

Site Number	Location	Name	Hwy	km
PH054	HWY 684:02 29+200 to 29+800	Shaftesbury Trail	684:02	28.35 to 30.30
Legal Description: 9-30-83-21 W5		UTM Co-ordinates		
		11U E 481485	N	6230854

Current Monitoring:	18-May-2024	Previous Monitoring	07-Oct-2023
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Nixon Mationg, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI20-4	Pneumatic Piezometers (PN): N/A	Vibration Wire Piezometers (VW): VW20-4	Standpipe Piezometers (SP): N/A
Load Cell (LC): N/A	Strain Gauges: N/A	SAA: N/A	Others:

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinator probe with 2 ft. wheelbase and RST Pocket PC readout	Pneumatic Piezometers:	Vibration Wire Piezometers: Downloaded from Datalogger	Standpipe Piezometers:
Load Cell:	Strain Gauges:	SAA:	Others:
Notes:			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	SI20-4 showed a cumulative movement of 3.1 mm over 1.9 m to 4.3 m depth, and 2.5 mm over 12.8 m to 15.3 m depth, with corresponding rates of movement of 3.2 mm/yr and 1.1 mm/yr, respectively, since the previous readings on June 14, 2023. Vibrating wire piezometer VW20-4 showed an increase in groundwater level of 0.32 m compared to the June 14, 2023, readings. Vibrating wire piezometer VW20-4 has generally shown a cyclical water level, with the highest water levels in the early spring months, and the lowest during the winter.
Future Work:	The instruments should be read again in the spring of 2025.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	

Attachments:	<ul style="list-style-type: none"> Table PH054-1 Spring 2024 – HWY 684:02 Shaftesbury Trail, Slope Inclinator Reading Instrumentation Summary
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	<ul style="list-style-type: none">▪ Table PH054-2 Spring 2024 – HWY 684:02 Shaftesbury Trail Piezometer Instrumentation Reading Summary▪ Statement of Limitations sand Conditions▪ APPENDIX A – PH054 SPRING 2024<ul style="list-style-type: none">□ Field Inspector's report□ Site Plans Showing Approximate Instrument Locations (Drawing No.23838-4)□ SI Reading Plots□ Figure PH054-1 (VW20-04 Piezometric Elevations)
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We trust this report meets your requirements at present. If you have any questions, please contact the undersigned at your convenience.

Yours very truly,
Thurber Engineering Ltd.
Don Proudfoot, M.Eng., P. Eng.
Partner | Senior Geotechnical Engineer

Lucas Green, P.Eng.
Geotechnical Engineer

Table PH054-1: Spring 2024 – Hwy 684:02 Shaftesbury Trail Inclinometer Instrumentation Reading Summary

Date Monitored: May 18, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI20-4	August 14, 2020	3.1 mm over 1.9 m to 4.3 m depth in 205° direction	3.2 mm/yr in May 2024	Operational	June 14, 2023	3.0	3.2	3.1
		2.5 mm over 12.8 m to 15.3 m depth in 205° direction	4.7 mm/yr in October 2020			1.0	1.1	1.1

Drawings 23838-4 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

Table PH054-2: Spring 2024 – Hwy 684:02 Shaftesbury Trail Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: May 18, 2024

INSTRUMENT #	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER ELEVATION (m)	CURRENT WATER ELEVATION (m)	PREVIOUS WATER ELEVATION (June 14, 2023) (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
VW20-4 (67878)	August 12, 2020	314.20	329.40	Operational	316.66 on August 15, 2020	315.42	315.10	0.32

Drawings 23838-4 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

Notes:

VW – vibrating wire piezometer.

BGS - below ground surface.



STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

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All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

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- b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.
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THURBER ENGINEERING LTD.

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022164)
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING RESULTS**

SPRING 2024

**APPENDIX A
DATA PRESENTATION**

SITE PH054: HWY 684:02, SHAFTESBURY TRAIL

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (PH054)
SPRING 2024**

Location: Hwy 684:02 Shaftesbury Trail Km 28.35 to Km 30.30 File Number: 32121 Probe: RST Set 8R Cable: RST Set 8R	Readout: Casing size: 2.75 Temp: 5 Read by: NRM
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SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 11V)		Date	Stickup (m)	Depth from top of casing (ft)	Azimuth of A+ Groove	Current Bottom Depth Readings				Probe/ Reel #	Remarks
	Easting (m)	Northing (m)					A+	A-	B+	B-		
SI 20-4	481485	6230854	18-May-24	0.89	52 to 2	59	-1061	1076	311	-309	8R/8R	

