



**Tutela Heights Slope Monitoring
Inclinometer and Survey Data
Brantford, Ontario
April 26, 2021**

Project No. IDG 180462

Prepared for:
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1. Introduction

In-Depth Geotechnical Inc. was retained by the City of Brantford to monitor slope conditions at the Tutela Heights site, along portions of the Grand River southern bank. The monitoring program consists of *a)* acquiring field survey data on a quarterly basis; *b)* evaluating the observed movements; and *c)* summarizing the findings in this report.

Specifically, this Monitoring Report provides an update on monitoring data from *a)* inclinometers and *b)* survey points, collected up to March 23, 2021, and March 3, 2021, respectively.

Inclinometer data was collected by In-Depth Geotechnical, while movements of survey points were measured/surveyed by the Survey Department – City of Brantford.

2. Field Monitoring Procedures

2.1 Inclinometers

Three inclinometer casings were installed on the subject area between September 28 and October 8, 2015. Approximate inclinometer locations are illustrated in Appendix One (Page 1).

Depths of installation below ground surface were as follows:

BH-01: 25.76 m;
BH-02: 24.99 m; and
BH-03: 32.49 m.

Inclinometer casing has two orthogonal sets of grooves. During installation, the primary orientation of grooves (A-A) were set pointing to the face of the slope, while the secondary orientation (B-B) were aligned parallel to the face of the slope.

Initial baseline readings for the three inclinometer casings was completed on October 15, 2015. Subsequent monitoring readings were completed on the following dates:

1. November 6, 2015;
2. December 18, 2015;
3. January 15, 2016;
4. April 12, 2016;
5. May 16, 2016;
6. August 27, 2018;
7. October 4, 2018;
8. November 2, 2018;
9. January 10, 2019;
10. February 4, 2019;
11. May 10, 2019;
12. September 18, 2019;
13. October 23, 2019;
14. March 5, 2020;
15. July 17, 2020;
16. November 23, 2020; and
17. March 3, 2021.

The summarized inclinometer data is attached into Appendix One. The data is provided in tables and plot formats. These data values refer to recorded displacements versus depth, along the A-A and B-B orientations. Displacements from base line readings are reported in *mm*. Depths, in meters, are referred from the ground surface to the center of probe at the time of the recording.

2.2 Survey Points

Nineteen survey points were installed by JC Cohoon Engineering with their locations illustrated in Appendix Two (Page 1). Installation date was January 13, 2015.

Baseline readings were recorded on January 15, 2015, with subsequent readings completed on the following dates:

April 24, 2015;
November 5, 2015;
May 8, 2018;
December 11, 2018;
May 8, 2019;
November 11, 2019;
April 3, 2020;
December 3, 2020; and
March 23, 2021 (latest records).

Survey readings consist of elevations and horizontal displacements measured with respect of the original or baseline readings. Summarized survey point data is attached into Appendix Two in tabular format. The last two sets of survey measurements are displayed into E-W and N-S alignments. This decomposition of total movements allows for interpretation of observed displacements in terms of field orientation.

3. Monitoring data – Summary

Based on the updated data the following observations can be made:

3.1 Inclinometers

1. At *Inclinometer BH01* location, maximum rate of ground displacement is less than 0.0012 mm/day, or less than 0.458 mm/years. This corresponds to displacements perpendicular to the face of slope. It is noted that this maximum rate of displacement corresponds to readings taken on March 3, 2021.
2. At *Inclinometer BH02* location, maximum rate of ground displacement is less than 0.0015 mm/day, or less than 0.564 mm/years. The ground mass at this location exhibits a small counter-clockwise rotation above the 8 m depth elevation. This is consistent with visual observations of ground surface, which exhibits a step-down type of localized slope failure. Below the 8 m depth, the soil mass is not showing significant movements. This trend is being confirmed with all readings recorded after March 3, 2021.
3. At *Inclinometer BH03* location, maximum rate of ground displacement is less than 0.0010 mm/day, or less than 0.390 mm/years. This corresponds to displacements perpendicular to the face of slope (towards the Grand River), and to the latest set of readings.
4. In relation to *inclinometer data*, recorded readings display small amounts of fluctuations (back and forth); these fluctuations can be associated in part a) to small ground motion due to temperature/weather-related changes through the seasons; and b) to intrinsic small variations of the inclinometer probe. Overall, inclinometer readings exhibit a satisfactory level of consistency, suggesting that they working as required and/or expected.
5. Details of the actual rate of lateral displacements from inclinometer locations can be appreciated in the tables and depth-plots attached in Appendix One.

3.2 Survey Iron Bars (SIB)

1. Details of the actual rate of displacements/settlements can be appreciated in the tables attached into Appendix Two, as well as the summary Table 1, included below.
2. The Iron Bar corresponding to MP 01-14 is no longer functional, as reported on our previous submission.
3. All other survey points registered low values for rate of displacements, i.e., less than 30 mm/yr. The latest data set from March 23, 2020 confirms the trend from previous data sets.
4. *Survey Point Nos. 11-08 and 11-14* exhibited rate of *settlements*, above the 30 mm/year.

5. In relation to survey points, the rate of displacement values listed above corresponds to the *latest set of readings*, April 3, 2020.
6. It is considered that future monitoring readings will reinforce actual trends of ground mass displacements/settlements while filtering out spurious displacements correlated to weather- or operator-related errors.

Table No. 1

MP	Rate of Displacements ⁽¹⁾					
	Last Reading: March 23, 2021					
	Vertical orientation (settlement)		N-S Orientation		E-W Orientation	
01-14	n/a	n/a	n/a	n/a	n/a	n/a
02-14	14.53	down	1.61	North	1.61	East
03-14	14.53	down	3.23	North	3.23	East
04-14	22.60	down	1.61	North	0.00	
05-14	16.14	down	1.61	North	1.61	West
06-14	11.30	down	0.00		0.00	
07-14	4.84	down	1.61	North	3.23	East
08-14	30.67	down	1.61	North	1.61	East
09-14	19.37	down	1.61	North	1.61	East
10-14	9.69	down	2.61	North	2.61	East
11-14	33.90	down	1.61	North	0.00	
12-14	9.69	down	1.61	North	1.61	West
13-14	1.61	down	0.00		1.61	East
14-14	9.69	down	6.46	North	1.61	East
15-14	11.30	down	1.61	North	1.61	East
16-14	27.44	down	0.00		0.00	
17-14	12.92	down	1.61	North	0.00	
18-14	9.69	down	0.00		0.00	
19-14	6.46	down	4.84	North	1.61	East

⁽¹⁾ Displacements in mm/year

⁽¹⁾ Rate of Displacements are in *mm/year*, and correspond to the latest set of survey reading, dated on March 23, 2021.

4. Closure

We trust that the present quarterly update report fulfills your present requirements. Should you have any question, please feel free to contact the undersigned.

Sincerely,

In-Depth Geotechnical Inc.



Gabriel Sedran, P.Eng., Ph.D.
President

Appendix One

Inclinometer Data

Updated with inclinometer data from fieldwork completed on March 3, 2021

Inclinometer Locations

Appendix One - Page 1

Inclinometer BH 01

Table for *A-A* Alignment and profile

Appendix One - Pages 2 to 4

Table for *B-B* Alignment and profile

Appendix One - Pages 5 to 7

Inclinometer BH 02

Table for *A-A* Alignment and profile

Appendix One - Pages 8 to 10

Table for *B-B* Alignment and profile

Appendix One - Pages 11 to 13

Inclinometer BH 03

Table for *A-A* Alignment and profile

Appendix One - Pages 14 to 16

Table for *B-B* Alignment and profile

Appendix One - Pages 17 to 19



Inclinometer BH01 A-A Alignment

Displacements along plane perpendicular to the face of slope
Profile Change in mm

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	0	1	2	3	4	5	6	7	8	9	10	11
Depth m	October 10, 2015	November 6, 2015	December 18, 2015	January 15, 2016	April 12, 2016	May 16, 2016	August 27, 2018	October 4, 2018	November 2, 2018	January 10, 2019	February 4, 2019	May 10, 2019
0.21	0.00	0.37	0.76	1.05	1.96	1.08	1.36	1.17	1.60	1.80	1.92	1.92
0.82	0.00	0.21	0.51	1.06	1.55	0.86	1.58	1.15	1.48	1.64	1.84	1.84
1.43	0.00	0.22	0.48	0.88	1.31	0.59	1.02	0.62	0.94	1.04	1.17	1.16
2.04	0.00	0.17	0.40	0.80	1.20	0.51	0.84	0.49	0.80	0.87	1.01	1.01
2.65	0.00	0.15	0.40	0.80	1.19	0.50	0.67	0.30	0.49	0.69	0.81	0.81
3.26	0.00	0.13	0.38	0.76	1.13	0.45	0.55	0.18	0.35	0.51	0.62	0.61
3.87	0.00	0.13	0.35	0.75	1.11	0.44	0.64	0.29	0.45	0.59	0.70	0.41
4.48	0.00	0.13	0.34	0.73	1.11	0.45	0.67	0.32	0.47	0.61	0.72	0.43
5.09	0.00	0.13	0.35	0.73	1.11	0.46	0.64	0.29	0.45	0.60	0.70	0.41
5.70	0.00	0.15	0.35	0.76	1.11	0.48	0.67	0.32	0.51	0.67	0.73	0.47
6.31	0.00	0.14	0.34	0.74	1.06	0.46	0.63	0.28	0.47	0.63	0.68	0.43
6.92	0.00	0.17	0.35	0.76	1.07	0.50	0.75	0.42	0.60	0.73	0.80	0.53
7.52	0.00	0.16	0.34	0.74	1.04	0.47	0.67	0.35	0.51	0.65	0.71	0.45
8.13	0.00	0.18	0.35	0.70	0.99	0.47	0.68	0.35	0.50	0.63	0.67	0.42
8.74	0.00	0.18	0.32	0.66	0.93	0.42	0.60	0.28	0.41	0.54	0.57	0.33
9.35	0.00	0.14	0.29	0.65	0.87	0.38	0.49	0.17	0.33	0.48	0.46	0.30
9.96	0.00	0.14	0.29	0.65	0.85	0.38	0.44	0.13	0.29	0.45	0.44	0.29
10.57	0.00	0.12	0.30	0.67	0.85	0.40	0.50	0.22	0.40	0.59	0.59	0.47
11.18	0.00	0.14	0.33	0.70	0.87	0.46	0.62	0.37	0.55	0.72	0.73	0.62
11.79	0.00	0.12	0.30	0.67	0.81	0.43	0.57	0.30	0.48	0.66	0.67	0.56
12.40	0.00	0.14	0.33	0.69	0.84	0.46	0.64	0.35	0.53	0.71	0.72	0.63
13.01	0.00	0.12	0.28	0.65	0.80	0.41	0.60	0.33	0.50	0.64	0.67	0.54
13.62	0.00	0.12	0.26	0.64	0.77	0.41	0.59	0.31	0.48	0.58	0.61	0.47
14.23	0.00	0.13	0.23	0.57	0.71	0.38	0.55	0.26	0.41	0.46	0.46	0.30
14.84	0.00	0.14	0.20	0.52	0.66	0.35	0.52	0.21	0.36	0.37	0.38	0.22
15.45	0.00	0.15	0.18	0.48	0.64	0.33	0.50	0.18	0.33	0.30	0.33	0.19
16.06	0.00	0.15	0.16	0.47	0.61	0.32	0.49	0.18	0.30	0.22	0.25	0.09
16.67	0.00	0.12	0.14	0.44	0.56	0.29	0.43	0.13	0.26	0.18	0.20	0.07
17.28	0.00	0.14	0.18	0.44	0.53	0.28	0.40	0.14	0.24	0.19	0.22	0.08
17.89	0.00	0.19	0.19	0.45	0.52	0.31	0.45	0.26	0.29	0.24	0.27	0.13
18.50	0.00	0.19	0.22	0.43	0.50	0.30	0.43	0.24	0.27	0.20	0.24	0.09
19.11	0.00	0.17	0.20	0.40	0.45	0.29	0.39	0.21	0.23	0.21	0.26	0.10
19.72	0.00	0.17	0.22	0.39	0.43	0.32	0.40	0.23	0.24	0.19	0.24	0.06
20.33	0.00	0.14	0.19	0.35	0.38	0.29	0.37	0.24	0.24	0.18	0.25	0.11
20.94	0.00	0.13	0.15	0.31	0.33	0.27	0.34	0.24	0.27	0.22	0.28	0.19
21.55	0.00	0.11	0.11	0.21	0.31	0.20	0.26	0.14	0.19	0.16	0.16	0.06
22.16	0.00	0.10	0.09	0.15	0.25	0.16	0.19	0.07	0.09	0.01	0.02	-0.11
22.76	0.00	0.10	0.08	0.13	0.23	0.15	0.20	0.10	0.13	0.02	0.05	-0.05
23.37	0.00	0.08	0.05	0.09	0.18	0.14	0.17	0.07	0.12	0.03	0.04	-0.04
23.98	0.00	0.02	0.00	0.03	0.09	0.07	0.08	0.01	0.05	0.03	0.01	-0.05
24.59	0.00	0.02	0.03	0.04	0.09	0.09	0.12	0.06	0.11	0.09	0.09	0.06
25.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Inclinometer BH01 A-A Alignment

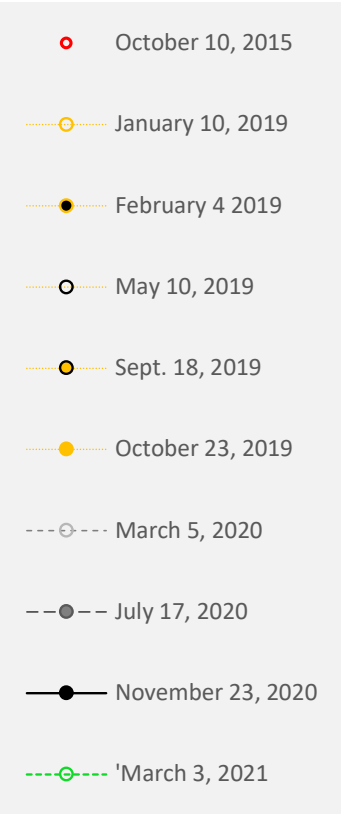
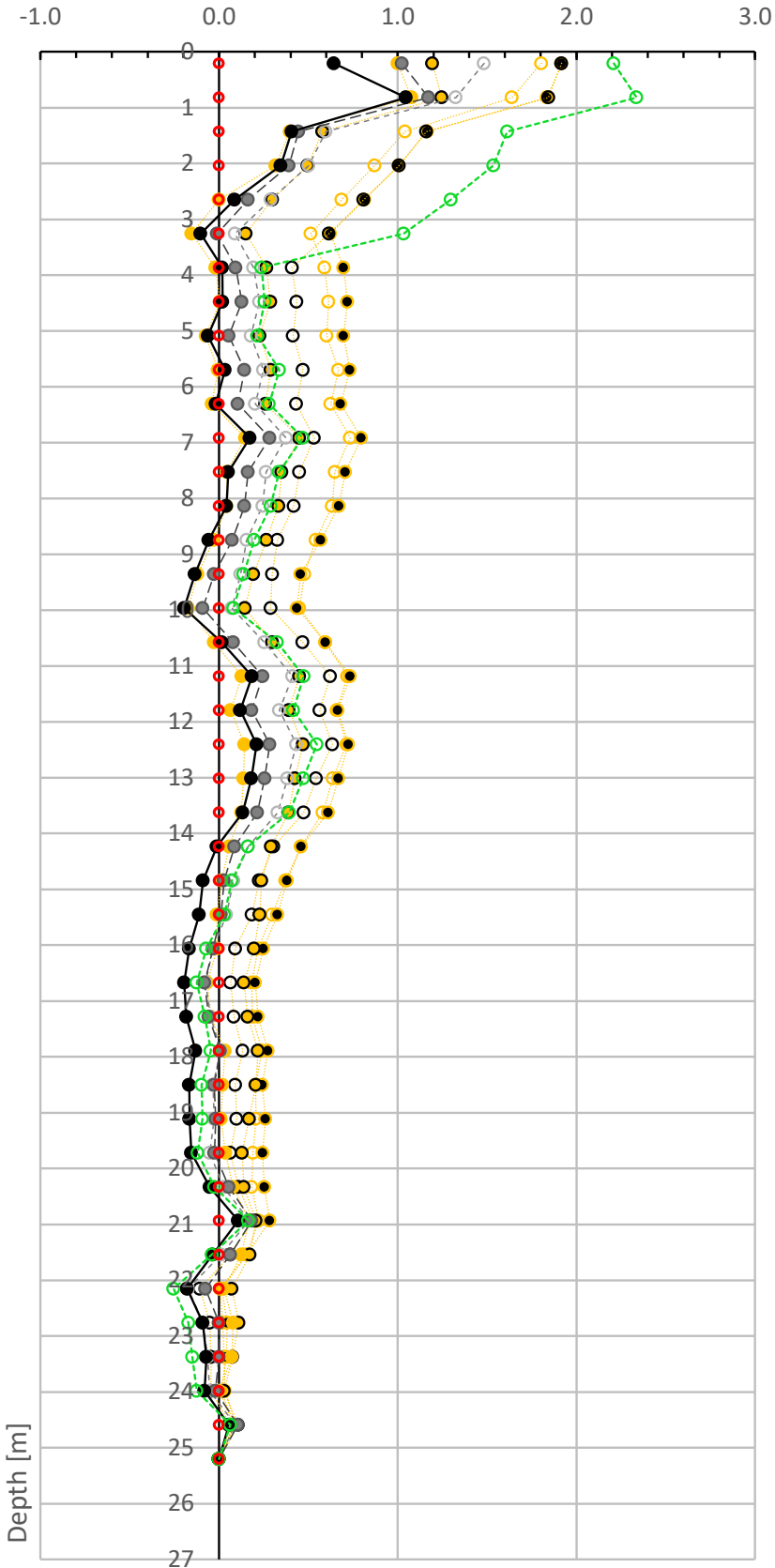
Displacements along plane perpendicular to the face of slope

