

GEOHAZARD ASSESSMENT PROGRAM
NORTH CENTRAL REGION – ATHABASCA

2010 INSPECTION



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
Legal Description		UTM Co-ordinates (NAD 83)		
NE 22-88-09-W4M		12 N 6284716	E 478265	

	Date	PF	CF	Total
Previous Inspection:	N/A	N/A	N/A	N/A
Current Inspection:	May 26, 2010	4	4	16
Road AADT:	34600		Year:	2009
Inspected By:	Tarek Abdelaziz, Don Proudfoot (Thurber) Neil Kjelland, Arthur Kavulok, Ron Behr (TRANS)			
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	Gentle depression in road surface at the west approach slab	
Dimensions:	The depressed area extends about 4 m long (along the bridge alignment to the west of the abutment) for the full width of bridge driving lanes.	
Date of any remediation:	N/A	
Maintenance:	The Interchange construction was completed in 2002 and the bridge has been in service since 2003.	
Observations:	Description	Worse?
<input checked="" type="checkbox"/> Pavement Distress	Approximately 200 mm vertical dip over a horizontal distance of 4 m	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	-Settlement of west slope concrete apron by about 70 mm -Settlement of bridge curb drains by 125 – 150 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	There is still 180-200 mm of clearance between the west abutment wall face and the four steel girder ends. No visible signs of distortion/movement in the girder bearings. No cracking or visible signs of movement/bulging in the abutment wall face	<input type="checkbox"/>

Instrumentation: (6SIs, 7PNs)
The instruments installed at this site are customarily read during the fall season. SI01-3A installed in the west approach fill at the depressed location was reinitialized in the fall of 2009 and read again in spring of 2010. However, the settlement in the vicinity of the instrument

appears to have caused temporary distortion in the SI casing which made it difficult to interpret the spring 2010 reading.

Prior to 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):

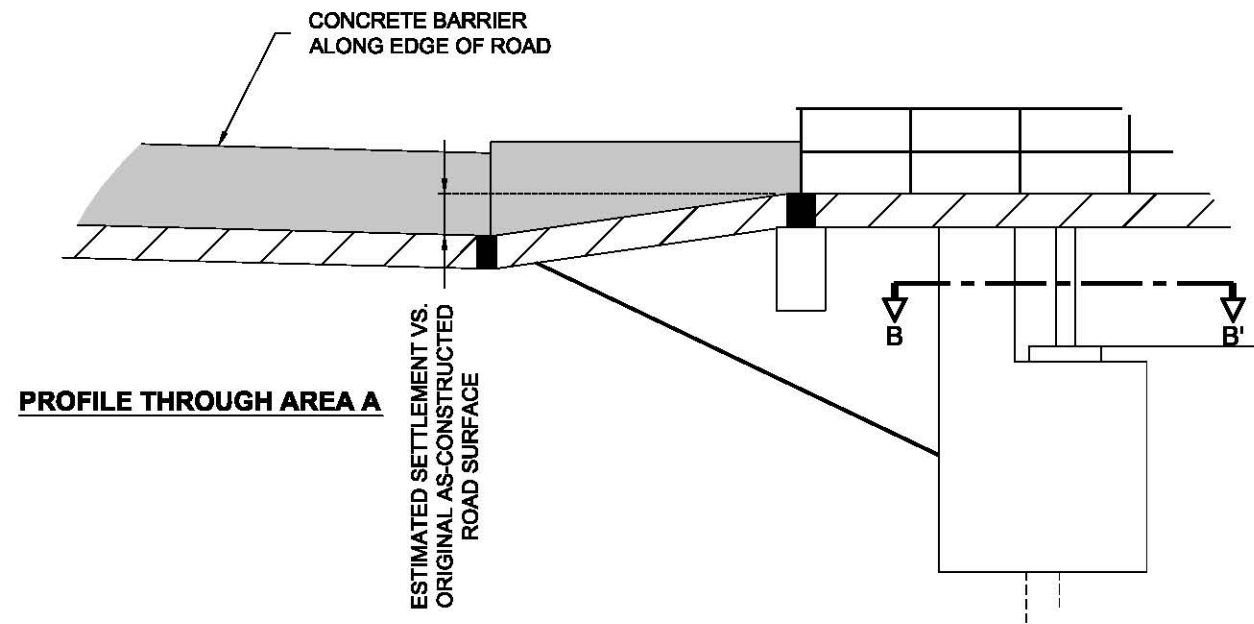
Signs of slope instability were not noted at the west approach fill location.

The site observations indicate that the depressed area at the end of the bridge is 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.

