Stantec

To:	Jerald Schnabel	From:	Paul Kos
	Riverbend Industries Inc.		Denver, CO 80222
File:	September 2023 Monitoring Summary	Date:	October 31, 2023

Reference: September 2023 Geotechnical Monitoring Summary Pikeview Quarry

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this September 2023 Geotechnical Monitoring Summary for the Pikeview Quarry. The Pikeview Quarry is situated along the foothills of the Rocky Mountains, northwest of Colorado Springs, Colorado. Riverbend Industries Inc. (Riverbend) operates the quarry, which is currently closed and undergoing reclamation. A geotechnical monitoring program was established to monitor reclamation activities which will affect the geotechnical performance of the existing and reclaimed slopes during and following reclamation grading. This report presents the geotechnical monitoring results for the slope reclamation activities at the site through the month of September 2023. Continuous monitoring by the robotic survey system began in 2010 and has continued through the month of September 2023. Visual inspections of the slopes were performed by Riverbend employees and Stantec engineers.

1.1 PURPOSE

The purpose of this report is to summarize the September 2023 geotechnical monitoring results and verify the geotechnical performance of the existing and reclaimed slopes with respect to the historical performance record. The goals of the geotechnical instrumentation monitoring program can be described as:

- Meet corporate risk management requirements,
- Provide ongoing slope monitoring and advance warning of any changed conditions that could pose a hazard to workers or to the public,
- Document the geotechnical performance of the slope, and
- Document monthly site grading activities and construction quality assurance.

1.2 MONITORING SUMMARY

Major components of the instrumentation monitoring program are listed in Table 1 and shown on Figure 1.

Table 1 Monitoring Frequency

Monitoring Type	Frequency
Visual inspection	Daily (Riverbend or Stantec) and Monthly (Stantec)
Robotic theodolite/prism	Continuous
Drone inspection	Monthly
Compaction testing	Every 5,000 yd^3 (min.)

2.0 VISUAL INSPECTIONS

Inspections are completed daily by site personnel and monthly by Stantec personnel to document visual observations of slope conditions, including conditions of instability (i.e., cracking, slumping, over-steepened slopes, seeps, perched boulders, rock falls, erosion, and areas undercut by construction or maintenance activities). Certain areas of the landslide have been designated as safety exclusion zones, and these areas are inspected from adjacent locations.

On working days, site operators inspect their work areas for signs of instability daily before starting work per site safety rules and regulations. The daily inspection starts by reviewing any prism alerts/alarms and inspecting those areas before work begins in that area. The daily inspection also includes visual observations of the quarry walls and floor for any changes. No changes to the quarry conditions were identified during daily inspections in September 2023. The notes from the daily inspections are included in Table A-1 in Appendix A.

Stantec conducted visual inspections of the Pikeview Quarry slopes on multiple days in September 2023 to observe conditions before areas were graded by the resumed reclamation construction. The engineering inspections were conducted by traversing each area of the mine and observing the uphill slope and the downhill slope for signs of instability, and areas in need of maintenance. Slopes that have been graded and are 2 horizontal (H):1 vertical (V) or shallower are also traversed on foot. The findings are listed below, and photographs of notable observations are included on Figure 2 in Appendix A.

- Reclamation grading began in February 2022 and continued throughout September 2023. A new primary contractor resumed reclamation construction in September 2023, which resulted in increased volumes placed in the buttress zone. Site maintenance, topsoil placement and riprap production continued throughout the month.
- Operators have resumed placing compacted material in the buttress zone. Material was excavated from the North Borrow Area. Material is initially excavated in benches for the majority of the excavation to efficiently remove the material; these benches are removed for final grading to create the reclamation surface.
- Compaction testing has resumed at the rate of at least one test per 5,000 cubic yards of fill placed in the buttress area.
- No cracking was observed on the native granite slopes above the extents of the disturbed area.
- Known cracks were monitored for changes. Currently the cracks are not growing in any of the areas on the slopes of the site. The hummocky field in the area immediately above the southern extent of the slide shows evidence of cracking, but they are not fresh or active. No new or open cracks were found immediately inside or next to the slide area.
- The slope below the first bench has been placed to the final grade, and this slope was traversed on foot and examined for cracks or signs of instability by Stantec engineers. This slope was graded and then covered with topsoil, and the slope was inspected prior to the grading. No cracks or signs of instability were identified.
- Seeding and tree/shrub planting occurred on areas that are at final grade.
- A safety buffer zone is being kept between the active work areas and the toe of the slide to stop any rocks that might come loose during grading operations. Compacted fill is placed in the buffer zone as the buttress fill is placed.
- Offsite topsoil was stockpiled at the base of the buttress area with the additional topsoil and growth medium. The topsoil stockpiles contain a sufficient volume of material to place cover on all disturbed

areas of the mine. Topsoil imports will continue, and any excess topsoil may be placed at increased thickness so that all topsoil is used in reclaiming the mine.

- Rock was being screened, sorted, and stockpiled as riprap for use as erosion protection in the channels.
- The culvert remains cleared but mostly blocked inside. Riverbend has partially cleared the debris, but access limitations and supports within the culvert inhibit clearing all the debris. Riverbend has procured a pump and will begin pumping operations if any water collects behind the culvert. Riverbend inspects the culvert for ponded water following rain events, and should any water be observed, it will be removed using pumps
- Visual inspections of the Pikeview Quarry did not reveal any evidence of large-scale instability outside of the landslide areas previously identified. No bulging, rippling, over-steepening, depressions, slumps, or dry slip-offs were observed in areas that have been graded and/or reclaimed

3.0 PRISM SURVEY

A Leica Robotic station is used to continuously survey the prisms onsite to document slope movements. The station records the location of each prism every hour. There were 20 prisms active in September; two prisms were control points located outside the slope movement area, six prisms are located on the slopes surrounding the slope movement area, five prisms were located on the slopes within the landslide area, and seven prisms were located on the buttress fill. As the slope is backfilled and graded, the existing prisms will be removed, and additional prisms will be installed. Prism P69A and NP3 were removed in September and a log of prism removals and installations is included in Appendix B. The prism locations are shown on the current topography in Figure 3, and the proposed prism locations are shown on the reclamation topography in Figure 4. Both figures are included in Appendix B.

The monitoring software, GeoMos, has been programed to provide automatic alerts if there is a movement recorded that is greater than 0.35 feet, if a prism cannot be located, or if there are communication errors. Following each alert, Riverbend clears the area of concern until the data can be reviewed and the slope can be inspected. Riverbend made sure that there were no workers in the area before inspecting the slope. The construction contractor also has a spotter monitoring the slope during construction, and they can radio the operators if there are any signs of movement or a falling rock. All alerts for potential movement have been attributed to weather, animal activity, equipment operations blocking the prism, or sun glare, and no alerts have been associated with slope movements. The alerts are listed in Table 2.

Table 2 Alert Summary

Date(s)	Alert	Cause/Actions taken	Alert Resolved
1-Sep	BR1 not found	Single event. No inclement weather and no work being performed at time of alerts. Possibly related to vegetation blocking prism.	1-Sep
9-Sep	B7200-3 not found	Single event. Likely related to equipment operating in the area.	9-Sep
9-10 to 9-11	Points not found	Rain, and fog. No work being performed at time of alerts.	11-Sep
11-Sep	B7200-3 not found	Single event. No work being performed at time of alert. Likely related to rain at time of scan.	11-Sep
12-Sep	Points not found	Rain, and fog. No work being performed at time of alerts or slope inspected to keep crews working.	12-Sep

13-Sep	Points not found	Rain, and fog. No work being performed at time of alerts.	13-Sep
9-14 to 9-15	Points not found	Rain, and fog. No work being performed at time of alerts.	15-Sep
28-Sep	P69A not found	Prism removed before grading begins in this area.	28-Sep
29-Sep	P32 regression limit	P32 was replaced by P32R, and alert is a data error. Prism inspected and likely related to animal movement.	29-Sep
29-Sep	CP4 not found	Single event. Likely related to equipment operating in the area.	29-Sep
30-Sep	NP3 not found	Prism removed before grading begins in this area.	30-Sep
30-Sep	B7200-3 not found	Prism covered by hydromulching operations. Prisms were cleaned after spraying was completed.	30-Sep

The prism monitoring results for transverse and height displacements, monthly change, and cumulative change are summarized in Table 3 below. The transverse displacement measures the change in the horizontal distance from the robotic station to the prism; positive displacements indicate less distance between the station and prism (movement towards the total station). The height displacement measures the change in the vertical distance from the robotic station to the prism; positive displacements indicate upward movement. The values for the last reading in the month are included in Table 3. The monthly delta is the most recent reading cumulative delta displacement (horizontal, lateral, and vertical) subtracted from the last reading from the previous month. The cumulative delta values are a total displacement and are not associated with a direction. The transverse, height, and cumulative delta displacements are the total displacement over the life of the monitoring, which was reset when the Leica station was moved in July 2022. According to Leica documentation, the survey accuracy is +/-4 mm+1.5 ppm for prisms located greater than 500m from the station; these equates to an accuracy of +/-0.016 ft.

The data show stable conditions with no movements at 15 of 20 prisms with recorded displacements limited to data scatter and not actual movements. Prisms BR1, BR2 P69A, NP3 and NP66 are located above the landslide, and these prisms recorded slope creep movements at slow velocity. This settlement was likely related to loose fill or landslide material consolidating under its own weight. These prisms were placed in areas where slope creep movements are likely to occur; therefore, movements being recorded is expected. Plots of the transverse and height displacements for each prism are included in Appendix B.

Table 3 Prism Summary

Prism ID	Cumulative Transverse Displacement (ft)	Cumulative Height Displacement (ft)	Monthly Delta (ft)	Cumulative Delta (ft)	Notes / Recommendations
BR1	-0.019	-0.309	0.040	0.582	Slope creep movements
BR2	0.123	-0.581	0.081	1.008	Slope creep movements
CP6	0.004	-0.008	-0.010	0.014	
CP7	0.080	-0.027	-0.004	0.085	
NP3	0.180	-0.356	0.024	0.408	Slope creep movements
NP66	0.760	-0.866	0.024	1.205	Slope creep movements
P2	-0.008	-0.014	-0.002	0.017	
P25	-0.004	-0.004	-0.004	0.007	
P32R	-0.020	0.010	-0.009	0.024	
P33	0.096	-0.017	-0.006	0.119	
P5	0.000	-0.012	-0.005	0.014	
P69A	0.330	-0.313	0.008	0.501	Slope creep movements
P70	0.019	-0.048	0.001	0.072	
B7200-1	-0.016	0.002	0.003	0.023	
B7200-2	0.007	-0.013	0.004	0.035	
B7200-3	0.119	-0.041	0.015	0.160	
B7300-0	-0.009	-0.039	0.015	0.047	
B7300-1	-0.057	-0.057	0.085	0.141	
B7300-2	0.014	-0.057	0.024	0.081	
B7300-3	0.033	-0.033	0.015	0.061	

4.0 DRONE SURVEY

The site was flown for aerial imagery using an unmanned aircraft system (UAS or ‘drone’) on September 30, 2023. The imagery was inspected for signs of instability and used to supplement the onsite visual inspections. Features noted in the aerial imagery review were inspected during Stantec’s engineering inspection and are summarized in Section 2 above. The imagery was also used to create site topography.

The September topography was also compared to the August topography to identify changes in the site topography. Comparison of the two surveys showed the placement of the fill material at the toe of the landslide. Fill material was excavated from the North Borrow Area and placed in the Embankment Area. No slope movements or other changes in topography were identified. The current imagery and topography are included in Figures 1 and 3, and the comparison surface is included as Figure 5 in Appendix C.

As previously reported in the September 2020 monitoring report, there are limitations with the method of comparing drone surveys from different months. The drone data indicate changes in the slopes along each of

the reclamation benches, buildings, and areas with trees or shrubs. These areas are stable, and the changes are the result of survey limitations on or near vertical slopes.

5.0 COMPACTION TESTING

Fill placement occurred from February 2022 through June 2023 and resumed in September 2023. Fill was excavated from the North Borrow Area and placed in the Embankment Area. All fill is moisture conditioned as necessary and then compacted. During September 2023, approximately 91,200 yd^3 were placed and compacted. Compaction testing occurs at the rate of at least one test per 5,000 yd^3 placed. This volume placed in the buttress zone required at least 19 compaction tests. There were 34 compaction tests taken in September. As of September 29, 2023, when the site was surveyed, a total of approximately 2,584,000 yd^3 had been placed and compacted. This required at least 517 compaction tests, and 933 tests have been taken. There were no failing tests in September; all tests met the minimum compaction requirement of 90%.

6.0 RECLAMATION PROGRESS

Riverbend has initiated reclamation grading at the Pikeview Quarry and has contracted with Stantec to provide EPCM services through completion. As an updated feature of our monthly report, we provide progress of activities, anticipated milestone schedule and a one month look ahead to better communicate project objectives. A phased or ‘gated” approach will be used to complete the reclamation process going forward (See milestone schedule below)

Phase 1 - Value Engineering and issue RFP to qualified contractors

Phase 2 - Commercial negotiations with successful contractor

Phase 3 - Execution planning and Contractor readiness review

Phase 4 - Site Construction execution

Phase 5 - Final revegetation (season 2)

Task/Milestone	Estimated Dates
Phase 1 – Issue RFP to Bidders	Completed June 2021
Phase 1 – RFP Evaluation & Recommendation	Completed July 2021
Phase 2 – Constructor Contract Award	Completed August 2023
Phase 3 – Project Kick-off with successful Contractor	Completed August 2023
Phase 4 – Contractor Mobilization to Site	Completed September 2023
Phase 4 – Reclamation Grading	February 2022 to Winter 2024 (est.)
Phase 4 – Contractor Demobilize from Site	Winter 2024
Phase 5 – Final Revegetation	2024 until acceptance

Progress of activities this month:

- Contracting with a new contractor was completed, and mobilization to the site began
- Earth moving activities and placement of compacted fill in the buttress area resumed at scheduled rates following new contractor mobilization

- The Technical Revision (TR) for site drainage and weed control was submitted to DRMS
- Topsoil was placed on the lower buttress slope. The slope was scarified to remove rills from the spring and summer storms
- Planting seed on the lower buttress slope
- Importing topsoil material continued
- Processing of riprap continued
- Geotechnical monitoring continued
- Cleanup operations following the heavy rains continued

Work planned for next month includes:

- Continue importing topsoil material
- Continue processing riprap
- Continue geotechnical monitoring
- Continue to remove and replace prisms on an as-needed basis.
- Continue cleanup operations from the storm events

7.0 CONCLUSIONS

The data collected in September 2023 demonstrate compliance with the reclamation grading plan. The buttress fill is being placed and compacted as intended and specified.

None of the data collected in September 2023 indicate evidence of any large-scale movements that increase risk to workers or to the public. Shallow surface erosion continues to occur requiring ongoing maintenance and cleanup.

- Restricted access to the ungraded landslide slopes should continue.
- All monitoring should continue at current frequencies.
- All alerts shall continue to be taken seriously even if data errors are suspected.

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LEGEND

- Permit/Affected Lands Boundary
- City Grading Permit Boundary
- Proposed Disturbance Limit
- Landslide Extent
- Buttress Fill Extent
- Existing Prism
- Removed Prism
- New Prism

N

0 300' 600'

Client/Project
RIVERBEND INDUSTRIES INC.

