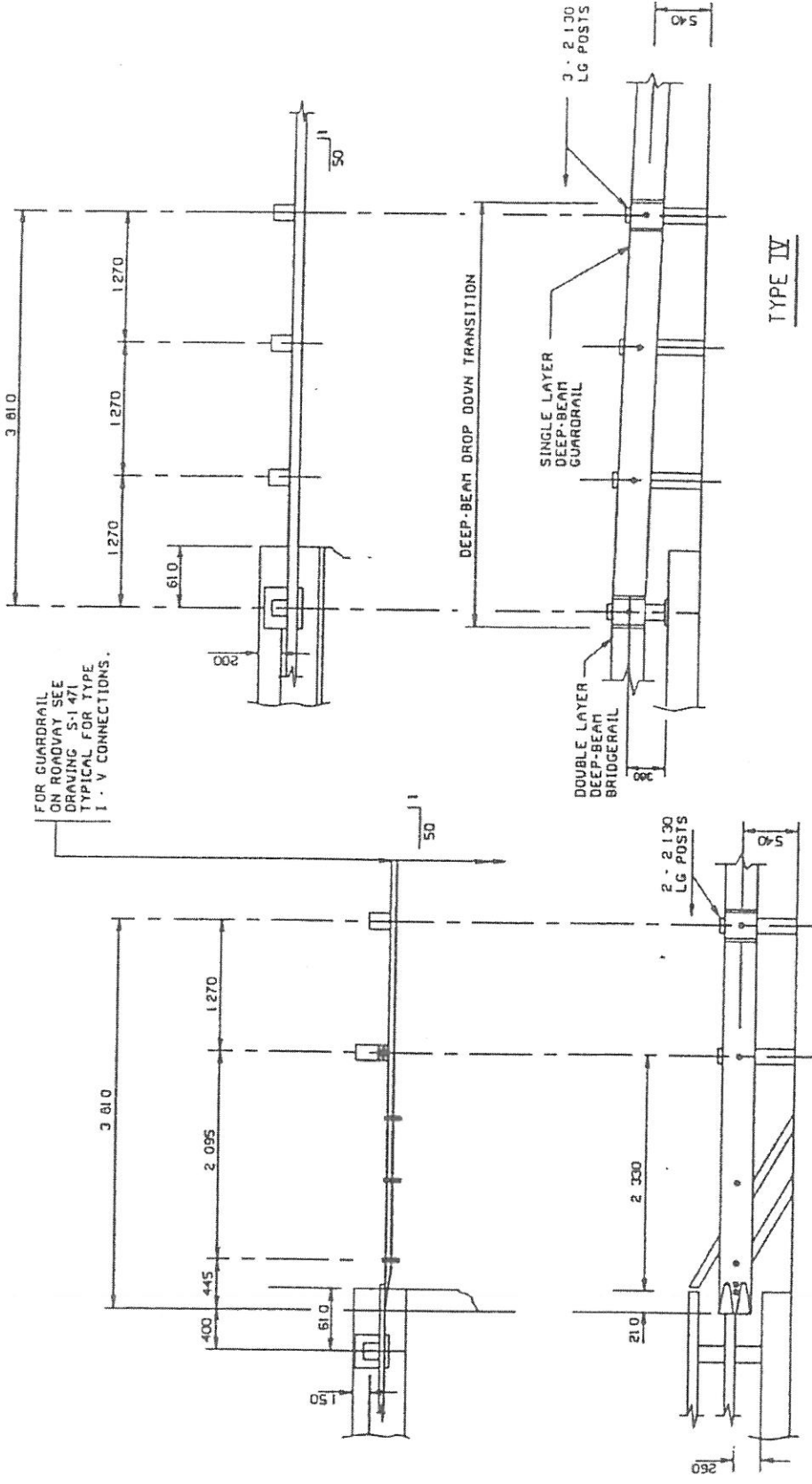
STANDARD TIMBER SPANS

1978

STANDARD TIMBER SPANS

36

S-1472



TYPE IV

CONNECTION TO DEEP-BEAM BRIDGERAIL

TYPE III

CONNECTION TO 700mm TUBE RAIL

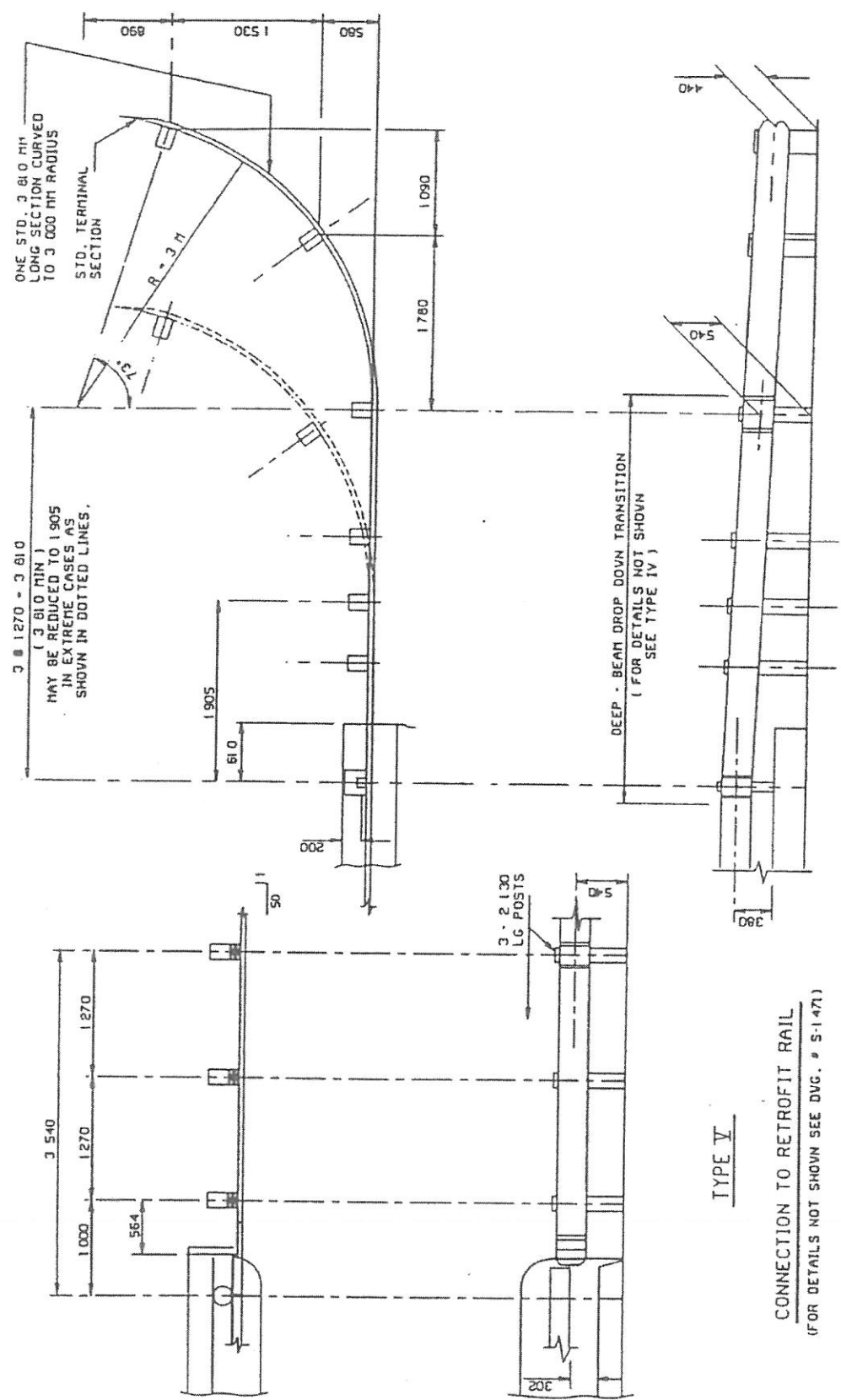
- GENERAL NOTES:**
- DIMENSIONS ARE GIVEN IN MM UNLESS OTHERWISE NOTED.
  - RAIL SECTIONS TO BE LAPPED IN DIRECTION OF TRAFFIC.
  - POSTS ARE 1.52 m LONG EXCEPT AS NOTED.
  - POSTS TO BE FIRMLY TAPPED INTO GROUND.
  - WORK THIS DWG. IN CONJUNCTION WITH DWG. #S · 1471.
  - LENGTHS TO BE INCREASED AS REQUIRED BY ROADWAY AND TRAFFIC CONDITIONS.

