

SITE NUMBER AND NAME: <b>C030 Slide and Erosion Site</b>		HIGHWAY & KM: 734:12, 40.628	PREVIOUS INSPECTION DATE: June 23, 2016	INSPECTION DATE: <b>June 12, 2017</b>
LEGAL DESCRIPTION: 09-10-19-033-08 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5745765 629598		RISK ASSESSMENT: PF: 1 CF: 1 TOTAL: 1	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 160 (south) (Ref No. 51280)			CONTRACT MAINTENANCE AREA (CMA): 18	

SUMMARY OF SITE INSTRUMENTATION:  None  LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) Courtney Mulhall (KCB) Roger Skirrow (AT) Tony Penney (AT)
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PRIMARY SITE ISSUE: Two slides on the south side (northbound lane) of Hwy 734 where the highway traverses the north slope of the James River Valley. Erosion damage caused by flooding in 2005 was previously repaired in September 2005. Additional drainage improvements were completed between 2014 and 2016 as part of AT's high-water-mitigation program.

APPROXIMATE DIMENSIONS:

DATE OF ANY REMEDIAL ACTION: 2004 – slope instability repaired; September 2005 – erosion damage caused by flooding in 2005 repaired; Fall 2014 – maintenance of the subsurface drains, culvert slope drains, drainage pipes, and slide area undertaken; June 2016 – four 1000 mm diameter CSP culverts with higher flow capacities and a riprap armored channel were installed/constructed to divert water away from the slide area, and w-beam guardrails were installed above the culverts and slide area. 2016 – original slide area repaired and slope drains repaired.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	None observed, gravel surfaced road		X
Slope Movement	X		Slide by outfall; slide downstream of riprap armored channel	X	
Erosion	X		Erosion gully downstream of outfall; erosion downstream of riprap armored channel		X
Seepage		X	None observed		X
Culvert Distress	X		Culverts damaged during construction, but open		X

**COMMENTS**

The culverts were damaged during construction. The MCI and AT bridge branch should inspect the culverts periodically to monitor their performance. The minimum 600 mm covering fill was present at the time of inspection. Drainage from the riprap armored channel is draining towards the crest of the James River valley slope. Drainage from the riprap armored channel is exacerbating a historic slide on the north slope (outside bend) of the James River Valley.

Vegetation is establishing itself on the east bank of the riprap armored channel, and growing through the erosion control cloth that was placed around the culverts and in the ditches in June 2016. The stockpile on the west bank of the riprap armored channel remains poorly vegetated.

