



December 21, 2007

File: 15-85-66

Alberta Infrastructure and Transportation
Unit 2, Jewell Building
3603 – 53 Street
Athabasca, Alberta
T9S-1A9

Attention: Mr. Arthur Kavulok

**NORTH CENTRAL REGION (ATHABASCA AREA)
GEOHAZARD ASSESSMENT
NC 17B – HWY 63:12 SUPERTEST HILL
2007 ANNUAL INSPECTION REPORT**

Dear Sir:

This letter documents the 2007 annual site inspection of an area that was subject to previous slope instability and erosion located along Hwy 63:12 at Supertest Hill. The legal description of the site is Sections 24 and 25-91-10-W4M. Thurber Engineering Ltd. (Thurber) undertook this inspection in partial fulfillment of our Geotechnical Services for Geohazard Assessment, Instrumentation Monitoring and Related Work contract (CE143/2006) with Alberta Infrastructure and Transportation (INFTRA).

Mr. Don Proudfoot, P.Eng. of Thurber undertook the inspection on July 17, 2007 in the presence of Mr. Roger Skirrow, P. Eng., Mr. Arthur Kavulok and Mr. Ron Behr of INFTRA.

1. BACKGROUND

Thurber last inspected the site in May 2006 and the condition of the site at that time is described in our Part B assessment letter in the site binder.

2. SITE OBSERVATIONS

The condition of the site and any noted changes since last year are described on the attached site plans. Cross-sections through the highway were provided



previously in Section F of the site binder. Selected photographs taken during the site visits are also attached.

Our site observations were as follows:

- The overall condition of the high backslope (Figure NC17B-12) was good. There were no visual indications of slope movement. The slope generally had good grass cover except for a portion of the first bench and a section along the toe of the slope;
- The maintenance contractor, as recommended during our last inspection, had removed the silt fences that had been installed along the backslope and highway side slopes during the original construction;
- The median ditch looked good. Grass is starting to grow up through the gabion lining. Trash has started to accumulate on the bubble grate over the drop pipe;
- There was still a section of the median sideslope where grass had not grown yet;
- Quads running under the bridges continue to create a preferential runoff path that is causing some erosion near the headslope area;
- The west sideslope of the highway embankment also had a good grass cover except for localized areas north of the stilling pond, along the top edge of the slope and near the start of the rectangular drainage section.
- The stilling pond was effectively stilling the runoff before releasing it towards the twin culverts. Bullrushes have grown in the silt that had accumulated at the outlets of the culverts, and there was no sign of silt getting past the silt fences erected beyond the outlet area during construction;
- The east sideslope of the highway embankment, berm surface and berm sideslope appeared in good condition. The few localized spots on the sideslope where small erosion rills have started to develop did not appear to have changed in size since the last visit; and
- There was still a bare backslope on the east side of the highway near Station 16+650 that was not included in the erosion repair works. This section continues to develop erosion rills due to the lack of topsoil and vegetation.



3. ASSESSMENT

The high backslope appears to be performing well to date. Although there were no visible signs of slope movement, some small movements in the clay layer were noted during construction and the Fall 2007 readings show continuing small creep movements along this layer in SI3 and SI5R at a rate of 3 to 4 mm/yr. Hence it will be important to continue to closely monitor the instruments to warn of the development of any potential larger scale slope movements in view of the major pipeline located within 30 m of the crest of the backslope.

To date the remedial measures carried out in 2002/2003 have been effective in dealing with the past erosion problems at this site. However, there are a few maintenance measures that still need to be carried out as noted in Section 5.

4. RISK LEVEL

The risk level to the highway due to the backslope has been assessed as follows:

$$PF(2) * CF(10) = 20$$

A Probability Factor of 2 is considered appropriate since there has been evidence of some small creep movements during and since construction but no visible development of a sliding mass. A consequence factor of 10 is considered appropriate due to the significant height of the backslope and the proximity of the major pipeline behind the crest of the backslope.