ALBERTA TRANSPORTATION  
BRIDGE ENGINEERING  
BRANCH

DEEP BEAM GUARDRAIL  
AT BRIDGE APPROACHES

SHEET 1 OF 2 S - 1472

25-1472



TYPE VI

CONNECTION TO CANAL BANK  
ACCESS ROAD LOCATION

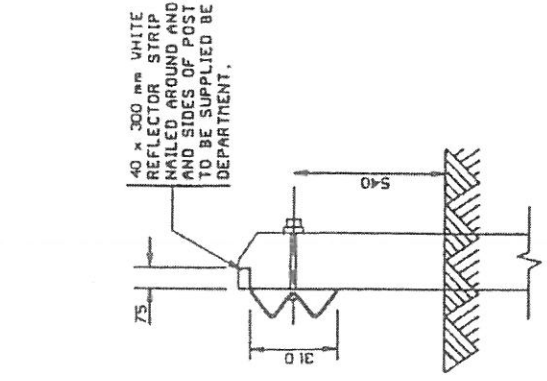
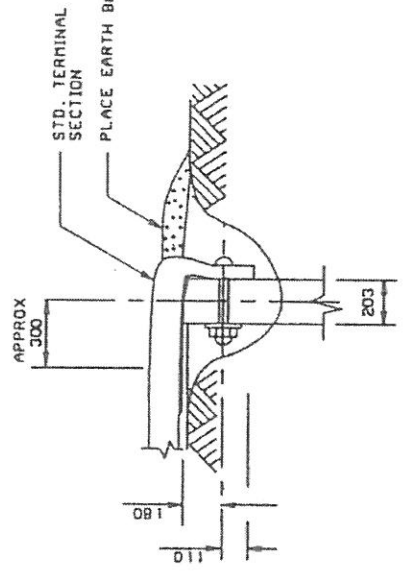
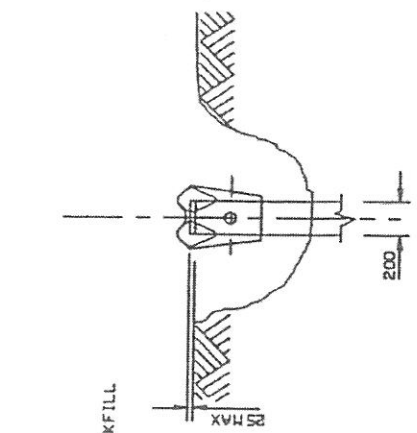
TYPE V

CONNECTION TO RETROFIT RAIL  
(FOR DETAILS NOT SHOWN SEE DVG. # S-1471)

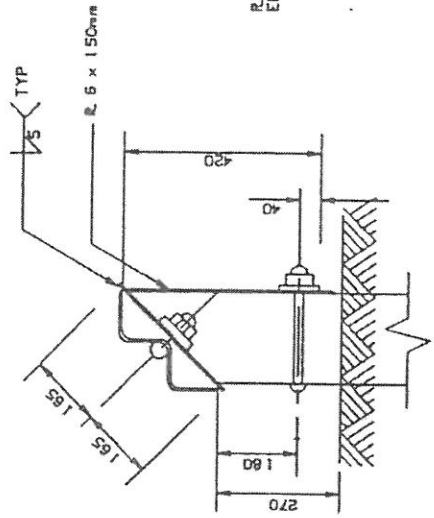
ALBERTA TRANSPORTATION BRIDGE ENGINEERING BRANCH	DEEP BEAM GUARDRAIL AT BRIDGE APPROACHES	
	SHEET 2 OF 2	S - 1472



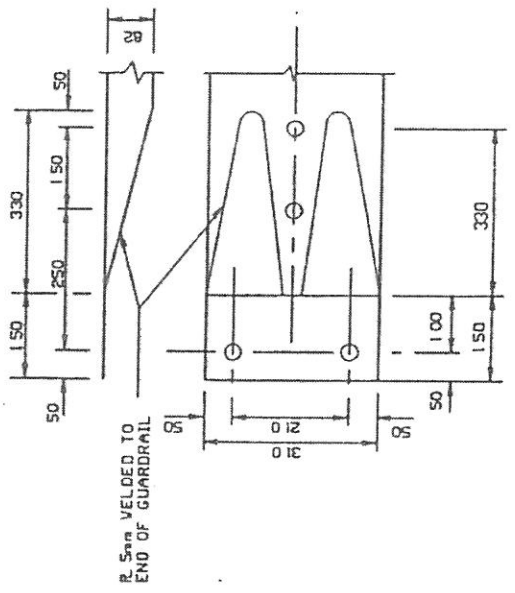
25-170



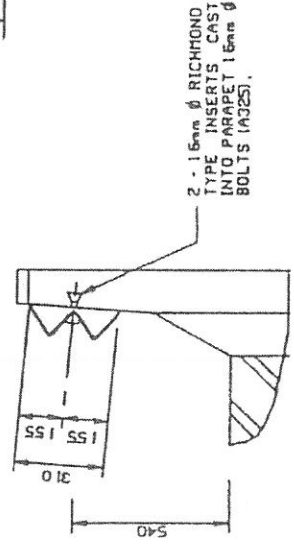
P DETAIL



B SECTION



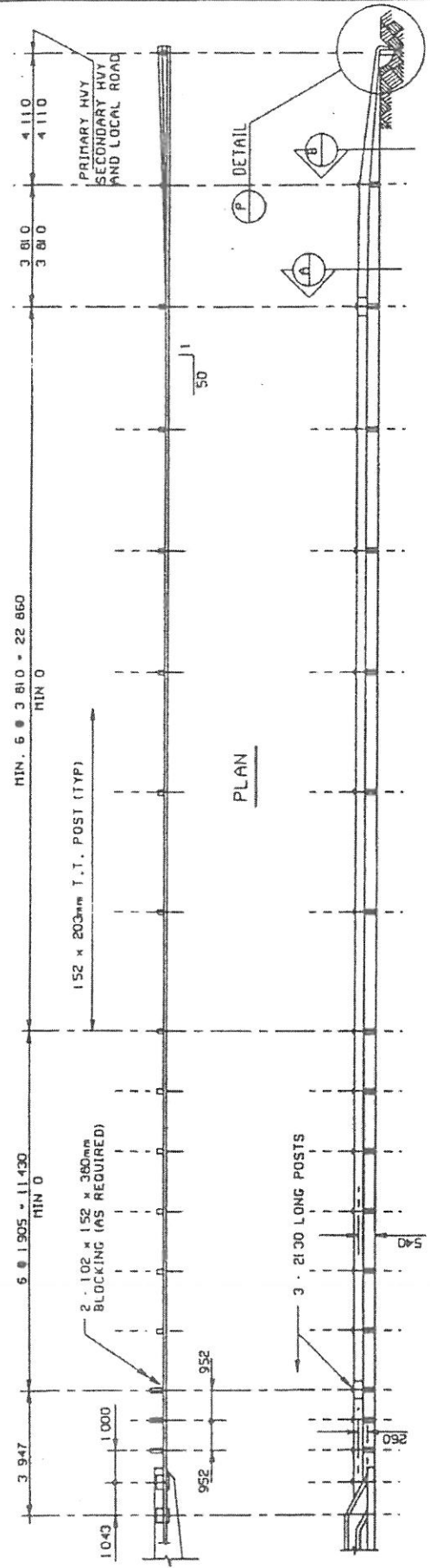
R DETAIL



C SECTION

ALBERTA TRANSPORTATION BRIDGE ENGINEERING BRANCH	DEEP BEAM GUARDRAIL AT BRIDGE APPROACHES
	SHHET 2 OF 2   S - 1471

S-1471



**PLAN**

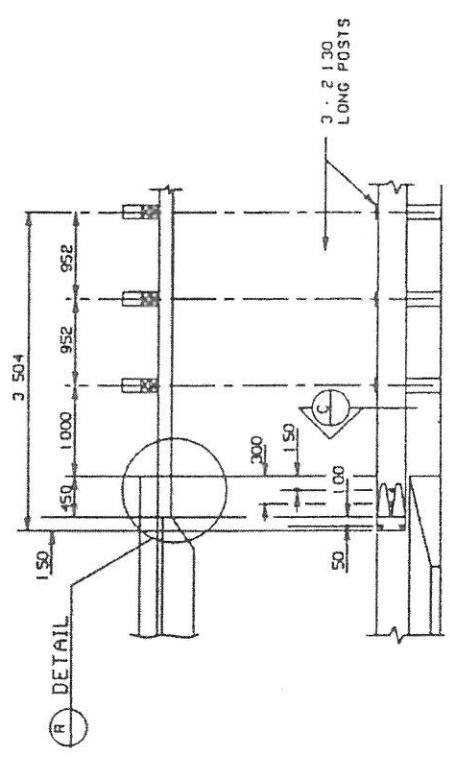
**ELEVATION**

**GUARDRAIL ON ROADWAY**

(TYPICAL FOR TYPE I TO V CONNECTIONS)

**TYPE I**

CONNECTION TO 850mm  
TUBE TYPE BRIDGERAIL



**TYPE II**

CONNECTION TO PARAPET

**GENERAL NOTES:**

- DIMENSIONS ARE GIVEN IN MM.
- RAIL SECTIONS TO BE LAPPED IN DIRECTION OF TRAFFIC.
- POSTS TO BE FIRMLY TAMPED INTO GROUND.
- WORK THIS DVG. IN CONJUNCTION WITH DVG. # S-1472.
- LENGTHS OF GUARDRAIL SHOWN ARE MINIMUMS. LENGTHS TO BE INCREASED AS REQUIRED BY ROADWAY AND TRAFFIC CONDITIONS.
- POSTS ARE 1.58M LONG EXCEPT AS NOTED.

ALBERTA TRANSPORTATION BRIDGE ENGINEERING BRANCH	DEEP BEAM GUARDRAIL AT BRIDGE APPROACHES
	SHEET 1 OF 2   S - 1471



## Bridges and Structures

### Standard and Typical Detail Drawings

Standard Drawings are engineered documents. The Consultant shall refer directly to these documents on the project detailed drawings and shall include them in the drawing tender set. However, the Consultant shall be aware that these Standard Drawings often require project specific engineering and detailing which shall be included on the detailed drawings. Standard Drawings are occasionally updated and Consultants shall ensure they are including the latest version of the drawings in their tender set.

Typical Detail Drawings are not engineered documents, rather are documents provided to demonstrate the Department's preferred details. Consultants shall utilize the preferred details unless otherwise permitted by the Department. Consultants are fully responsible to properly design and draft all details on the project detailed drawings. Typical Detail Drawings shall not be included in the drawing tender set.

