CENTRAL REGION GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **C018 Red Deer Riverbank Slide**	HIGHWAY & KM: 837:02, 2.1	PREVIOUS INSPECTION DATE: June 18, 2024	INSPECTION DATE: **June 10, 2025**
LEGAL DESCRIPTION: 27-29-21 W4M	NAD 83 COORDINATES: UTM 12 Northing 5708478 Easting 369823	RISK ASSESSMENT: Debris Flows > 0.5 m^3 PF: 15 CF: 7 TOTAL: 105 Debris Flows < 0.5 m^3 PF: 15 CF: 6 TOTAL: 90 Earth slide PF: 10 CF: 6 TOTAL: 60	
HIGHWAY SERVICE CLASSIFICATION: 4		CONTRACT MAINTENANCE AREA (CMA): 517	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 280 (north) (Reference No. 106230)			

SUMMARY OF SITE INSTRUMENTATION: A weather station was installed by KCB at the crest of the slope above the C018 site. LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) James Lyons (KCB) Tony Penney (TEC) Chris Newman (TEC) Imram Mehmood (TEC)

PRIMARY SITE ISSUE: Natural slope instability along a section of the west valley slope along Hwy 837:02 (C018-2) and highway embankment instability (C018-1).

APPROXIMATE DIMENSIONS: The total length of the site is approximately 400 m. C018-1: Includes three slope failures along the east highway embankment slope (approximately 20 m to 70 m in length and 6 m high). C018-2: The areas of slope instability include shallow slope failures that vary in depth from approximately 0.5 m to 1.0 m and extend approximately 10 m to approximately 30 m above the highway.

DATE OF ANY REMEDIAL ACTION: C018-1: Embankment repairs (including geogrid-reinforced granular fill, placing a rolled erosion control product (RECP) on the slope surface, and armouring the toe of the slope with riprap) have been completed in 2000, 2002, 2005, and 2024/2025. The 2024/2025 repair (completed by PME Inc. under Contract No. CON0022533) also included the installation of a brush layer within the riprap. C018-2: Following the earthflow slide that occurred in May 2018, TEC installed concrete jersey barriers along the centerline of the west (southbound) lane, resulting in one-way alternating traffic. Traffic control is via a stop sign because batteries were repeatedly stolen from the one-way-traffic signal-light system initially set up at the site. TEC's Highway Maintenance Contractor (HMC) regularly removes deposited material accumulating behind the concrete jersey barriers. New concrete jersey barriers were installed in 2020. A wire-mesh rockfall barrier system was attached to the concrete jersey barriers in 2024/2025 by PME Inc. under Contract No. CON0022533.

ITEM	**CONDITION EXISTS**		**DESCRIPTION AND LOCATION**	**NOTICABLE CHANGE FROM LAST INSPECTION**	
	YES	NO		YES	NO
Pavement Distress	X		C018-1: Longitudinal pavement cracking along the east (northbound) shoulder.	X	
Slope Movement	X		C018-1: Slope failures along the east (northbound) highway embankment slope (east riverbank slope). There is a new area of sliding north of the length of riverbank repaired in the early 2000s. C018-2: Active slide areas depositing material into the west (southbound) ditch and onto the highway surface	X	
Erosion	X		C018-2: Rill erosion observed on the valley slope	X	

Seepage	X		C018-2: Seepage observed at various locations along the toe of the valley slope above the highway		X
Culvert Distress		X	N/A – none observed during the 2025 inspection.		X

COMMENTS

Previous Work and Inspections:

- The C018 site has been regularly inspected by KCB and TEC since 2000 (annual inspections, call-out inspections, and as part of an ongoing highway geohazard research study with the University of Alberta (UofA)).
- There have been previous repairs at the C018-1 site constructed from 2000 to 2005. The repairs included rebuilding the slope with geogrid-reinforced granular full, placing turf reinforcement matting on the slope surface, seeding, riprap installation at the base of the embankment slope, and grading of the embankment slopes. The extents of the early 2000s repair work are shown on Figure 1 and the attached Issued for Tender (IFT) drawings.
- Between 2017 and 2021, there have been various topographic surveys and aerial drone surveys/mapping completed at the site.
- Following the May 2018 inspection, KCB recommended that TEC shut down the highway until the unstable rock mass was removed, and provisions were made to reduce rockfall risk to the public. The unstable ledge of rock was believed to be at risk of failure during a heavy rainfall or under the effect of gravity without rain. KCB completed an analysis of various rockfall mitigation options including the installation of jersey barriers (with and without an empty ditch), a rockfall catchment net, and a two-lock-block retaining wall. The effectiveness of these measures is presented in the letter issued to TEC dated June 20, 2018. The previous arrangement of concrete jersey barriers at the centre of the west (southbound) lane did not address the risk of collapse of the rock mass, nor offer enough catchment for the rockfall hazard at this site.
- In October 2021, a geotechnical investigation and laboratory testing program was completed to support design work for the C018-2 site.
- In 2022, KCB received approval from TEC to begin a Conceptual Engineering Assessment (CEA) for potential design repairs for the C018-2 site. The options assessed in the CEA report include re-routing traffic around the site, installation of a rock shed, installing a barrier wall in the upslope ditch and re-aligning the highway, and automated monitoring. The assessment included quantity and cost estimates. A Conceptual Engineering Assessment Report was issued to TEC on June 14, 2022 for review and comment. In a review meeting held between KCB and TEC on July 8, 2022, TEC indicated that their preferred options for the site that should proceed to preliminary design were a crest-of-backslope ditch to improve drainage to the highway backslope, an automated monitoring system, and an alternate route around the site. The final CEA report was issued to TEC on August 30, 2022.
- In February 2023, KCB submitted a proposal to TEC to complete design work for repair of the C018-1 site (a slide in the east highway embankment slope and riverbank erosion). TEC approved the proposal in February 2023. KCB began design work immediately and issued the final design report to TEC on June 28, 2023. During the 2023 Section B Inspection, TEC requested a rockfall barrier design be completed for the C018-2 subsite as part of this assignment. The design work was completed on March 19, 2024.
- Between 2023 and 2024, KCB prepared a tender (Tender No. TND0022533) that included the repair of the C017-1, C017-3, C018-1 and C018-2 sites. The final tender was issued to TEC, advertised, and a pre-tender meeting was held in May 2024. The tender closed in July 2024 and was awarded (Contract No. CON0022533) to PME Inc. (PME) in September 2024. Construction was completed between October 2024 and June 2025 and was monitored by KCB.
- After the 2024 Central Region GRMP Annual Review Meeting in December 2024, TEC requested KCB prepare and submit a proposal for a remote monitoring system for the C018-2 site. KCB submitted a proposal and it was approved in January 2025. Work is ongoing (including assessing different systems and preparing a Request for Quotation) and our systems comparison report will be issued to TEC in late summer or fall of 2025.

C018-1 Riverbank Slides:

- The slope failure in the east highway embankment slope and riverbank erosion were repaired between October 2024 and June 2025 by PME Inc. as part of CON0022533. The repair consisted of excavation of slide material, slope reconstruction with geogrid-reinforced granular fill, riprap armouring (Class 2) in the lower portion of the slope, a brush layer within the riprap, and protecting the slope face with a RECP. The repair work is complete and appears to be performing well. Vegetation (grass) is beginning to grow through the RECP (Photo 1) and the brush layer appears to be in growing well (Photo 2).
    - TEC informed KCB during the inspection that there was more topsoil placed below the RECP than along the access road constructed for temporary access to the toe of the slope during 2024/2025 construction, which may have resulted in more vegetation growth along the slope. Additional topsoil and seeding may be required if vegetation coverage does not improve.
- There is longitudinal pavement cracking in the shoulder of the east (northbound) lane along the C018-1 site. Longitudinal pavement cracking has been regularly observed during the site inspections and is the most severe near the south extent of the site. Increased traffic loading on the east (northbound) lane due to the closure of the west (southbound) lane along C018-2 may be attributing to slope movements that are impacting the pavement surface. Ground cracks have also been observed further north, closer to the length of riverbank repaired in the early 2000s.
- The pavement crack (up to approximately 75 mm wide and 25 m long, first observed during the 2024 Section B inspection) has worsened between the 2024 and 2025 inspections. The pavement crack begins in the east (southbound) lane behind the concrete jersey barriers and rockfall barrier and extends further north across the west (northbound) lane to the edge of pavement (Photo 6 through 8). Settlement in the east (northbound) lane is significantly worse than during the 2024 inspection and resulted in a noticeable dip (up to approximately 100 mm deep) in the highway surface (Photo 8). The pavement distress (cracking and settlement) is near the north extent of the early 2000s repair, indicating the slide is outflanking the previous repair. A red diamond hazard sign was installed adjacent to the guardrail between the 2024 and 2025 inspections to warn road users of the hazard (Photo 10). TEC informed KCB after the inspection that the contractor installed a “bump” hazard sign on July 3, 2025.
- Dispersive soil voids have been observed on the east side of the highway at the crest of the highway embankment slope (Photo 9). The sinkholes appear to be concentrated near the left (northwest) and right (southeast) extent of the early 2000s riverbank repair. KCB suspected surface water flow from the highway surface is flowing into the sinkholes likely increasing the rate of void formation and increasing the groundwater level in the slope. Between 5 and 10 voids were observed during the 2025 inspection:
    - Waypoint 378: Four sinkholes up to approximately 0.8 m in diameter and 1.5 m deep.
    - Waypoint 379: Location where surface water runoff from the highway flows into a sinkhole.
    - Waypoint 380 and 381: Two sinkholes up to approximately 0.7 m in diameter and 1 m deep.
- Material (soil and coal fragments) from the C018-2 site was observed on the east side of the guardrail, indicating that material falling down the slope was not being completely contained with just the concrete jersey barriers (Photo 10). The larger blocks deposited behind the guardrail appear older (weathered) and were generally less than approximately 0.5 m x 0.5 m x 0.5 m. The rate of material accumulation will likely decrease now that rockfall barrier installation is complete.
- There are two above-ground utility lines just east of the guardrail (at the crest of the highway embankment) that run the entire length of the site. One appeared to be severed while the other appeared intact.
- The riverbank is actively eroding south of the site. The crest of the eroding slope is still several metres from the edge of highway and it did not appear to be impacting the highway surface.