VIBRATING WIRE READINGS






VW	GPS Location (UTM 11)		VW Serial #	Datalogger Serial #	Date	Comment
	Easting (m)	Northing (m)				
VW20-4(Attached to SI20-4)	481485	6230854	67878	DT20211	18-May-24	Downloaded

INSPECTOR REPORT

H:\23000\23838 PH53 Hwy 68402 km 28.4 to 30.3 Embankment Stability Assessment\Drafting\2022\23838-1 OCTOBER 28 2022.dwg -4N - Oct 31, 2022



LEGEND

-  APPROXIMATE TEST HOLE LOCATION
-  APPROXIMATE INSTRUMENT LOCATION
-  VIBRATING WIRE PIEZOMETER
-  SLOPE INCLINOMETER
-  GEOHAZARD SITE NUMBER



AIR PHOTO FROM ESRI WORLD IMAGERY EXPORTED ON APRIL 18, 2022



**SHAFTESBURY TRAIL - HWY 684, km 28.3 TO 30.3
GEOTECHNICAL INVESTIGATION AND PRELIMINARY
ENGINEERING ASSESSMENT**

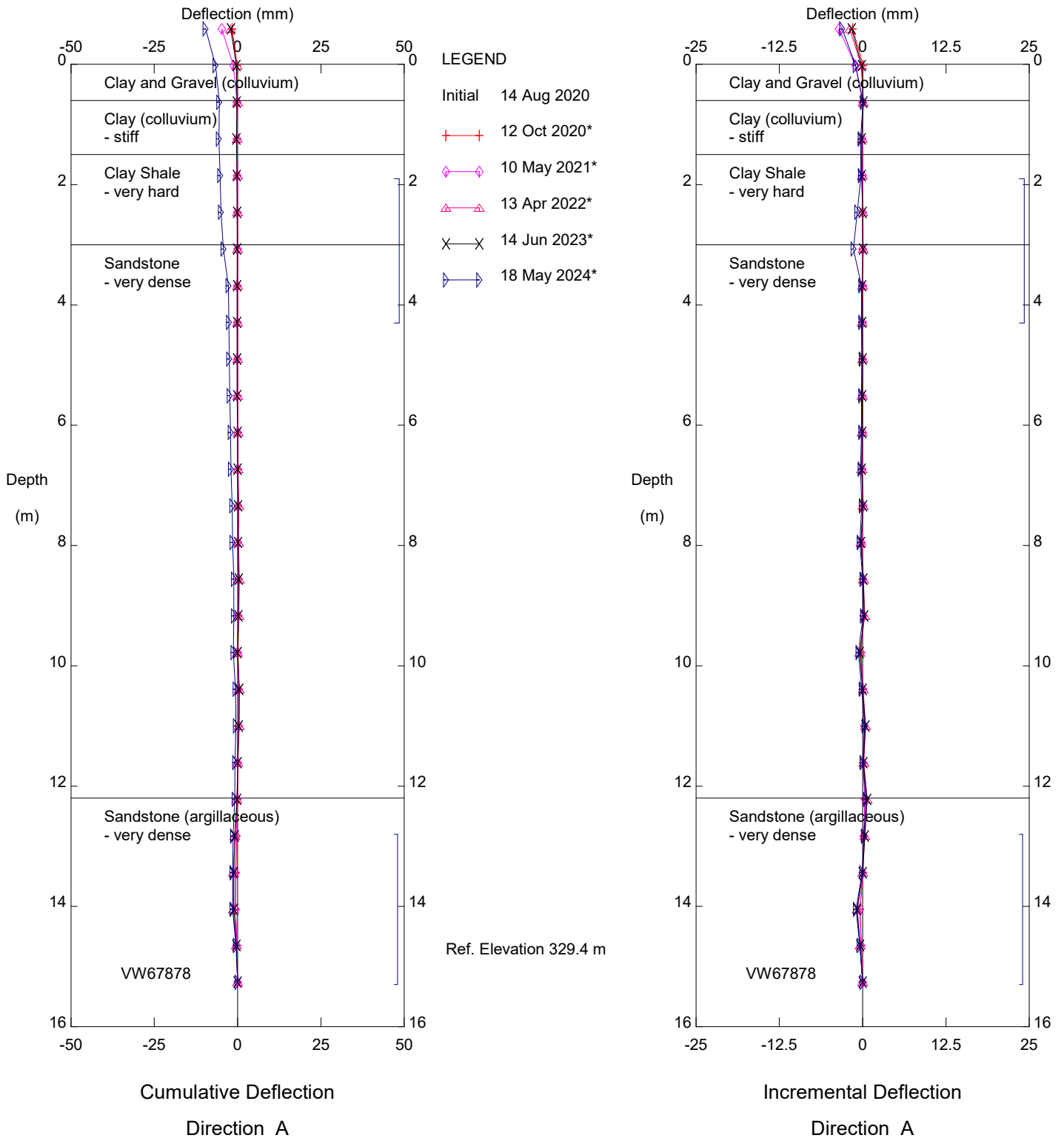
**DETAIL PLAN
(SHEET 3 OF 4)**

DWG No. 23838-4

DRAWN BY	ML
DESIGNED BY	LGM
APPROVED BY	DWP
SCALE	1:3000
DATE	OCTOBER 2022
FILE No.	23838



Thurber Engineering Ltd.

