



**ALBERTA TRANSPORTATION GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – PEACE-HIGH LEVEL
2020 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:	12-Jun-2018	3	2	6
Current Inspection:	11-Jun-2020	3	2	6
Road WAADT:	900	Year:		2019
Inspected By:	Ed Szmata, TRANS Rocky Wang, TRANS		Don Proudfoot, TEL Tyler Clay, TEL	
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input checked="" type="checkbox"/> Maintenance Items			

Primary Site Issue:	This area is located at a historic landslide site where erosion on both sides of the highway had been of ongoing concern. Primarily with respect to erosion along the creek on the north side of the road 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. Local mitigation repairs were completed in 2018/19 that included local erosion repairs of the riprap lined channel (i.e. North Channel), torn gabion baskets, side slope erosion rills, geomembrane damaged (Coletanche membrane), and removal of cable concrete tripping hazards.		
Dimensions:	South ditch: 800 m long North channel: 580 m long Slide at 32+500: Shallow		
Maintenance:			
Observations:	Description	Worsened?	
<input checked="" type="checkbox"/> Pavement Distress		<input type="checkbox"/>	
<input type="checkbox"/> Slope Movement		<input type="checkbox"/>	
<input checked="" type="checkbox"/> Erosion	New erosion / washout around culvert intake at the west end of the erosion control test ditch (32+050) (Photo 7-8).	<input checked="" type="checkbox"/>	

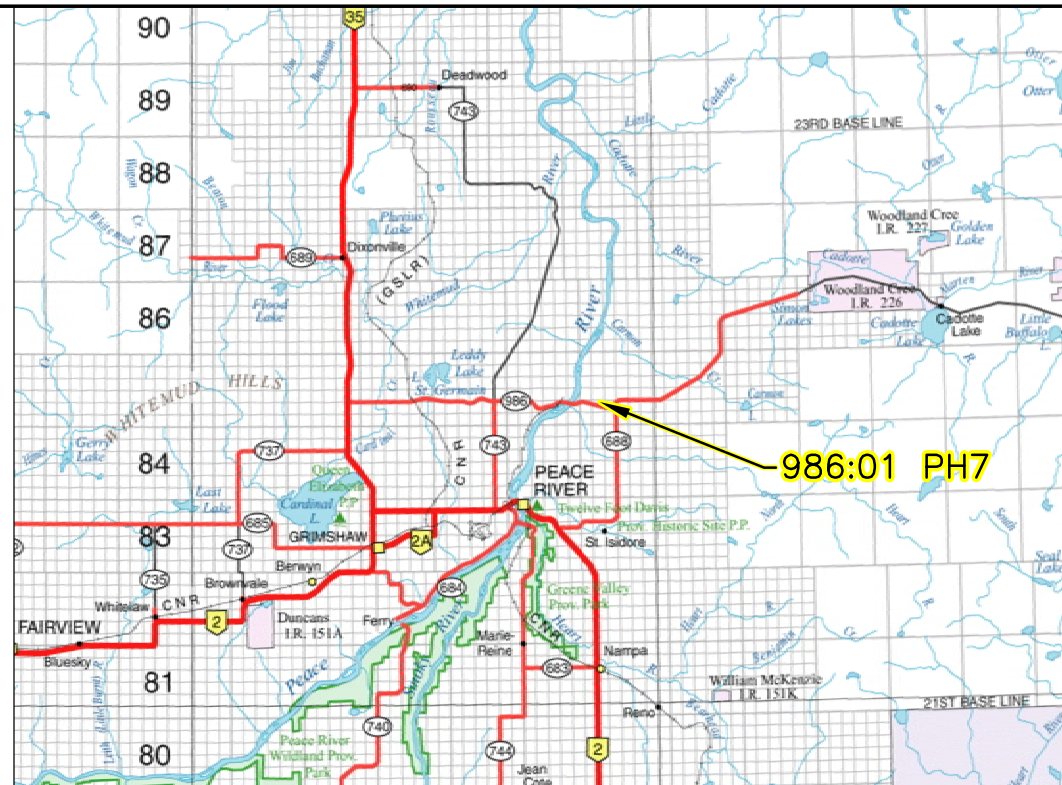
	<p>South Ditch Test Section Summary:</p> <p>TRM Section (32+100) - new channelized erosion damage on the north side of the ditch within the vegetated sediment over the rolled erosion control product (Photo 7-9).</p> <p>Channel Sock Section (32+150) - good vegetation growth but increased channelized erosion at the top of the section near the boundary of the geomembrane section (Photo 7-10).</p> <p>Coletanche Geomembrane Section (32+250) – Membrane was recently patched, the erosion underneath was backfilled and overall appeared to be performing well (Photo 7-11).</p> <p>Geoweb Section (32+400) - Section had vegetation growth and was performing well. Some minor rill damage was noted on the north side of the ditch (Photo 7-12).</p> <p>Gabion Mattress Section (32+500) - Section had vegetation growth and was performing well (Photo 7-13).</p> <p>Paving Stones Section (32+600) - Blocks have deteriorated and broken up in numerous locations and have been undermined by erosion exposing geotextile fabric beneath (Photo 7-14).</p> <p>Cabled Concrete Section (32+150) – Minor erosion/rill damage was noted on the north side of the ditch (Photo 7-15).</p> <p>Pillow Concrete Section (32+750) - Minor concrete deterioration was noted in select areas but erosion mitigation function was not impacted (Photo 7-16).</p> <p>North Channel Summary:</p> <p>(Photo 7-06): inlet had willow growth and condition was comparable to previous inspections. Previous areas of bank erosion and breach of armour have been repaired with additional riprap placement (Photos 71-05).</p>	
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	<p>The two gabion drop structures (32+490 and 32+540) were in good condition except for some bagging and broken wire within the centre of the channel (Photo 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 and was in good condition (Photo 7-01). Within the lower drop structure (31+800) some gabions within the middle of the channel showing some bagging and wire damage (Photo 7-07).</p> <p>Embankment area with rill damage has been repaired and TRM installed, overall appeared in good condition (Photo 7-02).</p>	
<input type="checkbox"/> Seepage		<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Other	<p>Bump in road (32+050) may be a result of frost heave or swelling conditions in the subgrade (no change from 2019).</p>	<input type="checkbox"/>
<p>Instrumentation:</p> <p>No instrumentation installed in this area.</p>		
<p>Assessment:</p> <p>Major erosion and gulying 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 cut flush.</p> <p>The north channel is functioning well and the recent rip rap additions are effective. Some maintenance of gabion baskets within the centre of the channels at the drop structures is required to prevent further damage and rock loss.</p> <p>The large erosion runnels noted on the north highway fill slope have been filled and TRM installed as part of the repairs.</p> <p>The previously noted 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.</p> <p>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.</p>		



