

**GEOHAZARD ASSESSMENT PROGRAM**  
**NORTH CENTRAL REGION – ATHABASCA**  
**2011 INSPECTION**



**Government of Alberta**  
**Transportation**

**THURBER ENGINEERING LTD.**

Site Number	Location	Name	Hwy	km
NC 35	City of Fort McMurray	King Street Bridge over Highway 63 in Fort McMurray: West Approach Slab Settlement	63:11	8.0
<b>Legal Description</b>		<b>UTM Co-ordinates (NAD 83)</b>		
NE 22-88-09-W4M		12 N 6284716	E 478265	

	Date	PF	CF	Total
<b>Previous Inspection:</b>	May 26, 2010	4	4	16
<b>Current Inspection:</b>	May 5, 2011	3	4	12
<b>Road AADT:</b>	35720		<b>Year:</b>	2010
<b>Inspected By:</b>	Tarek Abdelaziz, Don Proudfoot (Thurber) Arthur Kavulok, Roger Skirrow (TRANS)			
<b>Report Attachments:</b>	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

<b>Primary Site Issue:</b>	Gentle depression in road surface at the west approach slab	
<b>Dimensions:</b>	The depression noted in 2009 extended about 4 m long (along the bridge alignment to the west of the abutment) for the full width of bridge driving lanes.	
<b>Date of any remediation:</b>	N/A	
<b>Maintenance:</b>	The Interchange construction was completed in 2002 and the bridge has been in service since 2003. In 2010 a pavement overlay was placed on the bridge approach slab to provide a smooth ride to motorists. New valve cover extensions were placed by Thurber in 2010 to extend the instrument protection through the new asphalt patch.	
<b>Observations:</b>	<b>Description</b>	<b>Worse?</b>
<input checked="" type="checkbox"/> Pavement Distress	ACP overlay placed on approach slab in 2010	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	-Settlement of west slope concrete apron by about 65 mm -Settlement of bridge curb drains by 141-170 mm - No cracks or seepage at the bridge west head slope or side slopes	<input type="checkbox"/>
<input type="checkbox"/> Erosion		<input type="checkbox"/>
<input type="checkbox"/> Seepage		<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Other	182-200 mm of clearance between the west abutment wall face and the four steel girder ends. No visible signs of distortion/movement in the steel girder bearings. No cracking or visible signs of movement/bulging in the abutment wall face	<input type="checkbox"/>

**Instrumentation: (6SIs, 7PNs)**

The sinusoidal shape of the plots for SI01-3A, installed in the crest of the approach fill, suggested some possible vertical settlement resulting in compression of the casing.

Prior to the re-initialization event in 2009, this instrument consistently showed creep movement of about 2 mm /yr towards Hwy 63 in the clay fill and the underlying native clay since being initialized.

