

**ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – PEACE-HIGH LEVEL
2018 INSPECTION**



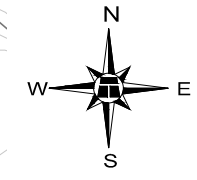
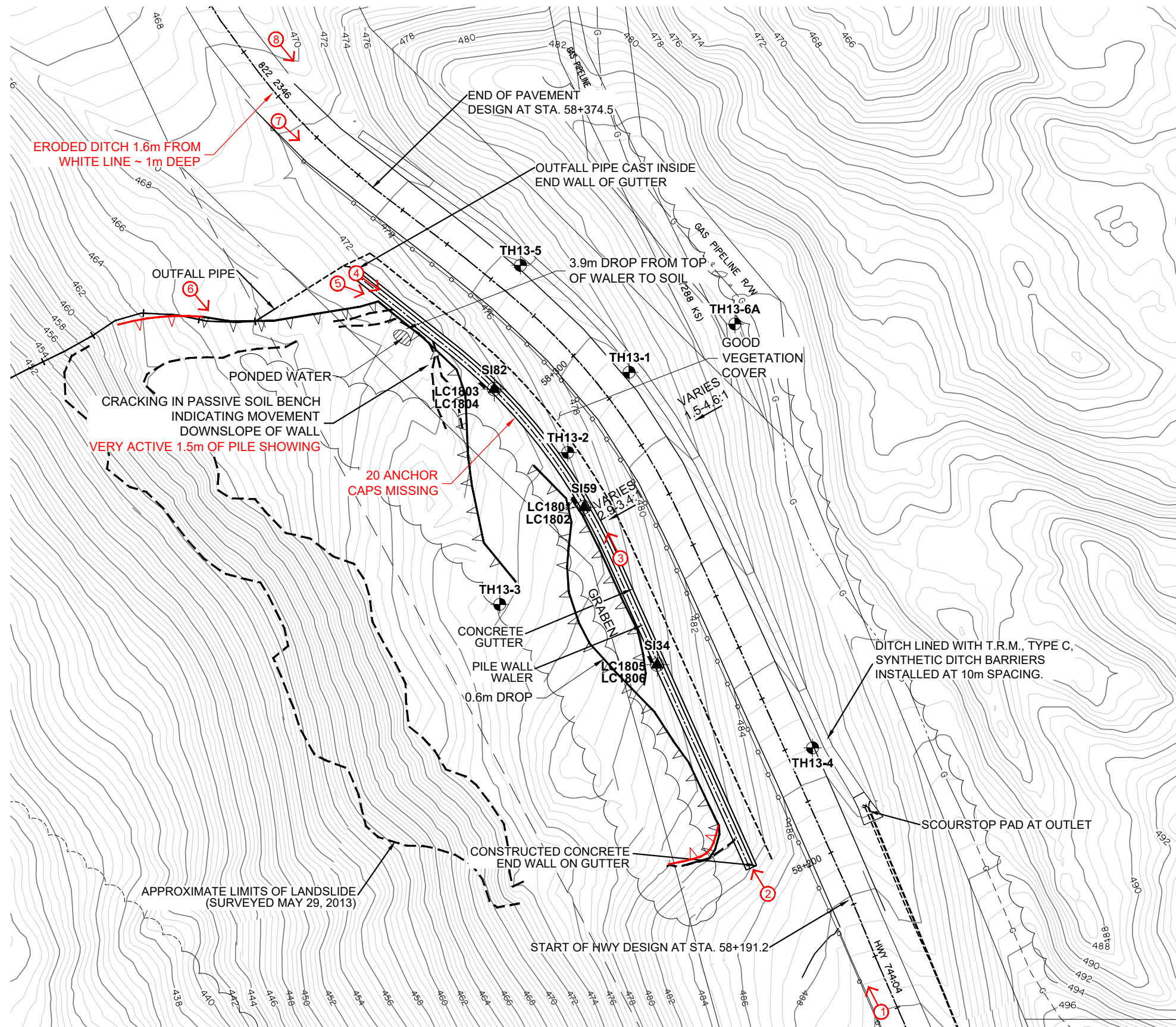
Site Number	Location	Name	Hwy	km
PH072	Judah Hill	Sunshine Landslide	744:04	58.154
Legal Description		UTM Co-ordinates		
NE¼ 20-083-21 W5M		11U E 483150	N 6230060	

	Date	PF	CF	Total
Previous Inspection:	6-Jun-2017	5	5	25
Current Inspection:	14-May-2018	5	5	25
Road AADT:	540		Year:	2017
Inspected By:	Roger Skirrow, TRANS Ed Szmata, TRANS		Don Proudfoot, Thurber Shawn Russell, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input checked="" type="checkbox"/> Maintenance Items			

