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To:	Jerald Schnabel	From:	Paul Kos
	Castle Aggregate		Denver, CO 80202
File:	April 2024 Monitoring Summary	Date:	May 20, 2024

Reference: April 2024 Geotechnical Monitoring Summary Pikeview Quarry

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this April 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 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 April 2024. Continuous monitoring by the robotic survey system began in 2010 and continued through the month of April 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 April 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.)

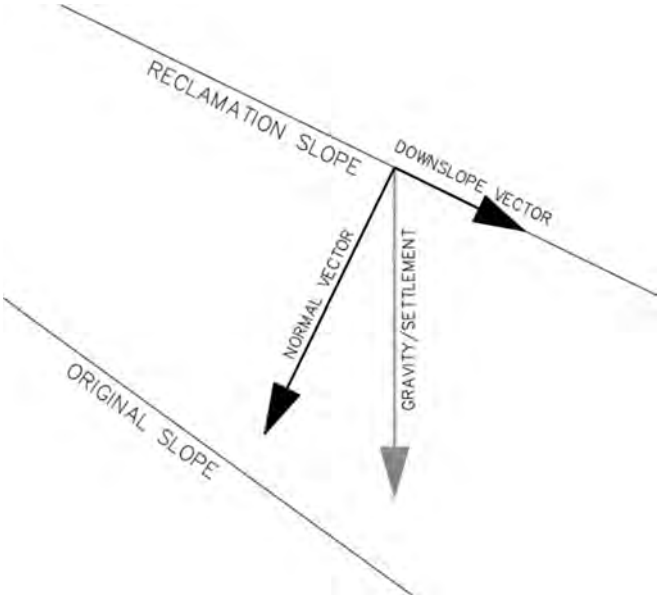
2.0 VISUAL INSPECTIONS

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 when appropriate, 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. The notes from the daily inspections are summarized in Table A-1 in Appendix A.

Stantec conducted visual inspections of the Pikeview Quarry slopes on April 3, 2024 and April 25, 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. Slopes that have been seeded are observed from adjacent areas to avoid disturbing the seed and mulch covering. The findings are listed below, and photographs of notable observations are included on Figure 2 in Appendix A.

- Cracking was observed on the graded slopes near the upper extents of the fill slope. These tension cracks were observed to be approximately 100 feet long and 2 inches wide. The nature and location of these cracks suggests ongoing settlement of the buttress fill as the likely cause of the cracking. The settlement of the fill on a sloping foundation results in a downslope vector that is causing the cracking. The location near the upper extent of the fill is expected considering the in-situ material further uphill would not experience the settlement that occurs in the fill. Stantec has observed similar cracks on mine slope regrades including sites that did not have a landslide component. The cracks at the other regrade projects also occurred at the upper extent of the fill slope. The vector diagram below shows the settlement due to gravity and the resulting movements normal and parallel to the slope.



- Reclamation grading began in February 2022 and continued throughout April 2024. Site maintenance, topsoil placement and riprap production also continued throughout the month.
- Operators placed compacted material in the buttress zone. Material was excavated from the Lower and South Borrow Areas. The material was hauled up ramps to the buttress floor and placed in lifts and compacted.
- No cracking was observed on the native granite slopes above the extents of the disturbed area.
- No cracking was observed on the slope south of the southern scarp.
- Seepage was noted from the graded granite slopes. This seepage was observed in previous years and is expected to occur each spring.
- 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.
- Topsoil was placed on areas at final grade.
- In April, blasting operations occurred on the South Peak and then the remaining material was removed by ripping. The material is being dozed to the buttress floor where it will be placed in compacted lifts.
- 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 total station is used to continuously survey the prisms onsite to document slope movements. The robotic total station records the location of each prism every hour. There were 24 prisms active in April; 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 thirteen 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. No prisms were installed or removed in April. 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 alerts are listed in Table 2.

