



January 29, 2003

File: 15-76-11

Alberta Transportation  
Room 223, Provincial Building  
4709 – 44 Avenue  
Stony Plain, Alberta  
T7Z 1N4

Attention: Mr. Rob Lonson, P.Eng.

**NORTH CENTRAL REGION LANDSLIDE ASSESSMENT  
SH 748:02 NORTH OF EDSON RIVER BRIDGE (NC15)  
2002 ANNUAL INSPECTION REPORT**

Dear Sir;

This letter documents the 2002 annual site inspection of a portion of Secondary Highway 748:02 located just north of the Edson River bridge, approximately 8 km north of the Town of Edson. The work was undertaken by Thurber Engineering Ltd. (Thurber) in partial fulfillment of our Geotechnical Services, Monitoring and Assessment of Instrumentation and Landslides contract with Alberta Transportation (AT).

The inspection was undertaken on June 11, 2002 by Messrs. Don Law, P.Eng and Renato Clementino, E.I.T. of Thurber. The site visit was carried out in the presence of Messrs. Roger Skirrow, P.Eng. and Kip Hritzuk of AT Geotechnical Branch, and Mr. Michael Baik of AT Stony Plain.

**1. BACKGROUND**

The area of previous roadway distress is located in an embankment fill through a gully, adjacent to the Edson River. The height of the slope is approximately 10 m from pavement to river level. The site history is summarized below, with more detail provided in Section A.

A 60 m long section of the highway failed in 1985, including a 60 mm drop in the pavement surface. Additional pavement cracking was noted in 1986 and 1987, however after overlay the section of road appeared to be performing well.

Further distress in 1992 prompted additional assessment and recommendations for remedial measures, including a trench drain in the east ditch and erosion protection on the river bank.

The slide was reactivated in 1999 requiring closure of the roadway. Repair was undertaken in August/September 1999, which included the installation of a retaining structure consisting of steel piles concreted into drilled holes and topped with a gabion basket wall. Subdrain piping was installed in the centre of the slide area, draining toward the river. A minor slump feature (scarp, graben and toe roll) was noted in the trees below the retaining wall structure during the 2000 site reconnaissance. The movement appeared inactive at that time.

In addition, a 250 m long trench drain was installed to a depth of approximately 3.5 m in the east ditch, extending from the north end of slide area to the river.

## **2. SITE OBSERVATIONS**

The highway roadway surface, back slopes and side slopes were inspected in the vicinity of the slide repair and the east ditch to the river. The following points summarize the observations made during the reconnaissance. Site features are shown on the site plan Figures NC15-1 in Section F. Selected photographs taken during the site reconnaissance are also included in Section F.

### **Slide Repair Area**

- No significant cracking was noted on the roadway surface or side slope. The pile wall and gabion structure appear to be performing satisfactorily.
- No significant development of the slump feature (noted below the retaining wall) was observed, compared to its condition observed during the 2001 site visit.

### **New Crack 40 m South of the Repaired Area**

- An arc shaped crack approximately 2 metres long was noted in the roadway surface, located about 40 metres south of the retaining wall area approximately as shown on the site plan. There was no differential height across the crack at the time of the site reconnaissance.
- Slope movement was observed in the side slope at this location. A 15 m to 20 m long scarp feature was noted close to the river, splitting a tree. Photos of the pavement crack and scarp are provided in Section F.

### East Ditch (Trench Drain)

- Vegetation cover has not been fully established in the ditch bottom, however more ingrowth has occurred since the 2001 site visit. Some minor erosion is occurring within the ditch bottom at the south end, where the ditch is somewhat steeper.
- The erosion gullying noted on the side slope around and above the culvert outlet is similar to that observed in 2001 and is still somewhat active. The silt fence located at the edge of the river as noted in the previous year had been removed.

### 3. ASSESSMENT AND RECOMMENDATIONS

Based on the above noted observations, the roadway repair appears to be performing satisfactorily. Further erosion may be expected at the toe of the slope, however any further slump development is not expected to impact the roadway due to the retaining wall installation.

The newly noted scarp located near the riverbank south of the repaired area is indicative of a slope failure, likely triggered by river erosion. The crack in the pavement surface indicates that a regressive failure may be occurring. As the toe of the slope moves toward the river it is likely allowing the block of soil behind it to move. It appears that this regressive slide behaviour has now impacted the roadway at the new location. This failure mechanism is likely similar to that of the original failure that has been repaired.

Continued visual monitoring of the area south of the repair should be undertaken. If further crack development occurs, consideration should be given to installation of slope monitoring instrumentation (inclinometers and piezometers) to gather geotechnical data to allow for design of remedial measures.

Recommended for erosion control within the east ditch and culvert outlet slope were provided previously (September 2002), and are attached. These include temporary silt fencing within the east ditch, and riprap armouring around the culvert outlet.