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Profile Change in mm

Depth m	0	12	13	14	15	16	17					
	October 10, 2015	September 18, 2019	October 23, 2019	March 5, 2020	July 17, 2020	November 23, 2020	March 3, 2021					
0.21	0.00	1.19	1.00	1.48	1.02	0.64	2.21					
0.82	0.00	1.25	1.08	1.33	1.17	1.05	2.34					
1.43	0.00	0.58	0.40	0.60	0.44	0.41	1.61					
2.04	0.00	0.50	0.32	0.50	0.39	0.35	1.54					
2.65	0.00	0.30	0.00	0.29	0.16	0.09	1.30					
3.26	0.00	0.15	-0.15	0.09	-0.01	-0.10	1.03					
3.87	0.00	0.27	-0.02	0.19	0.09	0.02	0.24					
4.48	0.00	0.29	0.01	0.23	0.13	0.02	0.26					
5.09	0.00	0.23	-0.07	0.18	0.06	-0.06	0.22					
5.70	0.00	0.29	-0.01	0.25	0.14	0.03	0.34					
6.31	0.00	0.26	-0.04	0.20	0.10	-0.02	0.28					
6.92	0.00	0.45	0.15	0.38	0.28	0.17	0.47					
7.52	0.00	0.35	0.04	0.26	0.16	0.05	0.34					
8.13	0.00	0.33	0.04	0.24	0.14	0.04	0.29					
8.74	0.00	0.27	-0.03	0.15	0.07	-0.06	0.20					
9.35	0.00	0.19	-0.12	0.12	-0.03	-0.13	0.14					
9.96	0.00	0.14	-0.17	0.07	-0.09	-0.20	0.08					
10.57	0.00	0.30	-0.03	0.25	0.08	0.02	0.33					
11.18	0.00	0.45	0.13	0.41	0.24	0.19	0.47					
11.79	0.00	0.39	0.07	0.34	0.18	0.12	0.42					
12.40	0.00	0.47	0.14	0.43	0.28	0.21	0.55					
13.01	0.00	0.42	0.14	0.38	0.26	0.18	0.47					
13.62	0.00	0.39	0.12	0.33	0.21	0.13	0.39					
14.23	0.00	0.29	0.06	0.16	0.09	-0.01	0.16					
14.84	0.00	0.24	0.02	0.08	0.03	-0.09	0.07					
15.45	0.00	0.23	-0.01	0.04	0.01	-0.11	0.03					
16.06	0.00	0.20	-0.01	-0.03	-0.03	-0.17	-0.07					
16.67	0.00	0.14	-0.07	-0.08	-0.08	-0.20	-0.12					
17.28	0.00	0.16	-0.05	-0.05	-0.06	-0.18	-0.08					
17.89	0.00	0.22	0.03	0.01	0.01	-0.13	-0.05					
18.50	0.00	0.21	0.02	-0.03	-0.03	-0.17	-0.10					
19.11	0.00	0.17	0.01	-0.03	-0.02	-0.17	-0.09					
19.72	0.00	0.13	0.04	-0.05	-0.03	-0.15	-0.12					
20.33	0.00	0.14	0.08	0.03	0.06	-0.05	-0.03					
20.94	0.00	0.21	0.17	0.17	0.18	0.11	0.17					
21.55	0.00	0.17	0.12	0.01	0.06	-0.04	-0.04					
22.16	0.00	0.07	0.03	-0.17	-0.08	-0.18	-0.25					
22.76	0.00	0.11	0.08	-0.09	0.00	-0.09	-0.17					
23.37	0.00	0.08	0.07	-0.06	0.00	-0.07	-0.15					
23.98	0.00	0.03	0.00	-0.05	-0.02	-0.08	-0.12					
24.59	0.00	0.11	0.08	0.09	0.10	0.06	0.06					
25.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

BH 01 A-A Displacements [mm]



Inclinometer BH01 B-B Alignment

Displacements along plane parallel to the face of slope

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Profile Change in mm

	0	1	2	3	4	5	6	7	8	9	10	11
Depth m	October 10, 2015	November 6, 2015	December 18, 2015	January 15, 2016	April 12, 2016	May 16, 2016	August 27, 2018	October 4, 2018	November 2, 2018	January 10, 2019	February 4, 2019	May 10, 2019
0.21	0.00	0.24	1.23	1.30	1.69	0.95	0.34	1.69	2.17	3.23	2.63	3.19
0.82	0.00	0.35	1.20	1.08	1.43	0.65	-0.04	1.22	1.63	2.59	2.27	2.61
1.43	0.00	-0.11	0.54	0.33	0.52	-0.29	-1.19	0.15	0.68	1.42	1.06	1.25
2.04	0.00	-0.53	0.12	-0.01	0.08	-0.63	-2.29	-1.03	-0.59	0.40	-0.07	0.21
2.65	0.00	0.20	1.01	0.90	1.08	0.45	-0.90	0.35	0.82	1.85	1.38	1.66
3.26	0.00	0.10	0.90	0.84	1.01	0.41	-0.86	0.36	0.85	1.71	1.37	1.59
3.87	0.00	0.08	0.84	0.77	0.91	0.32	-0.95	0.26	0.77	1.57	1.21	1.42
4.48	0.00	0.16	0.87	0.75	0.89	0.36	-0.86	0.31	0.82	1.62	1.30	1.44
5.09	0.00	0.15	0.82	0.71	0.84	0.31	-0.91	0.23	0.73	1.48	1.19	1.31
5.70	0.00	0.15	0.83	0.74	0.88	0.37	-0.80	0.35	0.87	1.65	1.31	1.47
6.31	0.00	0.10	0.77	0.68	0.80	0.31	-0.86	0.23	0.75	1.53	1.16	1.31
6.92	0.00	0.09	0.74	0.66	0.70	0.23	-1.05	0.13	0.53	1.28	0.91	1.08
7.52	0.00	0.09	0.72	0.64	0.69	0.21	-1.05	0.10	0.50	1.26	0.89	1.08
8.13	0.00	0.02	0.73	0.64	0.69	0.22	-1.01	0.11	0.53	1.21	0.87	1.04
8.74	0.00	0.21	0.67	0.56	0.61	0.15	-1.05	0.19	0.43	1.08	0.71	0.85
9.35	0.00	0.33	0.61	0.44	0.55	0.08	-1.13	0.12	0.24	0.78	0.59	0.52
9.96	0.00	0.33	0.61	0.41	0.54	0.09	-1.06	0.12	0.23	0.76	0.58	0.47
10.57	0.00	0.27	0.58	0.37	0.50	0.08	-1.15	0.06	0.23	0.77	0.62	0.53
11.18	0.00	0.22	0.54	0.36	0.45	0.04	-1.21	0.10	0.27	0.83	0.72	0.70
11.79	0.00	0.18	0.51	0.34	0.41	0.01	-1.24	0.06	0.26	0.84	0.71	0.66
12.40	0.00	0.18	0.50	0.33	0.39	0.00	-1.12	0.08	0.26	0.87	0.72	0.70
13.01	0.00	0.20	0.53	0.32	0.42	0.05	-1.04	0.17	0.31	0.96	0.71	0.77
13.62	0.00	0.18	0.49	0.26	0.37	0.01	-1.01	0.10	0.31	0.90	0.65	0.68
14.23	0.00	0.17	0.47	0.27	0.36	0.02	-0.95	0.10	0.35	0.90	0.69	0.77
14.84	0.00	0.09	0.41	0.20	0.29	-0.03	-1.01	0.03	0.26	0.77	0.55	0.60
15.45	0.00	0.03	0.38	0.19	0.28	-0.04	-0.88	0.06	0.10	0.73	0.51	0.47
16.06	0.00	0.06	0.35	0.15	0.28	-0.06	-0.85	0.04	0.07	0.67	0.39	0.37
16.67	0.00	0.05	0.35	0.15	0.26	-0.01	-0.77	0.03	0.06	0.59	0.42	0.36
17.28	0.00	0.02	0.31	0.13	0.23	-0.01	-0.72	-0.01	0.04	0.55	0.40	0.30
17.89	0.00	-0.03	0.23	0.10	0.19	-0.03	-0.78	-0.13	-0.01	0.46	0.26	0.17
18.50	0.00	-0.04	0.11	0.06	0.16	-0.03	-0.78	-0.19	-0.06	0.36	0.13	0.04
19.11	0.00	-0.06	0.05	0.03	0.13	-0.09	-0.75	-0.26	-0.09	0.18	-0.04	-0.19
19.72	0.00	-0.02	0.03	0.01	0.11	-0.10	-0.72	-0.27	-0.11	0.08	-0.11	-0.30
20.33	0.00	0.02	0.05	0.01	0.13	-0.08	-0.63	-0.18	-0.10	0.08	-0.09	-0.25
20.94	0.00	0.08	0.03	-0.03	0.06	-0.08	-0.60	-0.21	-0.10	0.06	-0.11	-0.24
21.55	0.00	0.02	0.09	0.04	0.05	-0.02	-0.46	-0.10	-0.04	0.01	-0.09	-0.20
22.16	0.00	0.00	0.07	0.03	0.02	-0.03	-0.41	-0.12	-0.09	-0.02	-0.11	-0.22
22.76	0.00	-0.05	0.05	0.02	0.00	-0.02	-0.32	-0.08	-0.07	-0.02	-0.09	-0.19
23.37	0.00	-0.03	0.06	0.04	0.00	0.01	-0.24	-0.01	-0.08	0.04	-0.03	-0.10
23.98	0.00	-0.10	-0.06	-0.09	-0.09	-0.08	-0.30	-0.12	-0.18	-0.13	-0.16	-0.23
24.59	0.00	-0.06	-0.03	-0.07	-0.06	-0.05	-0.20	-0.08	-0.13	-0.14	-0.14	-0.22
25.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Inclinometer BH01 B-B Alignment

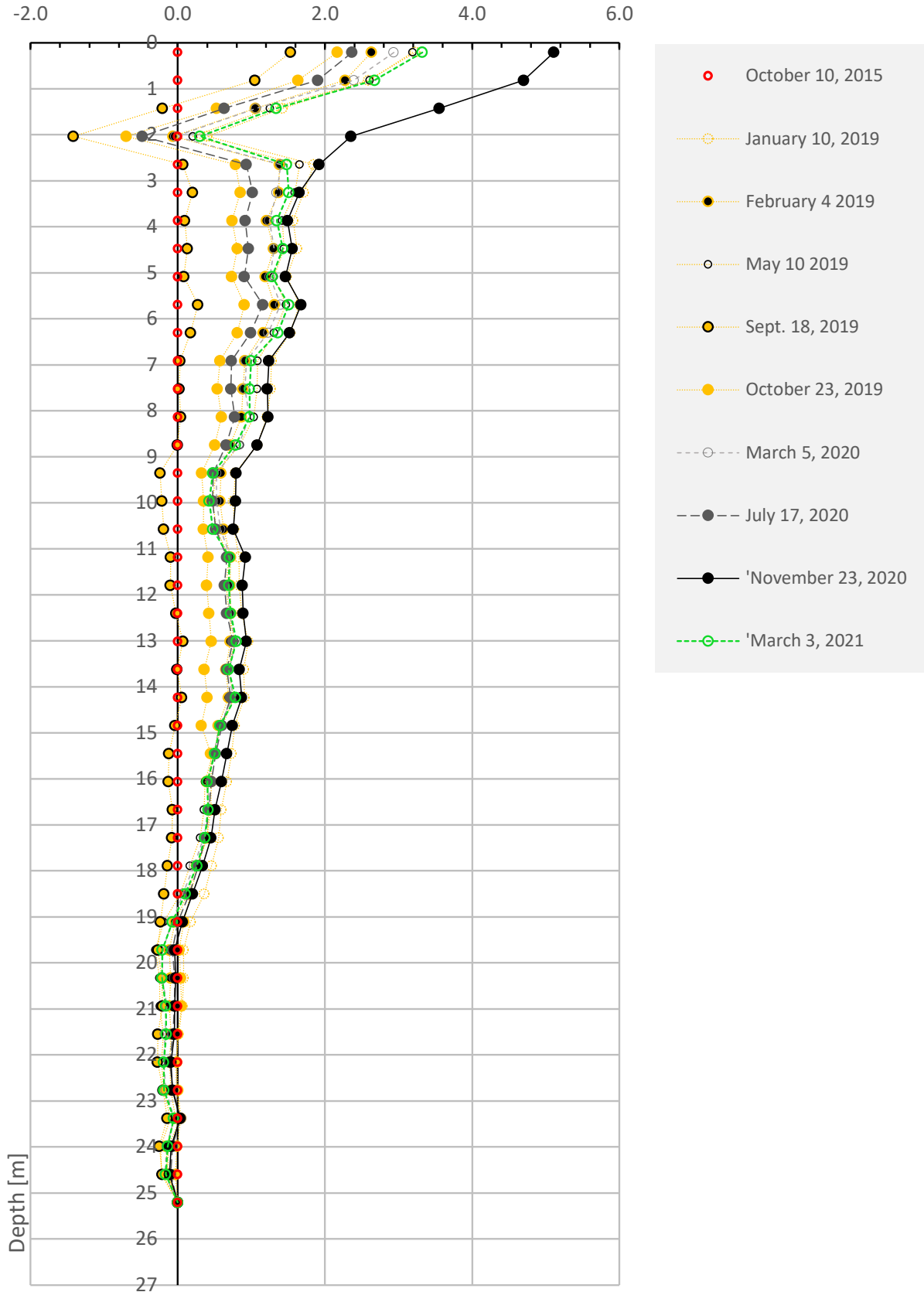
Displacements along plane parallel to the face of slope