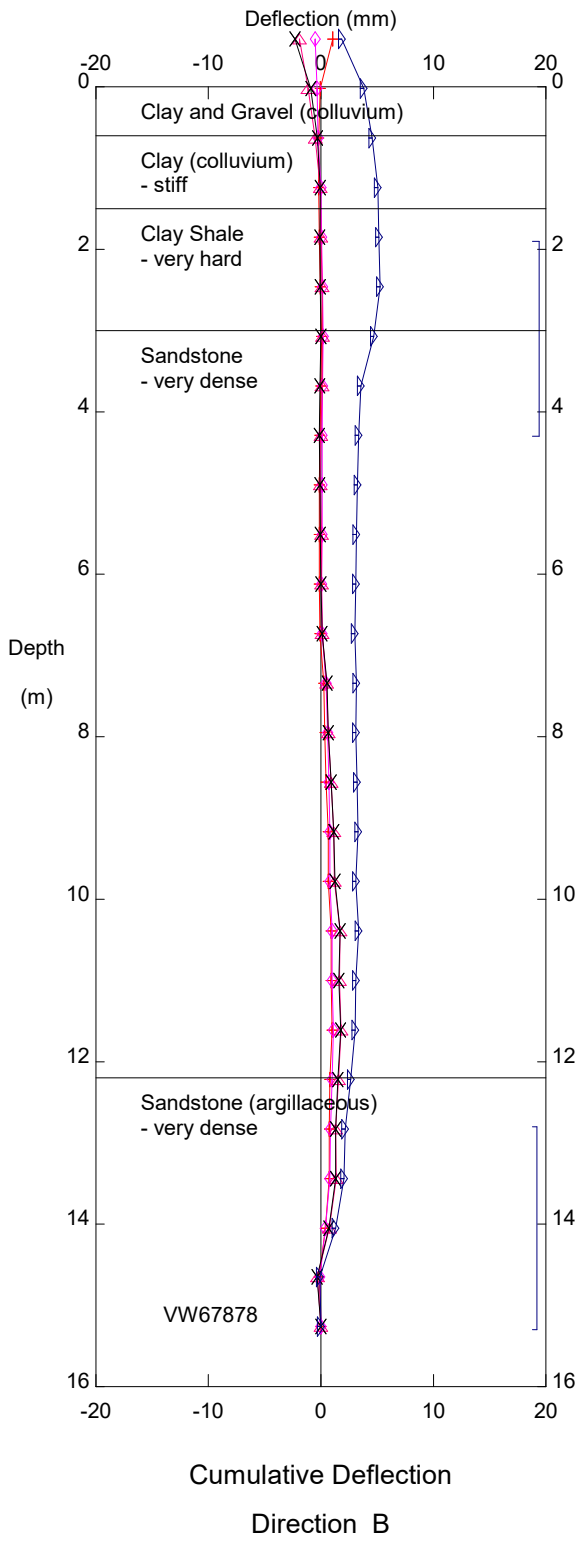


HWY 684 Shaftesbury trail, Inclinometer SI20-4

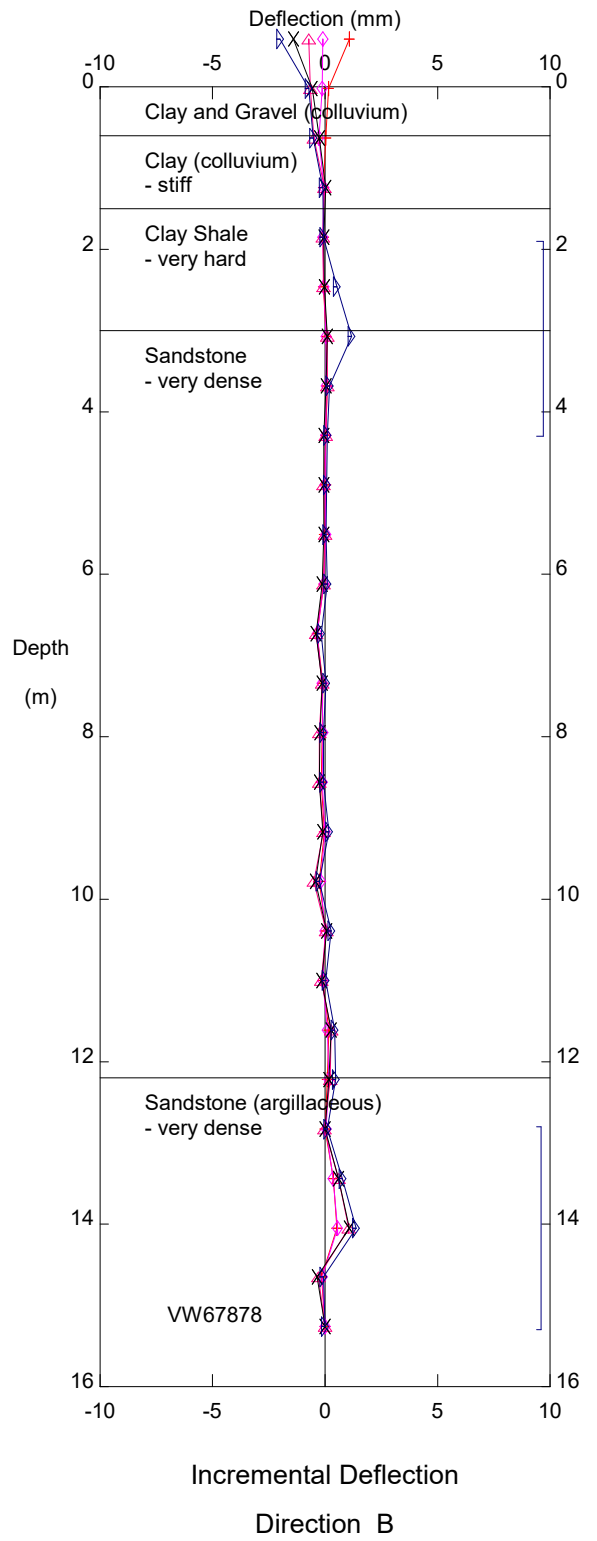
Alberta Transportation

Sets marked * include zero shift and/or rotation corrections.

