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To:	Jerald Schnabel	From:	Paul Kos
	Castle Aggregate		Denver, CO 80202
File:	January 2024 Monitoring Summary	Date:	February 29, 2024

Reference: January 2024 Geotechnical Monitoring Summary Pikeview Quarry

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this January 2024 Geotechnical Monitoring Summary for the Pikeview Quarry. The Pikeview Quarry is situated along the foothills of the Rocky Mountains, northwest of Colorado Springs, Colorado. Castle Aggregate 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 January 2024. Continuous monitoring by the robotic survey system began in 2010 and has continued through the month of January 2024. Visual inspections of the slopes were performed by Castle Aggregate employees and Stantec engineers.

1.1 PURPOSE

The purpose of this report is to summarize the January 2024 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 (Castle Aggregate 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 engineers to document visual observations of slope conditions, including signs 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 January 2024. 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 January 3 and 22, 2024. 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 January 2024. Site maintenance, topsoil placement and riprap production also continued throughout the month.
- Operators placed compacted material in the buttress zone. Material was primarily excavated from the Upper Borrow Area. The material was hauled down ramps to the buttress floor and placed in lifts and compacted.
- The fault between the granite and sedimentary rocks has been partially exposed. It is generally located farther east than originally thought; and the larger amount of granitic material reduces the driving force on the reclamation buttress and remaining sedimentary material. Castle Aggregate and Stantec are evaluating the fault location and the excavation quantities required in the upper, west portions of the quarry. Also, competent granitic rock has been encountered in multiple areas of the Upper Borrow Area, and these areas may require blasting, or they may be left as natural outcrops. If any design changes are required, Castle Aggregate will submit a Technical Revision.
- Compaction testing continued 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.
- 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.
- Rock was being screened, sorted, and stockpiled as riprap for use as erosion protection in the channels.
- Topsoil was placed on areas at final grade.
- The contractor began removal of the culvert. Castle Aggregate has procured a pump and will begin pumping operations if any water collects behind the culvert.
- 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 24 prisms active in January; two prisms were control points located outside the slope movement area, six prisms are located on the slopes surrounding the slope movement area, three prisms were located on the slopes within the landslide area, and eleven 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. Five prisms were installed in January, and no prisms were removed. 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, Castle Aggregate clears the area of concern until the data can be reviewed and the slope can be inspected. Castle Aggregate 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 monitoring system was offline multiple times due to power outages and system updates. These outages typically occurred at night when no work was being performed or during a day with inclement weather that prevented work from being performed. Reduced work, slope inspections, and spotters were used to monitor the slopes for movements when the monitoring system was not operating but construction was occurring. The batteries powering the monitoring system were replaced on January 17, 2024, which reduced the number of power outages. The alerts are listed in Table 2.

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Table 2 Alert Summary

Date(s)	Alert	Cause/Actions taken	Resolved
2-Jan	B7300-0 not found	Single event. Frost on prism	2-Jan
3-Jan	B7300-0 not found	Single event. Frost on prism	3-Jan
4-Jan to 5-Jan	Points not found	Snow and fog followed by power outage. Reduced or no work being performed at time of alerts.	5-Jan
6-Jan	Points not found	Snow and fog. No work being performed at time of alerts.	6-Jan
7-Jan	Points not found	Snow and fog. No work being performed at time of alerts.	7-Jan
8-Jan	Communication error alerts	Power outage. No work being performed at time of alerts.	8-Jan
9-Jan	Communication error alerts	Power outage. No work being performed at time of alerts. Batteries changed to reduce power outages.	9-Jan
9-Jan	B7300-0 not found	Equipment operations in area	9-Jan
9-Jan to 10-Jan	B7300-1 not found	Prism disturbed by rock during topsoil placement. Prism repaired and back in operation	10-Jan
10-Jan	P32R not found	Snow and fog. No work being performed at time of alert.	10-Jan
10-Jan	Communication error alerts	Power outage. No work being performed at time of alerts. Reduced time of outage due to new batteries.	10-Jan
11-Jan	P32R not found	Snow and fog. Limited work being performed at time of alert.	11-Jan
11-Jan	Communication error alerts	Power outage. No work being performed at time of alerts. Reduced time of outage due to new batteries but looking at options for additional batteries.	11-Jan
13-Jan	Communication error alerts	Power outage. No work being performed at time of alerts.	13-Jan
13-Jan	Points not found	Snow and fog. No work being performed at time of alerts.	13-Jan
14-Jan	Communication error alerts	Power outage. No work being performed at time of alerts.	14-Jan
14-Jan	Points not found	Snow and fog. No work being performed at time of alerts.	14-Jan
15-Jan	Communication error alerts	Power outage. No work being performed at time of alerts.	15-Jan
16-Jan	Communication error alerts	Power outage. No work being performed at time of alerts.	16-Jan
17-Jan	Communication error alerts	Power outage. No work being performed at time of alerts. New batteries installed to reduce power outages.	17-Jan
18-Jan to 19-Jan	Points not found	Snow and fog. No work being performed at time of alerts.	19-Jan
24-Jan	P32R regression limit	Single event. No sign of movement after inspection. Believed to be a data error.	24-Jan
25-Jan to 26-Jan	Points not found	Snow and fog. No work being performed at time of alerts.	26-Jan
28-Jan	B7300-1 not found	Single event during daytime and fair weather. No work being performed at time of alerts.	28-Jan
30-Jan to 31-Jan	Points not found	Fair weather during alerts. No sign of movement. Spotter used during alerts. Equipment malfunction.	31-Jan

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 total 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.

Table 3 Prism Summary

Prism ID	Cumulative Transverse Displacement (ft)	Cumulative Height Displacement (ft)	Monthly Delta (ft)	Cumulative Delta (ft)	Notes / Recommendations
BR1	-0.020	-0.425	0.0191	0.8047	Recorded slope creep movements
BR3	-0.055	-0.107	0.0232	0.1206	Recorded slope creep movements
CP6	-0.010	-0.026	0.0033	0.0280	
CP7	0.053	0.012	-0.0477	0.0590	
P2	-0.007	-0.019	-0.0106	0.0226	
P25	-0.004	0.014	-0.0238	0.0177	
P32R	-0.051	0.020	0.0111	0.0551	
P33	0.088	-0.016	0.0079	0.1142	
P5	-0.006	-0.015	-0.0074	0.0162	
P70	0.023	-0.044	0.0033	0.0607	
NP4	0.018	-0.065	0.0145	0.1165	
B7200-1	-0.028	0.008	0.0096	0.0359	
B7200-2	0.007	-0.018	0.0084	0.0490	
B7200-3	0.142	-0.070	0.0093	0.2042	
B7300-0	-0.074	-0.098	0.0219	0.1285	
B7300-1	-0.130	-0.127	0.0294	0.2636	
B7300-2	-0.010	-0.119	0.0287	0.1886	
B7300-3	0.100	-0.114	0.0399	0.2071	
B7300-4	0.077	-0.062	0.0436	0.1172	
B7400-1	-0.005	-0.024	0.0296	0.0357	New prism
B7400-2	0.000	-0.025	0.0181	0.0255	New prism
B7400-3	-0.003	-0.023	0.0241	0.0282	New prism
B7400-4	0.020	-0.015	0.0104	0.0320	New prism
B7400-5	-0.014	-0.016	0.0143	0.0239	New prism

The data show stable conditions with no movements at the 24 prisms with recorded displacements limited to data scatter and not actual movements. Prisms BR1 and BR3 are located above the landslide, and these prisms previously recorded slope creep movements at slow velocity. This settlement was likely related to loose fill or landslide material consolidating under its own weight. The continued rise of the buttress fill elevation may have halted these slope creep movements. The prisms placed on the buttress slope continue to show signs of settlement. A small amount of settlement is common for newly placed compacted fill. Plots of the transverse and height displacements for each prism are included in Appendix B.

4.0 DRONE SURVEY

The site was flown for aerial imagery using an unmanned aircraft system (UAS or 'drone') on January 24, 2024. 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 January topography was also compared to the December 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 primarily excavated from the Upper Borrow Area and placed in the Buttress 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 from September 2023 to present. In the month of January 2024, the contractor placed and compacted 55,000 yd^3 of material on the buttress floor. All of this material was from the Upper Borrow Area and was either pushed down by dozers or hauled by scrapers. All fill is moisture conditioned as necessary and then 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 11 compaction tests. There were 15 compaction tests taken in January. As of January 24, 2024, when the site was surveyed, a total of approximately 2,909,000 yd^3 had been placed and compacted. This required at least 582 compaction tests, and 1,156 tests have been taken. All tests in January met the minimum compaction requirement of 90%.

6.0 RECLAMATION PROGRESS

Castle Aggregate 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 approach is being used to complete the reclamation process (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)

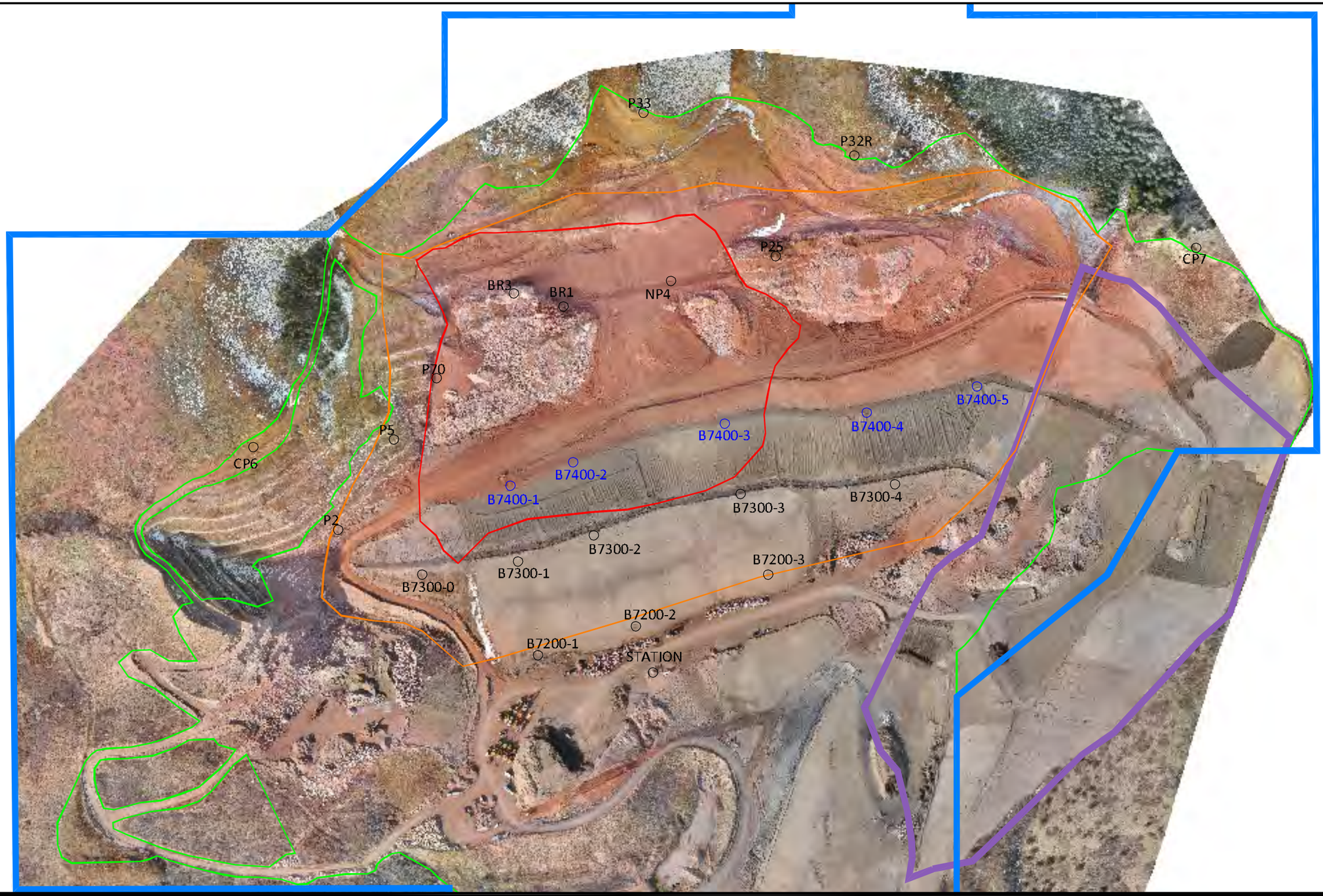
Task/Milestone	Estimated Dates
Phase 1 – Issue RFP to Bidders	Completed June 2021
Phase 1 – RFP Evaluation & Recommendation	Completed July 2021
Phase 2 – Constructor Contract Award	Completed August 2023
Phase 3 – Project Kick-off with successful Contractor	Completed August 2023
Phase 4 – Contractor Mobilization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

Progress of activities this month:

- Earth moving activities and placement of compacted fill in the buttress area continued.
- Construction activities continued in the Upper Borrow Area.
- Replaced system batteries which has eliminate system outages due to power failures.
- Processing of riprap continued.
- Geotechnical monitoring continued.
- Topsoil placement occurred where fill placement has been completed.

Work planned for next month includes:

- Evaluate the fault and competent rock locations and identify design revisions (if applicable). This evaluation will be used to determine if a Technical Revision is required.
- Mobilize blasting crews for operations on the south peak of the Upper Borrow Area.
- Continue placing compacted fill in the buttress area.
- Continue processing riprap.
- Continue placing topsoil where grading has been completed.
- Continue geotechnical monitoring.
- Continue to remove and replace prisms on an as-needed basis.



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'

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Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
SITE MAP

Revision
#

Date
2024.02.29

Drawn By
PK

Figure No.
1

7.0 CONCLUSIONS

The data collected in January 2024 demonstrate compliance with the reclamation grading plan. The buttress fill is being placed and compacted as intended and specified.

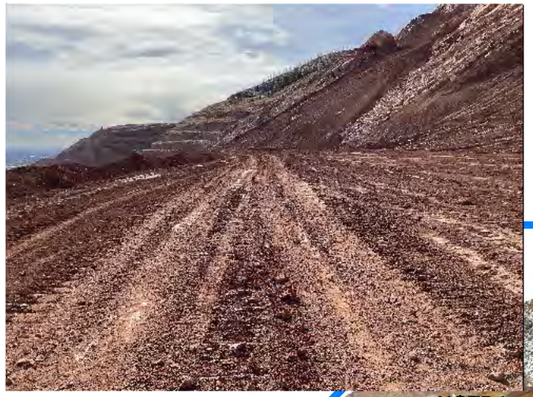
None of the data collected in January 2024 indicate evidence of any large-scale movements that increase risk to workers or to the public. Shallow surface erosion continues to occur requiring ongoing maintenance and cleanup.

- 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.

Appendix A

Visual Inspections

6. VIEW SOUTHEAST.



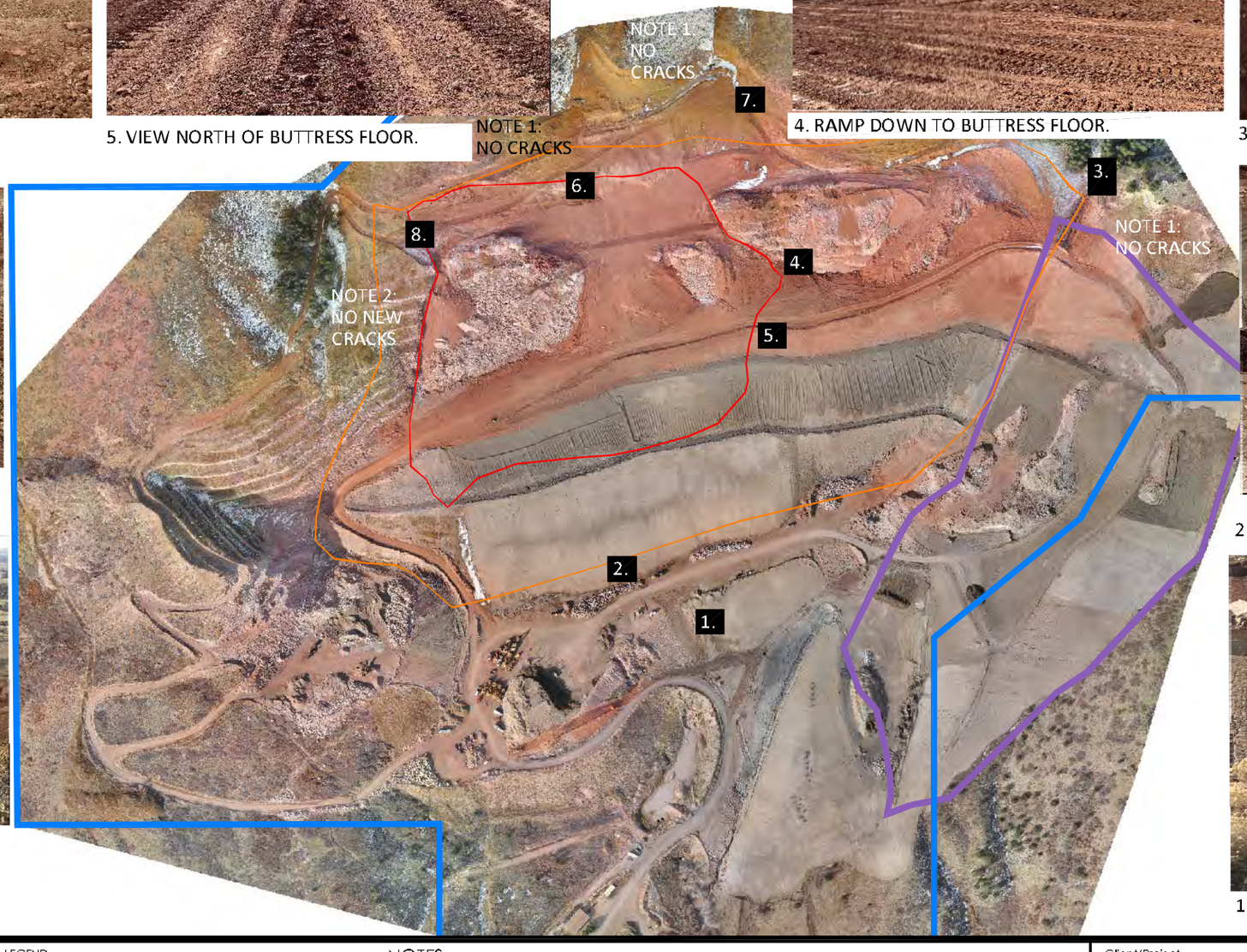
5. VIEW NORTH OF BUTTRESS FLOOR.

4. RAMP DOWN TO BUTTRESS FLOOR.

3. CULVERT PARTIALLY EXCAVATED.

7. WILDLIFE POND ALONG HAUL ROAD

8. VIEW TO EAST FROM P33 LOCATION.



2. SCREENED GRAVEL AND RIPRAP STOCKPILE.

1. DOZER REPAIRING EROSION GULLY.

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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 ON JANUARY 22, 2024.