continued from previous page

Profile Change in mm

Depth m	0	12	13	14	15	165	17					
	October 10, 2015	September 18, 2019	October 23, 2019	March 5, 2020	July 17, 2020	November 23, 2020	March 3, 2021					
0.21	0.00	1.53	2.17	2.94	2.37	5.11	3.32					
0.82	0.00	1.05	1.64	2.40	1.90	4.70	2.68					
1.43	0.00	-0.21	0.53	1.06	0.63	3.55	1.34					
2.04	0.00	-1.42	-0.70	-0.03	-0.48	2.35	0.30					
2.65	0.00	0.07	0.79	1.40	0.93	1.92	1.48					
3.26	0.00	0.20	0.85	1.34	1.02	1.65	1.51					
3.87	0.00	0.10	0.74	1.24	0.92	1.49	1.35					
4.48	0.00	0.13	0.81	1.31	0.96	1.55	1.43					
5.09	0.00	0.08	0.73	1.25	0.90	1.47	1.28					
5.70	0.00	0.27	0.90	1.40	1.16	1.68	1.51					
6.31	0.00	0.17	0.81	1.23	0.99	1.52	1.36					
6.92	0.00	0.03	0.58	0.93	0.73	1.24	1.00					
7.52	0.00	0.02	0.54	0.91	0.72	1.22	0.98					
8.13	0.00	0.04	0.60	0.97	0.77	1.22	0.98					
8.74	0.00	-0.01	0.51	0.83	0.66	1.08	0.79					
9.35	0.00	-0.24	0.33	0.53	0.49	0.80	0.48					
9.96	0.00	-0.21	0.35	0.53	0.47	0.79	0.43					
10.57	0.00	-0.19	0.35	0.58	0.52	0.75	0.47					
11.18	0.00	-0.10	0.41	0.72	0.67	0.92	0.70					
11.79	0.00	-0.10	0.39	0.68	0.64	0.88	0.70					
12.40	0.00	-0.03	0.42	0.70	0.67	0.89	0.72					
13.01	0.00	0.07	0.46	0.79	0.75	0.93	0.80					
13.62	0.00	-0.01	0.36	0.70	0.67	0.84	0.69					
14.23	0.00	0.05	0.40	0.75	0.72	0.87	0.79					
14.84	0.00	-0.04	0.32	0.57	0.60	0.74	0.57					
15.45	0.00	-0.12	0.45	0.49	0.52	0.67	0.50					
16.06	0.00	-0.13	0.46	0.41	0.46	0.60	0.40					
16.67	0.00	-0.07	0.45	0.43	0.42	0.51	0.41					
17.28	0.00	-0.08	0.39	0.35	0.37	0.45	0.37					
17.89	0.00	-0.14	0.27	0.22	0.28	0.34	0.26					
18.50	0.00	-0.19	0.17	0.07	0.16	0.20	0.10					
19.11	0.00	-0.24	0.08	-0.08	0.00	0.06	-0.07					
19.72	0.00	-0.27	0.02	-0.20	-0.07	-0.04	-0.21					
20.33	0.00	-0.21	0.04	-0.21	-0.04	-0.03	-0.21					
20.94	0.00	-0.21	0.05	-0.15	-0.04	-0.04	-0.17					
21.55	0.00	-0.27	0.00	-0.17	-0.06	-0.04	-0.15					
22.16	0.00	-0.27	-0.01	-0.19	-0.11	-0.09	-0.19					
22.76	0.00	-0.20	0.01	-0.16	-0.06	-0.07	-0.19					
23.37	0.00	-0.14	0.04	-0.05	0.04	0.03	-0.06					
23.98	0.00	-0.25	-0.01	-0.15	-0.07	-0.09	-0.13					
24.59	0.00	-0.21	-0.03	-0.17	-0.10	-0.11	-0.17					
25.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

BH 01 B-B Displacements [mm]



Inclinometer BH02 A-A Alignment

Displacements along plane perpendicular to the face of slope
Profile Change in mm

continues on next page

	0	1	2	3	4	5	6	7	8	9	10	11
Depth m	October 10, 2015	November 6, 2015	December 18, 2015	January 15, 2016	April 12, 2016	May 16, 2016	August 27, 2018	October 4, 2018	November 2, 2018	January 10, 2019	February 4, 2019	May 10, 2019
0.31	0.00	-0.12	-0.70	-1.89	-1.30	-1.70	1.38	1.48	0.08	-0.07	-0.08	0.19
0.92	0.00	0.03	-0.25	-0.72	-0.16	-0.49	0.37	0.44	-0.46	-0.33	-0.50	-0.12
1.53	0.00	0.05	0.03	0.02	0.70	0.42	0.09	0.13	-0.45	-0.15	-0.30	0.08
2.14	0.00	0.21	0.09	-0.25	0.22	-0.03	0.10	0.03	-0.27	-0.09	-0.07	0.27
2.75	0.00	0.34	0.12	-0.34	-0.15	-0.40	-0.33	-0.43	-0.36	-0.35	-0.27	0.05
3.36	0.00	0.20	-0.09	-0.67	-0.55	-0.79	-1.06	-1.17	-0.92	-1.07	-0.97	-0.70
3.97	0.00	0.17	-0.04	-0.60	-0.52	-0.75	-1.01	-1.13	-0.95	-1.23	-1.12	-0.88
4.58	0.00	0.07	-0.14	-0.43	-0.49	-0.70	-0.73	-0.82	-0.62	-1.07	-0.93	-0.72
5.19	0.00	0.02	-0.23	-0.21	-0.10	-0.30	0.14	0.08	0.22	-0.19	-0.04	0.14
5.80	0.00	0.05	-0.11	0.70	0.87	0.71	1.37	1.29	1.40	1.22	1.42	1.61
6.41	0.00	0.07	-0.11	0.64	0.72	0.56	0.85	0.73	0.80	1.22	0.98	1.20
7.02	0.00	0.06	-0.05	0.28	0.43	0.27	0.42	0.29	0.37	0.71	0.44	0.64
7.62	0.00	0.14	0.01	-0.01	0.14	-0.09	0.17	0.08	0.17	0.41	0.14	0.33
8.23	0.00	0.24	0.15	0.05	0.20	-0.06	0.26	0.17	0.23	0.46	0.21	0.36
8.84	0.00	0.21	0.06	-0.02	0.14	-0.10	0.04	-0.08	0.01	0.25	0.03	0.19
9.45	0.00	0.19	0.03	-0.01	0.13	-0.06	0.06	-0.03	0.05	0.19	0.01	0.14
10.06	0.00	0.16	-0.01	-0.02	0.13	-0.04	0.09	-0.03	0.05	0.25	0.07	0.20
10.67	0.00	0.16	-0.01	-0.03	0.12	-0.03	0.11	-0.03	0.05	0.24	0.10	0.22
11.28	0.00	0.19	0.03	-0.05	0.12	-0.04	0.15	0.05	0.09	0.29	0.14	0.27
11.89	0.00	0.20	0.05	-0.04	0.14	-0.03	0.19	0.09	0.15	0.33	0.19	0.31
12.50	0.00	0.23	0.08	-0.04	0.12	-0.05	0.12	0.02	0.07	0.24	0.09	0.20
13.11	0.00	0.23	0.08	-0.04	0.09	-0.06	0.14	0.04	0.09	0.23	0.10	0.20
13.72	0.00	0.20	0.07	-0.05	0.07	-0.09	0.23	0.13	0.21	0.32	0.23	0.30
14.33	0.00	0.19	0.05	-0.08	0.01	-0.13	0.00	-0.12	-0.01	0.06	-0.02	0.06
14.94	0.00	0.20	0.07	-0.04	0.08	-0.05	0.18	0.09	0.18	0.24	0.15	0.24
15.55	0.00	0.21	0.07	-0.09	0.03	-0.11	0.10	0.06	0.08	0.15	0.08	0.16
16.16	0.00	0.20	0.08	-0.08	0.03	-0.09	0.09	0.07	0.09	0.15	0.12	0.20
16.77	0.00	0.14	0.06	-0.04	0.04	-0.06	0.07	0.04	0.09	0.16	0.11	0.21
17.38	0.00	0.05	-0.14	-0.21	-0.22	-0.30	-0.47	-0.54	-0.45	-0.46	-0.48	-0.42
17.99	0.00	-0.10	-0.23	-0.27	-0.24	-0.30	-0.34	-0.41	-0.32	-0.29	-0.31	-0.24
18.60	0.00	0.01	-0.10	-0.17	-0.12	-0.17	-0.10	-0.16	-0.10	-0.07	-0.09	-0.03
19.21	0.00	0.06	-0.09	-0.22	-0.23	-0.26	-0.17	-0.22	-0.20	-0.15	-0.18	-0.13
19.82	0.00	0.35	0.20	-0.01	0.01	-0.06	0.15	0.15	0.11	0.21	0.13	0.20
20.43	0.00	0.27	0.19	0.03	0.08	0.01	0.19	0.21	0.17	0.24	0.19	0.25
21.04	0.00	0.20	0.14	-0.01	0.03	-0.03	0.13	0.15	0.12	0.20	0.13	0.19
21.65	0.00	0.13	0.11	0.04	0.10	0.08	0.18	0.18	0.17	0.21	0.18	0.22
22.26	0.00	-0.04	-0.06	-0.06	0.12	0.12	0.19	0.19	0.19	0.21	0.20	0.22
22.86	0.00	-0.11	-0.10	-0.09	0.01	0.04	0.07	0.08	0.09	0.09	0.10	0.10
23.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

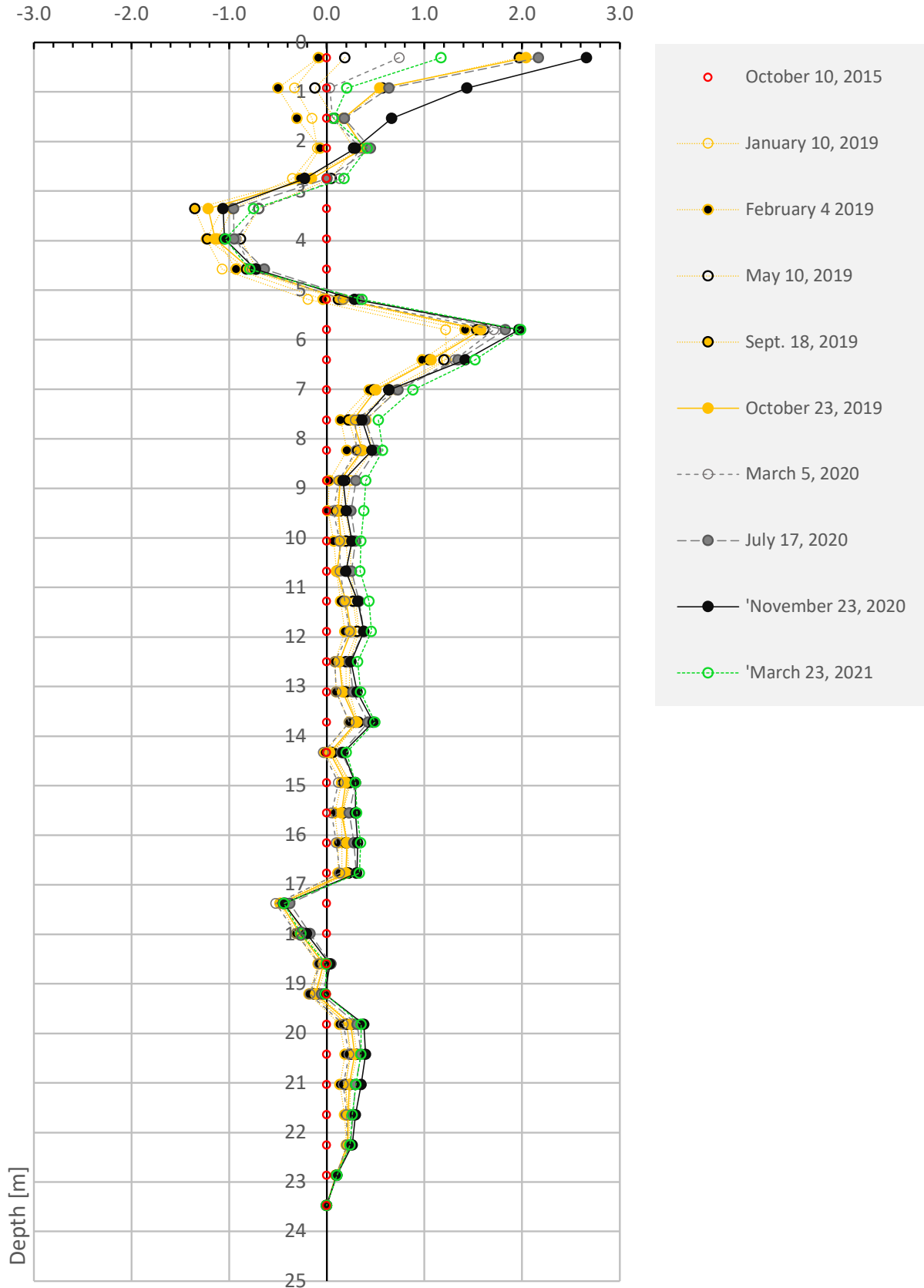
Inclinometer BH02 A-A Alignment

*Displacements along plane perpendicular to the face of slope
Profile Change in mm*

continued from previous page

Depth m	0	12	13	14	15	16	17					
	October 10, 2015	September 18, 2019	October 23, 2019	March 5, 2020	July 17, 2020	November 23, 2020	March 3, 2021					
0.31	0.00	1.97	2.04	0.74	2.17	2.66	1.17					
0.92	0.00	0.57	0.54	0.03	0.64	1.44	0.21					
1.53	0.00	0.18	0.17	0.06	0.18	0.67	0.07					
2.14	0.00	0.38	0.38	0.35	0.45	0.29	0.42					
2.75	0.00	-0.23	-0.16	0.13	0.01	-0.22	0.18					
3.36	0.00	-1.35	-1.21	-0.70	-0.96	-1.06	-0.75					
3.97	0.00	-1.22	-1.14	-0.93	-0.95	-1.05	-1.04					
4.58	0.00	-0.82	-0.78	-0.76	-0.64	-0.73	-0.79					
5.19	0.00	0.12	0.17	0.17	0.33	0.28	0.36					
5.80	0.00	1.54	1.58	1.71	1.83	1.97	1.99					
6.41	0.00	1.05	1.07	1.31	1.34	1.42	1.52					
7.02	0.00	0.48	0.51	0.72	0.73	0.64	0.88					
7.62	0.00	0.22	0.27	0.29	0.39	0.36	0.53					
8.23	0.00	0.32	0.36	0.30	0.51	0.46	0.57					
8.84	0.00	0.14	0.14	0.12	0.30	0.17	0.40					
9.45	0.00	0.10	0.12	0.07	0.25	0.20	0.38					
10.06	0.00	0.14	0.15	0.13	0.29	0.26	0.35					
10.67	0.00	0.11	0.11	0.14	0.25	0.20	0.34					
11.28	0.00	0.17	0.20	0.19	0.33	0.32	0.43					
11.89	0.00	0.24	0.25	0.23	0.38	0.38	0.46					
12.50	0.00	0.13	0.13	0.08	0.23	0.25	0.32					
13.11	0.00	0.18	0.16	0.10	0.27	0.31	0.35					
13.72	0.00	0.33	0.30	0.23	0.42	0.47	0.49					
14.33	0.00	0.05	0.03	-0.04	0.15	0.17	0.20					
14.94	0.00	0.22	0.20	0.12	0.29	0.29	0.29					
15.55	0.00	0.17	0.15	0.05	0.23	0.29	0.31					
16.16	0.00	0.21	0.21	0.10	0.28	0.32	0.35					
16.77	0.00	0.22	0.20	0.13	0.30	0.31	0.34					
17.38	0.00	-0.43	-0.47	-0.52	-0.38	-0.44	-0.44					
17.99	0.00	-0.23	-0.27	-0.31	-0.17	-0.21	-0.26					
18.60	0.00	-0.01	-0.03	-0.08	0.04	0.03	-0.01					
19.21	0.00	-0.09	-0.11	-0.17	-0.05	-0.02	-0.01					
19.82	0.00	0.26	0.25	0.17	0.31	0.38	0.35					
20.43	0.00	0.31	0.29	0.23	0.35	0.40	0.35					
21.04	0.00	0.24	0.23	0.17	0.29	0.35	0.30					
21.65	0.00	0.23	0.22	0.20	0.27	0.29	0.26					
22.26	0.00	0.23	0.22	0.21	0.24	0.26	0.24					
22.86	0.00	0.10	0.09	0.10	0.11	0.10	0.11					
23.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