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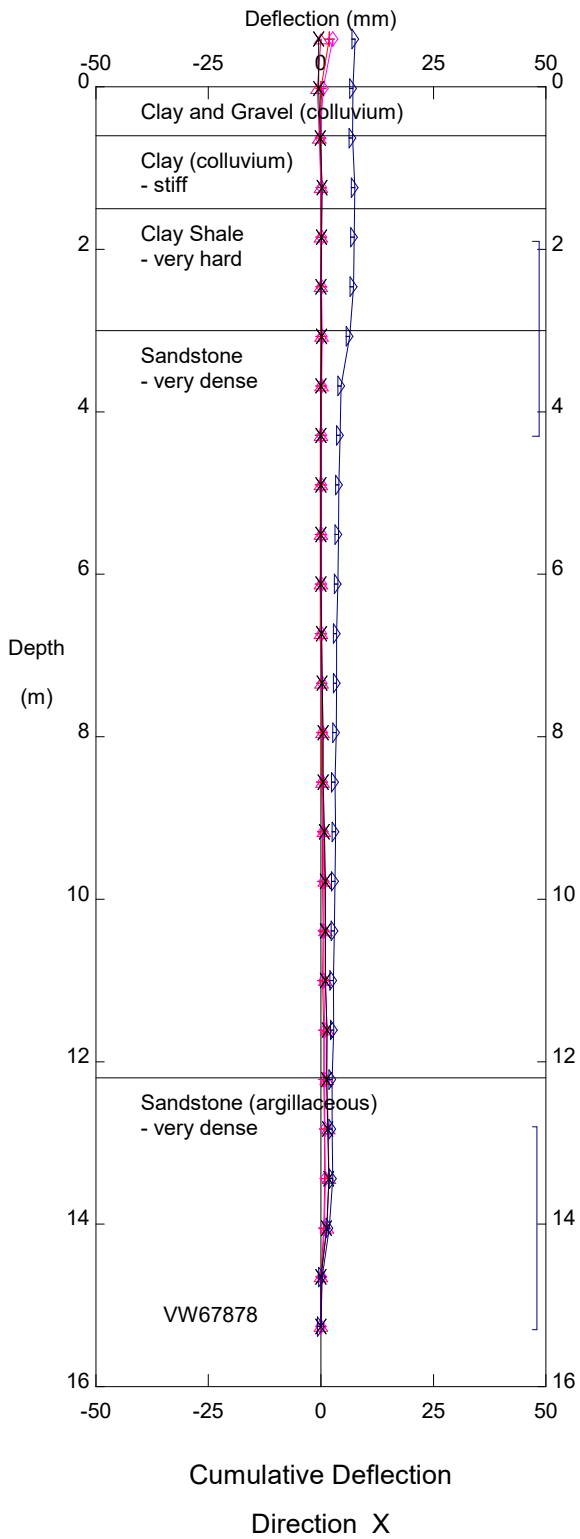
- LEGEND
- Initial 14 Aug 2020
 - 12 Oct 2020*
 - 10 May 2021*
 - 13 Apr 2022*
 - 14 Jun 2023*
 - 18 May 2024*