C018-2 Rockfall and Slide:

- In March 2025, a rockfall barrier was attached to the concrete barriers by PME as part of CON0022533 (Photos 3 through 6). The rockfall barrier appears to have been completed as per the design and is in good condition.
- In general, there was less material deposited behind the jersey barriers and rockfall barriers than previous years inspections, particularly along the southeast portion of the site (Photo 3). This may reflect maintenance efforts by the Highway Maintenance Contractor (HMC) and Maintenance Contract Inspector (MCI).
- Near the middle of the site, a relatively significant amount of failed material had been deposited into the west (southbound) lane between the 2024 and 2025 inspections (Photo 4 through 6). The material was deposited approximately 100 m along the base of the slope and the area of instability extends approximately one quarter to one third of the way up the slope.
- During the 2025 inspection, there was evidence of rockfalls striking the concrete jersey barriers and rockfall fence.
- Seepage has been previously observed at the base of the slope (Waypoint 382). At the southeast extent of the site, there is evidence of surface water flowing across the highway surface (sediment deposited in ditch and across the highway surface).

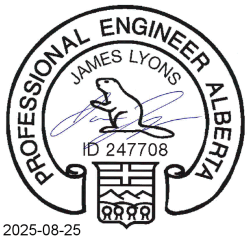
Maintenance/Repair/Monitoring Recommendations:

- The site should be regularly inspected by TEC's MCI, especially after precipitation events.
- The site should continue to be inspected annually as part of the Central Region Section B Inspections.
- Material deposited behind the jersey barriers and rockfall barrier should be regularly removed by TEC's HMC.
- KCB should prepare and issue a proposal for the repair of the slide near the northwest extent of the site. The proposal should include a site investigation (should include 2-3 boreholes through the highway surface), instrument installations (one slope inclinometer and one or two vibrating wire piezometers), initial instrumentation readings, design work, environmental and regulatory support, and contract procurement support (Request for Quotation or tender package).

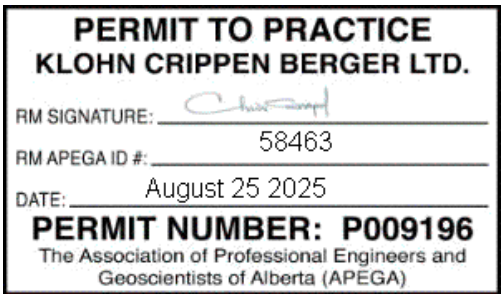
responsible to the Client for the consequences of any error or omission contained in Client-supplied information.

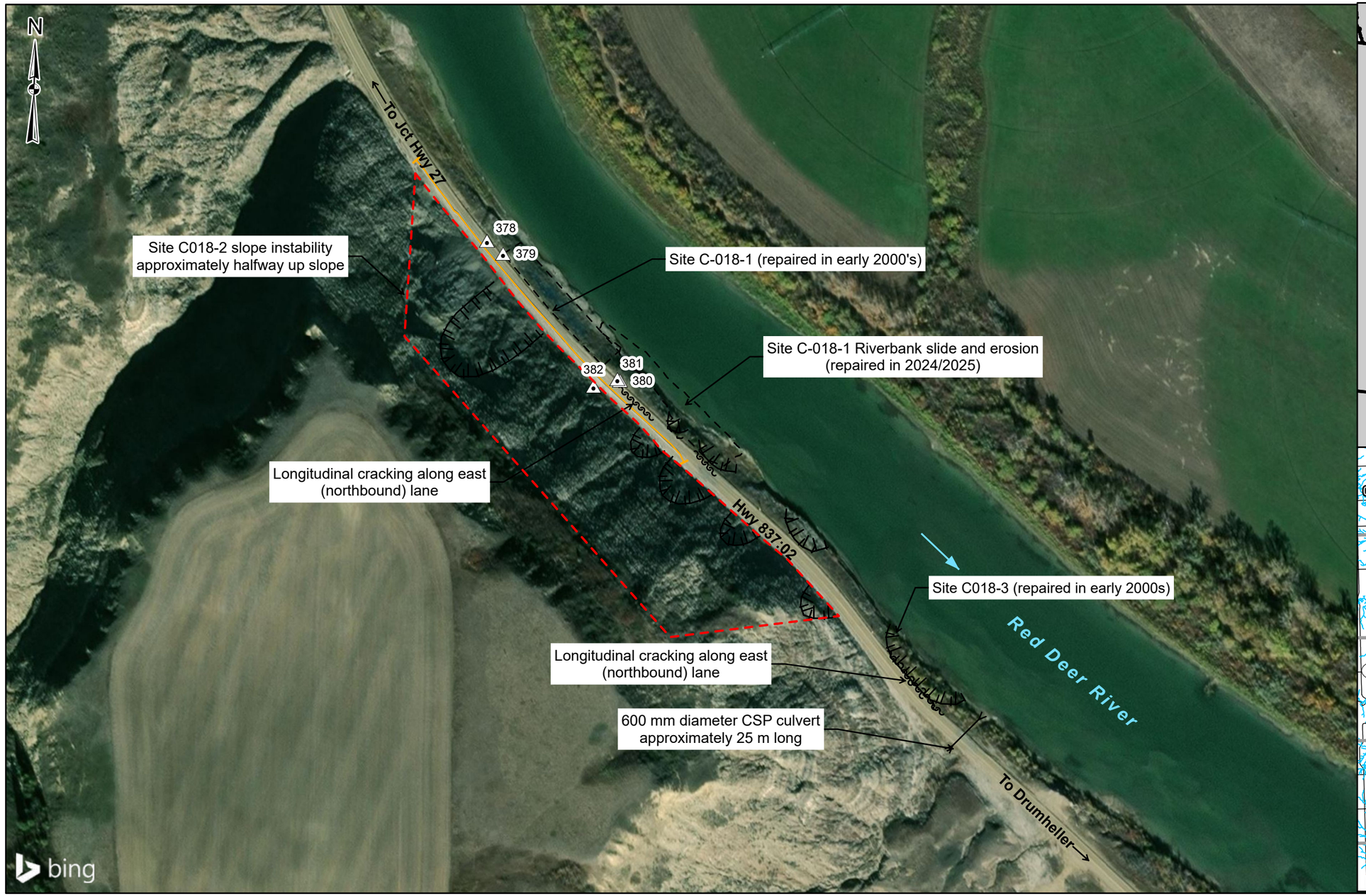
(iv) KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.

