

GEOHAZARD ASSESSMENT PROGRAM
NORTH CENTRAL REGION – ATHABASCA
2012 INSPECTION

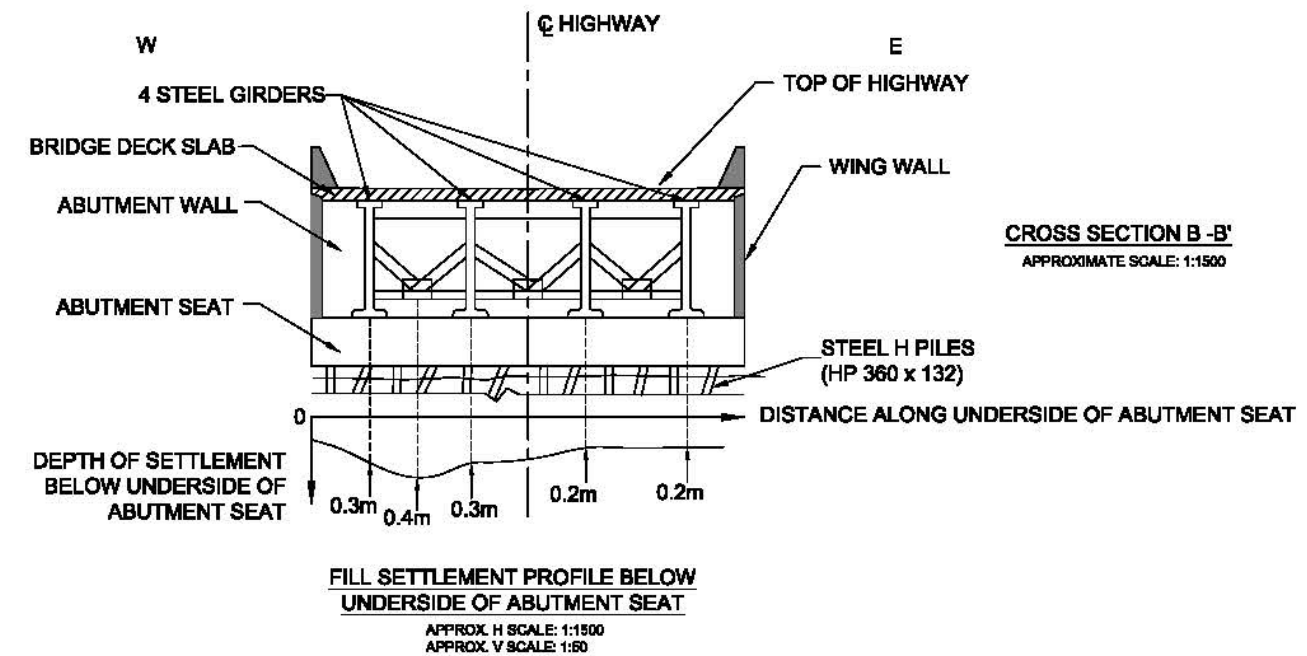
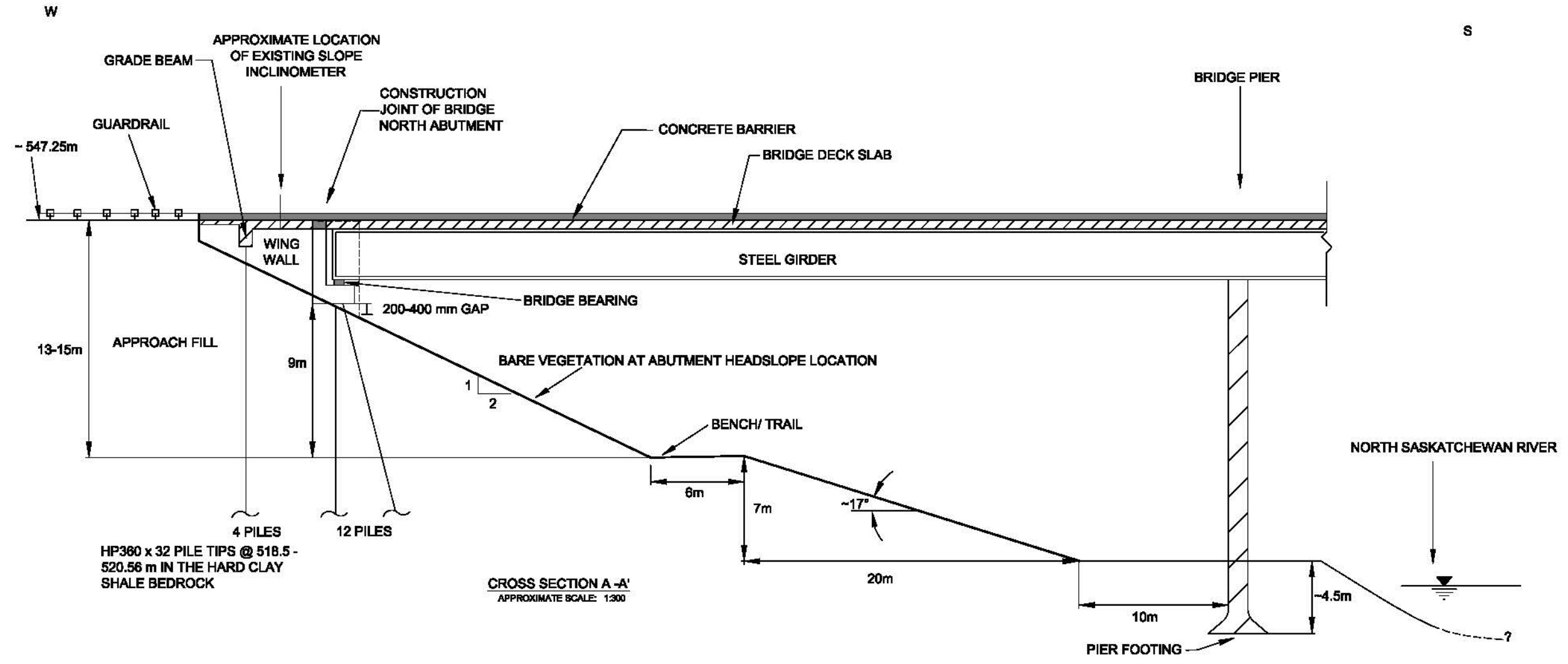