All current Standard and Typical Detail Drawings can be found using the following links:

- Barriers
- Precast Girders
- Steel Girders
- Deck and Deck Joints
- Bearings
- Culverts
- Bridge Construction Specification Drawings
- Miscellaneous

All Active Standard and Typical Detail Drawings (sorted by drawing number)

Non-current archived Standard and Typical Detail Drawings are provided for use with bridge assessments and rehabilitations and can be found using the following link:

All Non-Current Archived Standard and Typical Detail Drawings (sorted by drawing number)

<http://www.transportation.alberta.ca/4738.htm>

03/01/07

LACOMBE COUNTY  
Item Listing  
March 1, 2007

Item	Description	Type	Quantity On Hand	Price
loading time	loading time	Service	0	90.00
2921	PRECAST 11.6 M	Inventory Part	0	200.00
2925	PRECAST 11.6 M	Inventory Part	0	200.00
2929	PRECAST 11.6	Inventory Part	0	200.00
59940	LUMBER TREATED 2X12X16'	Inventory Part	0	200.00
59945	LUMBER TREATED 3X8X14'	Inventory Part	0	39.36
59960	LUMBER TREATED 3X10X12'	Inventory Part	0	33.92
59965	LUMBER TREATED 3X10X14'	Inventory Part	48	56.64
59970	LUMBER TREATED 3X10X16'	Inventory Part	79	65.38
59975	LUMBER TREATED 3X10X18'	Inventory Part	159	71.07
59980	LUMBER TREATED 3X10X20'	Inventory Part	79	84.96
59980 SAL...	3X10X20 SALVAGE LUMBER app wt 175 lbs	Inventory Part	121	94.40
59985	LUMBER TREATED 3X10X22'	Inventory Part	3	10.00
59990	LUMBER TREATED 3X10X24'	Inventory Part	3	103.83
59995	LUMBER TREATED 3X10X26'	Inventory Part	83	113.28
59995 SAL...	3X10X26 SALVAGE LUMBER 65FBM	Inventory Part	89	122.20
59997	LUMBER TREATED 3X12X10'	Inventory Part	8	13.00
60000	LUMBER TREATED 3X12X12'	Inventory Part	2	57.00
60005	LUMBER TREATED 3X12X14'	Inventory Part	193	67.95
60010	LUMBER TREATED 3X12X16'	Inventory Part	87	79.29
60010 SAL...	3X12X16 SALVAGE LUMBER 48FBM	Inventory Part	119	88.94
60015	LUMBER TREATED 3X12X18'	Inventory Part	0	9.60
60020	LUMBER TREATED 3X12X20'	Inventory Part	112	101.94
60020 SAL...	3X12X20 SALVAGE	Inventory Part	0	113.28
60025	LUMBER TREATED 3X12X22'	Inventory Part	2	12.00
60025 SAL...	3X12X22 SALVAGE LUMBER 66FBM	Inventory Part	1	130.34
60030	LUMBER TREATED 3X12X24'	Inventory Part	0	13.20
60030 SAL...	3X12X24 SALVAGE LUMBER 72FBM	Inventory Part	46	135.92
60045	LUMBER TREATED 4X6X16'	Inventory Part	0	14.40
60050	LUMBER TREATED 4X6X18'	Inventory Part	28	49.14
60055	LUMBER TREATED 4X6X20'	Inventory Part	33	59.08
60060	LUMBER TREATED 4X10X20'	Inventory Part	16	66.71
60075	LUMBER TREATED 4X12X18'	Inventory Part	0	0.00
60080	LUMBER TREATED 4X12X20'	Inventory Part	0	110.56
60080used	4x12x20used	Inventory Part	16	132.56
60085	LUMBER TREATED 4X12X22'	Inventory Part	0	61.44
60090	LUMBER TREATED 4X12X24'	Inventory Part	0	135.13
60090 SAL...	4X12X24 SALVAGE LUMBER 96FBM	Inventory Part	151	147.42
60095	LUMBER TREATED 4X12X26'	Inventory Part	0	19.20
60095 SAL...	4X12X26 SALVAGE LUMBER 104 FBM	Inventory Part	267	200.62
60100	LUMBER TREATED 4X12X28'	Inventory Part	0	20.80
60100 SAL...	4X12X28 SALVAGE LUMBER 112 FBB	Inventory Part	46	223.33
60120	LUMBER TREATED 6X8X18'	Inventory Part	0	22.40
60130	LUMBER TREATED 6X8X22'	Inventory Part	0	103.09
60135	LUMBER TREATED 6x8X28	Inventory Part	0	172.85
60145	LUMBER TREATED 6X12X12'	Inventory Part	0	235.15
60175	LUMBER TREATED 6X12X24'	Inventory Part	21	149.14
60180	LUMBER TREATED 6X12X26'	Inventory Part	3	298.28
60180 SAL...	6X12X26 SALVAGE LUMBER 156FBM	Inventory Part	55	323.14
60185	LUMBER TREATED 6X12X27'	Inventory Part	11	31.20
60205	LUMBER TREATED 6X16X20'	Inventory Part	64	335.57
60205 SAL...	6X16X20 SALVAGE LUMBER 160FBM	Inventory Part	0	415.53
60210	LUMBER TREATED 8X20X28'	Inventory Part	2	32.00
60210 SAL...	8X20X28 SALVAGE LUMBER 373FBM	Inventory Part	110	772.63
60210 USED		Inventory Part	0	74.66
60212	LUMBER TREATED 10X10X20'	Inventory Part	0	0.00
60214	LUMBER TREATED 10X16X16'	Inventory Part	8	343.85
60214 SAL...	10X16X16 SALVAGE LUMBER 213FBM	Inventory Part	0	0.00
60216	LUMBER TREATED 12X12X14'	Inventory Part	52	42.66
60220	LUMBER TREATED 12X12X16'	Inventory Part	13	381.25
60225	LUMBER TREATED 12X12X18'	Inventory Part	9	397.71
60235	LUMBER TREATED 12X12X24'	Inventory Part	4	523.09
60245	LUMBER TREATED 12X12X26'	Inventory Part	5	596.57
60250	LUMBER TREATED 12X12X28	Inventory Part	10	718.80
60255	LUMBER TREATED 12X12X30'	Inventory Part	1	695.99
60260	LUMBER TREATED 12X14X6'	Inventory Part	6	880.38
60266	LUMBER TREATED FRAMED 12X14X8.5'	Inventory Part	38	174.00
60280	LUMBER TREATED 12X14X12'	Inventory Part	6	379.35
		Inventory Part	14	348.00

44

LACOMBE COUNTY  
 Item Listing  
 March 1, 2007

03/01/07

Item	Description	Type	Quantity On Hand	Price
60290	LUMBER TREATED 12X14X15'	Inventory Part	67	435.00
60291	LUMBER TREATED FRAMED 12X14X15'	Inventory Part	7	407.03
60300	LUMBER TREATED 12X14X18'	Inventory Part	1	612.96
60305	LUMBER TREATED 12X14X20'	Inventory Part	12	653.83
60310	LUMBER TREATED 12X14X22'	Inventory Part	0	681.07
60315	LUMBER TREATED 12X14X24'	Inventory Part	19	817.28
60320	LUMBER TREATED 12X14X25'	Inventory Part	17	850.50
60325	LUMBER TREATED 12X14X26'	Inventory Part	14	884.52
60330	LUMBER TREATED 12X14X27'	Inventory Part	10	918.54
60335	LUMBER TREATED 12X14X28'	Inventory Part	5	958.65
60340	LUMBER TREATED 12X14X30'	Inventory Part	1	1,020.60
60360	PILING UNTREATED 35'	Inventory Part	51	245.53
60365	PILING UNTREATED 40'	Inventory Part	36	292.80
60380	PILING TREATED 20'	Inventory Part	130	200.31
60385	PILING TREATED 25'	Inventory Part	0	251.26
60390	PILING TREATED 30'	Inventory Part	0	301.27
60395	PILING TREATED 35'	Inventory Part	193	355.86
60400	PILING TREATED 40'	Inventory Part	32	402.91
60405	PILING TREATED 45'	Inventory Part	78	449.57
60410	PILING TREATED 50'	Inventory Part	115	491.39
61845	LUMBER TREATED 6X8X8'	Inventory Part	0	42.70
74200	DECKING TREATED/CCA 2X12X20'	Inventory Part	0	53.07
74210	DECKING TREATED/CCA 3X10X16'	Inventory Part	0	53.07
74215	DECKING TREATED/CCA 3X10X18'	Inventory Part	0	79.96
74220	DECKING TREATED/CCA 3X10X20'	Inventory Part	0	66.34
74225	DECKING TREATED/CCA 3X12X14'	Inventory Part	0	62.22
74230	DECKING TREATED/CCA 3X12X16'	Inventory Part	153	62.99
74235	DECKING TREATED/CCA 3X12X18'	Inventory Part	0	95.94
74237	DECKING TREATED/CCA 3X12X20'	Inventory Part	393	85.75
74240	LUMBER TREATED/CCA6x6x20	Inventory Part	61	85.00
MISC		Inventory Part	0	0.00
neoprene 23...		Inventory Part	669.27	34.00
neoprene 46...		Inventory Part	19.95	68.00
NPN		Inventory Part	-161.75	0.00
P0042	6.1 M PRECAST G LHF	Inventory Part	0	200.00
P0043	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0044	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0045	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0046	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0049	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0090	7.6 M PRECAST VS	Inventory Part	1	200.00
P0091	7.6 M PRECAST VS	Inventory Part	1	200.00
P0166	11.6 M PRECAST "HC" CURB	Inventory Part	1	200.00
P0167	11.6 M PRECAST "HC" CURB	Inventory Part	1	200.00
P0169	11.6 M PRECAST HC	Inventory Part	0	200.00
P0170	11.6 M PRECAST HC	Inventory Part	1	200.00
P0171	11.6 M PRECAST HC	Inventory Part	1	200.00
P0172	11.6 M PRECAST HC	Inventory Part	1	200.00
P0173	11.6 M PRECAST HC	Inventory Part	1	200.00
P0174	11.6 M PRECAST HC	Inventory Part	1	200.00
P0175	11.6 M PRECAST HC	Inventory Part	1	200.00
P0176	11.6 M PRECAST HC	Inventory Part	1	200.00
P0248	6.1M PRECAST G	Inventory Part	0	200.00
P0350	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0351	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0353	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0356	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0357	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0358	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0359	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0360	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0361	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0362	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0363	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P0364	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0365	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0366	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0367	6.1 M PRECAST HH LHF	Inventory Part	1	200.00