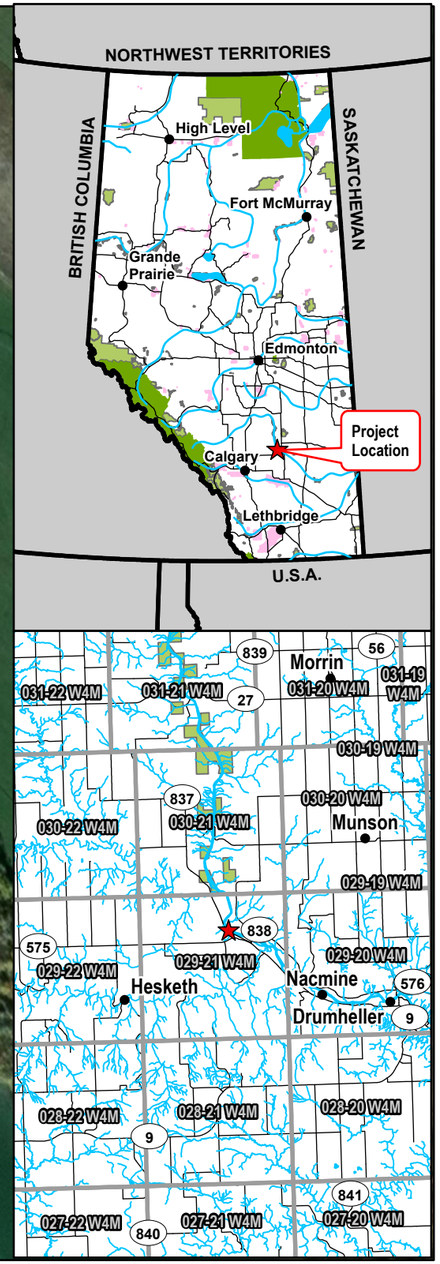
(v) This report is electronically signed and sealed and its electronic form is considered the original. A printed version of the original can be relied upon as a true copy when supplied by the author or when printed from its original electronic file.



James Lyons, P.Eng.
Civil Engineer







Legend

- Waypoint
- Flow Direction
- Rockfall Barrier (installed in 2024/2025)
- Culvert
- Scarp
- Crack

0 100 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 12N
3. IMAGE SOURCE: 2025 MICROSOFT CORPORATION, MAXAR, CNES DISTRIBUTION AIRBUS DS.

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
C018 - Red Deer Riverbank Slide
Hwy 837:02, km 2.100

SCALE 1:2,500 | PROJECT No. A05116A02 | FIG No. 1

File: Z:\AEDM\A05116A02 ABT Central Region GRMP400 Drawings\GIS\02_ProFiles\2025\Section C\AT_CentralRegion_SectionC_20250709.aprx Date: Time: Creator: : NMirhadi

DRAWING RD-22533-08-P

HIGHWAY 837:02

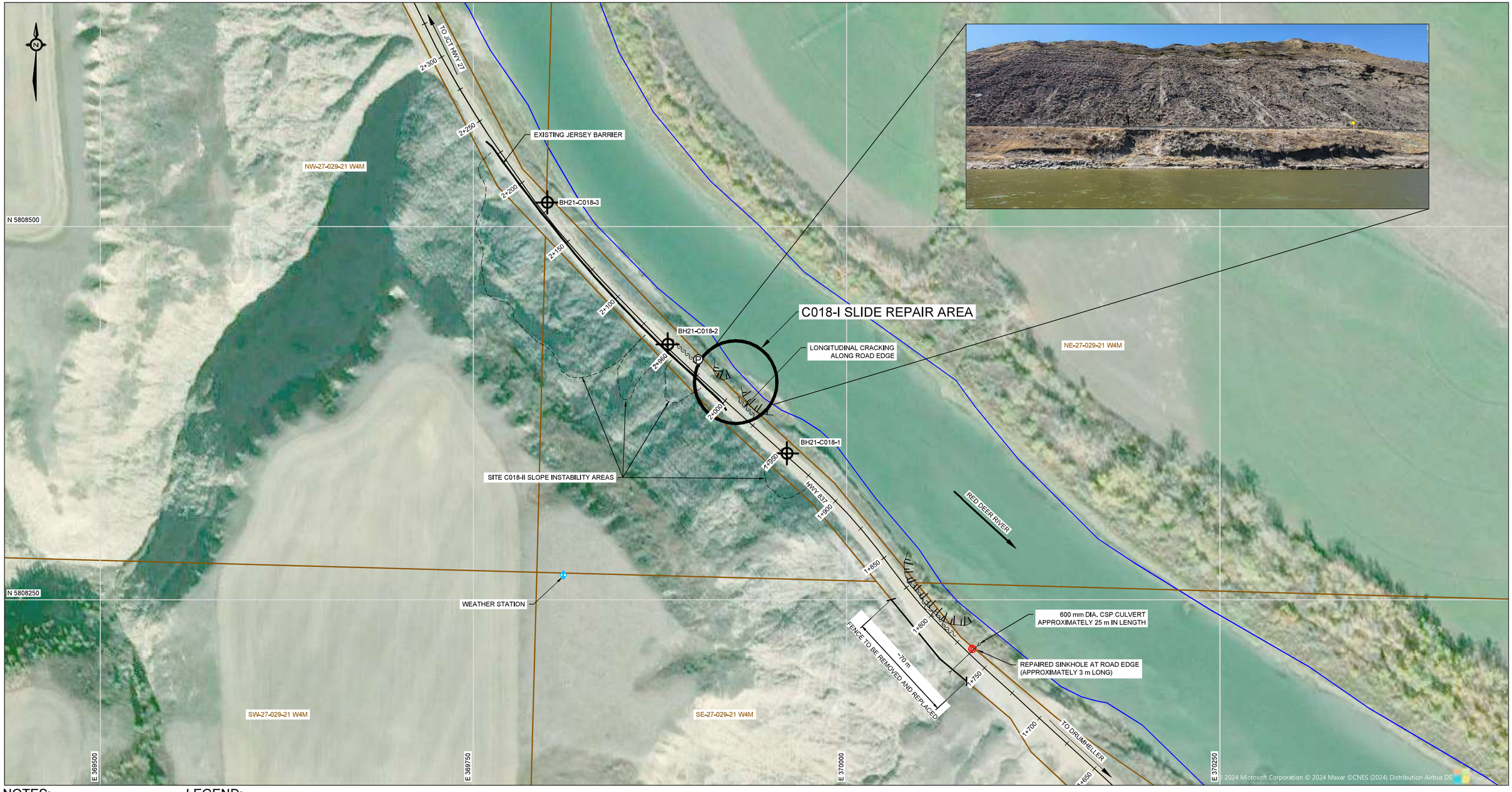
CONTRACT 22533

DESCRIPTION C018 SITE PLAN, GENERAL ARRANGEMENT, AND EXISTING CONDITIONS

PHOTO

DATE | BY | SURVEYED

DEPARTMENT BAR CODE



LOCATION PLAN
SCALE = 1:1250

NOTES:

1. ALL UNITS ARE IN METRIC U.N.O.
2. COORDINATES SHOWN ARE IN NAD83 UTM ZONE 12N.
3. BACKGROUND IMAGE FROM BING MAPS.
4. TOWNSHIP DATA WAS PURCHASED FROM ALTALIS.

LEGEND:

- PROPERTY BOUNDARIES
- RIVER LINE
- FLOW DIRECTION
- BOREHOLE
- PHOTO LOCATION
- C018-II SLOPE INSTABILITY AREAS
- WEATHER STATION
- SINKHOLE
- CRACK
- SCARP
- CULVERT

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc) ARE BASED ON 22" X 34" FORMAT DRAWINGS