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
SITE MAP

Revision
#

Date
2023.10.31

Drawn By
PK

Figure No.
1

Appendix A

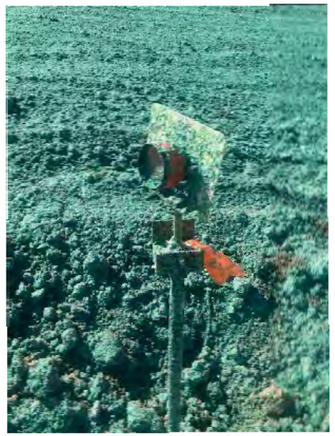
Visual Inspections

6. Vegetation growing on slopes.

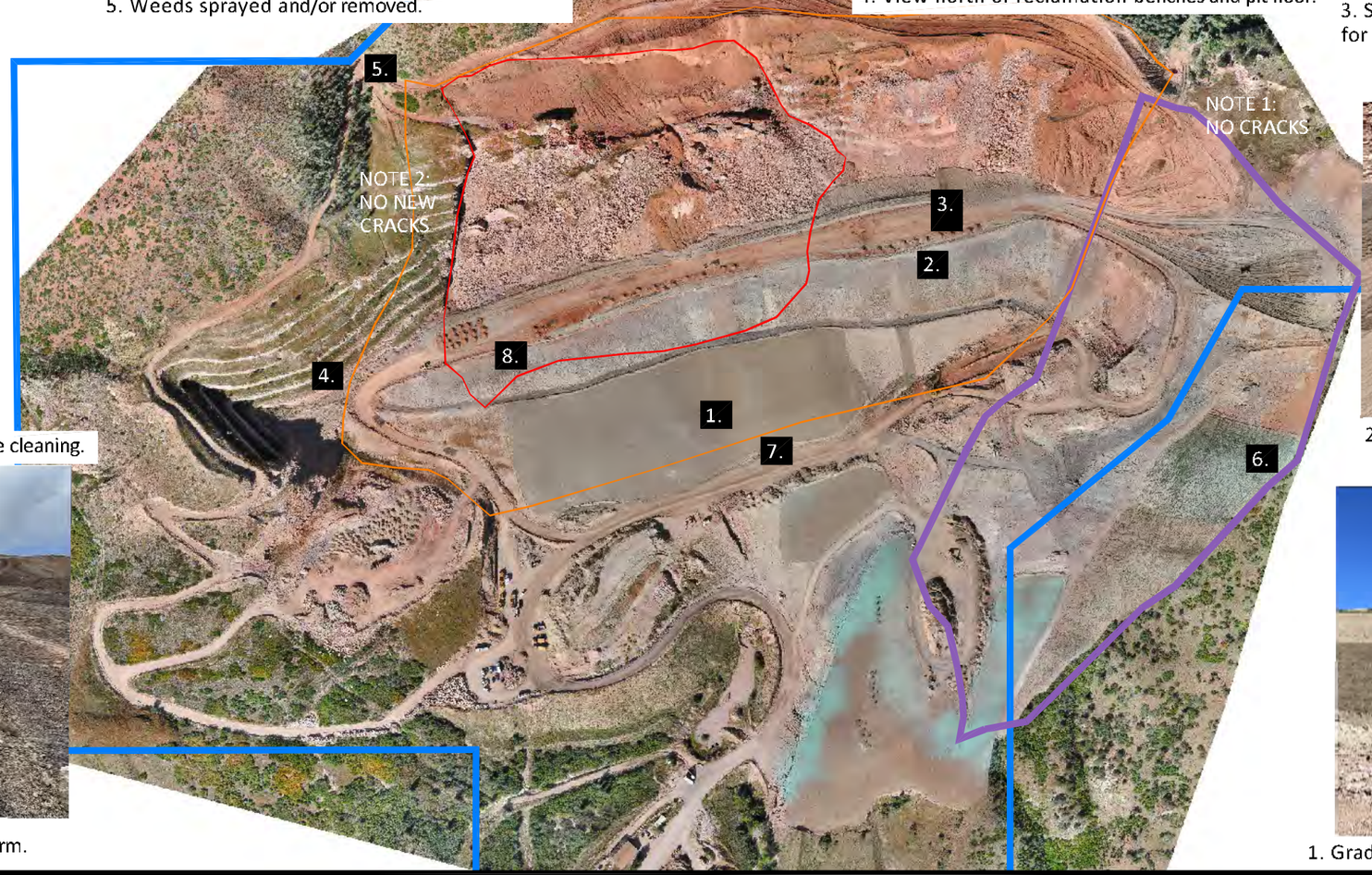
5. Weeds sprayed and/or removed.

4. View north of reclamation benches and pit floor.

3. Scrapers and haul trucks placing fill on buttress for compaction.



7. Hydromulched slope. Prism 7200-3 before cleaning.



2. Repairing erosion on buttress.

8. View north of compacted pit floor and berm.

1. Grading rills before placing topsoil.

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LEGEND

- Permit/Affected Lands Boundary
- City Grading Permit Boundary
- Proposed Disturbance Limit
- Landslide Extent
- Buttress Fill Extent

NOTES

1. NO CRACKS OBSERVED IN THIS AREA.
2. NO NEW CRACKS OBSERVED IN THIS AREA.
3. PHOTOS TAKEN OVER MULTIPLE DAYS IN SEPTEMBER 2023.

N

0 400' 800'

Client/Project
RIVERBEND INDUSTRIES INC.

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
OBSERVATIONS FROM SEPTEMBER INSPECTION

Revision
#

Date
2023.10.31

Drawn By
PK

Figure No.
2

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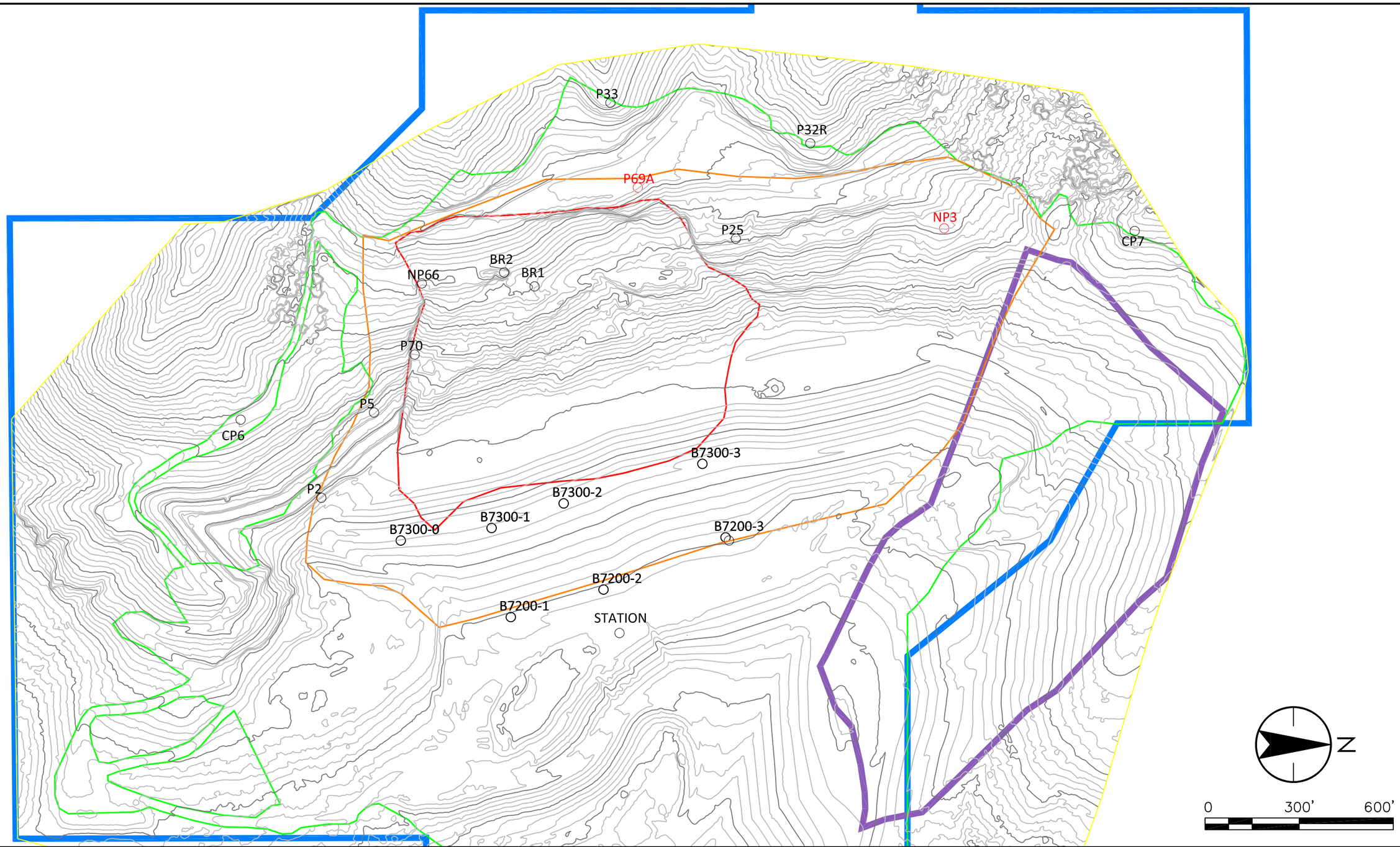
Table A-1 Summary of Daily Inspections

Date	Notes	Inspection By
1-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
2-Sep-23	No work.	Not applicable
3-Sep-23	No work.	Not applicable
4-Sep-23	No work.	Not applicable
5-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
6-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
7-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
8-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
9-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
10-Sep-23	No work.	Not applicable
11-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
12-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
13-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
14-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
15-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
16-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
17-Sep-23	No work.	Not applicable
18-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
19-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
20-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
21-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
22-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
23-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
24-Sep-23	No work.	Not applicable
25-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
26-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
27-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
28-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
29-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel
30-Sep-23	No movement observed. Good to proceed.	Jerald Schnabel

Appendix B

Prism Survey



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LEGEND

- Permit/Affected Lands Boundary
- City Grading Permit Boundary
- Proposed Disturbance Limit
- Landslide Extent
- Buttress Fill Extent
- Existing Prism
- Removed Prism
- New Prism

1. PRISMS WILL BE INSTALLED AS EACH BENCH IS FINISHED.
2. ALL PRISMS WILL BE RETAINED AS LONG AS POSSIBLE.
3. TOPOGRAPHY FROM SEPTEMBER 9, 2023 DRONE SURVEY.
4. CONTOUR INTERVAL IS 10 FEET

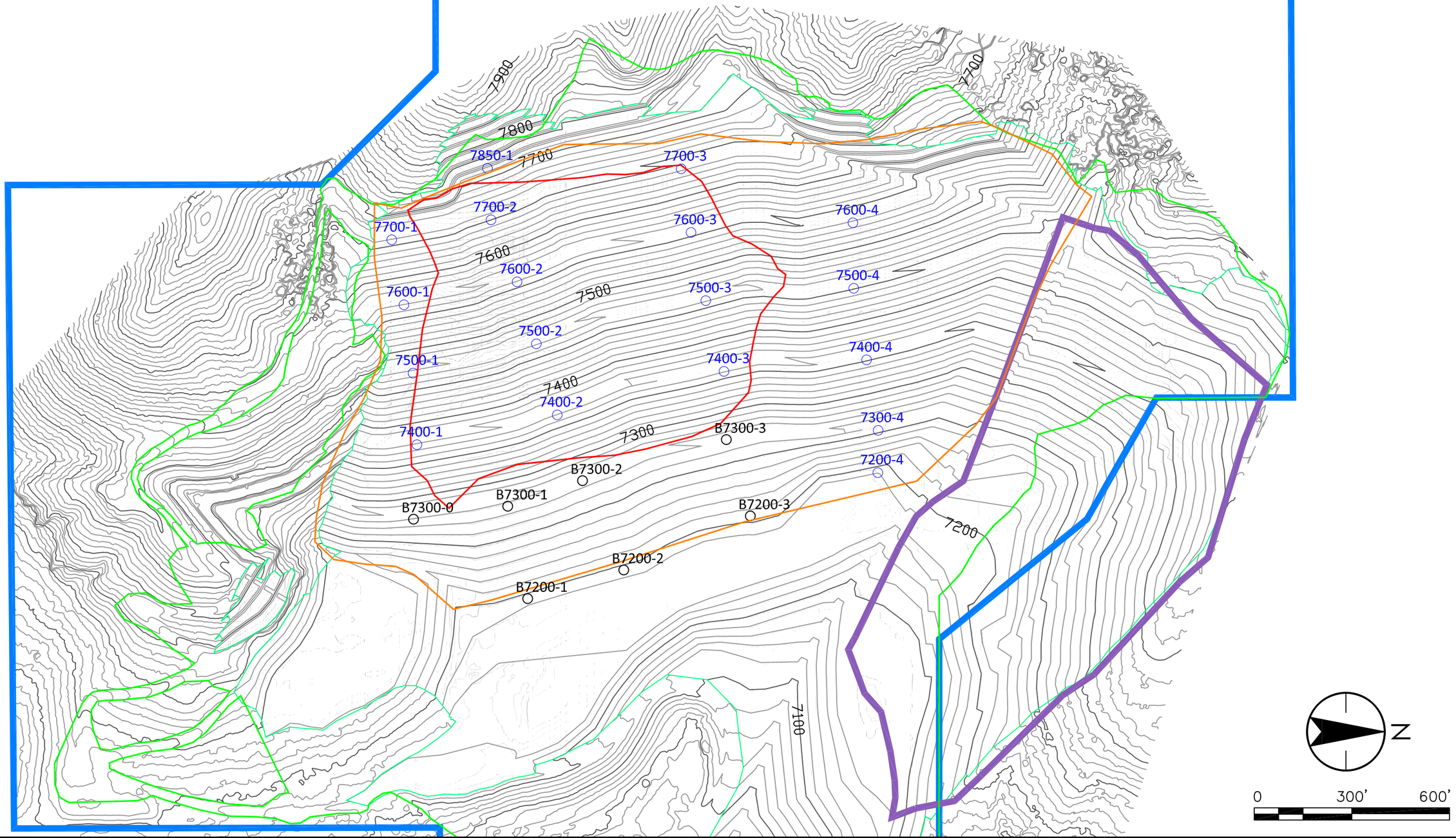
Client/Project
RIVERBEND INDUSTRIES INC.

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
EXISTING PRISMS WITH CURRENT SURFACE

Revision	Date
#	2023.10.31
Drawn By	Figure No.
PK	3



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LEGEND

- Permit/Affected Lands Boundary
- City Grading Permit Boundary
- Proposed Disturbance Limit
- Landslide Extent
- Buttress Fill Extent
- Existing Prism
- Proposed Prism

NOTES

1. PRISMS WILL BE INSTALLED AS EACH BENCH IS FINISHED.
2. EXISTING PRISMS WILL BE RETAINED AS LONG AS POSSIBLE.
3. RECLAMATION SURFACE FROM SEPTEMBER 2023 TECHNICAL REVISION.

Client/Project
CONTINENTAL MATERIALS CORP.
PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
PROPOSED PRISMS WITH RECLAMATION SURFACE

Revision	Date
#	2023.10.31
Drawn By	Figure No.
PK	4

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Prism Log

Prism	Date	Action	Comment
CP2	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future
CP3	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future
NP1	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future
TOE2	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future
CP4	11-Mar-22	Prism Added	Control Point Replacement
CP5	11-Mar-22	Prism Added	Control Point Replacement
TS1	12-Mar-22	Prism Added	New Prism Added
TOE3	30-Mar-22	Prism Removed	Reclamation grading to affect buffer filling activities
TOE4	8-Apr-22	Prism Added	New Prism Added
TOE5	8-Apr-22	Prism Added	New Prism Added
BR1	8-Apr-22	Prism Added	New Prism Added
BR2	8-Apr-22	Prism Added	New Prism Added
NP1	22-Apr-22	Prism Removed	Originally NP1. Prism re-set in same spot and is now NP3
NP3	22-Apr-22	Prism Added	
TOE3	22-Apr-22	Prism Removed	Originally TOE3. Prism moved to a higher elevation and is now TOE6
TOE6	22-Apr-22	Prism Added	
TOE1	22-Apr-22	Prism Removed	Reclamation grading to affect buffer filling activities
P4	17-Jun-22	Prism Removed	Prism removed due to rock deterioration
P69	20-Jul-22	Prism Removed	Prism was originally P69. It has been re-set to Higher Elevation and is now P69A. Related to base station relocation.
P69A	20-Jul-22	Prism Added	
P35	20-Jul-22	Prism Renamed	Prism was originally P35. It has been re-set to Higher Elevation and is now CP6. Related to base station relocation.
CP6	20-Jul-22	Prism Added	
CP5	20-Jul-22	Prism Renamed	Prism was originally CP5. It has been re-set to Higher Elevation and is now CP7. Related to base station relocation.
CP7	20-Jul-22	Prism Added	
CP1	20-Jul-22	Prism Removed	Not in line of sight of new base station.
CP4	20-Jul-22	Prism Removed	Not in line of sight of new base station.
TOE4	20-Jul-22	Prism Removed	Not in line of sight of new base station.
TOE6	20-Jul-22	Prism Removed	Not in line of sight of new base station.
TOE5	4-Aug-22	Prism Removed	Out of line of sight of base station.
P63	15-Aug-22	Prism Removed	Out of line of sight of base station.
NP2	28-Apr-23	Prism Removed	Prism location eroded.
P1	12-May-23	Prism Removed	Prism hit by falling rock.
B7200-1	1-Jun-23	Prism Added	New Prism Added
B7200-2	1-Jun-23	Prism Added	New Prism Added
B7200-3	28-Jun-23	Prism Added	New Prism Added
B7300-1	28-Jun-23	Prism Added	New Prism Added
B7300-2	28-Jun-23	Prism Added	New Prism Added
B7300-3	28-Jun-23	Prism Added	New Prism Added
B7300-0	27-Jul-23	Prism Added	New Prism Added

Prism	Date	Action	Comment
P32	1-Aug-23	Prism Removed	P32 was damaged by a falling rock. P32R was installed in the same location.
P32R	1-Aug-23	Prism Added	
P69A	28-Sep-23	Prism Removed	Reclamation grading to affect prism in near future
NP3	30-Sep-23	Prism Removed	Reclamation grading to affect prism in near future