Site Number	Location	Name	Hwy	km
NC 49	4 km South of Elk Point	North Saskatchewan River Bridge North Abutment	41:22	23.2
Legal Description		UTM Co-ordinates (NAD 83)		
SE-25-56-7-W4M		12 N 5968291	E 506736	

	Date	PF	CF	Total
Previous Inspection:	N/A			
Current Inspection:	June 13, 2012	7	4	28
Road AADT:	3300	Year:	2011	
Inspected By:	Tarek Abdelaziz, Don Proudfoot (Thurber) Roger Skirrow, Arthur Kavulok (TRANS)			
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	Slow creep movement and settlement of the north approach fill head slope resulting in a depression at the north end of the bridge	
Dimensions:	About 25 to 30 m long (along the bridge alignment to the north of the abutment) for the full width of the bridge driving lanes	
Date of any remediation:	N/A	
Site History/Maintenance:	<p>The original highway alignment was located to the east of its current location. In 1985, a new five span standard bridge with a total length of about 347 m was constructed over the North Saskatchewan River at the new highway location. The height of the north embankment approach fills varied from 13 to 15 m. The subsurface conditions below the fill consisted of about 10.5 m of compact to dense clayey sand/silt and gravel underlain by 3 m of very stiff to hard clay and 14 m of clay shale (bedrock). The abutment foundations consisted of steel H piles (HP 360X132), driven to practical refusal into the clay shale bedrock. In 1987, erosion gullies developed within the east and west sides of the approach fill. The repairs included the removal of erosion debris and installation of gabion mats (at the east side) and Geo Cell in-filled with gravel (at the southwest side) within the eroded gullies. In 2004, concerns were raised about the stability and the settlement of the north approach fill. A dip formed in a progressive manner at the north end of the bridge between 2004 and 2011. In 2011, an ACP overlay was placed along the full length of the bridge. A new valve cover extension was placed by Thurber in 2012 to extend the instrument protection through the new asphalt surface.</p>	