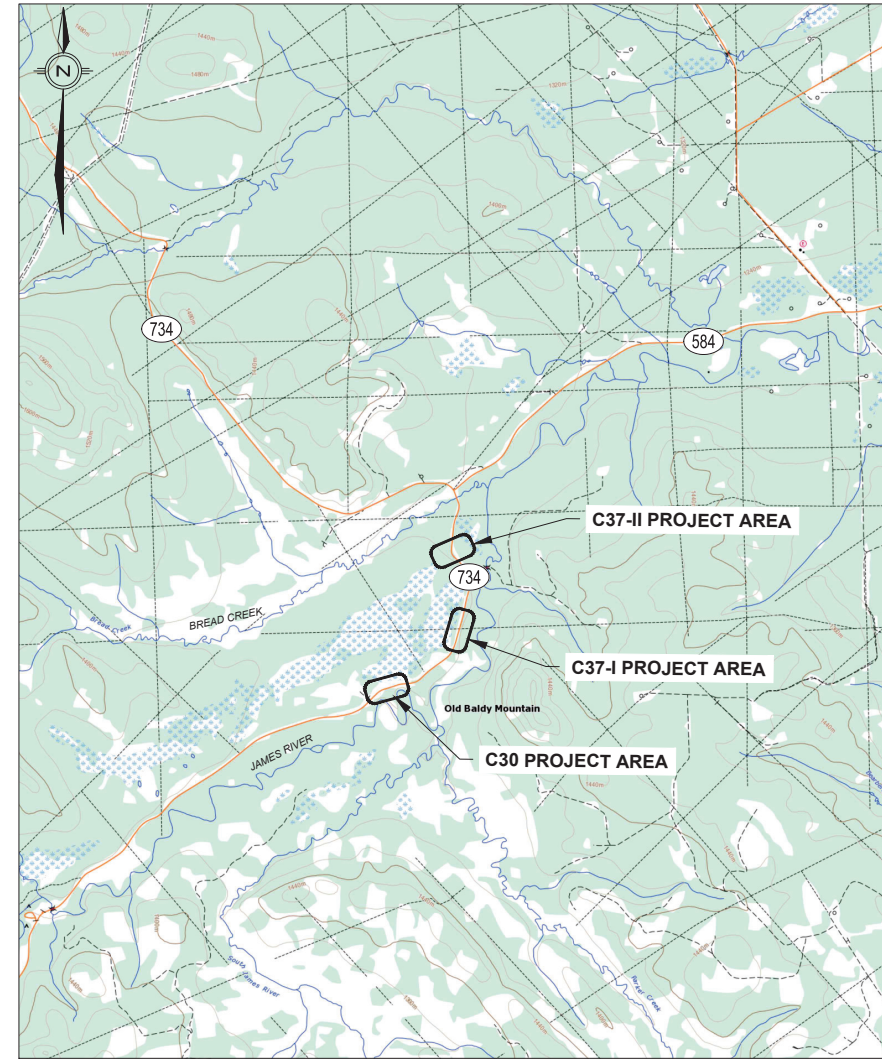
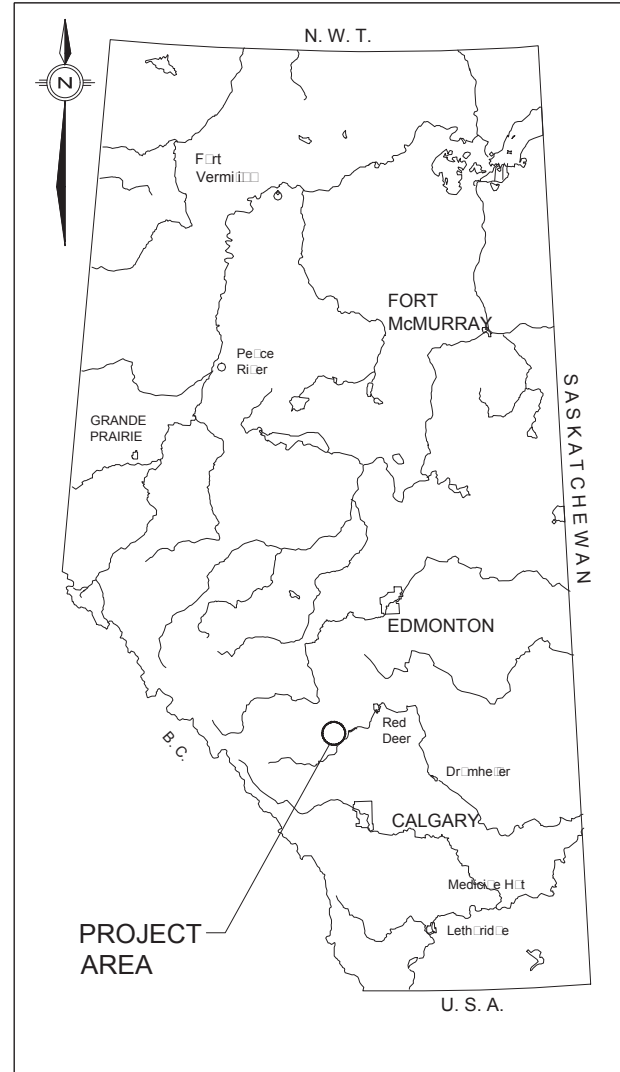
The quantity and diameter of culverts installed at the site resulted in the site becoming a bridge file (BF83183). The stockpile of excavated soil from the C030, C037-I, and C037-II sites has not vegetated. The contractor used broadcast seeding instead of drill seeding. Vegetation is growing in other areas on site. The warranty inspection

should include assessment of the vegetation growth on the stockpile.  
This site should be inspected every two years to monitor the landslide at the outlet of the riprap armoured channel and to assess vegetation growth.