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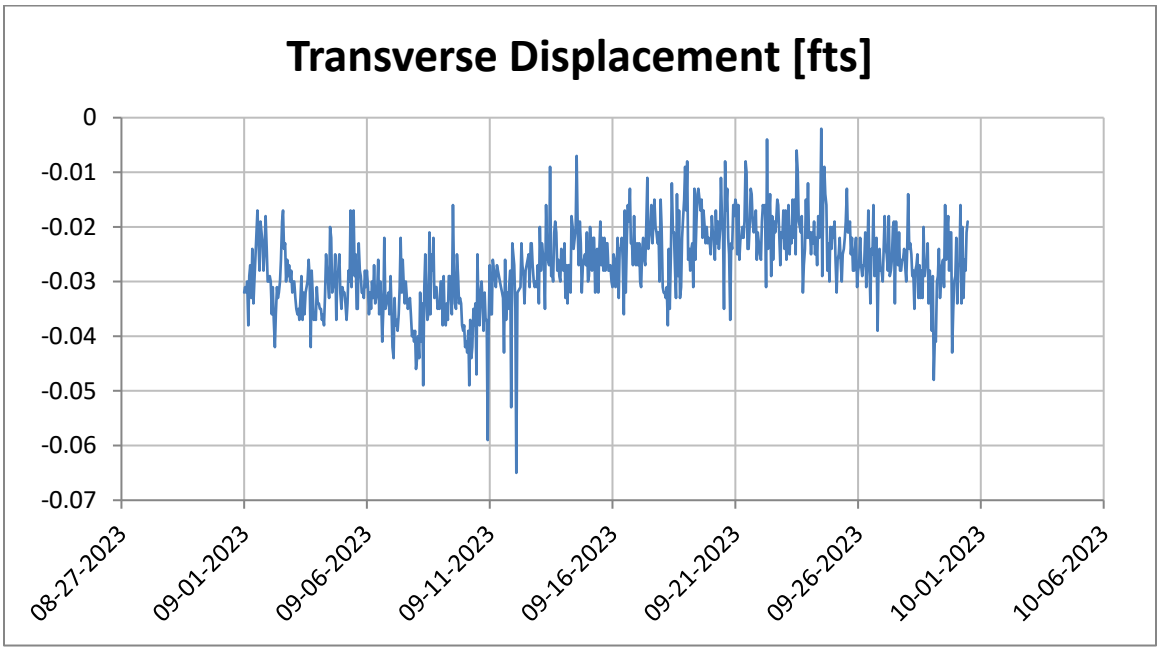
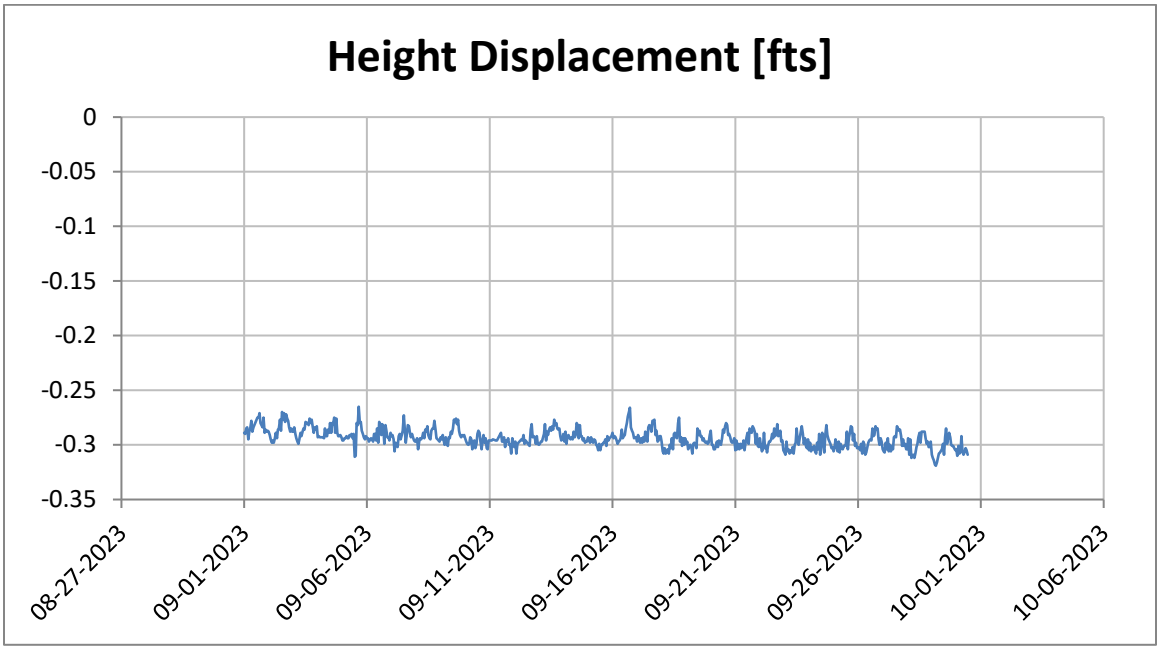
Prism BR1





Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Prism records slope creep movements.

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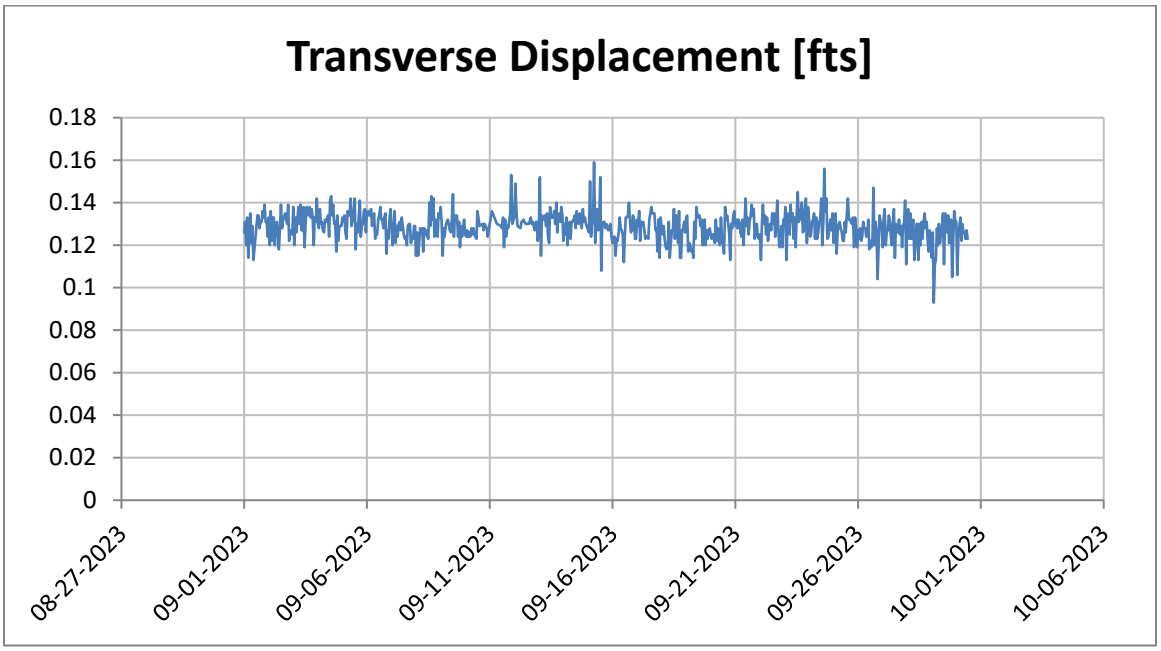
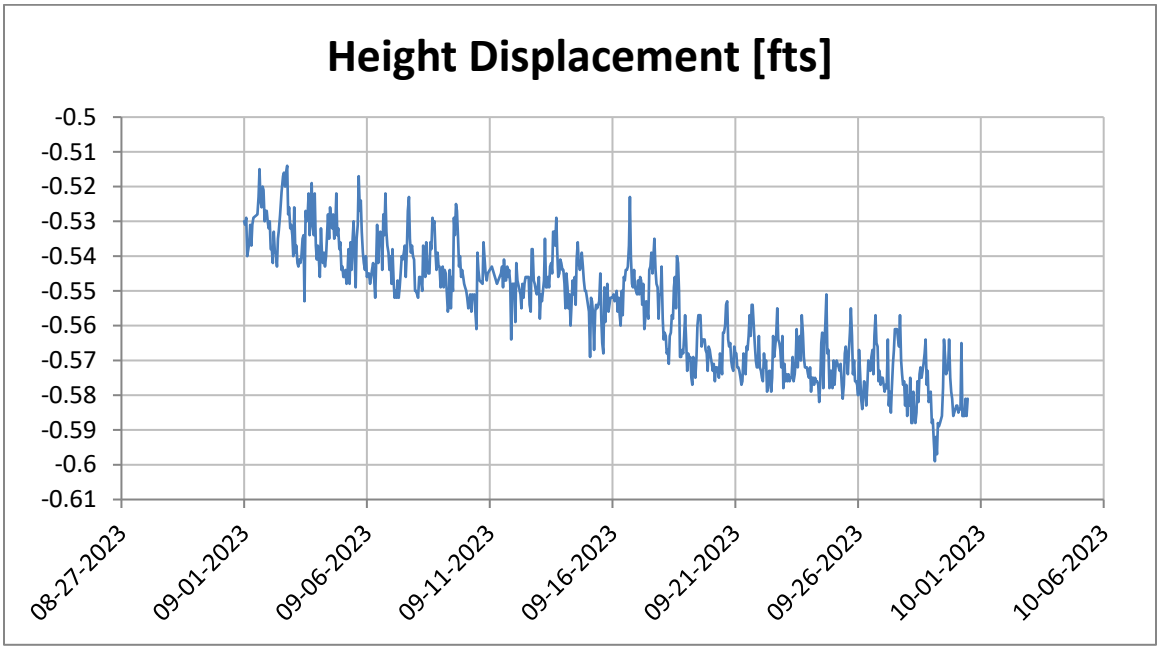
Stantec

Prism BR2



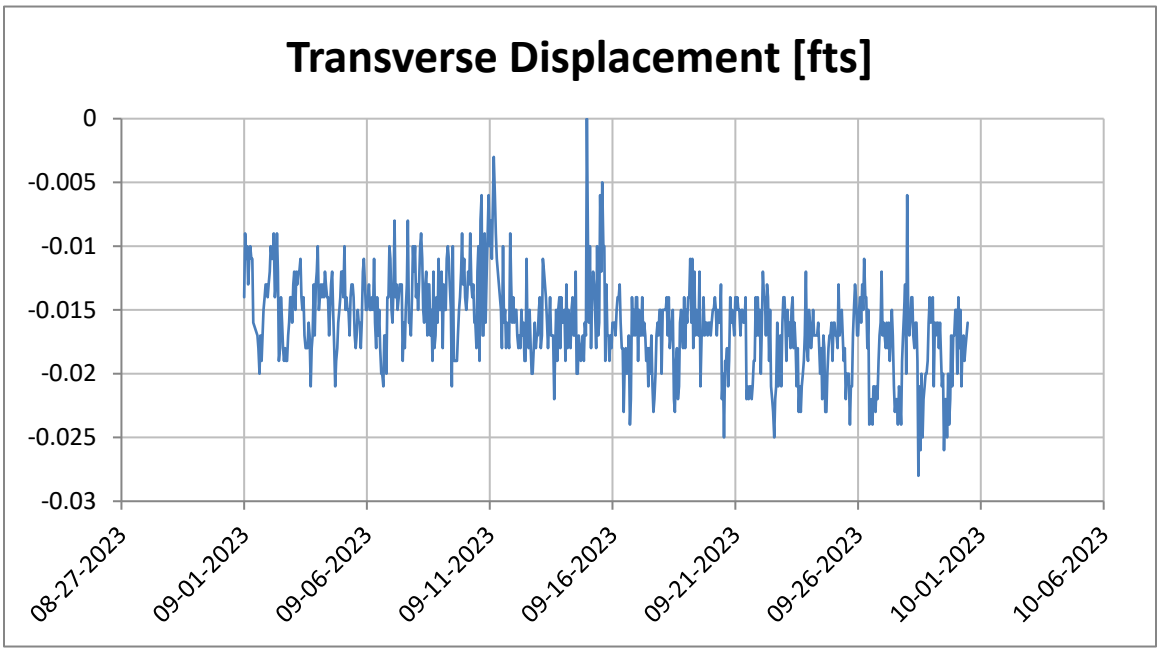


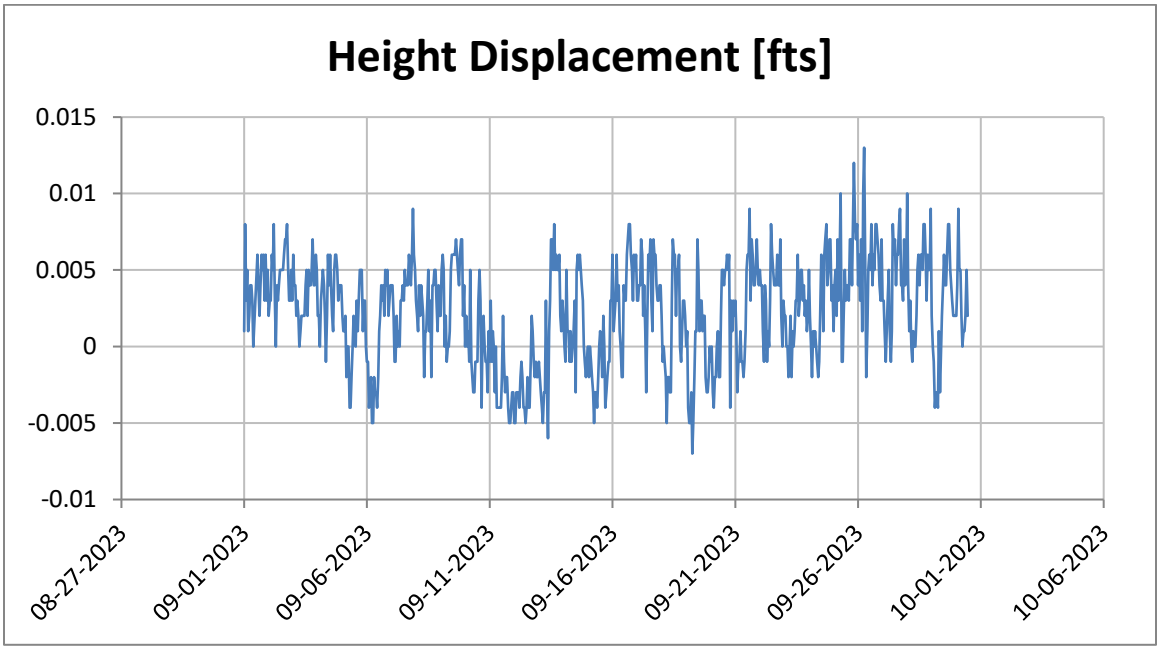
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Prism records slope creep movements.

Stantec

Prism B7200-1



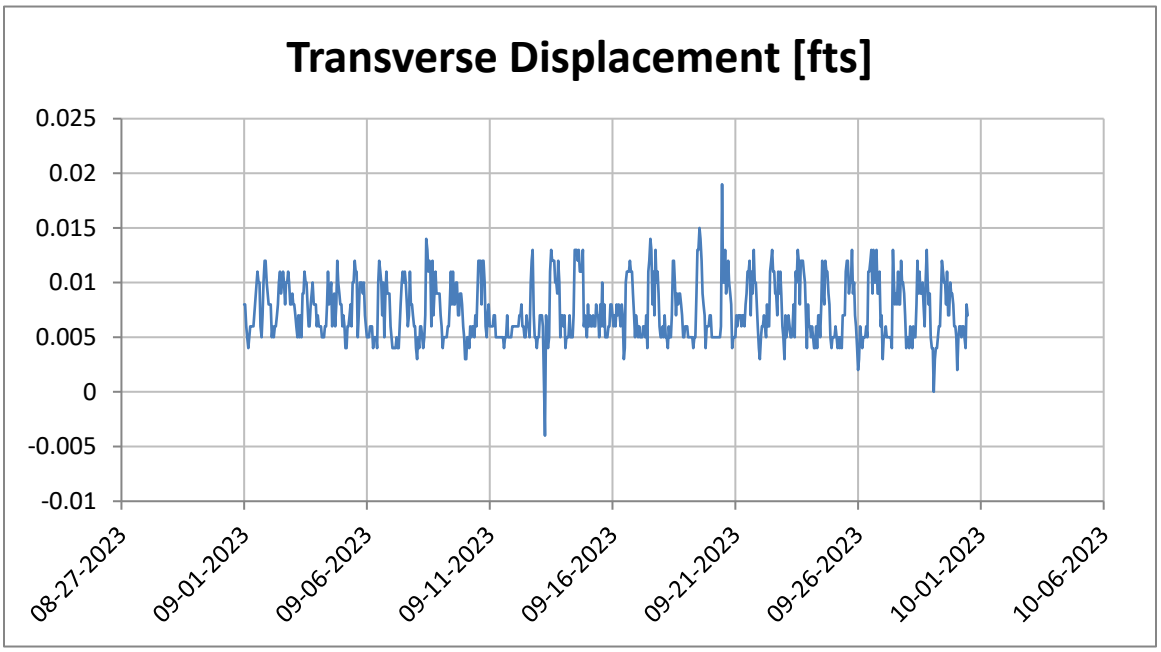


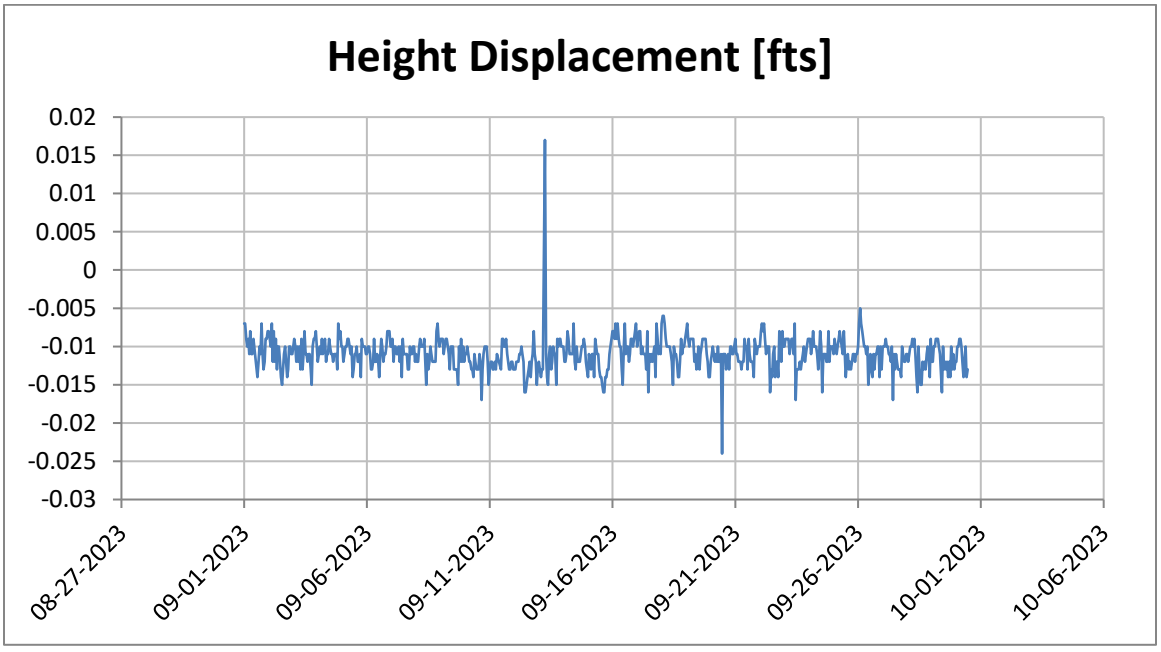
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7200-2