### 4. RISK LEVEL

A risk level of 24 is considered applicable to this site, based on a Probability Factor of 8 (active, defined movement zones, uncertain movement rate) and a Consequence Factor of 3. This risk level is higher than applied for 2001 due to the new slope movement noted south of the repaired area. It is recommended that this site continue to be assessed on an annual basis.

**5. CLOSURE**

We trust this assessment meets with your needs at this time. Please contact the undersigned should questions or concerns arise.

Yours very truly,  
Thurber Engineering Ltd.  
D.J. Law, P.Eng.  
Review Principal

original signed by:

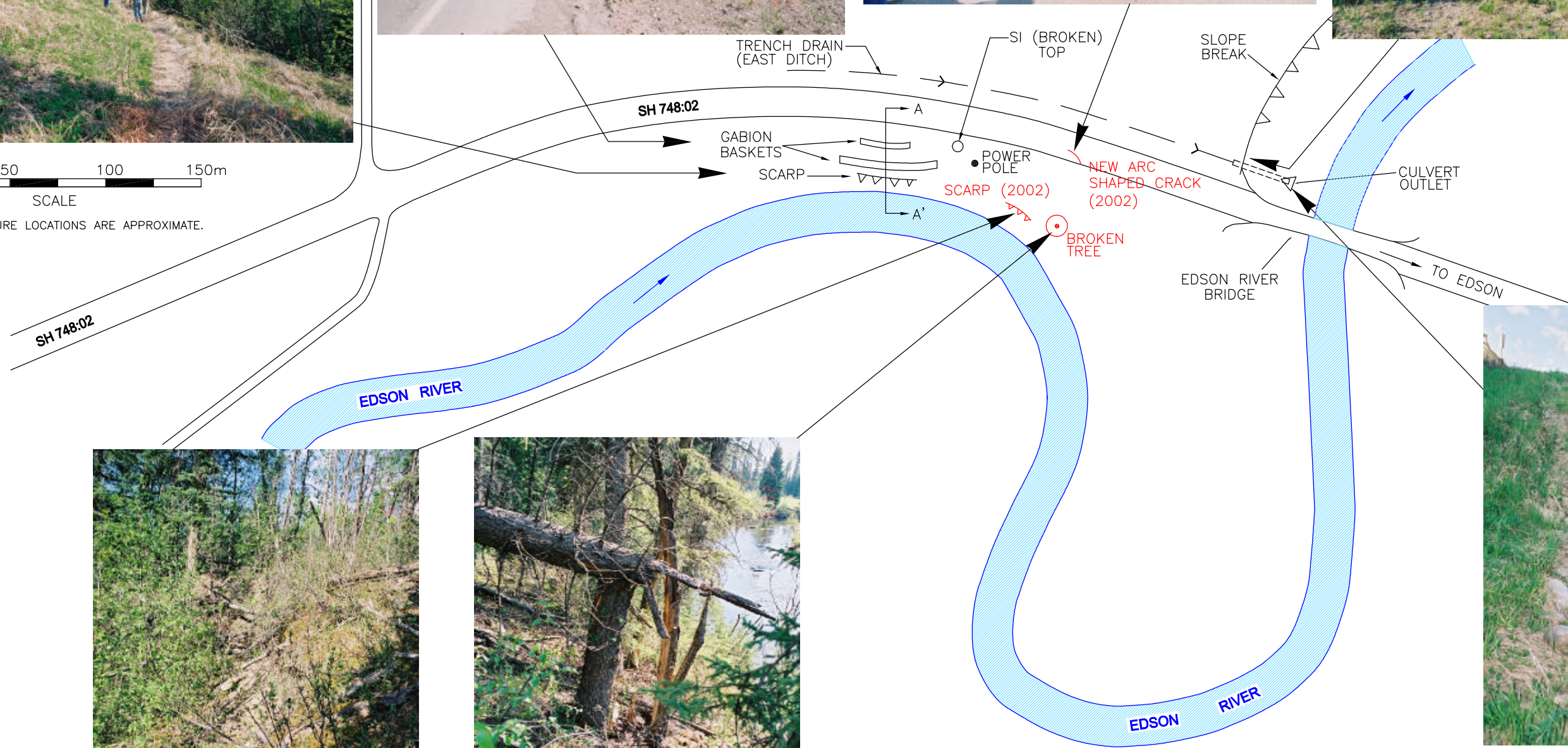
Renato Clementino, E.I.T.  
Project Engineer

Attachments

cc: Mr. Roger Skirrow, P.Eng.  
Director, Geotechnical Services, Alberta Transportation



NOTE: FEATURE LOCATIONS ARE APPROXIMATE.



THURBER PROJECT #15-76-11

ENGINEER	RVC
DRAWN	MNG
DATE	JUN 2002
APPROVED	
SCALE	1 : 2500 (APPROX.)

ALBERTA TRANSPORTATION

SITE PLAN

NORTH CENTRAL LANDSLIDE ASSESSMENT

SH748:02 NC15  
NORTH OF EDSON  
RIVER BRIDGE



FIGURE NC15-1 (2002)