



BRIEF SITE SUMMARY
AND
RISK ASSESSMENT

1. Site (GP#33) Hwy 40:36 Southview (culvert) Slide
@ km 39.4
2. Reference Location along Highway (i) Hwy 40:36 at about 43 km distance
south of Kakwa River bridge
(ii) Alternately, at Km 39.4 of Hwy 40:36 and at a
centerline CSP culvert (Sta. 43+580) location to bound
the site's west edge (Grande Cache direction)
3. Legal Description Section 27, Twp 59, Rge 6, W6M
4. UTM Coordinate N 5,999,773 E 381,629
5. AT File
6. Alberta Transportation Plan and Profile
7. General Description of Instability

Sliding movement of a low embankment fill and/or its underlying soils was suspected because a resemblance of headscarp crack was reflected through the highway pavement. This site is located about 43km distance south of Kakwa River Bridge. At this location, the highway is constructed along the top verge of the valley slope of the Smoky River valley which forms part of the mountain terrain along the fringe of Rocky Mountains.

A research of highway mosaic indicates the site can be located at about Km 39.4 of Hwy 40:36 and the site's west edge (Grande Cache direction) is bounded by a centerline CSP culvert (Sta. 43+580) which channels flow from a stream from the backslope (back-country flat area). Information on highway design mosaic indicated that this embankment is constructed along a sidehill terrain and seepage along fill footprint can be probable because vicinity areas indicated historic presence of wet ground conditions.

- This affected area is located just north of the "historic" area of groundwater seepage exits and subdrains (connected by manholes) were previously installed along highway ditch at time of early 1980 highway grading construction. This was the old area where groundwater seepage from mountain backcountry flows transverse to the highway was historically

intercepted by a subdrain system along highway ditch along some sections of highway at top elevations of Smoky river valley slope.

- Thus, this distress site falls under the similar category of adverse groundwater seepage influence.

More details of site is as follows:

- A headscarp crack was apparently under development and extends about 150m to 200m with portion of crack crossing the pavement centreline.
- The highway is located along the mid-to-top verge of the mountain terrain of Smoky River valley slope which heights can extend to about 200-300m (estimate only) from road elevation down to river level.
- The highway is constructed with common fill of about 1-2m (at 4H:1V to 5H:1V sideslope) along the sidehill of river valley.
- On the backslope side, there is a flat area of sparse shrub growth which might be a likely previous borrow excavation area as the area comprised of non-native sparse vegetation growth. A stream skirts around the backslope mountain area of this flat scarce shrub area. The stream flow is channeled across the highway via the culvert at Sta. 43+580. A source of groundwater feed from higher elevations is apparent for this area.
- The west edge (Grande Cache direction) of slide affected zone (150m to 200m along highway) is bounded by this culvert (Sta. 43+580).
- To the east (Grande Prairie direction) of this culvert, wet subgrade ground can be observed along sideslopes of this low fill embankment. Apparently, seepage flow transverse to through below footprint of fill roadway can be occurring.
- The east edge of this slide affected area is bounded by a small cut (estimated at Sta. 43+900).

8. Date of Initial Observation

2006 Slide Tour

9. Date of Recent Observation

2008 Slide Tour

Recent Site Conditions

The site was observed to have not deteriorated much from that observed in previous year. However, it was observed that

- the inlet end of the culvert might have been severed to have possibly caused a wetting and seepage along the footprint of the highway fills. The wet ground conditions were observed at the adjacent areas of sideslope at downstream side beside the culvert outlet area. (toward Grande Prairie direction).
- There is a small scour drop hole at outfall channel area of the culvert outlet. The scour drop hole should be in filled with erosion resistant rocky material to deter further downcut erosion of channel.

Future Strategy

This site was reviewed as not deteriorating. Future strategy will be that:

- this site will be categorized as INACTIVE for the time being. Should future deterioration of site be observed, future site inspection assessment will be re-initiated.

10. Instrumentation Installed

None

11. Instrumentation Operational

None

12. Risk Assessment

$$PF (8) * CF (3) = 24$$

PF (8)

- Active but with moderate rate of movement

CF (3)

- Road embankment movement will affect roadway serviceability but should not invoke closure of roadway

Note:

The risk assessment is provided based on a categorization of Hazard Probability Factor (PF) and Consequence Factor (CF) as provided by AIT's RFP 2000.

PF 1 to 20 scale

CF 1 to 10 scale

13. Geotechnical Conditions

The site is located in a mountainous area along the north fringes of the Rocky Mountain foothill and at top verge of the valley slope of the Smoky River.

From published information for this area.

The surficial deposits should be of colluvial deposits derived from local bedrock. The surficial deposits may resemble till in high plateaus and henchlands, very stony with sand loam to clay loam matrix. The morphology and relief can be in shape of stone stripes, circles, boulder fields (at Elev. +1800m); or otherwise found as a thin veneer mantling high relief hill and plateaus. The thickness can be variable, generally at 1m range and may exceed 2m in solifluction lobes.

The local bedrock should be of Paskapoo sandstone found in upland plateaus and Blackstone, Cardium, Wapiiabi, Brazeau sandstone in foothills commonly mantled in colluviums.

The local terrain can be steeply sloping scarps and ridges of moderate to high relief with a 0.5m to 2.0m depth of weathered bedrock .

The highway embankment is constructed along the mid-to-top verge of the mountain terrain of Smoky River valley slope which heights can extend to about 200-300m (estimate only) from road elevation down to river level. It can be probable that groundwater seepage maybe occurring along fill footprint. Or, surface flow water seepage from a broken culvert maybe likely the cause of wettening along fill footprint to destabilize the fills.

14. Chronology

2007 Slide Tour to initiate observation of the site

2008 Slide Tour to de-active observation of site because of no obvious deterioration of site conditions.

END