

Inspection Form Completion



Technical Standards Branch
Class B Bridge Inspection
Course



Verifying and Updating Inventory Data

- Inspector is responsible for obtaining, verifying and updating inventory data during inspection
- Check off each inventory item to indicate it was verified
- If item cannot be confirmed/verified do not check off – make comment why
- Not necessary to change data if measurement is only slightly different
- Inventory changes are made directly on the inspection form



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Verifying and Updating Inventory Data

Bridge Culvert Inspection		Form Type	CULM					
Bridge File Number	77153-2	Lot No.	4					
Year Built	2014	Inspector Name	G. Blawie					
Bridge or Town Name	Three Sisters	Inspector Class	Cl. A					
Located Over	Pigeon Creek (2)	Assistant Name						
Located On	Local Road	Assistant Class						
Water Body Cl/Year		Inspection Date	Jan 26/15					
Navigabil. Cl/Year		Arrive Time	3:00 PM					
Legal Land Location	SE Sec 13 Twp 24 Rge 10 N5/24	Depart Time	4:50 PM					
Longitude, Latitude	-115:15:21 51:02:27	Date Entry By						
Road Authority	RD of Sisson RR 8	Reviewer Name						
Contract Main Area	Valhalla	Review Date						
Clear Roadway/Skew	9.0	Dept. Reviewer Name						
ASOT/Year	70/2015	Follow Up By						
Road Classification	RL4-208-100							
Detour Length (km)	1							
Bridge Culvert Information								
Number of Culverts: 2								
Pipe #	Barrel	Span	Rise (or Dia.)	Type	Length	Corr. Profile	PI/Slab Thickness	Shape
1	MAIN	4370	2870	APP	28.9	152x51	4.0	Arch
2	MAIN	4370	2870	APP	28.9	152x51	4.0	Arch
2								
Special Features								
Special Features Comment								

- Inventory changes or revisions are made directly on the inspection form



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Bridge Component		Last	Now	Explanation of Condition
Abutments				
(Extended Backwall Piles (Y/N): Y)				
(Extended Backwall Piles Spacing (mm): 1500)				
(Total Number of Caps/Corbels: 11)				
Bearing Seats/Caps/Corbels Detail Ratings				
	N (count)	1 (count)	2 (count)	3 (count)
Last	0	0	0	1
Now	0	0	0	1
Bearing Seats/Caps/Corbels				
(Type: TREATED TIMBER)				
(Depth (mm): 326)				
(Width (mm): 356)				
Backwalls/Breastwalls				
Greatest Height (m)				
		2.40		5.5
Wingwalls				
(Total Number of Bearing Piles: 256)				
Piles Detail Ratings				
	N (count)	1 (count)	2 (count)	3 (count)
Last	0	0	0	0
Now	0	0	0	0
Piles				
			4	4

Cap replaced in 2015

Piles cored 17 Aug 2011
All piles cored are good except ASP4 with trace rot in 1 core only
Pile 4 is cracked but repaired with steel clamp.

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Wearing Surface (Material Type:)	<i>None</i>	X	X	Remnants of chipseal at W half of deck.
(Thickness:)				No connection
Latent Connection Problem (Y/N)	No	<input checked="" type="checkbox"/>		
Deck Top		5	5	
Deck Rideability		6	6	
Deck Joints		4	5	Butter angles with section removed at South - no problem
Rings (Y/N)	No	<input checked="" type="checkbox"/>		
Deck Drainage		7	7	
Drains Clogged (Y/N)	No	<input checked="" type="checkbox"/>		
Curbs/Median		4	8	Curbs damaged @ corner - asphalt trimmings removed
(Curb Type: Standard)	<input checked="" type="checkbox"/>			Repaired
Scaling (Percent Area)	10			
Bridge Rail	<i>Galvalume Fluted beam</i>	5	9	<i>REPAIR</i>
(Type: STRONG-BOND CONCRETE WASHER PLATES)				<i>Concrete rail 150 posts 40% of rail bolts</i>
Bridge Rail Posts	<i>CCA</i>	3	7	<i>Aluminum posts equal to 2 top posts on each pier</i>
(Type: TREATED TIMBER TREATED TIMBER)				
Bridge Rail/Poles Coating		4	5	<i>Galvalume</i>
(Type: PAINT Galvalume)				
Slidewalk		X	X	
Grider Detail Ratings				
N (count)	1 (count)	2 (count)	3 (count)	
Last	0	0	0	
Now	0	0	0	
Griders		5	5	Wide cracks in sound concrete of AZ at G3-7, end of rail of G1
Last Complete Inspection Date	<i>18-Aug-2011</i>	<i>14-Jul-2014</i>		1 point increase for type PG griders and 2 points for work.
Cracking (Y/N)	Yes	<input checked="" type="checkbox"/>		
Scaling (Percent Area)	5			
Lift or Connector Pocket (Struck) (Y/N)	Yes	<input checked="" type="checkbox"/>		
Number of Griders	<i>11</i>			