# HIGH WATER RELATED MITIGATION WORKS

## H734:12 - SITES C30 40.5 km, C37-I 41.8 km , AND C37-II 42.9 km

### ISSUED FOR TENDER, TENDER NO. 17035



SITE LOCATION PLAN  
1:50,000

#### DRAWING INDEX

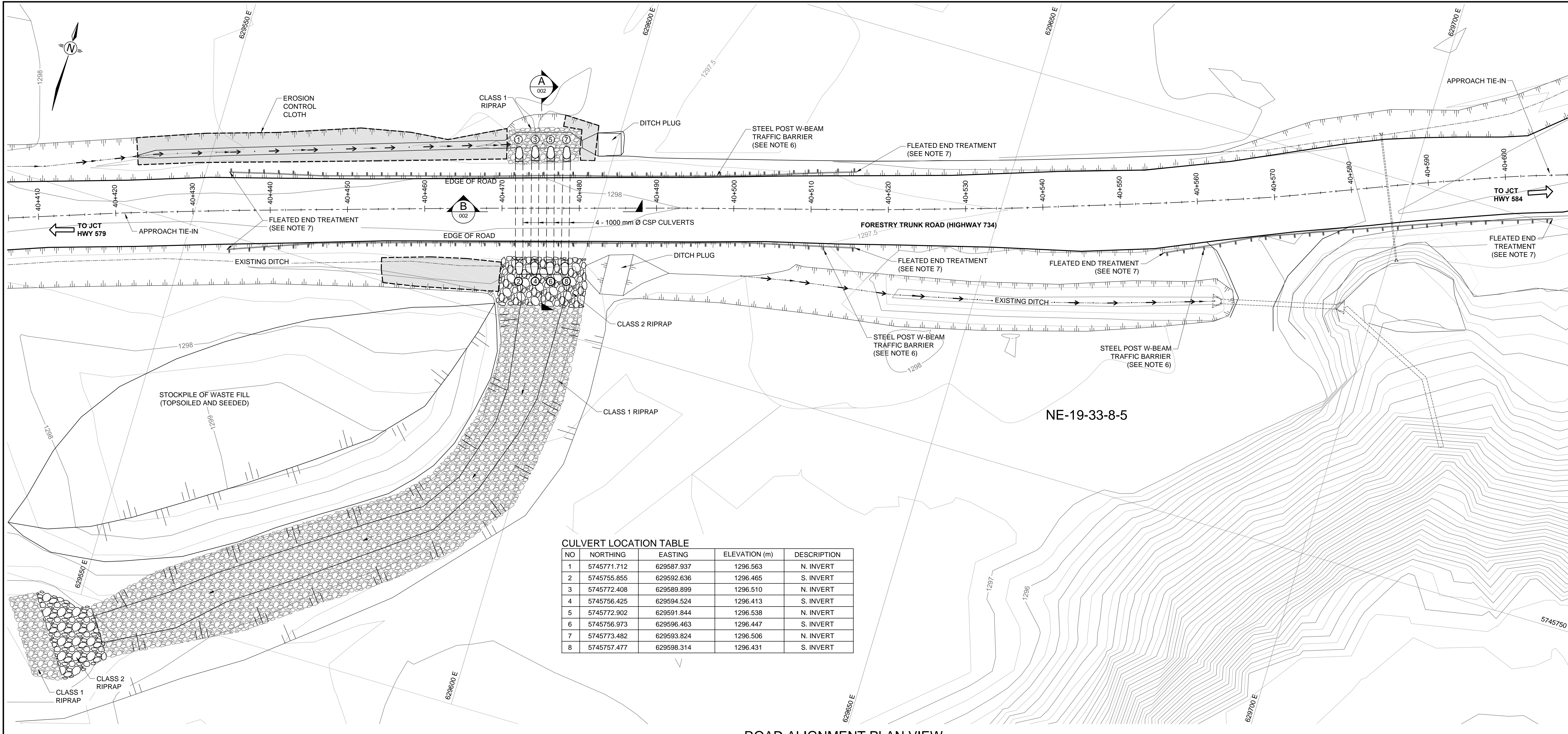
SHEET	DRAWING NO.	TITLE
1	RD-19281-P	SITE LOCATION PLAN AND DRAWING INDEX
2	RD-19282-P	H734:12 - SITE C30 40.5 KM: EXISTING CONDITIONS
3	RD-19283-P	H734:12 - SITE C30 40.5 KM: OVERALL SITE LAYOUT AND CONTRACT LIMITS
4	RD-19284-P	H734:12 - SITE C30 40.5 KM: ROAD ALIGNMENT AND DRAINAGE - PLAN AND PROFILE
5	RD-19285-P	H734:12 - SITE C30 40.5 KM: BF83183 CULVERT CROSSING - PLAN
6	RD-19286-P	H734:12 - SITE C30 40.5 KM: BF83183 CULVERT CROSSING - CROSS-SECTIONS
7	RD-19287-P	H734:12 - SITE C30 40.5 KM: PRIMARY CHANNEL - PLAN, PROFILE AND SECTION
8	RD-19287A-P	H734:12 - SITE C37-I 41.8 KM: CULVERT CROSSING - PLAN AND SECTIONS
9	RD-19287B-P	H734:12 - SITE C37-II 42.9 KM: BF83184 CULVERT CROSSING - PLAN AND SECTIONS