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Table 2 Alert Summary

Date(s)	Alert	Cause/Actions taken	Resolved
1-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	1-Apr
2-Apr	P5 not found	Equipment blocking prism. No work during alerts.	2-Apr
13-Apr	B7200-3 not found	Equipment operations in area.	13-Apr
16-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	16-Apr
16-Apr	P25 regression limits	Snow and fog at time of alerts. Readings in positive and negative directions.	16-Apr
16-Apr	P33 regression limit	Snow and fog at time of alerts. Readings in positive and negative directions.	16-Apr
18-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	18-Apr
19-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	19-Apr
20-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	20-Apr
21-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	21-Apr
25-Apr to 26-Apr	B7400-4 and B7400-5 not found	Hydroseeding operations in area covered prism lens.	26-Apr
26-Apr to 27-Apr	Points not found	Snow and fog. No work being performed at time of alerts.	27-Apr
27-Apr	P2 regression limits	Snow and fog at time of alerts. Readings in positive and negative directions. No work being performed at time of alerts.	27-Apr
27-Apr	P5 regression limits	Snow and fog at time of alerts. No work being performed at time of alerts.	27-Apr
27-Apr	P25 regression limits	Snow and fog at time of alerts. Readings in positive and negative directions. No work being performed at time of alerts.	27-Apr
27-Apr	P33 regression limit	Snow and fog at time of alerts. No work being performed at time of alerts.	27-Apr

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 total station to the prism; positive displacements indicate less distance between the robotic total station and prism (movement towards the robotic 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 monthly delta is the most recent reading cumulative delta displacement (horizontal, lateral, and vertical) subtracted from the first reading of the 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 robotic total 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 robotic total station; these equates to an accuracy of +/-0.016 ft.

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Table 3 Prism Summary

Prism ID	Cumulative Transverse Displacement (ft)	Cumulative Height Displacement (ft)	Monthly Delta (ft)	Cumulative Delta (ft)	Notes / Recommendations
BR1	-0.001	-0.444	0.0216	0.8467	
BR3	-0.050	-0.116	0.0047	0.1344	
CP6	-0.004	-0.018	-0.0091	0.0352	
CP7	0.101	-0.015	0.0582	0.1051	
NP4	0.038	-0.078	0.0168	0.1489	
P2	-0.005	-0.022	-0.0077	0.0247	
P5	-0.006	-0.016	-0.0062	0.0175	
P25	0.012	0.020	-0.0066	0.0235	
P32R	-0.029	-0.007	-0.0138	0.0312	
P33	0.094	-0.014	-0.0022	0.1140	
P70	0.043	-0.039	0.0061	0.0773	
B7200-1	-0.046	0.009	0.0024	0.0522	
B7200-2	0.005	-0.022	0.0067	0.0594	
B7200-3	0.189	-0.085	0.0121	0.2558	
B7300-0	-0.837	-0.131	0.8022	0.9935	Data jump on 4-23. No movement before or after offset.
B7300-1	-0.179	-0.169	0.0308	0.3743	Slope creep
B7300-2	0.022	-0.217	0.0344	0.2741	Slope creep
B7300-3	0.205	-0.155	0.0260	0.3138	Slope creep
B7300-4	0.232	-0.123	0.0676	0.2913	Slope creep
B7400-1	-0.334	-0.760	0.5792	1.2369	Data jump on 4-17. Slope creep movements before and after offset.
B7400-2	-0.041	-0.487	0.5864	1.0206	Slope creep
B7400-3	0.124	-0.352	0.0726	0.4739	Slope creep
B7400-4	0.530	-0.307	0.0743	0.7094	Slope creep
B7400-5	0.698	-0.127	0.6256	0.7672	Data jump on 4-26. No movement before or after offset.

The data show stable conditions with no or very small settlement movements at 21 of 24 prisms. Prisms B7300-0, B7400-1, and B7400-5 recorded movements in April, and these were likely caused by the revegetation crews that were operating in those areas at those time periods. The prisms are believed to have been bumped or impacted by the hydroseeding and/or erosion control matting operations. Prisms on the buttress slope continued to record slow and decreasing gradual movement as the fill consolidates along the benches. The fill is likely consolidating under its own weight and by the placement of topsoil. A small amount of settlement is common for newly placed compacted fill, and this is being recorded by the prisms, which were installed as the buttress was constructed. The previous prism installations were