**Assessment (Refer to attached Figure):**

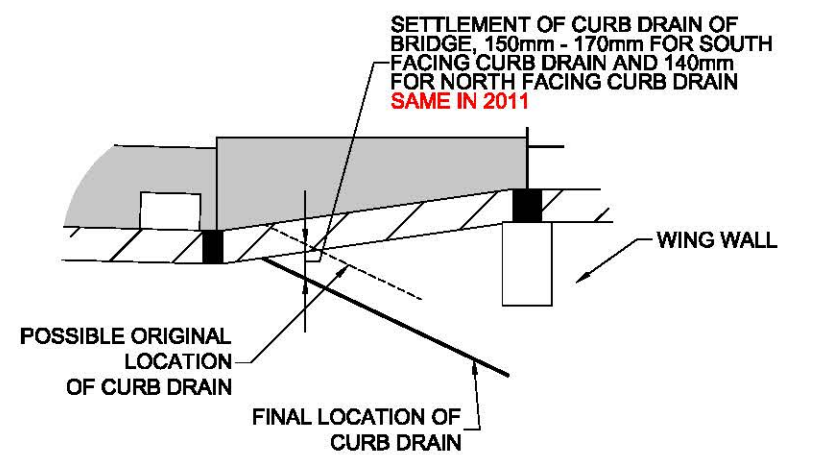
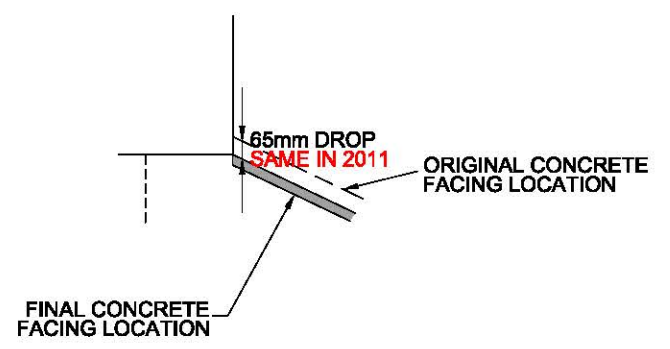
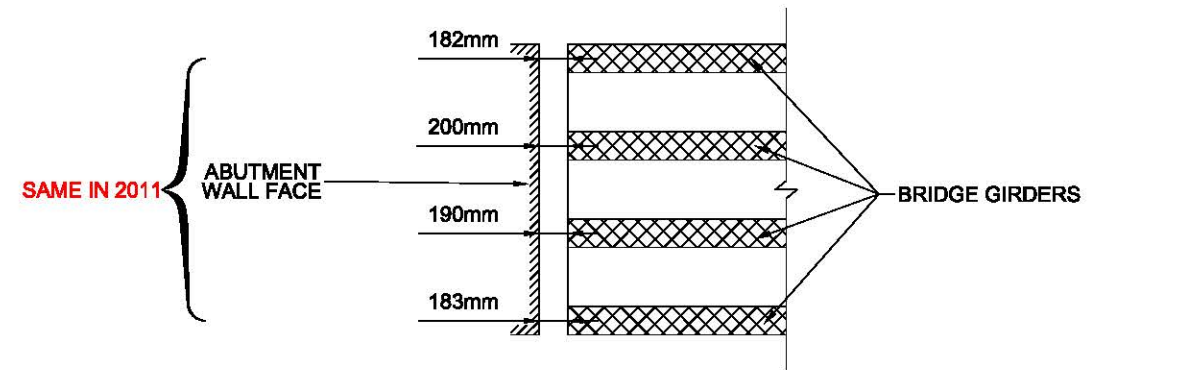
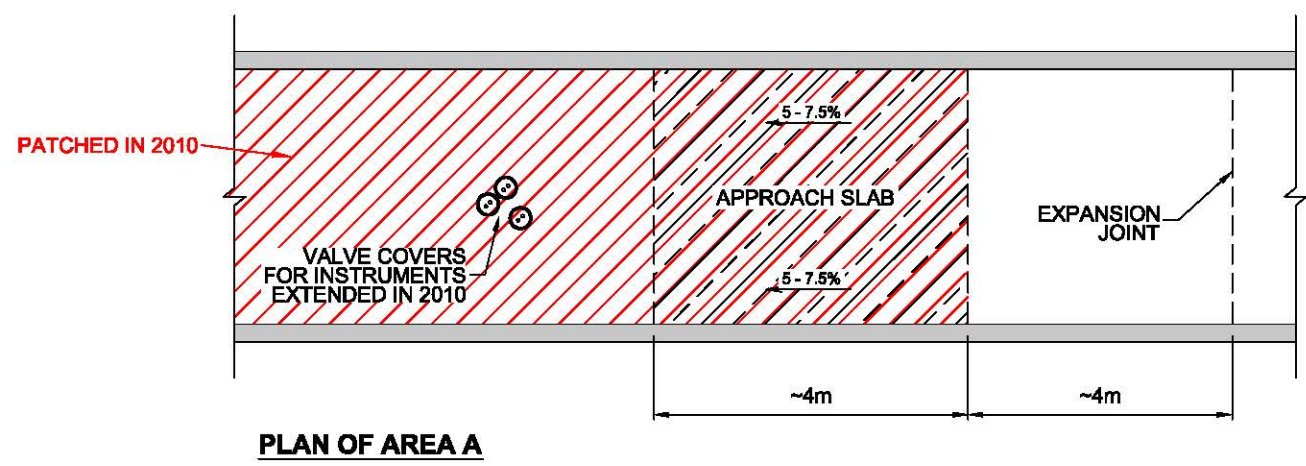
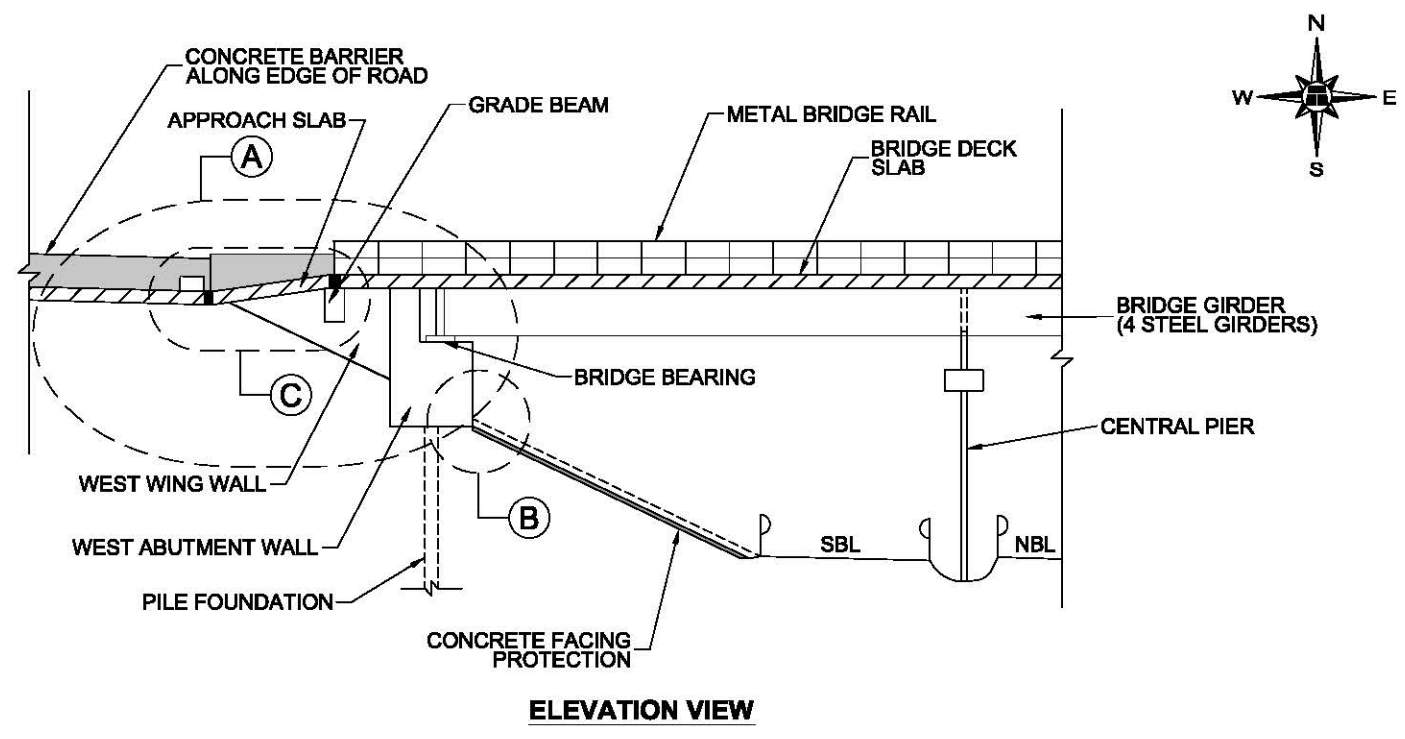
