THURBER

ALBERTA TRANSPORTATION GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – PEACE-HIGH LEVEL
2018 INSPECTION

Site Number	Location	Name	Hwy	km
PH7	Daishowa East Hill	Gabion Channel & Erosion Control Section	986:01	12.55
Legal Description		**UTM Co-ordinates**		
NE7-85-20 W5M		11V E 490505	N 6246235	

	Date	PF	CF	Total
Previous Inspection:	20-Jun-2017	3	2	6
Current Inspection:	12-Jun-2018	3	2	6
Road AADT:	840		**Year:**	2010
Inspected By:	Tyler Clay			
Report Attachments:	☑ Photographs ☑ Plans ☑ Maintenance Items			

Primary Site Issue:	This area is located at a historic landslide site where erosion on both sides of the road way had been of ongoing concern. The main concern is with respect to erosion along the creek on the north side of the roadway which was mitigated in 2003 with an armored gabion basket channel and drop structures. Erosion in the south ditch and at the culvert outlet (32+050) was mitigated in late 2007.	
Dimensions:	South ditch: 800 m long North channel: 580 m long Slide at 32+500: Shallow	
Maintenance:	Repairs were made to the gabion channel and north embankment erosion areas following the 2017 inspection.	
Observations:	**Description**	**Worsened?**
☐ Pavement Distress		☐
☑ Slope Movement	No changes were observed at the location of a small shallow slide noted in the highway fill slope (32+595).	☐
☑ Erosion	South Ditch: erosion control products	☑

	in similar condition as last year (Photos 7-10 to 7-17) with exception of the Coletanche geomembrane damage at 32+280. Channelized erosion occurring beneath the membrane is expected to be ongoing but difficult to observe or measure (Photo 7-15) The gabion mattress, geocell, turf reinforced matting and channel socks had vegetation growth and were functioning well. The protruding cables in the cabled concrete section have been cut away as part of the repair work. North Channel (Photo 7-06): inlet had willow growth but reduced debris relative to previous years. Previous areas of bank erosion and breach of armour have been repaired with additional riprap placement (Photos 71-03 and 71-05). The two gabion drop structures (32+490 and 32+540) were in good condition except for some minor basket deformation (Photos 7-02 to 7-04). Previous channel erosion and breach of armour (including geotextile exposure) compromising the foundation of the protective gabion wall (32+290) has been repaired with additional riprap placement (Photo 7-01). Culvert inlet and outlets (32+050 and 31+990 respectively) were functioning well. Minor erosion beneath inlet mouth was noted (Photo 7-18). Gabion flow dissipater at outlet was performing as intended. Gabion structure at channel bend (31+800) was in good condition and observed to performing well under flowing conditions (Photos 7-07 and 7-08).	

☐ Seepage		☐
☐ Bridge/Culvert Distress		☐
☑ Other	Bump in road (32+050) may be a result of artesian pressures, frost heave or swelling conditions in the subgrade.	☐

Instrumentation:

No instrumentation installed in this area.

Assessment:

Major erosion and gullying appears to have been mitigated along both the north and south sides of the highway. The localized damage in the north channel (bank slumping and breach of the rip rap) has been repaired with additional riprap placement as part of the PH42 Daishowa East Hill repair work. The cables in the concrete section have been cut; however, there is still some protruding rebar pins in the pillow concrete section that should be driven deeper or cut flush.

The large erosion runnels noted on the north highway fill slope have been filled as part of the repairs but will likely require ongoing maintenance unless water runoff is directed to an armored swale or improvements to the road shoulder are made.