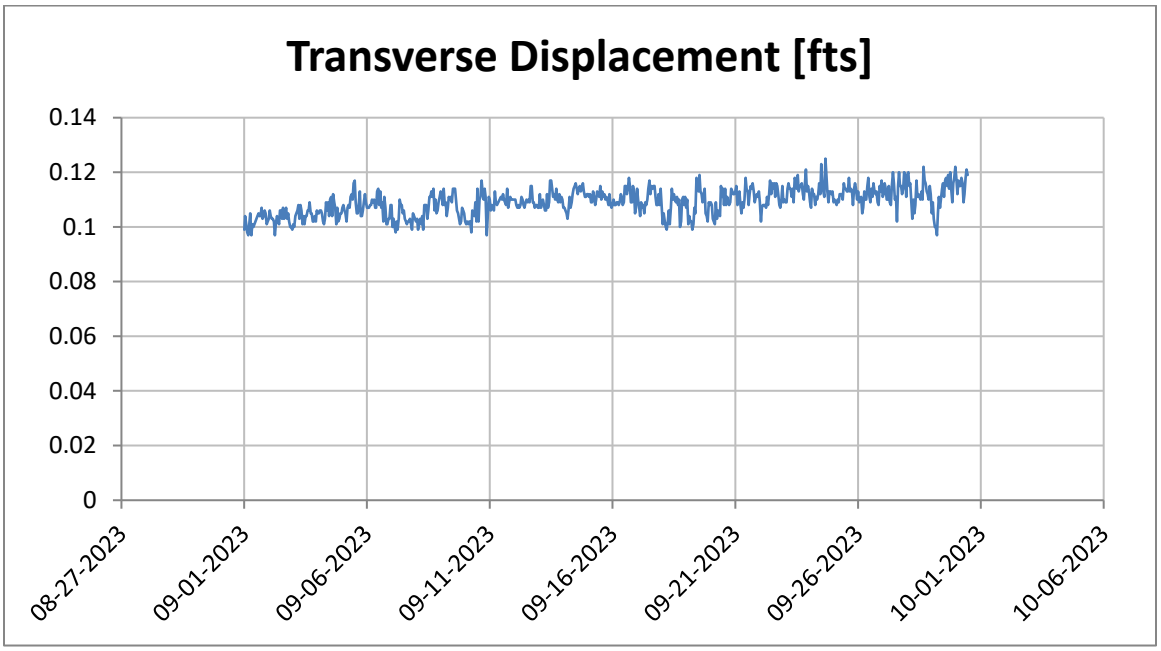


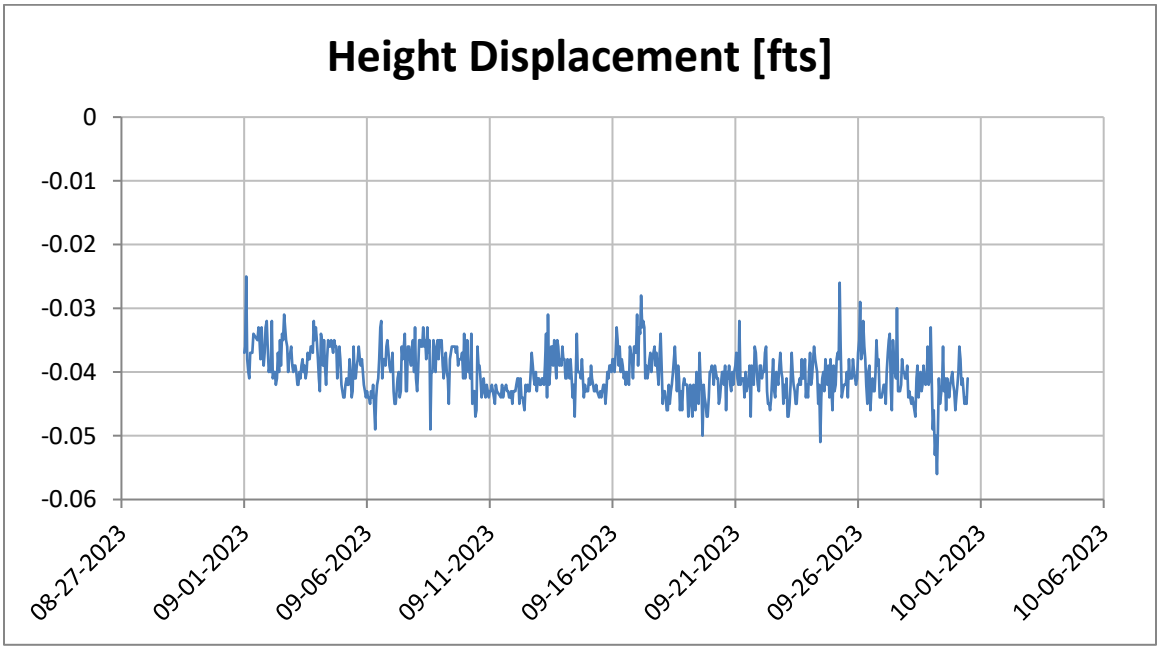
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7200-3



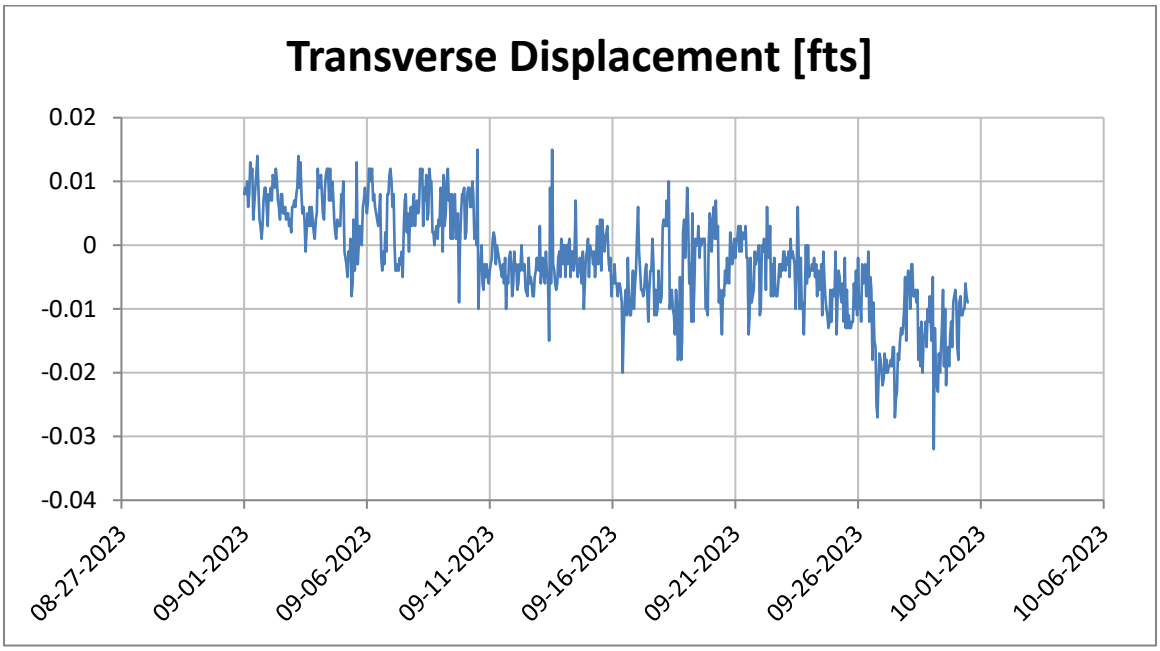


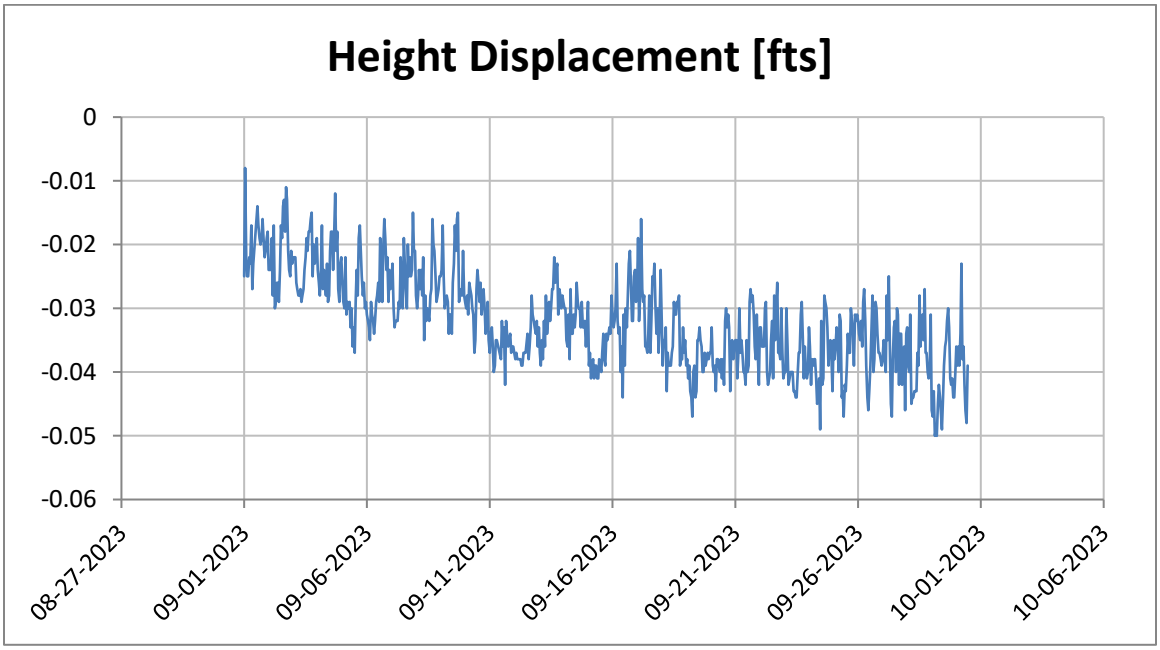
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7300-0



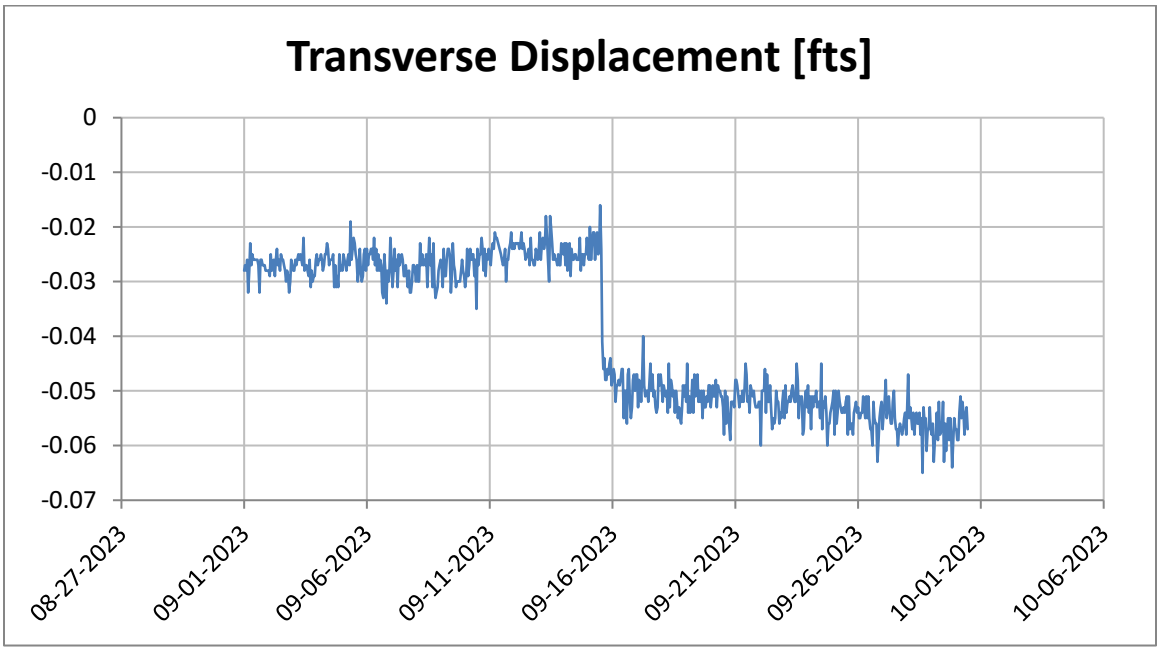


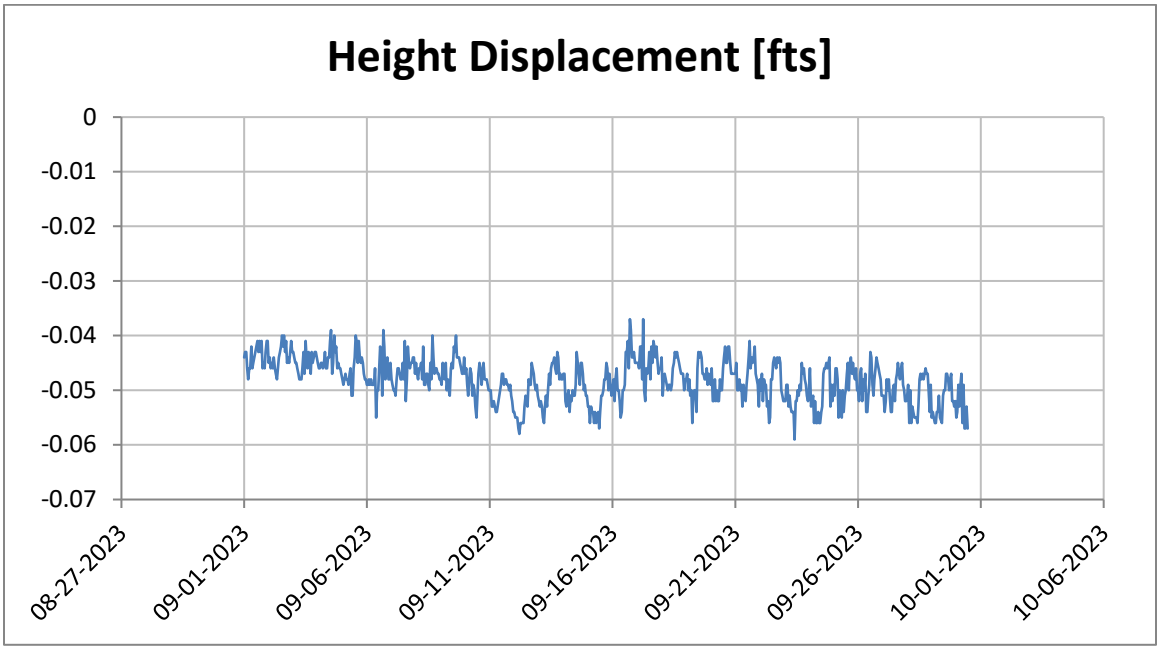
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Apparent movements believed to be the result of topsoil placement around prism.