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03/01/07

LACOMBE COUNTY  
 Item Listing  
 March 1, 2007

Item	Description	Type	Quantity On Hand	Price
P0508	6.1 M PRECAST HH RHF	Inventory Part	1	200.00
P0509	6.1 M PRECAST HH RHF	Inventory Part	1	200.00
P0510	6.1 M PRECAST G RHF	Inventory Part	1	200.00
P0511	6.1 M PRECAST HH RHF	Inventory Part	1	200.00
P0512	6.1 M PRECAST HH RHF	Inventory Part	1	200.00
P0513	6.1 M PRECAST HH RHF	Inventory Part	1	200.00
P0514	6.1 M PRECAST HH RHF	Inventory Part	1	200.00
P0550	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0551	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0552	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0553	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0554	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0555	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0556	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0557	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0558	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0559	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0560	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0561	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0562	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0563	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0564	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0565	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0566	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0567	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0568	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0569	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0570	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0573	6.1 M PRECAST HH LHF	Inventory Part	1	200.00
P0614	8.5 M PRECAST LHF	Inventory Part	1	200.00
P0615	8.5 M PRECAST HC LHF	Inventory Part	1	200.00
P0626	8.5 M PRECAST VS	Inventory Part	1	200.00
P0627	7.6 M PRECAST VS	Inventory Part	1	200.00
P0633	7.6 M PRECAST VS	Inventory Part	1	200.00
P0634	7.6 M PRECAST VS	Inventory Part	1	200.00
P0636	7.6 M PRECAST VS	Inventory Part	1	200.00
P0660	10.1 M PRECAST "HC"	Inventory Part	1	200.00
P0661	10.1 M PRECAST "HC"	Inventory Part	1	200.00
P0673	10.1 M PRECAST "HC"	Inventory Part	1	200.00
P3038	6.1 M PRECAST "HC"	Inventory Part	1	200.00
P3056	12.2 M PRECAST "HC"	Inventory Part	0	200.00
P3057	12.2 M PRECAST "HC"	Inventory Part	1	200.00
P3058	12.2 M PRECAST "HC"	Inventory Part	1	200.00
P3061	12.2 M PRECAST "HC"	Inventory Part	1	200.00
P3062	12.2 M PRECAST "HC"	Inventory Part	1	200.00
P3063	12.2 M PRECAST "HC"	Inventory Part	1	200.00
P3064	12.2 M PRECAST "HC"	Inventory Part	1	200.00
P3072	6.1 PRECAST "G"	Inventory Part	1	200.00
P3073	6.1 M PRECAST "G"	Inventory Part	0	200.00
P3076	6.1 M PRECAST "G"	Inventory Part	1	200.00
P3077	6.1 M PRECAST "G"	Inventory Part	0	200.00
P3088	6.1 M PRECAST G LHF	Inventory Part	1	200.00
P3089	6.1 M PRECAST "G"	Inventory Part	1	200.00
P3100	6.1 M PRECAST "A"	Inventory Part	1	200.00
P3137	8.5 M PRECAST	Inventory Part	1	200.00
P3138	8.5 M PRECAST	Inventory Part	1	200.00
P3194	8.5 M PRECAST	Inventory Part	1	200.00
P3201	8.5 M PRECAST	Inventory Part	1	200.00
P3202	8.5 M PRECAST	Inventory Part	1	200.00
P4220	10.1 M PRECAST "HC" CURB	Inventory Part	1	200.00
P4249	10.1 M PRECAST "HC" CURB	Inventory Part	1	200.00
P4274	10.1 M PRECAST "HC" CURB	Inventory Part	1	200.00
P4334	10.1 M PRECAST HC CURB	Inventory Part	1	200.00
P4336	10.1 M PRECAST HC CURB	Inventory Part	1	200.00
P5267	8.5 M PRECAST HC LHF	Inventory Part	1	200.00
P5305	8.5 M PRECAST "HC" 15 LHF	Inventory Part	1	200.00

5% Vertically Ellipse Pipes		
Diameter	Span	Rise
1500	1429	1575
1810	1724	1901
2120	2019	2226
2430	2314	2552
2740	2610	2877
3050	2905	3203
3360	3200	3528
3670	3495	3854
3980	3800	4190
4300	4095	4515
4610	4390	4841
4920	4686	5165
5230	4981	5492
5540	5276	5817
5850	5571	6142
6160	5866	6468

Arch Culverts		
Equivalent Diameter	Span	Rise
CSP		
1524	1829	1118
1676	1854	1397
1829	2057	1499
1981	2210	1600
2134	2413	1702
2286	2616	1803
2438	2845	1905
SPCSP		
1676	1854	1397
1753	1930	1448
1829	2057	1499
1905	2134	1549
1981	2210	1600
2057	2337	1651
2134	2413	1702
2210	2489	1753
2286	2616	1803
2362	2464	1854
2438	2845	1905
2515	2896	1956
2591	2972	2007
2667	3124	2057
2743	3251	2108
2819	3327	2159
2896	3480	2210
2972	3531	2261
3048	3607	2311
3124	3759	2362
3200	3810	2413
3277	3861	2464
3353	3912	2540
3429	4089	2565
3505	4242	2616
3581	4293	2667
3658	4343	2718
3734	4521	2769
3810	4674	2819
3886	4724	2870
3962	4775	2921
4039	4826	2997
4115	5004	3023
4191	5055	3073



## BIM INSPECTION MANUAL UPDATE

### INSPECTION AND RATING OF CULVERTS WITH STRUTS

#### EFFECTS OF STRUTS ON ELEMENT AND GENERAL RATINGS

There are many culverts on the Provincial road system that are strutted with either steel or timber struts. While the intent is not to arbitrarily increase the barrel general rating due to the presence of the struts, there are situations where a 1 or 2 rating point increase to the barrel general rating may be justified.

If the following guidelines are met, then the inspector has the flexibility to increase the barrel general rating by a maximum of 2 rating points (not to exceed a barrel general rating of 4) without increasing the element rating.

#### RATING GUIDELINES

- The inspector must verify the struts have been in place for 2 years or more. This is to ensure that the struts and culvert are stable.
- The struts must be in good condition (i.e. rated as a "special feature" at 5 or more).
- The culvert must have at least 1 permanent reference point for measuring and future monitoring.
- The culvert struts must be inspected on a minimum 1/2 cycle, or after any significant flood event. Ideally, struts should be inspected every spring to ensure they are tight and have not been damaged by ice or run-off.
- Consideration should be given to the size of the culvert and to the depth of cover over the culvert. (Complete failure of a large diameter culvert under high fills may not be as threatening to public safety as the failure of the same culvert under shallow fill).
- The rating increase would not apply to any culvert with deflections greater than 30%, or with cracked seams with less than 25 mm or remaining steel.
- The rating increase is applied to the "general rating" only. The "element rating" (i.e. seams, barrel, roof, etc) would not change.

The following suggestions are offered to Class B inspectors in the hope that it may save them repeat visits to a site for additional information.

1. **Make sure that you are at the correct site:**

- (a) on bridges check for file tags.
- (b) check the description of the structure to see if it matches the information on the top of the first page of your BIM report (span types, lengths, culvert size, skew, etc.).

2. **Ratings that are 4 or less require:**

- (a) description of the problem in the explanation of condition section.
- (b) photographs or sketches to back up your rating.
- (c) measurements (this may mean marking the actual element like a girder with a crayon to measure crack growth).
- (d) maintenance recommendations.
- (e) remark in special comments section if follow up is needed (checking the load rating). Monitoring of elements would also be mentioned here.
- (f) enter the next inspection date if it is needed before the next inspection cycle.
- (g) if the rating is 1 or 2, call the proper authority ASAP.

3. **Cross out comments that are no longer applicable:**

A comment such as "large scour hole at D/S end" may have been repaired since the last inspection. This should be crossed out.

4. **Discrepancies between the last inspection and the current one:**

You have to determine why there is a difference of 2 or more between the two inspections. Is it because:

- (a) if the last inspection was rated 3 (poor) and you feel it should be rated 7 (good), maybe the problem has been fixed since the last inspection.
- (b) during the last inspection the ground could have been snow covered or there may have been a higher water level which could explain why something like a scour hole or backwall sheeting not being low enough was missed.
- (c) the last inspector could have rated it incorrectly.

5. **Don't leave the site until you have:**

- (a) determined all ratings and all general ratings.
- (b) taken all measurements.
- (c) taken any necessary pictures.
- (d) made any maintenance recommendations.
- (e) checked and confirmed all inventory items.
- (f) noted any monitoring.