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

<p>CONSULTANT</p> <p><b>Klohn Crippen Berger</b></p>	<p>PERMIT TO PRACTICE KLOHN CRIPPEN BERGER LTD. PERMIT NUMBER: P 9196</p> <p>The Association of Professional Engineers, Geologists and Geophysicists of Alberta</p>	<p>DESIGNER</p> <p>DATE: September 2, 2015</p>	<p>CHECKER</p> <p>DATE: Sept 2, 2015</p>	<p>2015-09-02</p>	ISSUED FOR TENDER	FD	
				<p>2015-05-15</p>	ISSUED FOR 95% REVIEW	EC	
				<p>2015-04-07</p>	ISSUED FOR 70% REVIEW	EL	<p>SITE LOCATION PLAN AND DRAWING INDEX</p>
				<p>REV</p>	REVISION	BY	
				<p>DATE</p>	<p>LOCATION</p>	<p>SITE</p>	<p>CONTRACT</p>
				<p>2015-09-01</p>	<p>NW-29-33-8-5 &amp; NW-19-33-8-5</p>	-	<p>17035</p>
							<p>HIGHWAY</p>
							<p>734:12</p>
							<p>SHEET</p>
							<p>1 OF 9</p>
							<p>DRAWING</p>
							<p>RD-19281-P</p>

DRAWING 001  
 HIGHWAY 734:12  
 CONTRACT 17035  
 DESCRIPTION H734:12 - SITE C30 40.5 KM: ROAD ALIGNMENT AND DRAINAGE PLAN AND PROFILE  
 PHOTO  
 DATE  
 BY  
 SURVEYED  
 DEPARTMENT BAR CODE