Stantec

Prism B7300-1



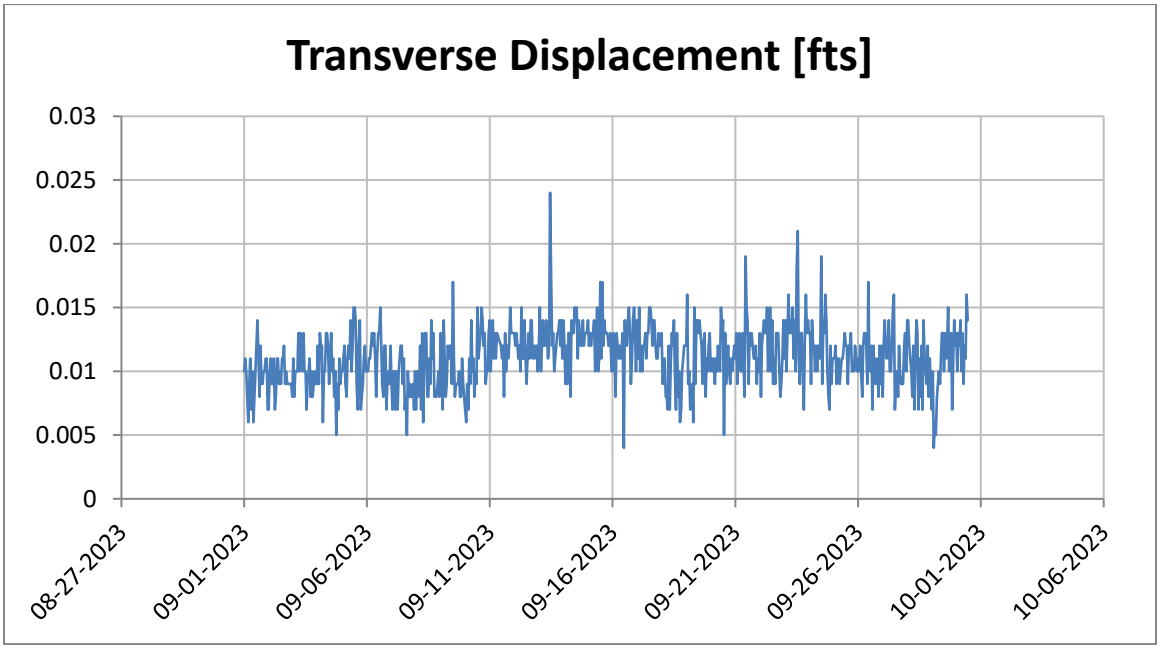


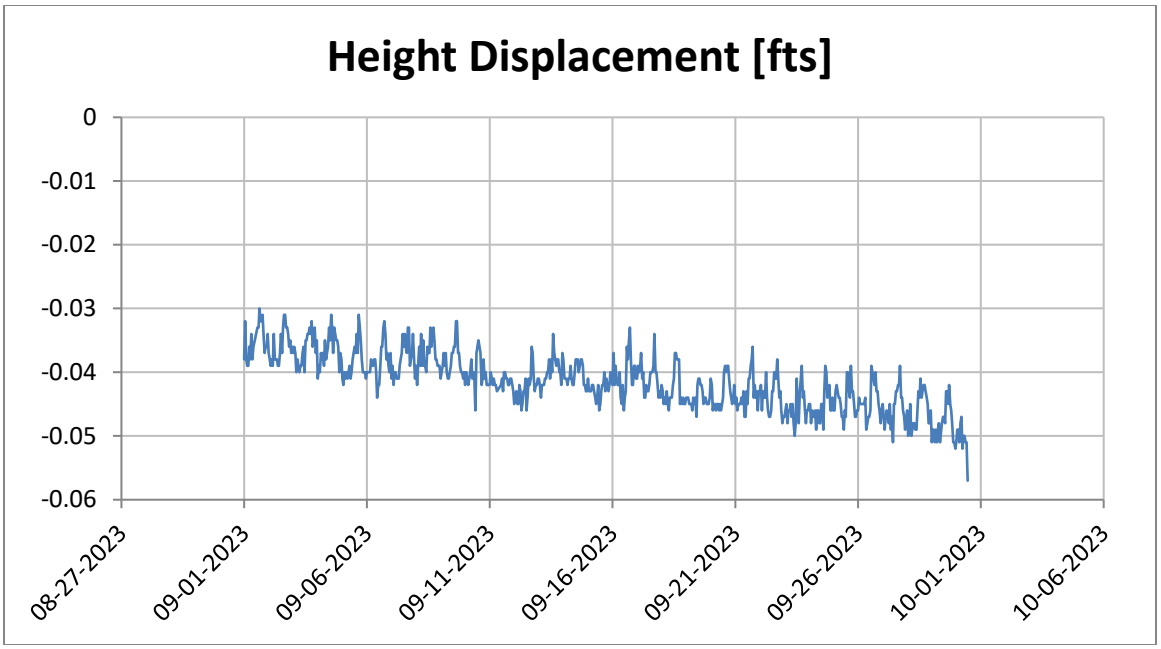
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Apparent movements believed to be the result of topsoil placement around prism.
6. Prisms was disturbed by topsoiling operations on September 15.

Stantec

Prism B7300-2





Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Apparent movements believed to be the result of topsoil placement around prism.

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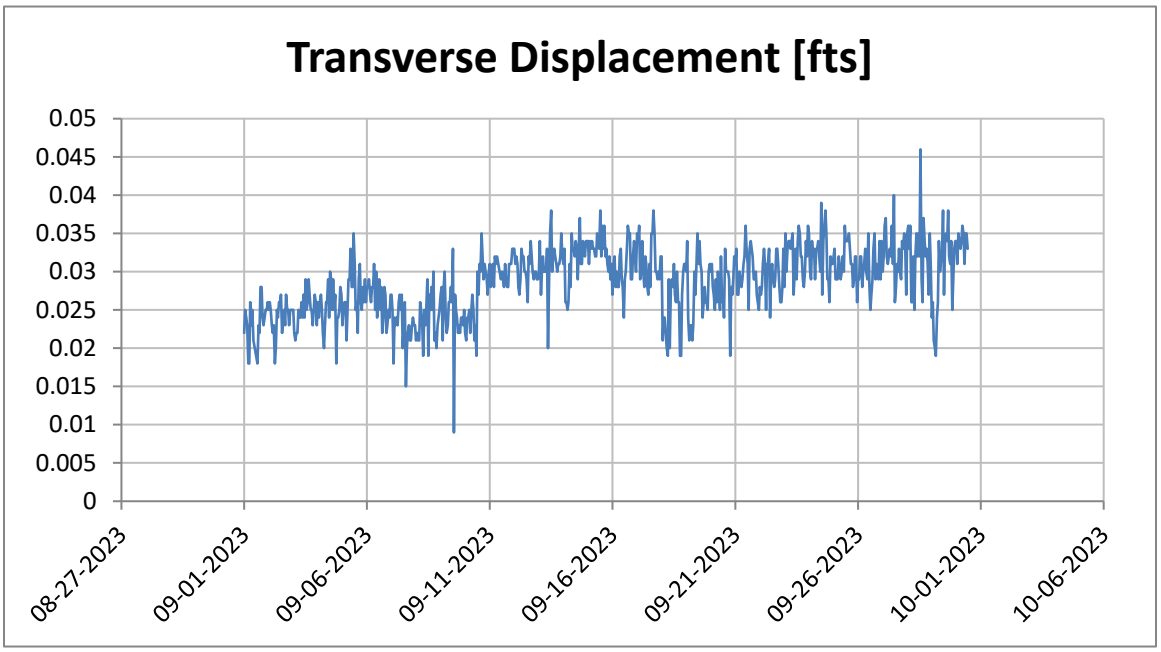
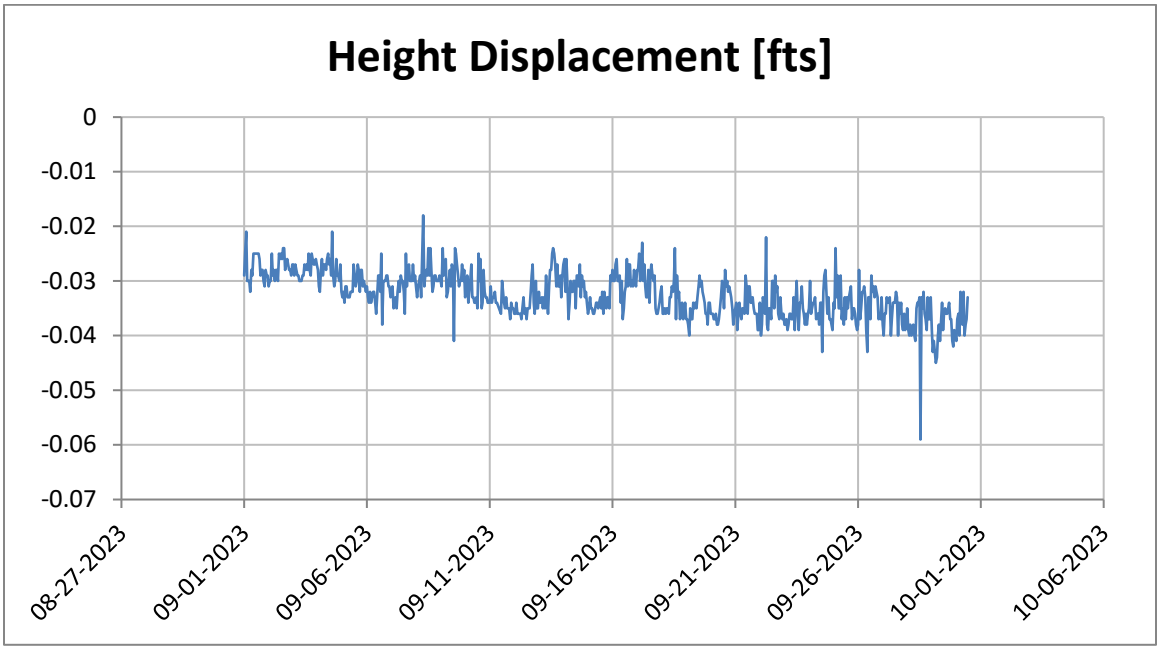
Stantec

Prism B7300-3



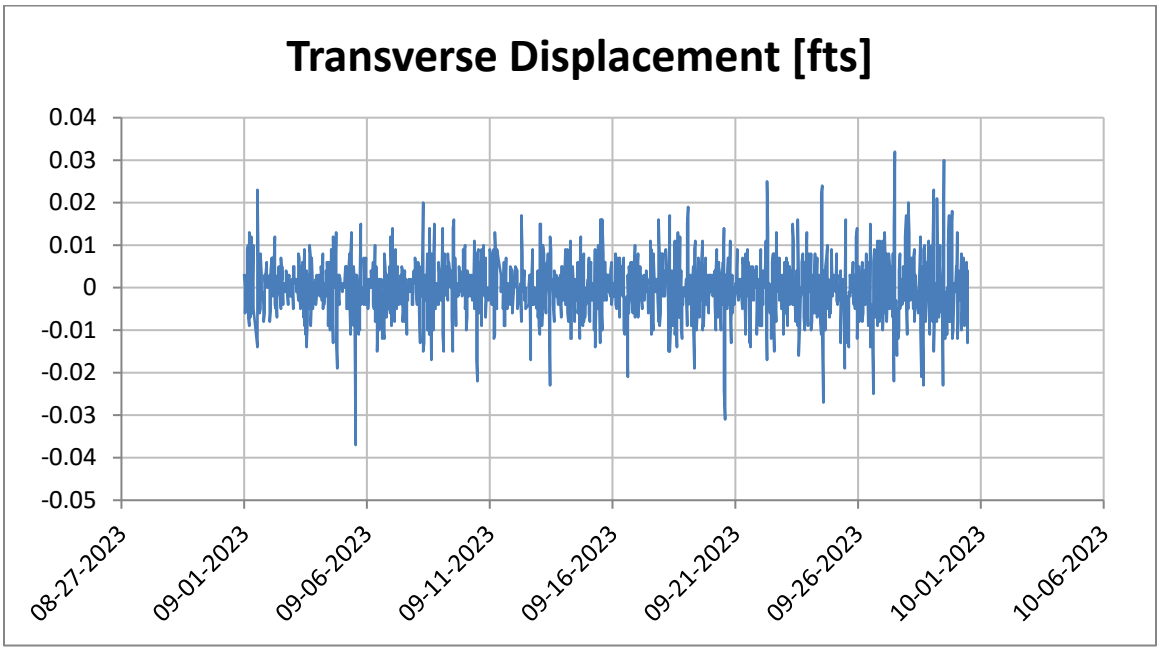


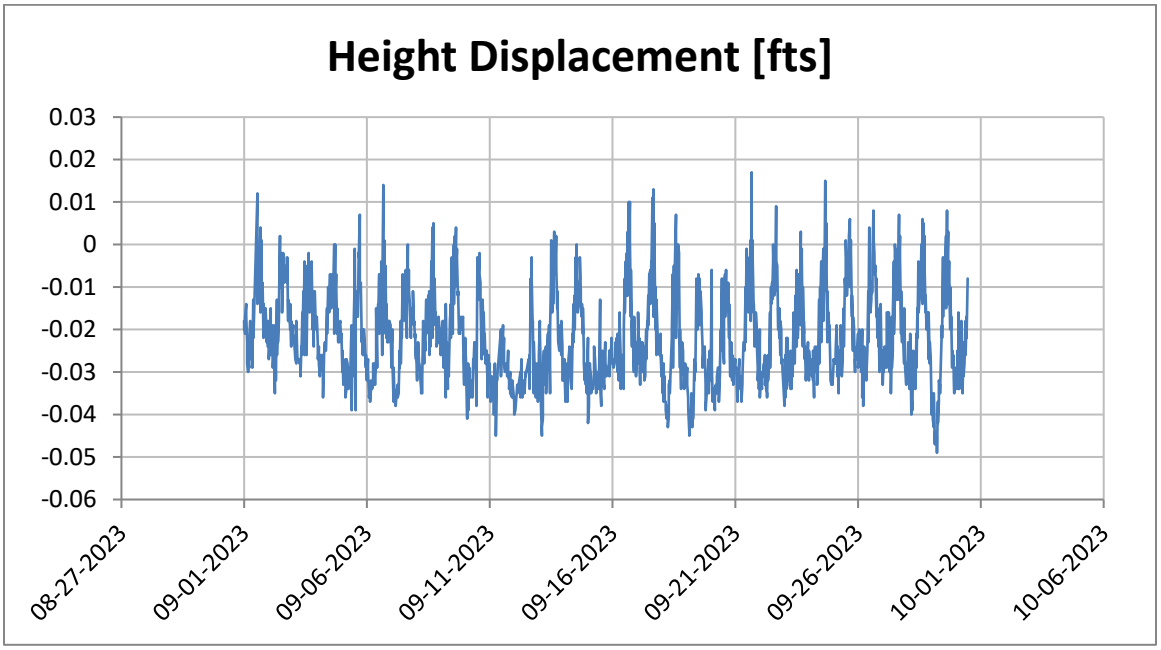
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Apparent movements believed to be the result of topsoil placement around prism.

