

SECTION A – FILE REVIEW

Site Location

- ▶ This site is located on Highway 3, approximately 500 m west of Bocket, Alberta, and approximately 1 km westbound along Highway 3 from the junction between Highway 3 and Rand Road 284. At the site location, Highway 3 is a paved, three lane, undivided roadway with two eastbound lanes ascending towards Bocket, AB, and a single westbound lane descending towards a bridge that crosses Pincher Creek approximately 1.5 km westbound from the site.
- ▶ 8-7-28 W5M
- ▶ UTM Coordinates: Easting 298973, Northing 5491984 (NAD83, Zone 12U)
- ▶ NTS Mapsheet 82H/12

Chronological Background

Table 1A provides a chronological background for this site.

Site Geology, Hydrogeologic and Geomorphologic Setting

Based on test hole and pit logs available in AT files and mapping of the valley wall exposures, the surficial soils comprise a sequence of medium to high plastic glaciolacustrine silty clays with occasional lenses or discontinuous beds of sands and gravels. Underlying the surficial soils is a stiff to hard clay till, which overlies clay shale bedrock.

There is an absence of well-defined surface drainage features and reports of seasonally flooded basements, indicating the existence of artesian pressure and an underground drainage system which discharges to the riverbank escarpment. These adverse groundwater conditions are expected to have been a significant factor in the slope instabilities.

Description of Past Site Problems and Investigations

A geotechnical assessment and detailed file review was completed by Thurber Engineering in 1998. This report can be located in Section G of this binder.

Description of Mitigative Measures Implemented

In Fall 1978, it was reported that about 20 horizontal drains were installed in six areas. A section of Range Road 284 was rebuilt with lightweight fill (sawdust and woodchips) in 1979.

Two gabion basket retaining walls were built in 2002 in “Area A” and “Area B”. Refer to the Thurber Engineering report in Section G of this binder for more information.

Table A1 – S39– Highway 3:06, West Brocket Hill Slide
Chronological Background

Date	Description
Fall 1978	20 Horizontal drains installed in six areas by AT.
1979	A section of Range Road 284 was rebuilt with lightweight fill (sawdust and woodchips) in 1979.
1998	Thurber Engineering conducted a detailed file review and geotechnical assessment. Slope at the site had been subject to several failures in the past. Surficial soils comprise a sequence of medium to high plastic glaciolacustrine silty clays. There is absence of well-defined surface drainage features. Retaining walls were recommended in two areas. Report located in Section G of this binder.
2002	Repair works installed at “Area A” and “Area B”. Gabion basket retaining walls installed at both areas.
June 1, 2011	Site first inspected by AMEC as part of a call-out request. Cracking in the pavement was noted along the north shoulder of the highway. There was a large landslide in the valley slope below the highway which appeared consistent with a series of rotational failures. Visible signs of groundwater discharge in the lower and middle portion of the slope. Recommended risk level set to 40. Recommendations included constructing an asphalt berm along the north edge of the pavement surface, sealing existing cracks and any new ones that form, and re-inspecting two weeks following during the annual tour. Investigations recommended included airphoto review, borehole drilling for instrument installations, site surveys, and development of repair options.
June 21, 2011	Annual site inspection by AMEC and AT personnel. No significant changes since call-out inspection. No change to recommended risk level or recommendations.
June 2012	Annual site inspection by AMEC and AT personnel. Site in similar condition to previous inspection. Extent of cracking in road surface had increased slightly. An asphalt berm had been constructed on the north shoulder and was functioning as intended. Recommended risk level reduced to 36. Recommendations included maintenance of the roadway and asphalt berm and a geotechnical inspection.
May 2013	Annual site inspection by AMEC and AT personnel. Site in similar condition to the previous inspection. Asphalt berm was no longer effective due to settlement of the road surface; water was ponding at the road edge. Risk level remained at 36. Recommendations included maintenance of asphalt berm, installing a geosynthetic reinforced wall system for temporary support, and a geotechnical investigation.
August 2013	Site visited on a call-out request. Slope had numerous seepage zones with wet soil or visible seepage. Recent soil flows and rotational features were present on the slope above. Recent slide activity was apparent at several area across the site but considered minor. Repair works installed in 2002 in good condition. Boreholes and flush-mounted casing protectors visible along the road shoulder at two areas, upslope of the retaining walls. Horizontal and trench drains were located. Drains were wet but not flowing. Risk level reduced to 18. Recommendations included obtaining 2002 construction information, further investigation of rotational slide to determine if mitigation is warranted.

<p>May 2014</p>	<p>Annual site inspection by AMEC and AT personnel. Landslide and site conditions had not changed significantly since previous inspection. Erosion and retrogression along the headscarp appeared active. Asphalt berm had been rebuilt and was functioning properly. Risk level remained at 36. Recommendations included maintenance of the asphalt berm and road surface, construction of a pile wall or geosynthetic wall, and a geotechnical investigation.</p>
<p>May 2015</p>	<p>Annual site inspection by AMEC and AT personnel. Landslide conditions had not changed significantly since previous inspection. Cracks in the road surface were more developed than before. Asphalt berm had settled and was no longer effective. Retrogression was most active in the middle of the scarp. Recommended risk level increased to 44 due to the fresh cracks in the road shoulder. Recommendations included repairing asphalt berm, installing a pile wall or geosynthetic reinforced wall and a geotechnical investigation.</p>