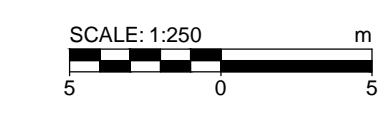
**CULVERT LOCATION TABLE**

NO	NORTHING	EASTING	ELEVATION (m)	DESCRIPTION
1	5745771.712	629587.937	1296.563	N. INVERT
2	5745755.855	629592.636	1296.465	S. INVERT
3	5745772.408	629589.899	1296.510	N. INVERT
4	5745756.425	629594.524	1296.413	S. INVERT
5	5745772.902	629591.844	1296.538	N. INVERT
6	5745756.973	629596.463	1296.447	S. INVERT
7	5745773.482	629593.824	1296.506	N. INVERT
8	5745757.477	629598.314	1296.431	S. INVERT

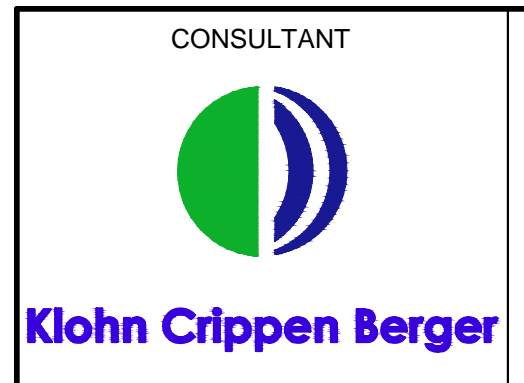
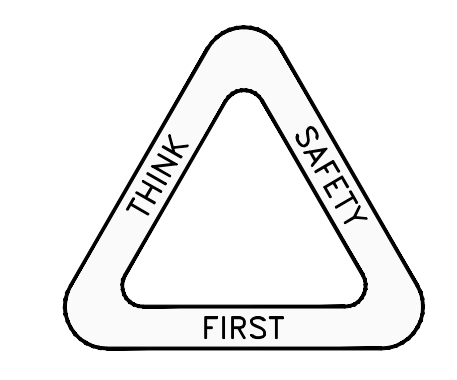
**ROAD ALIGNMENT PLAN VIEW**  
 SCALE 1:250

- NOTES**
- AS CONSTRUCTED SURVEY CONDUCTED BY HAMILTON & OLSEN SURVEYS LTD. IN SEPTEMBER 27, 2016.
  - DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
  - CONTOURS SHOWN GENERATED FROM THE COMBINATION OF LIDAR AND TOPOGRAPHIC SITE SURVEY.
  - COORDINATES IS IN UTM PROJECTION WITH NAD83 DATUM, ZONE 11; CENTRAL MERIDIAN 117d W.
  - CHAINAGE BASED ON SITE LOCATION DISTANCE ALONG HWY 734.
  - TRAFFIC BARRIERS FOR SLIDE 2 HAZARD MITIGATION CONSIST OF STEEL POST W-BEAM SYSTEM (ALBERTA TRANSPORTATION DRAWING TEB 3.09).
  - TRAFFIC BARRIER SYSTEM INCLUDES FLARED ENERGY ABSORBING TERMINAL (FLEAT) END TREATMENT (ALBERTA TRANSPORTATION DRAWING RDG-B1.5).

- LEGEND**
- CONTOUR (0.5 m INTERVAL)
  - CULVERT
  - CLASS 1 RIPRAP
  - CLASS 2 RIPRAP
  - EXTENT OF EROSION CONTROL CLOTH
  - FLOW DIRECTION
  - TRAFFIC BARRIER