Stantec

Prism CP6



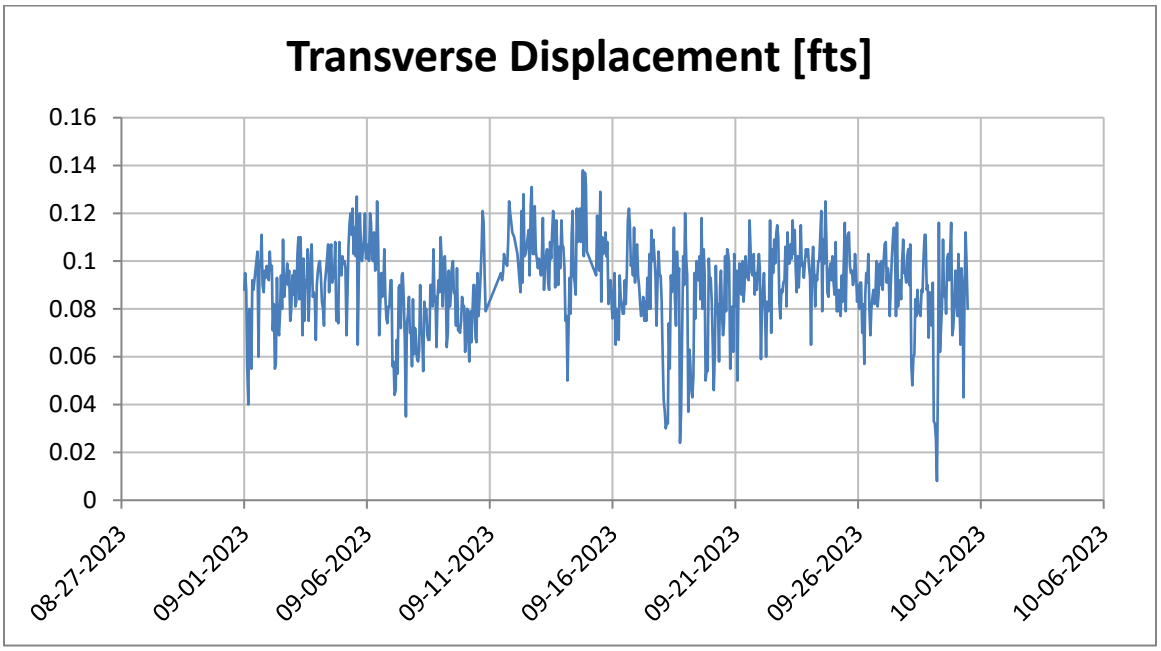


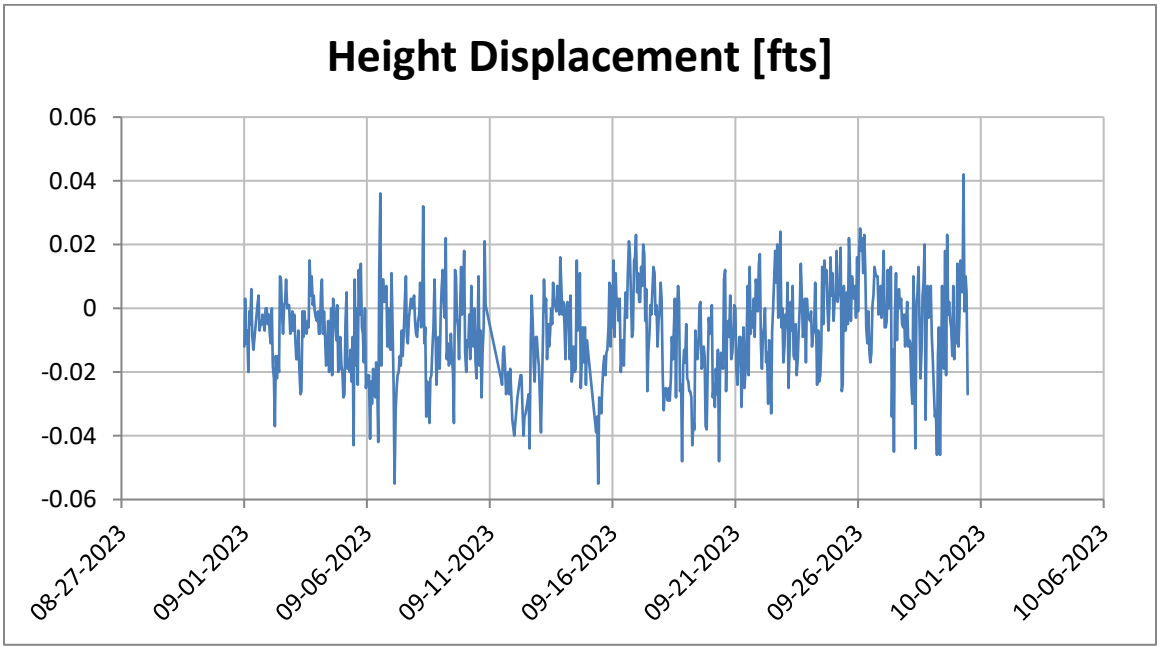
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism CP7



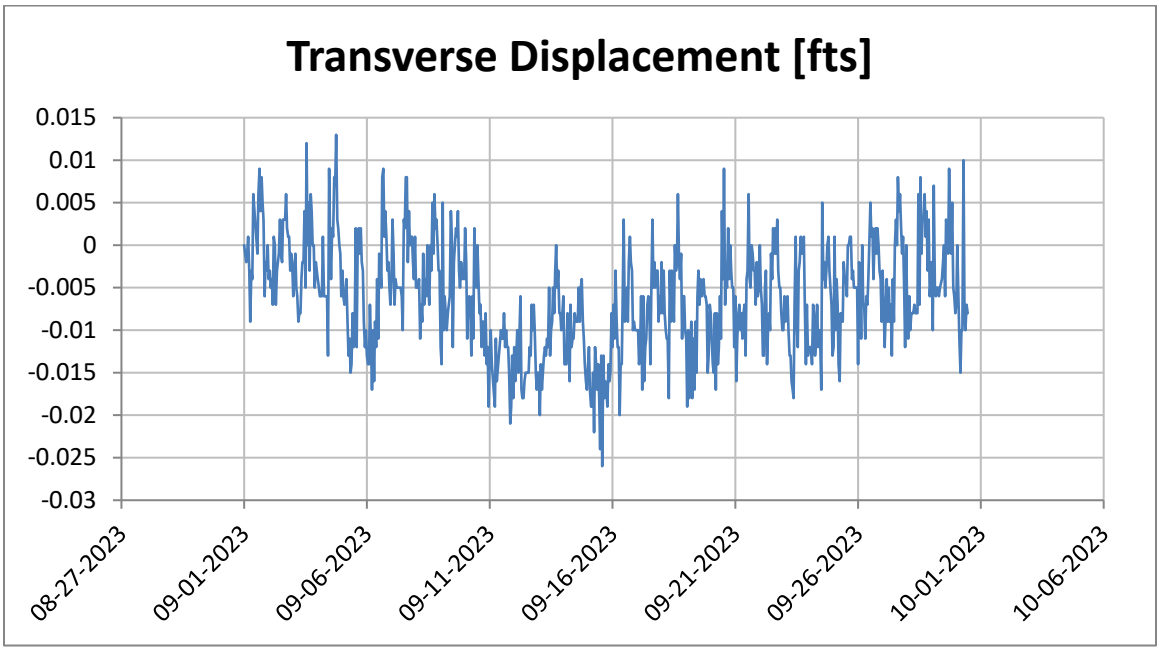


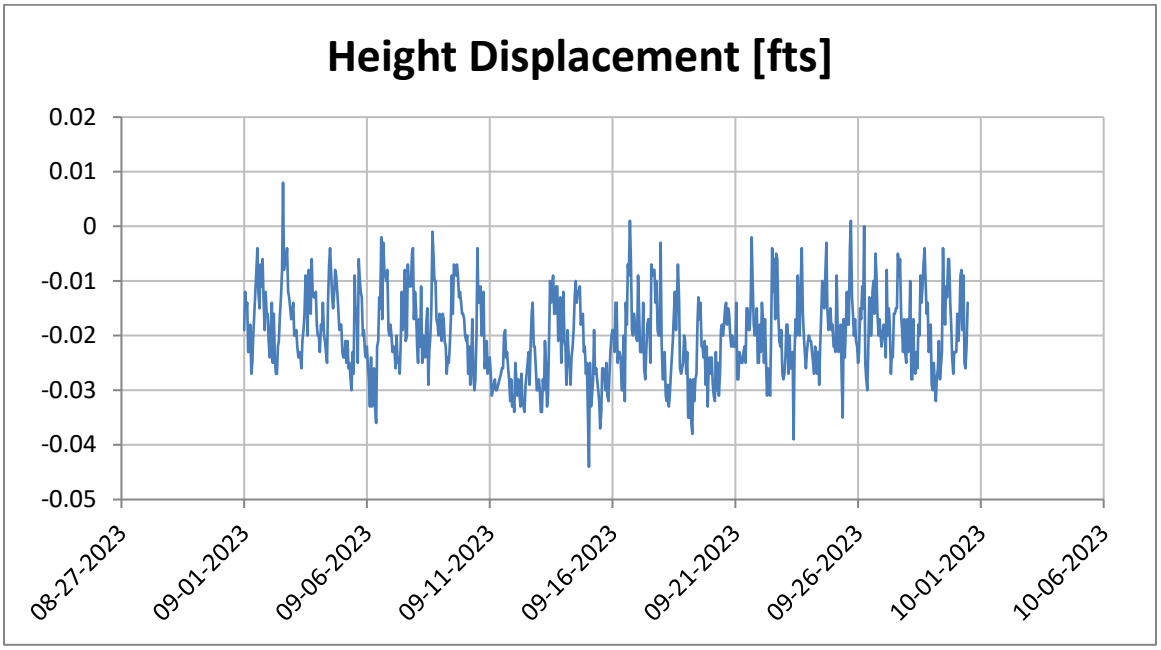
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism P2



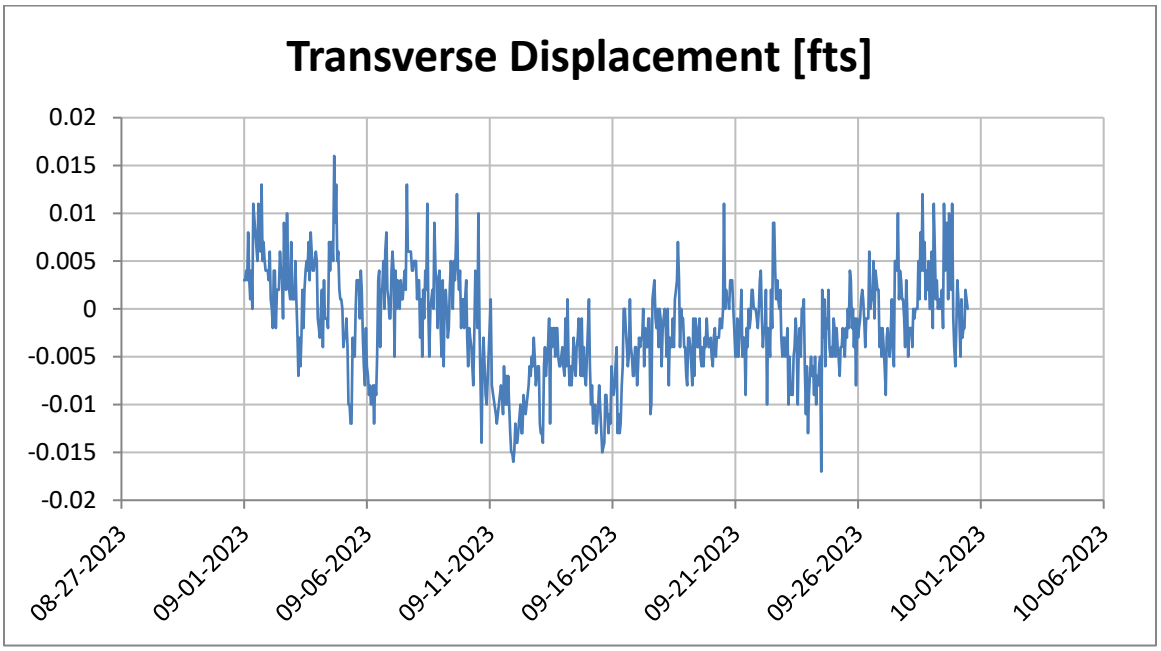


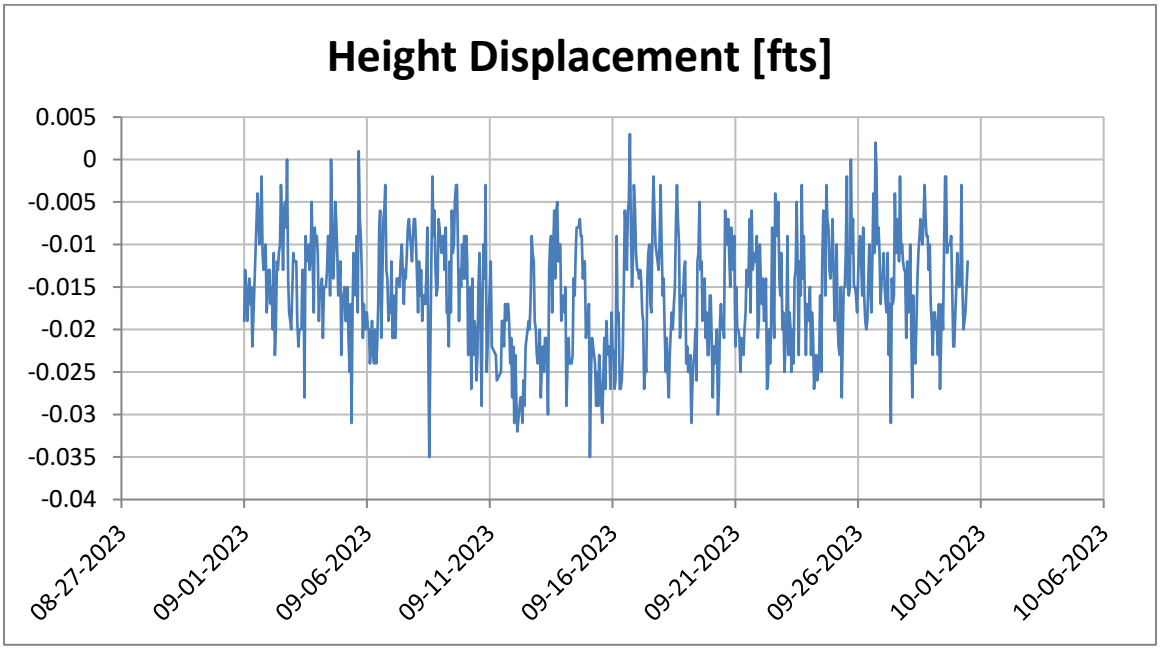
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism P5



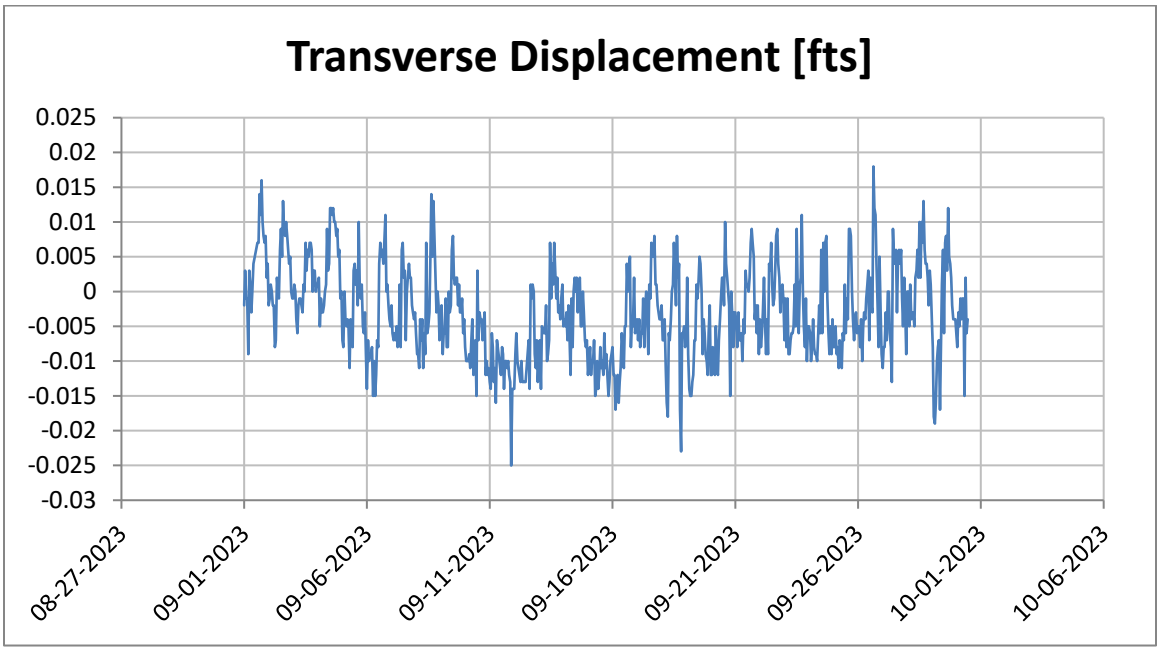


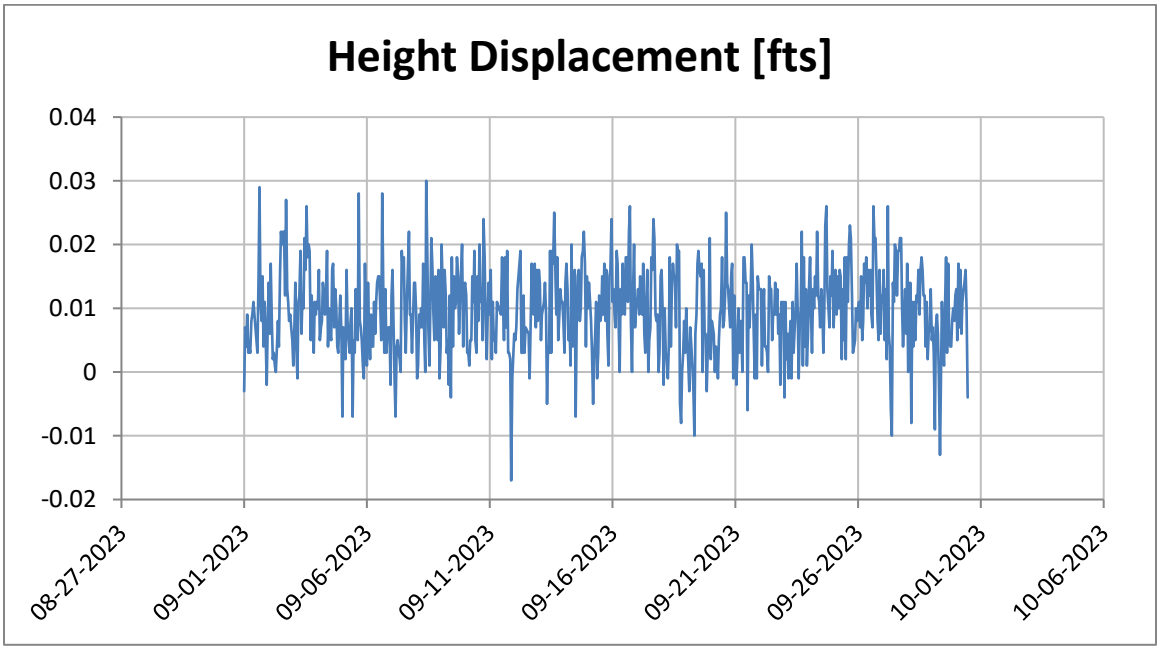
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism P25