Primary Site Issue:	In May of 2013, a new landslide developed that encompassed both lanes of the highway through a side hill fill that was located at the top of a high steep valley slope. A cast-in place concrete pile wall supported with soil anchors was constructed to buttress the section of the road affected by the landslide, the highway embankment was rebuilt with expanded polystyrene light-weight fill and the roadway was reinstated to a gravel surface under AT Contract CON0015153 in 2014. This section of Hwy 744:04 was paved with ACP in June of 2016.
Dimensions:	The 2013 landslide affected about 100 m of highway. The landslide was about 100 m by 140 m in plan size. The backscarp was partially located in the NBL ditch and in the backslope above the highway.
Maintenance:	

Observations:	Description	Worsened?
<input type="checkbox"/> Pavement Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	The passive support bench downslope of the newly constructed pile wall is showing signs of failure below the wall (Photos 2 to 6).	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	There is a scour forming in the bottom of the NBL ditch at km 58.38	<input checked="" type="checkbox"/>
<input type="checkbox"/> Seepage		<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input checked="" type="checkbox"/> Other	The wall surface gutter drain periodically clogs with sediment and needs to be cleaned on a regular basis.	<input checked="" type="checkbox"/>

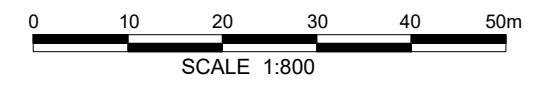
Instrumentation:	
SI-34, 59 and 82	Three slope inclinometers were installed in retaining wall piles during construction. Since the final lock off the soil anchors in September of 2014, the slope inclinometers have shown about 1 mm to 5 mm of downslope movement in the pile wall.
Load Cells VC1802 to VC1806	All soil anchors were initially locked off to 162 kN (0.8 of the design SLS load of 192 kN). Since their final lock off, the anchors have exhibited a slight 5 kN increase in load over the winter months, which then relaxes in the summer months. Two anchors, VC1801 and VC1802 Installed in pile P60 near the center of the pile wall are carrying loads of 216 and 213 kN respectively, which are 21 kN to 24 kN above the design anchor service load of 192 kN.
Assessment:	
The newly reconstructed highway embankment and supporting pile wall appear to be performing well. Recent movement observed in the passive soil bench below wall was anticipated and accounted for in the design.	
Recommendations:	Cost
The slope inclinometers will continue to be read manually twice per year and the datalogger installed at the site will continue to take readings of the load cells twice daily as part of the Geohazard Assessment Program.	Monitoring
The pile wall surface drainage gutter will require to be regularly cleaned to continue to provide erosion protection for the partially buried pile wall and avoid clogging of its solid down drain evacuation pipe.	Maintenance
The base of the NBL ditch should where a scour has formed should be excavated and rebuilt with compacted clay. Consideration should be given to placing a TRM Type C mat or a gabion mattress in the ditch to reduce the risk of further scouring.	\$25,000




LEGEND

- SURVEYED GAS LINE
- ESTIMATED CURRENT ALIGNMENT OF ATCO PIPELINE
- TREE LINE
- TREE LINE (ESTIMATED)
- APPROXIMATE LIMITS OF LANDSLIDE (SURVEYED MAY 29, 2013)
- NEW STRONG POST GUARD RAIL (2015)
- GUARD RAIL
- DIRECTION AND PHOTO NUMBER
- SLOPE INCLINOMETER
- TEST HOLE
- LOAD CELL

NOTE:
1 MAY 14, 2018 OBSERVATIONS SHOWN IN RED.






**PEACE REGION (PEACE RIVER/HIGH LEVEL)
PH072-1 SUNSHINE SLIDE**

2018 PH072-1 INSPECTION PLAN

DWG No. 13351-PH072-1

DRAWN BY	ML
DESIGNED BY	SGR
APPROVED BY	DWP
SCALE	1:800
DATE	MAY 2018
FILE No.	13351



THURBER ENGINEERING LTD.



Photo 1.
Looking northwest from the guardrail of the SBL of Hwy 744:04 at km 58.170 at the south end of the Sunshine pile wall. No signs of any cracks in the ACP.



Photo 2.
Looking northwest from south end of the Sunshine pile wall at km 58.200. Vegetation directly above the pile wall is still thick.



Photo 3.
Looking northwest from below the pile wall at km 58.26. Slide in bench below wall is very active. Some piles are exposed to 1.5 m. About 20 anchor grease caps have fallen off.



Photo 4.
Looking southeast along the pile wall at km 58.33. The cracking in the passive soil bench below the pile wall has grown since 2017.



Photo 5.
Looking southeast along the pile wall at km 58.33. The cracking in the passive soil bench below the pile wall has grown since 2017. Some piles are exposed to 1.5 m. About 20 anchor grease caps have fallen off. Water is ponding in graben area along the wall.



Photo 6.
Looking southeast from 30 m south of the pile wall along the backscarp at the slide bowl.



Photo 7.
Looking southeast from the centerline of Hwy 744:04 at km 58.34 at the reinstated embankment.



Photo 8.
Looking south from the NBL shoulder of Hwy 744:04 at km 58.38. The scour in the ditch bottom is worse than in 2017 and is now at 1.6 m from the white line.