

4.8 S10 – HIGHWAY 762 S10(A)

Background

Site A is located on Secondary Highway 762, approximately 12 km south of the junction with Highway 22X (as measured along the highway).

The highway is oriented roughly north/south along a cross slope down to the west at this site. There is limited background information available regarding this site. It is understood that there was a failure at this site in the mid-1990's – either a failure of the road subgrade and/or slope instability in the underlying native soil and the slope face downslope (west) of the road. This instability required temporary closure of at least the southbound lane of the road prior to repair. There are no details currently available on the associated investigation and repair aside from that the road was reconstructed with granular fill.

Settlement and cracking of an approximately 30 m long segment of the southbound lane at this site has been ongoing since approximately 2000. The semi-circular pattern of the cracking suggests a slump failure down towards the west. Asphalt overlays have been placed at this site at least annually since 2002.

Annual assessments have been performed at this site by AIT and AMEC personnel since the spring of 2000.

AMEC drilled a series of boreholes and installed two SI's and two pneumatic piezometers at this site in March 2007. This work followed from recommendations in the previous annual inspection reports to characterize the subsurface conditions and slope instability at this site. The most recent readings of these new instruments were taken in June 2007.

Site Assessment

The site assessment was performed on June 18, 2007. The weather at the time of the site assessment was partly cloudy and there had recently been a rain shower at the site.

The site assessment covered the highway surface as well as the slope face below (west) of the highway.

Observations

The following points summarize the observations made during the site assessment. Please also refer to Appendix S10 for a site plan and photographs of the site.

- An overlay had recently been placed across the entire road surface at the site, therefore it was not possible to confirm magnitude of damage to the road surface since the 2006 annual inspection. Photos S10(A)-1, 3 and 4 show views of the site from the time of the site inspection.

- It is inferred that the recent overlay was placed in order to mitigate continued settlement and cracking of the road surface in the same pattern as observed during the previous annual inspections. This damage was noted during the borehole drilling March 2007 as well.
- The slope face below (to the west of) the road had not changed significantly since the previous inspections. The apparent toe bulge around the toe of the road fill embankment slope to the west of the fenceline did not appear to have changed significantly.

Overall, the conditions at this site do not appear to have changed significantly since the previous annual inspection.

Assessment and Risk Level

Based on the current conditions at this site, the assessment and recommended Risk Level for this site from the 2005 and 2006 annual inspections have not changed. In summary:

- The settlement and cracking has been treated as a maintenance issue to date and in recent years has required at least annual repaving of the site. The approximately 30 m long segment of the highway affected by the settlement and cracking does not seem to have changed significantly since the annual assessments started in 2000.
- The data from the March 2007 borehole drilling, instrument installations and subsequent instrument readings indicates that the road surface at this site is underlain by approximately 6 m of granular backfill. This is consistent with the expected conditions based on the previous annual inspections and the limited background information available for this site. As of the June 2007 readings, the depth of any downslope movement in either of the SI's was not yet confirmed.

Therefore, AMEC recommends the following Risk Level factors for this site:

- A Probability Factor of 11 in order to reflect the estimated "moderate" rate of movement that appears to have increased in recent years. The future data from the SI's that were installed at this site will help to clarify the depth, rate and trend of movement over time.
- A Consequence Factor of 4 based on the understanding that the mid-1990's failure caused the closure of at least one lane of traffic and the assumption that the recently observed settlement and cracking could cause the same damage if full reactivation of the movement occurred or if it is not repaired as required on an ongoing basis.

Therefore, the recommended Risk Level for this site is 44, which is the same value recommended after the 2005 and 2006 assessments.

Recommendations

AMEC recommends the following future work for this site:

Borehole drilling and installation of the previously-recommended SI in the area to the west of the fenceline below the damaged segment of the road surface. AMEC has an approved scope of work for this and will do so upon confirmation of landowner permission and whether or not the drill rig can access this location. An SI at this location will provide information as to whether or not any slope movement measured in the SI's in the road extends below and beyond the highway fill embankment and provide a basis to determine if a toe berm/buttress could stabilize the embankment.

Develop repair options for this site based on the borehole, instrument and survey data. AMEC has an approved scope of work for this task and will be completing it in the near future. AIT can then review the repair options and select one for detailed design, tendering and implementation.

AIT and/or maintenance contractor personnel should check the settlement and cracking conditions at this site regularly. This would provide a level of due diligence in case the rate of settlement accelerates and cautionary signage and/or repaving is required promptly.

The semi-annual instrument readings should be continued.

The annual site assessments should be continued.