5. RECOMMENDATIONS

5.1 Maintenance

The silt fences were removed last year however there still remain a few maintenance items that should be carried out at this site. They are as follows:

- Topsoil and seed all of the bare areas shown on the attached drawings where vegetation has not caught. Hydroseeding may also be considered. Prior to spreading topsoil, any rilled slope areas should be smoothed and track-packed in an up and down slope direction. After topsoil spreading and seeding any sloped areas should be covered with low flow soil covering. A shallow topsoil berm or Filtrexx Sock should be placed diagonally across the west sideslope near Station 16+220 to intercept flow down the slope and direct it back into the gabion lined left ditch. Salt resistant seed mix should be used to revegetate the upper bare side slope



areas adjacent to the highway. As an alternate to topsoil, composte with a tackifier could be sprayed onto the harder to reach slope sections;

- Build up the east median sideslope along the edge of the gabion mat dissipater fan with topsoil and line the border along the fan with riprap salvaged from the old rock check berms in the median to prevent any further flow around the east edge of the fan;
- The quad trail under the bridges could be formalized with interlocking turf stones to keep traffic on a designated path and reduce damage to vegetation off of the path. Alternatively, it is understood that Mr. Behr is considering to block off the southeast quad access with a guardrail and sign access to the river from the north side of the bridge;
- Mr. Behr indicated that the guardrail along the west ditch near Station 16+280 should be extended to provide better protection for motorists from the sudden drop off into the rectangular gabion lined ditch channel; and
- Trash should be removed from the bubble grate over the drop pipe.

The ball park cost for the above maintenance measures, excluding the quad path, is \$80,000.

6. CLOSURE

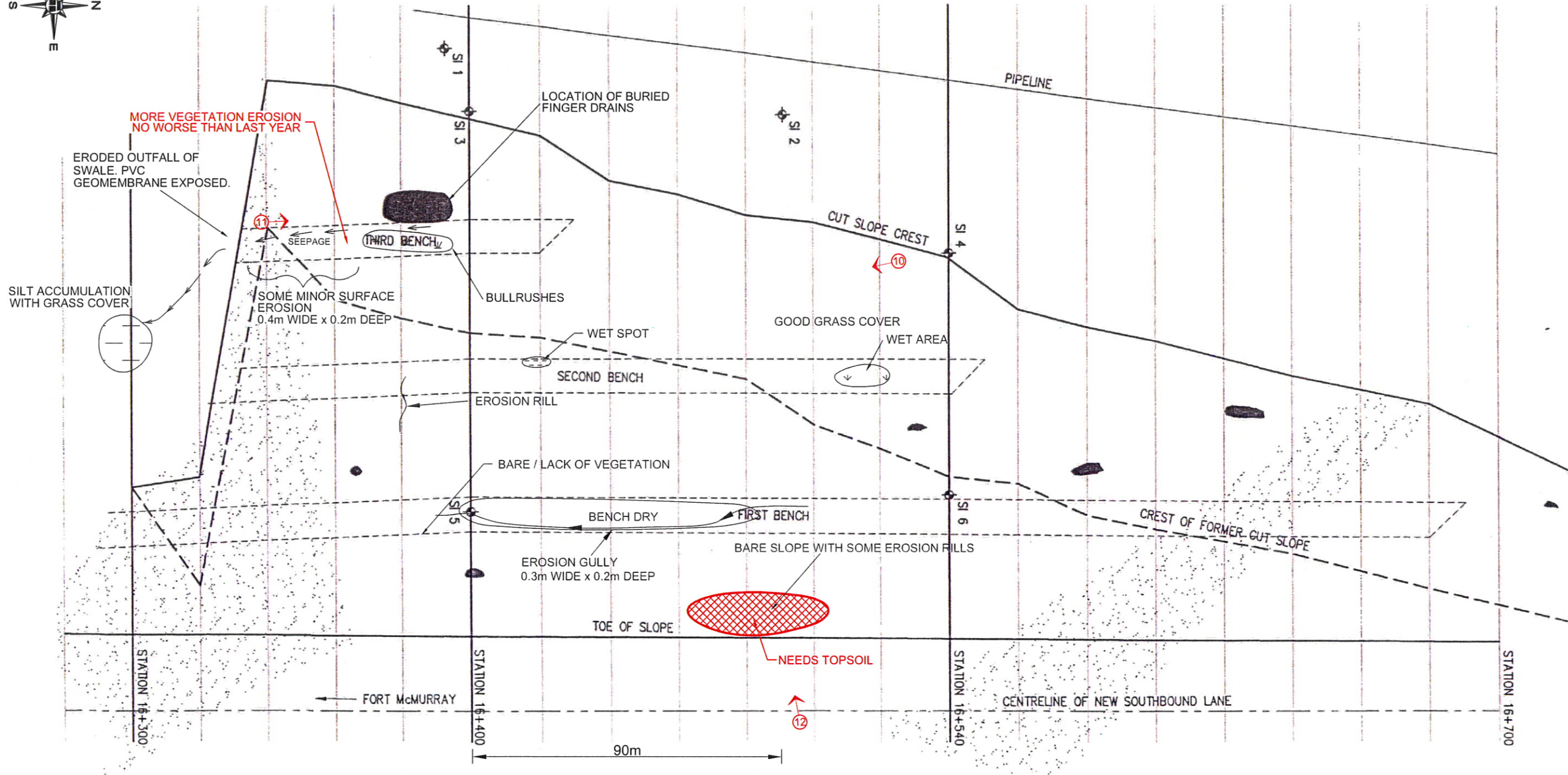
We trust this assessment and recommendations meet with your needs at this time. Please contact the undersigned should questions arise or if the condition of the site worsens.