N

0 400' 800'

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
OBSERVATIONS FROM JANUARY INSPECTION

Revision
#

Date
2024.02.29

Drawn By
PK

Figure No.
2

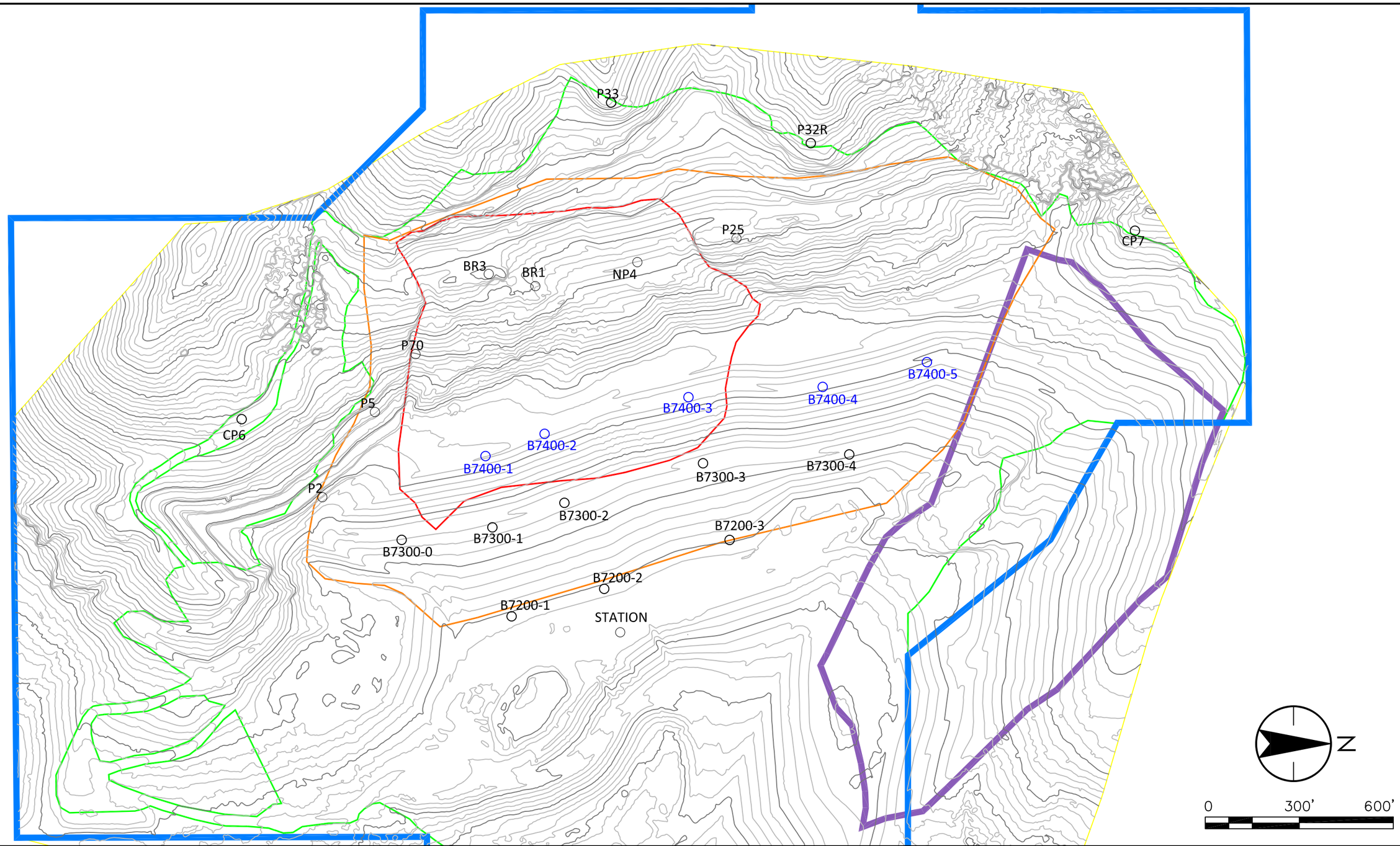
Stantec

Table A-1 Summary of Daily Inspections

Date	Notes	Inspection By
1-Jan-24	No work.	Not applicable
2-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
3-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
4-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
5-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
6-Jan-24	No work.	Not applicable
7-Jan-24	No work.	Not applicable
8-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
9-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
10-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
11-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
12-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
13-Jan-24	No work.	Not applicable
14-Jan-24	No work.	Not applicable
15-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
16-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
17-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
18-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
19-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
20-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
21-Jan-24	No work.	Not applicable
22-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
23-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
24-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
25-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
26-Jan-24	No movement observed. No work due to weather.	Jerald Schnabel
27-Jan-24	No work.	Not applicable
28-Jan-24	No work.	Not applicable
29-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
30-Jan-24	No movement observed. Good to proceed.	Jerald Schnabel
31-Jan-24	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 JANUARY 24, 2024 DRONE SURVEY.
4. CONTOUR INTERVAL IS 10 FEET

Client/Project
CASTLE AGGREGATE

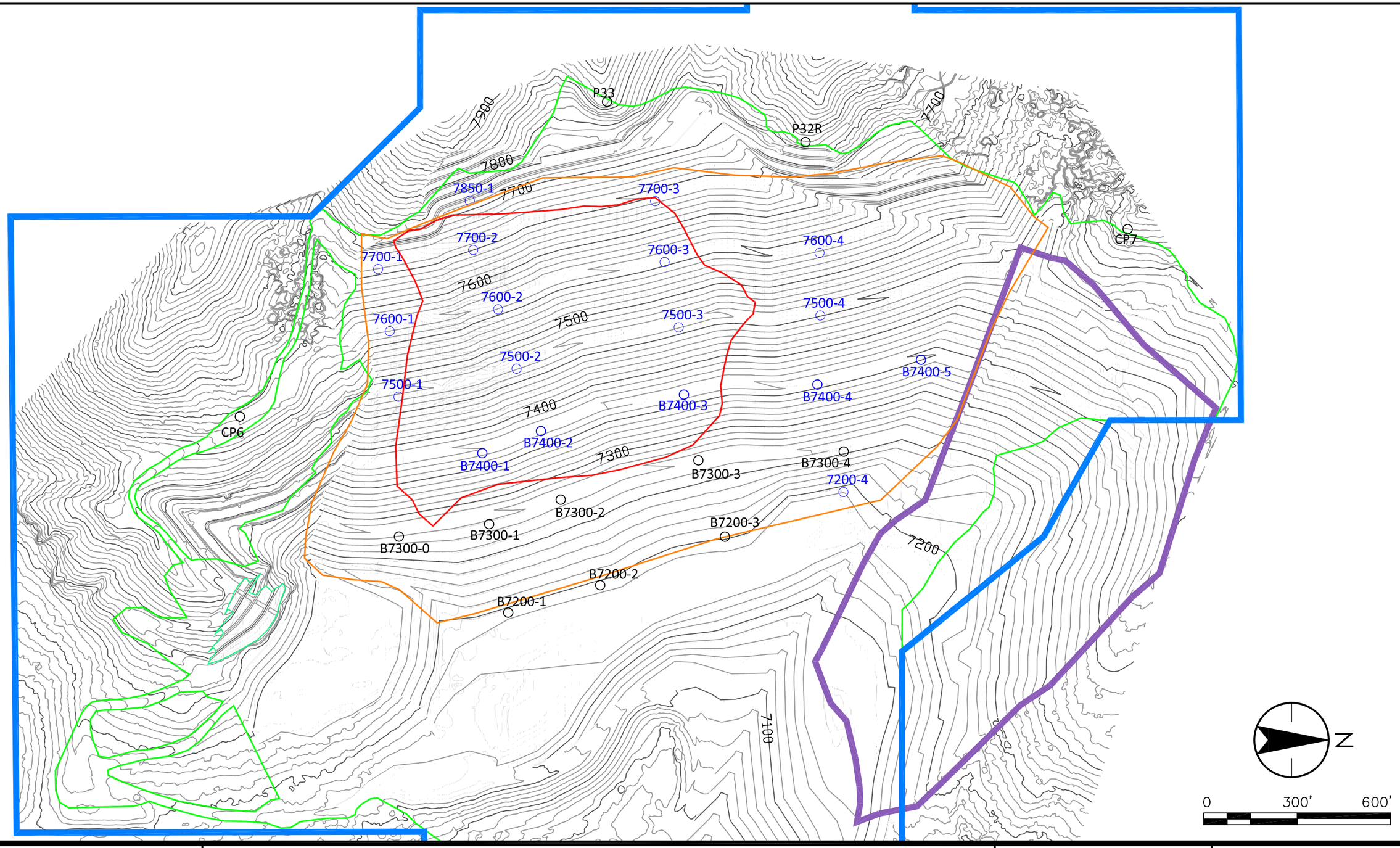
PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
EXISTING PRISMS WITH CURRENT SURFACE

Revision	Date
#	2024.02.29

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
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
PROPOSED PRISMS WITH RECLAMATION SURFACE

Revision	Date
#	2024.02.29
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
BR2	20-Oct-23	Prism Removed	Reclamation grading in Upper Borrow Area affected prim
B7300-4	6-Nov-23	Prism Added	New Prism Added
NP4	6-Nov-23	Prism Added	New Prism Added
BR3	6-Nov-23	Prism Added	New Prism Added
NP66	15-Nov-23	Prism Removed	Reclamation grading to affect prism in near future
B7400-1	Jan-24	Prism Added	New Prism Added
B7400-2	Jan-24	Prism Added	New Prism Added
B7400-3	Jan-24	Prism Added	New Prism Added
B7400-4	Jan-24	Prism Added	New Prism Added
B7400-5	Jan-24	Prism Added	New Prism Added

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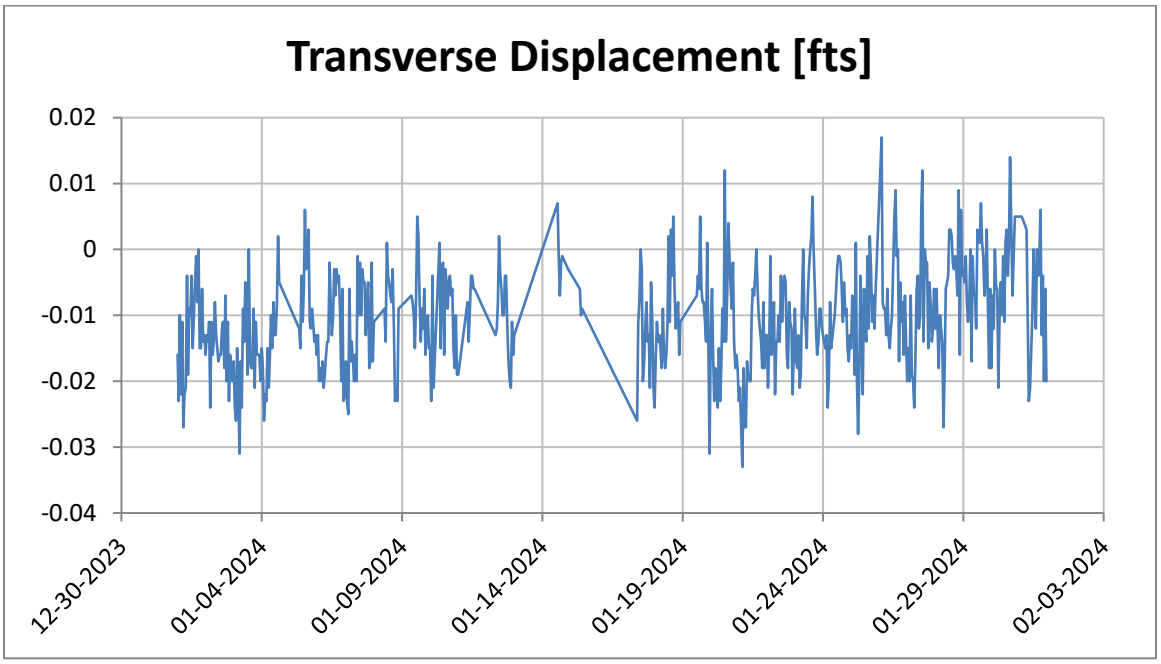
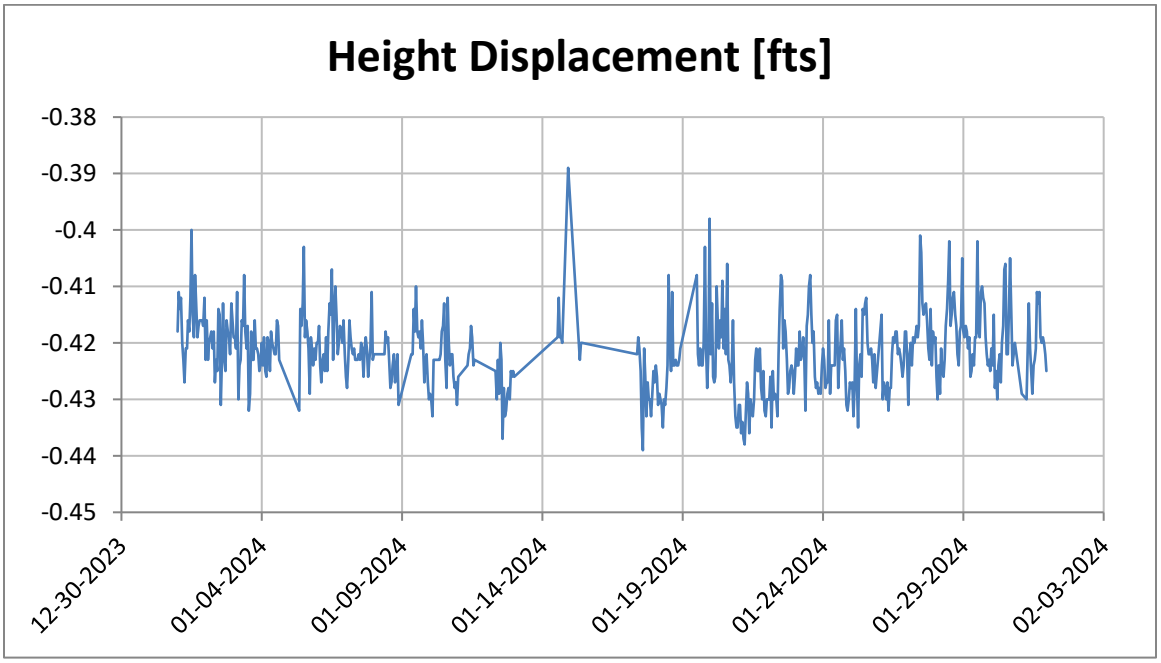
Prism BR1





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 previously recorded slope creep movements.

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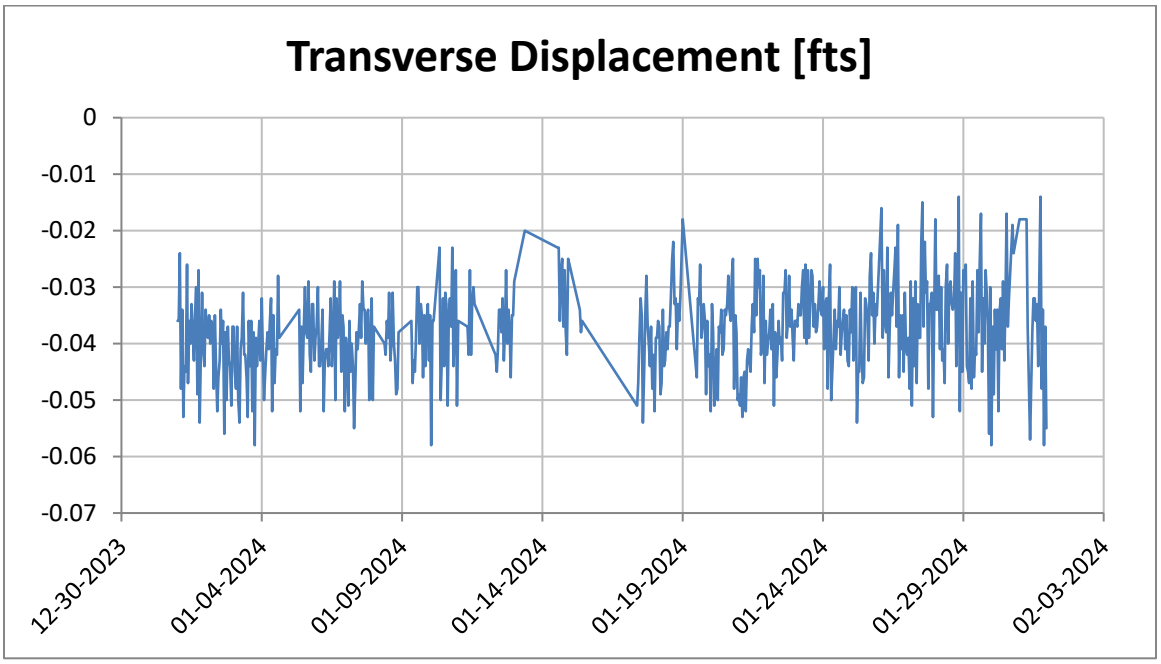
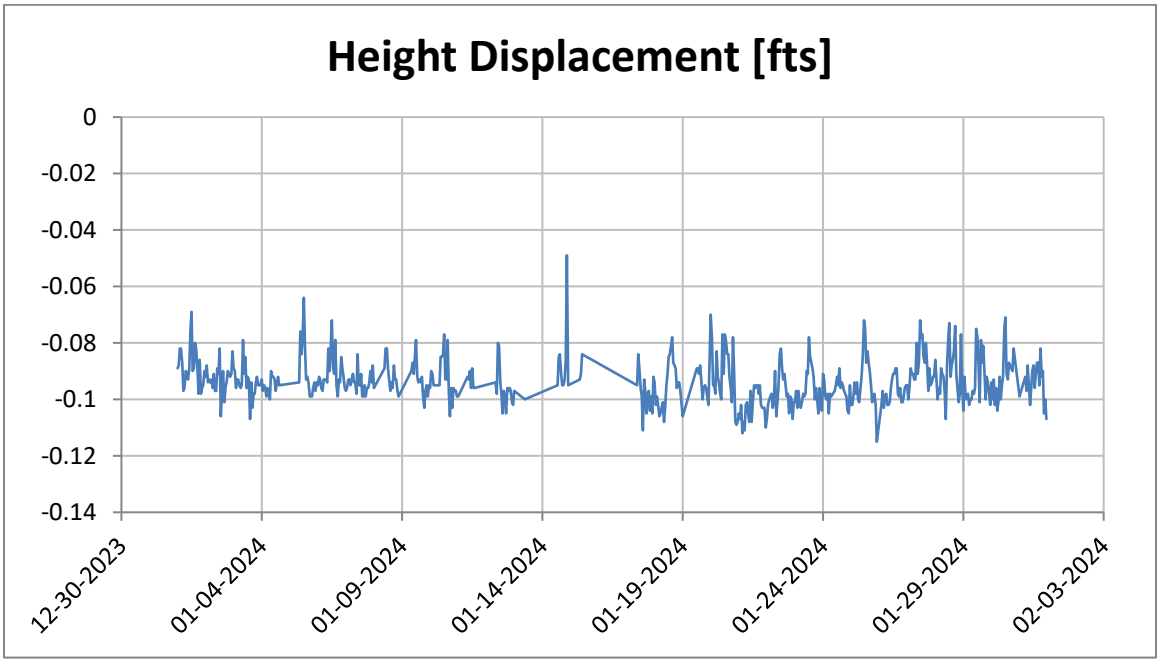
Prism BR3



