

**ALBERTA TRANSPORTATION  
GEOHAZARD ASSESSMENT PROGRAM  
PEACE REGION – HIGH LEVEL  
2017 INSPECTION**



Site Number	Location	Name	Hwy	km
PH005-1	North of Manning, AB	Meikle River (km 25.21)	35:08	25.51
Legal Description		UTM Co-ordinates		
SW7-94-22-W5M		11U E 467,717	N	6,332,466

	Date	PF	CF	Total
<b>Previous Inspection:</b>	13-June-2016	3	4	12
<b>Current Inspection:</b>	21-June-2017	3	4	12
<b>Road AADT:</b>	1590		<b>Year:</b>	2016
<b>Inspected By:</b>	Roger Skirrow, TRANS Ed Szmata, TRANS		Ken Froese, Thurber Don Proudfoot, Thurber	
<b>Report Attachments:</b>	<input type="checkbox"/> Photographs	<input checked="" type="checkbox"/> Plans	<input type="checkbox"/> Maintenance Items	

<b>Primary Site Issue:</b>	Slope movement	
<b>Dimensions:</b>	50 m long with 32 m main active zone	
<b>Date of Remediation:</b>	2015: 28 m long pile wall and waler constructed.	
<b>Maintenance:</b>	Pre-remediation: ACP patch in 2011, milled in 2013. 2016: Overlay and chip seal of Highway 35 including this site. 2017: High-tension cable barrier installed.	
<b>Observations:</b>	<b>Description</b>	<b>Worsened?</b>
<input checked="" type="checkbox"/> Pavement Distress	Crack pattern has not reflected through 2016 patch.	<input type="checkbox"/>
<input type="checkbox"/> Slope Movement	Pile wall installed in 2015. No evidence of slope movement above or below.	<input type="checkbox"/>
<input type="checkbox"/> Erosion		<input type="checkbox"/>
<input type="checkbox"/> Seepage	Wet area previously seen on sideslope not visible due to re-grading during construction.	<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input type="checkbox"/> Other	Guardrail was removed at the time of the inspection so previous deflection not observed.	<input type="checkbox"/>

Instrumentation (as of Fall 2017):	
Previous	SI63 sheared of at 5.5 m depth between May and October 2007; SI64 sheared off at 6 m depth between October 2008 and May 2009.
2014	TH14-2 and -3 destroyed during construction; TH14-4 has trended downward since Fall 2016 to about 2.7 m below ground surface.
2015	SI-14, SI-23, and SI-32 installed in the corresponding piles: cumulative deflections were between 4.4 mm and 4.6 mm.

**Assessment:**

A slope failure occurred in 1998 resulting in a 3 m high backscarp close to the highway. Ongoing movement had begun to extend the failure into the highway surface. In 2015, the site was remediated with the construction of 47 cast-in-place concrete tangent piles of 1.2 m diameter and 15.8 m depth. A concrete waler was constructed across the piles incorporating sleeves for future tie-back anchors, if required. The site was regraded with a bench on the downslope side of the wall to reduce driving forces on the main slide. There is a concrete gutter on the upslope side of the wall which directs surface water to a half-culvert downpipe at the south end. Both the downpipe and the subdrain from behind the waler drain to a splash pad located at the tree line. Three slope inclinometers were installed

in the wall to monitor future movements. The Project Summary Report has been added to Section G of the site binder.

There has been some minor movement of the wall recorded in the year since construction with the total cumulative movements less than 5 mm in Fall 2017. This movement is expected as the wall comes to equilibrium and should decrease in the future. The remaining piezometer (TH14-4) had showed a cyclic pattern with water levels higher in the fall than the spring; however, it has decreased since the historic high reading in Fall 2016 to 2.7 m below ground surface (elevation 412.9 m) in Fall 2017.














Based on the inclinometer readings and the absence of change in the crack pattern, it appears that the pile wall is acting as expected to reduce the movement at the highway. The site was milled and overlaid in the summer of 2016 and the crack patterns have not yet reflected through the overlay.