BH 02 A-A Displacements [mm]



Inclinometer BH02 B-B Alignment

*Displacements along plane parallel to the face of slope
Profile Change in mm*

continues on next page

	0	1	2	3	4	5	6	7	8	9	10	11
Depth m	October 10, 2015	November 6, 2015	December 18, 2015	January 15, 2016	April 12, 2016	May 16, 2016	August 27, 2018	October 4, 2018	November 2, 2018	January 10, 2019	February 4, 2019	May 10, 2019
0.31	0.00	0.65	0.17	0.57	-0.07	0.40	1.56	1.84	1.11	1.31	1.42	0.45
0.92	0.00	0.76	0.40	0.79	-0.11	0.24	1.40	1.65	1.08	1.17	1.46	0.49
1.53	0.00	0.57	0.15	0.90	-0.19	0.29	0.96	1.06	0.87	0.75	1.12	0.28
2.14	0.00	0.42	0.12	1.09	0.20	0.69	0.74	0.61	0.72	0.93	1.27	0.50
2.75	0.00	0.60	0.31	0.97	0.18	0.58	1.15	1.07	1.18	1.44	1.70	0.92
3.36	0.00	0.66	0.72	1.74	0.81	1.12	2.14	1.95	2.08	2.48	2.67	2.00
3.97	0.00	0.82	0.84	1.86	1.07	1.35	1.96	1.84	1.98	2.47	2.56	1.88
4.58	0.00	0.89	1.07	1.75	1.00	1.28	0.90	0.86	1.14	1.48	1.55	0.90
5.19	0.00	0.90	1.05	1.35	0.60	0.82	-0.01	0.02	0.36	0.44	0.52	-0.24
5.80	0.00	0.77	0.90	1.19	0.39	0.63	0.00	0.05	0.46	0.35	0.53	-0.21
6.41	0.00	0.73	0.85	1.45	0.64	0.90	0.52	0.56	0.93	0.90	1.17	0.44
7.02	0.00	0.80	0.89	1.29	0.65	0.96	0.68	0.76	1.00	0.96	1.15	0.56
7.62	0.00	0.82	0.94	1.44	0.79	1.08	0.68	0.74	1.04	1.04	1.32	0.73
8.23	0.00	0.83	0.95	1.41	0.80	1.04	0.69	0.76	1.02	0.96	1.22	0.65
8.84	0.00	0.83	0.95	1.39	0.82	1.04	0.71	0.72	0.96	0.96	1.20	0.65
9.45	0.00	0.90	0.99	1.40	0.81	1.01	0.79	0.75	0.99	0.95	1.21	0.69
10.06	0.00	0.90	0.99	1.41	0.81	0.99	0.86	0.85	1.08	0.99	1.24	0.72
10.67	0.00	0.84	1.02	1.44	0.83	1.01	0.99	1.00	1.17	1.10	1.32	0.84
11.28	0.00	0.80	1.00	1.38	0.80	0.98	0.91	0.93	1.10	0.99	1.23	0.75
11.89	0.00	0.79	0.95	1.42	0.80	1.03	0.93	0.94	1.17	1.01	1.27	0.83
12.50	0.00	0.68	0.86	1.44	0.81	1.08	0.88	0.86	1.13	0.92	1.21	0.74
13.11	0.00	0.55	0.85	1.34	0.72	1.07	0.98	0.87	1.04	0.81	1.32	0.59
13.72	0.00	0.47	0.86	1.30	0.69	1.07	0.88	0.74	0.96	0.68	1.23	0.52
14.33	0.00	0.43	0.85	1.31	0.72	1.13	0.65	0.68	0.93	0.57	1.12	0.41
14.94	0.00	0.34	0.72	1.25	0.65	1.10	0.53	0.61	0.84	0.45	1.03	0.32
15.55	0.00	0.22	0.60	1.16	0.56	1.07	0.54	0.65	0.85	0.45	1.04	0.29
16.16	0.00	0.25	0.66	1.15	0.56	1.04	0.46	0.67	0.85	0.46	0.94	0.33
16.77	0.00	0.26	0.74	1.08	0.50	0.88	0.38	0.66	0.67	0.62	0.82	0.49
17.38	0.00	0.40	0.95	0.99	0.71	1.03	0.55	0.89	0.80	0.79	0.86	0.67
17.99	0.00	0.65	0.92	0.88	0.67	0.81	0.67	1.04	0.95	0.91	0.91	0.93
18.60	0.00	0.85	1.31	1.29	1.21	1.34	1.41	1.83	1.73	1.72	1.67	1.71
19.21	0.00	0.63	0.76	0.81	0.80	0.65	0.94	1.23	1.22	1.26	1.13	1.26
19.82	0.00	0.57	0.64	0.58	0.56	0.38	0.69	0.94	0.93	1.02	0.81	0.97
20.43	0.00	0.63	0.77	0.55	0.58	0.36	0.70	0.93	0.85	0.88	0.77	0.94
21.04	0.00	0.69	0.85	0.82	0.84	0.73	1.00	1.10	1.10	1.02	1.04	1.14
21.65	0.00	0.26	0.47	0.38	0.51	0.51	0.63	0.59	0.64	0.54	0.61	0.61
22.26	0.00	-0.15	-0.03	-0.06	0.00	0.00	0.10	0.07	0.06	0.01	0.09	0.09
22.86	0.00	-0.24	-0.24	-0.25	-0.19	-0.20	-0.17	-0.16	-0.19	-0.20	-0.15	-0.16
23.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

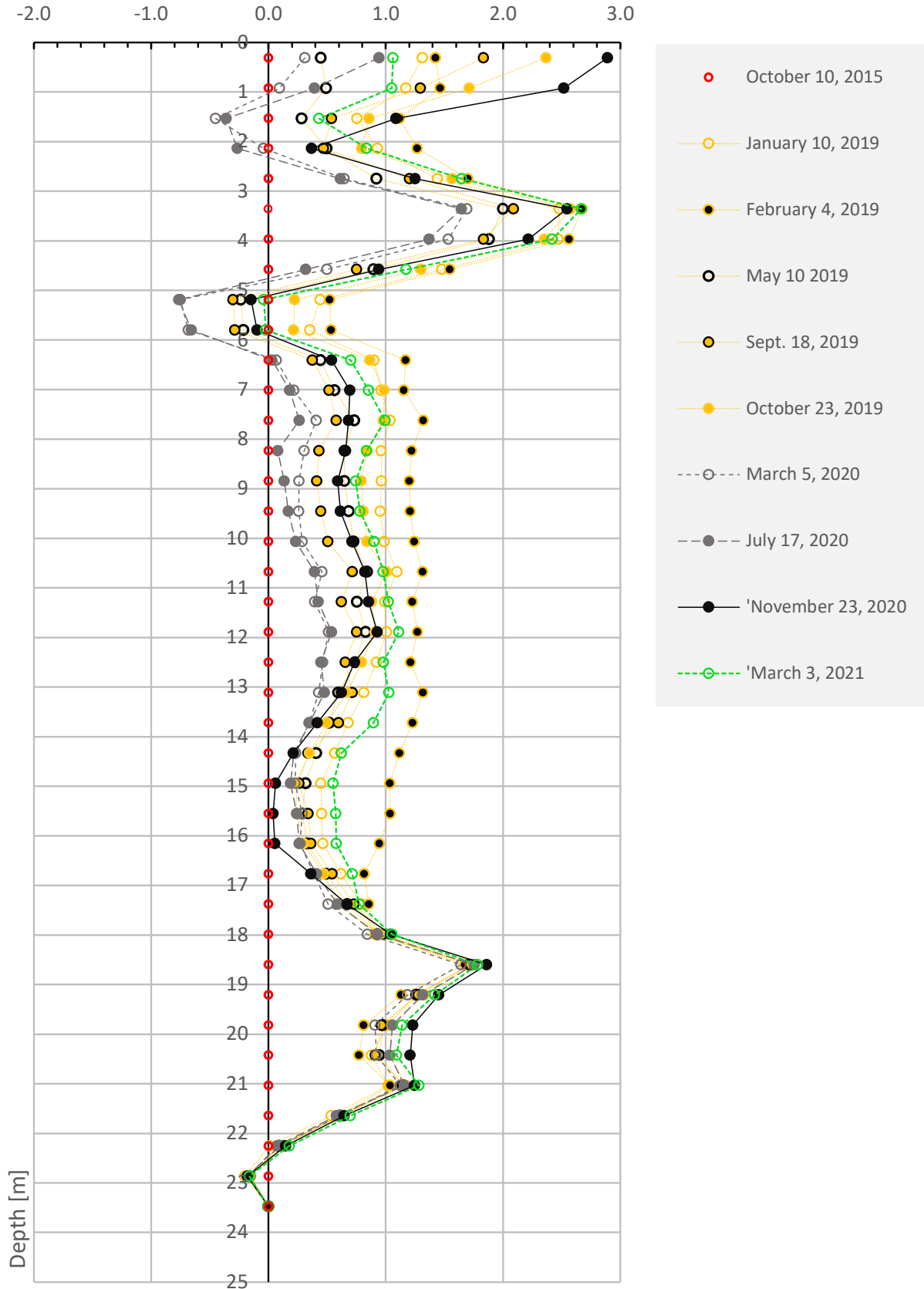
Inclinometer BH02 B-B Alignment

*Displacements along plane parallel to the face of slope
Profile Change in mm*

continued from previous page

Depth m	0	12	13	14	15	16	17					
	October 10, 2015	September 18, 2019	October 23, 2019	March 5, 2020	July 17, 2020	November 23, 2020	March 3, 2021					
0.31	0.00	1.83	2.37	0.31	0.94	2.89	1.06					
0.92	0.00	1.30	1.71	0.09	0.39	2.52	1.05					
1.53	0.00	0.54	0.86	-0.45	-0.36	1.09	0.43					
2.14	0.00	0.47	0.80	-0.04	-0.26	0.37	0.84					
2.75	0.00	1.20	1.56	0.65	0.61	1.25	1.65					
3.36	0.00	2.09	2.58	1.69	1.65	2.55	2.67					
3.97	0.00	1.83	2.35	1.53	1.37	2.21	2.42					
4.58	0.00	0.75	1.30	0.50	0.32	0.94	1.17					
5.19	0.00	-0.30	0.22	-0.75	-0.76	-0.15	-0.04					
5.80	0.00	-0.29	0.21	-0.68	-0.66	-0.10	-0.03					
6.41	0.00	0.38	0.86	0.07	0.03	0.54	0.70					
7.02	0.00	0.52	0.99	0.22	0.18	0.70	0.85					
7.62	0.00	0.58	0.98	0.41	0.26	0.68	1.00					
8.23	0.00	0.43	0.84	0.30	0.08	0.66	0.84					
8.84	0.00	0.41	0.79	0.26	0.13	0.59	0.74					
9.45	0.00	0.45	0.81	0.26	0.17	0.61	0.78					
10.06	0.00	0.51	0.84	0.29	0.23	0.71	0.90					
10.67	0.00	0.71	1.01	0.46	0.39	0.82	0.98					
11.28	0.00	0.62	0.88	0.39	0.42	0.85	1.02					
11.89	0.00	0.75	0.91	0.51	0.54	0.93	1.11					
12.50	0.00	0.66	0.80	0.46	0.45	0.73	0.98					
13.11	0.00	0.71	0.67	0.43	0.48	0.62	1.03					
13.72	0.00	0.60	0.50	0.35	0.35	0.42	0.90					
14.33	0.00	0.34	0.35	0.23	0.22	0.21	0.62					
14.94	0.00	0.26	0.23	0.23	0.19	0.06	0.55					
15.55	0.00	0.34	0.24	0.29	0.24	0.04	0.57					
16.16	0.00	0.36	0.30	0.27	0.26	0.06	0.58					
16.77	0.00	0.54	0.47	0.39	0.41	0.36	0.71					
17.38	0.00	0.73	0.59	0.51	0.59	0.67	0.77					
17.99	0.00	0.98	0.94	0.84	0.93	1.04	1.05					
18.60	0.00	1.72	1.76	1.64	1.76	1.86	1.78					
19.21	0.00	1.28	1.33	1.19	1.32	1.45	1.42					
19.82	0.00	0.96	1.05	0.91	1.06	1.23	1.14					
20.43	0.00	0.91	1.04	0.92	1.03	1.21	1.09					
21.04	0.00	1.16	1.17	1.13	1.16	1.24	1.28					
21.65	0.00	0.61	0.61	0.61	0.58	0.65	0.70					
22.26	0.00	0.12	0.10	0.10	0.07	0.15	0.18					
22.86	0.00	-0.17	-0.16	-0.18	-0.17	-0.18	-0.16					
23.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

BH 02 B-B Displacements [mm]



Inclinometer BH03 A-A Alignment

Displacements along plane perpendicular to the face of slope
Profile Change in mm