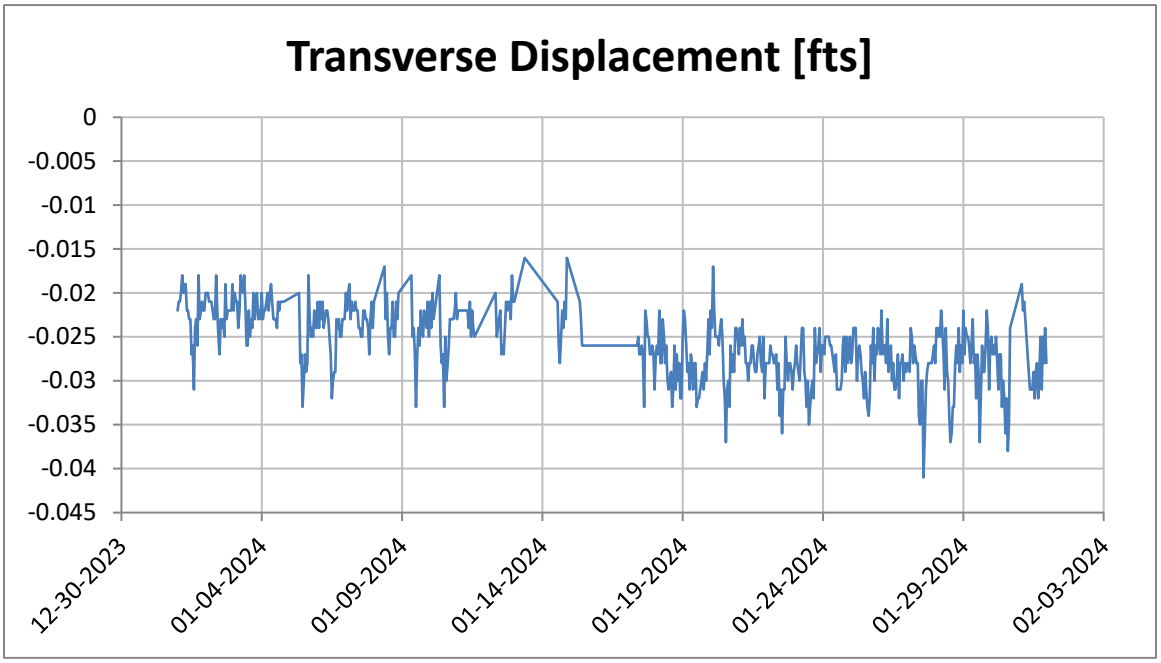


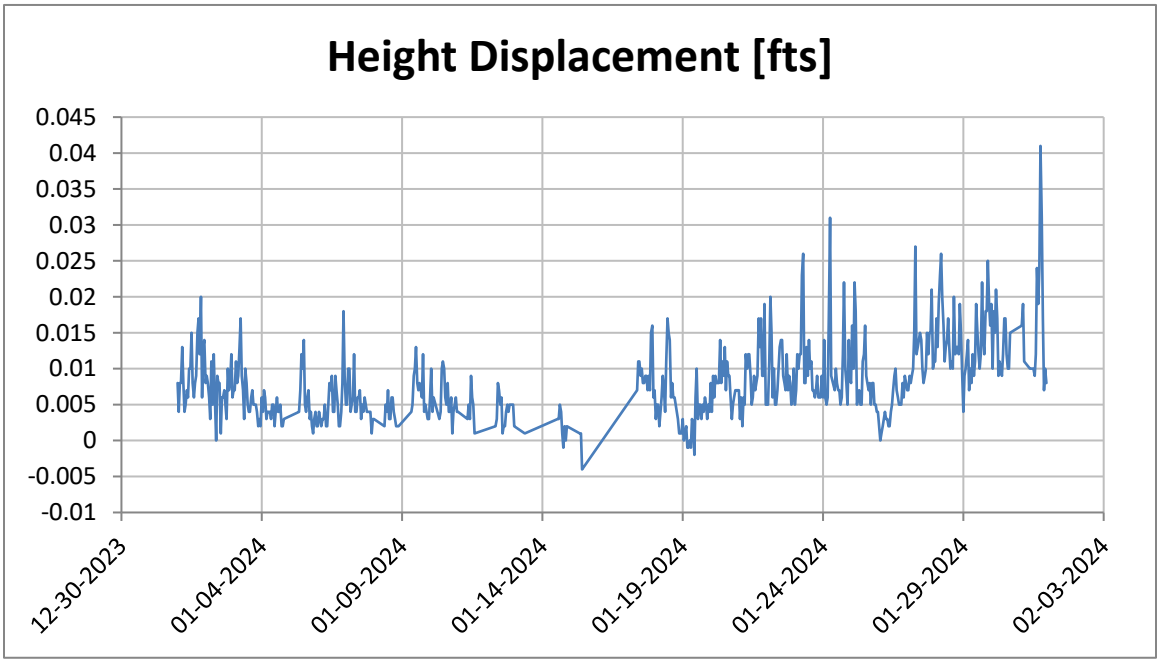
Notes:

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 previously recorded slope creep movements.

Stantec

Prism B7200-1



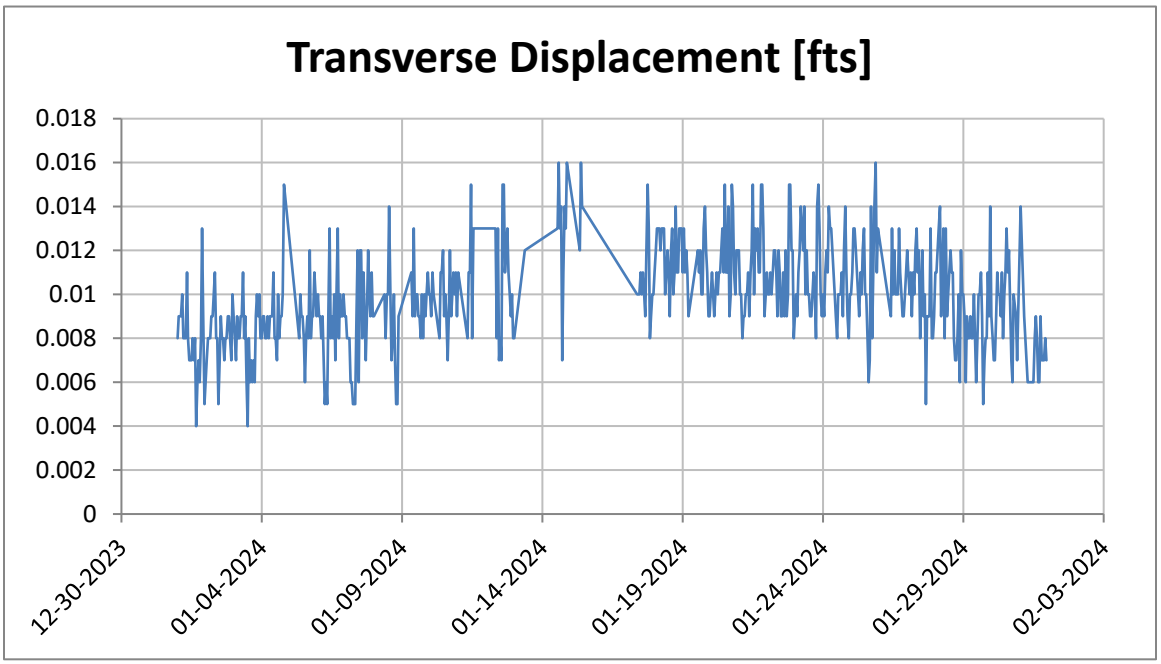


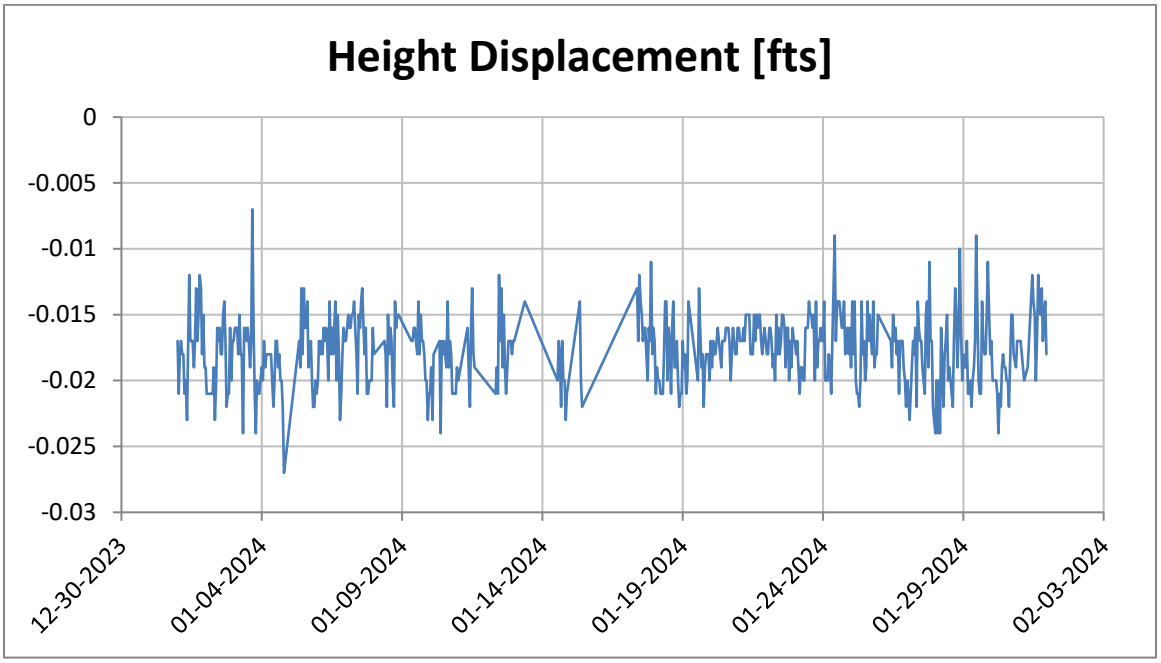
Notes:

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



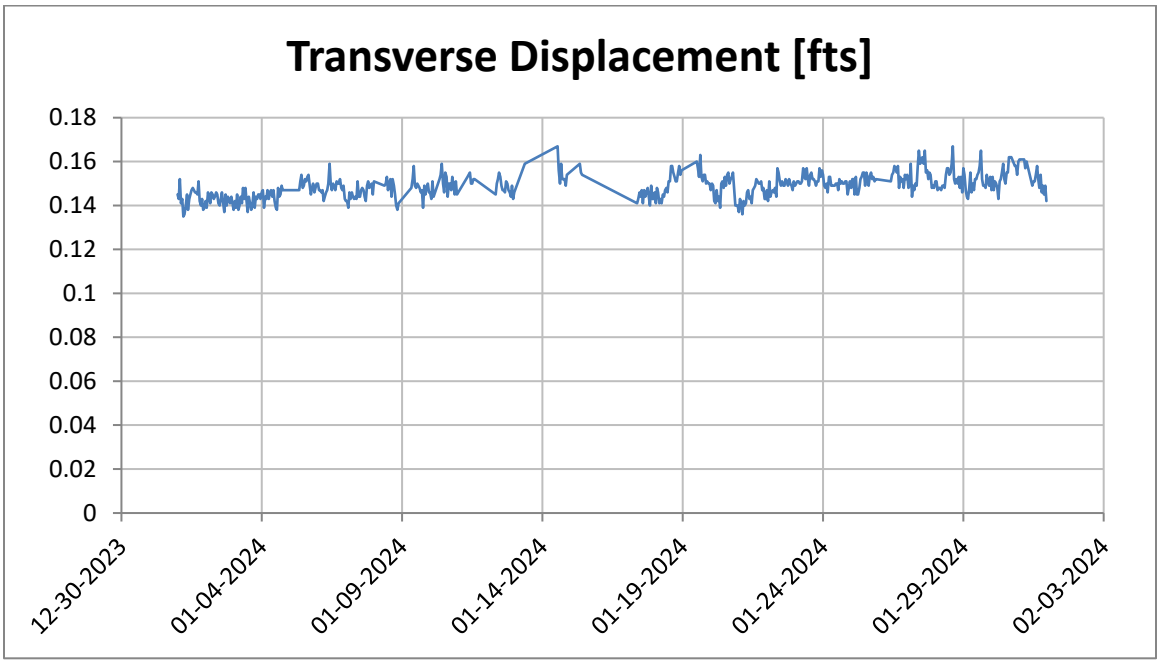


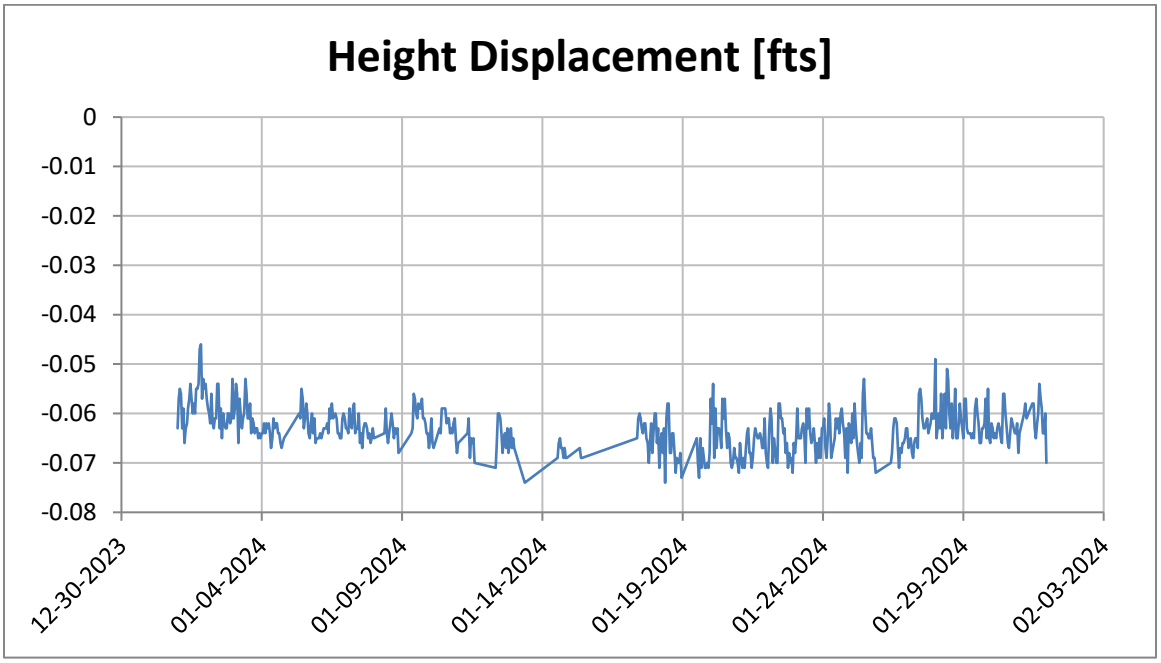
Notes:

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



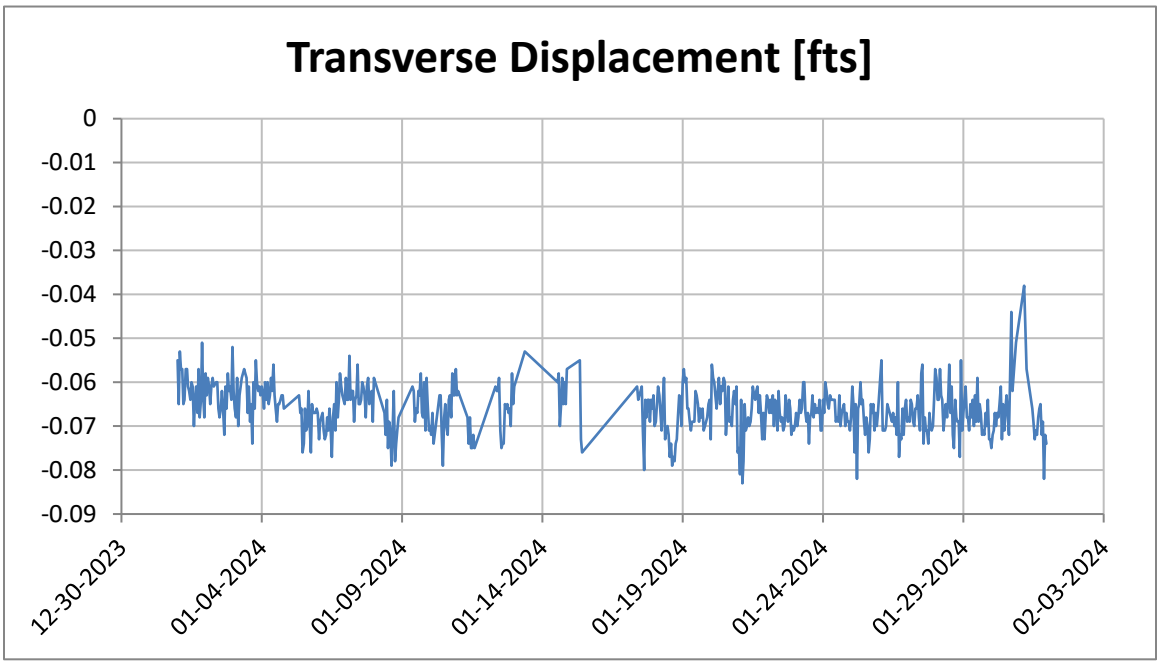


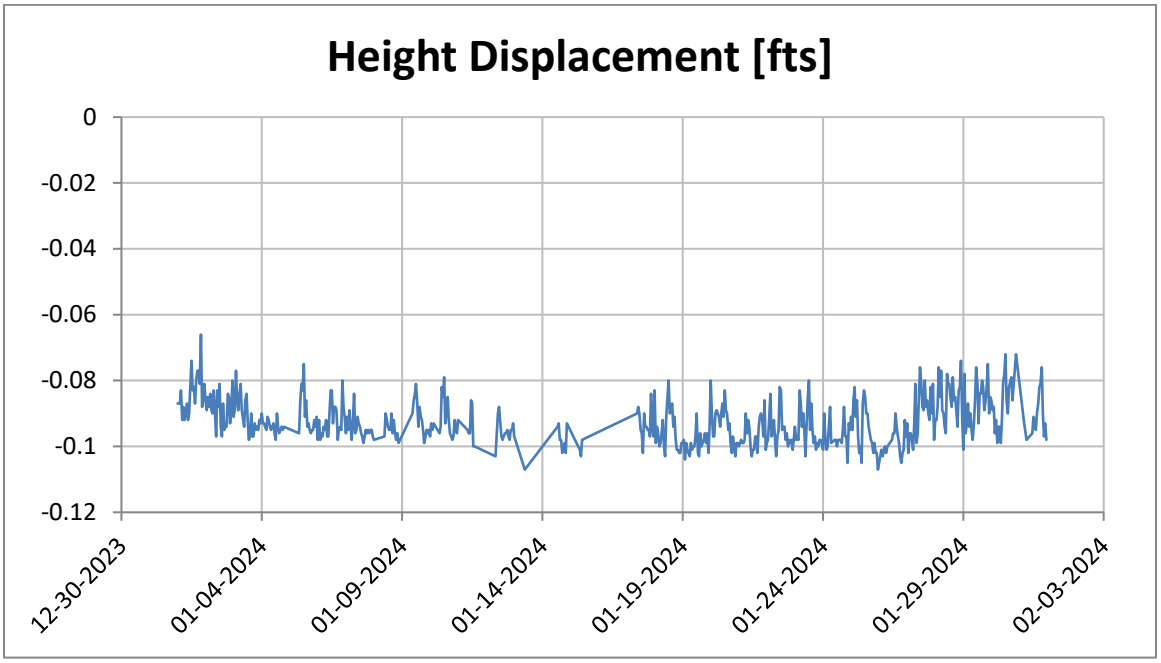
Notes:

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



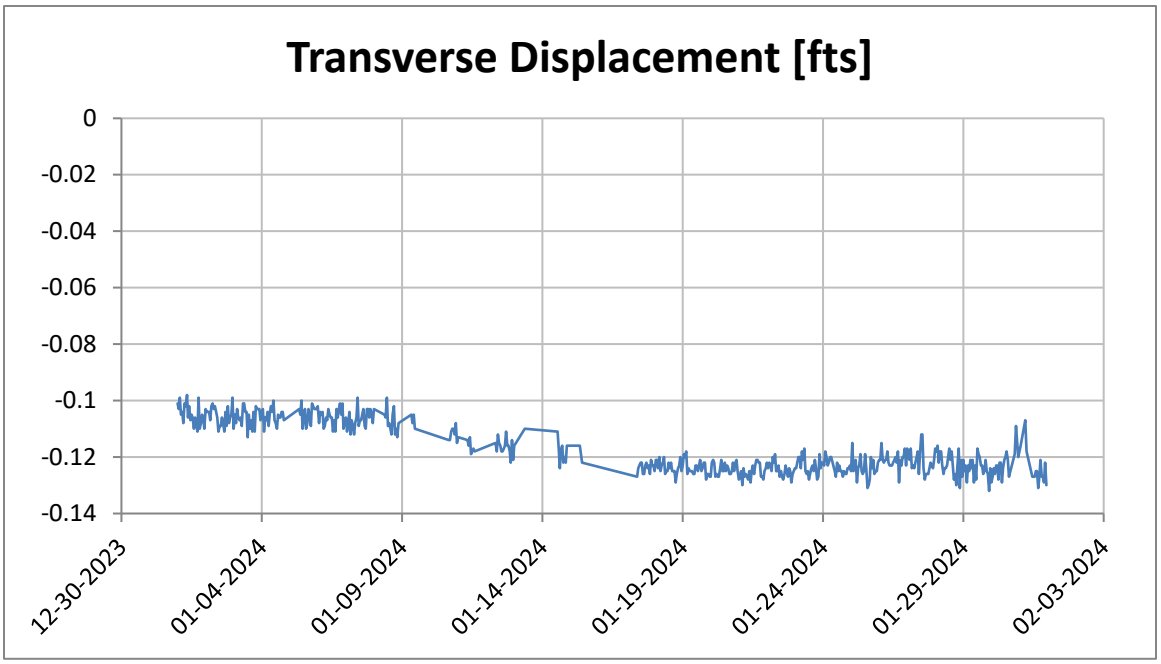


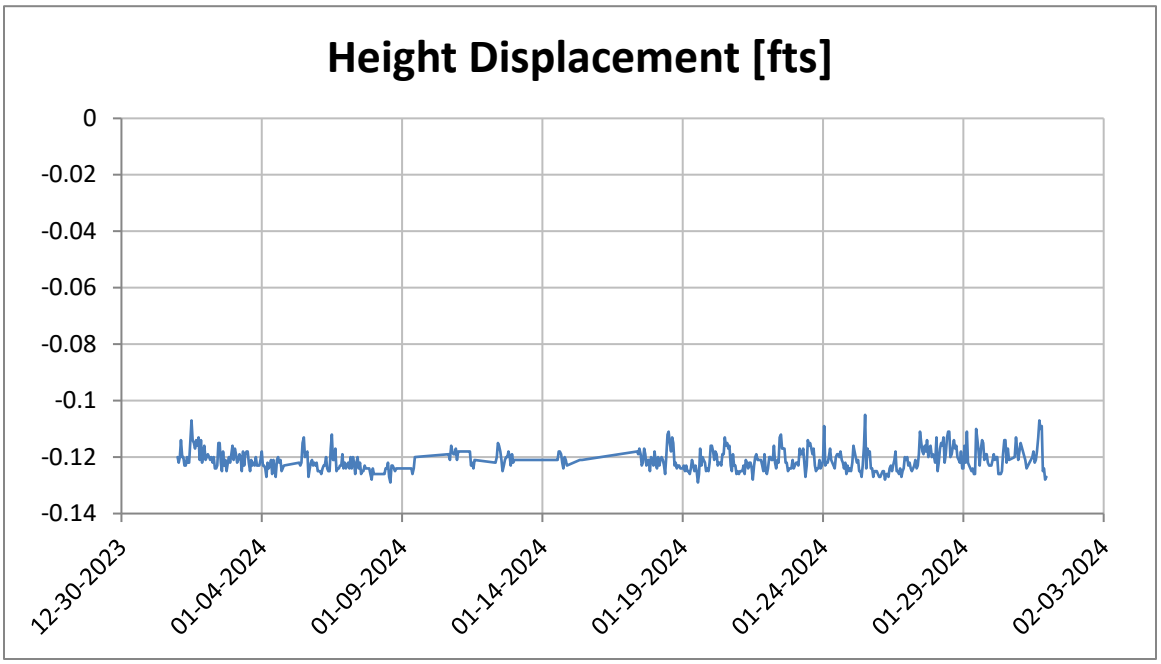
Notes:

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.

Stantec

Prism B7300-1



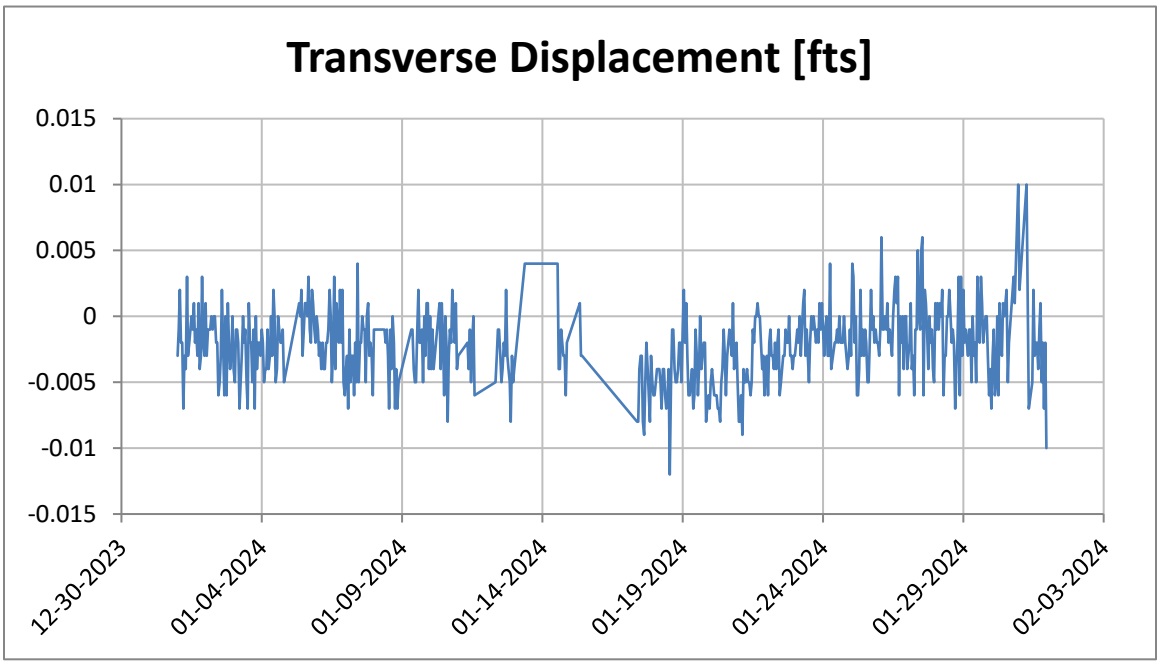


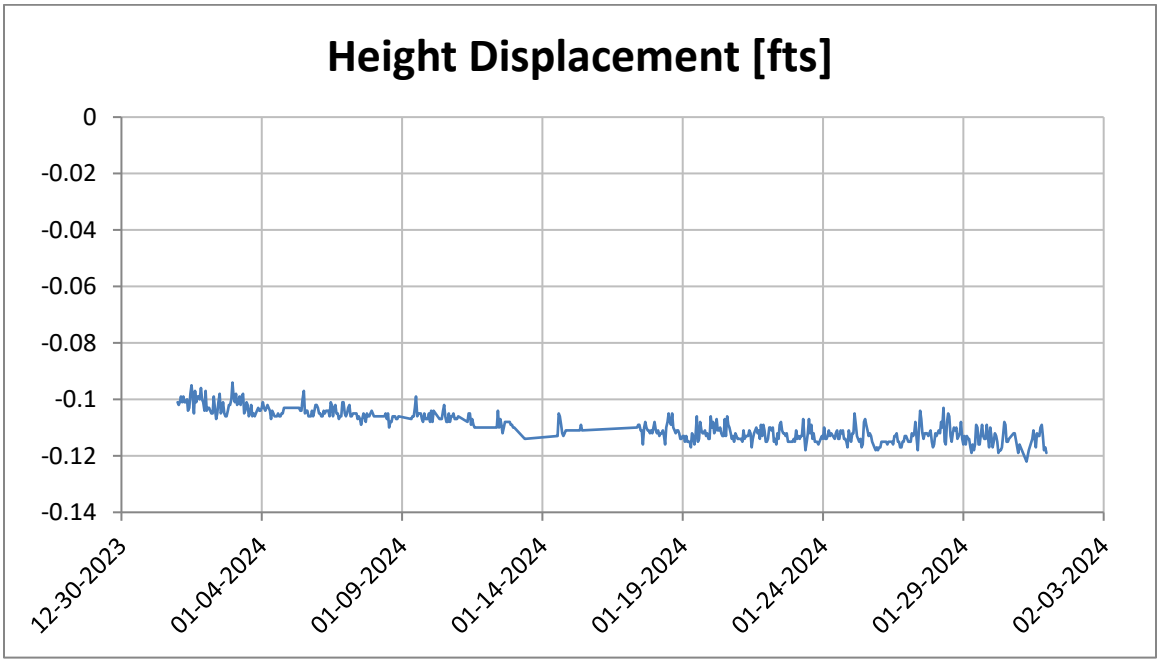
Notes:

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.

Stantec

Prism B7300-2



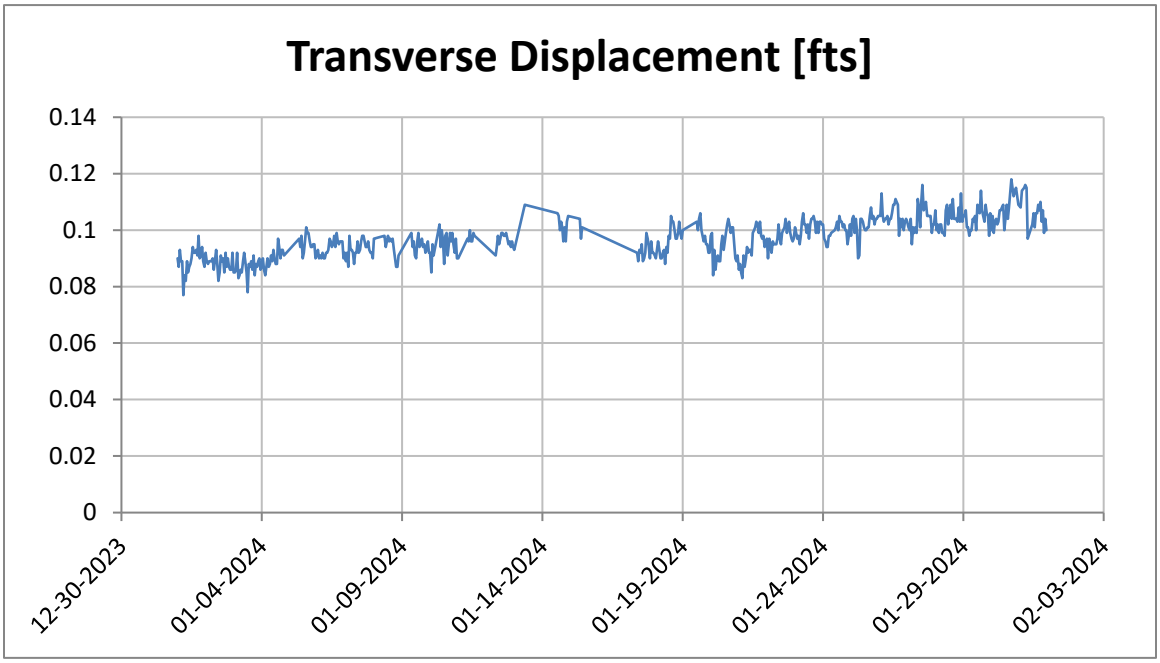


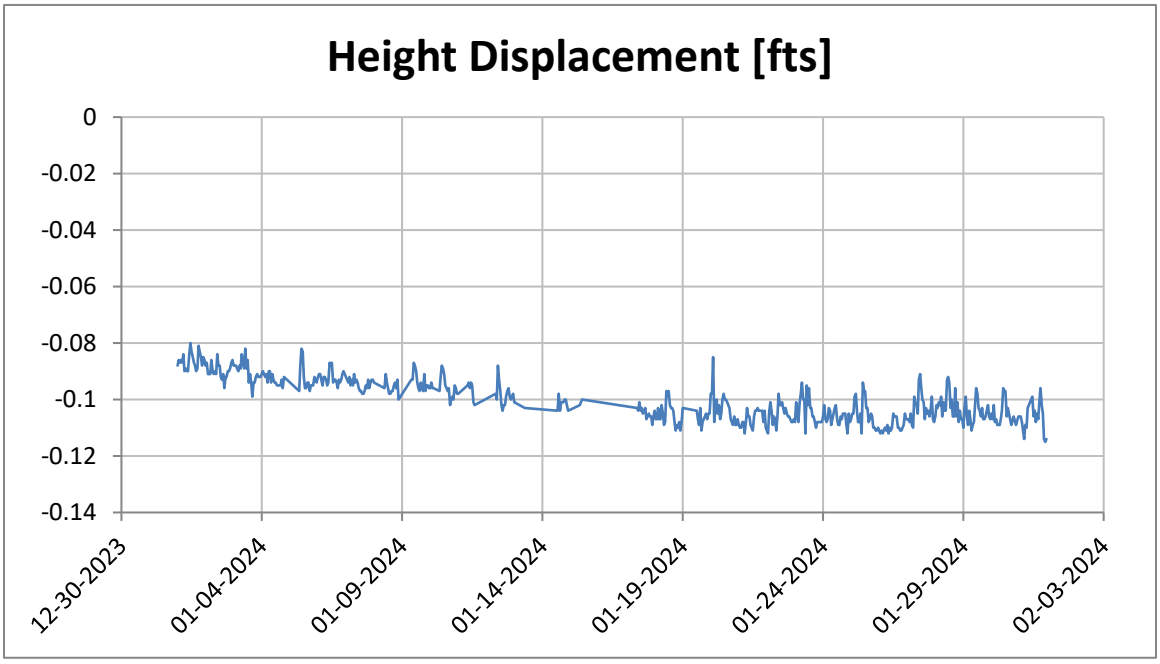
Notes:

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.

Stantec

Prism B7300-3



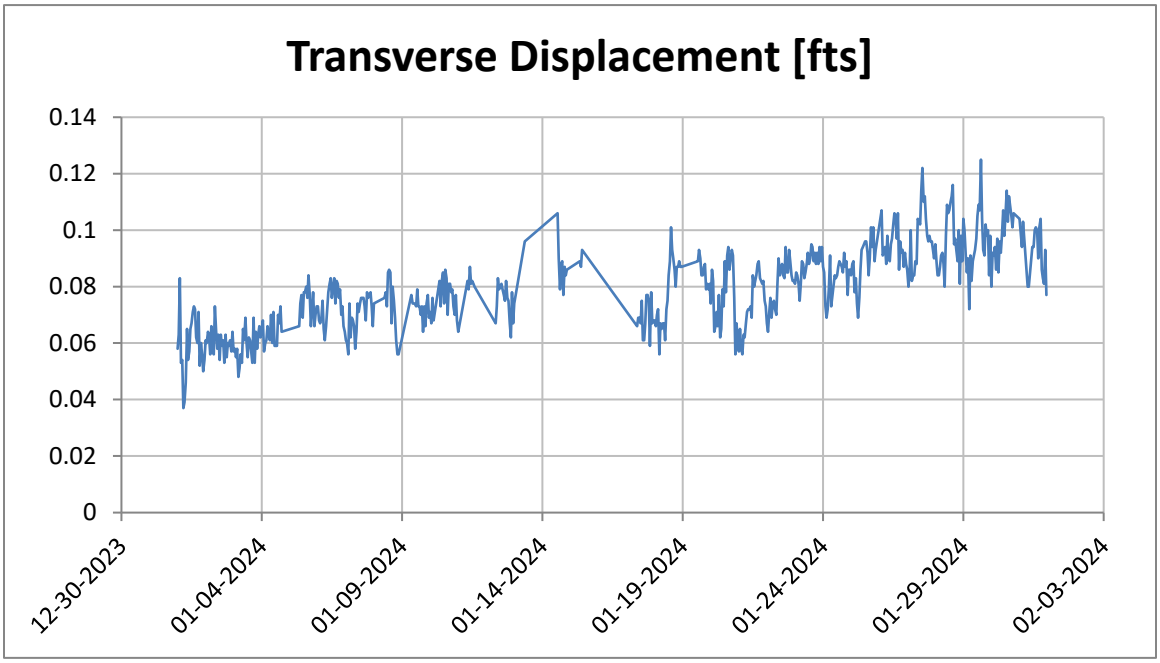


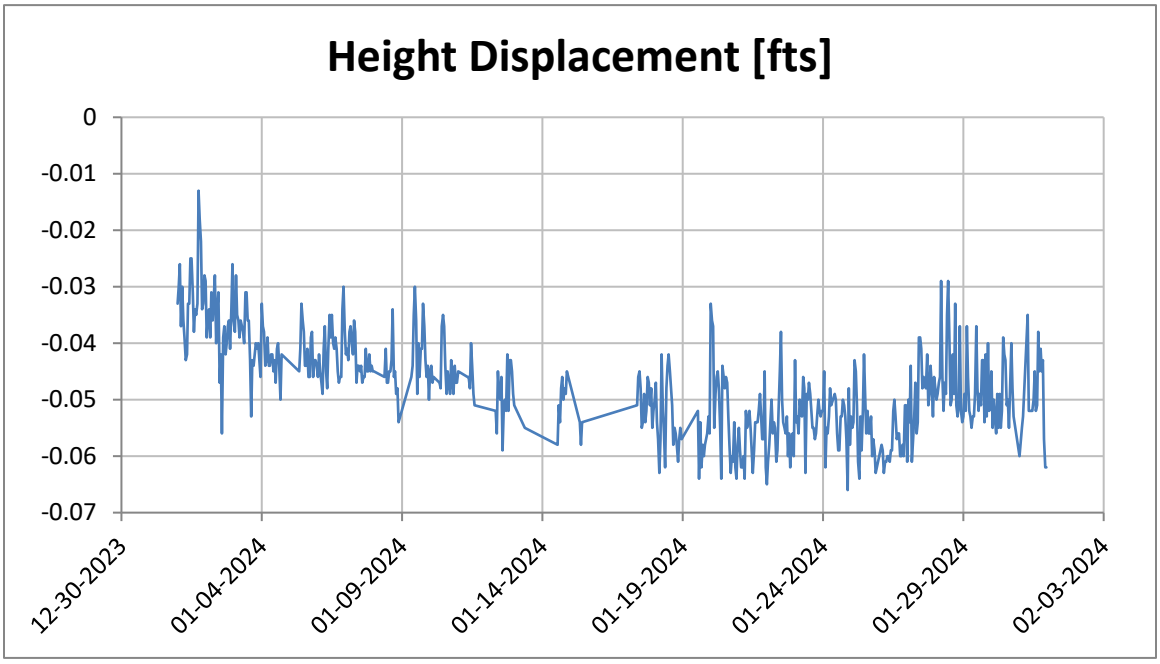
Notes:

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.