delayed by the topsoil and revegetation operations, and this initial settlement would not have been recorded. 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 April 15, 2024 and on May 2, 2024. An additional flight was conducted mid-month for a better understanding of the site conditions as the reclamation grading is nearing conclusion. 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 April topography was also compared to the March 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 Lower Borrow and South Borrow Areas and placed in the Buttress Area. No slope movements or other changes in topography were identified. No slope movements were recorded in the area where cracking was observed. 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 April 2024, a total of 155,700 yd^3 of material were placed and compacted on the buttress floor. All this material was from the Lower Borrow and South Borrow Areas and was hauled to the buttress floor. 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. One test did not meet the compaction specification, and this area was reworked, and the subsequent test met the requirements. The test (#1063) that did not meet the compaction requirements has not been included in the test count. This volume placed in the buttress zone required at least 32 compaction tests. There were 34 compaction tests taken in April, including 5 tests taken May 1, 2024. Since the UAV flight took place May 2, these 5 tests were added to the April report. As of May 2, 2024, when the site was surveyed, a total of approximately 3,404,000 yd^3 had been placed and compacted. This required at least 682 compaction tests, and 1,118 tests have been taken.

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.
- Processing of riprap continued.
- Geotechnical monitoring continued.
- Continued drilling operations for blasting on the south peak of the Upper Borrow Area.
- Continued seeding, matting, and mulching operations.
- Topsoil placement occurred where fill placement has been completed.
- Submit Technical Revision for drainage revisions required by leaving granite bedrock.

Work planned for next month includes:

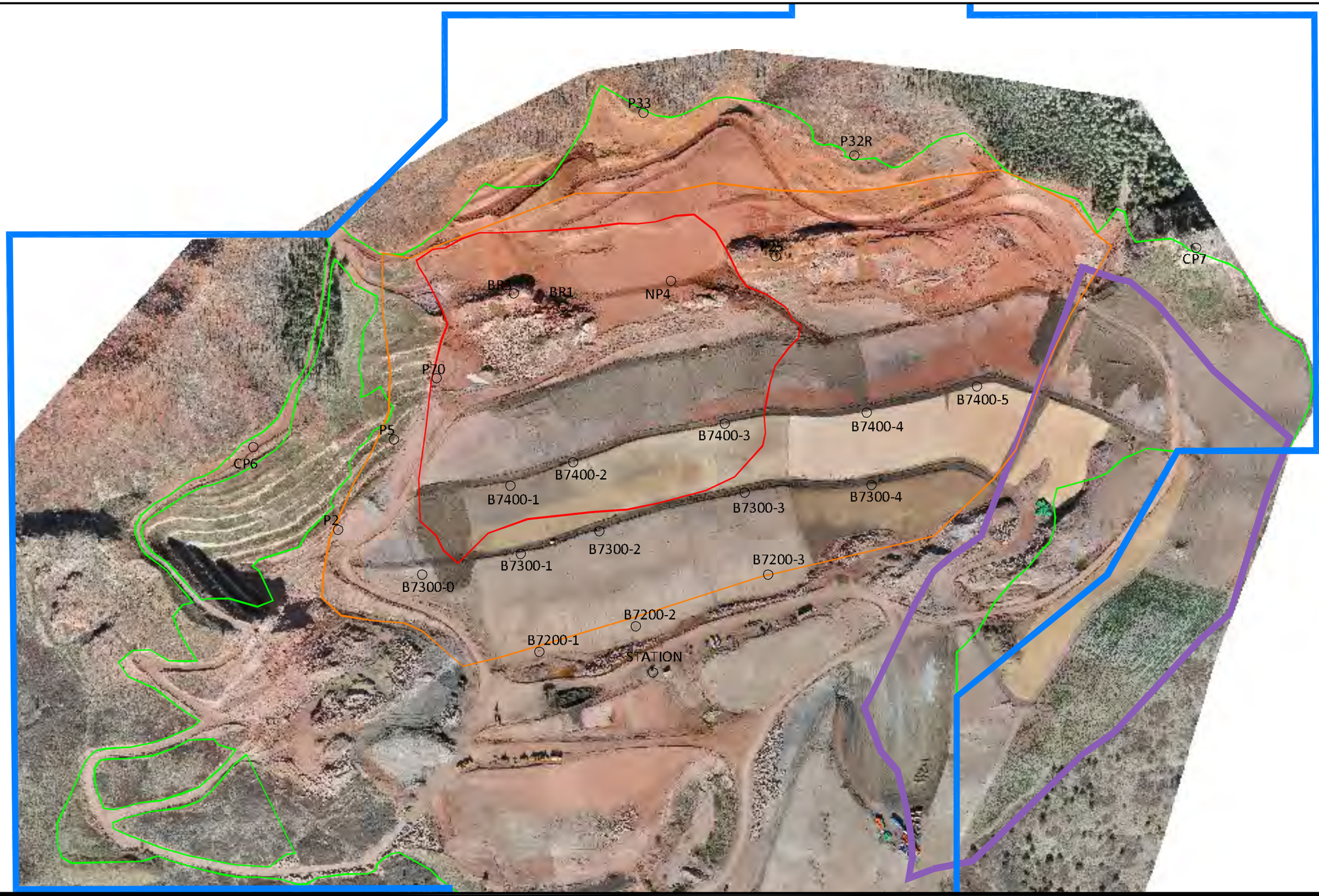
- Continue placing compacted fill in the buttress area.
- Continue processing riprap.
- Continue placing topsoil where grading has been completed.
- Continue seeding, matting, and mulching operations.
- Conduct blasting operations on the lower channel outcropping.
- Continue geotechnical monitoring.
- Continue to remove and replace prisms on an as-needed basis.
- Begin tree planting.
- Compete blasting operations.