The bump in the road at 32+050 should be checked on a regular basis by maintenance personnel to check for pavement damage and traffic rideability safety and repaired if the condition worsens.

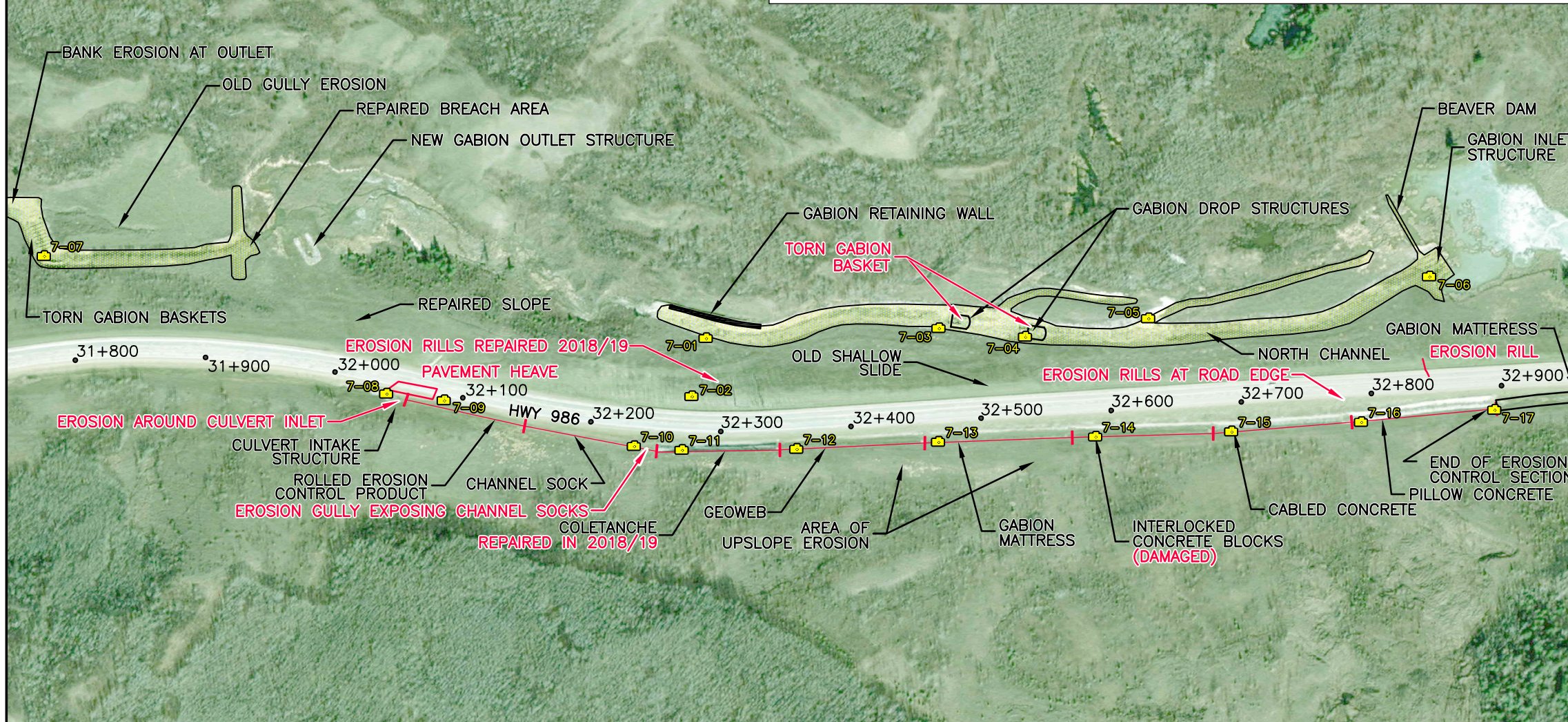
Recommendations:	Cost
The erosion around the culvert inlet (32+050) should be backfilled and riprap reconfigured.	Maintenance
Continue to monitor the site and undertake annual inspections.	-
Gabion baskets in the north channel within the drop structure should be rewired and shaped where they have come apart.	-
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
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
The paving stones section of the south ditch lining will continue to deteriorate and will eventually need to be repaired. Gabion mattress would be a good replacement strategy.	\$ 30,000