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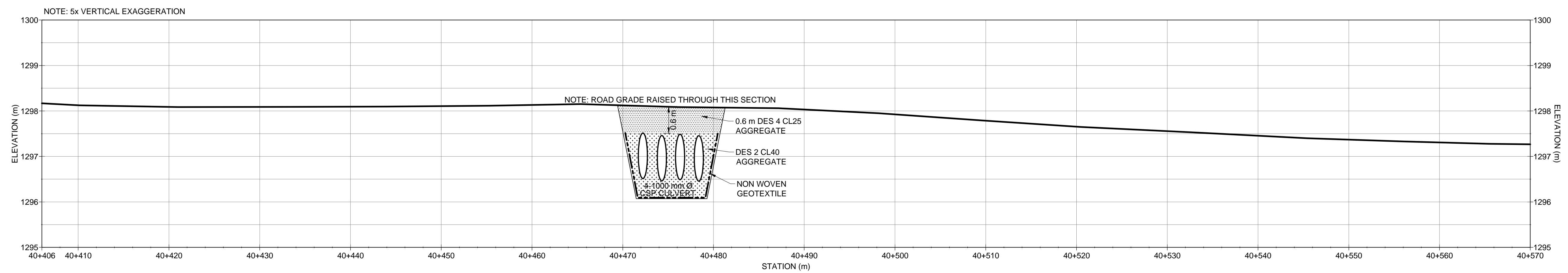
DESIGNER  
 CHECKER  
 DATE  
 DATE

REV	DATE	REVISION	FD BY
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	2015-09-01	NE-19-33-8-5	C30

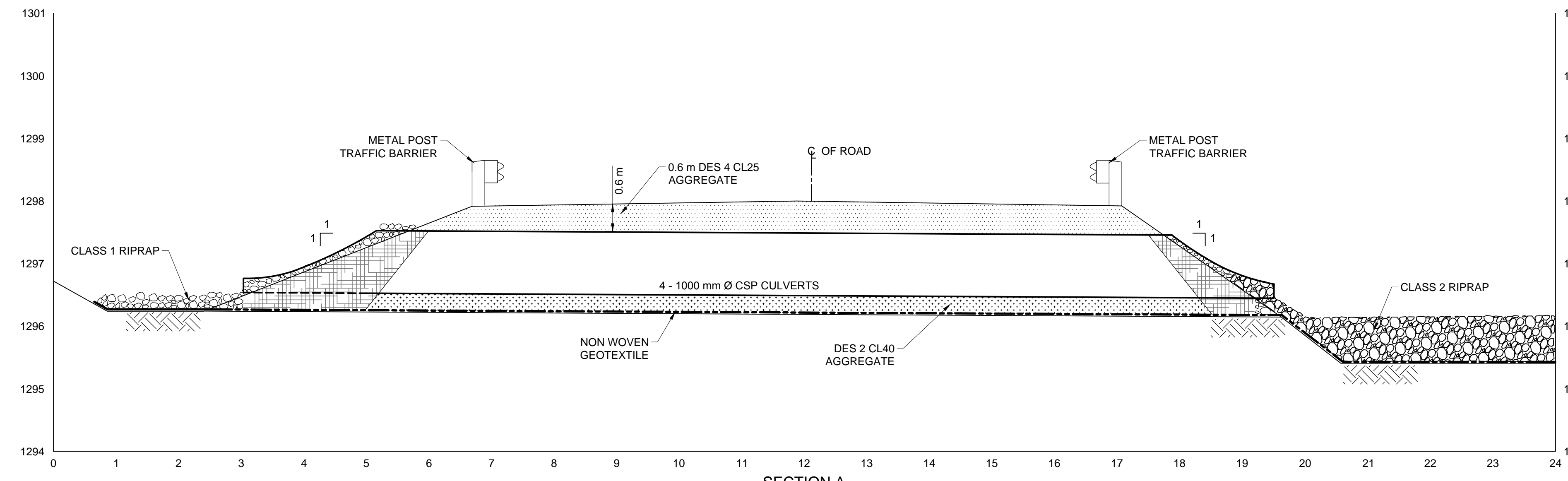
Alberta Transportation  
 H734:12 - SITE C30 40.5 KM  
 BF 83183 ROAD ALIGNMENT AND DRAINAGE PLAN  
 RECORD DRAWING