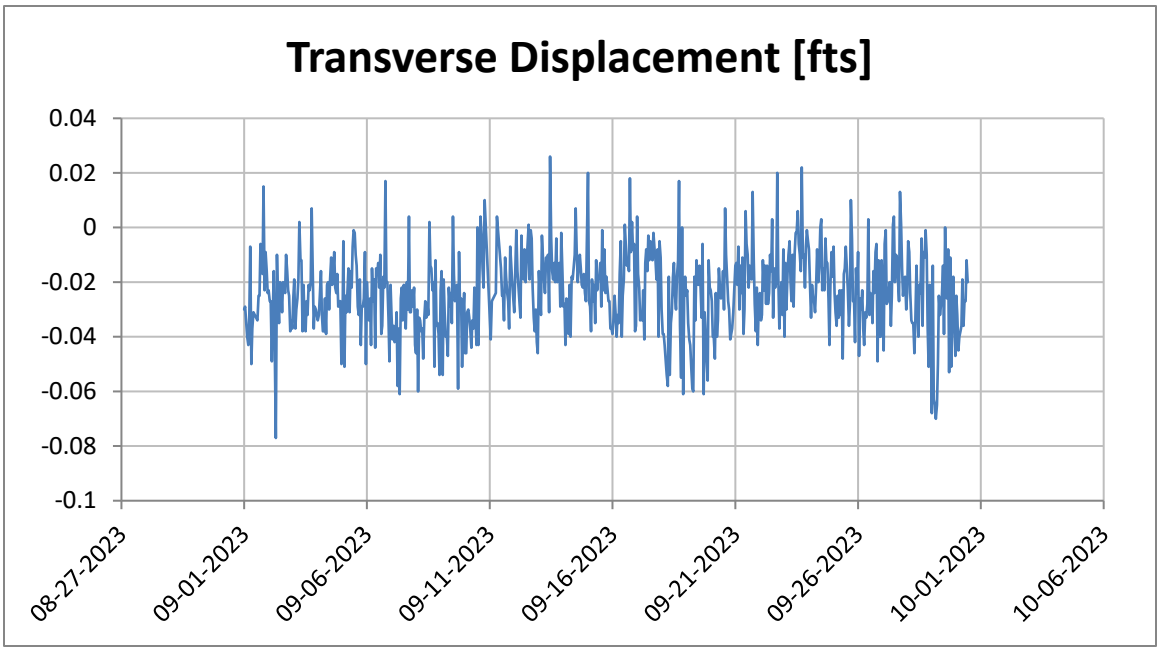


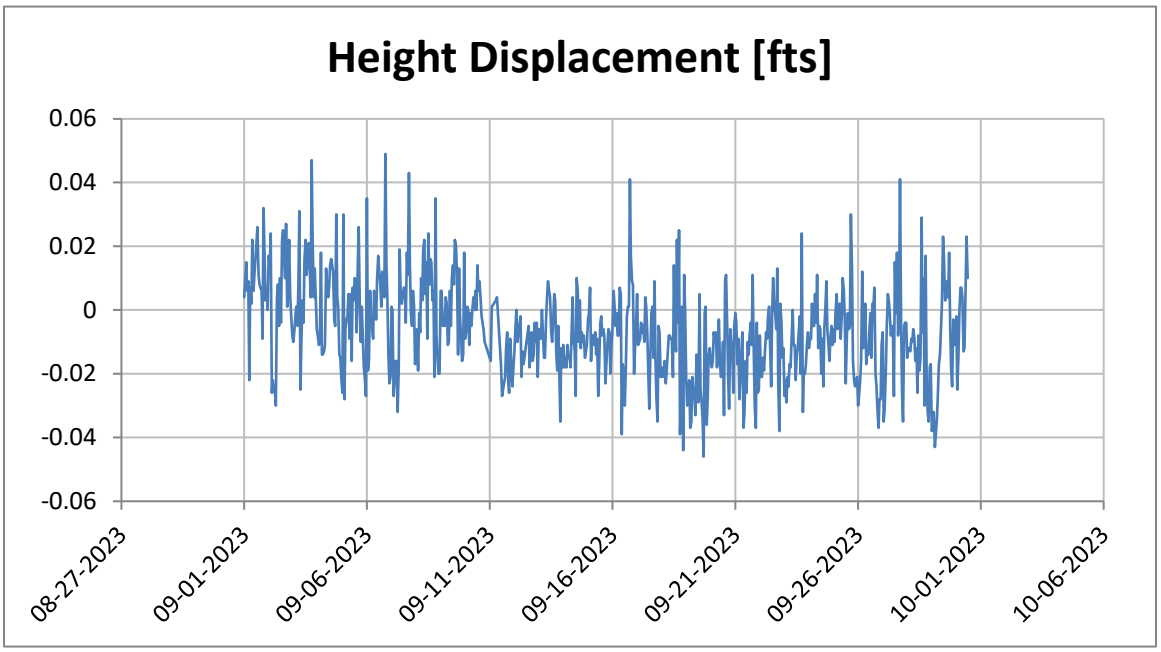
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism P32R



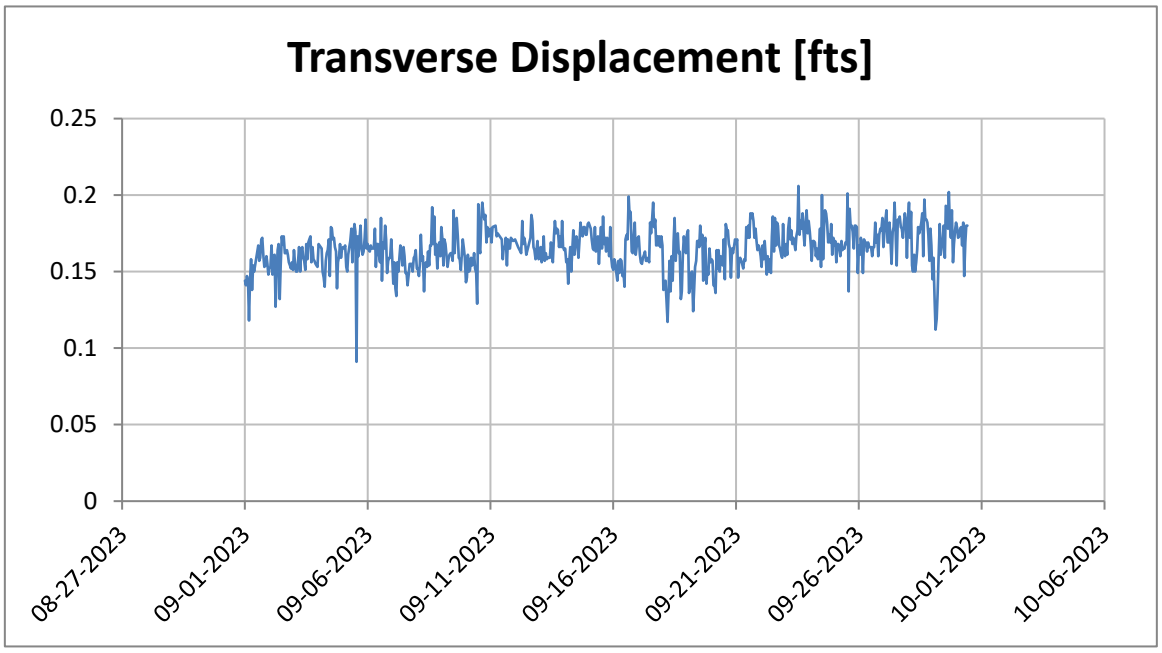


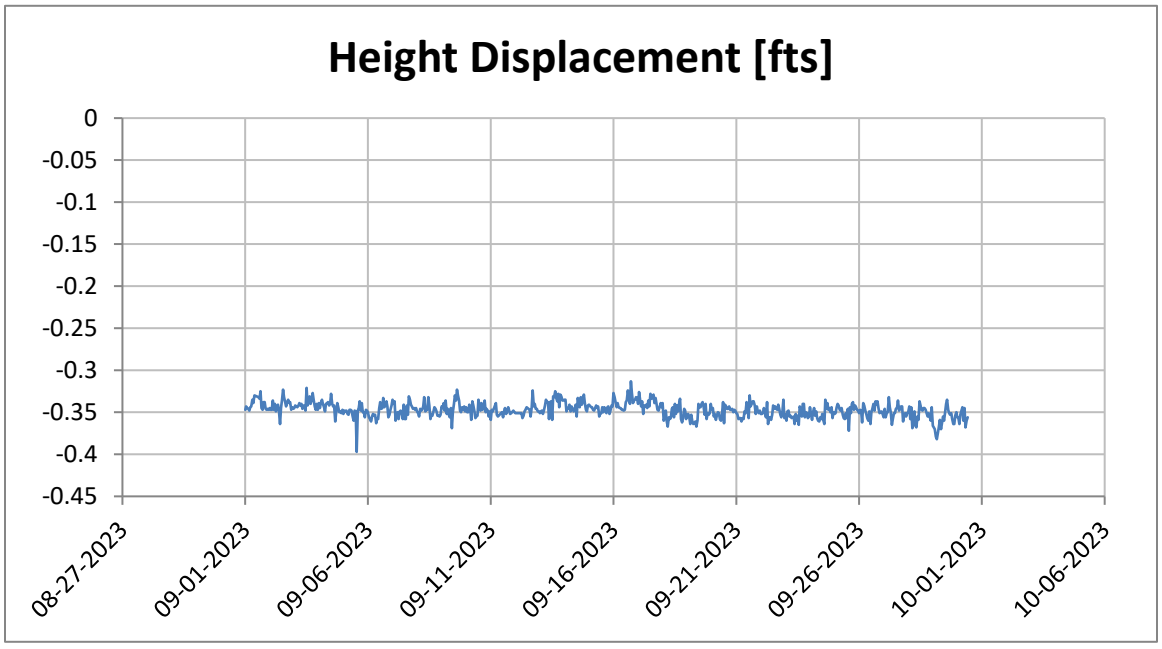
Notes:

1. P32R replaced P32 on August 1, 2023.
2. Survey accuracy is +/-0.016 feet.
3. Alert threshold is +/-0.35 feet.
4. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
5. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

NP3





Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Prism records slope creep movements.

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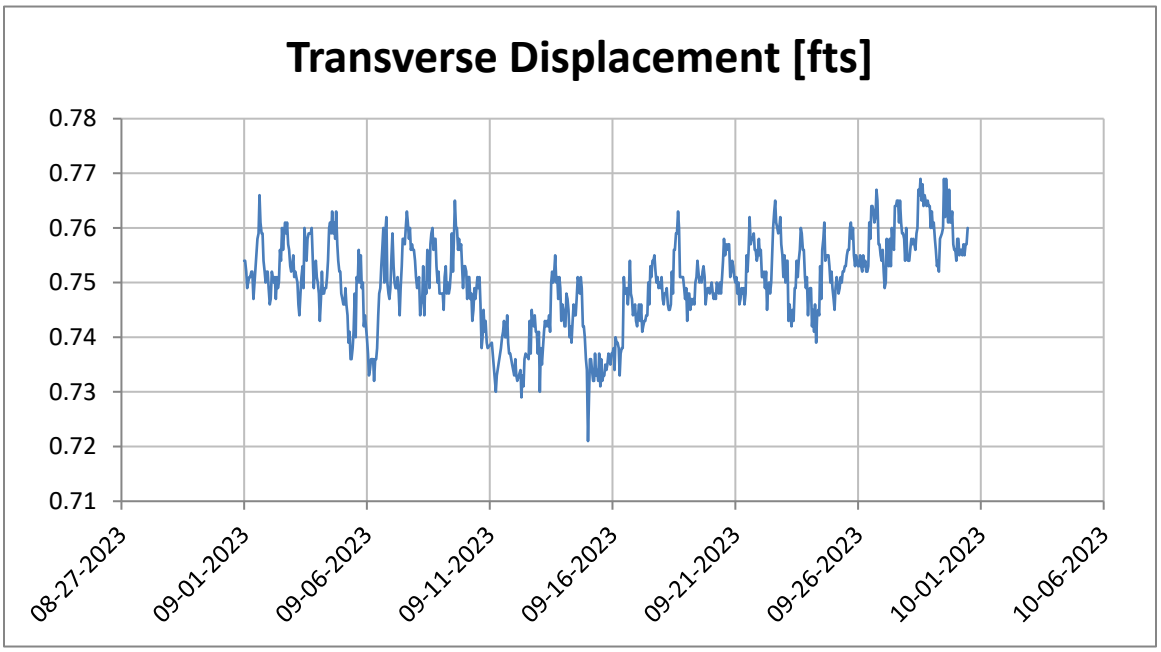
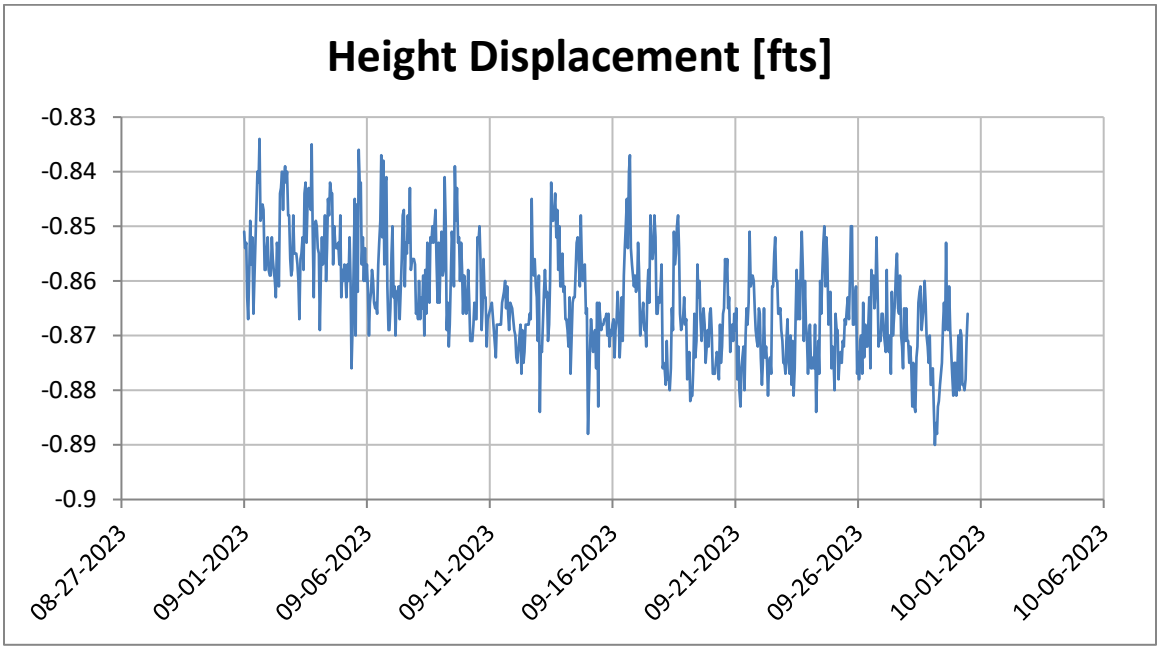
Stantec

