

Highway 940 – Km 26.1 Cut Slope

This site is located immediately southbound from the Vicary Creek bridge and approximately 26 km northbound along Highway 940 from the intersection between Highway 940 and Highway 3, in Coleman, AB. The site location is shown on Figures B1 and B3 in Appendix B. The site coordinates are listed in Table B1 in Appendix B.

The site inspection was performed on September 27, 2008 by Mr. Andrew Bidwell, P.Eng. of AMEC.

Background

AMEC is not aware of any previously reported problems or repair work at this site. The September 2008 site inspection was performed as part of the Highway 940 geohazard corridor review.

A general description of the geological and climatic conditions in this area is presented in Section 5.2 of this report.

Site Observations

- There is an 8 to 10 m high cut slope at 36 to 38° inclination along an approximately 40 to 50 m segment of the north/upslope side of the highway at this site. The cut slope exposes rocky soil, with up to boulder-sized rocks visible. Photo 940-27 shows a general view of the cut slope.
- There is no ditch along the north side of the road. Rocks that have eroded out from the cut slope have slid and/or rolled downslope and come to rest along the north/upslope edge of the road. As shown in Photo 940-29, up to boulder-sized rocks were present along the edge of the road at the time of the site inspection.
- The road surface adjacent to the cut slope is approximately 12 m wide. Downslope of the road there is an approximately 10 m high slope at 36° inclination down to the left bank of Vicary Creek.
- There are some minor low spots along the south/downslope side of the road that may in the future become prone to erosion from concentrations of surface runoff from the highway similar to the Km 25.9 Erosion site. However, at the time of the site inspection there did not appear to have been any significant erosion and loss of road width at this site.

Assessment

There is a potential for large rocks to erode and ravel out from the cut slope and then slide or roll into the traffic lanes of the highway, particularly with the lack of a ditch along the toe of the cut slope to contain any such rocks. None of the rocks from the slope were in the traffic lanes at the time of the site inspection, however it is possible that they do roll onto the road at other times and are later pushed to the edge of the road by maintenance crews.

There is a potential for concentrations of surface runoff from the road to flow through the low spots along the south/downslope edge of the road, causing erosion and loss of road width similar to the Km 25.9 Erosion site.

Risk Level

The recommended Risk Level for this site, based on AT's rockfall risk matrix, is as follows:

- Probability Factor of 13 to reflect the apparent numerous rocks each year that roll and/or slide down the cut slope to the edge of the road and possibly into the traffic lanes.
- Consequence Factor of 2 based on the probable minor damage to vehicles striking the typical size of rocks that may roll out into the traffic lanes.

Therefore, the current recommended Risk Level for this site is 26.

Recommendations

Maintenance and Short Term Measures

The accumulation of cobble to boulder-sized rocks along the north edge of the road should be removed. Future accumulations of such rocks should also be removed in order to keep the amount of rocks along the edge of the road at a practical minimum.

Medium To Long Term Measures

A small ditch/swale should be excavated along the north side of the road to ensure that rocks sliding or rolling down the cut slope are contained within the ditch and do not roll into the traffic lanes. Such a ditch would also reduce the reliance on ongoing and timely clearing of the accumulated rocks from along the edge of the road.

Hwy 940 – Km 26.1 Cut Slope

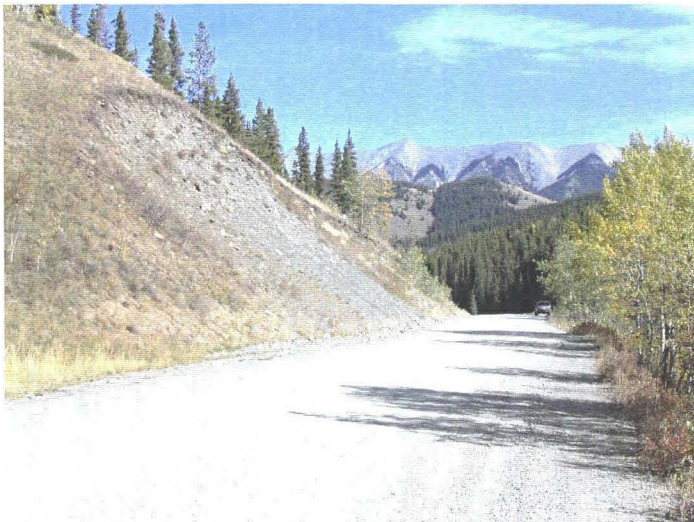


Photo 940-27 (top) – Facing east/northbound across the cut slope at the Km 26.1 site.



Photo 940-28 (middle) – Closer view facing east/northbound. Note the lack of a ditch and the accumulation of material eroded from the cut slope along the upslope side of the road.



Photo 940-29 (bottom) – A boulder-sized rock that has been eroded from the cut slope and come to rest along the edge of the highway.