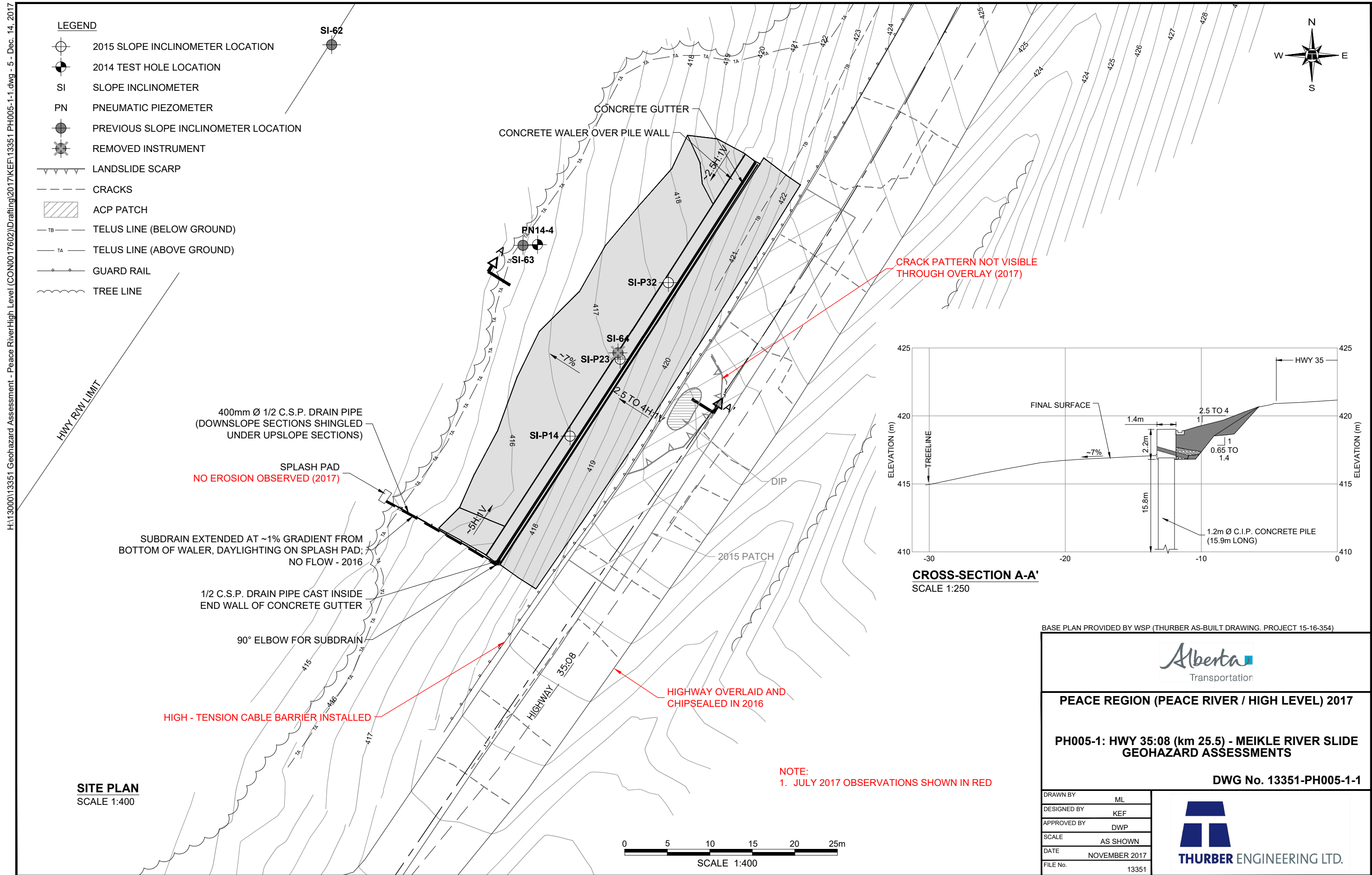
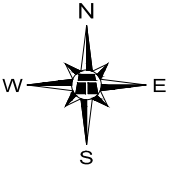
**Recommendations:**

- As no adverse conditions were noted during the 2017 inspection, this site can be removed from the inspection program. It is recommended that the instrumentation reading program continue as scheduled for at least the duration of the current contract.