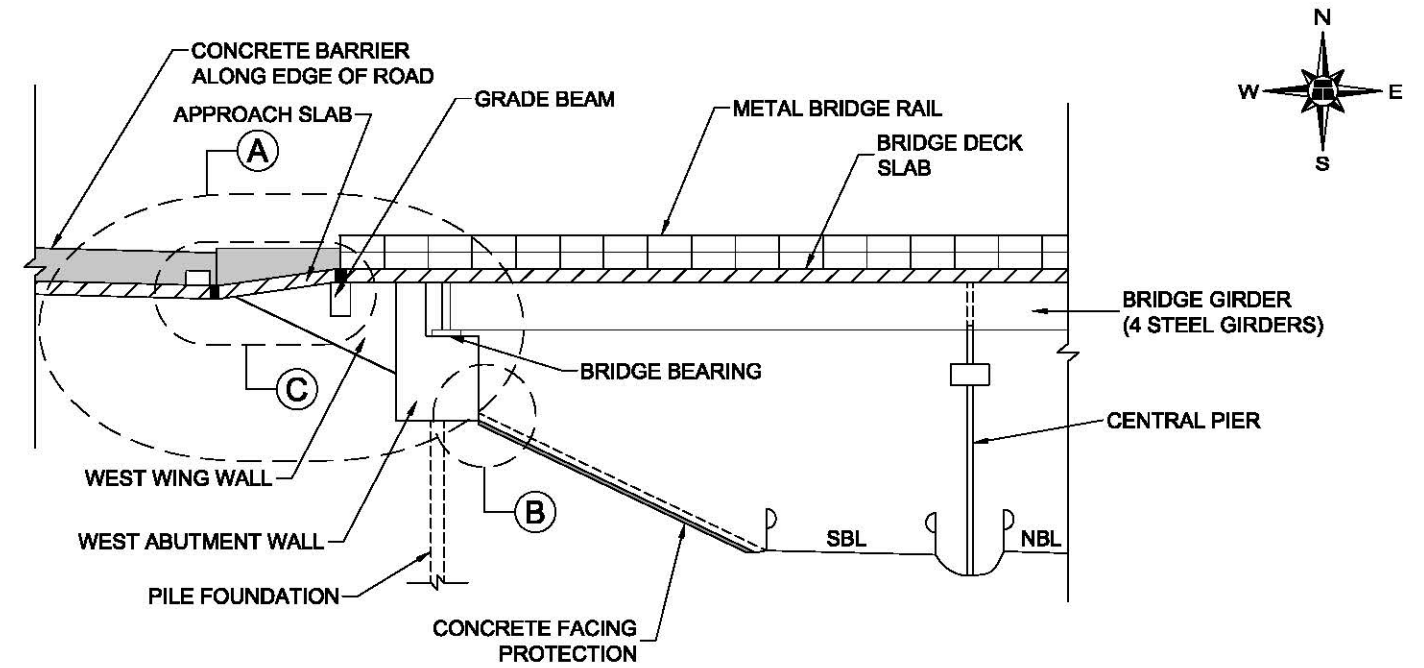
Recommendations:

A pavement overlay should be placed at the end of the bridge to establish a smooth even pavement surface and maintain a comfortable ride to travellers. It is understood that an ACP patch will be placed later this year as part of an ongoing maintenance paving project.

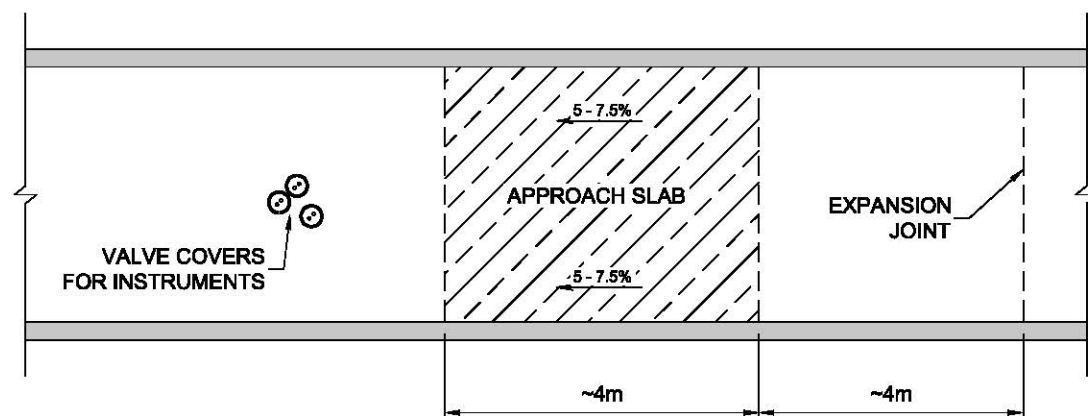
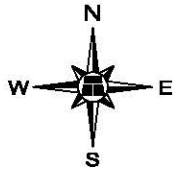
We recommend extending the associated valve covers in the depressed area before applying a new patch. Thurber will coordinate with Carillion to do the extensions length while the patch is being placed this year.