THINK SAFETY FIRST

1:1250 0 25 50 m

CONSULTANT
Klohn Crippen Berger

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Date Created: 2024-04-26

DESIGNER
DATE

CHECKER
DATE

REV	DATE	REVISION	BY
1	2024-04-22	ISSUED FOR TENDER	PR

DATE	LOCATION	SITE
2024-04-22	NE-27-29-21-W4M	C018

Alberta

SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1
C018 SITE - PLAN, GENERAL ARRANGEMENT, AND EXISTING CONDITIONS

CONTRACT	HIGHWAY	SHEET	DRAWING
22533	837:02	8 OF 15	RD-22533-08-P

DRAWING RD-22533-09-P

HIGHWAY 837:02

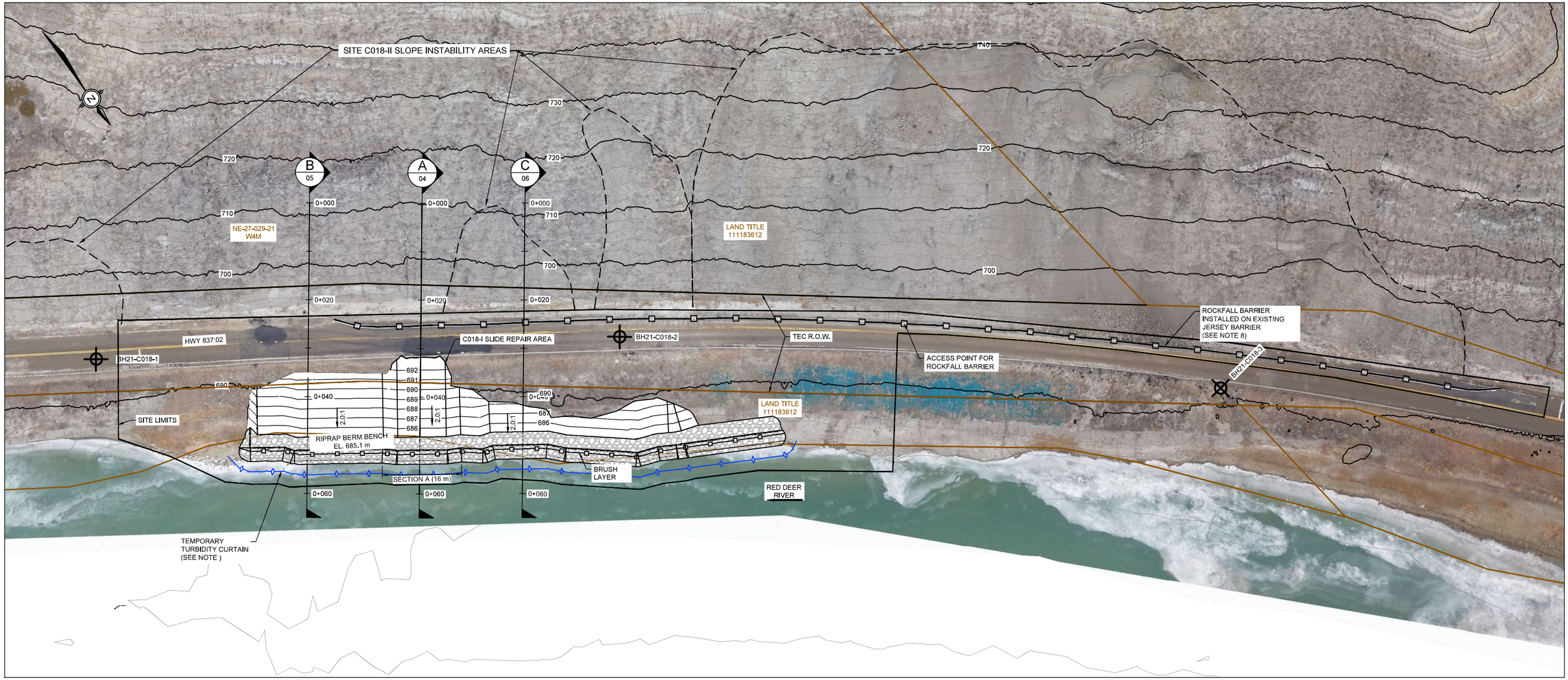
CONTRACT 22533

DESCRIPTION C018-I: REPAIR PLAN

PHOTO

DATE | BY | SURVEYED

DEPARTMENT BAR CODE



C018-I: REPAIR PLAN

SCALE = 1:250

NOTES:

1. ALL UNITS ARE IN METRIC U.N.O.
2. SITE SURVEY WAS PERFORMED VIA UNMANNED AERIAL VEHICLE (UAV) BY CHALLENGER GEOMATICS LTD. ON NOVEMBER 04, 2021. BATHYMETRIC SURVEY COMPLETED BY CHALLENGER GEOMATICS LTD. ON MAY 5, 2022.
3. CONTOUR INTERVAL IS 1 m.
4. RED DEER RIVER ELEVATION AS OF NOVEMBER 4, 2021.
5. AERIAL IMAGERY IS 2021 UAV PERFORMED BY CHALLENGER GEOMATICS LTD.
6. TOWNSHIP DATA WAS PURCHASED FROM ALTALIS.
7. TEMPORARY TURBIDITY CURTAIN OFFSET UP TO 2 m FROM TOE OF RIPRAP.
8. ROCKFALL BARRIER TO BE INSTALLED ALONG ENTIRE XX m LENGTH OF EXISTING JERSEY BARRIER.

LEGEND:

- 310 — EXISTING GROUND CONTOURS
- 310 — DESIGN CONTOURS
- C018-II SLOPE INSTABILITY AREAS
- SITE LIMITS
- TEC RIGHT-OF-WAY (R.O.W.)
- PROPERTY BOUNDARIES
- FLOW DIRECTION
- BRUSH LAYER
- TEMPORARY TURBIDITY CURTAIN
- RIPRAP BERM

1:250 0 5 10 m

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CONSULTANT: Klohn Crippen Berger

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DESIGNER DATE

CHECKER DATE

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DATE	LOCATION	SITE
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Alberta

SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1

C018-I: REPAIR PLAN

CONTRACT	HIGHWAY	SHEET	DRAWING
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DRAWING RD-22533-10-P
HIGHWAY 837:02
CONTRACT 22533
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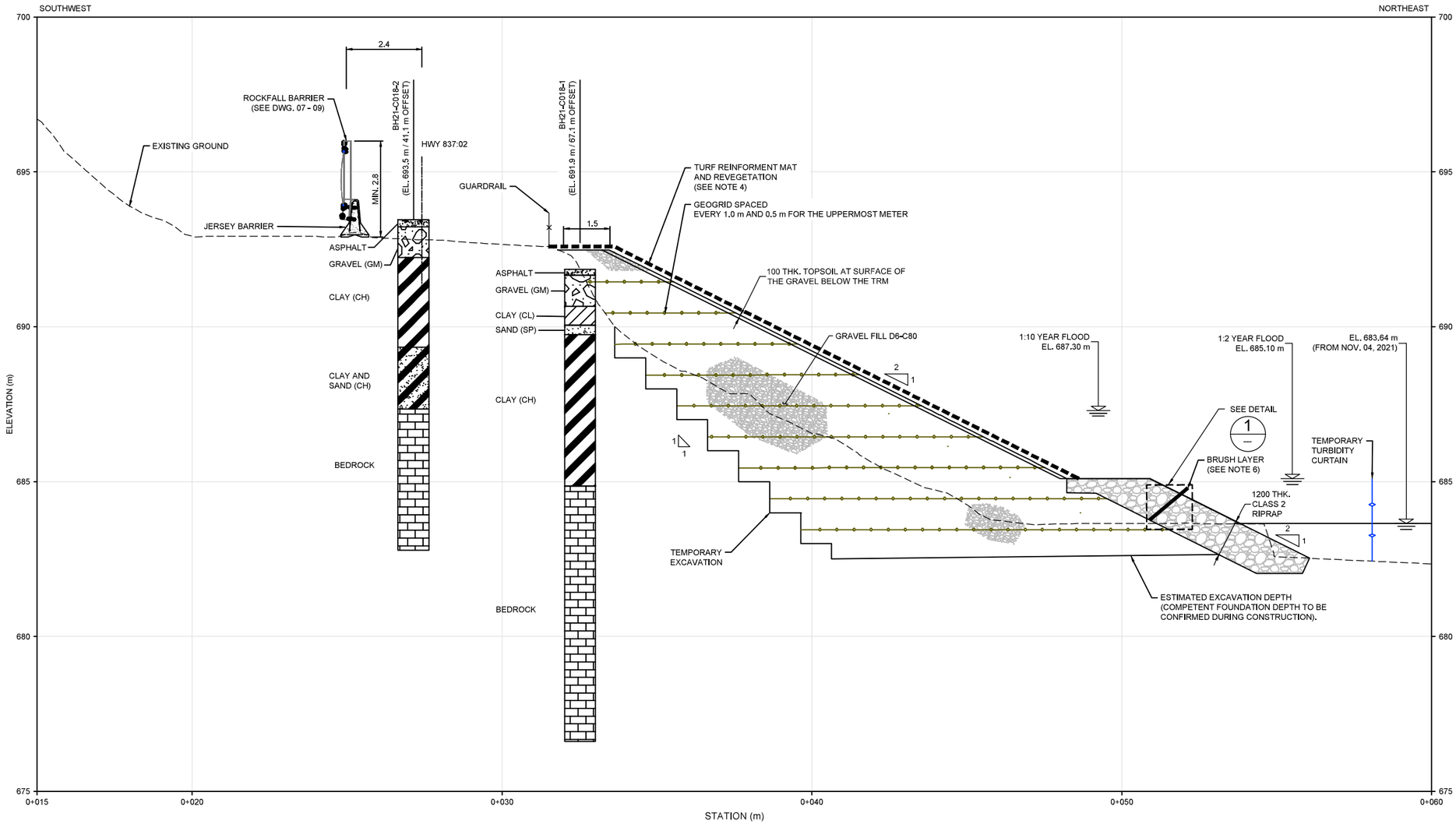
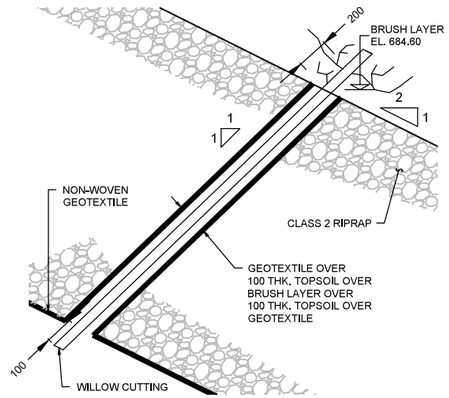
PHOTO
DATE
BY
SURVEYED
DEPARTMENT BAR CODE



A 03 C018-I TYPICAL SECTION
SCALE = 1:75



1 — DETAIL - BRUSH LAYER
SCALE = N.T.S

NOTES:

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3. RED DEER RIVER ELEVATION AS OF NOVEMBER 4, 2021.
4. ANCHORED WITH WOODEN STAKES WITH MINIMUM 0.2 m LENGTH, SPACED EVERY 0.6 m IN ZIGZAG PATTERN. COCONUT FIBRE MAT COVERED WITH HV BLACK POLYPROPYLENE NETTING.
5. BOREHOLES SHOWN ON THE SECTION ARE OFFSET. BOREHOLES WERE DRILLED ON THE PAVEMENT SURFACE IN THE NORTHBOUND LANE.
6. PLACE BRUSH LAYER MIN 1500 mm LONG NATIVE WILLOW CUTTINGS AT 20 CUTTINGS PER LINEAR METER.