Stantec

Prism B7300-4



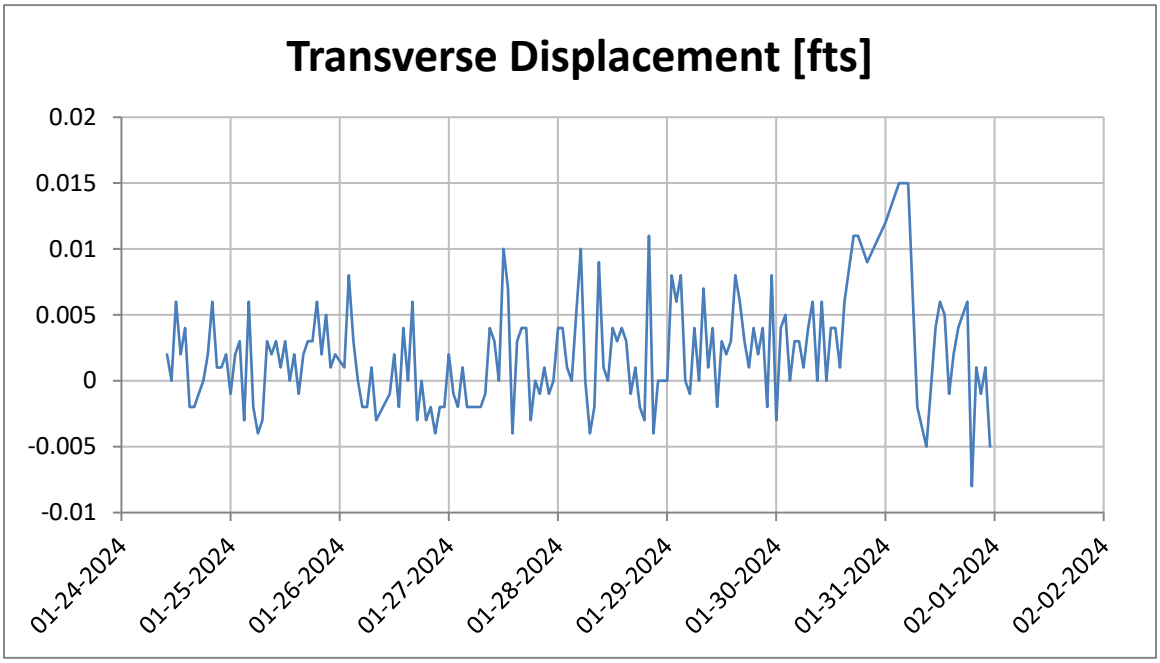


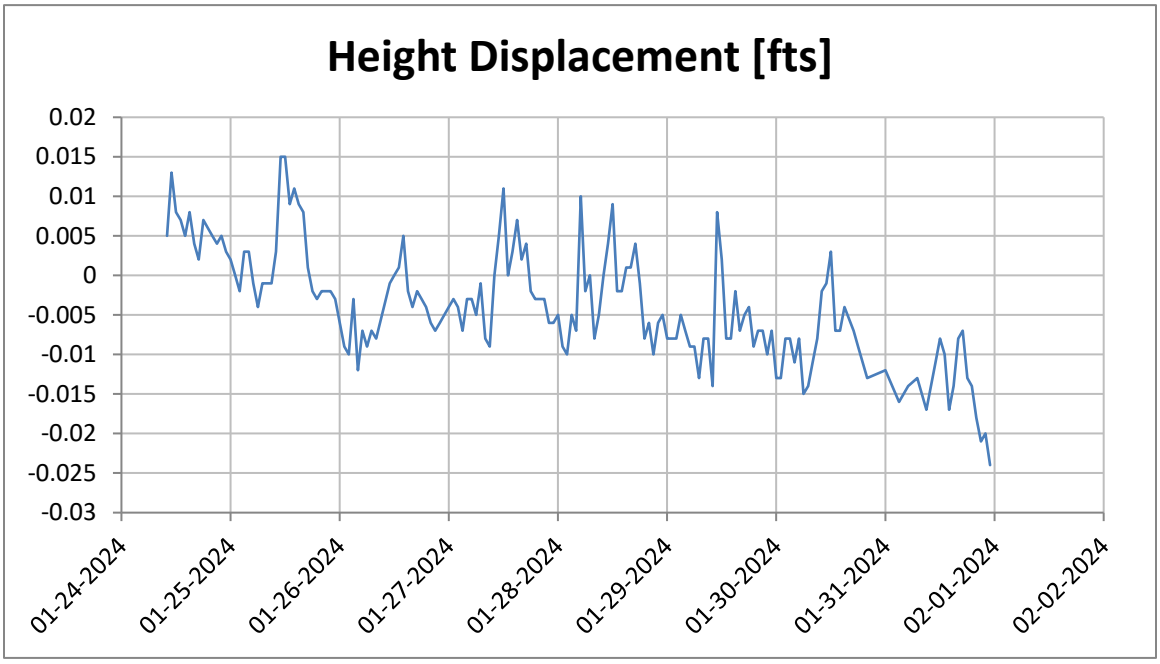
Notes:

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 B7400-1





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. New prism installed January 2024

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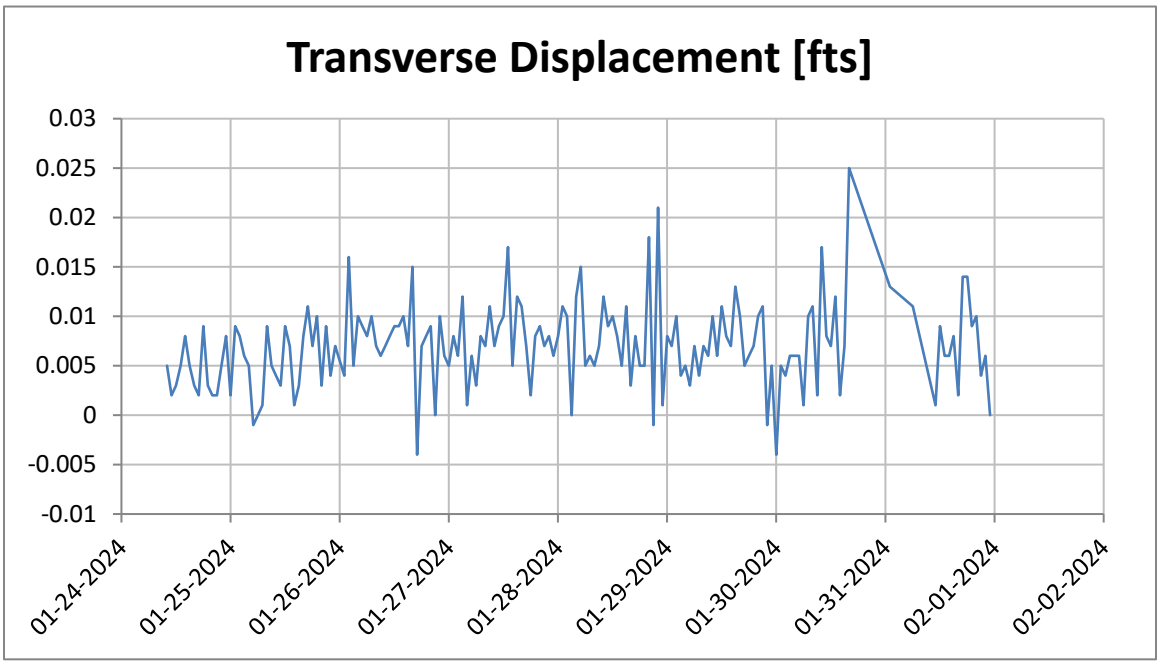
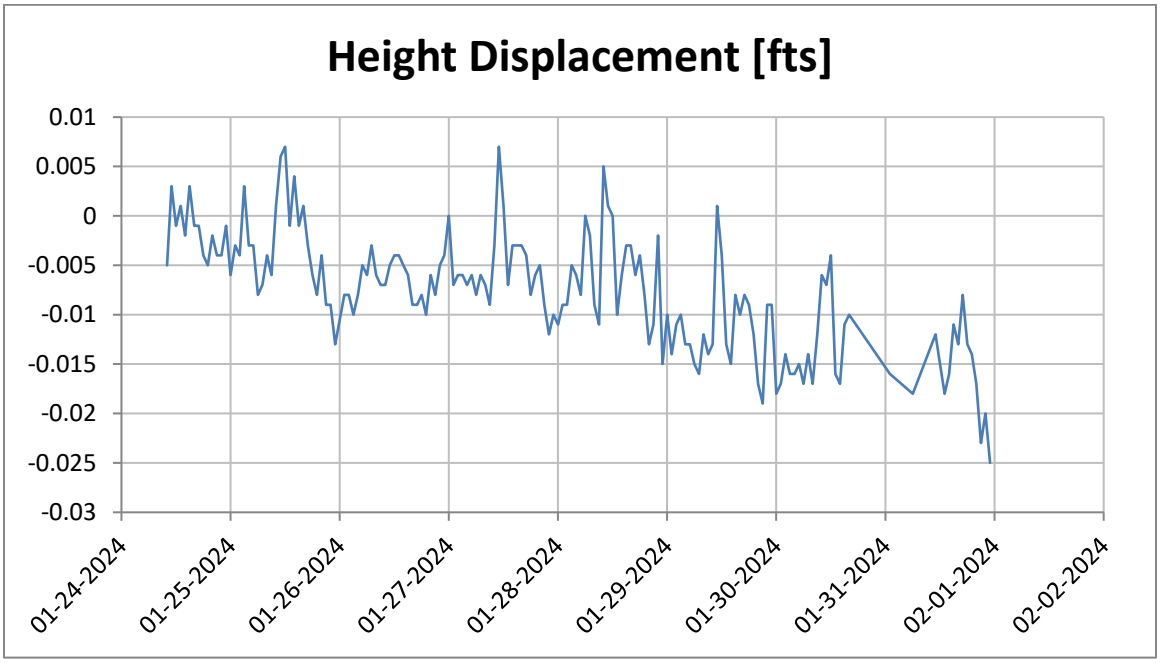
Stantec

Prism B7400-2





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. New prism installed January 2024

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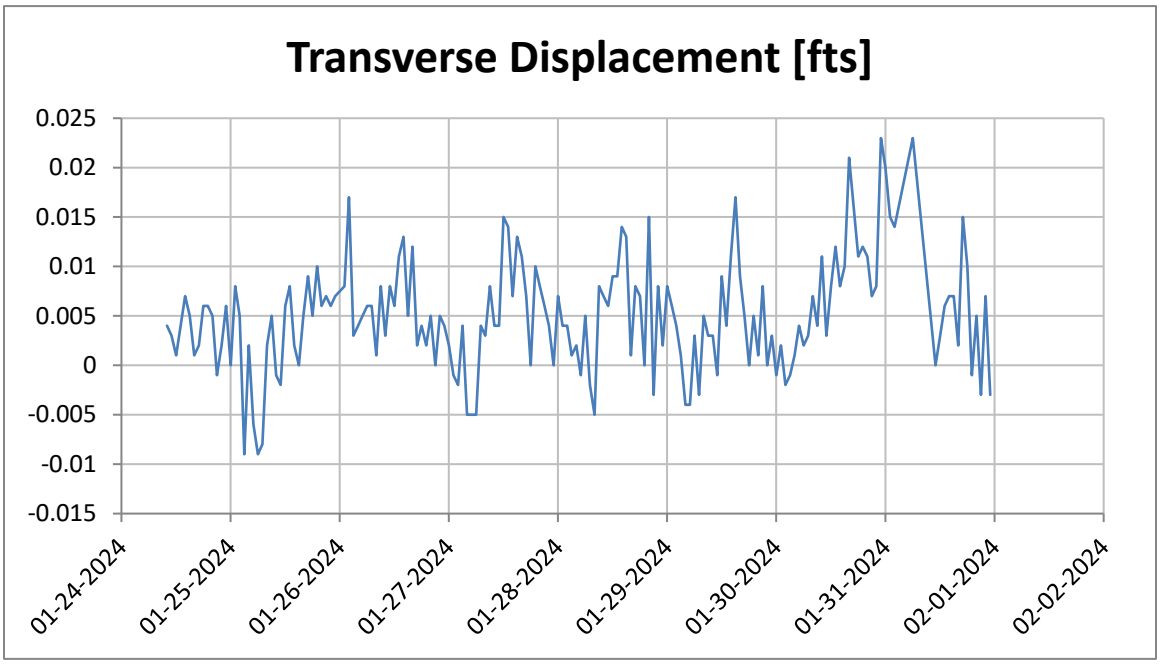
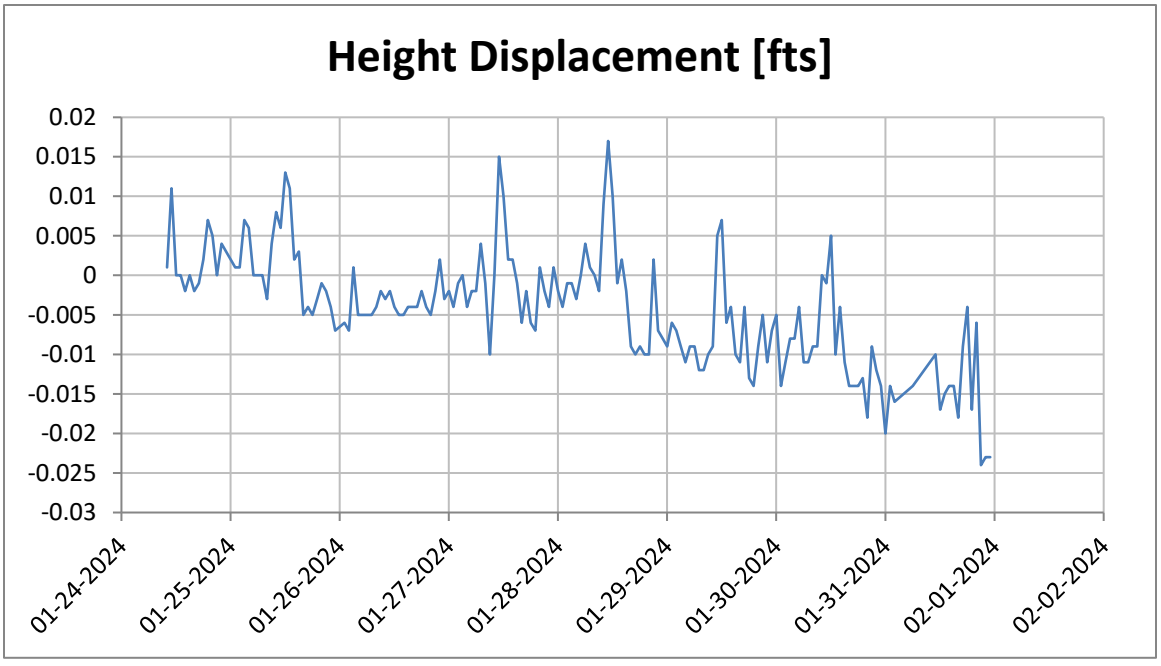
Stantec

Prism B7400-3





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. New prism installed January 2024

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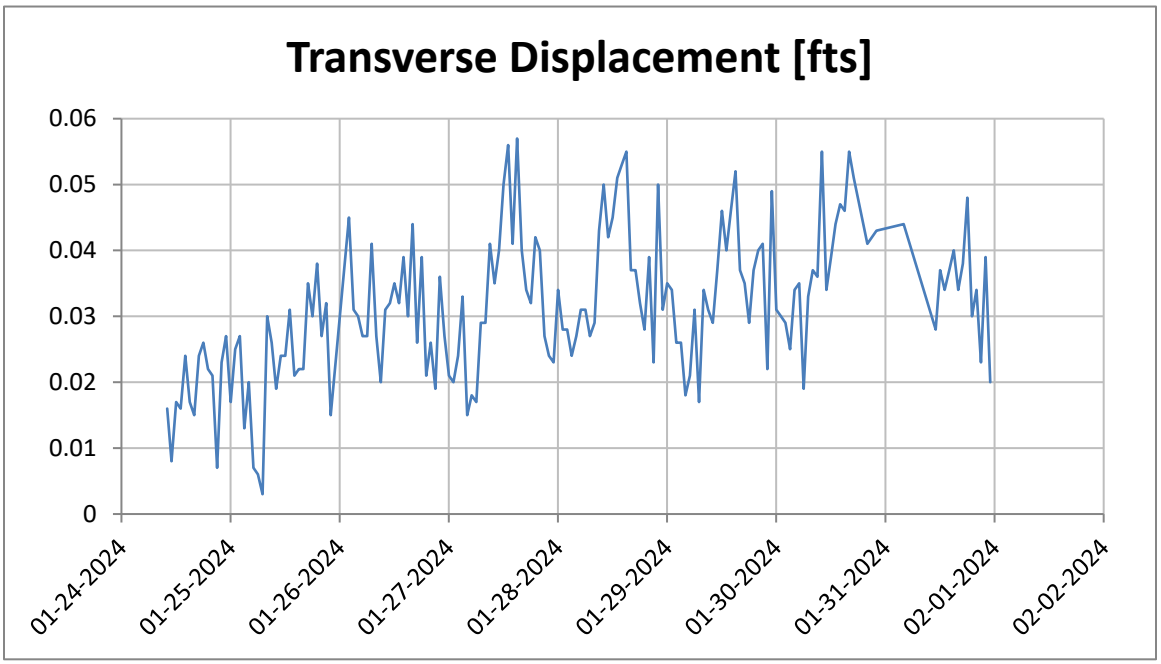
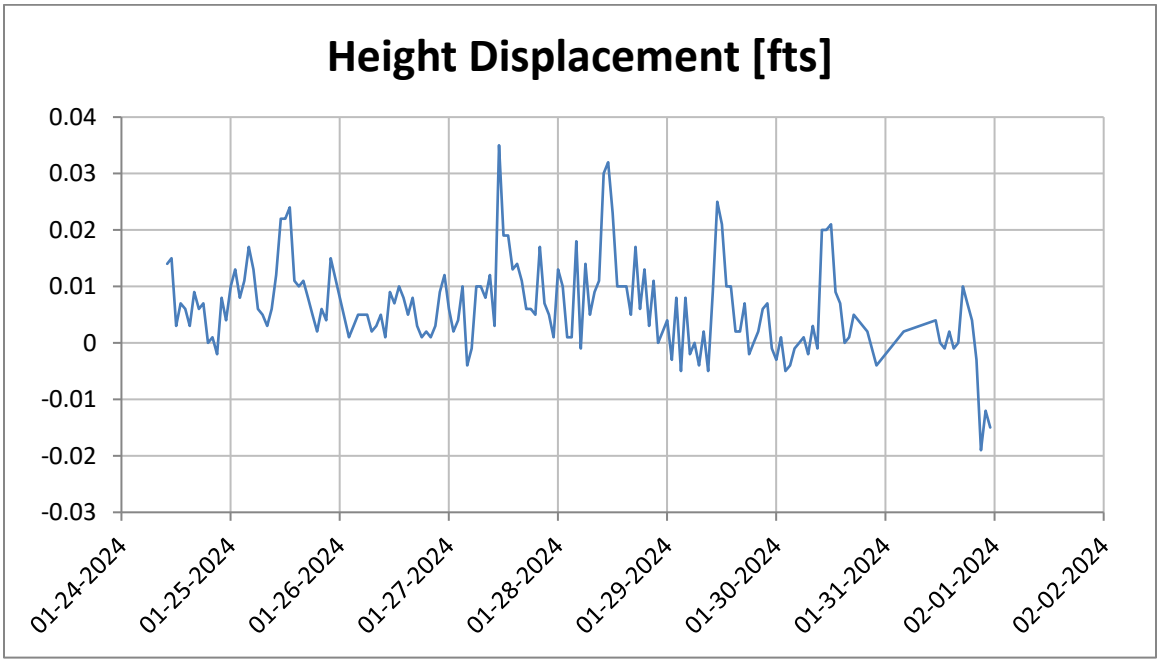
Stantec