HWY 684 Shaftesbury trail, Inclinometer SI20-4
 Alberta Transportation

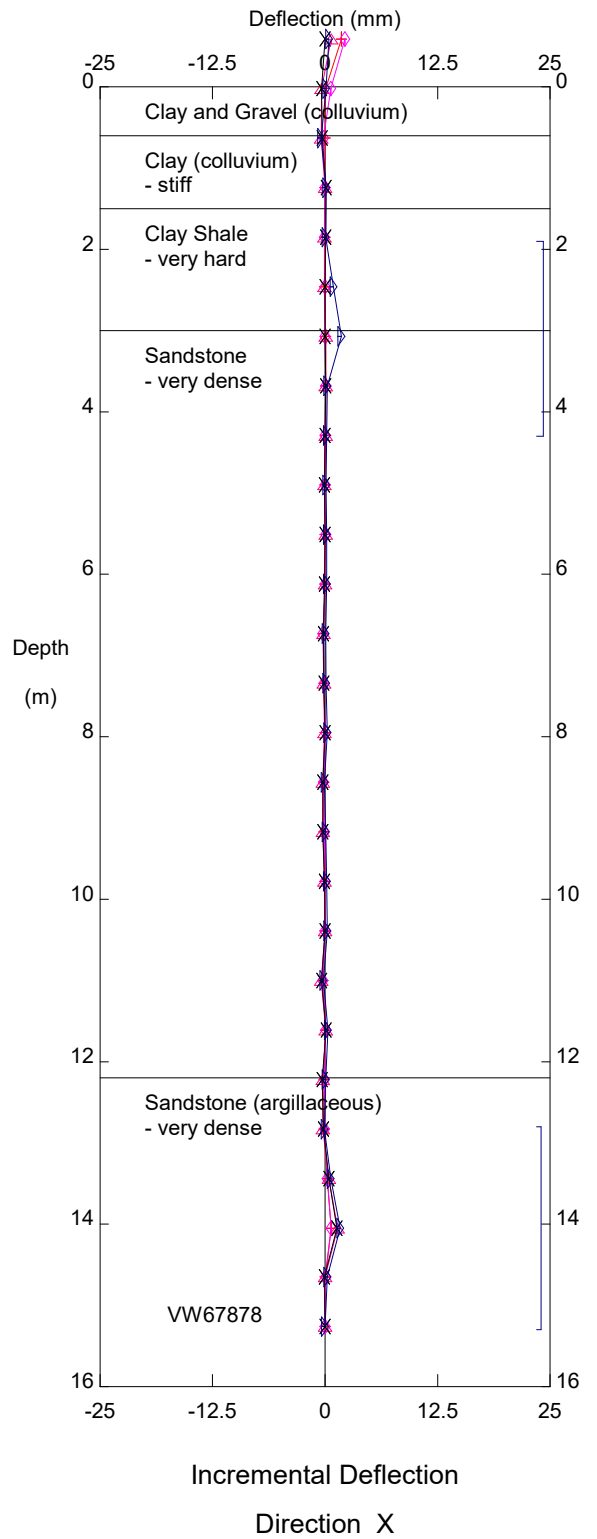
Sets marked * include zero shift and/or rotation corrections.

