

Level II Inspection

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# Level II Inspection

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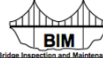
## Introduction

- Level I
  - primarily visual with standard tools
  - no special access
  - in accordance with BIM manual
- Level II
  - specialized knowledge / training and equipment
  - detailed information on a particular component or components
  - supervised by certified bridge inspector

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## Level II Inspection Types

- Copper Sulfate Electrode (CSE Testing)
- Chloride Testing
- Concrete Deck Inspection
- Ultrasonic Truss Inspection
- Culvert Barrel Measurements
- Vertical Clearance Measurements

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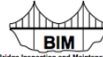
## Types of Level II Inspection

- Concrete Girder Inspection
- Paint Inspection
- Timber Coring
- Scour Monitor
- Special Structure Monitor
- Underwater Inspection
- Steel Culvert Corrosion Testing
- Pin and Hanger Connection Testing
- Steel Girder Cover Plate Inspection

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## General Principles

- BIM condition rating system
- Quantifies rating categories
- Provides technical data / measurements
- As required / ordered by Level I Inspector
- Regular / predetermined schedule




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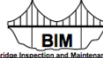
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## When Required?

- Special access required
  - swing stages or manlifts
  - dewatering culverts
  - underwater (scour or foundations)
- Overall assessment for rehabilitation or major maintenance
  - deck or paint inspections
  - condition evaluation
  - CSE, timber coring, ultrasonic



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## Level II Inspection Forms

### Bridges


(Primary Span : FC, Spans: 1,2,3, Lengths(m): 29-16.2-29)  
(Total Length : 29-16.2-29 = 74.2)

### Culverts

Pipe #	Design Span/Cam. & Rise	Type	Length	Corr. Profile	PI Thickness	Number of Rings	Top Arc Radius	Side Arc Radius	Bottom Arc Radius	Corner Arc Radius
1	1810	SP	65.900	152X51	2.8	30	LN			




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## Level II Inspection Forms – Common Inventory Information

Level 2 Inspection - Concrete Deck	
Bridge File Number	07871 - 1 Bridge
Year Built/Year Suppl	1956/1958
Bridge or Trestle Name	MAANVILLE
Located Over	VERMILION RIVER, S.S. WATERCROSS-ST
Located On	881-08 C1 4.791
Water Body C1/Year Navigable, C1/Year	
Legal Land Location	SW SEC 8 TWP 51 RGE 8 W4M
Longitude, Latitude	-111.1028, 53.2231
Contract Authority	Alberta Transportation (AT)
Contract Man. Area	CMA15
Clear Widthway/Draw	7.91
AADT/Year	300 / 2013 (A)
Road Classification	RCU-209-110
Debour Length (m)	43
Form Type	CDK
List No.	
Inspector Name	John Doe
Inspector Class	BR CLS A
Assistant Name	
Assistant Class	
Inspection Date	20-May-2014
Active Time	15:48
Depart Time	17:19
Date Entry By	Jane Doe
Date Entry Date	13-Dec-2014
Reviewer Name	Joe Blow
Review Date	13-Dec-2014
Dept. Reviewer Name	John Snow
Dept. Review Date	13-Mar-2015
Follow-Up By	
Visual Inspection?	Y
CSE Testing?	Y
Chordle Testing?	N
Allowable Load (t): Single	CS1 39
Design Loading:	HSD1
(Primary Span : FC, Spans: 1, Lengths(m): 25.9)	
(Total Length : 25.9 = 25.9)	




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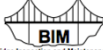
## Level II Inspection Forms – Inspection Scheduling Information

Previous Level 2 Inspector's Name	Previous Level 2 Insp Date	18-Aug-2008
Next Level 2 Insp Date	Discontinue Level 2 Insp? (Y/N)	No
Level 2 Insp (Previously Completed)	Level 2 Insp Cycle (Default) (Months)	12
Detailed Report/Report? (Y/N)	Yes	
Level 2 Insp Comments	There is erosion at the northeast corner of the bridge, beginning to encroach into roadway (0.5m x 0.1m)	
Next Level 2 Inspection/Test	Concrete Deck Insp? (Y/N)	Yes
	CSIR Testing? (Y/N)	Yes
	Chloride Testing? (Y/N)	No
Department Reviewer Comments		