CONTRACT	HIGHWAY	SHEET	DRAWING
17035	734:12	1 OF 2	001

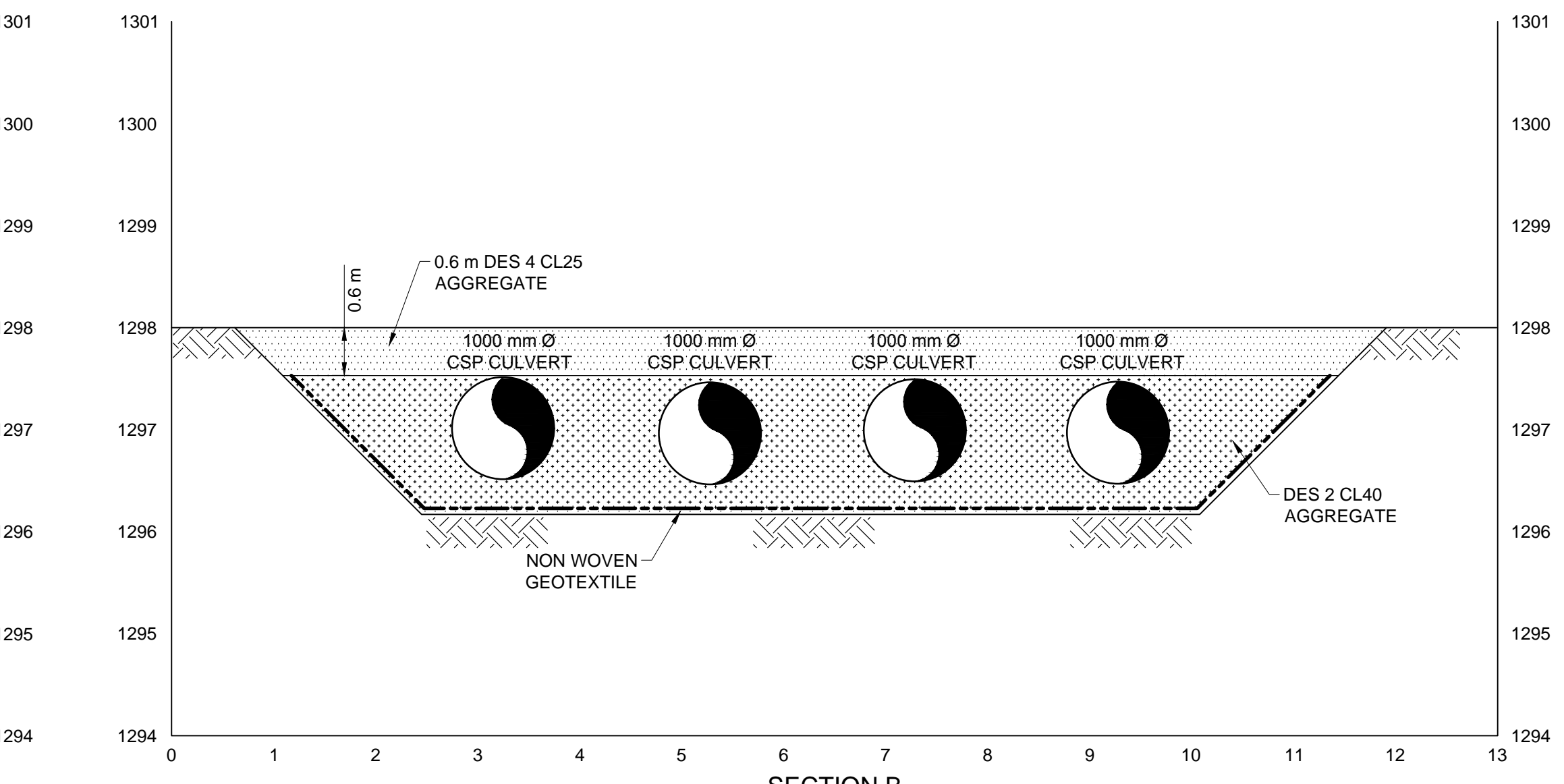
DRAWING 002  
 HIGHWAY 734:12  
 CONTRACT 17035  
 DESCRIPTION H734:12 - SITE C30 40.5 KM: ROAD ALIGNMENT AND DRAINAGE PLAN AND PROFILE  
 PHOTO  
 DATE  
 BY  
 SURVEYED  
 DEPARTMENT BAR CODE