# SECTION III

## Mass of Materials

### Timber:

Untreated .....	3000 lbs/fbm .....	1360 kg/fbm
Treated .....	4000 lbs/fbm .....	1800 kg/fbm
Untreated Piling .....	25 lbs/ft .....	37 kg/m
Treated Piling .....	30 lbs/ft .....	45 kg/m

### Steel Pipe:

356 mm x 7 mm .....	41.3 lbs/ft .....	61.3 kg/m
406 mm x 6 mm .....	42.2 lbs/ft .....	62.6 kg/m
406 mm x 7 mm .....	47.4 lbs/ft .....	70.3 kg/m
508 mm x 7 mm .....	59.4 lbs/ft .....	88.1 kg/m
610 mm x 10 mm .....	94.9 lbs/ft .....	140.8 kg/m
762 mm x 10 mm .....	119.1 lbs/ft .....	176.6 kg/m

### Steel Piling:

HP 250 x 62 .....	42 lbs/ft .....	62 kg/m
HP 310 x 79 .....	53 lbs/ft .....	79 kg/m
HP 310 x 94 .....	63 lbs/ft .....	94 kg/m
HP 360 x 132 .....	89 lbs/ft .....	132 kg/m

### Miscellaneous:

3.81 m Flexbeam .....	90 lbs .....	40.7 kg
6" x 8" x 5' T.T. Post.....	75 lbs .....	33.9 kg
6" x 8" x 7' T.T. Post .....	100 lbs .....	45.2 kg

### Reinforcing Steel:

Bar Designation	10 M	15 M	20 M	25 M	30 M	35 M	
Mass	kg/m	.785	1.570	2.335	3.925	5.495	7.850
	lbs/ft	.53	1.05	1.57	2.63	3.69	5.27

**Steel Plate:**

Thickness in mm (inches)	kg per square metre	Pounds per square foot
9.5 (3/8) .....	74.80 .....	15.3
12.7 (1/2) .....	99.76 .....	20.4
16.0 (5/8) .....	124.70 .....	25.5
19 (3/4) .....	149.60 .....	30.6
22 (7/8) .....	174.57 .....	35.7
25.4 (1) .....	195.10 .....	40.8
29 (1 1/8) .....	224.45 .....	45.9
32 (1 1/4) .....	249.39 .....	51.0
35 (1 3/8) .....	274.33 .....	56.1
38.1 (1 1/2) .....	292.27 .....	61.2
44.5 (1 3/4) .....	349.15 .....	71.4
50.8 (2) .....	399.02 .....	81.6

**Material:**

	kg per cubic metre	lbs per cubic foot
Crushed Rock .....	2000 .....	125
Sand .....	1925 .....	120
Dry Earth .....	1550 .....	95
ACP .....	2325 .....	145
Concrete .....	2400 .....	150
Water .....	1000 .....	62.4

### Weight of Bridge Materials — Treated Timber

Type	F.B.M.	LBS.	KG.
3" x 8" x 10'	20	80	36
3" x 8" x 12'	24	96	44
3" x 8" x 14'	28	112	51
3" x 8" x 16'	32	128	58
3" x 8" x 18'	36	144	65
3" x 8" x 20'	40	160	73
3" x 8" x 22'	44	176	80
3" x 10" x 10'	25	100	45
3" x 10" x 12'	30	120	54
3" x 10" x 14'	35	140	64
3" x 10" x 16'	40	160	73
3" x 10" x 18'	45	180	82
3" x 10" x 20'	50	200	91
3" x 10" x 22'	55	220	100
3" x 10" x 24'	60	240	109
3" x 10" x 26'	65	260	118
3" x 12" x 10'	30	120	54
3" x 12" x 12'	36	144	65
3" x 12" x 14'	42	168	76
3" x 12" x 16'	48	192	87
3" x 12" x 18'	54	216	98
3" x 12" x 20'	60	240	109
3" x 12" x 22'	66	254	115
3" x 12" x 24'	72	288	131
3" x 12" x 26'	78	312	142
4" x 10" x 8'	27	107	49
4" x 10" x 10'	34	134	60
4" x 10" x 12'	40	160	73
4" x 10" x 14'	47	187	85
4" x 10" x 16'	54	213	97
4" x 10" x 18'	60	240	109
4" x 10" x 20'	67	268	122
4" x 10" x 22'	74	293	133
4" x 10" x 24'	80	320	145
4" x 10" x 26'	87	347	157

### Weight of Bridge Materials — Treated Timber

Type	F.B.M.	LBS.	KG.
4" x 12" x 8'	32	128	58
4" x 12" x 10'	40	160	73
4" x 12" x 12'	48	192	87
4" x 12" x 14'	56	224	102
4" x 12" x 16'	64	256	116
4" x 12" x 18'	72	288	130
4" x 12" x 20'	80	320	145
4" x 12" x 22'	88	352	160
4" x 12" x 24'	96	384	174
4" x 12" x 26'	104	416	189
12" x 12" x 8'	96	384	174
12" x 12" x 10'	120	480	217
12" x 12" x 12'	144	576	261
12" x 12" x 14'	168	672	304
12" x 12" x 16'	192	768	348
12" x 12" x 18'	216	864	391
12" x 12" x 20'	240	960	435
12" x 12" x 22'	264	1056	479
12" x 12" x 24'	288	1152	522
12" x 12" x 26'	312	1248	566
12" x 12" x 28'	336	1344	610
12" x 12" x 30'	360	1440	653
12" x 14" x 8'	112	448	203
12" x 14" x 10'	140	560	254
12" x 14" x 12'	168	672	304
12" x 14" x 14'	196	784	355
12" x 14" x 16'	224	896	406
12" x 14" x 18'	252	1008	457
12" x 14" x 20'	280	1120	508
12" x 14" x 22'	308	1232	559
12" x 14" x 24'	336	1344	609
12" x 14" x 26'	364	1456	660
12" x 14" x 28'	392	1568	711
12" x 14" x 30'	420	1680	762

### Weight of Bridge Materials — Treated Timber

Type	F.B.M.	LBS.	KG.
6" x 12" x 8'	48	192	87
6" x 12" x 10'	60	240	108
6" x 12" x 12'	72	288	130
6" x 12" x 14'	84	336	152
6" x 12" x 16'	96	384	174
6" x 12" x 18'	108	432	196
6" x 12" x 20'	120	480	218
6" x 12" x 22'	132	528	240
6" x 12" x 24'	144	576	261
6" x 12" x 26'	156	624	283
6" x 14" x 8'	56	224	102
6" x 14" x 10'	70	280	127
6" x 14" x 12'	84	336	152
6" x 14" x 14'	98	392	178
6" x 14" x 16'	112	448	203
6" x 14" x 18'	126	504	229
6" x 14" x 20'	140	560	254
6" x 14" x 22'	154	616	279
6" x 14" x 24'	168	672	304
6" x 14" x 26'	182	728	330
6" x 16" x 8'	64	256	116
6" x 16" x 10'	80	320	145
6" x 16" x 12'	96	384	174
6" x 16" x 14'	112	448	203
6" x 16" x 16'	128	512	232
6" x 16" x 18'	144	576	261
6" x 16" x 20'	160	640	290
6" x 16" x 22'	176	704	319
6" x 16" x 24'	192	768	348
6" x 16" x 26'	208	832	377

### Weight of Bridge Materials — Treated Timber

Type	F.B.M.	LBS.	KG.
8" x 20" x 8'	107	426	193
8" x 20" x 10'	134	533	242
8" x 20" x 12'	160	640	290
8" x 20" x 14'	187	747	339
8" x 20" x 16'	213	853	387

### Weight of Bridge Materials — Treated Timber

Type	F.B.M.	LBS.	KG.
8" x 20" x 18'	240	960	435
8" x 20" x 20'	267	1066	483
8" x 20" x 22'	294	1173	532
8" x 20" x 24'	320	1280	580
8" x 20" x 26'	346	1384	627
8" x 20" x 28'	373	1492	676
8" x 20" x 30'	400	1600	725

### Weight of Bridge Materials — Untreated Timber

Type	F.B.M.	LBS.	KG.
3" x 8" x 10'	20	60	27
3" x 8" x 12'	24	72	32
3" x 8" x 14'	28	84	38
3" x 8" x 16'	32	96	43
3" x 8" x 18'	36	108	49
3" x 8" x 20'	40	120	54
3" x 8" x 22'	44	132	60
3" x 8" x 24'	48	144	65
3" x 10" x 10'	25	75	34
3" x 10" x 12'	30	90	41
3" x 10" x 14'	35	105	48
3" x 10" x 16'	40	120	54
3" x 10" x 18'	45	135	61
3" x 10" x 20'	50	150	68
3" x 10" x 22'	55	165	75
3" x 10" x 24'	60	180	82
3" x 12" x 10'	30	90	41
3" x 12" x 12'	36	108	49
3" x 12" x 14'	42	126	57
3" x 12" x 16'	48	144	65
3" x 12" x 18'	54	162	74
3" x 12" x 20'	60	180	82
3" x 12" x 22'	66	198	90
3" x 12" x 24'	72	216	98
12" x 12" x 10'	120	360	164
12" x 12" x 12'	144	432	196
12" x 12" x 14'	168	504	229



### Weight of Bridge Materials — Untreated Timber

Type	F.B.M.	LBS.	KG.
12" x 12" x 16'	192	576	262
12" x 12" x 18'	216	648	294
12" x 12" x 20'	240	720	326
12" x 12" x 22'	264	792	360
12" x 12" x 24'	288	864	392
12" x 12" x 26'	312	936	425
12" x 12" x 28'	336	1008	457
12" x 12" x 30'	360	1080	490
12" x 12" x 32'	384	1152	523

### Bailey Bridge Components and Their Weights

	LBS.	KG.
Standard Panel	603	274.00
Panel Pin	6	2.72
End Posts	130	59.00
Transom (floorbeams)	470	213.63
Interior Stringers	183	83.20
Edge Stringers	190	86.40
Sway Brace	65	29.50
Chord Reinforcing	210	95.45
Chord Bolts	8	3.65
Bracing Frame	40	18.20
Raker	18	8.20
Transom Clamp	6	2.72
Bearing	70	31.80
Base Plate	400	181.80
Mark I Link	12	5.45
Mark II Link	28	12.72
Rocking Roller	202	91.80
Plain Roller	105	47.70

## SECTION IV

### Weights of Precast Units

#### Calculated Weights of Standard VS Units With Semi-Light Weight Aggregate

**Weights in Tonnes**

Length	Interior	Curb	Posts
20'	4.763	6.264	4
25'	5.955	7.791	5
30'	7.145	9.359	6
35'	8.336	10.905	6

