Site 41 – East of Eyrie Gap Rock Cut I

This site consists of a rock and soil cut slope along the northeast side of the highway. The maximum vertical height of the cut is approximately 7 m with a variable cut angle, typically around 45°. The lower portion of the cut exposes highly fractured rock that dips at approximately 45° down towards the northwest. This dip direction is oblique to the highway alignment and therefore slightly unfavorable from a slope stability perspective.

At the time of the inspection there was abundant cobble to boulder sized rockfall debris in the ditch and one boulder was approximately 1 m from the edge of the pavement (Photo 1). There were no rocks on the road or visible asphalt damage due to previous rockfalls at the time of the inspection. There was also debris from a flowslide of the upper (soil) portion of the cut slope blocking the ditch at one location (Photos 1 and 2).

The width of the ditch typically ranges between 5 and 6 m. The depth of the ditch is typically 1 to 1.25 m. For a maximum slope height of 7 m, the ditch sizing criteria shown on Figure B1 in Appendix B indicate that the ditch width should be at least 4 m and the ditch depth should be at least 1.5 m for a 60° slope which is the least conservative assumption for the variable slope angle at this site. The existing ditch exceeds the width criteria but does not meet the depth criteria. However, given the distribution of rockfall debris noted during the site inspection it is judged that the existing ditch is sufficiently large, albeit possibly without a significant margin of safety against rocks rolling onto the road.

The northwestern end of the site transitions into a cut slope entirely in soil and an apron of soil debris has built up in the ditch and reduced the effective width of the ditch by about 50% (Photo 3). The exposed soil in the upper portion of the cut slope in this area includes cobble sized rocks, some of which have been released during erosion of the soil, rolled across the apron of accumulated soil in the ditch and been deposited on the sideslope of the ditch adjacent to the road.

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

- Probability Factor of 13 based on observations of debris from several rockfalls judged to have occurred in the past year along with the soil flow slide.

- Consequence Factor of 2 based on the possibility for rocks to be deposited along the upslope edge of the road surface due to the volume of rockfall debris currently accumulated within the ditch.

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

It is recommended that the accumulated rock and soil debris be cleaned from the ditch in order to restore the full capacity of the ditch and reduce the Consequence Factor to 1

and the Risk Level to 13. Also, the debris should be cleaned from the ditch as necessary in the future and this should be treated as an ongoing maintenance issue.

Photo 1 (top) – Rock and soil cut slope along the northeast side of the highway. The overall cut slope angle is about 45°. The bedding dip in the rock is approximately 45° in an unfavorable orientation relative to the highway alignment. Note the rockfall debris in the ditch, including a boulder approximately 1 m from the edge of the pavement.

A flow slide has also occurred in the soil exposed in the upper portion of the cut slope and deposited debris into the ditch.

Photo 2 (middle) – Flow slide debris from upper portion of cut slope that has blocked the ditch.

Photo 3 (bottom) – The northwest end of the cut slope. An apron of soil debris has built up in the ditch and reduced the effective width of the ditch by about 50%.