Observations:	Description	Worse?
<input type="checkbox"/> Pavement Distress	ACP overlay along the full length of the bridge in 2011	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	200 to 400 mm gap below the underside of the north abutment seat; approach fill head slope creeps at a very slow rate.	<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	Bare vegetation at head slope location; no signs of distortion in the steel girder bearings	<input type="checkbox"/>
Instrumentation: (1SI)		
Creep movement at a rate of 0.4 mm/yr and 0.6 mm/yr over 13.7 to 16.2 m and 19.2 to 21 m, respectively		
Assessment (Refer to attached Figures):		
<p>The progressive development of the depression at the north end of the bridge may be due to the slow creep movement of the head slope and the self-weight settlement of the fill. At the time of the site visit, there were no evidence of landslide cracks at the approach fill head slope/side slopes, or pavement distress at the north end of the bridge.</p> <p>The new pavement overlay provided a smooth ride to motorists and eliminated safety concerns.</p> <p>It is anticipated that the slope will continue to exhibit slow creep movements in addition to the ongoing settlement of the approach fill. It is unlikely that a new pavement overlay will be required in the near future.</p> <p>The bare head slope could be due to plant sterilization due to salt.</p>		
Recommendations:		
This site should be visited again next year to confirm the site observations. If the site condition remains unchanged next year, the subsequent site inspection visit could be deferred for a few years.		






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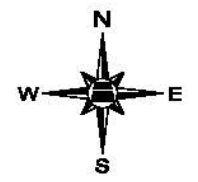
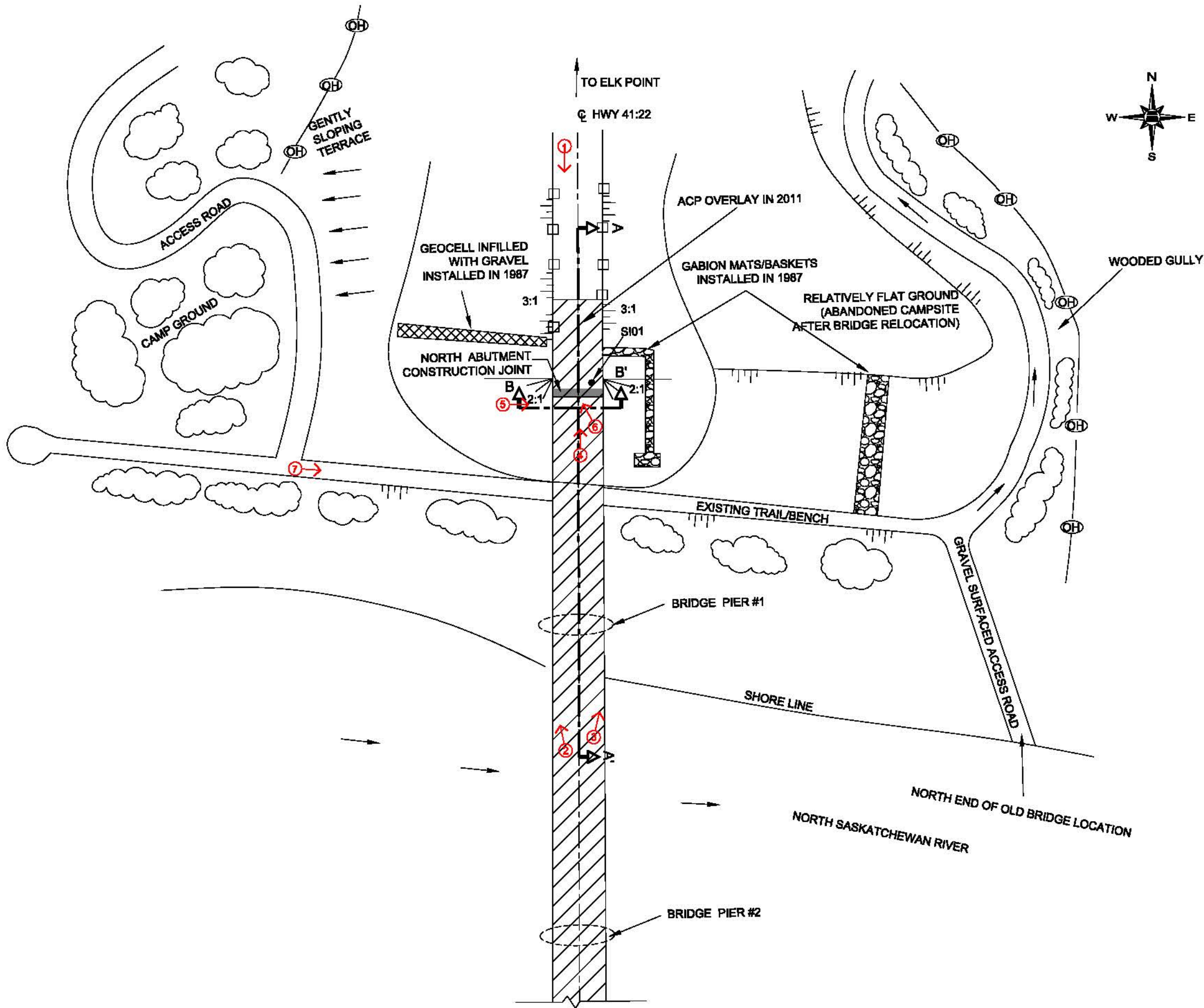
**NC49: HWY 41:22 NORTH SASKATCHEWAN
RIVER BRIDGE NORTH ABUTMENT (km 23.2)
CROSS - SECTIONS A - A' AND B - B'**