continues on next page

Depth m	0	1	2	3	4	5	6	7	8	9	10	11
	October 10, 2015	November 6, 2015	December 18, 2015	January 15, 2016	April 12, 2016	May 16, 2016	August 27, 2018	October 4, 2018	November 2, 2018	January 10, 2019	February 4, 2019	May 10, 2019
0.61	0.00	0.15	0.76	1.07	0.68	0.72	-1.80	-2.67	-1.80	-1.17	-0.96	-0.44
1.22	0.00	0.21	0.73	0.99	0.44	0.47	-0.86	-1.37	-0.94	-0.64	-0.41	0.01
1.83	0.00	0.15	0.58	0.76	0.10	0.15	-0.17	-0.45	-0.35	-0.17	-0.01	0.33
2.44	0.00	0.33	0.80	0.96	0.29	0.35	0.35	0.19	0.29	0.38	0.56	0.86
3.05	0.00	0.31	0.79	0.88	0.13	0.19	0.40	0.29	0.48	0.52	0.72	1.00
3.66	0.00	0.22	0.69	0.90	0.21	0.29	0.63	0.50	0.80	0.83	1.04	1.31
4.27	0.00	0.20	0.67	0.94	0.29	0.37	0.60	0.49	0.75	0.80	1.01	1.27
4.88	0.00	0.15	0.62	0.91	0.22	0.30	0.54	0.41	0.74	0.78	0.96	1.18
5.49	0.00	0.15	0.63	0.93	0.23	0.31	0.55	0.44	0.80	0.85	1.02	1.24
6.10	0.00	0.18	0.65	0.92	0.19	0.25	0.42	0.32	0.66	0.70	0.87	1.06
6.71	0.00	0.19	0.65	0.91	0.19	0.23	0.57	0.49	0.78	0.85	1.00	1.17
7.32	0.00	0.16	0.49	0.85	0.13	0.18	0.54	0.46	0.79	0.77	0.94	1.14
7.92	0.00	0.12	0.43	0.84	0.10	0.15	0.30	0.21	0.62	0.61	0.80	0.98
8.53	0.00	0.12	0.44	0.86	0.12	0.18	-0.03	-0.10	0.31	0.30	0.48	0.66
9.14	0.00	0.18	0.50	0.93	0.20	0.27	0.24	0.18	0.59	0.60	0.76	0.96
9.75	0.00	0.17	0.49	0.88	0.20	0.26	0.45	0.41	0.83	0.85	1.00	1.20
10.36	0.00	0.19	0.51	0.92	0.23	0.29	0.47	0.43	0.85	0.91	1.04	1.23
10.97	0.00	0.23	0.56	0.98	0.31	0.29	0.60	0.61	1.06	1.10	1.26	1.47
11.58	0.00	0.19	0.51	0.94	0.28	0.23	0.50	0.51	0.96	1.01	1.17	1.35
12.19	0.00	0.20	0.49	0.94	0.29	0.25	0.50	0.50	0.97	1.02	1.17	1.37
12.80	0.00	0.23	0.50	0.87	0.30	0.23	0.52	0.49	0.89	0.91	1.05	1.23
13.41	0.00	0.25	0.50	0.84	0.33	0.24	0.54	0.50	0.88	0.89	1.03	1.18
14.02	0.00	0.26	0.53	0.93	0.39	0.34	0.67	0.66	1.11	1.17	1.32	1.51
14.63	0.00	0.28	0.54	0.91	0.41	0.35	0.58	0.56	0.99	1.05	1.20	1.36
15.24	0.00	0.28	0.54	0.91	0.39	0.34	0.56	0.55	0.98	1.04	1.21	1.38
15.85	0.00	0.31	0.57	0.95	0.43	0.38	0.65	0.64	1.07	1.15	1.31	1.51
16.46	0.00	0.28	0.53	0.93	0.39	0.34	0.60	0.58	1.04	1.12	1.30	1.52
17.07	0.00	0.29	0.52	0.90	0.41	0.34	0.58	0.55	0.96	1.06	1.21	1.41
17.68	0.00	0.39	0.63	0.96	0.54	0.45	0.78	0.73	1.08	1.19	1.32	1.49
18.29	0.00	0.44	0.67	0.97	0.61	0.51	0.82	0.75	1.06	1.17	1.28	1.40
18.90	0.00	0.58	0.81	1.07	0.76	0.66	0.87	0.79	1.05	1.16	1.27	1.36
19.51	0.00	0.34	0.51	0.73	0.44	0.32	0.49	0.37	0.60	0.71	0.81	0.88
20.12	0.00	0.16	0.27	0.51	0.19	0.09	0.13	0.03	0.31	0.41	0.53	0.65
20.73	0.00	0.19	0.30	0.55	0.23	0.15	0.23	0.11	0.41	0.52	0.64	0.77
21.34	0.00	0.20	0.30	0.55	0.24	0.17	0.18	0.08	0.38	0.52	0.65	0.78
21.95	0.00	0.29	0.41	0.63	0.36	0.30	0.37	0.28	0.53	0.69	0.80	0.93
22.56	0.00	0.09	0.15	0.38	0.06	-0.02	-0.10	-0.19	0.12	0.27	0.41	0.57
23.16	0.00	0.18	0.28	0.49	0.23	0.15	0.23	0.12	0.39	0.54	0.66	0.80
23.77	0.00	0.30	0.43	0.57	0.39	0.30	0.44	0.31	0.53	0.67	0.75	0.86
24.38	0.00	0.30	0.42	0.53	0.38	0.29	0.29	0.12	0.31	0.45	0.51	0.59
24.99	0.00	0.44	0.53	0.74	0.48	0.45	0.58	0.47	0.73	0.87	0.99	1.12
25.60	0.00	0.51	0.59	0.81	0.55	0.56	0.72	0.61	0.92	1.07	1.21	1.37
26.21	0.00	0.73	0.86	1.04	0.89	0.86	1.08	0.93	1.19	1.33	1.45	1.57
26.82	0.00	0.55	0.66	0.80	0.67	0.64	0.84	0.67	0.89	1.02	1.13	1.22
27.43	0.00	0.74	0.85	0.99	0.87	0.84	1.03	0.86	1.06	1.19	1.30	1.39
28.04	0.00	0.11	0.19	0.29	0.20	0.16	0.28	0.10	0.29	0.42	0.52	0.59
28.65	0.00	-0.11	-0.11	-0.02	-0.15	-0.17	-0.11	-0.28	-0.08	0.06	0.17	0.25
29.26	0.00	0.09	0.06	0.15	0.03	0.04	0.07	-0.10	0.10	0.26	0.36	0.46
29.87	0.00	0.05	0.05	0.14	0.06	0.08	0.15	-0.03	0.15	0.30	0.40	0.47
30.48	0.00	0.18	0.18	0.24	0.17	0.19	0.26	0.07	0.22	0.38	0.44	0.52
31.09	0.00	-0.02	-0.03	0.02	-0.02	-0.02	0.02	-0.19	-0.07	0.08	0.10	0.13
31.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Inclinometer BH03 A-A Alignment

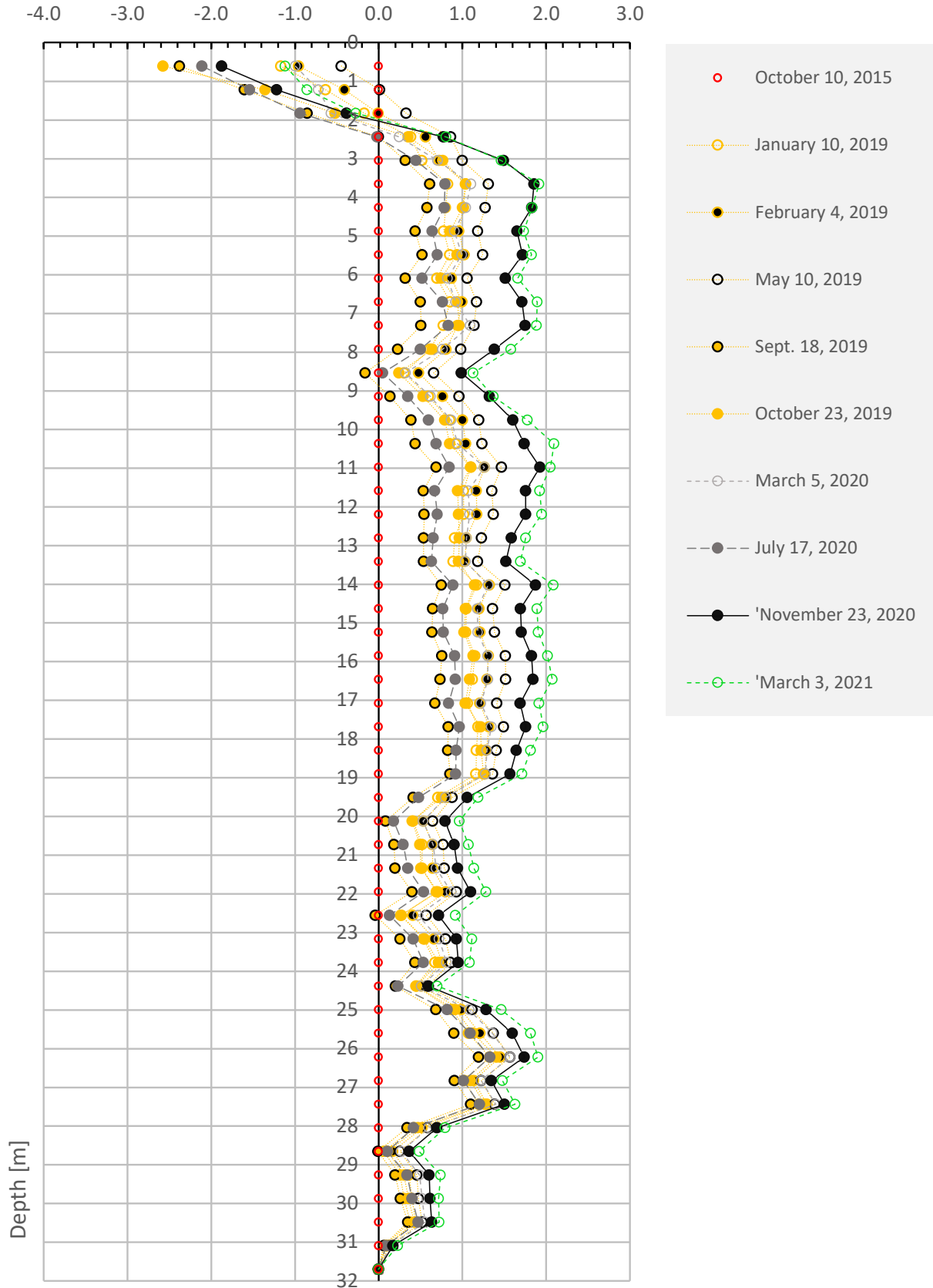
Displacements along plane perpendicular to the face of slope

continued from previous page

Profile Change in mm

Depth m	0	12	13	14	15	16	17					
	October 10, 2015	September 18, 2019	October 23, 2019	March 5, 2020	July 17, 2020	November 23, 2020	March 3, 2021					
0.61	0.00	-2.38	-2.58	-0.99	-2.11	-1.87	-1.12					
1.22	0.00	-1.60	-1.36	-0.72	-1.54	-1.22	-0.86					
1.83	0.00	-0.85	-0.52	-0.57	-0.94	-0.38	-0.27					
2.44	0.00	0.00	0.35	0.24	-0.02	0.77	0.81					
3.05	0.00	0.32	0.76	0.70	0.45	1.49	1.47					
3.66	0.00	0.61	1.04	1.10	0.80	1.86	1.92					
4.27	0.00	0.58	1.00	1.04	0.78	1.83	1.83					
4.88	0.00	0.44	0.85	0.90	0.64	1.65	1.73					
5.49	0.00	0.52	0.93	0.99	0.70	1.72	1.82					
6.10	0.00	0.32	0.74	0.82	0.52	1.51	1.66					
6.71	0.00	0.50	0.94	0.92	0.76	1.71	1.89					
7.32	0.00	0.51	0.96	1.09	0.83	1.75	1.88					
7.92	0.00	0.23	0.64	0.76	0.50	1.38	1.58					
8.53	0.00	-0.16	0.24	0.32	0.05	0.99	1.13					
9.14	0.00	0.14	0.53	0.62	0.35	1.32	1.37					
9.75	0.00	0.39	0.79	0.87	0.59	1.60	1.78					
10.36	0.00	0.44	0.85	0.94	0.69	1.74	2.09					
10.97	0.00	0.69	1.10	1.26	0.84	1.93	2.05					
11.58	0.00	0.53	0.94	1.07	0.67	1.76	1.92					
12.19	0.00	0.54	0.96	1.09	0.70	1.76	1.95					
12.80	0.00	0.54	0.96	1.05	0.65	1.58	1.76					
13.41	0.00	0.54	0.96	1.04	0.63	1.52	1.69					
14.02	0.00	0.75	1.14	1.31	0.89	1.87	2.09					
14.63	0.00	0.65	1.04	1.18	0.77	1.69	1.89					
15.24	0.00	0.64	1.02	1.18	0.77	1.70	1.91					
15.85	0.00	0.76	1.13	1.30	0.91	1.82	2.02					
16.46	0.00	0.73	1.09	1.31	0.91	1.84	2.07					
17.07	0.00	0.67	1.03	1.22	0.84	1.69	1.92					
17.68	0.00	0.83	1.22	1.35	0.97	1.76	1.96					
18.29	0.00	0.83	1.22	1.30	0.93	1.65	1.82					
18.90	0.00	0.85	1.25	1.28	0.92	1.57	1.71					
19.51	0.00	0.41	0.75	0.80	0.48	1.06	1.19					
20.12	0.00	0.08	0.40	0.53	0.18	0.80	0.96					
20.73	0.00	0.18	0.49	0.65	0.29	0.90	1.07					
21.34	0.00	0.20	0.51	0.69	0.35	0.94	1.14					
21.95	0.00	0.40	0.71	0.87	0.54	1.10	1.28					
22.56	0.00	-0.04	0.26	0.47	0.13	0.72	0.92					
23.16	0.00	0.25	0.55	0.72	0.41	0.93	1.11					
23.77	0.00	0.43	0.72	0.81	0.53	0.95	1.08					
24.38	0.00	0.20	0.45	0.51	0.23	0.60	0.70					
24.99	0.00	0.68	0.91	1.08	0.82	1.28	1.47					
25.60	0.00	0.90	1.13	1.36	1.09	1.60	1.81					
26.21	0.00	1.19	1.40	1.57	1.33	1.74	1.90					
26.82	0.00	0.90	1.10	1.22	1.01	1.35	1.48					
27.43	0.00	1.10	1.26	1.40	1.20	1.50	1.63					
28.04	0.00	0.34	0.47	0.60	0.42	0.70	0.80					
28.65	0.00	-0.01	0.11	0.27	0.10	0.37	0.49					
29.26	0.00	0.20	0.30	0.49	0.34	0.60	0.74					
29.87	0.00	0.26	0.36	0.52	0.40	0.61	0.72					
30.48	0.00	0.35	0.43	0.55	0.47	0.64	0.72					
31.09	0.00	0.06	0.10	0.14	0.09	0.17	0.23					
31.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

BH 03 A-A Displacements [mm]