LEGEND:

EXISTING GROUND SURFACE

WATER LEVEL

1:75 0 1.5 3 m

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Alberta

SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1

C018-I: CROSS-SECTION A

CONTRACT	HIGHWAY	SHEET	DRAWING
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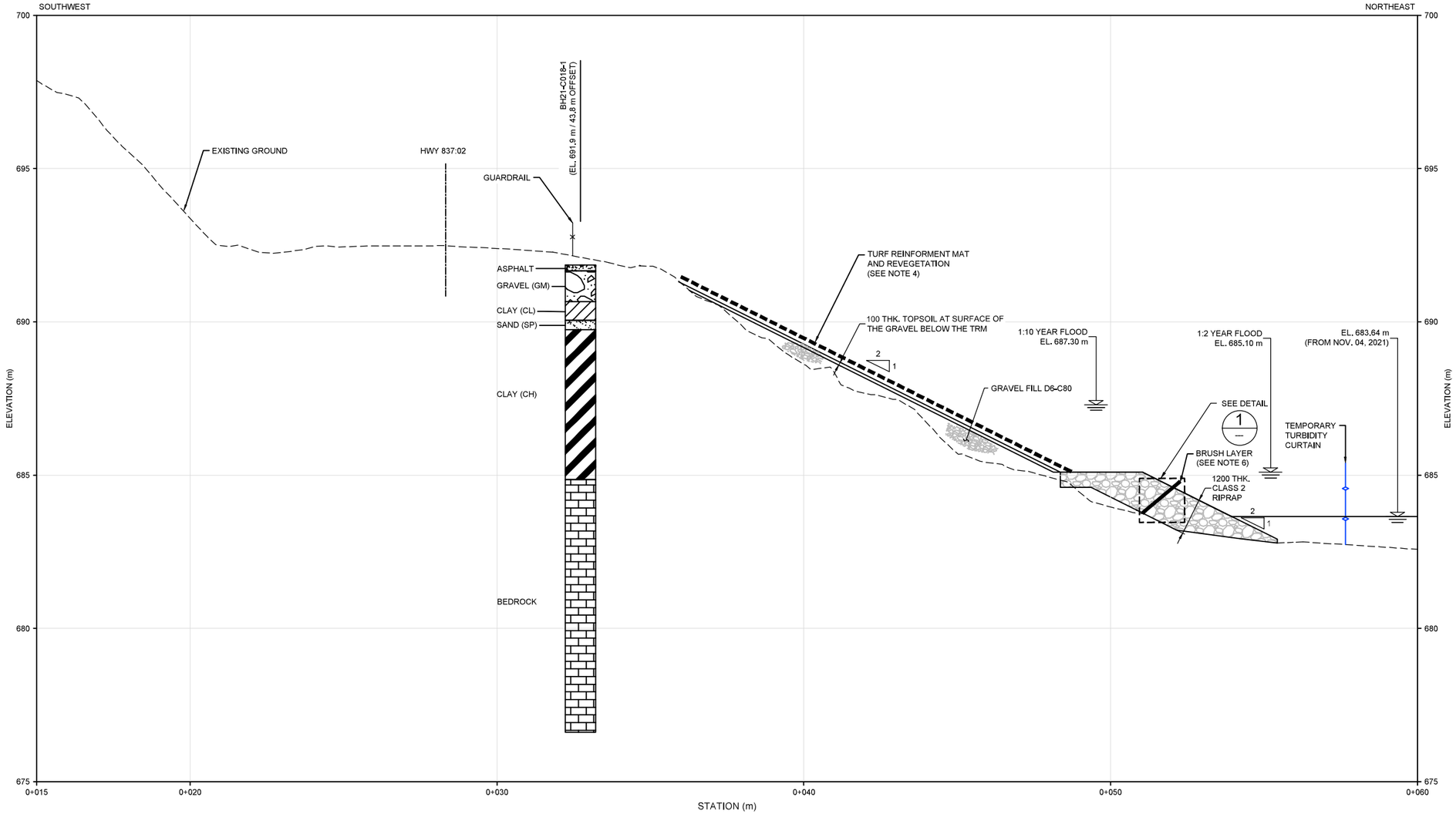
DRAWING RD-22533-11-P
HIGHWAY 837:02
CONTRACT 22533
DESCRIPTION C018-I: CROSS-SECTION D
PHOTO
DATE
BY
SURVEYED
DEPARTMENT BAR CODE



B 03 C018-I TYPICAL SECTION
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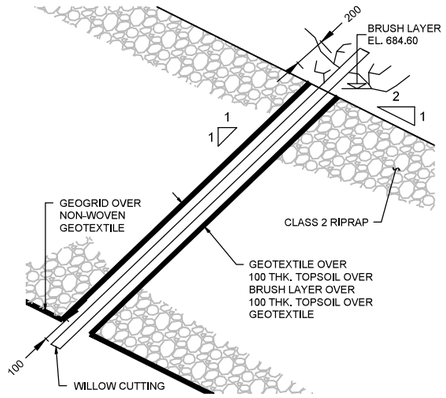

1 — DETAIL - BRUSH LAYER
SCALE = N.T.S

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LEGEND:

EXISTING GROUND SURFACE

WATER LEVEL

1:75 0 1.5 3 m

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THINK SAFETY FIRST

CONSULTANT
Klohn Crippen Berger

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DATE

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DATE	LOCATION	SITE
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Alberta

SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1

C018-I: CROSS-SECTION B

CONTRACT	HIGHWAY	SHEET	DRAWING
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DRAWING RD-22533-12-P
HIGHWAY 837:02
CONTRACT 22533
DESCRIPTION C018-I: CROSS-SECTION E
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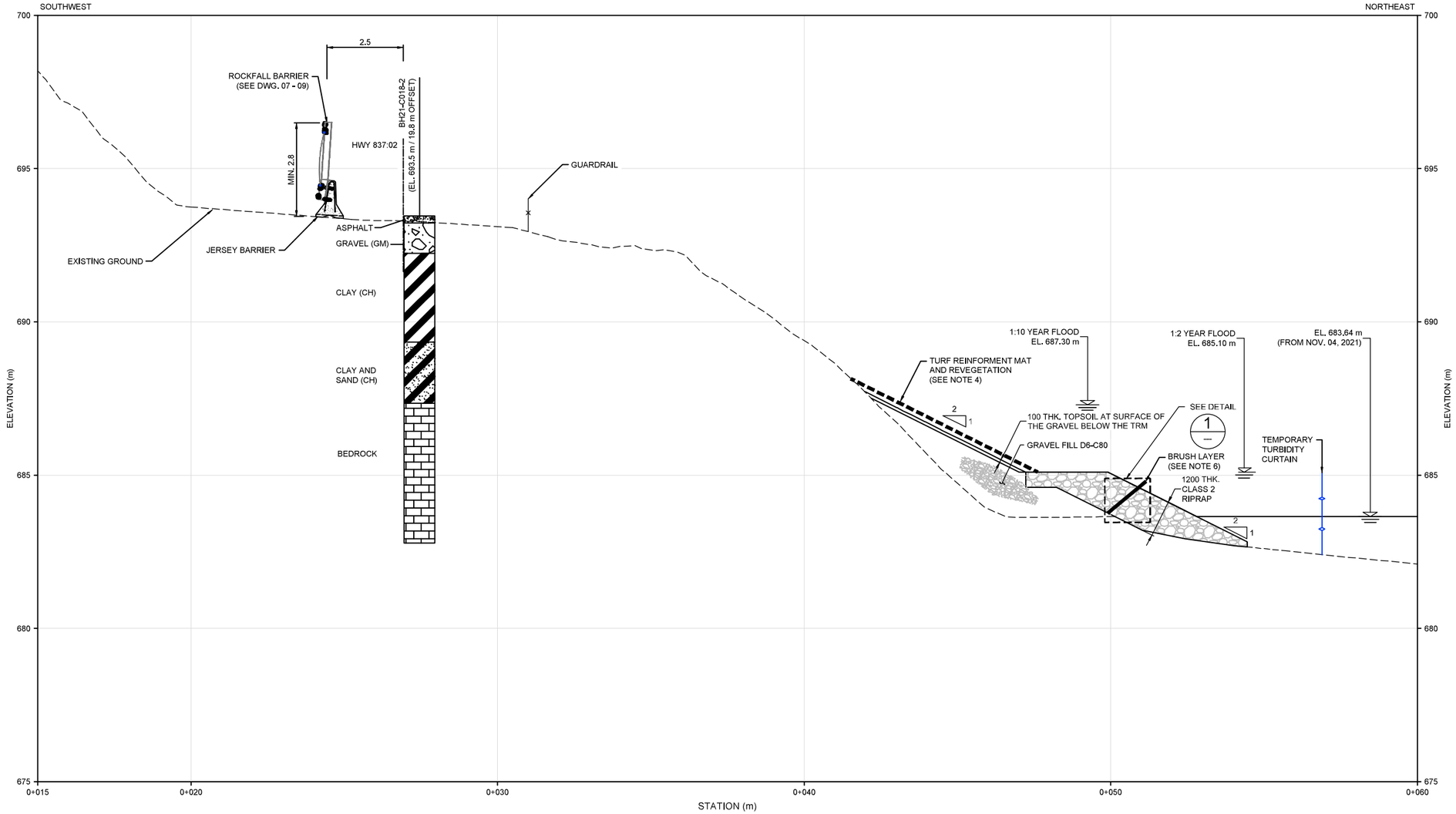
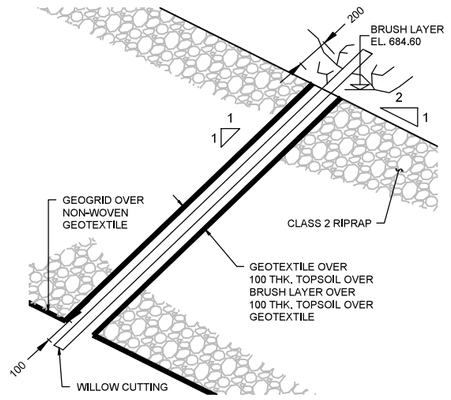
BY
SURVEYED
DEPARTMENT BAR CODE





1 — DETAIL - BRUSH LAYER
SCALE = N.T.S

C 03 C018-I TYPICAL SECTION
SCALE = 1:75

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3. RED DEER RIVER ELEVATION AS OF NOVEMBER 4, 2021.
4. ANCHORED WITH WOODEN STAKES WITH MINIMUM 0.2 m LENGTH, SPACED EVERY 0.6 m IN ZIGZAG PATTERN. COCONUT FIBRE MAT COVERED WITH HV BLACK POLYPROPYLENE NETTING.
5. BOREHOLES SHOWN ON THE SECTION ARE OFFSET. BOREHOLES WERE DRILLED ON THE PAVEMENT SURFACE IN THE NORTHBOUND LANE.
6. PLACE BRUSH LAYER MIN 1500 mm LONG NATIVE WILLOW CUTTINGS AT 20 CUTTINGS PER LINEAR METER.

LEGEND:

EXISTING GROUND SURFACE

WATER LEVEL

THIS DRAWING MAY HAVE BEEN REDUCED.
ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc)
ARE BASED ON 22" X 34" FORMAT DRAWINGS

1:75 0 1.5 3 m

THINK SAFETY FIRST

CONSULTANT
Klohn Crippen Berger

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Date Created: 2024-04-26

DESIGNER
DATE

CHECKER
DATE

REV	DATE	REVISION	BY
1	2024-04-22	ISSUED FOR TENDER	PR

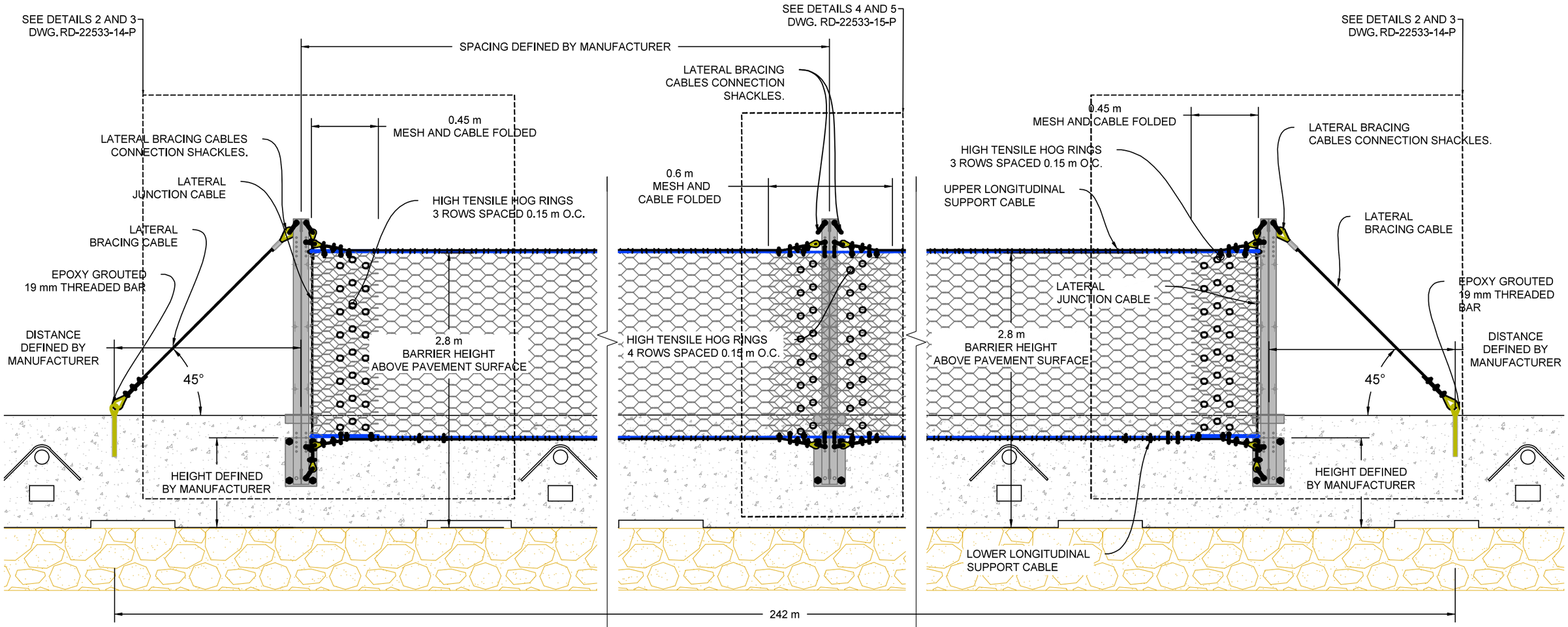
Alberta

SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1

C018-I: CROSS-SECTION C

DATE	LOCATION	SITE	CONTRACT	HIGHWAY	SHEET	DRAWING
2024-04-22	NE-27-29-21-W4M	C018	22533	837:02	12 OF 15	RD-22533-12-P

DRAWING RD-22533-13-P
HIGHWAY 837:02
CONTRACT 22533
DESCRIPTION ROCKFALL BARRIER: ELEVATION, SPECIFICATIONS, AND DETAILS
PHOTO
DATE
BY
SURVEYED
DEPARTMENT BAR CODE



ELEVATION - 35 kJ ROCKFALL BARRIER

NOTES:

1. ROCKFALL BARRIER INSTALLATION PROCEDURES AND SPECIFICATIONS TO BE PROVIDED BY AN APPROVED ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS (TEC) SUPPLIER SUCH AS MACCAFERRI, TRUMER, OR EQUIVALENT. THIS INCLUDES, BUT NOT LIMITED TO, WIRE MESH AND WIRE ROPE SPACING, CLIP SPACING, HOG RING DIMENSIONS, AND WIDE FLANGE BEAM DIMENSIONS.
2. THE SELECTED SUPPLIER MUST BE PRESENT DURING CONSTRUCTION AND INSTALLATION OF ROCKFALL BARRIER.
3. THE CONTRACTOR SHOULD UTILIZE THE EXISTING JERSEY BARRIERS, 242 m IN LENGTH, FOR ROCKFALL BARRIER INSTALLATION.