**SM Units Semi-Light Weight Aggregates**

Length	Interior	Curb	Posts
6 m	4.73	6.33	3
8 m	6.30	8.45	4
10 m	7.88	10.56	5
11 m	8.67	11.61	5

#### Calculated Weights of Precast Units in Tonnes. Standard Weight Aggregate

**"HC Units"**

Length	Interior	Curbs
20'	3.435	4.959
28'	4.728	6.897
33'	5.517	8.067
38'	6.352	9.265

**"G Units"**

Length	Interior	Curbs
20'	3.475	4.383
28'	4.740	6.260

**"VH Units"**

Length	Interior	Curbs
20'	3.816	5.336
28'	4.147	5.309
33'	6.765	9.342
38'	7.813	10.690

### Calculated Weights of Precast Units in Tonnes. Standard Weight Aggregate - Con't.

#### "E Units"

Length	Interior	Curbs
30'	7.963	10.694
35'	9.229	12.464
40'	10.499	14.188
42'	10.998	14.868

#### "M Units"

Length	Interior	Curbs
40'	11.379	15.839
42'	12.234	16.636
45'	13.117	17.836
50'	14.170	19.782
55'	15.622	21.733
58'	17.377	23.730
58'	Parapet 28.358	

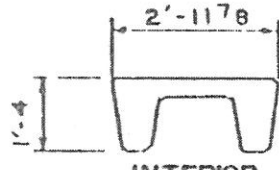
#### "FC" Units - Standard Weights

Length	Tonnes	Length	Tonnes
40'	16.924	80'	32.668
45'	18.874	85'	34.619
50'	20.917	90'	35.345
55'	22.868	95'	38.612
60'	24.773	100'	47.913
65'	26.724	105'	50.363
70'	28.766	110'	52.722
75'	30.717	115'	55.127

#### "FC" Units - Semi-Light Weight

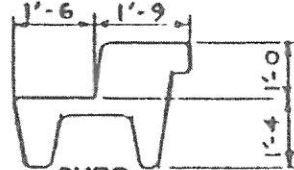
Length	Tonnes	Length	Tonnes
85'	26.679	110'	42.123
90'	28.448	115'	44.038
95'	30.036	120'	45.917
100'	38.294	125'	47.866
105'	40.209		

# Sketch of Precast Units

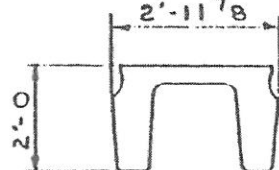


INTERIOR

TYPE 'G' GIRDER

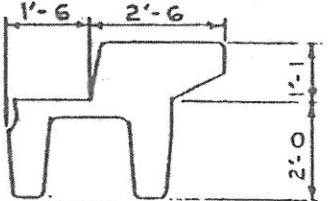


CURB

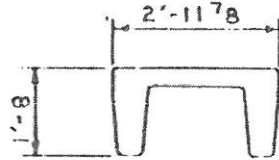


INTERIOR

TYPE 'E' GIRDER

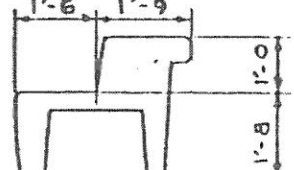


CURB

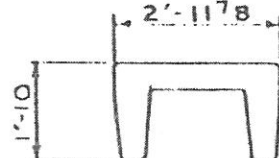


INTERIOR

TYPE 'HC' GIRDER

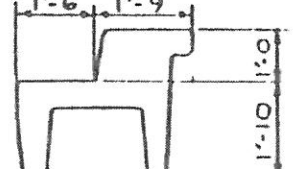


CURB

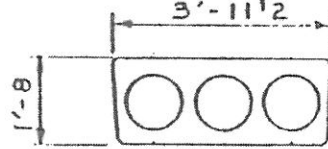


INTERIOR

TYPE 'VH' GIRDER

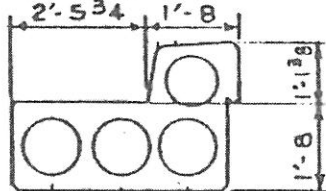


CURB

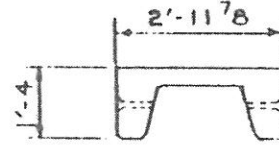


INTERIOR

TYPE 'VS' GIRDER

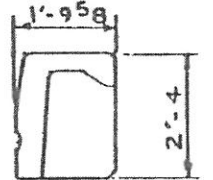


CURB

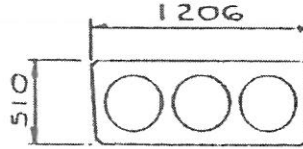


INTERIOR

TYPE 'A' GIRDER

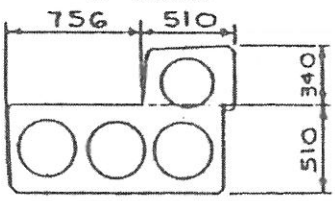


'C' CURB



INTERIOR

TYPE 'SM' GIRDER



CURB

## Rope Specification Table

All Weights, Footage and Tensile Strength Figures shown on this list are approximate and are subject to the **STANDARD 5% TOLERANCE.**

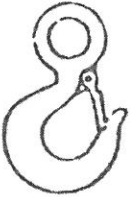
Size		Tensile Strength			Weight lbs/100 ft		
Dia.	Circ.	Manila	Nylon	Poly-propylene	Manila	Nylon	Poly-propylene
3/16"	9/16"	450	960	725	1.5	1.2	.75
1/4"	3/4"	600	1500	1250	2	1.8	1.1
5/16"	1"	1000	2400	1925	2.9	2.9	1.8
3/8"	1-1/8"	1350	3400	2550	4.1	4.1	2.5
1/2"	1-1/2"	2650	6200	4150	7.5	6.7	4.9
5/8"	2"	4400	10,000	6500	13.1	11.3	8.1
3/4"	2-1/4"	5400	14,000	8700	16.7	14.7	12
7/8"	2-3/4"	7700	19,000	11,000	22.5	23.5	15
1"	3"	9000	24,000	14,400	27	27	17.6
1-1/8"	3-1/2"	12,000	31,500	18,750	36	37	27.6
1-1/4"	3-3/4"	13,500	36,000	21,000	41.8	42	31
1-5/16"	4"	15,000	42,000	24,000	48	48	36
1-1/2"	4-1/2"	18,500	51,000	30,250	60	57	43
1-5/8"	5"	22,500	62,000	36,400	75	72	52
1-3/4"	5-1/2"	26,500	75,000	43,600	90	85	56
2"	6"	31,000	89,500	52,000	108	103	63

**Note** — Weights and strengths vary with different constructions.

The following tables of loads are included to provide an indication of what can be expected from a hook based on its throat opening. Refer to the manufacturers' ratings for specific values of specific hooks.

### Eye Hooks, Shank Hooks, Swivel Hooks

Forged Alloy Steel  
(Safety Factor = 5)



Eye Hook






Swivel Hook



Shank Hook

Throat Opening (Inches)	Maximum Safe Working Load (Pounds)
5/8	600
11/16	800
1	1,500
1 1/16	2,000
1 1/8	2,500
1 1/4	4,000
1 3/8	4,500
1 13/32	5,000
1 1/2	5,500
1 17/32	6,000
1 11/16	6,800
1 25/32	8,000
1 7/8	8,400
1 15/16	10,000
2 1/16	10,400
2 1/8	11,000
2 1/4	12,500
2 5/16	13,000
2 1/2	16,000
2 9/16	18,000
3	19,200
3 1/16	20,000
3 3/8	24,000
3 7/16	26,000
4	33,400

<div style="display: flex; justify-content: space-between; align-items: center;">  <div style="text-align: center;"> <h3>Chain Slip Hooks</h3> <p>(Clevis Type and Eye Type) Forged Alloy Steel (Safety Factor = 4)</p> </div>  </div>		
Throat Opening (Inches)	For Size of Chain (Inches)	Maximum Safe Working Load (Pounds)
$\frac{15}{16}$	$\frac{1}{4}$	2,750
$1\frac{1}{16}$	$\frac{5}{16}$	4,300
$1\frac{5}{16}$	$\frac{3}{8}$	5,250
$1\frac{9}{16}$	$\frac{7}{16}$	7,000
$1\frac{11}{16}$	$\frac{1}{2}$	9,000
2	$\frac{5}{8}$	13,500
$2\frac{1}{8}$	$\frac{3}{4}$	19,250
$2\frac{3}{4}$	$\frac{7}{8}$	26,000
3	1	34,000

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <h3>Typical Sorting Hook</h3> <p>Forged Alloy Steel</p> </div>  </div>	
I.D. of Eye Opening at Top of Hook Safe Working Load $2\frac{1}{2}$ " From Tip Safe Working Load at Bottom of Hook	$1\frac{1}{4}$ " $2\frac{13}{16}$ " 2 Tons $7\frac{1}{2}$ Tons

02



Clevis Type

**Chain Grab Hooks**  
(Clevis Type and Eye Type)  
Forged Alloy Steel



Eye Type

Throat Opening (Inches)	For Size of Chain (Inches)	Maximum Safe Working Load (Pounds)
$\frac{11}{32}$	$\frac{1}{4}$	2,750
$\frac{7}{16}$	$\frac{5}{16}$	4,300
$\frac{1}{2}$	$\frac{3}{8}$	5,250
$\frac{9}{16}$	$\frac{7}{16}$	7,000
$\frac{21}{32}$	$\frac{1}{2}$	9,000
$\frac{25}{32}$	$\frac{5}{8}$	13,500
$\frac{15}{16}$	$\frac{3}{4}$	19,250
$1\frac{1}{16}$	$\frac{7}{8}$	26,000
$1\frac{3}{16}$	1	34,000