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## Level II Inspection Forms – Inspection Scheduling Information

Structural Condition Rating (%)	55.6	Sufficiency Rating (%)	61.0	Est Insp Year	2030
Level 1 Insp Date	29-Oct-2014	Next Level 1 Insp Date	29-Jan-2018	Current Level 1 Insp Cycle (Default) (Months)	39
Special Comments for Next Insp.					
Snooper? (Y/N)	No	LRT? (Y/N)	No	Traffic Control? (Y/N)	Yes
		Boat? (Y/N)	No	Ladder? (Y/N)	No
Other Special Requirements Comments					



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## Level II Inspection Forms – Maintenance Recommendations


Alberta Transportation      Bridge Inspection & Maintenance System (Web 2005)      07871-1 Bridge

Maintenance Recommendations						
Inspector Recommendations	Year	Inspector Comments	Department Comments	Target Year	Est. Cost	Cost #
SEAL CURBS						
PATCH DECK						
SEAL DECK						
OVERLAY DECK						
REPAIR/REPLACE DECK JOINTS						
WARNING						
OTHER ACTION						
CRACK REPAIR/TREATMENT						
PATCH CURBS/PARAPETS						
OTHER ACTION						
OTHER ACTION						
OTHER ACTION						



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## Concrete Deck Inspection

- Primarily visual with standard tools
- Measurement of damage / condition
- Components inspected are
  - wearing surfaces
  - concrete overlay
  - concrete deck
  - concrete edge elements
  - deck joints



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## Concrete Deck Inspection – Wear Surface Inventory and Condition

Concrete Deck Inspection									
		Last	Now	Explanation of Condition					
Wearing Surface									
Polymer? (Y/N)			N						
ACP? (Y/N)			N						
Chip Seal Coat? (Y/N)			Y						
Type		CHIP SEAL COAT		Year Installed		Avg. Total Thickness (mm)		Area (m <sup>2</sup> )	
				1999		1298.1			
Polymer Rating (% Area)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	0	0	0	0	0	0	100
ACP Rating (% Area)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	0	0	0	0	0	0	100
Chip Seal Coat Rating (% Area)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	0	0	0	0	0	0	100
Chip seal coat has all but worn off.									
Total Debonded Area (m <sup>2</sup> )		0		0		0		0	
ACP Total Debonded Area (m <sup>2</sup> )		0		0		0		0	
ACP Average Measured Depth (mm)		0		0		0		0	
ACP Crack Frequency (m/m)		0		0		0		0	
Chip Seal Coat Total Lost Area (m <sup>2</sup> )		999		999		999		999	

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## Concrete Deck Inspection – Concrete Overlay Inventory and Condition

Concrete Overlay									
Overlay? (Y/N)		Y							
(Span Type : CT)									
(Span Numbers : 1, 2, 3, 4)									
Concrete Overlay									
		Last	Now	Explanation of Condition					
Overlay type: CONCRETE (HIGH DENSITY)									
(Area(m <sup>2</sup> ) : 1298.1)									
(Year Installed : 1978)									
(Thickness(mm) : 80)									
(Average Cylinder Strength(Mpa) : )									
Overlay Rating (% Area)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	65	15	0	0	0	0	20
Partially covered by chip seal coat.									
Total Crack Length - Medium/Wide (m)		371		453		0		0	
Total Scaled Area - Light (m <sup>2</sup> )		0		0		0		0	
Total Scaled Area - Moderate/Heavy/Severe (m <sup>2</sup> )		0		0		0		0	
Debonded Area (m <sup>2</sup> )		84		30		0		0	
Spalled Area (m <sup>2</sup> )		1		2.5		0		0	
Fractured Area (m <sup>2</sup> )		0		0		0		0	
Average Measured Cover Depth (mm)		100		100		100		100	
Standard Deviation of Measured Cover Depth (mm)		14		15		14		15	