Yours very truly,
Thurber Engineering Ltd.

Don Proudfoot, P.Eng.
Principal
/dw

Attachments

cc Mr. Roger Skirrow, P. Eng, Director of Geotechnical Services, INFTRA

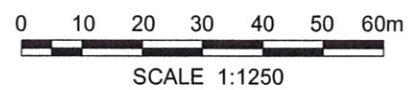


LEGEND

- SAND ENCOUNTERED
- WET SPOT
- INCLINOMETER LOCATIONS
- PHOTO AND DIRECTION

NOTES

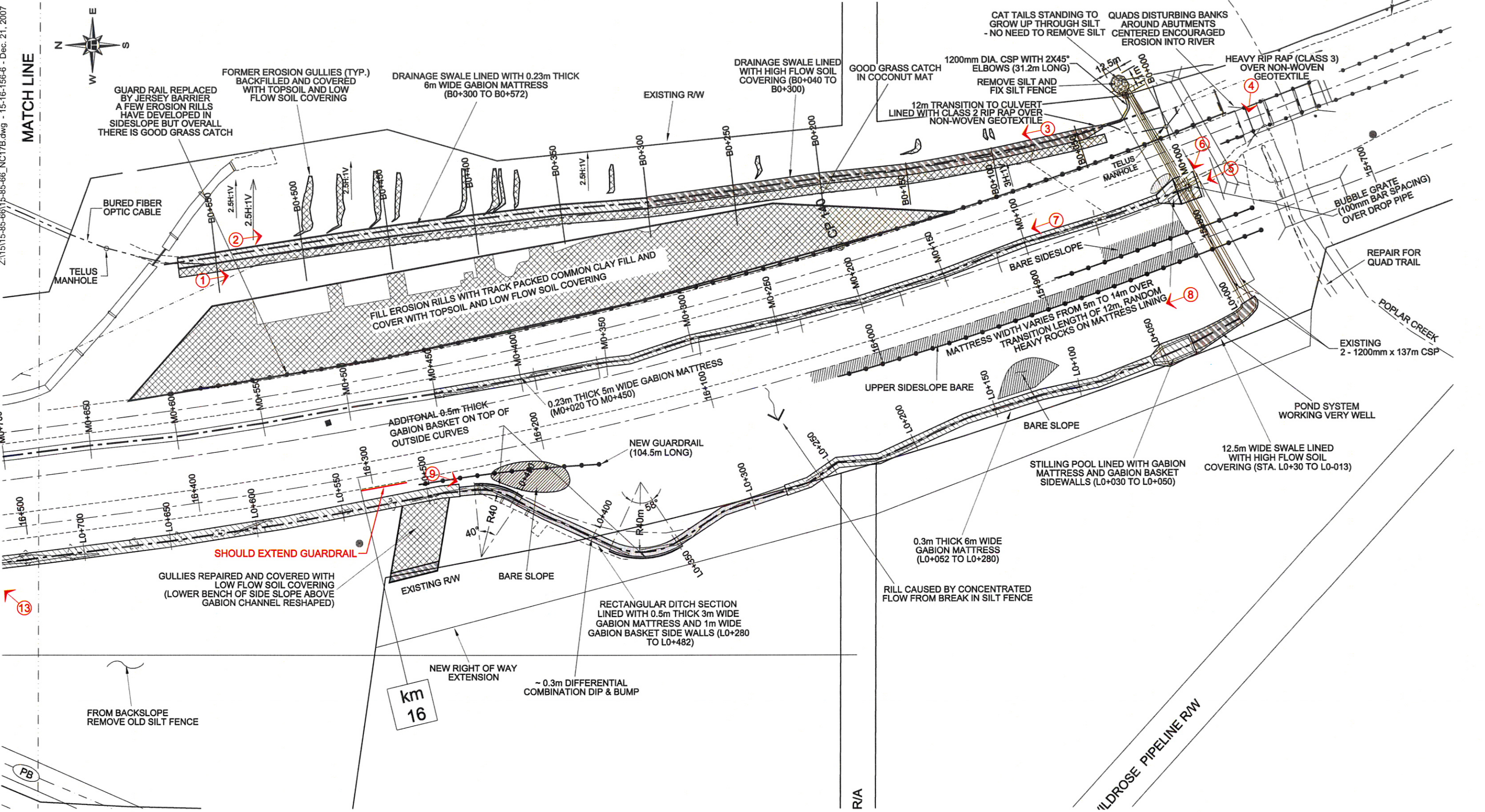
1. OBSERVATIONS IN PREVIOUS YEARS SHOWN IN BLACK
2. JULY 17, 2007 OBSERVATIONS SHOWN IN RED
3. OLD SILT FENCES ON SLOPE WERE CUT OFF AT GROUND LEVEL AND REMOVED.