NP66



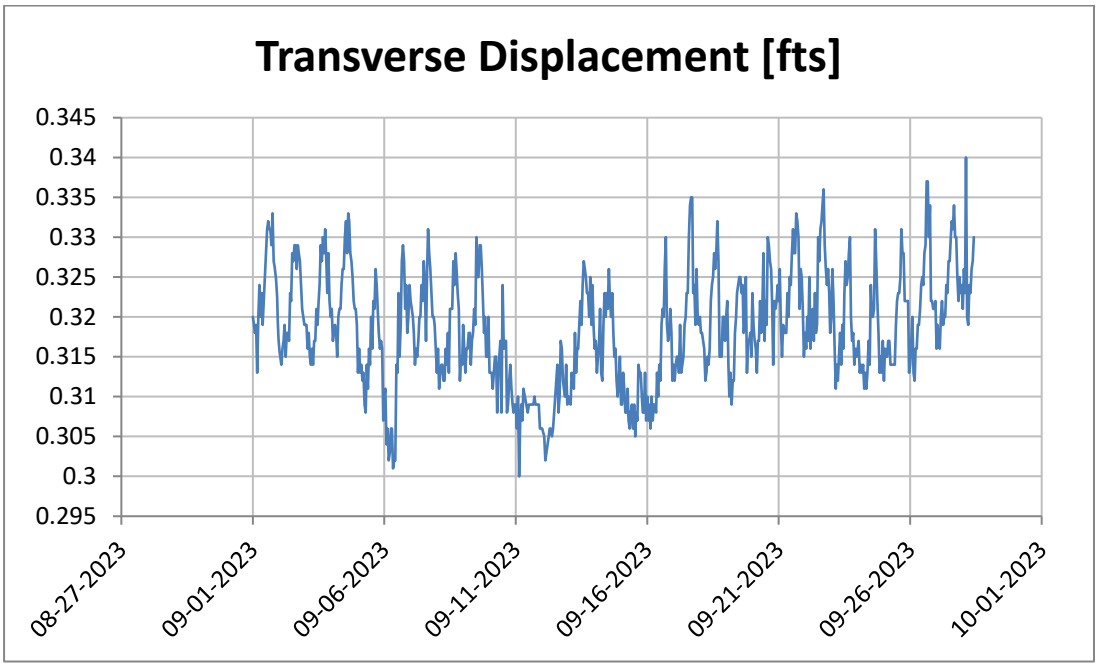


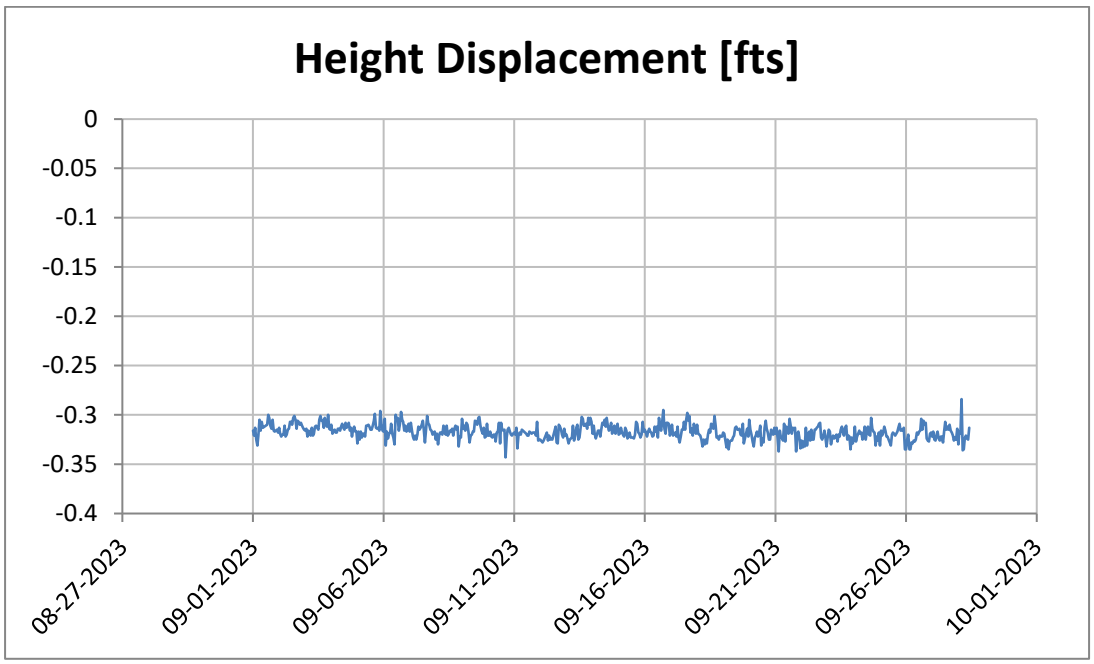
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Prism records slope creep movements.

Stantec

Prism P69A



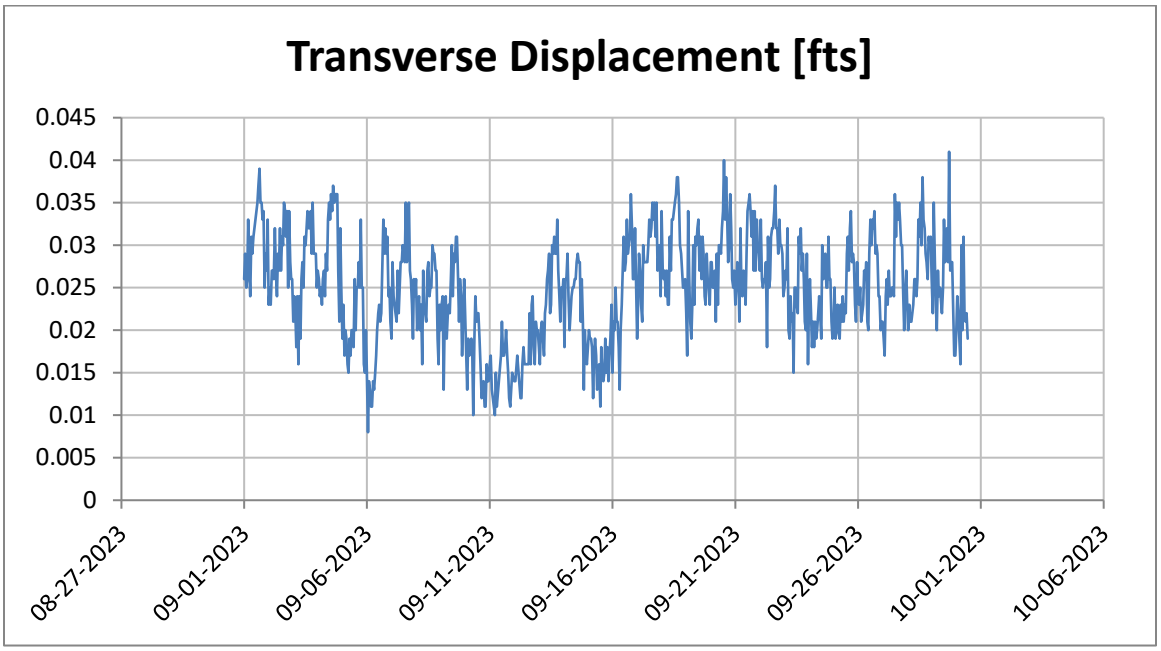


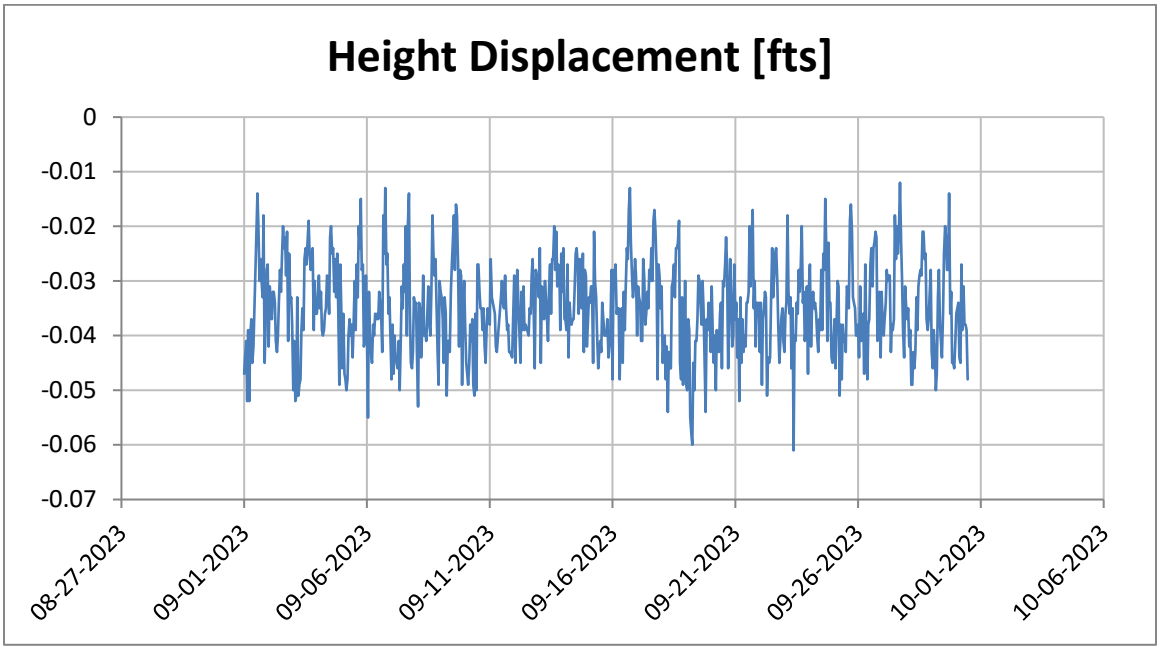
Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Prism records slope creep movements.

Stantec

Prism P70



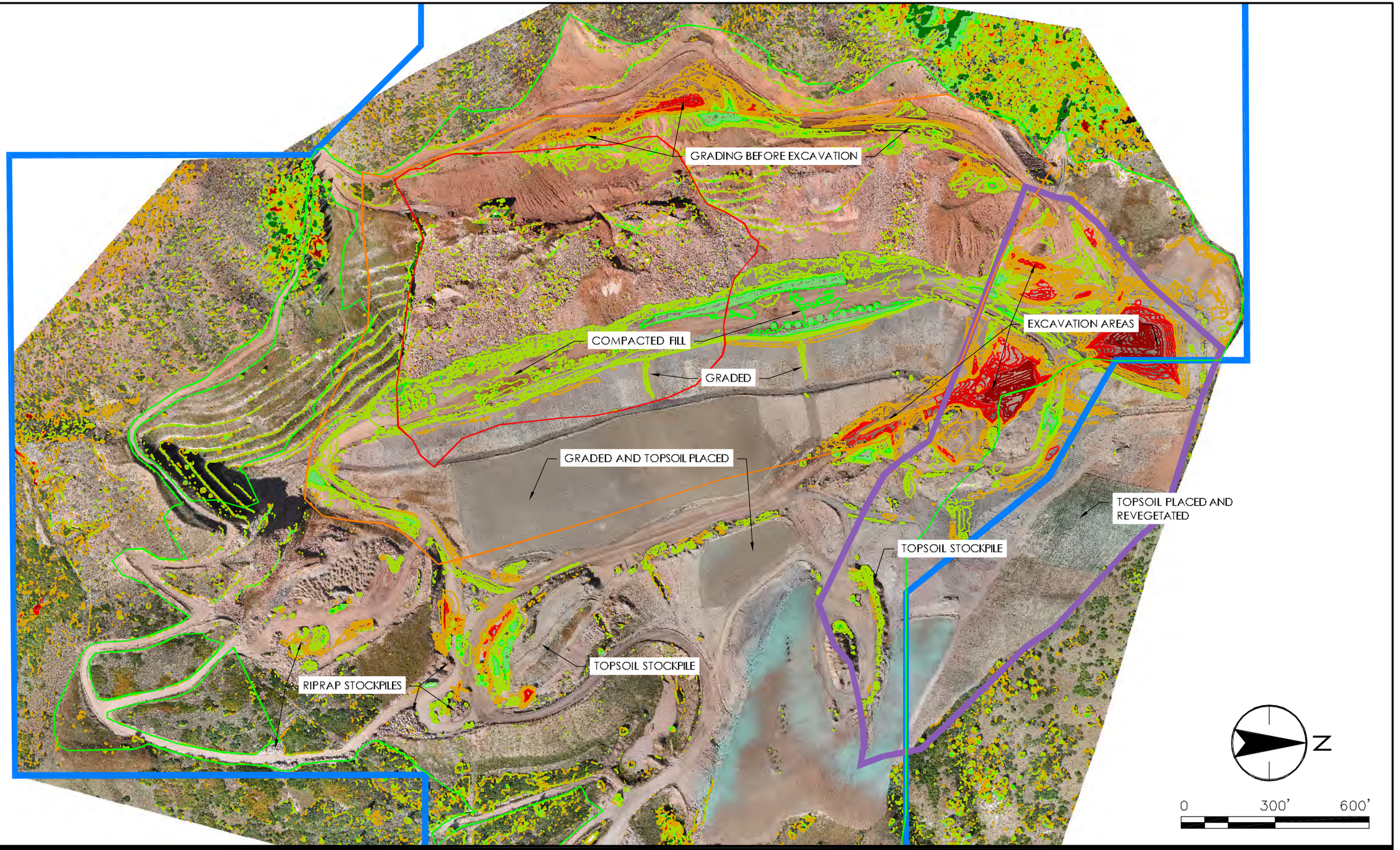


Notes:

1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Appendix C

Drone Survey



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Stantec

Stantec Consulting Services Inc.
410 17th Street Suite 1400
Denver CO 80202-4427
Tel (303) 295-1717
www.stantec.com

LEGEND

- Permit/Affected Lands Boundary
- City Grading Permit Boundary
- Proposed Disturbance Limit
- Landslide Extent
- Buttress Fill Extent
- Comparison Contour. Increase in elevation. (CI=2')
- Comparison Contour. Decrease in elevation. (CI=2')

1. COMPARISON OF DRONE FLIGHTS FROM 08/30/2023 to 09/29/2023.

Client/Project
RIVERBEND INDUSTRIES INC.

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
EXISTING PRISMS WITH CURRENT SURFACE

Revision	Date
#	2023.10.31
Drawn By	Figure No.
PK	5

Appendix D

Compaction Testing Results

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Denver CO 80202-4427
Tel: (303) 295-1717
www.stantec.com

LEGEND

- Permit/Affected Lands Boundary
- City Grading Permit Boundary
- Proposed Disturbance Limit
- Landslide Extent
- Buttress Fill Extent
- Compaction Test Location

N

0 150' 300'

Client/Project
RIVERBEND INDUSTRIES INC.

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
COMPACTION TEST LOCATIONS

Revision
#

Date
2023.10.31

Drawn By
PK

Figure No.
6

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Stantec

Compaction Testing Log

Test No.	Date	Elevation (ft)	Northing (ft)	Easting (ft)	Wet Density (pcf)	Moisture Content (%)	Dry Density (pcf)	Compaction (%)
689	18-Sep-23	7342	1402495	3172997	126.6	9.8	115.3	94
690	18-Sep-23	7340	1402105	3173048	125.9	13.8	110.6	90
691	18-Sep-23	7340	1401673	3173110	138.5	5.6	131.2	107
692	18-Sep-23	7341	1401166	3173306	140.6	6.9	131.5	107
693	19-Sep-23	7344	1401318	3173188	133	10.4	120.5	98
694	19-Sep-23	7344	1401492	3173185	135.7	9.4	124	101
695	20-Sep-23	7344	1401232	3173272	134.3	7.6	124.8	102
696	20-Sep-23	7344	1401472	3173195	126.2	6.5	118.5	96
697	20-Sep-23	7340	1401892	3173088	131.3	11.1	118.2	96
698	20-Sep-23	7343	1401643	3173078	126.1	14.4	110.2	90
699	21-Sep-23	7345	1401400	3173185	126.2	6.1	118.9	97
700	21-Sep-23	7342	1401720	3173066	138.1	10.2	125.3	102
701	21-Sep-23	7346	1402290	3172946	130.8	6.6	122.7	100
702	22-Sep-23	7348	1402508	3172967	126.8	10.8	114.4	93
703	22-Sep-23	7347	1402092	3172981	144.1	10.5	130.4	106
704	22-Sep-23	7342	1401853	3173067	136.1	7.5	126.6	103
705	22-Sep-23	7344	1401159	3173240	134.7	4.7	128.7	105
706	25-Sep-23	7346	1402285	3172977	138.8	7.1	129.6	106
707	25-Sep-23	7350	1402668	3172898	135.8	6.7	127.3	104
708	26-Sep-23	7345	1401138	3172352	148.8	5.4	141.2	115
709	26-Sep-23	7346	1401328	3173209	145.3	7.2	135.6	110
710	26-Sep-23	7345	1401595	3173159	128.5	7.5	119.5	97
711	27-Sep-23	7351	1402573	3172934	132.3	6.0	124.8	102
712	27-Sep-23	7351	1402409	3172937	129.5	6.1	122.0	99
713	27-Sep-23	7348	1402238	3172984	122.3	5.7	115.7	94
714	27-Sep-23	7349	1402018	3172997	133.9	6.6	125.6	102
715	29-Sep-23	7344	1401644	3173137	137.5	5.0	130.9	107
716	29-Sep-23	7346	1401826	3173089	125.5	6.5	120.7	98
717	29-Sep-23	7351	1402512	3172956	135.6	7.5	126.1	103
718	29-Sep-23	7347	1401145	3173243	133.8	16.7	114.7	93
719	29-Sep-23	7348	1401399	3173207	129.1	5.0	122.9	100
720	29-Sep-23	7347	1401630	3173096	138.4	6.4	130.1	106
721	29-Sep-23	7346	1401638	3173096	141.7	6.5	133.1	108
722	29-Sep-23	7348	1401825	3173051	142.5	8.6	131.2	107

Note:

A total 2,584,000 yd3 had been placed and compacted. This requires at least 517 compaction tests, and 933 tests have been taken.