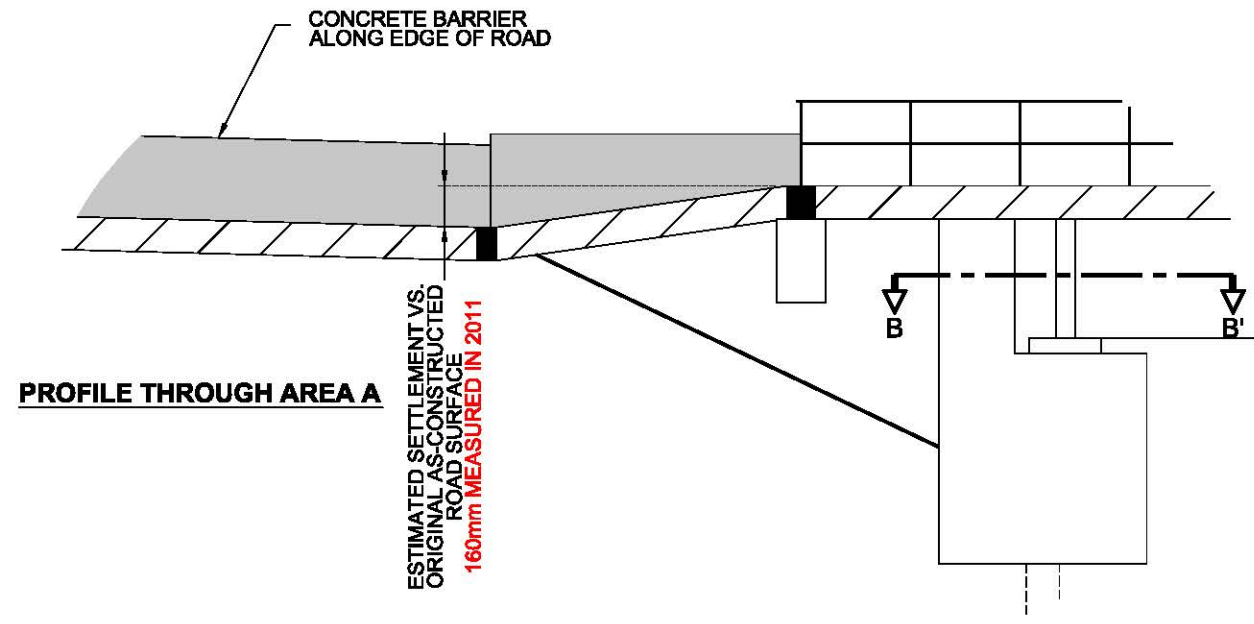
The new pavement overlay provided a smooth ride to motorists and eliminated the safety concerns. Apart from filling the depression on the top of the bridge, the site conditions remained unchanged since the 2010 inspection event.

