PART B: 2003 SITE VISIT
LANDSLIDE RISK ASSESSMENT
PEACE REGION (PEACE RIVER VALLEY/HIGH LEVEL)

SITE PH11: WHITEMUD RIVER CROSSING

LEGAL LOCATION: 88-21-W5M

Location along Highway: Station 42+600 to 46+000

AT FILE: SH743:02

Date of Site Visit: 28 May 2003

Secondary Highway 743:02 approaches the valley of the Whitemud River from the south, turning towards the west as it crosses the valley. The valley is approximately 150 m deep. The road follows the valleys of tributaries at each side of the crossing.

Since construction of the road in 1970, sliding has occurred at a number of locations on both sides of the crossing. Slope movements or other activity have been reported at the following sites (bridge is at Station 44+300):

- 42+600: slide of embankment;
- 42+650: sideslope slide, dates back to 1971 and 1983; failure may have been caused by overloading during construction;
- 43+200: slumping of sideslope due to scour by creek;
- 44+700 to 45+000: old slide, no active movement;
- 45+350: sinkhole due to collapse of culvert, culvert replaced;
- 45+800 to 46+000: slide, lime and flyash stabilization carried out in 1984

The road was not surfaced and the traffic volume appeared low.

Station 42+600, Embankment Slide

Remedial measures were implemented at this slide in November-December 2002. Remedial measures consisted of reconstruction of the slope, incorporating geogrids and drainage layers; construction of a downdrain; erosion protection of the creek bed; and repair of the culvert outlet.

Significant Observations

- This is a surficial failure of a fill slope at the upstream side of a culvert crossing.
- The fill slope was steep (2H:1V or steeper).
- The slide mass appeared wet.
- The toe of failed mass was encroaching on the culvert inlet.
- The road is a low-traffic unsurfaced secondary highway.
- The slide was approximately 30 m wide and 40 m long.
- The guard rail had been moved towards the center of the road, such that the scarp of the slide was outside the guard rail.

- Slumped material had encroached on the creek bed and was being eroded. The material may have blocked the creek, because there were signs of a water level approximately 0.5 m above the water level at the time of the site visit.

Changes from Previous Visits

The embankment was reconstructed in November-December 2002 (Photos 1 & 2). Slide debris was removed and the slope was reconstructed with the inclusion of geogrids and drainage layers. The creek bed was armored with gabions and riprap. A welded HDPE downdrain was constructed to carry water from the ditch to the creek. At the culvert outlet, at the downstream side of the embankment, a stilling basin was constructed with gabions and riprap.

Discussion

There are some minor issues that are to be resolved. Runoff from the western ditch has resulted in erosion at the culvert outlet. The flow from the western ditch is to be diverted to the eastern ditch. It is proposed that a centerline culvert be constructed to accomplish this.

Assessment

Remedial measures were implemented in November-December 2002.

Recommendations

It is recommended that the centerline culvert be installed.

Station 42+650

A buttress has been constructed at this site to stabilize the slope. Signs of instability were noted, but they don't appear recent (Photo 3).

Station 42+750

Signs of instability were noted at this site, but they do not appear recent (Photos 4 & 5).

Station 43+200

No changes were reported at this site.

At this location the road has been shifted into the cut slope, after a failure that resulted in loss of the road prior to 1990. The cut slope is in shale. It is very steep. An accumulation of loose shale has to be removed once a year typically. It is recommended that visual monitoring continue at this site.

Station 44+700 to 45+000

No changes were reported at this site.

The road had been shifted uphill of the slide area prior to 1990. Grabens indicate that significant movement has occurred here; however, none of the features appeared recent. A toe was not identified. The slope inclinometers could not be located. It is recommended that visual monitoring continue at this site.

Station 45+350 Overtopped Embankment

The embankment at Station 45+350 had overtopped during spring runoff in 2003. In addition, a sinkhole had formed at the side of the road, along the alignment of the culvert (Photo 6).

At the culvert outlet, a number of erosion control measures have been implemented (Photos 7 & 8). These include gabions and plywood sheets. However, the gabion baskets have been washed out and severe erosion has occurred in the channel.

Remarkably, at this site, (rafted) shale bedrock is exposed in the banks of the creek.

It is recommended that remedial measures be designed for the outlet of the culvert. The Bridge Branch has been notified.

Station 45+800 to 46+000

No changes were reported at this site.

Scarps were observed uphill of a culvert outlet halfway down the slope below the road (Photo 9). There appears to be no immediate threat to the road. It is recommended that visual monitoring continue at this site.