Inclinometer BH03 B-B Alignment

Displacements along plane parallel to the face of slope
Profile Change in mm

continues on next page

	0	1	2	3	4	5	6	7	8	9	10	11
Depth m	October 10, 2015	November 6, 2015	December 18, 2015	January 15, 2016	April 12, 2016	May 16, 2016	August 27, 2018	October 4, 2018	November 2, 2018	January 10, 2019	February 4, 2019	May 10, 2019
0.61	0.00	0.80	1.02	0.67	0.64	0.39	1.45	1.68	1.29	0.95	0.68	0.47
1.22	0.00	0.90	1.14	0.84	0.83	0.56	1.53	1.79	1.57	1.26	1.00	0.85
1.83	0.00	0.76	0.97	0.73	0.72	0.43	1.31	1.39	1.27	0.97	0.73	0.60
2.44	0.00	0.63	0.82	0.63	0.49	0.18	0.85	0.82	0.73	0.40	0.17	0.15
3.05	0.00	0.65	0.86	0.74	0.58	0.28	0.89	0.84	0.77	0.46	0.23	0.21
3.66	0.00	0.55	0.76	0.71	0.58	0.31	0.91	0.83	0.75	0.45	0.19	0.18
4.27	0.00	0.49	0.73	0.72	0.78	0.51	1.49	1.40	1.42	1.14	0.94	0.92
4.88	0.00	0.53	0.68	0.65	0.49	0.20	0.96	0.87	0.78	0.51	0.27	0.26
5.49	0.00	0.53	0.67	0.61	0.38	0.08	0.61	0.53	0.42	0.14	-0.10	-0.09
6.10	0.00	0.47	0.64	0.60	0.45	0.18	0.62	0.67	0.55	0.29	-0.01	0.01
6.71	0.00	0.41	0.61	0.61	0.44	0.20	0.78	0.90	0.78	0.52	0.27	0.29
7.32	0.00	0.38	0.67	0.64	0.46	0.26	0.77	0.83	0.71	0.57	0.33	0.34
7.92	0.00	0.41	0.71	0.72	0.53	0.31	0.76	0.80	0.72	0.54	0.36	0.39
8.53	0.00	0.49	0.77	0.77	0.63	0.40	1.17	1.20	1.09	0.90	0.75	0.76
9.14	0.00	0.52	0.76	0.78	0.64	0.40	1.19	1.16	1.10	0.93	0.76	0.77
9.75	0.00	0.44	0.68	0.68	0.53	0.29	0.84	0.80	0.71	0.54	0.37	0.37
10.36	0.00	0.52	0.78	0.73	0.63	0.39	0.96	0.86	0.83	0.61	0.51	0.52
10.97	0.00	0.43	0.69	0.67	0.50	0.37	0.79	0.72	0.62	0.41	0.30	0.31
11.58	0.00	0.44	0.72	0.72	0.56	0.42	0.86	0.80	0.65	0.50	0.35	0.35
12.19	0.00	0.42	0.69	0.69	0.52	0.36	0.79	0.72	0.53	0.40	0.26	0.21
12.80	0.00	0.41	0.69	0.68	0.51	0.31	0.70	0.56	0.39	0.25	0.12	0.02
13.41	0.00	0.38	0.68	0.73	0.52	0.35	0.75	0.64	0.54	0.41	0.33	0.23
14.02	0.00	0.36	0.67	0.71	0.47	0.33	0.72	0.60	0.55	0.43	0.34	0.26
14.63	0.00	0.42	0.70	0.77	0.50	0.36	0.63	0.44	0.34	0.21	0.10	-0.01
15.24	0.00	0.41	0.69	0.74	0.50	0.35	0.68	0.48	0.36	0.21	0.10	-0.01
15.85	0.00	0.43	0.69	0.71	0.52	0.35	0.73	0.53	0.32	0.22	0.09	-0.10
16.46	0.00	0.47	0.72	0.73	0.55	0.40	0.81	0.52	0.33	0.20	0.04	-0.17
17.07	0.00	0.51	0.70	0.73	0.61	0.40	0.84	0.57	0.40	0.26	0.11	-0.04
17.68	0.00	0.47	0.68	0.70	0.57	0.39	0.84	0.64	0.47	0.34	0.22	0.08
18.29	0.00	0.34	0.56	0.56	0.46	0.27	0.64	0.44	0.32	0.14	0.06	-0.11
18.90	0.00	0.29	0.52	0.50	0.38	0.25	0.64	0.48	0.42	0.25	0.18	0.06
19.51	0.00	0.26	0.47	0.44	0.32	0.17	0.36	0.18	0.12	-0.09	-0.10	-0.21
20.12	0.00	0.25	0.47	0.46	0.32	0.21	0.37	0.23	0.22	0.02	0.06	0.01
20.73	0.00	0.22	0.43	0.42	0.28	0.20	0.41	0.19	0.24	0.01	0.08	-0.01
21.34	0.00	0.32	0.57	0.58	0.48	0.39	0.64	0.44	0.53	0.30	0.40	0.33
21.95	0.00	0.39	0.65	0.64	0.57	0.47	0.84	0.66	0.76	0.53	0.60	0.54
22.56	0.00	0.45	0.73	0.72	0.69	0.56	1.03	0.87	0.99	0.72	0.81	0.75
23.16	0.00	0.59	0.89	0.89	0.82	0.74	1.18	1.04	1.25	0.97	1.12	1.09
23.77	0.00	0.64	0.94	0.91	0.85	0.77	1.22	1.05	1.26	0.99	1.11	1.08
24.38	0.00	0.34	0.58	0.52	0.45	0.37	0.73	0.53	0.75	0.45	0.57	0.54
24.99	0.00	0.47	0.65	0.64	0.56	0.52	0.88	0.75	1.02	0.71	0.84	0.83
25.60	0.00	0.35	0.51	0.56	0.42	0.42	0.57	0.48	0.74	0.40	0.56	0.59
26.21	0.00	-0.23	-0.13	-0.07	-0.24	-0.21	-0.14	-0.21	0.07	-0.25	-0.07	-0.04
26.82	0.00	-0.26	-0.13	-0.08	-0.23	-0.19	-0.12	-0.20	0.06	-0.17	-0.09	-0.08
27.43	0.00	-0.62	-0.52	-0.51	-0.60	-0.60	-0.58	-0.68	-0.46	-0.69	-0.63	-0.66
28.04	0.00	-0.84	-0.80	-0.78	-0.87	-0.89	-0.89	-0.95	-0.72	-0.93	-0.85	-0.87
28.65	0.00	-0.45	-0.44	-0.41	-0.49	-0.49	-0.52	-0.56	-0.29	-0.52	-0.45	-0.46
29.26	0.00	-0.19	-0.15	-0.19	-0.25	-0.23	-0.29	-0.34	-0.11	-0.32	-0.31	-0.34
29.87	0.00	-0.23	-0.13	-0.20	-0.19	-0.18	-0.25	-0.28	-0.10	-0.30	-0.34	-0.38
30.48	0.00	-0.20	-0.12	-0.23	-0.17	-0.20	-0.27	-0.30	-0.13	-0.34	-0.40	-0.45
31.09	0.00	0.26	0.33	0.23	0.32	0.27	0.25	0.25	0.36	0.15	0.08	-0.01
31.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

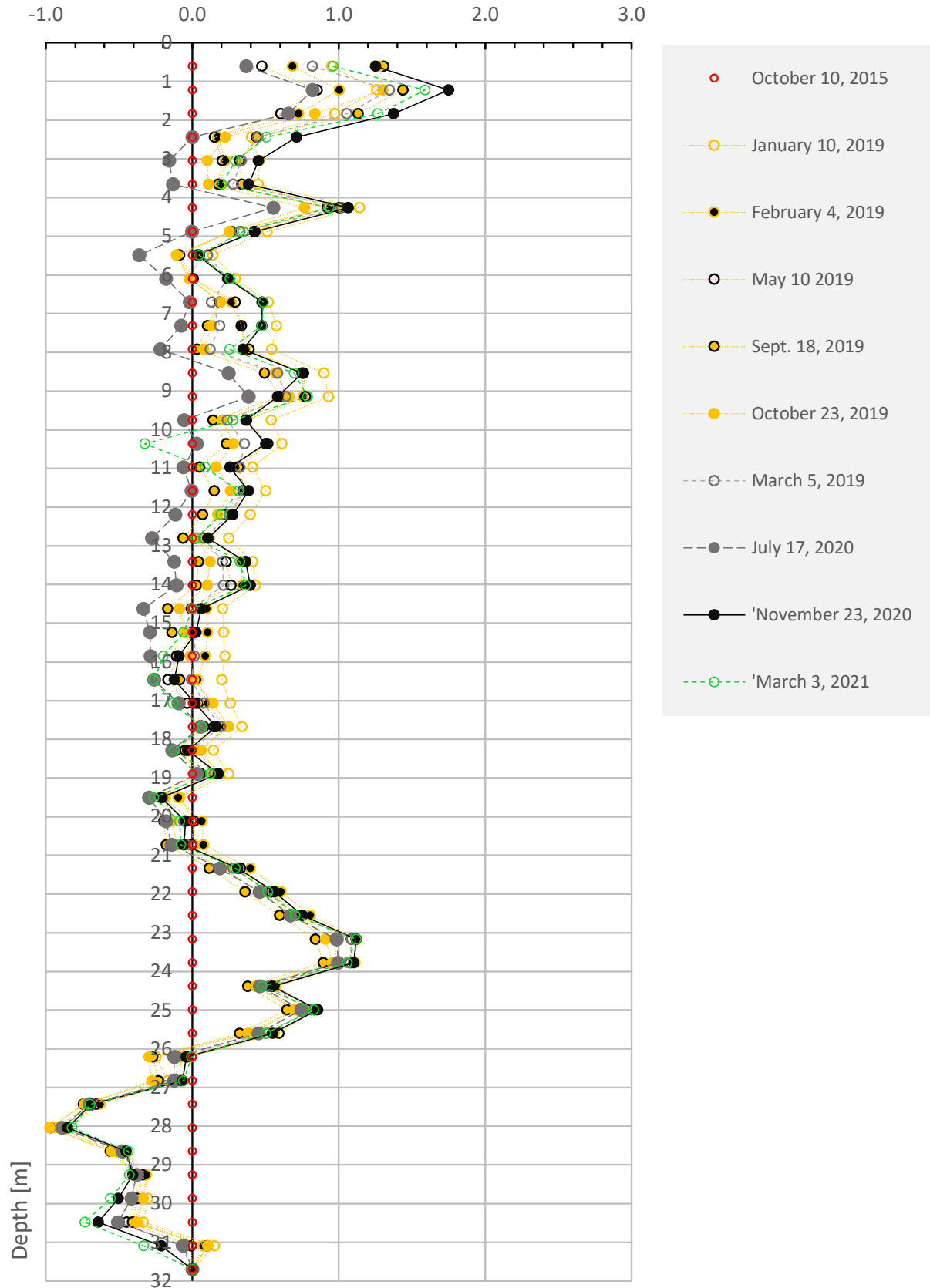
Inclinometer BH03 B-B Alignment

Displacements along plane parallel to the face of slope
Profile Change in mm

continued from previous page

Depth m	0	12	13	14	15	16	17					
	October 10, 2015	November 6, 2015	December 18, 2015	March 5, 2020	July 17, 2020	November 23, 2020	March 3, 2021					
0.61	0.00	1.31	1.28	0.82	0.37	1.25	0.96					
1.22	0.00	1.44	1.30	1.35	0.82	1.75	1.59					
1.83	0.00	1.13	0.84	1.05	0.66	1.37	1.27					
2.44	0.00	0.44	0.23	0.45	0.00	0.71	0.51					
3.05	0.00	0.32	0.10	0.34	-0.16	0.45	0.29					
3.66	0.00	0.34	0.11	0.28	-0.13	0.38	0.20					
4.27	0.00	1.00	0.77	1.02	0.55	1.06	0.93					
4.88	0.00	0.42	0.25	0.33	0.00	0.43	0.35					
5.49	0.00	0.05	-0.11	0.10	-0.36	0.04	0.05					
6.10	0.00	-0.01	-0.02	0.24	-0.18	0.24	0.26					
6.71	0.00	0.19	0.19	0.13	-0.02	0.48	0.49					
7.32	0.00	0.10	0.13	0.19	-0.08	0.47	0.47					
7.92	0.00	0.03	0.08	0.12	-0.22	0.35	0.25					
8.53	0.00	0.49	0.57	0.58	0.25	0.75	0.70					
9.14	0.00	0.60	0.66	0.64	0.38	0.58	0.79					
9.75	0.00	0.14	0.21	0.24	-0.06	0.37	0.28					
10.36	0.00	0.23	0.28	0.36	0.03	0.50	-0.33					
10.97	0.00	0.05	0.16	0.33	-0.06	0.26	0.09					
11.58	0.00	0.15	0.26	0.35	-0.01	0.38	0.32					
12.19	0.00	0.07	0.17	0.25	-0.12	0.28	0.20					
12.80	0.00	-0.06	0.04	0.08	-0.27	0.11	0.03					
13.41	0.00	0.04	0.12	0.21	-0.12	0.36	0.33					
14.02	0.00	0.03	0.10	0.21	-0.11	0.40	0.36					
14.63	0.00	-0.17	-0.09	0.00	-0.34	0.06	0.00					
15.24	0.00	-0.14	-0.05	0.02	-0.29	0.03	-0.06					
15.85	0.00	-0.11	-0.01	0.02	-0.28	-0.09	-0.20					
16.46	0.00	-0.09	0.01	-0.01	-0.26	-0.12	-0.26					
17.07	0.00	0.04	0.14	0.08	-0.09	0.02	-0.13					
17.68	0.00	0.15	0.25	0.19	0.06	0.16	0.07					
18.29	0.00	-0.05	0.05	-0.02	-0.14	-0.03	-0.12					
18.90	0.00	0.05	0.14	0.15	0.03	0.18	0.12					
19.51	0.00	-0.29	-0.18	-0.20	-0.29	-0.21	-0.26					
20.12	0.00	-0.19	-0.14	-0.06	-0.18	-0.05	-0.09					
20.73	0.00	-0.18	-0.10	-0.04	-0.14	-0.06	-0.08					
21.34	0.00	0.12	0.20	0.28	0.19	0.31	0.29					
21.95	0.00	0.36	0.46	0.52	0.46	0.56	0.52					
22.56	0.00	0.60	0.69	0.71	0.67	0.75	0.70					
23.16	0.00	0.84	0.91	1.09	0.99	1.12	1.12					
23.77	0.00	0.89	0.96	1.08	1.00	1.10	1.06					
24.38	0.00	0.38	0.43	0.52	0.46	0.55	0.48					
24.99	0.00	0.65	0.70	0.81	0.74	0.86	0.83					
25.60	0.00	0.32	0.38	0.50	0.45	0.55	0.50					
26.21	0.00	-0.27	-0.29	-0.10	-0.12	-0.04	-0.01					
26.82	0.00	-0.23	-0.27	-0.11	-0.12	-0.07	-0.06					
27.43	0.00	-0.74	-0.74	-0.69	-0.70	-0.69	-0.70					
28.04	0.00	-0.97	-0.97	-0.88	-0.89	-0.85	-0.82					
28.65	0.00	-0.56	-0.55	-0.46	-0.48	-0.45	-0.44					
29.26	0.00	-0.39	-0.37	-0.38	-0.38	-0.41	-0.43					
29.87	0.00	-0.38	-0.34	-0.42	-0.42	-0.51	-0.56					
30.48	0.00	-0.41	-0.38	-0.51	-0.51	-0.64	-0.73					
31.09	0.00	0.10	0.11	-0.07	-0.06	-0.21	-0.33					
31.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00					

BH 03 B-B Displacements [mm]



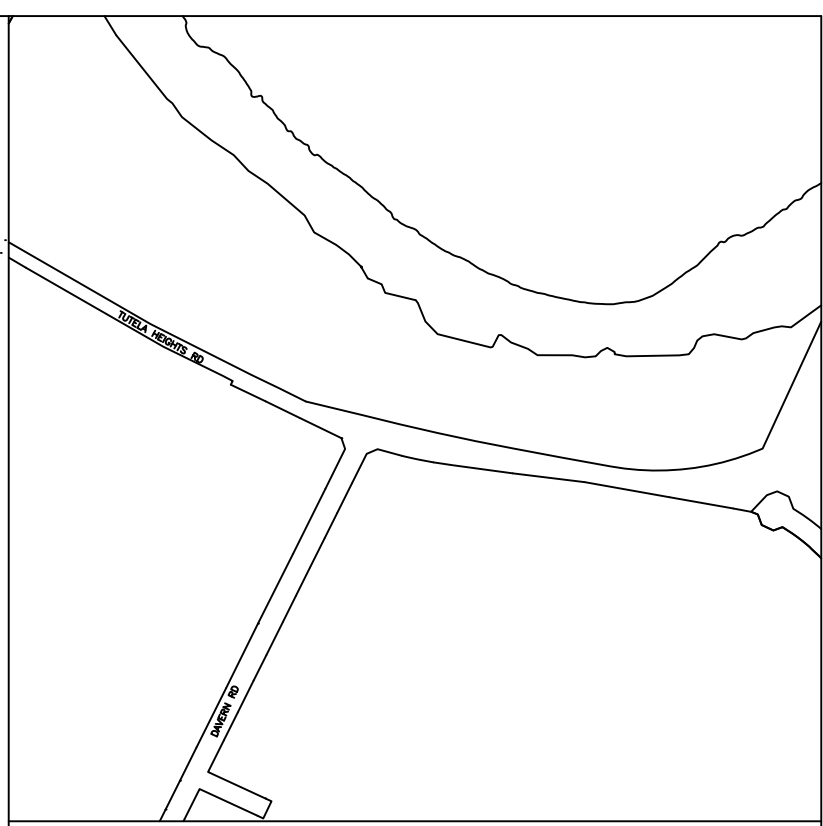
Appendix Two

Survey Data

Updated with surface survey provided by City of Brantford,
Survey Department
Update completed on March 23, 2021.