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**LEGEND**

-  2015 SLOPE INCLINOMETER LOCATION
-  2014 TEST HOLE LOCATION
-  SLOPE INCLINOMETER
-  PNEUMATIC PIEZOMETER
-  PREVIOUS SLOPE INCLINOMETER LOCATION
-  REMOVED INSTRUMENT
-  LANDSLIDE SCARP
-  CRACKS
-  ACP PATCH
-  TELUS LINE (BELOW GROUND)
-  TELUS LINE (ABOVE GROUND)
-  GUARD RAIL
-  TREE LINE



CRACK PATTERN NOT VISIBLE THROUGH OVERLAY (2017)

400mm Ø 1/2 C.S.P. DRAIN PIPE (DOWNSLOPE SECTIONS SHINGLED UNDER UPSLOPE SECTIONS)

SPLASH PAD  
NO EROSION OBSERVED (2017)

SUBDRAIN EXTENDED AT ~1% GRADIENT FROM BOTTOM OF WALER, DAYLIGHTING ON SPLASH PAD; NO FLOW - 2016

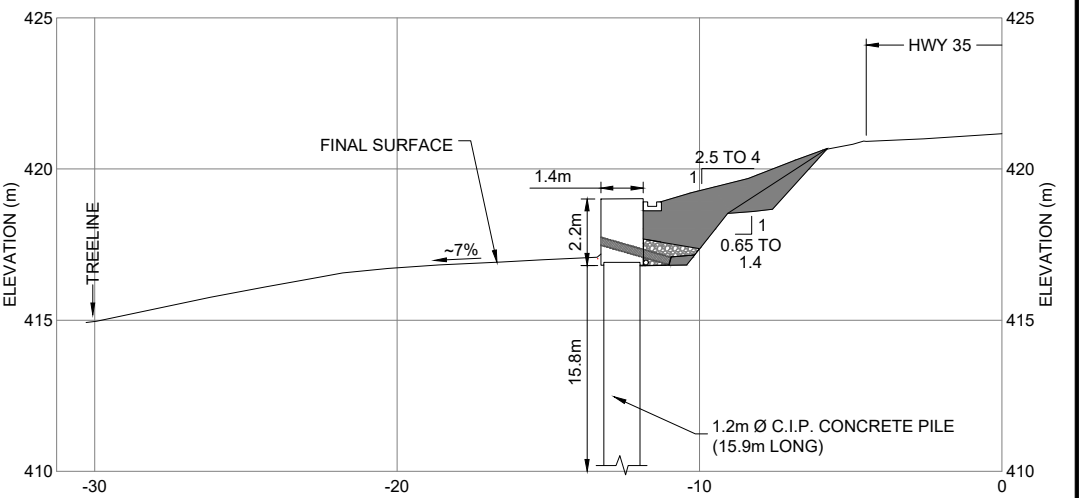
1/2 C.S.P. DRAIN PIPE CAST INSIDE END WALL OF CONCRETE GUTTER

90° ELBOW FOR SUBDRAIN

HIGH - TENSION CABLE BARRIER INSTALLED

HIGHWAY OVERLAID AND CHIPSEALED IN 2016

NOTE:  
1. JULY 2017 OBSERVATIONS SHOWN IN RED



**CROSS-SECTION A-A'**  
SCALE 1:250

BASE PLAN PROVIDED BY WSP (THURBER AS-BUILT DRAWING. PROJECT 15-16-354)



**PEACE REGION (PEACE RIVER / HIGH LEVEL) 2017**

**PH005-1: HWY 35:08 (km 25.5) - MEIKLE RIVER SLIDE GEOHAZARD ASSESSMENTS**

DWG No. 13351-PH005-1-1

DRAWN BY	ML
DESIGNED BY	KEF
APPROVED BY	DWP
SCALE	AS SHOWN
DATE	NOVEMBER 2017
FILE No.	13351



**SITE PLAN**  
SCALE 1:400

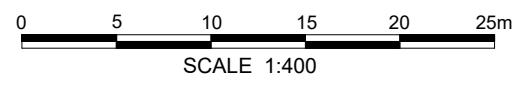




Photo 1 – Looking north along rebuilt slope with pile wall. Guardrail was removed as part of the milling and overlay on Highway 35 and replaced with a high-tension cable barrier.



Photo 2 – Looking northeast at north end of the pile wall. Note the plates along the bottom of the wall covering the sleeves for future tie-back installation, if required.



Photo 3 – Looking south along pile wall.



Photo 4 – Looking west along half-culvert down drain at the south end of the wall.