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- LEGEND
- Initial 14 Aug 2020
 - 12 Oct 2020*
 - 10 May 2021*
 - 13 Apr 2022*
 - 14 Jun 2023*
 - 18 May 2024*

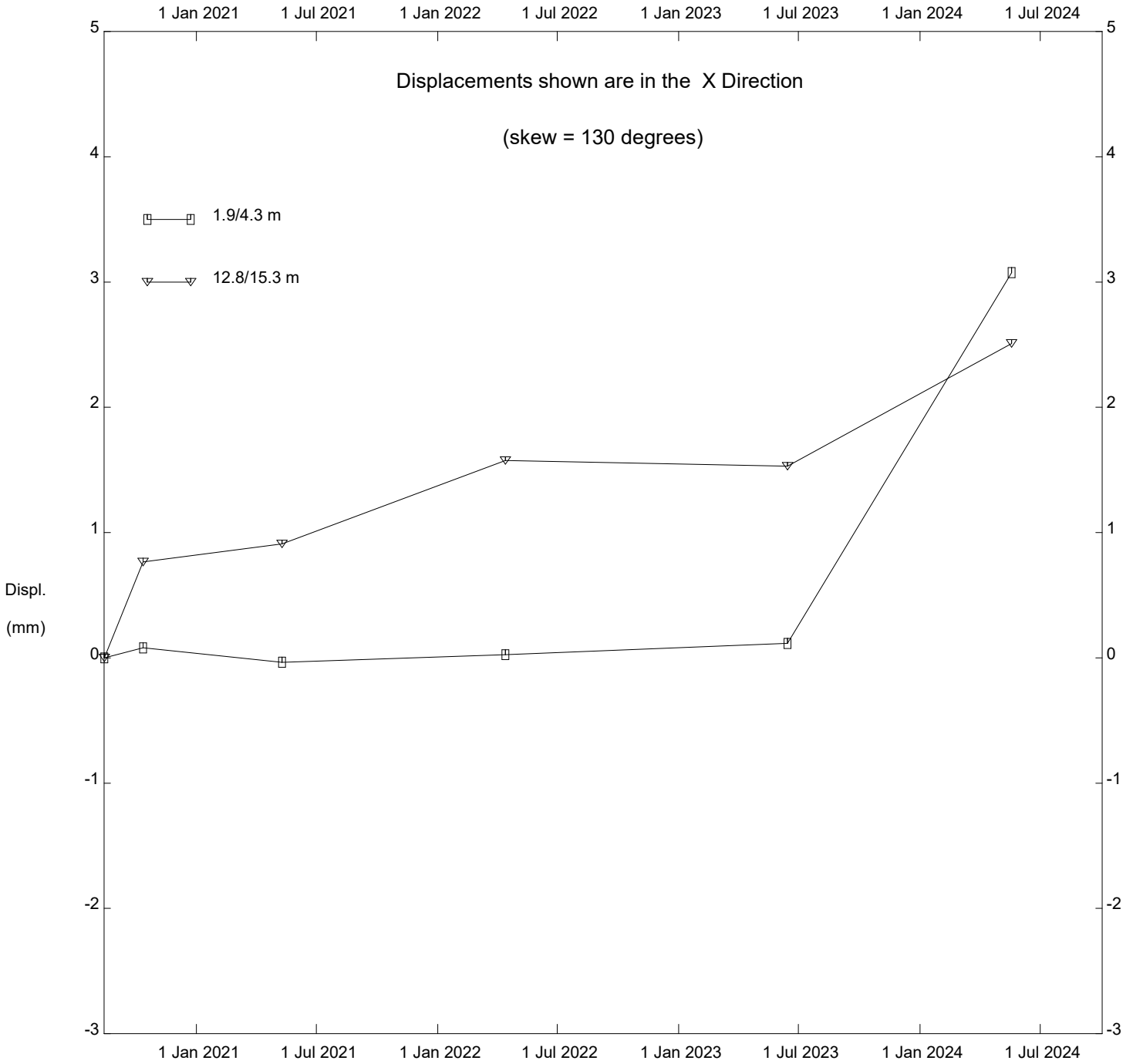
Ref. Elevation 329.4 m
skew = 130deg



HWY 684 Shaftesbury trail, Inclinator SI20-4
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Sets marked * include zero shift and/or rotation corrections.

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HWY 684 Shaftesbury trail, Inclinator SI20-4

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PH054 - 1- VW20-4

