

S10 – SECONDARY HIGHWAY 762 MISCELLANEOUS SITES

AMEC responded to a call-out request by AIT for the three miscellaneous sites along Highway 762 on June 21, 2005. The report for this call-out request was submitted to AIT under separate cover¹. The following subsections summarize the observations from the June 27, 2005 site inspections by AMEC and AIT personnel, with reference to the report on the June 21, 2005 call-out.

Site 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.

At least three overlays have been placed at this site in recent years – one each in 2002, 2003 and 2004.

Annual assessments have been performed at this site by AIT and AMEC personnel since the spring of 2000. AMEC also inspected the site during a call-out request by AIT on June 21, 2005.

Site Assessment

The site assessment was performed on June 27, 2005. The weather at the time of the site assessment was overcast with light rain.

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

¹ AMEC letter report dated June 30, 2005, "Geotechnical Risk Management Program, Highway 762 Sites – Call-Out Request – June 21, 2005".

Observations

The following points summarize the observations made during the site assessment. Please also refer to Appendix S10 for annotated photographs.

- Significant cracking and settlement had occurred in the southbound lane since the 2004 inspection. Photos S10(A)-1 to S10(A)-4 show the damage to the road surface. The location and pattern of the cracking was consistent with that noted in previous years. The separation and downdrop across the cracks varied up to 75 to 100 mm at the time of the inspection. The width of the cracking area, as measured along the west shoulder of the road, was approximately 30 m. The cracking had an overall semi-circular layout in plan view, with cracking extending to a maximum of 0.6 m east of the road centerline. This pattern is suggestive of a slump failure down towards the west.
- The site was marked for the application of an overlay this year, as shown in Photo S10(A)-2.

Discussion

The settlement and cracking affecting the southbound lane are continuing in the same pattern as noted during previous assessments and appears to have worsened significantly in response to the heavy rains during June 2005.

Assessment and Risk Level

The settlement and cracking has been treated as a maintenance issue to date and in recent years has required annual repaving of the site. The size of the portion of the road affected by the settlement and cracking at this site does not seem to have changed significantly since the annual assessments started in 2000, however the magnitude of the cracking noted during the 2005 inspection is greater than previously noted. It appears that the instability may extend into the native soils underlying the road embankment, however there is some uncertainty regarding this in the absence of information on the subsurface conditions and the instability mechanism(s).

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

- A Probability Factor of 11 (an increase from 9 recommended in 2004) because the rate and magnitude of the cracking and settlement has increased since the 2004 inspection. because the ongoing cracking and settlement has led to up to approximately 50 mm of vertical displacement since July 2003.
- 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 currently 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 an increase from the value of 36 recommended after the 2004 assessment.

Recommendations

AMEC recommends the following future work for this site:

Perform a site investigation and follow-up instrumentation readings in order to gather information on the subsurface and stability conditions and provide a basis for the design of remedial measures. AMEC submitted a proposal for this work to AIT in early 2005 and will revise and resubmit the proposal to AIT during the summer of 2005 as discussed on site.

Remedial measures should be considered for this site. As noted, the information from the recommended site investigation is required in order to fully consider practical options for remedial measures and their approximate costs.

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 annual site assessments should be continued.