Site 22 – Gap Mountain Cut Slope

This site consists of a soil and rock cut slope along the northeast side of the highway approximately 3 km south of the Elpoca Creek crossing. There is a warning sign ("Watch For Fallen Rock") posted for northbound traffic approaching this site.

The cut slope at this site has a maximum vertical height of approximately 10 m. The cut slope exposes both soil and bedrock, and can be divided into two general segments along the highway:

- Northern End: The upper portion of the northern end of the cut slope exposes rocky soil at an angle of about 45°. The lower portion of the cut slope exposes bedrock at an angle of approximately 60°. Gullying of the exposed soil has released cobble to boulder-sized debris which has accumulated as an apron along the toe of the slope and within the ditch. At the time of the inspection, the volume of material in the ditch was such that some debris had rolled down and been deposited within 2 m of the edge of the pavement. There were no signs of damage to the pavement from previous rockfalls. Photos 1 and 2 show views of the northern end of the site.

- Southern End: The exposed soil in the upper portion of the cut slope tapers out towards the southeast, such that only rock is exposed in the southern end of the cut slope. The overall slope angle is 45°, with the lowermost 2 to 3 m of the slope at approximately 60°. At the time of the inspection there was very little rockfall debris in the ditch in this area. Photo 3 shows the southern end of the site.

The ditch along the toe of the slope is typically 6 m wide and 1.25 m deep. The ditch sizing criteria shown on Figure B1 in Appendix B indicate that for a maximum cut slope height of 10 m and slope angles between 45° and 60°, the ditch should be at least 4.7 m wide and 1.8 m deep. The existing ditch exceeds this width criteria however it does not meet the depth criteria. Based up on the distribution of debris in the ditch and that lack of evidence of rockfalls reaching the road, it is judged that the existing ditch is sufficient.

Based on the distribution of debris within the ditch, the most significant rockfall hazard at this site is along the northern end of the cut slope.

AMEC recommends the following Risk Level factors for this site using the rock fall frequency-severity matrix:

- Probability Factor of 14 based on the volume of debris in the ditch below the northern end of the cut slope that suggests that at least several rockfalls occur each year.

- Consequence Factor of 1 based on no visual evidence of past rockfalls reaching the paved surface of the road.

Therefore, the recommended Risk Level for this site is 14. This Risk Level value is contingent upon the ditch being cleaned out as necessary to maintain its capacity to hold the rockfall debris.

It is recommended that the accumulated debris be cleared from the ditch. The ditch should also be cleaned as required in the future. This should be treated as an ongoing maintenance issue with cleaning performed as required.

Photo 1 (top) – Facing southeast across the site. The northern end of the cut slope (visible in the foreground) exposes rocky soil at an angle of 45° overlying a rock cut at about 60°. Gullying of the exposed soil has released cobble to boulder-sized rocks and an apron of this debris has built up along the toe of this segment of the cut slope. Cobble to boulder-sized material has been deposited within 2 m of the edge of the pavement. The thickness of the exposed soil in the upper portion of the cut slope tapers out towards the southeast. The southeast end of the cut slope (in the background of this photo) exposes intact bedrock at an overall angle of 45° with very little debris in the ditch below.

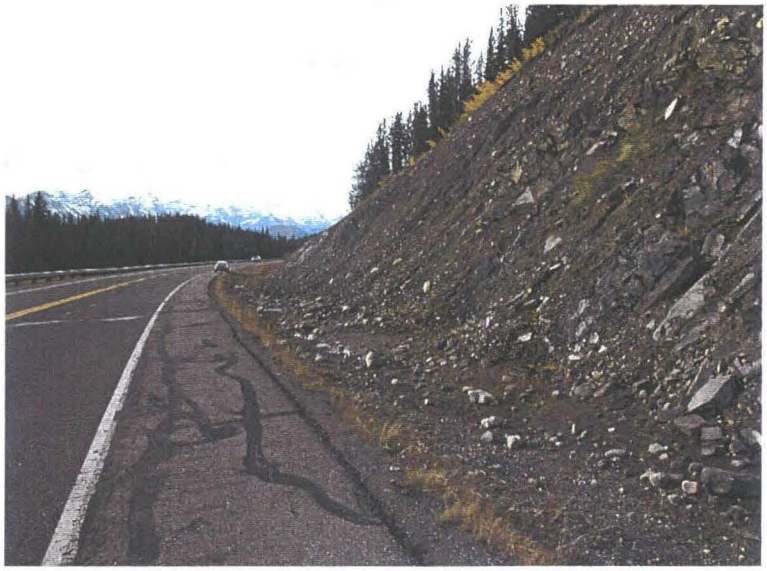

Photo 2 (middle) – Facing northwest across the northern end of the cut slope. Note the proximity of the debris in the ditch to the edge of the pavement.

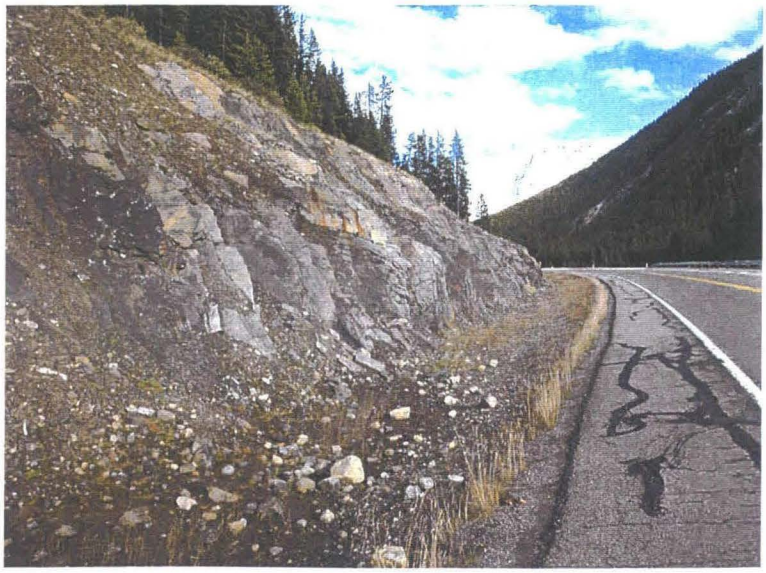

Photo 3 (bottom) – Closer view of the southern end of the cut slope that exposes rock. The overall cut slope angle is around 45°. The lowermost 2 to 3 m of the cut slope are at approximately 60°. There was very little debris in the ditch below this segment of the cut slope.