7.0 CONCLUSIONS

The data collected in April 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 April 2024 indicate evidence of any large-scale movements that increase risk to workers or to the public.

- 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.
- The upper fill slope should continue to be monitored for signs of increased or ongoing cracking. The area where cracking was observed will be covered with topsoil and erosion control matting in the near future, and the cracking will no longer be visible.
- Areas where cracking has been observed should be graded and compacted to prevent infiltration of runoff through the cracks.



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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Tel: (303) 295-1717
www.stantec.com

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
SITE MAP

Revision
#

Date
2024.05.20

Drawn By
PK

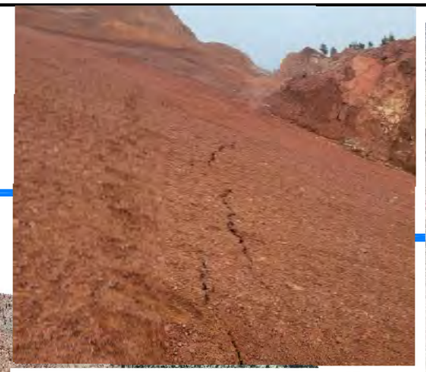
Figure No.
1

Appendix A

Visual Inspections

6. PLACING COMPACTED FILL ON BUTTRESS.

5. BENCHING ON SOUTH PEAK.

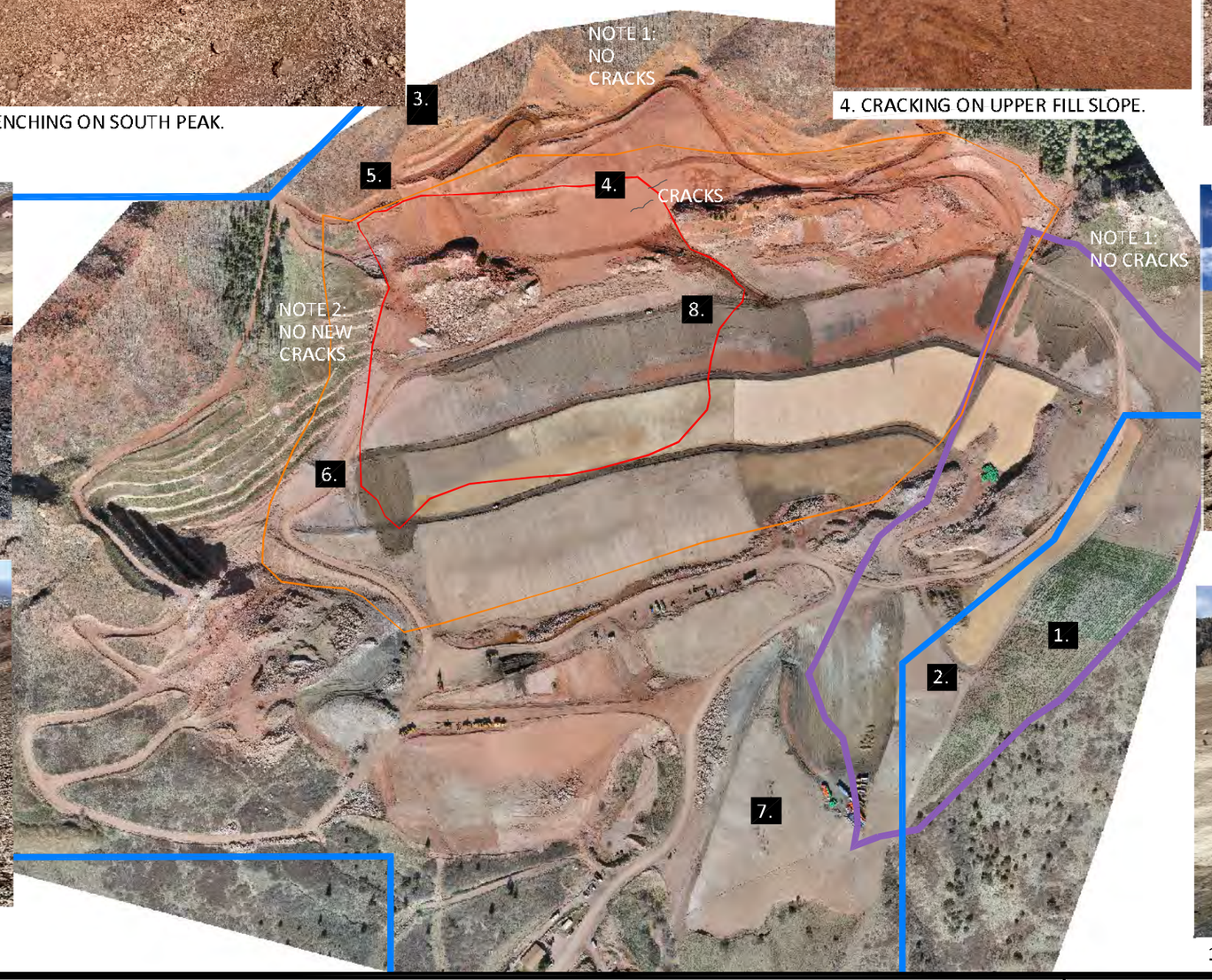


4. CRACKING ON UPPER FILL SLOPE.

3. BLASTING PREPARATION ON SOUTH PEAK.

7. VIEW SOUTHWEST OF RECLAMATION.

8. SLOPE BELOW CRACKING AREA. NO SIGNS OF MOVEMENT.



2.GROWTH MEDIUM WITH GRASS ON NORTH SLOPE.

1. GROWTH MEDIUM WITH TREES ON NORTH SLOPE.

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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 MULTIPLE DAYS IN APRIL

N

0 400' 800'

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
OBSERVATIONS FROM APRIL INSPECTION