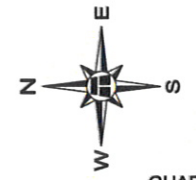
HWY 63:12 Km 15.45 TO 16.8 TWINNING AT SUPERTEST HILL (NC17B)
 NE 25 - 91 - 10 - W4M
 FIGURE NC17B-12 UPDATED SITE PLAN (JULY 17, 2007)

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MATCH LINE



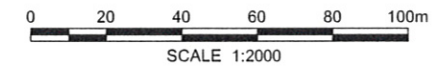
LEGEND

- HIGH FLOW SOIL COVERING
- LOW FLOW SOIL COVERING
- GABION MATTRESS (TRAPEZOIDAL SECTION)
- GABION BASKET / GABION MATTRESS (RECTANGULAR SECTION)

PHOTO AND DIRECTION

NOTES

1. FEATURE LOCATIONS ARE APPROXIMATE.
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK
3. JULY 17, 2007 OBSERVATIONS SHOWN IN RED
4. OLD SILT FENCES HAVE BEEN REMOVED, EXCEPT AT POPLAR CREEK BRIDGE AREA.



HWY 63:12 Km 15.45 TO 16.8 TWINNING AT SUPERTEST HILL (NC17B)
 E 24 - 91 - 10 - W4M
 FIGURE NC17B-15 SITE PLAN SHOWING RECENT EROSION REPAIRS
 AND COMMENTS OF JULY 17, 2007 VISIT (SHEET 2 OF 2)

THURBER PROJECT #15-85-66





Photo 1 - Upper Part of East Sideslope.



Photo 2 - Lower Part of East Sideslope.



Photo 3 - South End of East Sideslope.



Photo 4 - Erosion Along a Quad Trail Under the Northbound Bridge.



Photo 5 - Looking North Along Median Ditch.



Photo 6 Drop Pipe Grate Needs to be Cleaned.



Photo 7 - Gabions in Median Ditch.



Photo 8 - Looking North along West Sideslope from South End.



Photo 9 - Looking South along West Sideslope from North End.



Photo 10 - Looking South along High Backslope.



Photo 11 -Third Bench of High Backslope.



Photo 12 - Bare Area on Lower Part of Backslope.



Photo 13 - Bare Backslope on East Side of Highway at North End of Site.