		MP-01-14			MP-02-14			MP-03-14			MP-04-14			MP-05-14			MP-06-14			MP-07-14			MP-08-14			MP-09-14			MP-10-14			MP-11-14			MP-12-14			MP-13-14			MP-14-14			MP-15-14			MP-16-14			MP-17-14			MP-18-14			MP-19-14		
		ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE									
JAN. 13/2015		225.99	---	---	224.16	---	---	216.41	---	---	205.93	---	---	199.24	---	---	203.01	---	---	198.54	---	---	202.13	---	---	198.52	---	---	200.05	---	---	207.59	---	---	204.28	---	---	202.96	---	---	212.07	---	---	223.24	---	---	204.27	---	---	210.25	---	---	218.75	---	---	221.72	---	---
APR. 24/2015		225.99	0.02m		224.17	0.02m		216.39	0.02m		205.95	0.02m		199.16	0.01m		203.00	0.05m		198.54	0.04m		202.11	0.04m		198.52	0.03m		200.08	0.02m		207.60	0.01m		204.22	0.04m		202.98	0.01m		212.07	0.05m		223.24	0.04m		204.27	0.02m		210.25	0.01m		218.73	0.03m		221.71	0.04m	
NOV. 5/2015		225.99	0.02m		224.15	0.02m		216.43	0.03m		205.91	0.05m		199.23	0.02m		203.00	0.02m		198.55	0.02m		202.10	0.02m		198.50	0.00m		200.01	0.04m		207.60	0.04m		204.27	0.02m		202.96	0.01m		212.04	0.05m		223.21	0.01m		204.28	0.01m		210.26	0.01m		218.74	0.02m		221.71	0.01m	
MAY 8/2018		225.95	0.16m (DISTURBED)		224.13	0.04m		216.37	0.03m		205.88	0.05m		199.16	0.05m		202.94	0.02m		198.52	0.07m		202.06	0.31m		198.48	0.05m		200.00	0.04m		207.57	0.21m		204.27	0.02m		202.95	0.06m		212.03	0.27m		223.16	0.04m		204.21	0.05m		210.24	0.03m		218.73	0.03m		221.69	0.03m	
DEC. 11/2018		225.94	0.14m	S 0.12m W 0.07m	224.12	0.03m	N 0.03m E 0.02m	216.37	0.04m	N 0.04m E 0.01m	205.85	0.04m	N 0.04m E 0.02m	199.15	0.07m	N 0.07m E 0.02m	202.96	0.05m	N 0.05m E 0.02m	198.50	0.07m	N 0.07m W 0.01m	202.09	0.37m	N 0.35m W 0.11m	198.46	0.04m	N 0.04m E 0.02m	200.03	0.03m	N 0.03m W 0.01m	207.53	0.23m	N 0.15m W 0.18m	204.21	0.04m	N 0.04m W 0.01m	202.99	0.05m	N 0.05m E 0.00m	212.02	0.27m	N 0.27m E 0.01m	223.22	0.01m	S 0.01m E 0.01m	204.21	0.04m	N 0.03m E 0.02m	210.24	0.03m	S 0.01m E 0.03m	218.72	0.02m	N 0.02m E 0.01m	221.70	0.02m	N 0.01m E 0.02m
MAY 8/2019		225.93	0.16m	S 0.14m W 0.07m	224.10	0.05m	N 0.03m E 0.04m	216.37	0.05m	N 0.04m E 0.02m	205.84	0.01m	N 0.01m E 0.01m	199.15	0.07m	N 0.07m E 0.00m	203.11	0.04m	S 0.01m E 0.04m	198.52	0.08m	N 0.08m E 0.01m	201.97	0.46m	N 0.45m W 0.12m	198.45	0.08m	N 0.07m E 0.04m	200.04	0.05m	N 0.05m E 0.01m	207.47	0.49m	N 0.31m W 0.35m	204.24	0.10m	N 0.08m W 0.05m	202.98	0.06m	N 0.04m E 0.04m	212.01	0.29m	N 0.29m E 0.03m	223.22	0.04m	N 0.02m E 0.04m	204.16	0.06m	N 0.04m E 0.04m	210.25	0.05m	N 0.01m E 0.04m	218.74	0.01m	N 0.00m E 0.01m	221.71	0.03m	S 0.01m E 0.03m
NOV. 11/2019		225.94	0.16m	S 0.04m W 0.15m	224.10	0.08m	N 0.07m E 0.04m	216.37	0.09m	N 0.08m E 0.04m	205.85	0.06m	N 0.06m E 0.03m	199.18	0.11m	N 0.11m E 0.03m	202.95	0.06m	N 0.06m E 0.01m	198.67	0.35m	N 0.35m W 0.04m	201.99	0.53m	N 0.51m W 0.14m	198.44	0.13m	N 0.13m E 0.01m	200.01	0.04m	N 0.04m W 0.01m	207.38	0.60m	N 0.40m W 0.49m	204.25	0.17m	N 0.12m W 0.12m	202.90	0.05m	N 0.05m E 0.00m	212.04	0.32m	N 0.32m E 0.00m	223.20	0.03m	S 0.01m E 0.03m	204.16	0.09m	N 0.08m E 0.04m	210.32	0.03m	N 0.01m E 0.02m	218.72	0.00m	N 0.00m E 0.00m	221.67	0.01m	N 0.01m E 0.01m
APR. 3/2020	BENT	BENT	BENT	224.09	0.08m	N 0.05m E 0.06m	216.35	0.10m	N 0.07m E 0.07m	205.81	0.06m	N 0.05m E 0.05m	199.18	0.14m	N 0.13m E 0.07m	202.96	0.07m	N 0.06m E 0.04m	198.48	0.35m	N 0.35m W 0.02m	202.01	0.57m	N 0.55m W 0.14m	198.41	0.15m	N 0.15m E 0.03m	200.02	0.03m	N 0.03m W 0.00m	207.40	0.63m	N 0.40m W 0.49m	204.22	0.18m	N 0.13m W 0.12m	202.98	0.04m	N 0.04m E 0.01m	212.00	0.32m	N 0.32m E 0.00m	223.18	0.04m	S 0.02m E 0.02m	204.15	0.09m	N 0.09m E 0.01m	210.19	0.03m	N 0.02m E 0.00m	218.71	0.01m	S 0.01m E 0.01m	221.62	0.02m	N 0.01m E 0.01m	
DEC. 3/2020	BENT	BENT	BENT	224.08	0.02m	N 0.02m W 0.01m	216.32	0.01m	N 0.01m W 0.01m	205.82	0.01m	N 0.01m E 0.00m	199.15	0.01m	N 0.01m E 0.01m	202.93	0.02m	N 0.01m W 0.02m	198.49	0.08m	N 0.07m W 0.03m	201.96	0.07m	N 0.05m W 0.01m	198.39	0.05m	N 0.05m E 0.02m	199.96	0.01m	S 0.01m E 0.00m	207.38	0.01m	N 0.01m W 0.01m	204.22	0.01m	S 0.01m E 0.00m	202.92	0.01m	N 0.01m E 0.00m	211.98	0.02m	N 0.02m E 0.00m	223.21	0.02m	S 0.01m W 0.02m	204.16	0.06m	N 0.06m E 0.01m	210.21	0.03m	E 0.03m E 0.00m	218.70	0.02m	N 0.02m E 0.01m	221.68	0.01m	N 0.00m W 0.01m	
MAR. 23/2021	BENT	BENT	BENT	224.07	0.01m	N 0.01m E 0.01m	216.32	0.03m	N 0.01m E 0.02m	205.79	0.01m	N 0.01m E 0.00m	199.14	0.02m	N 0.01m W 0.01m	202.94	0.00m	N 0.00m E 0.00m	198.51	0.02m	N 0.01m E 0.02m	201.94	0.01m	N 0.01m E 0.01m	198.40	0.01m	N 0.01m W 0.01m	199.99	0.01m	N 0.01m E 0.01m	207.39	0.01m	N 0.01m E 0.00m	204.22	0.01m	N 0.01m E 0.01m	202.95	0.01m	N 0.01m E 0.01m	212.01	0.05m	N 0.04m E 0.01m	223.17	0.02m	N 0.01m E 0.01m	204.11	0.00m	N 0.00m E 0.00m	210.17	0.01m	N 0.01m E 0.00m	218.69	0.00m	N 0.00m E 0.00m	221.68	0.03m	N 0.03m E 0.01m	

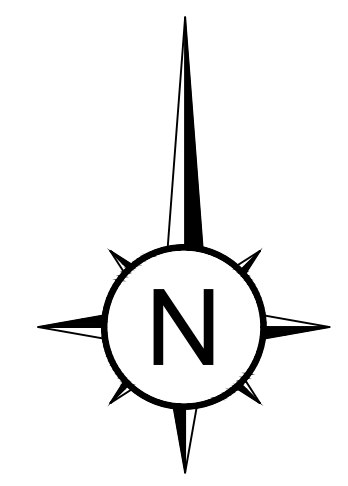
NOTE:
 1. MONITORING POINTS IN THIS CHART PLANTED ON JAN. 13/2015.
 2. DISTANCE CHANGE IS FROM THE JAN. 13/2015 LOCATIONS.
 3. NORTH/SOUTH/EAST/WEST (N.S.E.W.) CHANGE IS FROM THE JAN. 13/2015 LOCATIONS.
 4. STARTING APRIL 3 2020 MEASUREMENTS TAKEN BY CITY OF BRANTFORD SURVEY DEPARTMENT. ELEVATIONS ARE REFERRED TO CVD 1928.78 ADJUSTMENT



KEY PLAN N.T.S.

NOTES:
 1. ALL ELEVATIONS & DISTANCES SHOWN ARE METRIC.
 2. MONITORING POINTS PLANTED ON JAN. 13/2015.
 3. HORIZONTAL MEASUREMENTS ACCURATE TO ±0.02m

LEGEND:
 ● 200.00 EXISTING ELEVATIONS
 → GENERAL DIRECTION OF MOVEMENT
 --- EXISTING TOP OF SLOPE (JAN. 15, 2015)
 - - - EXISTING TOP OF SLOPE (APR. 24, 2015)



NO.	REVISIONS	DATE	BY
9	ADDED MAR 23/2021 SURVEY	03/26/21	J.M.B.
8	ADDED DEC 3/2020 SURVEY	03/26/21	C.D.
7	ADDED APR 3/2020 SURVEY	08/06/20	C.D.
6	ADDED NOV 11/2019 SURVEY	11/11/19	K.P.B.
5	ADDED MAY 8/2019 SURVEY	05/08/19	K.P.B.
4	ADDED DEC. 11/2018 SURVEY	12/11/18	K.P.B.
3	ADDED MAY 8/2018 SURVEY	05/08/18	K.P.B.
2	ADDED NOV. 5/2015 SURVEY	11/05/15	K.P.B.
1	ADDED APR. 24/2015 SURVEY	04/24/15	K.P.B.

April 7, 2021



TUTELA HEIGHTS ROAD SLOPE STABILITY
 CITY OF BRANTFORD

SITE PLAN

RATIO: HORIZ. 1:1000
 VERT. N/A
 DRAWN BY: J.M.B.
 CHECKED BY: P.J.B.
 DATE: 03-26-21

H:\Design and Construction\00 Survey Department\01-Projects 2021\Captial Projects\06-1853 ST1908 Tutela Heights Slope\AutoCAD\Tutela Heights - Slope - 210323.dwg

MP-01-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	225.99	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	225.99	0	0	2	2	n/a	n/a	n/a	n/a
3	November 5, 2015	225.99	0	0	0	2	n/a	n/a	n/a	n/a
4	May 8, 2018	225.95	-4	-4	14	16	n/a	n/a	n/a	n/a
5	December 11, 2018	225.94	-1	-5	-2.1	13.9	12	12	7	7
6	May 8, 2019	225.93	-1	-6	1.8	15.7	14	14	7	7
7	November 11, 2019	225.94	1	-5	-0.1	15.5	4	4	15	15
8	April 3, 2020	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
9	December 3, 2020	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10	March 23, 2021	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm
- V. As per Survey Drawing Notes, this iron bar has been bent and is no longer available for monitoring.

		Interpretation from last reading on March 23, 2021			
Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	2261.00	n/a	mm/day	Total	E-W
years	6.19	n/a	mm/year	n/a	n/a
			down	n/a	n/a
				n/a	n/a

MP-02-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	224.16	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	224.17	1	1	2	2	n/a	n/a	n/a	n/a
3	November 5, 2015	224.15	-2	-1	0	2	n/a	n/a	n/a	n/a
4	May 8, 2018	224.13	-2	-3	2	4	n/a	n/a	n/a	n/a
5	December 11, 2018	224.12	-1	-4	-0.4	3.6	3		2	
6	May 8, 2019	224.1	-2	-6	1.4	5.0	3		4	
7	November 11, 2019	224.1	0	-6	3.1	8.1	7		4	
8	April 3, 2020	224.09	-1	-7	-0.3	7.8	5		6	
9	December 3, 2020	224.08	-1	-8	-5.6	2.2	2		1	
10	March 23, 2021	224.07	-1	-9	-0.8	1.4	1		1	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.040	14.529	0.004	0.004
			down	1.614	1.614
				0.006	0.004
				2.283	1.614
					mm/day
					mm/year

MP-03-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	216.41	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	216.39	-2	-2	2	2	n/a	n/a	n/a	n/a
3	November 5, 2015	216.43	4	2	1	3	n/a	n/a	n/a	n/a
4	May 8, 2018	216.37	-6	-4	0	3	n/a	n/a	n/a	n/a
5	December 11, 2018	216.37	0	-4	1.1	4.1	4		1	
6	May 8, 2019	216.37	0	-4	0.3	4.5	4		2	
7	November 11, 2019	216.37	0	-4	4.5	8.9	8		4	
8	April 3, 2020	216.35	-2	-6	1.0	9.9	7		7	
9	December 3, 2020	216.32	-3	-9	-8.5	1.4	1		1	
10	March 23, 2021	216.32	0	-9	1.4	2.8	2		2	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021			
Time interval	Rate of settlement (accumulated)		Rate of horizontal displacement
	Total	N-S	E-W
days	2261.00	0.040	mm/day
years	6.19	14.529	mm/year down
		0.013	0.009
		4.566	3.229
			mm/day
			mm/year

MP-04-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	205.93	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	205.95	2	2	2	2	n/a	n/a	n/a	n/a
3	November 5, 2015	205.91	-4	-2	3	5	n/a	n/a	n/a	n/a
4	May 8, 2018	205.88	-3	-5	0	5	n/a	n/a	n/a	n/a
5	December 11, 2018	205.85	-3	-8	-0.5	4.5	4		2	
6	May 8, 2019	205.84	-1	-9	-3.1	1.4	1		1	
7	November 11, 2019	205.85	1	-8	4.9	6.3	6		2	
8	April 3, 2020	205.81	-4	-12	-0.5	5.8	5		3	
9	December 3, 2020	205.82	1	-11	-4.8	1.0	1		0	
10	March 23, 2021	205.79	-3	-14	0.0	1.0	1		0	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.062	22.601	0.004	0.000
			down	1.614	0.000
				1.614	0.000
					mm/year

MP-05-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	199.24	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	199.16	-8	-8	1	1	n/a	n/a	n/a	n/a
3	November 5, 2015	199.23	7	-1	1	2	n/a	n/a	n/a	n/a
4	May 8, 2018	199.16	-7	-8	3	5	n/a	n/a	n/a	n/a
5	December 11, 2018	199.15	-1	-9	2.3	7.3	7	7	2	2
6	May 8, 2019	199.15	0	-9	-0.3	7.0	7	7	0	0
7	November 11, 2019	199.18	3	-6	4.4	11.4	11	11	3	3
8	April 3, 2020	199.18	0	-6	2.9	14.3	13	13	6	6
9	December 3, 2020	199.15	-3	-9	-12.9	1.4	1	1	1	1
10	March 23, 2021	199.14	-1	-10	0.0	1.4	1	1	1	1

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.044	16.143	0.004	0.004
			down	1.614	1.614
				0.006	0.004
				2.283	1.614
					mm/day
					mm/year

MP-06-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	203.01	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	203.00	-1	-1	5	5	n/a	n/a	n/a	n/a
3	November 5, 2015	203.00	0	-1	-3	2	n/a	n/a	n/a	n/a
4	May 8, 2018	202.94	-6	-7	0	2	n/a	n/a	n/a	n/a
5	December 11, 2018	202.96	2	-5	3.4	5.4	5		2	
6	May 8, 2019	203.11	15	10	-1.3	4.1		1	4	
7	November 11, 2019	202.95	-16	-6	2.0	6.1	6		1	
8	April 3, 2020	202.96	1	-5	1.1	7.2	6		4	
9	December 3, 2020	202.93	-3	-8	-6.2	1.0	1		0	
10	March 23, 2021	202.94	1	-7	-1.0	0.0	0		0	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	Total	E-W
2261.00	6.19	0.031	down	0.000	0.000
		11.300	down	0.000	0.000

