

## **S8 – FISHER CREEK**

### **Background**

The Fisher Creek site is located on Secondary Highway 762:02, approximately 2 km north of the junction with SH 549 and approximately 900 m north of the Fisher Creek bridge.

The highway runs north-south on a cross-slope down to the west in this area. Settlement and cracking of the road surface was first noted at this site in 1988. Several geotechnical investigations have been performed by the Municipal District, AIT and consultants working for AIT since that time. These investigations generally concluded that the settlement and cracking of the road surface was the result of surface drainage percolating into poor-quality fill and remnant organic matter underlying the road alignment. Remedial measures including lime/gravel columns and the installation of a drainage blanket are understood to have been installed, however the available records of this work are discontinuous and incomplete. Please refer to Section A of the site binder for further discussion.

The most recent geotechnical investigations at this site were performed by AMEC in 2001 and 2002 in response to continued settlement and cracking at the north end of the site and the observation of additional cracking at a previously undisturbed area at the south end of the site. AMEC submitted the design for two shear keys to repair the damage to the road and prevent future settlement and cracking to AIT in the fall of 2004.

### **Site Assessment**

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

Please refer to Appendix S8 for a site plan illustrating the layout of the site. The assessment covered the highway surface through the settlement and cracking areas 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 S8 for a site plan and annotated photographs illustrating key observations.

- No significant new cracking was noted in the previous cracking and settlement areas at the north and south ends of the site. Photos S8-1 and S8-2 show this area.
- The slope faces to the east (upslope) and west (downslope) of the road were in good condition with no visible signs of significant slope instability.

- The east (upslope) road ditch was in good condition after the heavy rains in June 2005. The portion of the ditch that is lined with rip-rap placed over filter cloth did not show any damage from high volumes of ditch flow.
- The protective cover over the piezometer cables in Borehole 2002-2 was missing and appeared to have been sheared off of the borehole casing by a snowplow during the previous winter. Photo S8-3 shows this borehole within the southbound lane of the road.
- Groundwater seepage discharge was noted on the slope face below (to the west of) the road, at the location downslope of Borehole 2002-2 as shown on Figure S8-1.
- Portions of the road at the site were marked with spray-painted lines for the application of an overlay this year.
- As noted in previous reports, the SI in Borehole 2002-3 was paved over and cannot be accessed for instrument readings.

### **Discussion**

There has been little to no cracking and settlement of the road surface at this site since the previous annual inspection and it appears, as of June 27, 2005, that the heavy rains during June 2005 did not trigger any increased instability at this site. The SI's at the north end of the site have been sheared-off or paved over since 2002, therefore there is no subsurface monitoring of the previously-noted movement zones below the north end of the site to confirm if the movement has stopped in the past year. The two remaining functioning SI's at the south end of the site have shown no significant movement since the fall of 2004.

The June 2004 repaving of the site has effectively "re-set" the road surface and will provide a good benchmark for the future observations of the crack development and settlement at both the north and south ends of the site.

### **Assessment and Risk Level**

AMEC has previously recommended separate Risk Levels for the north and south ends of the site, however given the instrument data since the fall of 2004 and the observations from the current site inspection AMEC recommends that a single Risk Level be assigned to this site as follows:

- The Probability Factor should be set at 8 to reflect the apparent recent inactivity of the cracking and settlement but with a high level of uncertainty if it will remain inactive given the heavy rains in June 2005.

- The Consequence Factor should be set at 4 to reflect the magnitude and extent of previous damage to the road surface at this site, which could reasonably be expected to occur again if the settlement and cracking started again.

Therefore, the current recommended overall Risk Level for this site is equal to 32.

### **Recommendations**

AMEC recommends the following future work for this site:

The implementation of remedial measures should be deferred pending the installation and monitoring of additional instrumentation. The purpose of the additional instrumentation would be to check if the previously-noted movement at the north and south ends of the site is actually a single, continuous area of instability – if so the previous design of two separate shear keys (one for the north end of the site and another for the south end of the site) should be revised to combine them as necessary to stabilize the entire site.

**The semi-annual readings of the instrumentation at the south end of the site should be continued.**

**The paved-over SI in Borehole 2002-3 should be recovered and read.**

**The protective cover for the piezometers in Borehole 2002-2 should be replaced.** AMEC has provided contact information for the supplier of the protective cover to AIT so that the maintenance contractor can take care of this.

**Annual assessments should be continued.**