**Sliding Choker Hooks**  
Forged Alloy Steel  
(Safety Factor = 5)





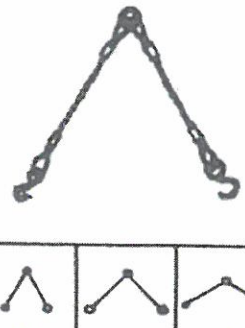


Throat Opening (Inches)	For Rope Size (Inches)	Maximum Safe Working Load (Pounds)
$\frac{1}{2}$	$\frac{1}{4} - \frac{5}{16}$	1,500
$\frac{5}{8}$	$\frac{3}{8}$	2,600
$\frac{7}{8}$	$\frac{1}{2}$	3,400
$1\frac{1}{8}$	$\frac{5}{8}$	5,100
$1\frac{1}{8}$	$\frac{3}{4}$	8,000
$1\frac{7}{16}$	$\frac{7}{8} - 1$	15,000
$1\frac{3}{4}$	$1\frac{1}{8} - 1\frac{1}{4}$	23,000
$2\frac{3}{16}$	$1\frac{3}{8} - 1\frac{1}{2}$	30,000



# SAFE WORKING LOADS FOR WIRE ROPE




63







 FLEMISH EYE LOOP	 VERTICAL LIFT	 CHOKER HITCH	 BASKET HITCH			
				60°	90°	120°
				W.L.L. 2 LEGS	W.L.L. 2 LEGS	W.L.L. 2 LEGS
ROPE SIZE (Inches)	TONS (2000 lbs)	TONS (2000 lbs)	TONS (2000 lbs)	TONS (2000 lbs)	TONS (2000 lbs)	TONS (2000 lbs)
1/4	.60	.45	1.20	1.00	.84	.60
3/8	1.34	1.00	2.65	2.30	1.85	1.34
1/2	2.40	1.80	4.80	4.10	3.35	2.40
5/8	3.50	2.60	7.00	6.20	5.00	3.50
3/4	5.40	4.00	10.80	9.20	7.50	5.40
7/8	7.00	5.20	14.00	12.00	9.80	7.00
1	9.10	6.80	18.20	16.00	13.00	9.10
1 1/8	11.30	8.40	22.60	19.40	15.80	11.30
1 1/4	13.50	10.10	27.00	23.20	18.90	13.50
1 3/8	16.40	12.30	32.80	28.20	22.90	16.40
1 1/2	19.40	15.00	38.80	34.00	27.10	19.40
1 5/8	23.50	17.60	47.00	40.40	32.90	23.50
1 3/4	27.00	20.20	54.00	46.40	37.80	27.00
1 7/8	30.50	22.80	61.00	52.40	47.70	30.50
2	35.00	26.00	70.00	60.00	49.00	35.00

CALCULATED ON THE BASIS OF  
5 - 1 WORKING LOAD FACTOR

Using Wire Rope Industries Ltd. 6 x 19 or 6 x 37 classification. The regular lay is preformed improved plow steel with independent wire rope centre.

## Safe Working Loads for Chain Slings

Nominal Chain Size	Single Chain 90°	Double Chain Slings		
				
mm	kg	kg	kg	kg
7	1500	2500	2100	1500
10	3200	5500	4500	3200
13	5400	9300	7600	5400
16	8000	13,800	11,300	8000
19/20	11,500	19,900	16,200	11,500
inch	lbs	lbs	lbs	lbs
1/4	3300	5500	4620	3300
3/8	7040	12,100	9900	7040
1/2	11,880	20,460	16,720	11,880
5/8	17,600	30,360	24,860	17,600
3/4	25,300	43,780	35,640	25,300

Nominal Chain Size	Triple and Quad Chain Slings		
	 	 	 
mm	kg	kg	kg
7	3800	3100	2250
10	3800	6700	4800
13	14,000	11,400	8100
16	20,700	16,900	12,000
19/20	29,800	24,300	17,200
inch	lbs	lbs	lbs
1/4	8360	6820	4950
3/8	18,260	14,740	10,560
1/2	30,800	25,080	17,820
5/8	45,540	37,180	26,400
3/4	65,560	53,460	37,840

Calculated on the basis of a 4 – 1 working load factor.

# SECTION VII

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## Miscellaneous

### Bolted Connection

Bolt tension

**Bolt Size  
(A325 Bolts)**

**Minimum Bolt Tension  
(kilonewtons)**

M16 x 2	94.2
M20 x 2.5	147
M24 x 3	212
M30 x 3.5	337
M36 x 4	490

Refer to Construction Specifications Section 6 "Structural Steel Erection" for details and methods of checking bolt tension.

### Minimum Edge Distance For Drilled Holes in Members

**Bolt Size**

**Minimum distance center of hole  
to edge of material**

19 mm	32 mm
22 mm	40 mm

Minimum bolt spacing center to center  
3 times bolt dia. preferred minimum spacing 76 mm

# Rope Knots

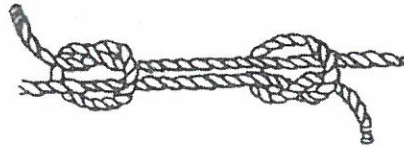
66



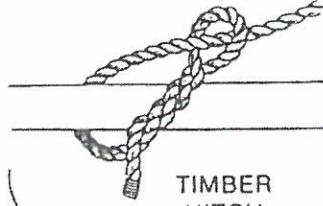
FIGURE EIGHT KNOT



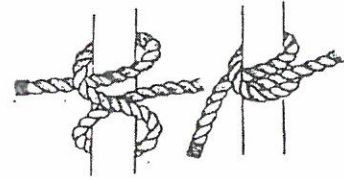
BLACKWALL HITCH



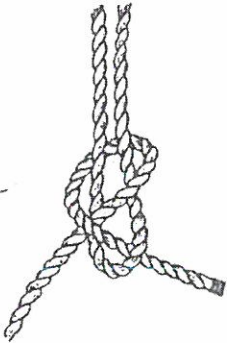
FISHERMAN'S KNOT



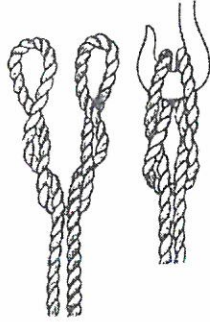
TIMBER HITCH



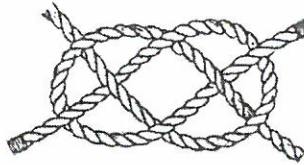
CLOVE HITCH



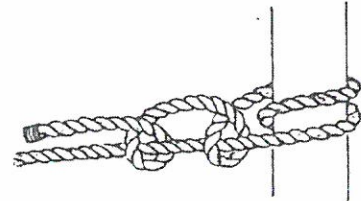
SHEET BEND



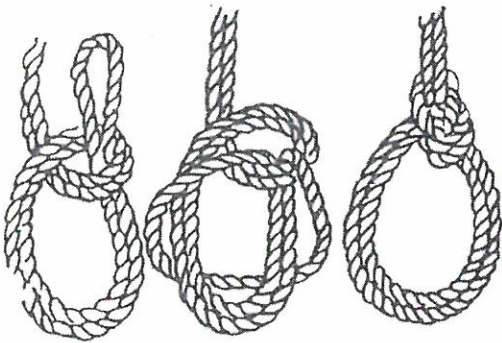
CATSPAW



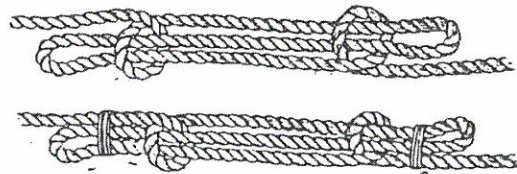
CARRICK BEND



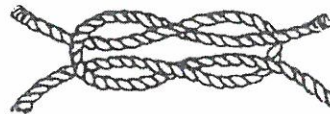
ROUND TURN



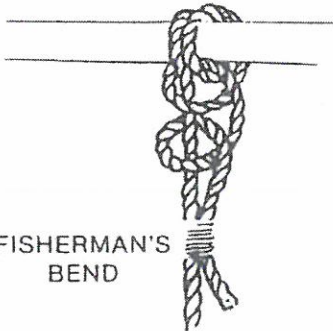
BOWLINE ON A BIGHT



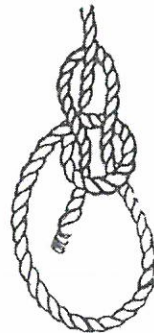
SHEEPSHANK



REEF KNOT



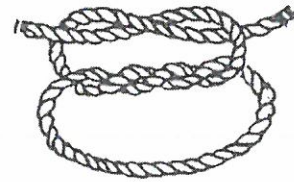
FISHERMAN'S BEND



BOWLINE



RUNNING BOWLINE



SURGEON'S KNOT

## Metric Conversion Table

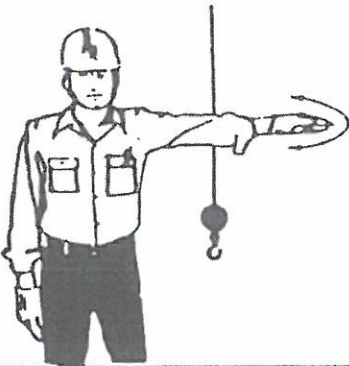


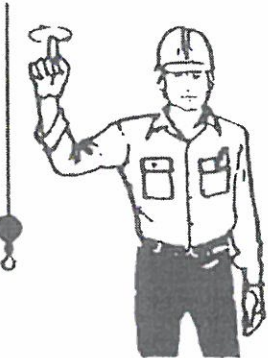
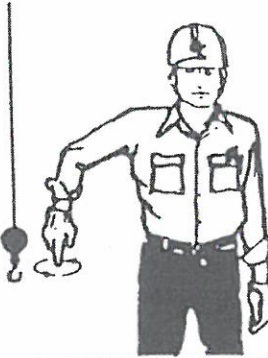
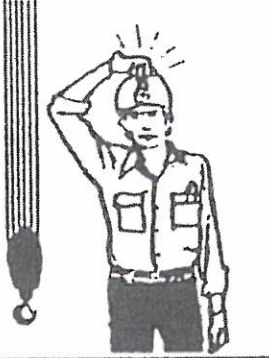