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THINK SAFETY FIRST

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REV	DATE	REVISION	BY
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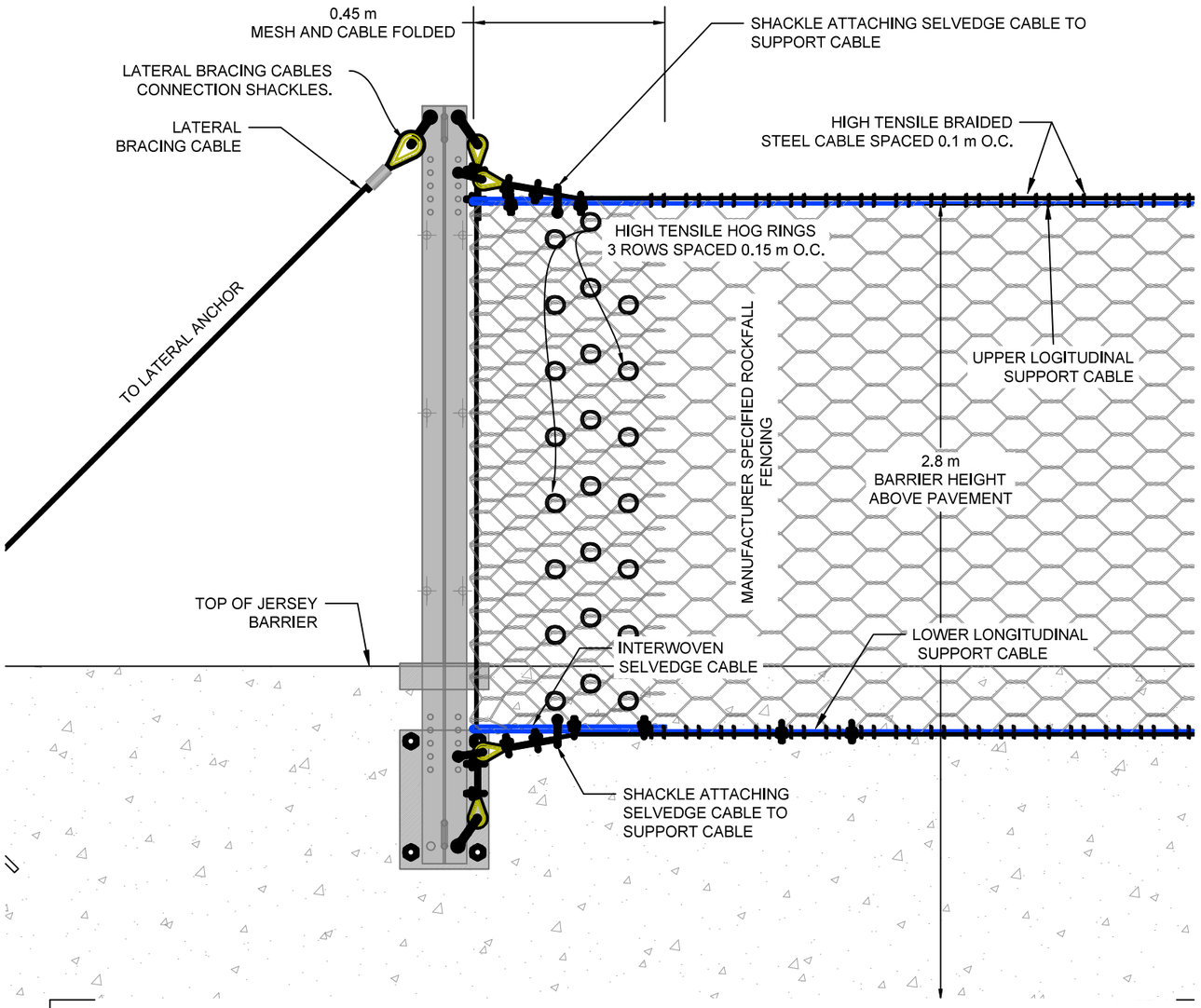
DATE	LOCATION	SITE
2024-04-22	NE-27-29-21-W4M	C018

Alberta

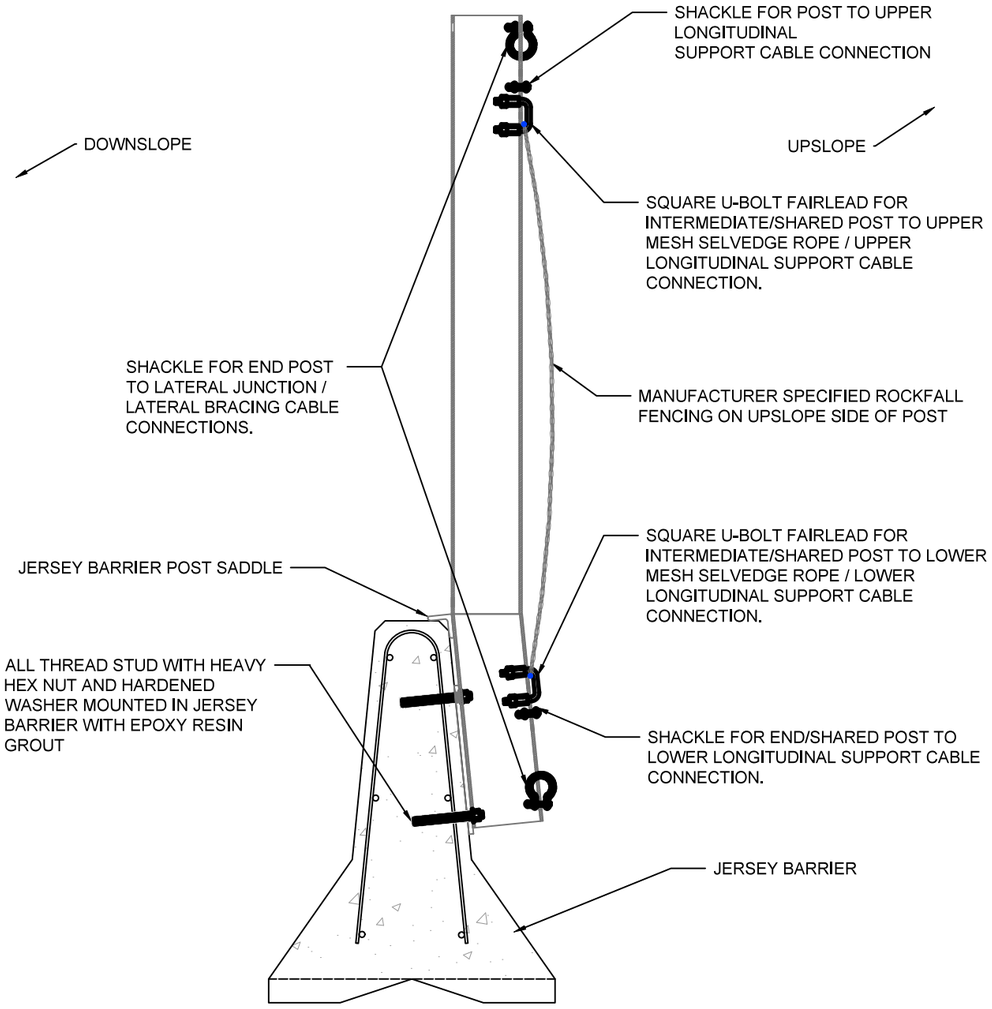
SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1

C018-II ROCKFALL BARRIER: ELEVATION

CONTRACT	HIGHWAY	SHEET	DRAWING
22533	837:02	13 OF 15	RD-22533-13-P



DETAIL 2 - END POST CONNECTION



DETAIL 3 - ROCKFALL BARRIER CROSS SECTION

DRAWING RD-22533-14-P
HIGHWAY 837:02
CONTRACT 22533
DESCRIPTION ROCKFALL BARRIER: DETAILS CONTD
PHOTO
DATE
BY
SURVEYED
DEPARTMENT BAR CODE

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REV	DATE	REVISION	BY
1	2024-04-22	ISSUED FOR TENDER	PR