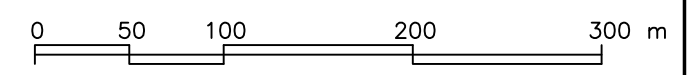
KEY MAP
SCALE 1:1 000 000

LEGEND:

- 32+100
- 📍 7-01
- ▭



- NOTES:**
- 1 DRAWING MUST BE USED IN CONJUNCTION WITH THE ATTACHED REPORT REFERENCE 13351 DATED DECEMBER 2020 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 CHANIANAGE ARE SHOWN APPROXIMATE ONLY.



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	DWP
SCALE	1:4 000
DATE	DECEMBER 14, 2020
FILE No.	13351-C6A





Photo 7-01.
Gabion retaining wall and armoured channel observed in good condition (32+290).



Photo 7-02.
Looking east towards area with previous rill erosion that was repaired in 2018 with backfill and TRM (32+300). Overall area was in good condition.



Photo 7-03.
Looking east, upslope from below two gabion drop structures. Overall the armoured channel was in good condition and recently repaired areas of rip-rap replacement/bank erosion were intact (32+450).



Photo 7-04.
Close-up view of the internal upper gabion drop structure (32+540). Baskets in the channel centre have some bagging and broken wire. Maintenance recommended to prevent further damage / loss of gabion rock. Otherwise structure is intact and functioning as intended.



Photo 7-05.
 Previous areas of bank erosion and breach of armour on south side, repaired with placement of additional rip rap which was still intact (32+650).



Photo 7-06.
 North channel gabion inlet structure. Condition was comparable to previous inspections (32+855).



Photo 7-07.
View of the lower segment of the gabion channel bend and drop structure (31+800). Gabions within the middle of the channel showing some bagging and wire damage that will require eventual maintenance to prevent further basket damage. Overall structure was intact and functioning as intended.



Photo 7-8.
New erosion / washout around the culvert intake structure at the west end of the erosion control test ditch (32+050).



Photo 7-9.
New channelized erosion through vegetated sediment buildup on the north side of the ditch within the rolled erosion control product (turf reinforced matting) test section (32+100).

06/11/2020 12:57



Photo 7-10.
Looking east towards 300 m diameter channel sock erosion control section (32+150). Section had good vegetation growth but increased channelized erosion at the top of the section near the boundary of the geomembrane section.

06/11/2020 13:06



Photo 7-11.
Looking upslope (east) at the Coletanche geomembrane erosion control section (32+250). Membrane was recently patched, the erosion underneath was backfilled and overall appeared to be performing well.



Photo 7-12.
Looking upslope the ditch (east) at the geoweb control section (32+400). Section had vegetation growth and was performing well. Some minor rill damage was noted on the north side of the ditch.



Photo 7-13.
Looking upslope the ditch (east) at the gabion mattress section (32+500). Section had vegetation growth and was performing well.



Photo 7-14.
View of the damage within the interlocked concrete block (i.e. Lafarge paving stones) paving stone section (32+600). Blocks have deteriorated and broken up in numerous locations and have been undermined by erosion exposing geotextile fabric beneath. Overall section is performing poorly.



Photo 7-15.
Looking east towards cabled concrete section (32+700). Section was performing well. Minor erosion damage was noted on the north side of the ditch



Photo 7-16.
Looking east towards pillow concrete section (32+800). Section was performing well. Minor concrete deterioration was noted in select areas but erosion mitigation function was not impacted.



Photo 7-17.
Looking east
(upslope) at the top
of the erosion control
test ditch (32+900).
Ditch upslope of the
test section has been
lined with gabion
mattress as part of
the 2018/2019 East
Daishowa (PH42)
mitigation work. The
ditch and new
mitigation works were
in good condition.