**ROAD ALIGNMENT PROFILE**  
 SCALE 1:250 (HORIZONTAL)  
 1:50 (VERTICAL)

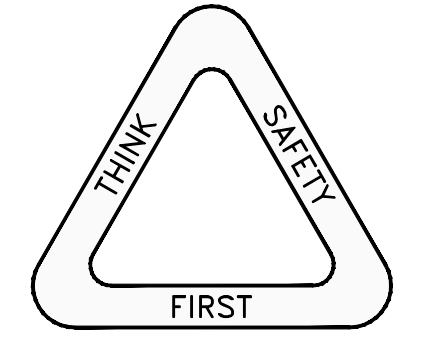
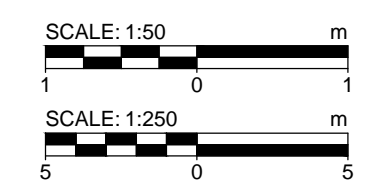


**SECTION A**  
**SECTION A**  
 1:50

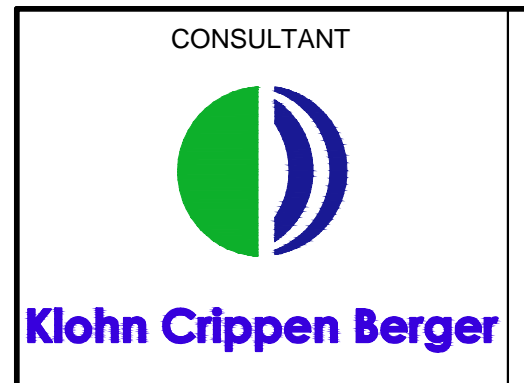


**SECTION B**  
**SECTION B**  
 1:50

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DESIGNER  
 CHECKER  
 DATE  
 DATE

REV	DATE	ISSUED FOR REVIEW	FD BY
1	2017-01-02	ISSUED FOR REVIEW	FD BY
	DATE	LOCATION	SITE
	2015-09-01	NE-19-33-8-5	C30

**Alberta** Transportation

H734:12 - SITE C30 40.5 KM  
 BF 83183 ROAD ALIGNMENT AND DRAINAGE  
 PROFILE AND CROSS SECTION  
 AS CONSTRUCTED

CONTRACT	HIGHWAY	SHEET	DRAWING
17035	734:12	2 OF 2	002

**Photo 1**      **The C030 high-water-mitigation site. Photo taken June 12, 2017 looking southwest.**



**Photo 2**      **The inlets of the four 1000-mm culverts that were installed in June 2016. Vegetation is growing through the erosion control cloth that was placed around the culverts and in the ditch in June 2016. Photo taken June 12, 2017 looking southwest.**



**Photo 3** The outlet of the 1000-mm culverts, and the riprap armoured channel that were installed/constructed in June 2016. Vegetation is establishing itself on the east bank of the riprap armoured channel; however, the stockpile on the west bank remains poorly vegetated. Photo taken June 12, 2017 looking south.



**Photo 4** Ponded water at the end of the riprap armoured channel. Photo taken June 12, 2017 looking south.



**Photo 5** Drainage from the riprap armored channel is exacerbating a historic slide on the north slope (outside bend) of the James River Valley. Photo taken June 12 2017 looking south to southwest.



**Photo 6** The erosion gully and slide area located on the north slope of the James River Valley, downstream of the drain outfall. The site is the original C030 site that the high-water-mitigation drainage works were designed to divert water away from. Photo taken June 12, 2017 looking southeast.

