

**GEOHAZARD ASSESSMENT PROGRAM
NORTH CENTRAL REGION – ATHABASCA
2012 INSPECTION**



Site Number	Location	Name	Hwy	km
NC 14	Northeast boundary of the Town of Fort Assiniboine	Fort Assiniboine	661:02	1.8
Legal Description		UTM Co-ordinates (NAD 83)		
NW-1-62-6-W5M		11 N 6023391	E 644779	

	Date	PF	CF	Total
Previous Inspection:	May 4, 2011	8	4	32
Current Inspection:	June 11, 2012	8	4	32
Road AADT:	1090	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:	Slope creep movements causing pavement distress to a sidehill alignment due to seasonal high ground water levels	
Dimensions:	About 250 m long	
Date of any remediation:	None recently	
Maintenance:	None	
Observations:	Description	Worse?
<input checked="" type="checkbox"/> Pavement Distress	10-30 mm depression in the SBL of Mid-Hill section.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Cracks up to 35 mm wide with up to 30 mm differential height across cracks in the Mid-Hill slope section	<input checked="" type="checkbox"/>
<input type="checkbox"/> Erosion		<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	<ul style="list-style-type: none"> ▪ MH#1: Water ponding around the manhole. Approximately 1 m thick silt layer existed at the bottom of the manhole and the drain outlets are submerged under water. Water levels remained unchanged in the manhole since last year ▪ MH#2: MH's cover was locked by someone else and could not be inspected ▪ Ongoing seepage from the metal cover located on the top of the slope above MH#2. 	<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>
Instrumentation: (2SIs and 12 SPs)		
No discernable movement in SI06-6 and 06-11. Water levels fluctuated in the majority of the standpipes by +/-0.3 m.		

Assessment (Refer to attached Figures 1 and 2):

The site observations and the instrument readings indicated that the site continued to show creep movements due to seasonal fluctuations in water levels. In general, the highway conditions did not change significantly since last year, except for at the Mid-Hill slope section. The changes in the highway surface conditions were more perceptible within the Mid-Hill slope section of the highway, presumably due to the infiltration of surface water from past rainfall events into existing open cracks.

The accumulated silt inside MH#1 may have caused partial plugging of the sub-horizontal drain outlets and the outflow pipe (if any). The natural gully upslope of the manhole drains into the manhole. The outlet pipe of the manhole could be connected to the manhole covered with cobbles, located downslope of MH #1.

The existing metal cover upslope of MH#2 is probably a cover for a third drainage collection system. It was not possible to fully remove the cover during the site visit, but significant amount of water flowed out from below the cover when it was disturbed, indicating the existence of a partially plugged drainage collection system below the metal cover.

Recommendations:

In the short term, it is recommended to seal all open cracks in the pavement to prevent surface water infiltration into the landslide cracks. Consideration should be given for patching the Mid-Hill slope section to provide a smooth ride to travellers on the highway.

As mentioned previously, the sub-horizontal drains in both manholes should be flushed on a periodic basis to maintain drainage of the slope.

Flushing MH #1 drains will first require hydrovacating the accumulated silt inside the manhole to expose the drain outlets. To flush both manhole drains, it is better to dig down around the manholes to expose the drain pipes, cut-off the flexible hose connecting the PVC drain pipes to the manholes, flush the solid drain pipes, install solid connection pipes and backfill the excavation. Otherwise, a field person will need to enter the manholes, which would be difficult considering the small diameter manhole (MH#2, 0.6 m in diameter).

Ideally, both manholes should be excavated out and replaced with bigger diameter manholes complete with inside ladders for future access and flushing. The excavations around new manholes should be backfilled with washed rock enveloped in a non-woven geotextile fabric. A screened inlet will be required for MH #1 to drain the surface water from the existing creek into the manhole.

With regard to the existing metal cover above MH#2 location, it is recommended to remove the cover to check the source of water. If a third manhole exists below the cover, it is recommended as a minimum to pump the trapped water, hydrovac the silt (if any) inside the manhole, and flush the drains (if possible). If it is required to replace the manhole at this location, equipment access could be very challenging due to the steepness of the treed slope.

Although we completed Part A for this site, we could not find any details about the drain pipes and the drainage collection manholes. Any existing plans showing the implemented drainage scheme will be beneficial for future planning of drainage improvement.