MP-07-14									
		A	B	C	D	E	F	G	
Reading Number	Date	Elevation			Partial Displacement [cm]	Horizontal Displacement			
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]		Total cm	Alignment N cm	Alignment S cm	Alignment W cm
1	January 13, 2015	198.54	0	0	0	0	n/a	n/a	
2	April 24, 2015	198.54	0	0	4	4	n/a	n/a	
3	November 5, 2015	198.55	1	1	-2	2	n/a	n/a	
4	May 8, 2018	198.52	-3	-2	5	7	n/a	n/a	
5	December 11, 2018	198.50	-2	-4	0.1	7.1	7	1	
6	May 8, 2019	198.52	2	-2	1.0	8.1	8	1	
7	November 11, 2019	198.67	15	13	27.2	35.2	35	4	
8	April 3, 2020	198.48	-19	-6	-0.2	35.1	35	2	
9	December 3, 2020	198.49	1	-5	-27.4	7.6	7	3	
10	March 23, 2021	198.51	2	-3	-5.4	2.2	1	2	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021					
Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	0.013	mm/day	Total	E-W
2261.00	6.19	0.013	mm/day	0.010	0.009
		4.843	mm/year	3.610	3.229
			down	1.614	mm/year

MP-08-14		A	B	C	D	E	F	G
Reading Number	Date	Elevation			Partial Displacement [cm]	Horizontal Displacement		
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]		Total cm	Alignment N cm	Alignment S cm
1	January 13, 2015	202.13	0	0	0	0	n/a	n/a
2	April 24, 2015	202.11	-2	-2	4	4	n/a	n/a
3	November 5, 2015	202.10	-1	-3	-2	2	n/a	n/a
4	May 8, 2018	202.06	-4	-7	29	31	n/a	n/a
5	December 11, 2018	202.09	3	-4	5.7	36.7	35	11
6	May 8, 2019	201.97	-12	-16	9.9	46.6	45	12
7	November 11, 2019	201.99	2	-14	6.3	52.9	51	14
8	April 3, 2020	202.01	2	-12	3.9	56.8	55	14
9	December 3, 2020	201.96	-5	-17	-49.7	7.1	7	1
10	March 23, 2021	201.94	-2	-19	-5.7	1.4	1	1

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021				
Time interval	Rate of settlement (accumulated)		Rate of horizontal displacement	
	Total	N-S	E-W	
days	2261.00	0.084	mm/day	0.004
years	6.19	30.672	mm/year	1.614
			down	1.614
				mm/year

MP-09-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	198.52	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	198.52	0	0	3	3	n/a	n/a	n/a	n/a
3	November 5, 2015	198.50	-2	-2	-3	0	n/a	n/a	n/a	n/a
4	May 8, 2018	198.48	-2	-4	5	5	n/a	n/a	n/a	n/a
5	December 11, 2018	198.46	-2	-6	-0.5	4.5	4		2	
6	May 8, 2019	198.45	-1	-7	3.6	8.1	7		4	
7	November 11, 2019	198.44	-1	-8	5.0	13.0	13		1	
8	April 3, 2020	198.41	-3	-11	2.3	15.3	15		3	
9	December 3, 2020	198.39	-2	-13	-14.3	1.0		1		0
10	March 23, 2021	198.4	1	-12	0.4	1.4	1		1	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.053	19.372	0.004	0.004
			down	1.614	1.614
				0.006	0.004
				2.283	1.614
					mm/day
					mm/year

Interpretation from last reading on March 23, 2021

MP-10-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	200.05	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	200.08	3	3	2	2	n/a	n/a	n/a	n/a
3	November 5, 2015	200.01	-7	-4	2	4	n/a	n/a	n/a	n/a
4	May 8, 2018	200.00	-1	-5	0	4	n/a	n/a	n/a	n/a
5	December 11, 2018	200.03	3	-2	-0.8	3.2	3			1
6	May 8, 2019	200.04	1	-1	1.9	5.1	5		1	
7	November 11, 2019	200.01	-3	-4	-1.0	4.1	4			1
8	April 3, 2020	200.02	1	-3	-1.1	3.0	3			0
9	December 3, 2020	199.96	-6	-9	-2.0	1.0		1		0
10	March 23, 2021	199.99	3	-6	0.4	1.4	1		1	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.027	9.686	0.004	0.004
			down	1.614	1.614
				0.006	0.004
				2.283	1.614
					mm/day
					mm/year

Interpretation from last reading on March 23, 2021

MP-11-14									
		A	B	C	D	E	F	G	
Reading Number	Date	Elevation			Partial Displacement [cm]	Horizontal Displacement			
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]		Total cm	Alignment N cm	Alignment S cm	Alignment W cm
1	January 13, 2015	207.59	0	0	0	0	n/a	n/a	n/a
2	April 24, 2015	207.60	1	1	1	1	n/a	n/a	n/a
3	November 5, 2015	207.60	0	1	3	4	n/a	n/a	n/a
4	May 8, 2018	207.57	-3	-2	17	21	n/a	n/a	n/a
5	December 11, 2018	207.53	-4	-6	2.4	23.4	15	18	18
6	May 8, 2019	207.47	-6	-12	25.6	49.0	31	38	38
7	November 11, 2019	207.38	-9	-21	11.4	60.4	38	47	47
8	April 3, 2020	207.40	2	-19	2.8	63.3	40	49	49
9	December 3, 2020	207.38	-2	-21	-61.8	1.4	1	1	1
10	March 23, 2021	207.39	1	-20	-0.4	1.0	1	0	0

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021					
Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days		0.088	mm/day	Total	E-W
2261.00		33.901	mm/year	0.004	0.000
6.19			down	1.614	0.000
				1.614	mm/year

MP-12-14		A	B	C	D	E	F	G	
		Elevation			Horizontal Displacement				
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment W cm
1	January 13, 2015	204.28	0	0	0	0.0	n/a	n/a	n/a
2	April 24, 2015	204.22	-6	-6	4	4.0	n/a	n/a	n/a
3	November 5, 2015	204.27	5	-1	-2	2.0	n/a	n/a	n/a
4	May 8, 2018	204.27	0	-1	0	2.0	n/a	n/a	n/a
5	December 11, 2018	204.21	-6	-7	2.1	4.1	4		1
6	May 8, 2019	204.24	3	-4	5.9	10.0	8		6
7	November 11, 2019	204.25	1	-3	7.0	17.0	12		12
8	April 3, 2020	204.22	-3	-6	0.7	17.7	13		12
9	December 3, 2020	204.22	0	-6	-16.7	1.0		1	0
10	March 23, 2021	204.22	0	-6	0.4	1.4	1		1

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.027	9.686	0.004	0.004
			down	1.614	1.614
				0.006	0.004
				2.283	1.614
					mm/day
					mm/year

Interpretation from last reading on March 23, 2021

MP-13-14		A	B	C	D	E	F	G
Reading Number	Date	Elevation			Partial Displacement [cm]	Horizontal Displacement		
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]		Total cm	Alignment N cm	Alignment S cm
1	January 13, 2015	202.96	0	0	0	0.0	n/a	n/a
2	April 24, 2015	202.98	2	2	1	1.0	n/a	n/a
3	November 5, 2015	202.96	-2	0	0	1.0	n/a	n/a
4	May 8, 2018	202.95	-1	-1	5	6.0	n/a	n/a
5	December 11, 2018	202.99	4	3	-1.0	5.0	5	0
6	May 8, 2019	202.98	-1	2	0.7	5.7	4	4
7	November 11, 2019	202.90	-8	-6	-0.7	5.0	5	0
8	April 3, 2020	202.98	8	2	-1.0	4.0	4	0
9	December 3, 2020	202.92	-6	-4	-2.6	1.4	1	1
10	March 23, 2021	202.95	3	-1	-0.4	1.0	0	1

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021				
Time interval	Rate of settlement (accumulated)		Rate of horizontal displacement	
	Total	N-S	EW	
days	2261.00	0.004	mm/day	0.004
years	6.19	1.614	mm/year	1.614
			down	mm/year

MP-14-14														
	A		B		C		D		E		F		G	
Reading Number	Date	Elevation				Horizontal Displacement								
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm				
1	January 13, 2015	212.07	0	0	0	0.0	n/a	n/a	n/a	n/a				
2	April 24, 2015	212.07	0	0	5	5.0	n/a	n/a	n/a	n/a				
3	November 5, 2015	212.04	-3	-3	0	5.0	n/a	n/a	n/a	n/a				
4	May 8, 2018	212.03	-1	-4	22	27.0	n/a	n/a	n/a	n/a				
5	December 11, 2018	212.02	-1	-5	0.0	27.0	27		1					
6	May 8, 2019	212.01	-1	-6	2.1	29.2	29		3					
7	November 11, 2019	212.04	3	-3	2.8	32.0	32		0					
8	April 3, 2020	212.00	-4	-7	0.0	32.0	32		1					
9	December 3, 2020	211.98	-2	-9	1.0	33.0		2	0					
10	March 23, 2021	212.01	3	-6	1.0	34.0	4		1					

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021										
Time interval		Rate of settlement (accumulated)				Rate of horizontal displacement				
days	years	0.027	mm/day	9.686	mm/year	Total	N-S	E-W	mm/day	mm/year
2261.00	6.19					0.150	0.018	0.004		
						54.887	6.457	1.614		

MP-15-14		A	B	C	D	E	F	G
Reading Number	Date	Elevation			Partial Displacement [cm]	Horizontal Displacement		
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]		Total cm	Alignment N cm	Alignment S cm
1	January 13, 2015	223.24	0	0	0	0.0	n/a	n/a
2	April 24, 2015	223.24	0	0	4	4.0	n/a	n/a
3	November 5, 2015	223.21	-3	-3	-3	1.0	n/a	n/a
4	May 8, 2018	223.16	-5	-8	3	4.0	n/a	n/a
5	December 11, 2018	223.22	6	-2	-2.6	1.4	1	1
6	May 8, 2019	223.22	0	-2	3.1	4.5	2	4
7	November 11, 2019	223.20	-2	-4	-1.3	3.2	1	3
8	April 3, 2020	223.18	-2	-6	1.3	4.5	2	4
9	December 3, 2020	223.21	3	-3	-2.2	2.2	1	2
10	March 23, 2021	223.17	-4	-7	-0.8	1.4	1	1

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021		Rate of settlement (accumulated)		Rate of horizontal displacement	
Time interval				Total	E-W
days	2261.00	0.031	mm/day	0.006	0.004
years	6.19	11.300	mm/year	2.283	1.614
			down		mm/day
					mm/year

MP-16-14		A	B	C	D	E	F	G
Reading Number	Date	Elevation			Partial Displacement [cm]	Horizontal Displacement		
		Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]		Total cm	Alignment N cm	Alignment S cm
1	January 13, 2015	204.28	0	0	0	0.0	n/a	n/a
2	April 24, 2015	204.27	-1	-1	2	2.0	n/a	n/a
3	November 5, 2015	204.28	1	0	-1	1.0	n/a	n/a
4	May 8, 2018	204.21	-7	-7	4	5.0	n/a	n/a
5	December 11, 2018	204.21	0	-7	-1.4	3.6	3	2
6	May 8, 2019	204.16	-5	-12	2.1	5.7	4	4
7	November 11, 2019	204.16	0	-12	3.3	8.9	8	4
8	April 3, 2020	204.15	-1	-13	0.5	9.5	9	3
9	December 3, 2020	204.16	1	-12	-3.4	6.1	6	1
10	March 23, 2021	204.11	-5	-17	-6.1	0.0	0	0

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Interpretation from last reading on March 23, 2021		Rate of settlement (accumulated)		Rate of horizontal displacement		
Time interval		Rate of settlement (accumulated)		Total	N-S	E-W
days	2261.00	0.075	mm/day	0.000	0.000	mm/day
years	6.19	27.444	mm/year	0.000	0.000	mm/year
			down			

MP-17-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	210.25	0	0	0	0.0	n/a	n/a	n/a	n/a
2	April 24, 2015	210.25	0	0	1	1.0	n/a	n/a	n/a	n/a
3	November 5, 2015	210.26	1	1	0	1.0	n/a	n/a	n/a	n/a
4	May 8, 2018	210.24	-2	-1	2	3.0	n/a	n/a	n/a	n/a
5	December 11, 2018	210.24	0	-1	0.2	3.2	1	3		
6	May 8, 2019	210.25	1	0	1.0	4.1	1	4		
7	November 11, 2019	210.32	7	7	-1.9	2.2	1	2		
8	April 3, 2020	210.19	-13	-6	0.6	2.8	2	2		
9	December 3, 2020	210.21	2	-4	0.2	3.0	3	0		
10	March 23, 2021	210.17	-4	-8	-2.0	1.0	1	0		

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.035	12.915	0.004	0.000
			down	1.614	0.000
				1.614	0.000
					mm/day
					mm/year

Interpretation from last reading on March 23, 2021

MP-18-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	218.75	0	0	0	0	n/a	n/a	n/a	n/a
2	April 24, 2015	218.73	-2	-2	3	3	n/a	n/a	n/a	n/a
3	November 5, 2015	218.74	1	-1	-1	2	n/a	n/a	n/a	n/a
4	May 8, 2018	218.73	-1	-2	1	3	n/a	n/a	n/a	n/a
5	December 11, 2018	218.72	-1	-3	-0.8	2.2	2		1	
6	May 8, 2019	218.74	2	-1	-1.2	1.0	0		1	
7	November 11, 2019	218.72	-2	-3	-1.0	0.0	0		0	
8	April 3, 2020	218.71	-1	-4	1.4	1.4	1		1	1
9	December 3, 2020	218.7	-1	-5	0.8	2.2	2		1	
10	March 23, 2021	218.69	-1	-6	-2.2	0.0	0		0	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	N-S	E-W
2261.00	6.19	0.027	9.686	0.000	0.000
			down	0.000	0.000
				0.000	0.000

Interpretation from last reading on March 23, 2021

MP-19-14		A	B	C	D	E	F	G		
		Elevation			Horizontal Displacement					
Reading Number	Date	Actual Elevation [m]	Partial Settlement [cm]	Accumulated Settlement [cm]	Partial Displacement [cm]	Total cm	Alignment N cm	Alignment S cm	Alignment E cm	Alignment W cm
1	January 13, 2015	221.72	0	0	0	0.0	n/a	n/a	n/a	n/a
2	April 24, 2015	221.71	-1	-1	4	4.0	n/a	n/a	n/a	n/a
3	November 5, 2015	221.71	0	-1	-3	1.0	n/a	n/a	n/a	n/a
4	May 8, 2018	221.69	-2	-3	2	3.0	n/a	n/a	n/a	n/a
5	December 11, 2018	221.70	1	-2	-0.8	2.2	1		2	
6	May 8, 2019	221.71	1	-1	0.9	3.2	1	1	3	
7	November 11, 2019	221.72	1	0	-1.7	1.4	1	1	1	
8	April 3, 2020	221.67	-5	-5	0.8	2.2	1	1	2	
9	December 3, 2020	221.68	1	-4	-1.2	1.0	0			1
10	March 23, 2021	221.68	0	-4	2.2	3.2	3	1	1	

NOTES:

- I. Actual elevation: corresponds to elevation recorded at the date of reading.
- II. Partial settlement: corresponds to change of elevation since previous reading date.
- III. Accumulated settlement: corresponds to change of elevation since date of installation, i.e., January 13, 2015.
- IV. Resolution of displacements is ± 1 cm

Time interval		Rate of settlement (accumulated)		Rate of horizontal displacement	
days	years	mm/day	mm/year	Total	E-W
2261.00	6.19	0.018	6.457	0.014	0.004
			down	5.105	1.614
				0.013	0.004
				4.843	1.614
					mm/day
					mm/year

Interpretation from last reading on March 23, 2021