The depression developed at the end of the bridge was probably due to the settlement of the approach fill slab as a result of the continued self-weight settlement of the clay fill and the long-term consolidation of the native clay underlying the fill over the past years. The lateral slow creep movement of the clay fill and underlying native clay was probably another contributing factor to the current condition.

It is anticipated that the slope will continue to creep in the future. However, a new pavement overlay will not be required in the near future.

**Recommendations:**

This site could be removed from the Geo-hazard Assessment Program. The local MCI should continue to closely monitor the site and inform Thurber if the site conditions changed significantly.



**NOTE:**  
MAY 5, 2011 OBSERVATIONS ARE SHOWN IN RED

**FIGURE NC35-1**  
**NC35 - HWY 63:11 KING STREET BRIDGE**  
**WEST HEAD SLOPE SETTLEMENT - BF78154**  
**NE 22-88-9 W4M, FORT McMURRAY, AB**



**Photo #1** General view of the west side of the bridge (looking northwest)



**Photo #2** ACP overlay placed on the top of the bridge (looking north east from top of west head slope)





**Photo #3** Settlement of bridge curb drain; the change in color of the side barrier signifies the original location of drain prior to settlement (looking north)



**Photo #4** Settlement of west headslope concrete facing. Note the dents on abutment wall seat (looking west)



**Photo #5** Looking northwest at the bridge girder bearings; no signs of distortion in the steel girder bearings



**Photo #6** Looking southwest at the concrete barrier; the concrete barrier dropped by about 160 mm