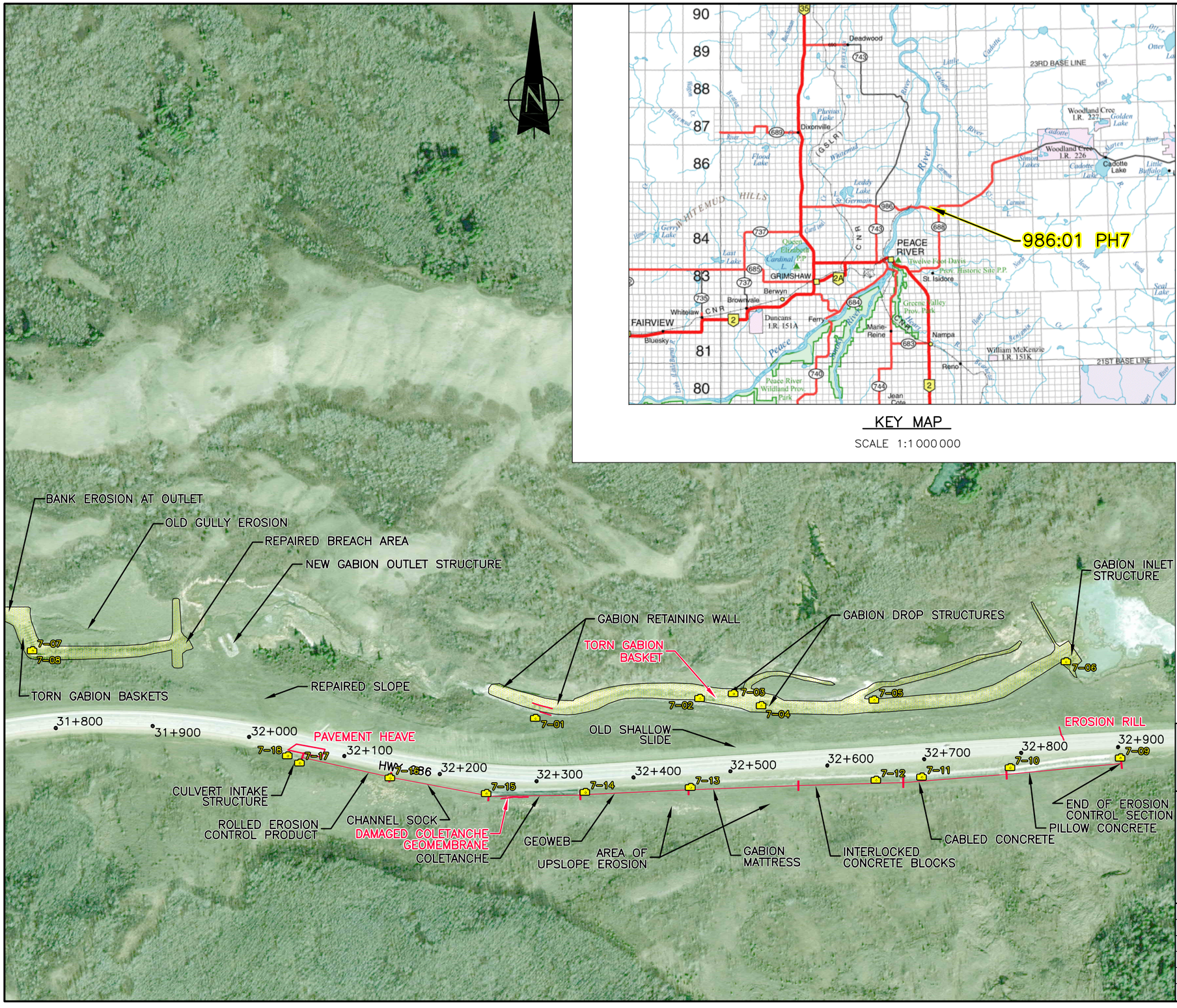
The old shallow slide or settlement noted at 32+500 is not considered a threat to the highway at this time, but should continue to be monitored.

The willows noted within the upper portion of the North Channel may reduce the hydraulic capacity of the inlet and should be checked by a hydraulic engineer.

Erosion under the Coletanche geomembrane damage at 32+280 is currently undermining the south ditch up to 40 m downstream from this location.

The bump in the road at 32+050 should be checked on a regular basis by maintenance personnel to check for pavement damage and/or if the condition has worsened.