- Inventory changes are made directly on the inspection form

Verifying and Updating Inventory Data

Culvert Component	Downstream End		Explanation of Condition
	Last	Now	
Direction			
End Treatment (Concrete, Steel, STEEL, Others, None)	<i>W</i>	<i>W</i>	
Headwall		X	X
Collar		X	X
Wingwalls		X	X
(Shape:)			
Cutoff Wall		X	X
Bevel End			Rocks in bevel
Heading (mm)	0	7	7
Invert Above/Below Stream Bed	BELOW		
Above/Below (mm)	300		
Scour Protection		7	7
(Type: PILE None)			All protection washed out
(Avg. Rock Stream) - <i>apt</i>			
Scour/Erosion		7	3
Deavers (Y/N)	No		
Downstream End General Rating	7	3	<i>6 x 10 x 1 M deep Scour left off base and scoured along both sides</i>

- Inventory changes are made directly on the inspection form

Verifying and Updating Inventory Data

- Culvert design dimensions are shown on first page of culvert form
- SPCSP equivalent round should be changed to correct dimensions
- Used to determine sagging and deflecting measurements
- If culvert is not deformed, large sag and deflection values may indicate wrong design dimensions - then use measurements from both ends

Verifying and Updating Inventory Data

- Incorrect Inventory data is changed by crossing out recorded value and writing in new information
- Update and verify Inventory data directly on the form
- Record data only in values that box is asking for (mm, m, %, Y/N)
- Minor changes to things like roadway width are not required

Supporting Information

- Ratings of 4 or less must have an explanation of condition
- Ratings of 3 or less must have 3 things;
 1. Supporting comment
 2. Supporting photograph
 3. Recommendation for action
- Action may be in the form of:
 - Maintenance recommendations
 - Monitoring on regular inspection cycle
 - Monitoring on a shorter inspection cycle if warranted
 - Don't overuse monitoring
- Photographs, quantities, measurements and/or sketches are provided for ratings of 3 or less or any maintenance recommendation regardless of rating

BIM Y/N Inventory Questions

- Explanation of condition is required when answering YES for certain areas
- Exceptions for Class B inspector are
 - approach guardrail meeting standards
 - Longitudinal seams proper lap
 - Longitudinal seams staggered
- if NO, provide comments explaining why

Significant Changes From Previous Rating

- Ratings of most elements do not change significantly over an inspection cycle
- Provide an explanation of condition if rating has changed significantly
- Required even if rating is 5 or more
- For example:
 - treated timber piles rated 8 and 21 months later piles rated 5 - why the big change?

Significant Changes From Previous Rating

- Some elements are expected to change significantly over an inspection cycle
- For example:
 - Timber strip deck rated 8 and 57 months later, rating reduced to 4
 - Scour protection rated 7 and after flood reduced to 3

Measurement Based Ratings

- Record the actual measured values in space provided or if space not provided in Explanation of Condition
- Record the location of any measurements of defects in space provided or if space not provided in the Explanation of Condition
 - 250 x 400 spall in A1 abutment seat under G3
 - wide longitudinal crack in unsound concrete of Sp1-G3 AZ in 1 leg.



Previous Comments

- Comments from previous inspection which no longer apply must be deleted
- Carry over previous comments if information cannot be confirmed or denied
 - place brackets around comment or part thereof and add date the comment originated – if known. (deck ices in WBL)
- If element cannot be seen or is not accessible to confirm comments or data
 - Do not check mark data (don't confirm)
 - Explain why inaccessible or not visible
 - Retain comment in brackets. Add date comment originated - if known



Previous Comments

- Types of information retained:
 - measurements that cannot be verified
 - previous high water marks
 - information recorded during particular weather conditions
 - information recorded during particular season