FIGURE NC49-2

DRAWN BY	KLW
DESIGNED BY	TSA
APPROVED BY	DWP
SCALE	AS SHOWN
DATE	NOVEMBER 2012
FILE No.	15-16-275



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- LEGEND**
- ① PHOTOGRAPH NUMBER, AND APPROXIMATE DIRECTION AND LOCATION (JUNE 13, 2012)
 - ACP OVERLAY
 - TREES
 - OH OVERHEAD POWERLINE

- NOTES:**
1. THE DIMENSIONS SHOWN ON THE SITE PLAN AND CROSS-SECTION ARE BASED ON SIMPLE FIELD MEASUREMENTS AND MAY DEVIATE FROM THE ACTUAL CONDITION.
 2. JUNE 13, 2012 SITE OBSERVATIONS ARE SHOWN IN RED.



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**NC49: HWY 41:22 NORTH SASKATCHEWAN RIVER
BRIDGE NORTH ABUTMENT (km 23.2) - BF 70318
SITE PLAN SHOWING SITE FEATURES**

FIGURE NC49-1

DRAWN BY	KLW
DESIGNED BY	TSA
APPROVED BY	DWP
SCALE	APPROX. 1:1000
DATE	NOVEMBER 2012
FILE No.	15-16-275

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Photo#1 Looking south from the north side of the bridge at the ACP overlay



Photo#2 Looking north from the top of the bridge at the highway west side slope and river valley slope



Photo#3 Looking north from the top of the bridge at the river valley and approach fill slopes; note the presence of two gabion mattresses along existing slope above the river valley slope



Photo#4 Looking north at the approach fill slope; note that the slope surface is partially bare of vegetation



Photo#5 Looking east at the steel girder rocker bearings



Photo#6 Looking north at north abutment seat; note the gap developed below the seat due to fill settlement



Photo#7 Looking east from the crest of the river bank slope at the existing trail and bridge pier