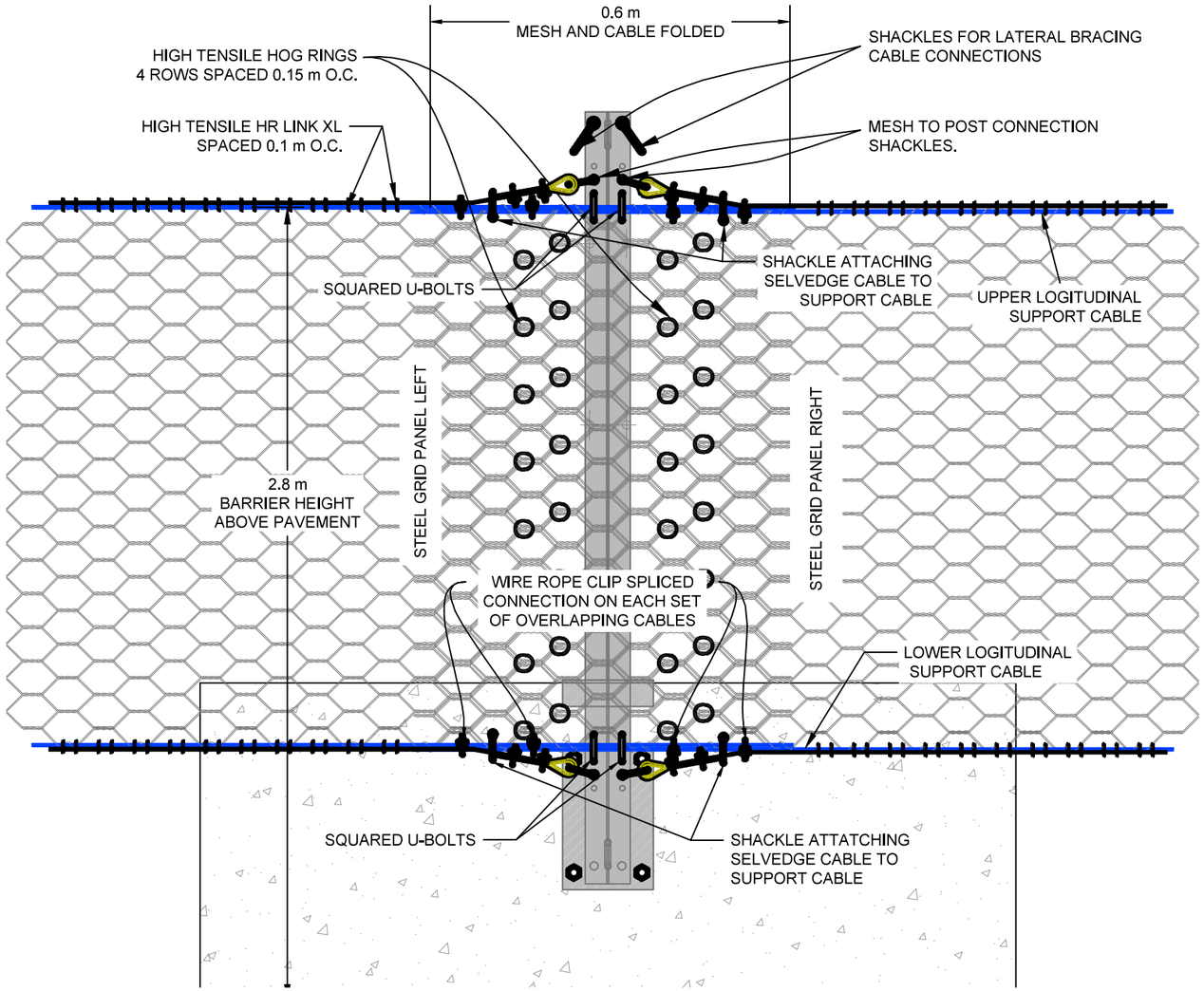
DATE	LOCATION	SITE
2024-04-22	NE-27-29-21-W4M	C018

Alberta

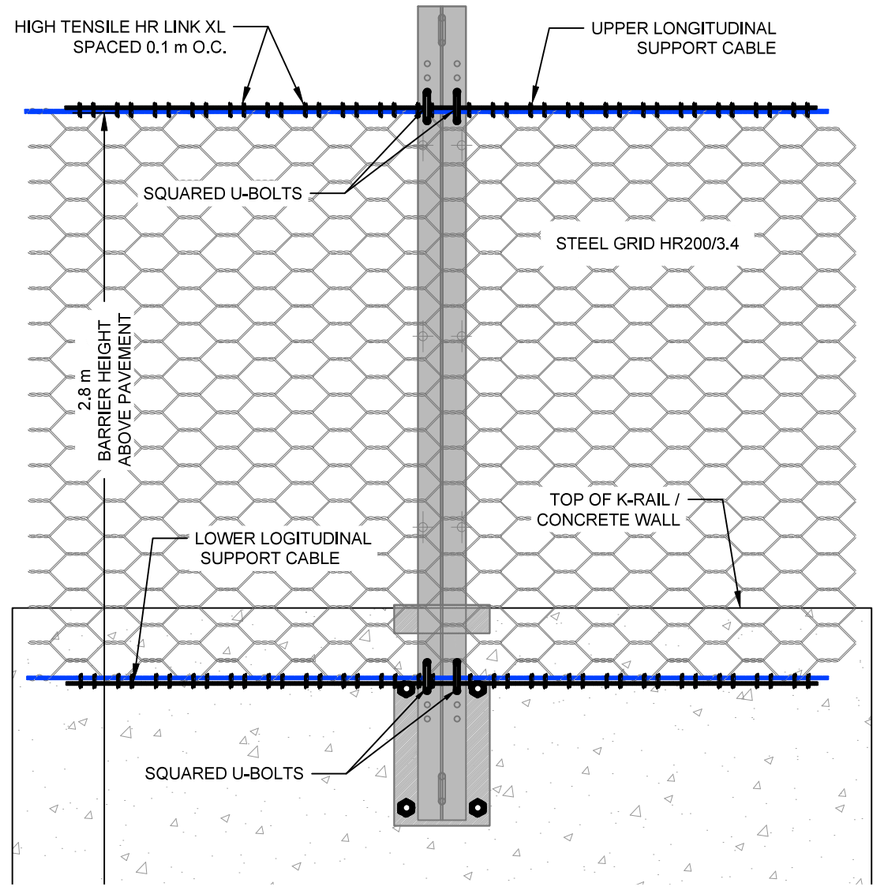
SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1

C018-II ROCKFALL BARRIER: DETAILS CONT'D

CONTRACT	HIGHWAY	SHEET	DRAWING
22533	837:02	14 OF 15	RD-22533-14-P



DETAIL 4 - PANEL TO PANEL CONNECTION



DETAIL 5 - INTERMEDIATE POST CONNECTION

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REV	DATE	REVISION	BY
1	2024-04-22	ISSUED FOR TENDER	PR

DATE	LOCATION	SITE
2024-04-22	NE-27-29-21-W4M	C018

Alberta

SLIDE REPAIR AND SLOPE STABILIZATION
SITE C018, HWY 837:02, KILOMETER 2.1
C018-II ROCKFALL BARRIER: DETAILS CONT'D

CONTRACT	HIGHWAY	SHEET	DRAWING
22533	837:02	15 OF 15	RD-22533-15-P

DRAWING RD-22533-15-P
HIGHWAY 837:02
CONTRACT 22533
DESCRIPTION ROCKFALL BARRIER: DETAILS CONT'D
PHOTO
DATE
BY
SURVEYED
DEPARTMENT BAR CODE

Inspection Photographs

Photo 1 **Slope instability and erosion at C018-1 along the east (right) riverbank of the Red Deer River was repaired late-2024 to early-2025 with geogrid-reinforced granular fill, Class 2 riprap, RECP, and brush layer within the riprap. Photo taken June 10, 2025, facing north.**

Photo 2 **At the C018-1 repair, vegetation is growing through the RECP and the brush layer is growing in well. Photo taken June 10, 2025, facing northwest.**

Photo 3 **Rockfall fence installed on jersey barriers along the C018-2 in late-2024 and early-2025. Photo taken June 10, 2025, facing northwest.**

Photo 4 **Material accumulating behind the jersey barrier and rockfall fence along C018-2. Photo taken June 10, 2025, facing northwest.**

Photo 5 **Material accumulating behind the jersey barrier and rockfall fence along C018-2. Photo taken June 10, 2025, facing southeast.**

Photo 6 **Pavement crack near the northwest extent of C018-2 appears wider (up to approximately 75 mm wide) than during the 2024 inspection when it was first observed. Photo taken June 10, 2025, facing northwest.**

Photo 7 **Ground crack near the northwest extent of C018-2 is approximately 75 mm wide. The downstream (east) side of the crack has settled between the 2024 and 2025 inspections. Photo taken June 10, 2025, facing southwest.**

Photo 8 **Pavement distress (settlement and cracking) near the northwest extent of the C018-2 site. The settlement has worsened between the 2024 and 2025 inspections and there is a significant dip in the east (northbound) lane. Photo taken June 10, 2025, facing south.**

Photo 9 **Between 5 and 10 sinkholes up to approximately 0.6 m in diameter have been observed on the crest of the riverbank, on either side of the early 2000s repair. Photo taken June 10, 2025 facing northeast.**

Photo 10 **Material that has accumulated along the crest of the riverbank on the east side of the highway. Photo taken June 10, 2025, facing northwest.**