Sample Completed Form

Bridge Culvert Barrel			
Culvert Component	Rating	Notes	Explanation of Condition
Barrel Last Accessible Date	06-Jul-2015		Plates from bottom are EN, DN, DN, EN.
Special Features			
Special Feature (Type: VERY STEEL STRUTS)	7	7	Struts installed in 1997. 5.0 heavy wall steel struts on E' x E' TT.
Special Feature		X	
Floor			
Measured Rise (mm)	2170	3	Rating due to deflection.
Measured At Ring No.	9		
Sag (mm)	374		
Percent Sag	15		
Sidewall			
Measured Span (mm)	2670	2	Where bolted correctly sidewalls are crimping & cracked @ R11, 13, 15.
Measured At Ring No.	9		Cracked seams.
Deflection (mm)	245		
Percent Deflection	15		
Floor			
Bulge (mm)	200	4	(Rating due to floor bulge, 02-Sep-2011)
Measured At Ring No.	6		Could not confirm bulge due to depth of water.
Abrasion (Y/N)	No		
Circumferential Seams			
Separation (mm)	0	4	Bulbs pulled through @ 4 rings.
Longitudinal Beams			
Total No. of Cracked Rings	9	2	Cracks in both W & E sidewalls at R2-5 and R7.
Total No. of Rings with Two Cracked Beams	5		
Min. Remaining Steel Between Cracks (mm)	25		R11 is cracked where bolted correctly at W side.
Proper Lap (Y/N)	No		At ring 6, E sidewall.
Longitudinal Stagger (Y/N)	Yes		
Corrosion			
Corrosion By Soil (Y/N)	Yes	4	Corrosion with pitting.
Corrosion By Water (Y/N)	Yes		
Gambler POSITIVE/NEG	NEG		
Ponding (Y/N)	No		
Fish Passage Adequacy			
Baffle	X	X	
Wellness Adequacy			
Long (Y/N)	No	3	Drift on floor of R1-R4.
Sifting (Y/N)	No		
Drift (Y/N)	Yes		
Barrel General Rating	3	3	1 point increase for struts.



Photographs and Sketches

- Excellent means of providing supporting information
- Required for all ratings of 3 or less
- Required for all maintenance recommendations regardless of rating
- Not acceptable to say “see photo” on form
- 4 standard photos normally required;
 - Road alignment looking increasing chainage
 - Profile – normally U/S
 - Channel alignment looking U/S
 - Channel alignment looking D/S

Photographs and Sketches

- Submit color photos with inspection form to AT data entry consultant
- Minimum 5 megapixels
 - One hard copy of all photographs if AT managed structure
 - Two hard copies if non AT structure
- Two photos per page (3 ½ x 5 or 4 x 6) with descriptive text, inspector and stream name, date, BF# , Page #.
- Submit electronic copies of photos with inspection reports in pdf file with min. 300 dpi and unlocked for copying in following format;

BF12345-01_LVL1_YYYYMMDD_P.pdf

Photographs and Sketches BF01310-01_LVL1_20130823_P

Bridge File No.: 01310 Date: Aug. 23, 2013 Pictures By: G. Roberts		Highway: Local Road Location: Tachuk Stream: Thasilla Creek
<p>1. Road alignment looking east</p>		
<p>2. Looking west along U/S profile</p>		
Page 1 of 2		

Photographs and Sketches BF01310-01_LVL1_20130823_P

Bridge File No.: 01310 Date: Aug. 23, 2013 Pictures By: G. Roberts		Highway: Local Road Location: Tachuk Stream: Thasilla Creek
<p>3. Channel alignment looking south - U/S</p>		
<p>4. Channel alignment looking north - U/S</p>		
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Estimating Quantities

- Inspectors are to estimate quantities for recommended repairs and maintenance
- Record in Maintenance Inspector Comments (expandable). Use separate sheet only if necessary
- Place in pre-prepared maintenance areas whenever possible
- Examples:
 - PLACE ADDITIONAL RIPRAP - 3m³ Class 1 rock at D/S end
 - PATCH DECK - 5 timber stripdeck planks, each 75x300x 3 m long

Inspection Checks

- Inspector should do the following checks before leaving the site:
 - all ratings have been entered
 - » element condition ratings entered
 - » General Rating entered
 - » Estimated Replacement Year
 - condition ratings consistent with BIM manual
 - ratings are supported by
 - » explanations of condition (ratings of 4 or less)
 - » photos (and sketches if necessary) (3 or less)
 - » recommendations for maintenance, monitoring, other appropriate action (3 or less)
 - inventory information verified or changed
 - maintenance recommendations are appropriate
 - maintenance recommendations are supported with material dimensions and quantities.

Inspection Checks

- Office follow-up:
 - Low rating advisories or 2 Notifications sent to Bridge Manager (and LRA if applicable)
 - Answer questions raised during the inspection
 - Review previous inspection history in BIS
 - Review standard or site specific drawings
 - Review for appropriate maintenance, monitoring and timing
 - load restrictions and other signing
 - notify road authority
 - prepare photos in standard format with descriptive comments
 - Prepare electronic photos

Estimated Replacement Year Standard Bridges (Table 11.1)

TYPE	LIFE EXPECTANCY		
	LOW	AVE	HIGH
Untreated Timber	10	15	20
Treated Timber	35	40	45
Prestressed - Composite	55	60	70*
Prestressed **	40	45	60*
Precast (Except PA & PX)**	30	35	50
Precast (PA) & Other (PX)	25	30	45