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## Concrete Deck Inspection – Concrete Deck and Underside Inventory and Condition

Concrete Deck and Underside									
(Span Type : CT)									
(Span Numbers : 1, 2, 3, 4)									
(Deck Type : CONCRETE (CLASS C))									
(Area(m <sup>2</sup> ) : 1298.1)									
(Year Constructed : 1987)									
(Year Widened : )									
(Thickness(mm) : 180)									
(Average Cylinder Strength(MPa) : )									
Type		Size	Design Cover (mm)	Spacing (mm)					
Long Reinforcing - REINFORCING STEEL		10	35	190					
Trans. Reinforcing - REINFORCING STEEL		15	35	190					
Deck Top Rating (% Area)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	0	0	0	0	0	0	100
Total Crack Length - Medium/Wide (m)		N		N		N		N	
Total Scaled Area - Light (m <sup>2</sup> )		N		N		N		N	
Total Scaled Area - Moderate/Heavy/Severe (m <sup>2</sup> )		N		N		N		N	
Debonded Area (m <sup>2</sup> )		N		N		N		N	
Spalled Area (m <sup>2</sup> )		N		N		N		N	
Fractured Area (m <sup>2</sup> )		N		N		N		N	
Average Measured Cover Depth (mm)		N		N		N		N	
Standard Deviation of Measured Cover Depth (mm)		N		N		N		N	
Deck Underside Rating (% Area)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	75	1	0	0	0	0	25
Rating between 0-100 on the width-span.									
There is fouling and shear cracking along the CT girders.									
There are rashes by medium width transverse cracks in the deck.									
Under deck, isolated spalled patch between G032 & 04 (North span).									
Total Stained Area - Heavy/Severe (m <sup>2</sup> )		0		0		0		0	
Total Stained Area - Moderate (m <sup>2</sup> )		0		0		0		0	
Total Crack Length - Medium/Wide (m)		140		139		140		139	
% of Medium/Wide Cracks Stained		80		85		80		85	

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## Concrete Deck Inspection – Edge Elements Inventory and Condition

Edge Elements									
Curbs? (Y/N)		Y							
Parapets? (Y/N)		N							
Edge Elements									
		Last	Now	Explanation of Condition					
Material? (Y/N)									
Concrete? (Y/N)		N							
Culverts									
(Type : CONCRETE)									
(Total Length(m) : 179.8)									
(Depth(m) : )									
(Width(m) : )									
(Average Cylinder Strength(MPa) : )									
Reinforcement Type		Size	Design Cover (mm)	Spacing (mm)					
		10	50	800					
Curb Rating (% Length)									
Last		9-7	6/5	4	3	2/1	NX		
Now		0	100	0	0	0	0	0	0
Transverse cracking									
Total Crack Length - Medium/Wide (m)		38		38		38		38	
Total Scaled Area - Light (m <sup>2</sup> )		4		4		4		4	
Total Scaled Area - Moderate/Heavy/Severe (m <sup>2</sup> )		0		0		0		0	
Debonded Length (m)		0		0		0		0	
Spalled Length (m)		0.1		0.1		0.1		0.1	
Fractured Length (m)		7		8		7		8	
Average Measured Cover Depth (mm)		84		73		84		73	
Standard Deviation of Measured Cover Depth (mm)		21		14		21		14	
Isolated areas of exposed rebar due to insufficient concrete cover along the west curb.									

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## Concrete Deck Inspection – Deck Joint Inventory and Condition

<b>Deck Joints</b>		
(Type : <u>GLAND (WABO-MAUER, TRANSFLEX, ETC)</u> )		
(Number of Joints : <u>2</u> )		
(Expansion / Fixed? : <u>EXPANSION</u> )		
(Location : <u>A1, A2</u> )		
% Inspected	100	-100
% Joints Leaks	0	-0
% Joint Length Leaks	0	-0
Superstructure Damage Rating	6	-6
Substructure Damage Rating	6	-6
Level 1 Joint Rating	7	-7

Inspected joints after a hard snow/rain, no leakage was observed.  
There are horizontal cracks in the abutments. There are vertical cracks along the piers.

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