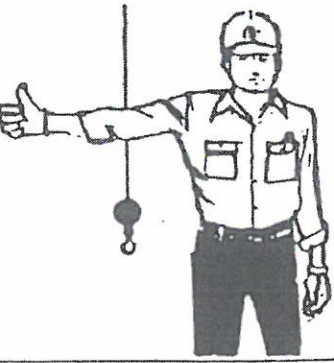
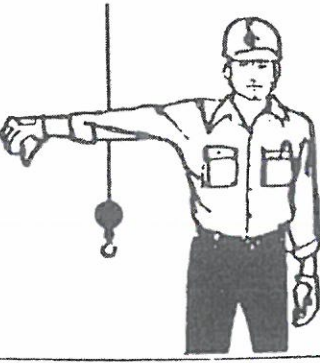
67

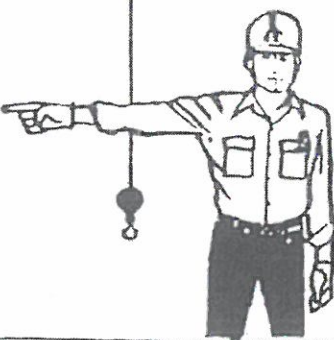
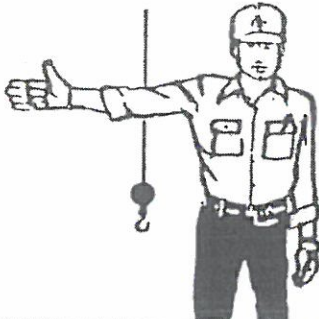

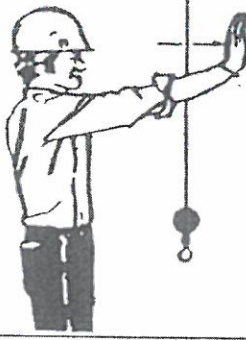
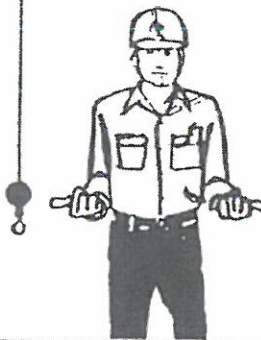
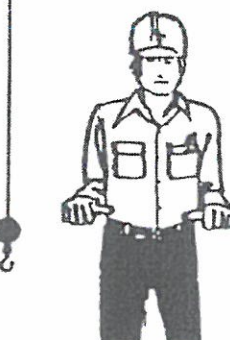
In an effort to familiarize readers with the metric system, at least two project features in this issue have measurements entirely in metric. This conversion table is provided as an aid to those who have difficulty in coping with the new system.

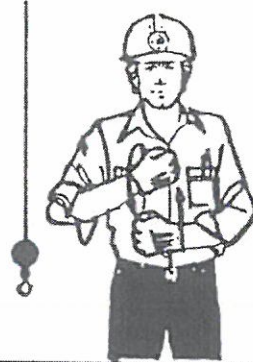
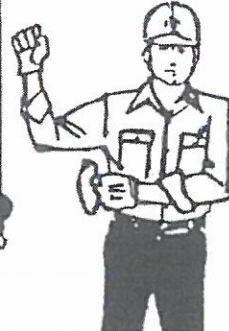
<b>When you know</b>	<b>Multiply by</b>	<b>To find</b>
<b>Length</b>		
centimetres (cm)	0.3937	inches
decimetres (dm)	0.3281	feet
	3.281	feet
metres (m)	1.094	yards
kilometres (km)	0.6214	miles
<b>Area</b>		
square centimetres (cm <sup>2</sup> )	0.155	square inches
	10.76	square feet
square metres (m <sup>2</sup> )	1.196	square yards
square kilometres (km <sup>2</sup> )	0.386	square miles
hectares (ha)	2.471	acres
<b>Mass</b>		
grams (g)	0.035	ounces
kilograms (kg)	2.205	pounds
tonnes (t)	1.102	tons
<b>Volume</b>		
litres (L)	0.220	gallons
	35.315	cubic feet
cubic metres (m <sup>3</sup> )	1.308	cubic yards
<b>Pressure</b>		
kilopascals (kPa)	0.1450	pounds/square inch
<b>Power</b>		
kilowatts (kW)	1.34	horsepower
<b>Energy</b>		
joules (J)	0.7375	foot-pounds
Newton	9.80665	kilogram FORCE
1KIP =	1000 lbs	
1KIP =	4.448 KN	

# Crane & Hoist Signals

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<p><b>STOP</b> Arm extended, palm down, move hand and forearm in a chopping motion</p>	<p><b>DOG EVERYTHING.</b> Clasp hands in front of body</p>	<p><b>MOVE SLOWLY</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal (HOIST SLOWLY SHOWN AS EXAMPLE)</p>
		
<p><b>HOIST</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circles</p>	<p><b>LOWER</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>	<p><b>USE MAIN HOIST.</b> Tap hat on head, then use regular signals.</p>
		
<p><b>USE WHIPLINE</b> (Auxiliary hoist) Tap elbow with one hand, then use regular signals</p>	<p><b>RAISE BOOM</b> Arm extended, fingers closed, thumb pointing upward.</p>	<p><b>LOWER BOOM</b> Arm extended, fingers closed, thumb pointing downward</p>

		
<p>SWING Arm extended, point with finger in direction of swing of boom</p>	<p>RAISE THE BOOM AND LOWER THE LOAD With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	<p>LOWER THE BOOM AND RAISE THE LOAD With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired</p>
		
<p>TRAVEL Arm extended forward, hand open and slightly raised, making pushing motion in direction of travel.</p>	<p>EXTEND BOOM (Telescoping booms) Both fists in front of body with thumbs pointing outward.</p>	<p>RETRACT BOOM (Telescoping booms) Both fists in front of body with thumbs pointing toward each other.</p>

	
<p>TRAVEL (Crawler Crane, Both Tracks) Arm extended forward, hand open and slightly raised, making pushing motion in direction of travel</p>	<p>TRAVEL (Crawler Crane, One Track) Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist rotated vertically in front of body (for crawler cranes only)</p>

# SECTION VIII

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## Working Limits from Power Lines

Safe Limits of Approach in Metres from Power Lines for  
Persons and Equipment

Voltages (Line to Ground) kv	Distance m
0 - 5	2.0
5 - 50	3.0
50 - 250	4.5
over 250	6.0



# SECTION IX

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Table 1.

## Ice Strength For Continuous Travel

These tables are for clear, blue ice on lakes and on rivers. This table does not apply for parked loads, or where ice faults are evident.

Permissible load (clear, blue ice)	Effective Ice Thickness In Millimetres	
	Lake	River
One person on foot	50	60
Group, in single file	80	90
Passenger car 2000 kg	180	210
Light truck 2500 kg	200	230
Medium truck 3500 kg	260	300
Heavy truck 7000 to 8000 kg	350	405
10,000 kg	380	435
25,000 kg	630	725
45,000 kg	800	920
70,000 kg	1000	1150
110,000 kg	1250	1440

Table 2.

## Ice Strength for Stationary Loads and Working on Ice

This table applies to loads to be stationary on ice for more than two hours.

Permissible load (clear, blue ice)	Effective Ice Thickness In Millimetres	
	Lake	River
1,000 kg	200	230
2,000 kg	300	350
4,000 kg	450	520
8,000 kg	600	1270
25,000 kg	1100	1730
45,000 kg	1500	1725
70,000 kg	1800	2070
110,000 kg	2300	2650

## How to Calculate Effective Thickness

The effective thickness of a base of clear blue ice plus white ice or snow ice is a thickness of clear blue ice of equivalent load bearing strength. The formula to calculate total effective ice thickness is:

$$\text{Clear} + \frac{1}{2} T \text{ White} = T \text{ Effective}$$

Example: 400 mm of clear ice plus 200 mm of snow ice = 400 mm clear +  $\frac{1}{2}$  of 200 mm snow ice = 500 mm effective.

**Where water lies between layers, use only the depth of the top layer of ice.**

## Temperature Variations

Daily air temperatures must be constant over a given period so that ice thickness will withstand the permissible loads at outlined in the tables.

When ice is

- Less than 500 mm thick, temperature must be constant for three (3) days.
- Between 500 and 1000 mm thick, temperature must be constant for four (4) days.
- Over 1000 mm thick, temperature must be constant for five days.

During a sudden drop in temperature and for three to five days following such a decline, the minimum ice thickness should be adjusted. If the temperature drop is excessive, severe thermal stressing or cracking of the ice will require caution and temporary load restrictions.

If drop is

- 5° or less - multiply 1.4 X minimum ice thickness
- 5° to 10° - multiply 2.0 X minimum ice thickness
- 10° + - multiply 2.4 X minimum ice thickness

Under thawing temperatures where the average air temperature exceeds 0°C, increase the required ice thickness given in the tables by 20 per cent or, reduce the allowable weight by one-third.

## Additional Necessary Precautions

### Continuous Use Areas

Construction of flooded areas for ice crossings, parking areas or bridge erection requires daily measurement for ice thickness, air temperature and ice cracks. Currents can create wear to the underside of the ice and reduce its thickness.