*Use maximum of 50 years for timber substructure

**Add 5 years if overlaid with concrete

Considerations:

- Traffic - volume, amount of truck traffic, log haul
- Salt usage - road surfacing, traffic, climatic conditions
- Deck drainage, leakage
- Decay favourable conditions


Forms Completion

Estimated Replacement Year Culverts


TYPE	LIFE EXPECTANCY		
	LOW	AVE	HIGH
Concrete	40	60	80
Corrugated Steel	25	45	60
Timber and Other	20	35	60

Considerations:

- Deformation and cracking (quality of installation)
- Corrosive or chemically aggressive environment
- Abrasive bed load
- Decay favorable conditions, preservative treatment
- Refer to Table 13.4 – Life Expectancy Table for Culverts



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Special Comments

Special Comments for Next Inspection	Inspect struts yearly. 2 Notification sent to LRA and Bridge Manager June 6, 2015. Cracks stable since last inspection, but sidewall deflection appears to be worse. Currently scheduled for design in 2015 and replacement in 2016.
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- Special comments useful for next inspection
 - Notification to BM and LRA of low structural ratings
 - Measurements for monitoring purposes
 - Monitoring locations
 - Recommendation for reduced cycle
 - Data is not sortable



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Level II Inspections

- Detailed inspection requiring specialized equipment and/or expertise
- Gathers specific measurements or observations
- Recommended by Level I inspectors
- Reviewed by Bridge Manager and/or LRA
- Do not proceed until Bridge Manager an/or LRA has been contacted regarding:
 - technical need
 - funding




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Timber Coring

- Recommended when there are suspicions of rot in timber
- Carried out by Class A inspector
- Focus normally on critical structural elements:
 - caps
 - piles
 - stringers



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Level 2 - Culvert Barrel Measurement

- Recommended when critical barrel elements rated 3 or less and safety concerns identified
 - roof rating
 - sidewall rating
 - longitudinal seam rating
- Recommend when two inspections completed without access to barrel section

or

 schedule Level I inspection during low flow or winter conditions
- Some culverts barrels are inaccessible year round

Bridge Maintenance Recommendations

Inspector Recommendations		Maintenance Recommendations	
Inspector Recommendations	Year	Inspector Comments	Depart
REPAIR/REPLACE BRIDGE RAIL			
SEAL CURBS			
PATCH DECK	2016	2 m ² partial depth NH - If bridge not replaced.	
OVERLAY DECK			
STRAIGHTEN/REPLACE MEMBERS	2016	Band A2-P6 - If bridge is not replaced.	
WASHING	2016		
SHOTCRETE REPAIRS			
CORE TIMBER CAPS/CORBELS			
REPAIR/REPLACE TIMBER CAPS	2016	Replace all caps (If bridge is not replaced.)	
REPAIR ABUTMENT SCOUR/EROSION			
PLACE ADDITIONAL RIP RAP	2016	35m ³ of Cl. 1 at NW wing-if bridge not replaced.	
REMOVE DRIFT ACCUMULATION			
INSTALL STRUTS			
OTHER ACTION	2015	Assess for allowable loading post to 10T in interim.	
OTHER ACTION	2016	Replace bridge.	
OTHER ACTION			
OTHER ACTION			

- Place recommendations in pre-prepared areas.
- Use Other Action only if no pre-prepared area available
- Record Year based on priority levels associated with ratings
- Provide material sizes and quantities

Culvert Maintenance Recommendations

Inspector Recommendations		Maintenance Recommendations	
Inspector Recommendations	Year	Inspector Comments	Depart
SHOTCRETE REPAIRS			
PLACE ADDITIONAL RIP RAP	2016	30m ³ Class 2 at D/S, if not replaced within 5 years.	
REMOVE DRIFT ACCUMULATION	2016	At D/S and in barrel, if not replaced	
INSTALL CONCRETE/STEEL LINING			
INSTALL STRUTS			
INSTALL CONCRETE COLLAR/CUTOFF			
REPAIR SEAMS			
OTHER ACTION	2015	Design replacement structure.	
OTHER ACTION			
OTHER ACTION	2017	Replace culvert.	
OTHER ACTION			

- Place recommendations in pre-prepared areas.
- Use Other Action only if no pre-prepared area available
- Record Year based on priority levels associated with ratings
- Provide material sizes and quantities

Supporting Information

Proposed Long-Term Strategy	
On 3-Year Program (Y/N)	
Proposed Action	
Previous Inspector's Name	
Next Inspection Date	
Inspection Cycle (months)	

- Information provided by TIMS data base
- Inspection Cycle shown is normally default but may be reduced
- Reduction to inspection cycle cannot be done by inspector – only recommended by inspector
- Reduced Cycle set by Department

Questions??



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