Recommendations:	Cost	
Continue to monitor the site and undertake annual inspections.		-
If it is determined that the hydraulic capacity of the north channel inlet is being adversely affected by willow growth, they should be cut flush to the channel bottom with the roots left in place.	$	5,000
The Coletanche geomembrane should be cut for 40 m, the exposed underlying erosion channel should be backfilled with compacted gravel and then patched. The erosion channel section is about 2000 mm wide by 600 mm high.	$	10,000
Consideration should be given to a permanent curb constructed along the guard rail with all flow directed to controlled discharge points, such as a split culvert, that carries the flow to the lined channel at the toe of the slope. “Geocell” would be one possible option to construct the curb. The curb would have to be on the north side of the guard rail to avoid conflict with snow clearing equipment. If such an option were to be implemented, about 150 m of curb would be required. Two controlled discharges, likely 300 m length would be required. Damage noted at 32+850 not significant yet but may need similar type of repair if left unchecked.	$	60,000



KEY MAP

SCALE 1:1 000 000

LEGEND:

HORIZONTAL CHAINAGE 32+100

PHOTOGRAPH LOCATION 7-01

ARMOURED CHANNEL

NOTES:

1 DRAWING MUST BE USED IN CONJUNCTION WITH THE ATTACHED REPORT REFERENCE 13351 DATED NOVEMBER 2018 AND IS SUBJECT TO THE STATEMENT OF LIMITATIONS AND CONDITIONS INCLUDED IN THE REPORT.

2 AIR PHOTO BASE FROM ESRI (DIGITAL GLOBE, 2016).

3 SLIDE FEATURES, PHOTOGRAPHS AND CHANIANGE ARE SHOWN APPROXIMATE ONLY.

0 50 100 200 300 m

Alberta Transportation

PEACE REGION (PEACE RIVER/HIGH LEVEL)

DAISHOWA
HWY 986:01 (PH7)
LOCATION PLAN

FIGURE PH7-1

DRAWN BY	ICB
DESIGNED BY	TTC
APPROVED BY	WCW
SCALE	1:4 000
DATE	OCTOBER 17, 2018
FILE No.	13351-B5A

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	**Photo 7-01.** Looking at protective gabion wall along north side of channel near end of armouring. Previous area of channel erosion and armour breach has since been repaired (32+290).
	**Photo 7-02.** Looking upstream from lower gabion drop structure (32+495).

	**Photo 7-03.** Previous area of geotextile exposure and bank erosion at north side gabion drop structure that has been filled in with additional rip rap (32+500).
	**Photo 7-04.** Upper gabion drop structure (32+540).

	**Photo 7-05.** Previous area of bank erosion and breach of armour on south side, recently repaired with placement of additional rip rap (32+660).
	**Photo 7-06.** North channel inlet structure. Note vegetation and willow growth (32+855).

	**Photo 7-07.** Upper segment of the gabion channel bend and drop structure (31+800).
	**Photo 7-08.** Lower segment of the gabion channel bend and drop structure (31+800).

	**Photo 7-9.** Looking up the ditch slope (east) at end of erosion control section (32+900).
	**Photo 7-10.** Looking upslope the ditch (east) at the pillow concrete erosion control section (32+825). Note rebar protruding.

	**Photo 7-11.** Looking up the ditch slope (east) at the cabled concrete erosion control section (32+700). Nearly all exposed cable loops in this segment have been cut.
	**Photo 7-12.** Looking upslope (east) at weathered and broken interlocked concrete blocks (100 mm thick Lafarge paving stones) (32+660).

	**Photo 7-13.** Looking upslope the ditch (east) at the 300 mm thick gabion mattress erosion control section (32+450). Section had vegetation growth and was performing well.
	**Photo 7-14.** Looking upslope the ditch (east) at the geocell filled with gravel (32+350). Section had vegetation growth and was performing well.

	**Photo 7-15.** Looking upslope (east) at the Coletanche geomembrane erosion control section (32+250).
	**Photo 7-16.** Looking east towards 300 m diameter channel sock erosion control section (32+150). Section had good vegetation growth.

	**Photo 7-17.** Looking east towards rolled erosion control product (turf reinforced matting) section (32+75).
	**Photo 7-18.** Culvert inlet at west end of erosion control section (32+050).