Prism B7400-4



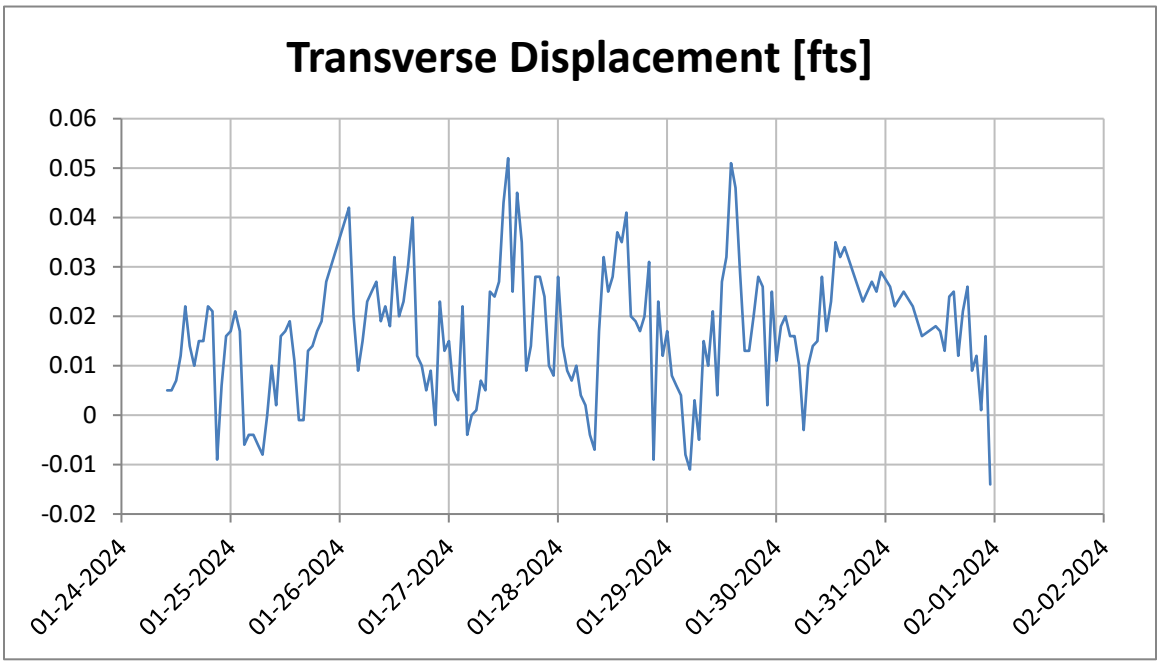


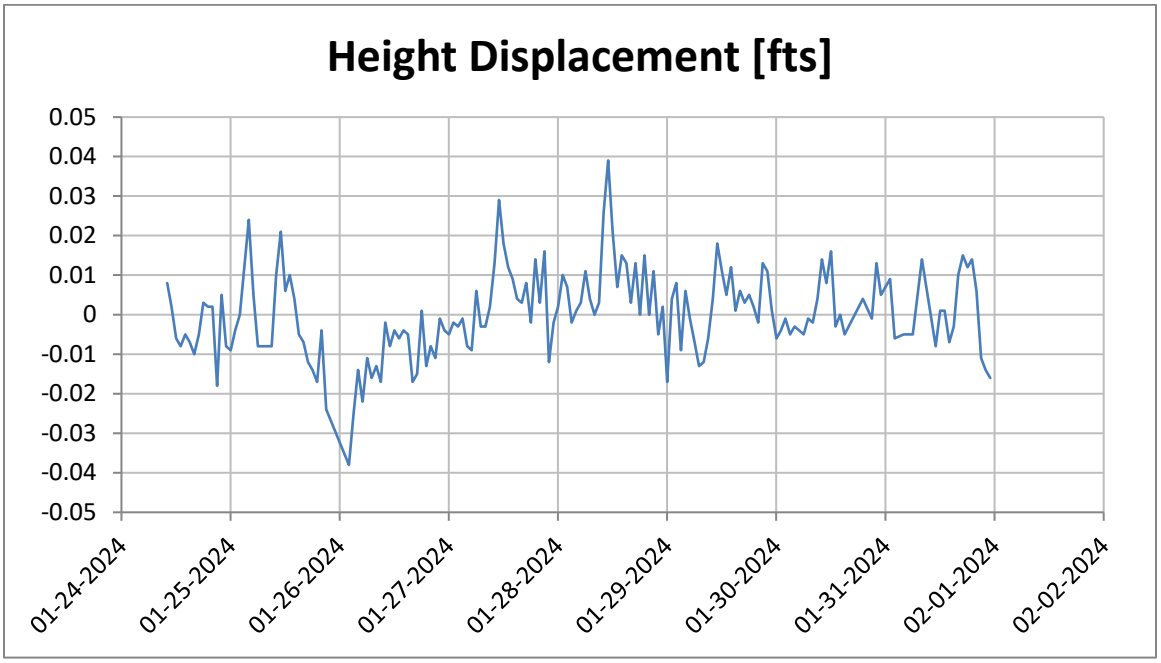
Notes:

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. New prism installed January 2024

Stantec

Prism B7400-5



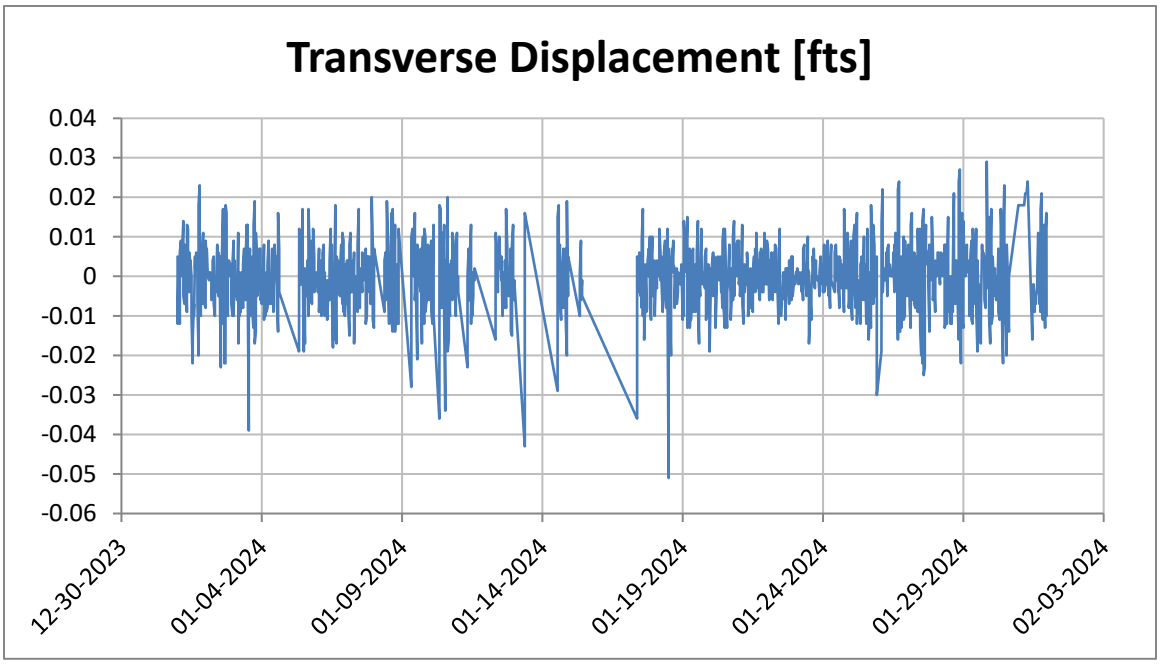


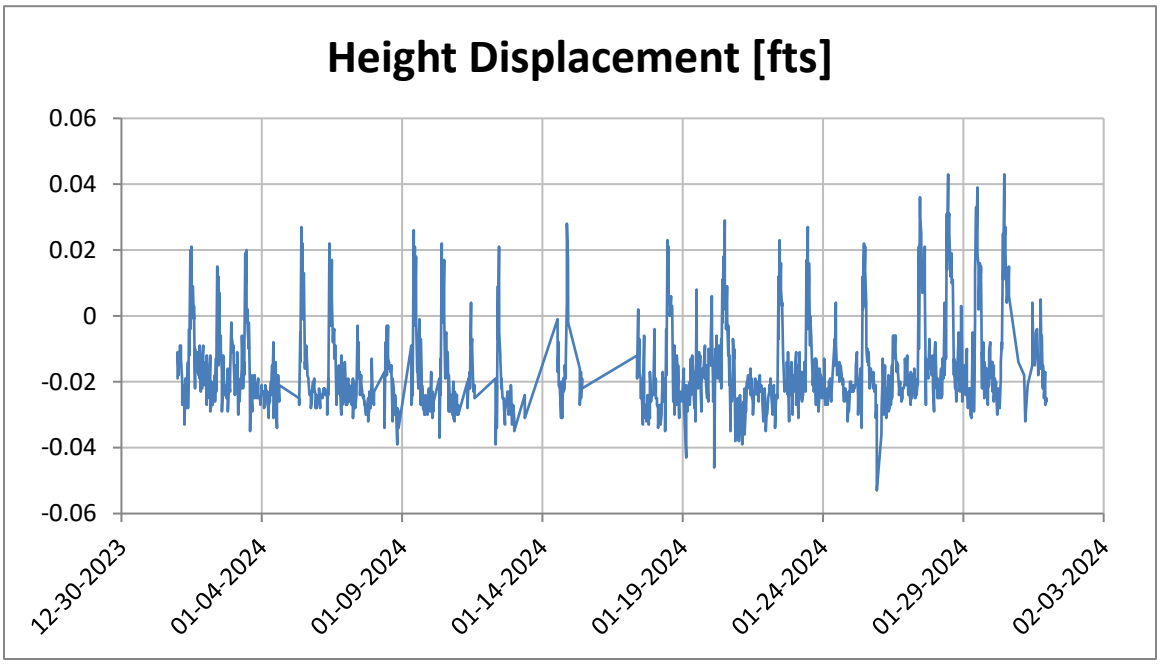
Notes:

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. New prism installed January 2024

Stantec

Prism CP6



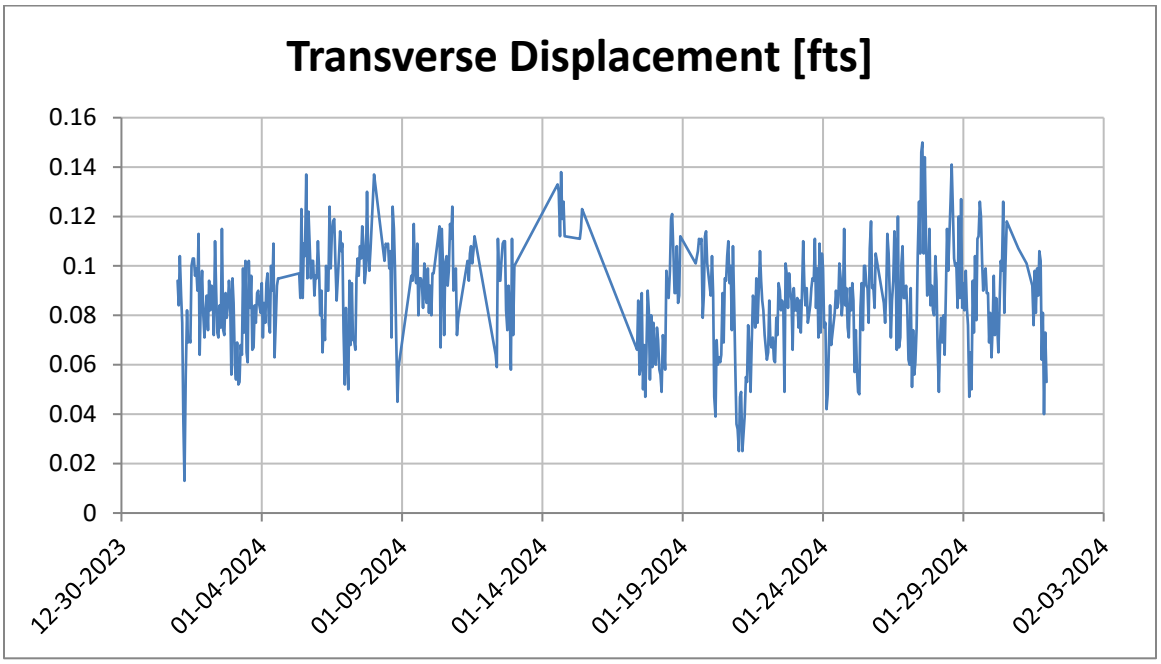


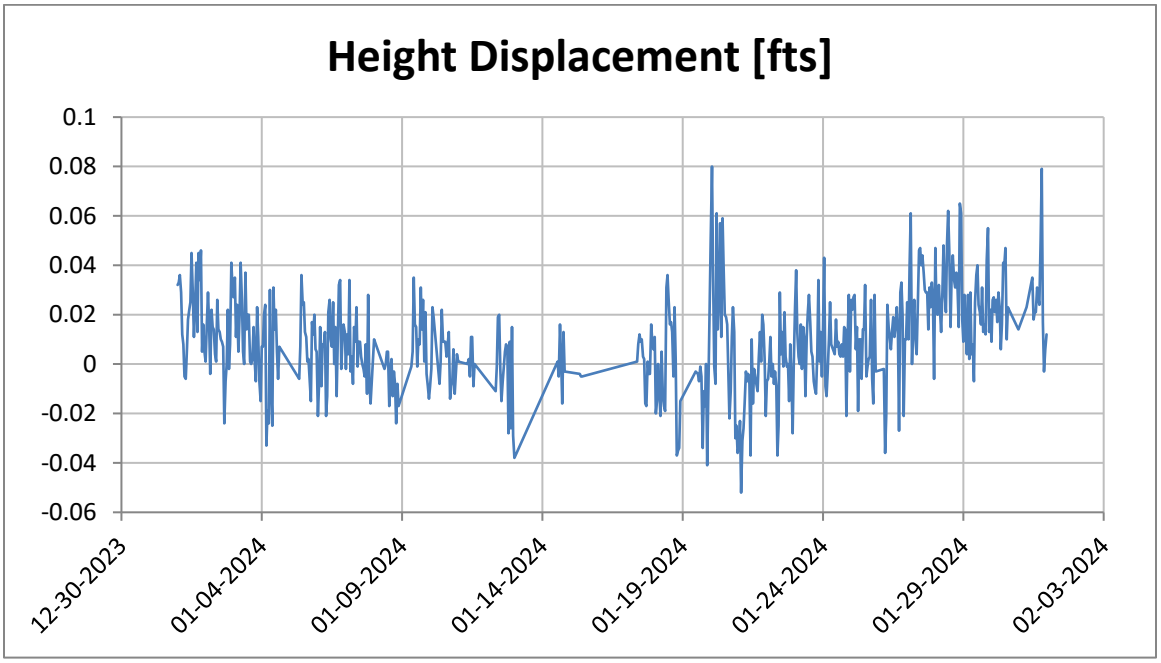
Notes:

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



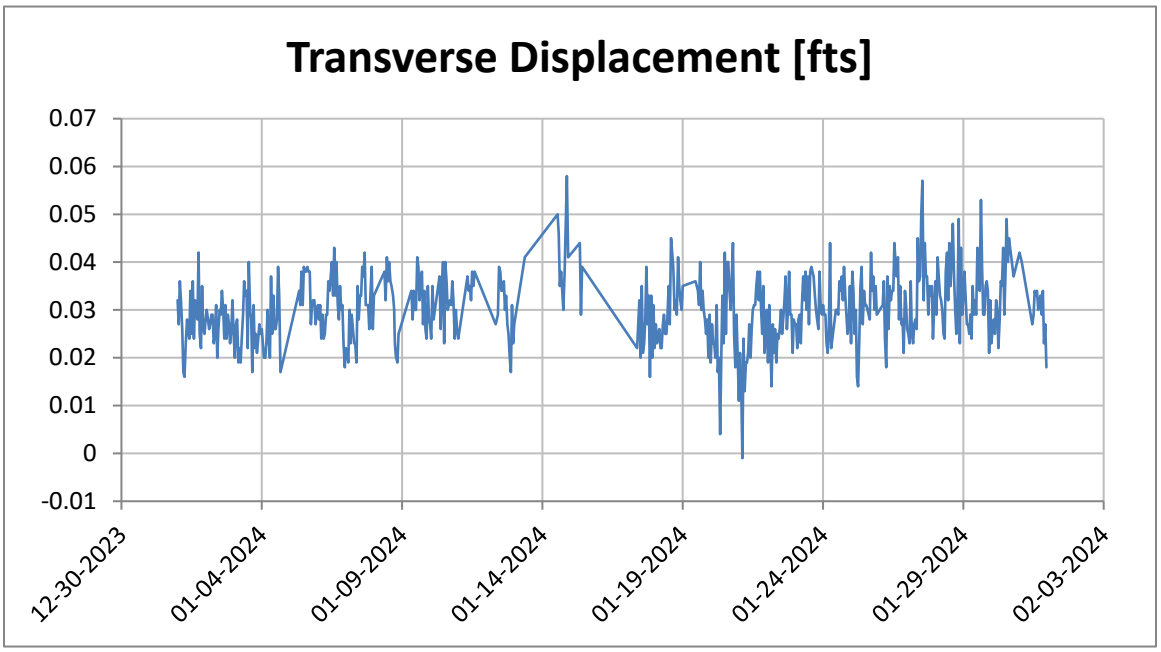


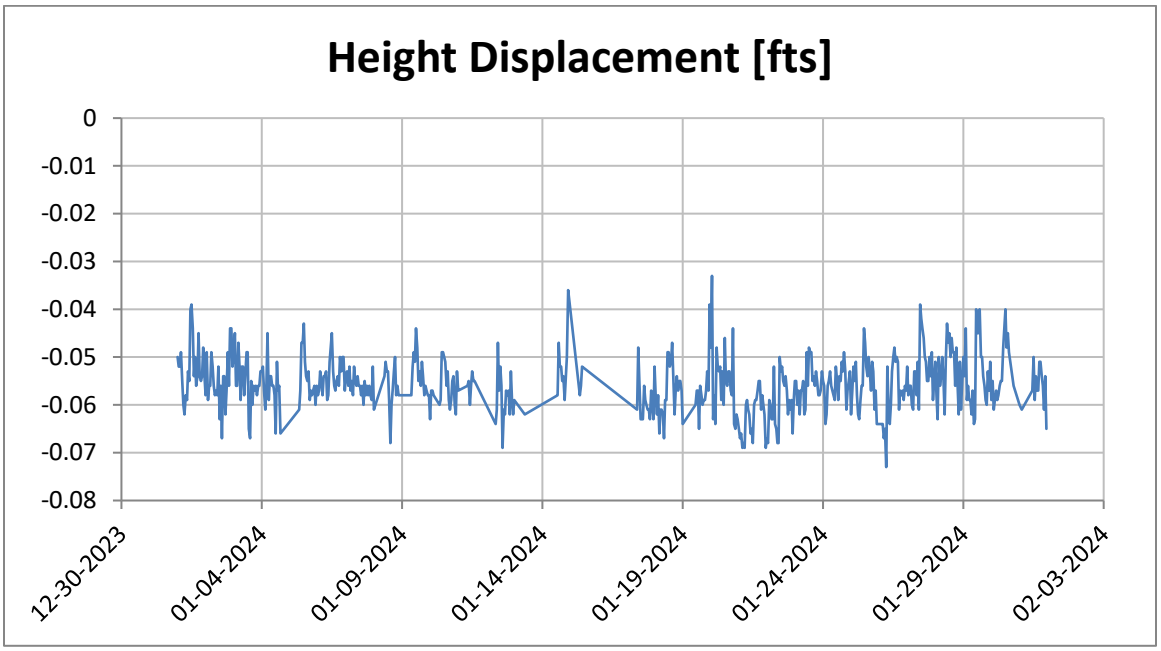
Notes:

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 NP4



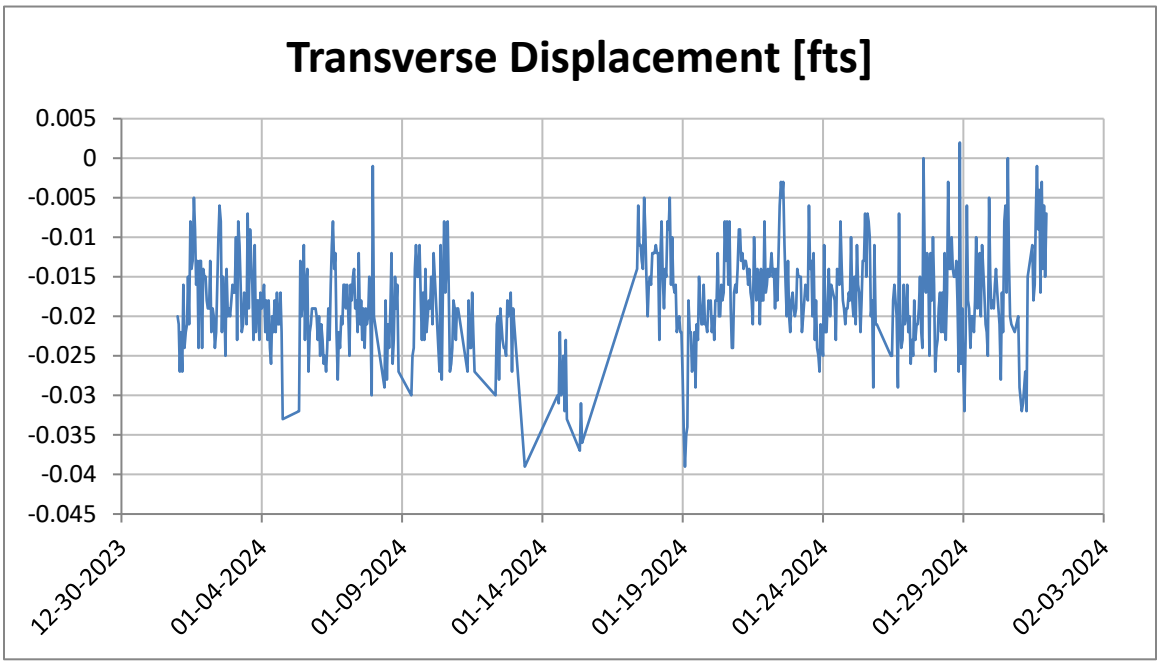


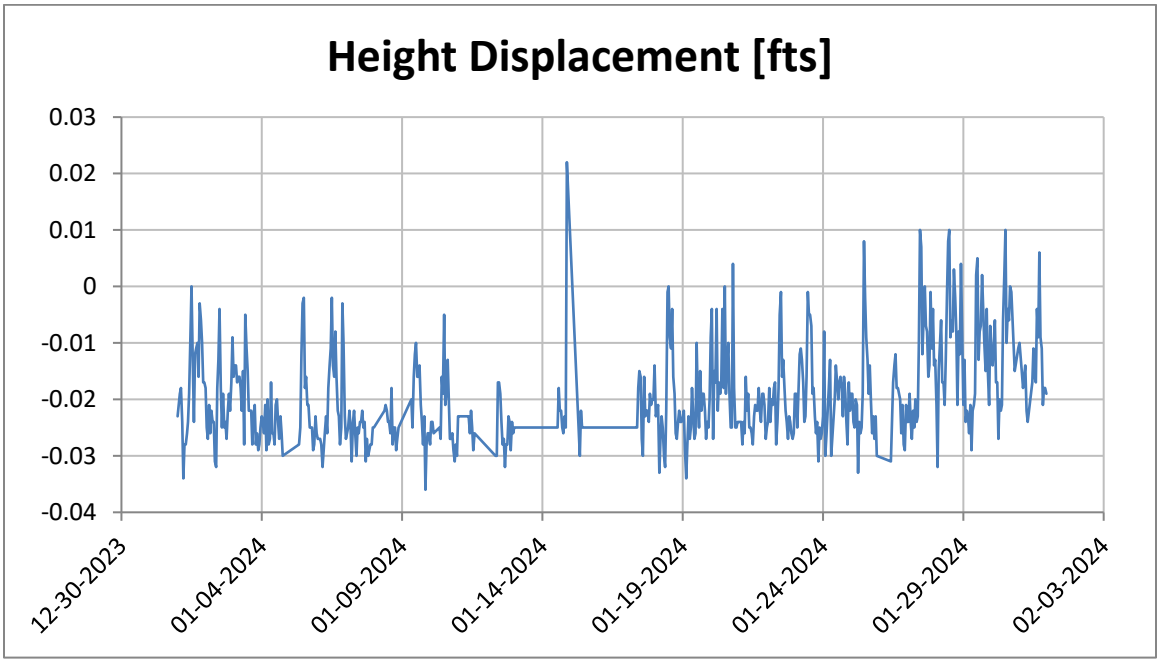
Notes:

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



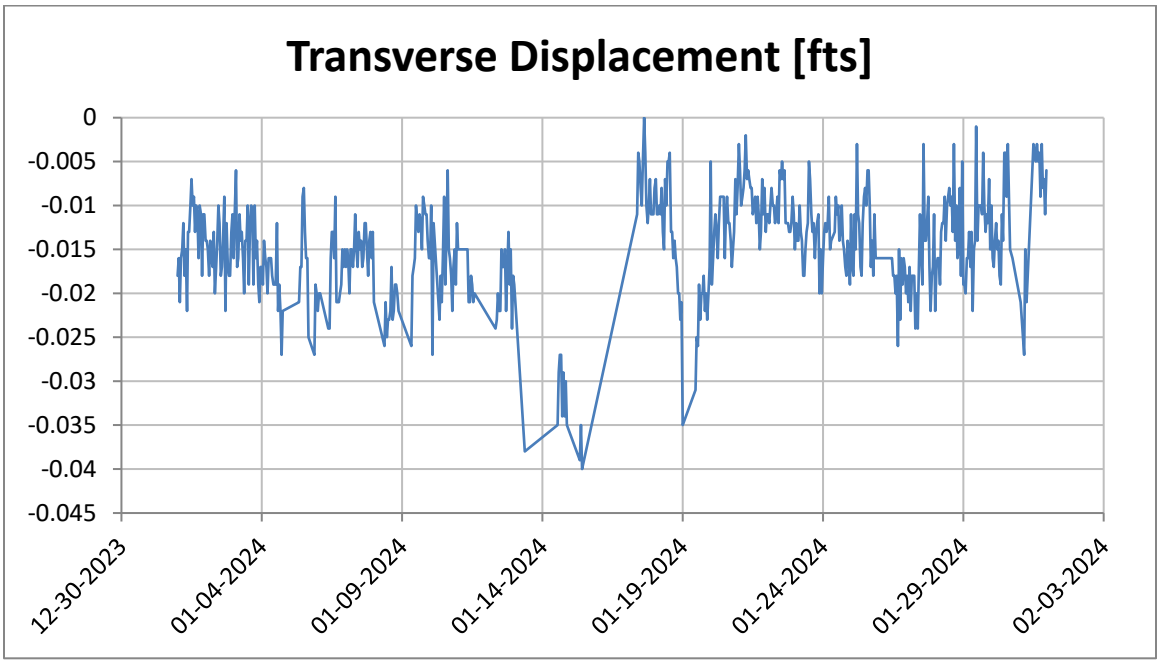


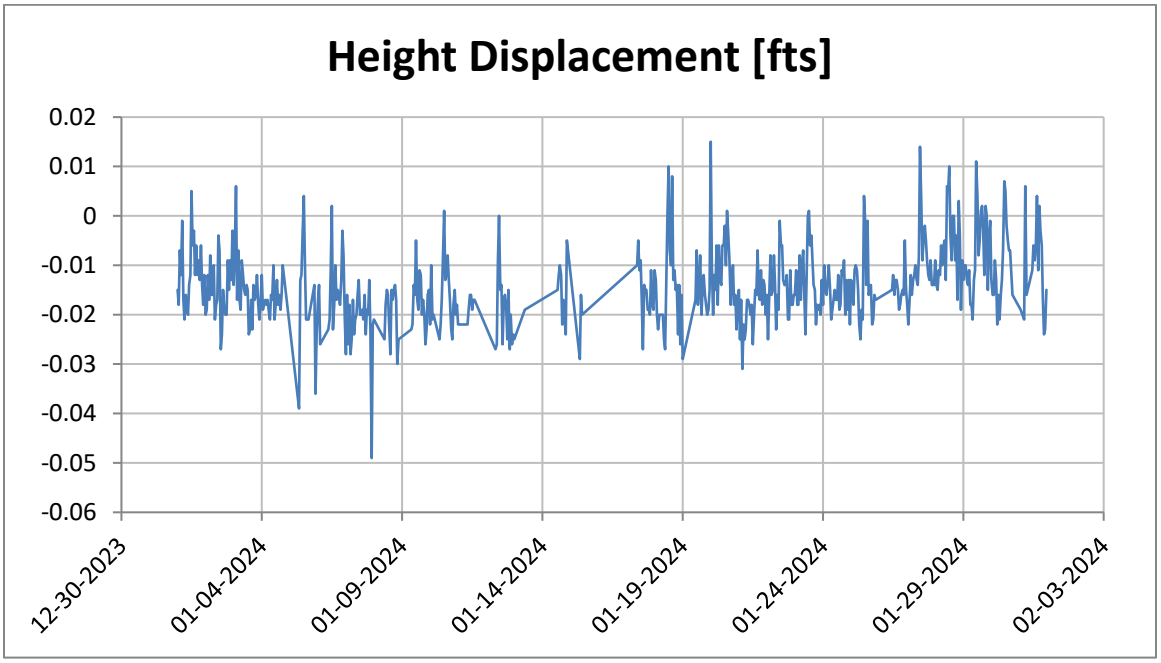
Notes:

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



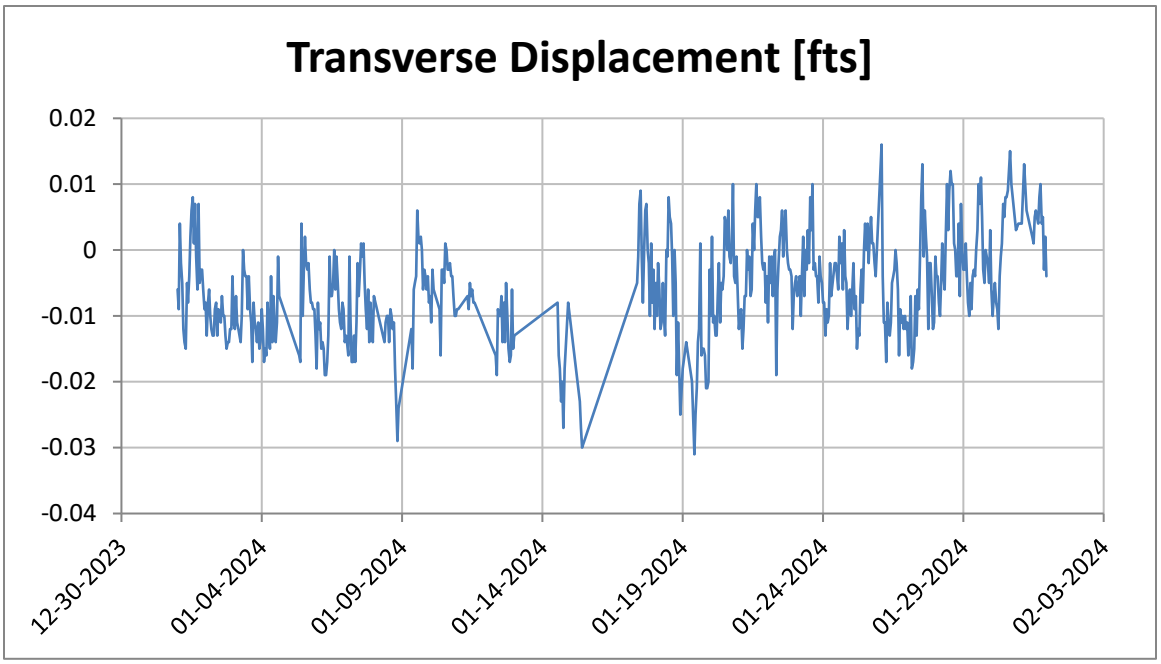


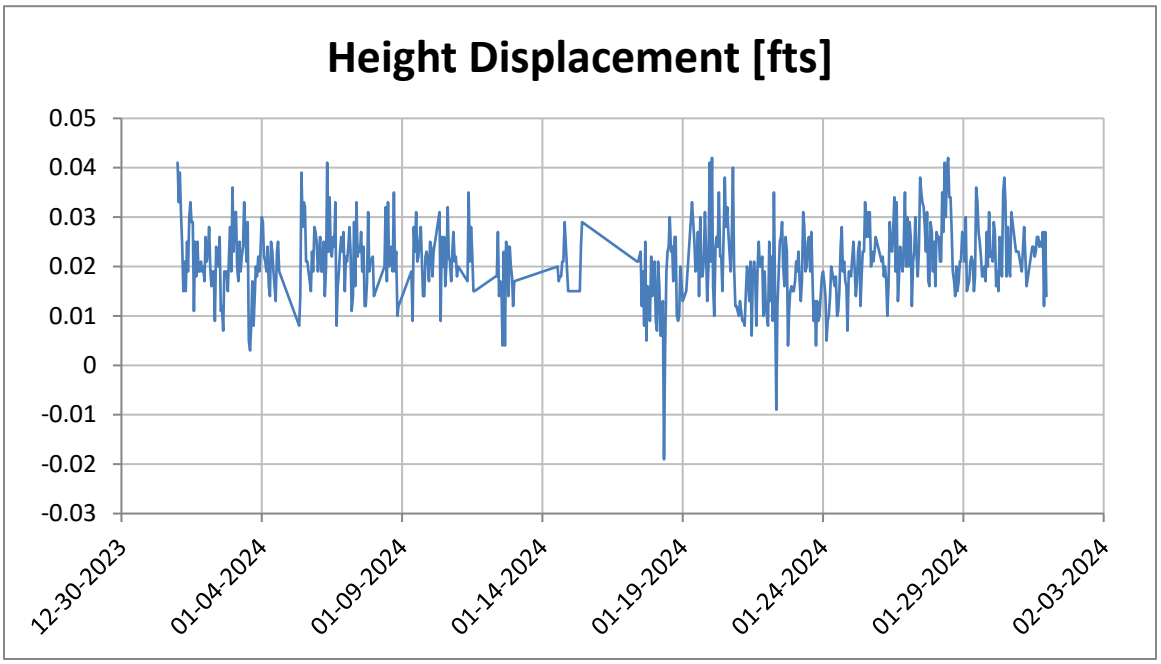
Notes:

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



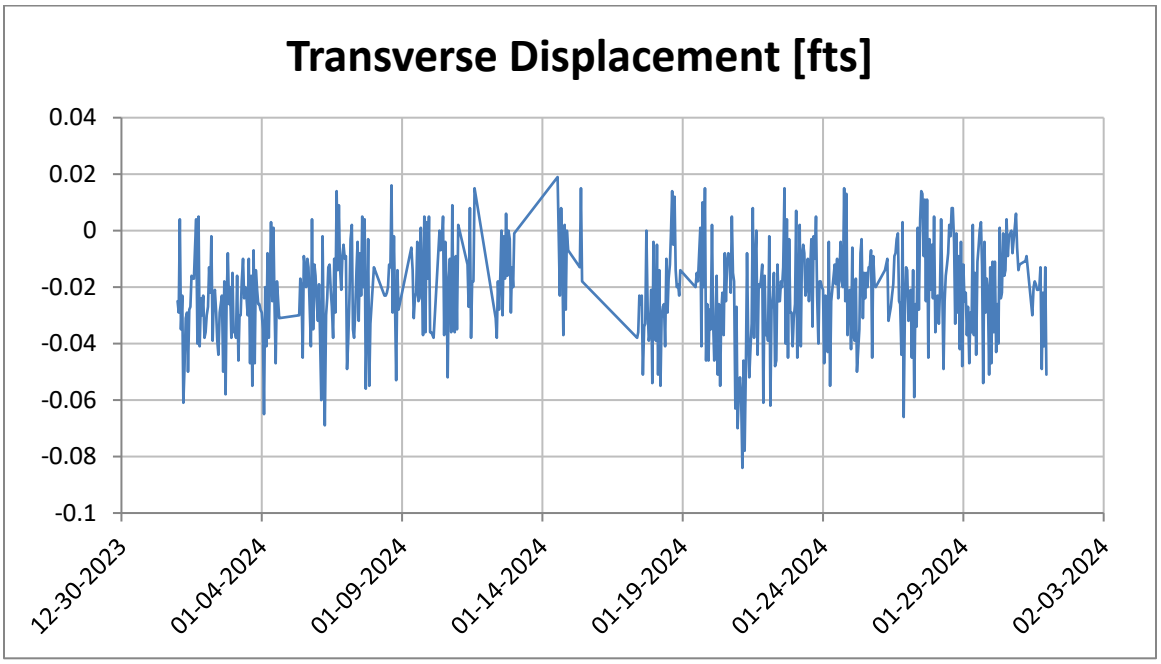


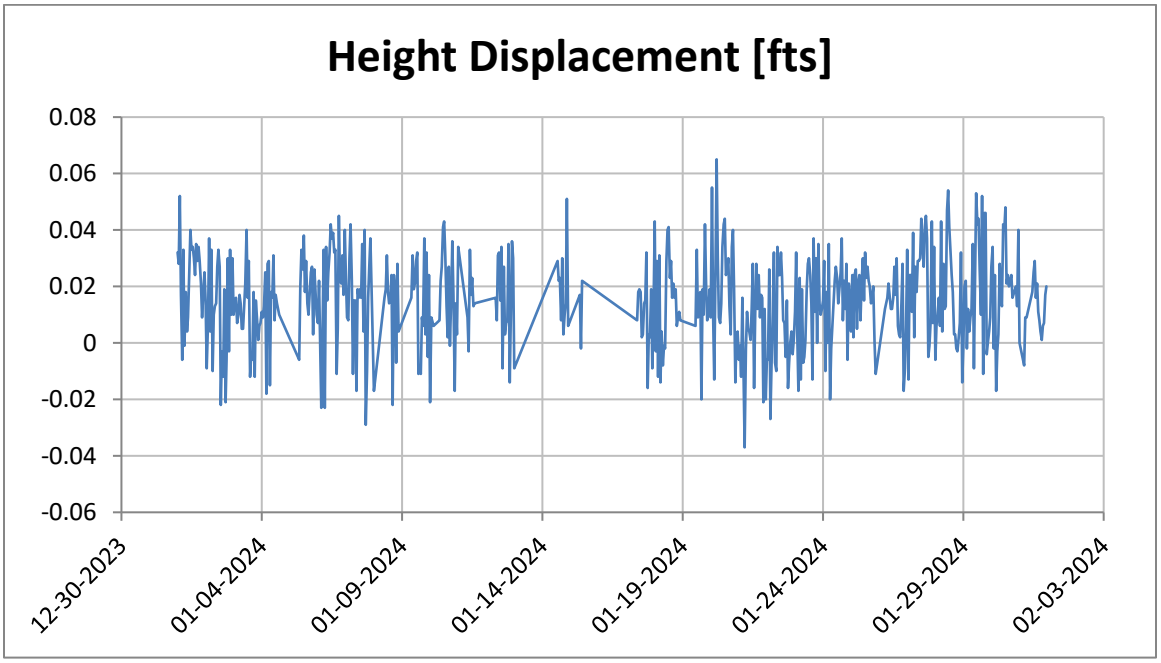
Notes:

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. 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.

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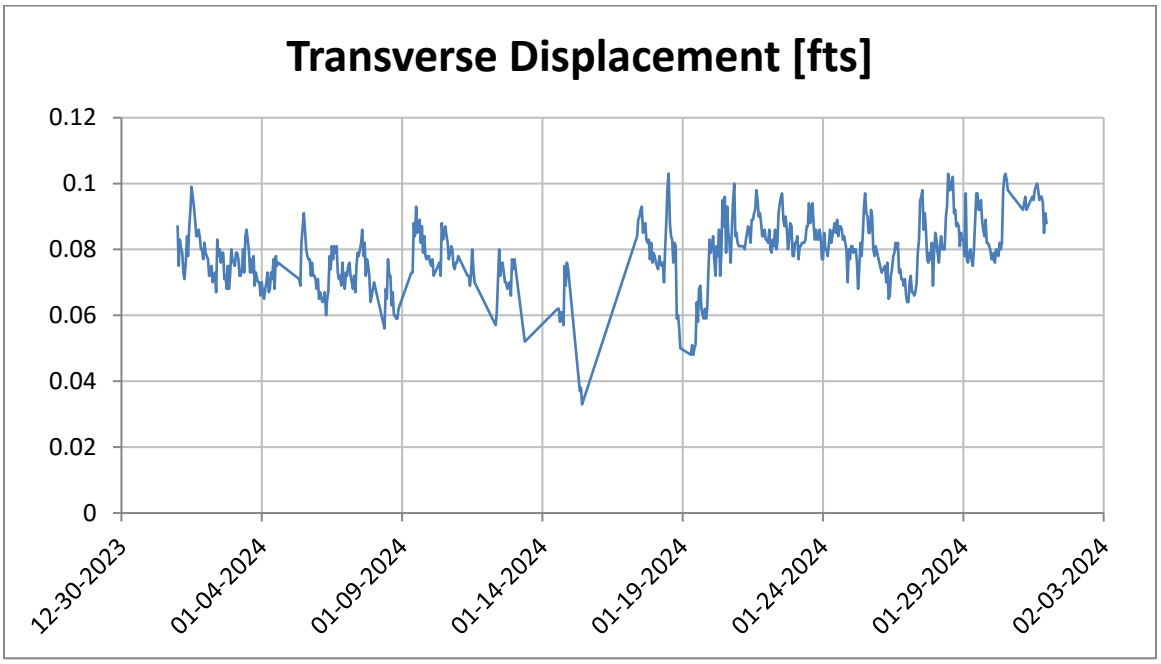
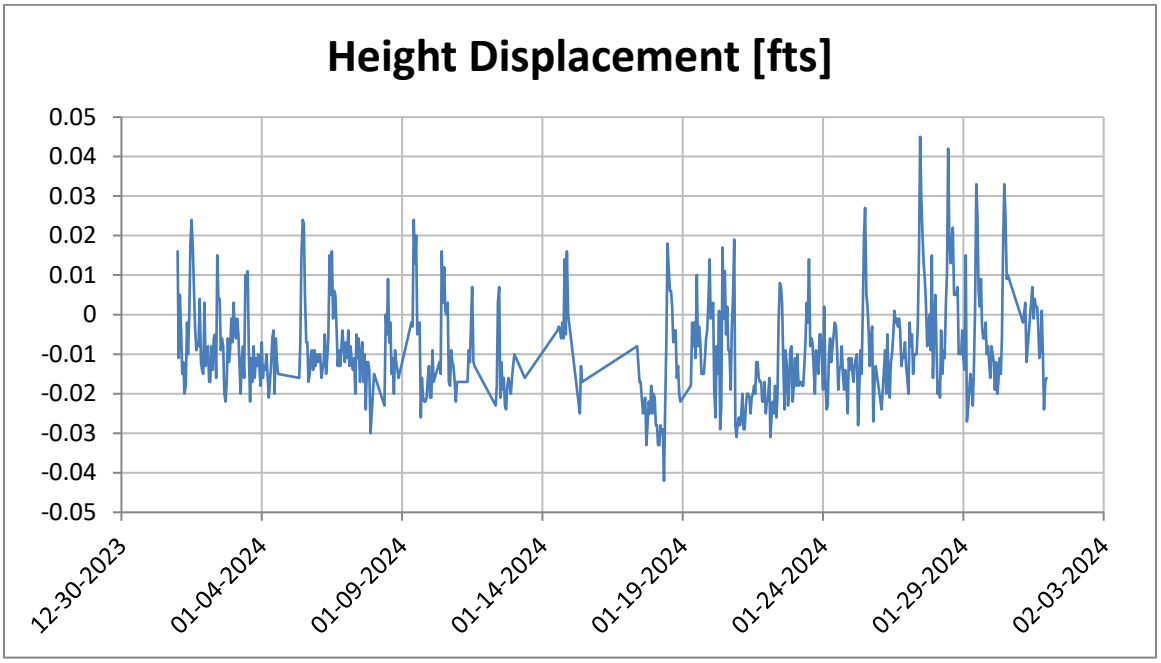
Prism P33





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.

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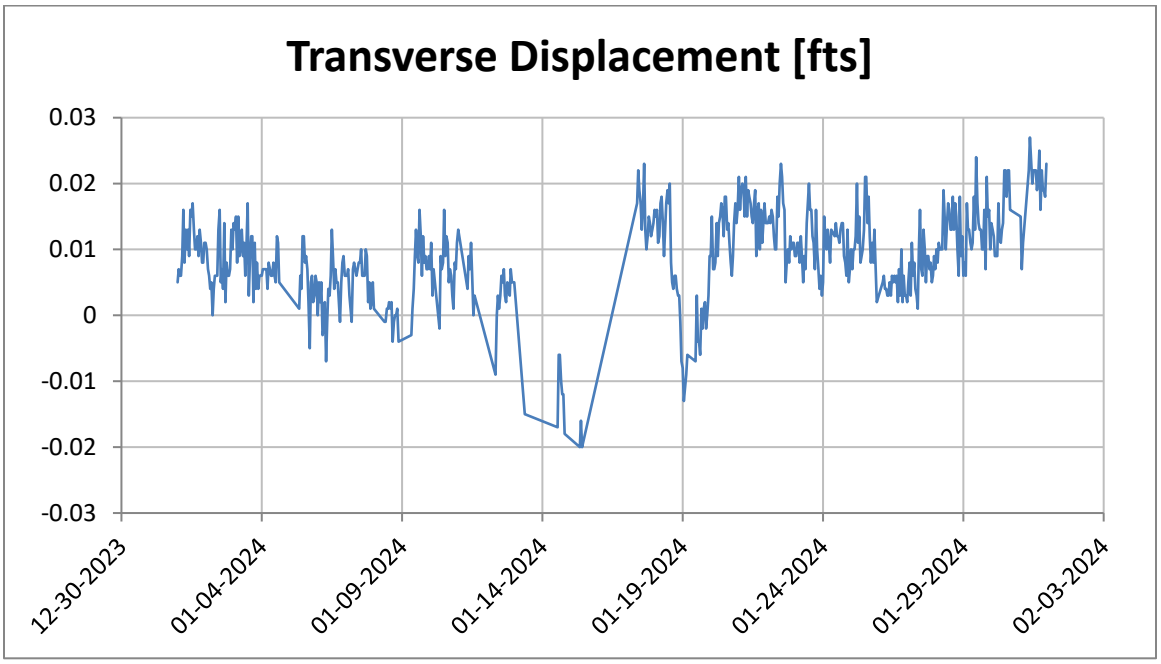
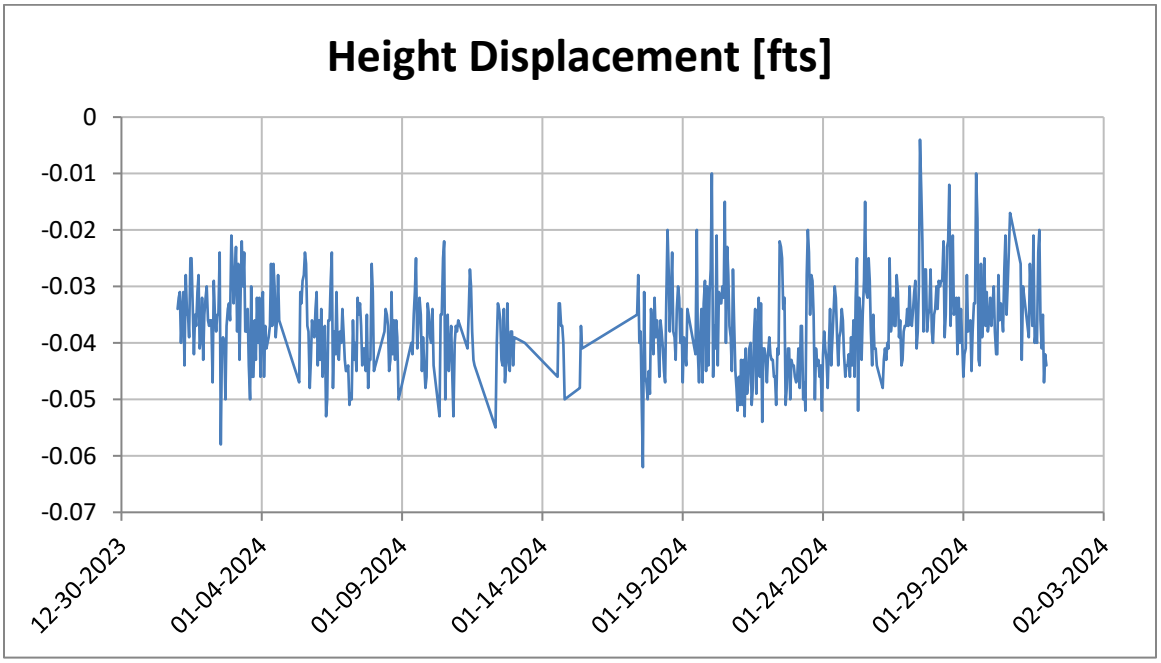
Prism P70



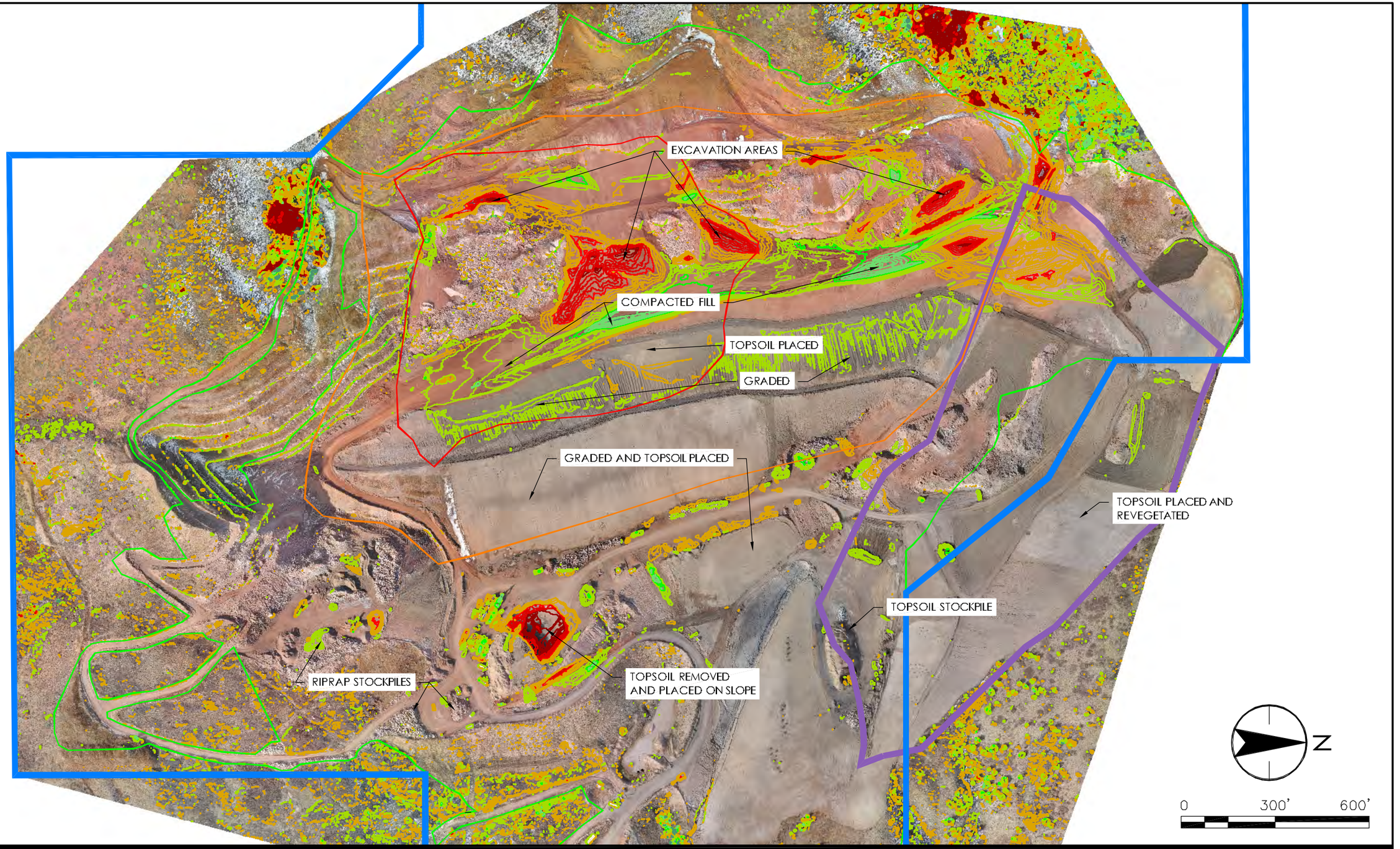


Notes:

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



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 12/29/2023 TO 01/24/2024

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
COMPARISON OF RECENT AND PREVIOUS SURVEYS

Revision	Date
#	2024.02.29
Drawn By	Figure No.
PK	5

2024.02.29 5:19:32 PM

u:\2057288200\06_design\monitoring\2024-01\dwg\pitreview pitsms_20240227

Appendix D

Compaction Testing Results

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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
- Compaction Test Location

1. TEST LOCATIONS 949 AND 950 ARE APPROXIMATE LOCATIONS.

N

0 150' 300'

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
COMPACTION TEST LOCATIONS

Revision
#

Date
2024.02.29

Drawn By
PK

Figure No.
6

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Compaction Testing Log

Test No.	Date	Elevation (ft)	Northing (ft)	Easting (ft)	Wet Density (pcf)	Moisture Content (%)	Dry Density (pcf)	Compaction (%)
935	4-Jan-24	7396	1402276.8	3172916	136.2	6.2	128.2	104
936	4-Jan-24	7397	1402305.1	3172856.7	136.5	6.1	128.7	105
937	4-Jan-24	7399	1402305.1	3172856.7	133.5	5.7	126.3	103
938	4-Jan-24	7397	1402426.2	3172853.5	139	4.9	132.5	108
939	11-Jan-24	7371	1401143.4	3173161.3	125.5	4.2	120.4	98
940	11-Jan-24	7374	1401217.2	3173156.4	125.1	4.1	120.2	98
941	11-Jan-24	7378	1401313.1	3173117.5	130.4	4.6	124.7	102
942	11-Jan-24	7380	1401383.8	3173101.4	126.7	3.8	122.1	99
943	12-Jan-24	7366	1401149	3173252.4	124.7	3.5	120.5	98
944	12-Jan-24	7372	1401245.6	3173237	123.3	3.5	119.1	97
945	18-Jan-24	7398	1401844.3	3172937.8	113.6	4.6	118.3	96
946	18-Jan-24	7400	1402038.5	3172892.8	124.5	5.3	119.2	97
947	18-Jan-24	7387	1401404.8	3173039.1	117	4.1	112.9	91
948	18-Jan-24	7383	1401346.1	3173083.3	118.6	4.5	114.1	92
949	22-Jan-24	7400	1402480.4	3172804.7	130.2	3.5	125.8	102
950	22-Jan-24	7400	1402169.2	3172978.2	132.3	3.4	128	104

Notes:

- A total 2,909,000 yd3 had been placed and compacted. This requires at least 582compaction tests, and 1,146 tests have been taken.
- The locations for tests 949 and 950 are approximate.