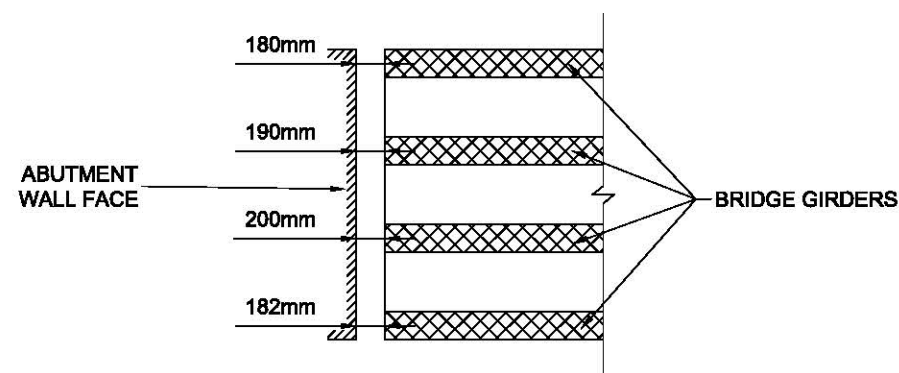
PROFILE THROUGH AREA A



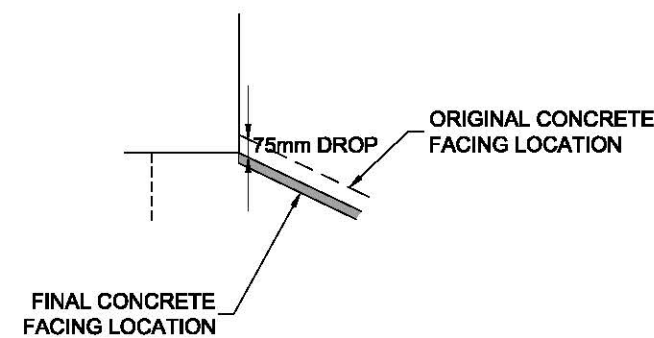
ELEVATION VIEW



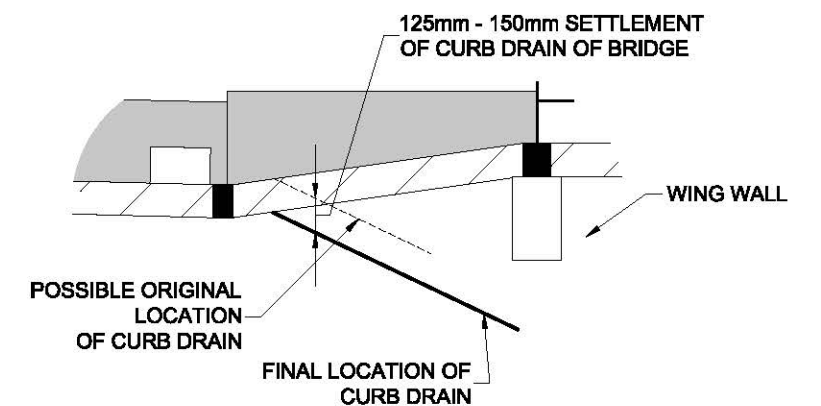
PLAN OF AREA A



SECTION B-B': MEASUREMENTS OF CLEAR SPACE BETWEEN WEST WALL FACE AND GIRDER ENDS



DETAIL B: SETTLEMENT OF CONCRETE FACING PROTECTION



DETAIL C: SETTLEMENT OF CURB DRAIN

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

SCALE N.T.S.
MAY, 2010 SITE OBSERVATIONS
THURBER PROJECT #15-16-246



THURBER ENGINEERING LTD.
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Photo #1 General view of the west side of the bridge (looking northwest)



Photo #2 Dip along the bridge top surface over a distance of 4 m. (looking north from top of west head slope)



Photo #3 Settlement of bridge curb drain. Note that the dents in the side barrier are probably signifying original location of drain prior to settlement (looking south)



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



Photo #5 Looking along the west abutment wall face. No signs of abutment wall cracking/bulging. The clear space varied between the abutment wall face and girder ends from 180-200 mm (looking north)



Photo #6 Looking northwest at the bridge girder bearings; no signs of distortion in the steel girder bearings