Revision
#

Date
2024.05.20

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PK

Figure No.
2

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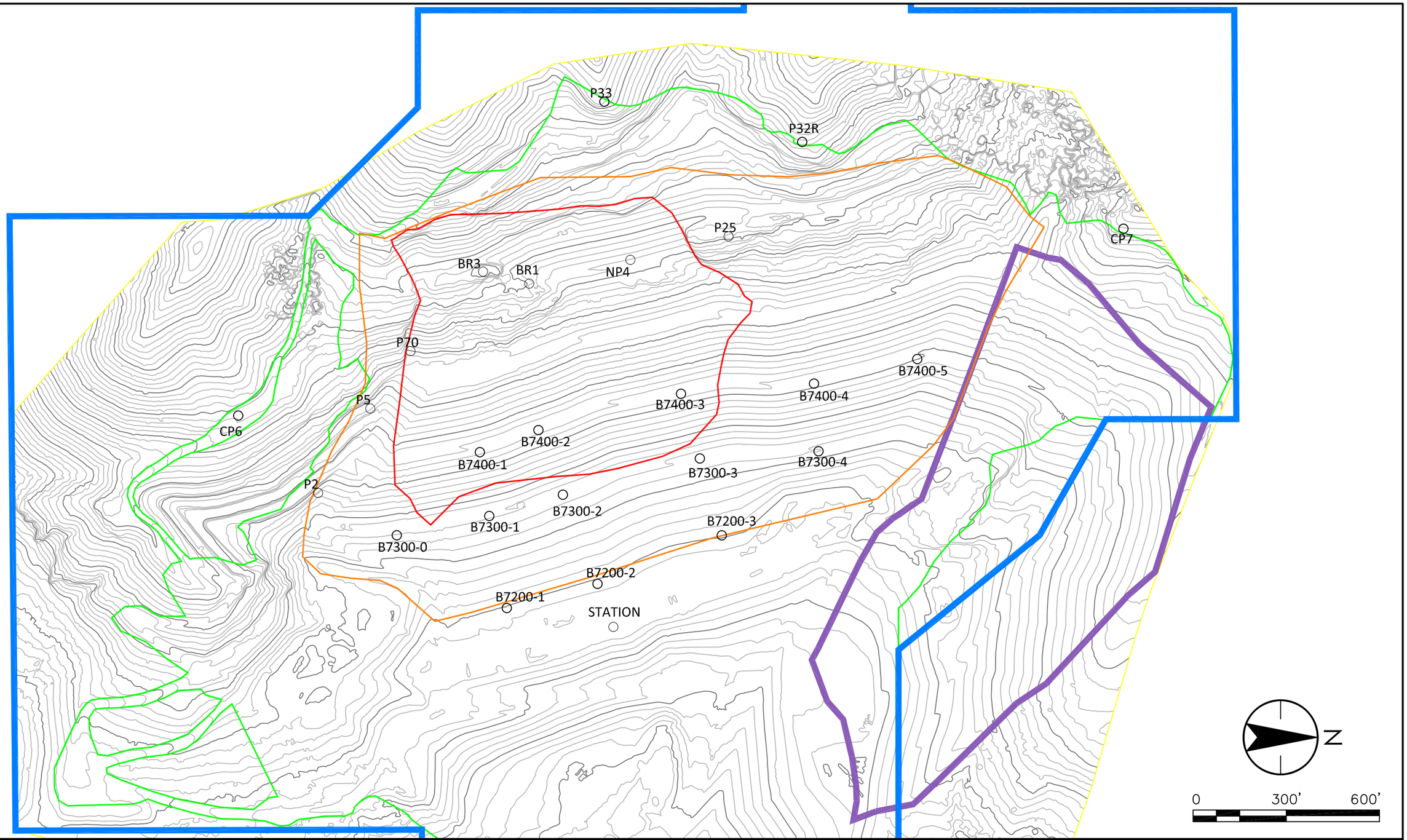
Table A-1 Summary of Daily Inspections

Date	Notes	Inspection By
1-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
2-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
3-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
4-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
5-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
6-Apr-24	No work.	Not applicable
7-Apr-24	No work.	Not applicable
8-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
9-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
10-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
11-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
12-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
13-Apr-24	No work.	Not applicable
14-Apr-24	No work.	Not applicable
15-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
16-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
17-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
18-Apr-24	No movement observed. Good to proceed. Cracks identified on the upper slope during later inspection.	Jerald Schnabel
19-Apr-24	No work.	Not applicable
20-Apr-24	No work.	Not applicable
21-Apr-24	No work.	Not applicable
22-Apr-24	No work.	Not applicable
23-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
24-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
25-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
26-Apr-24	No movement observed. Good to proceed.	Jerald Schnabel
27-Apr-24	No work.	Not applicable
28-Apr-24	No work.	Not applicable
29-Apr-24	No work.	Not applicable
30-Apr-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 MAY 2, 2024 DRONE SURVEY.
4. CONTOUR INTERVAL IS 10 FEET

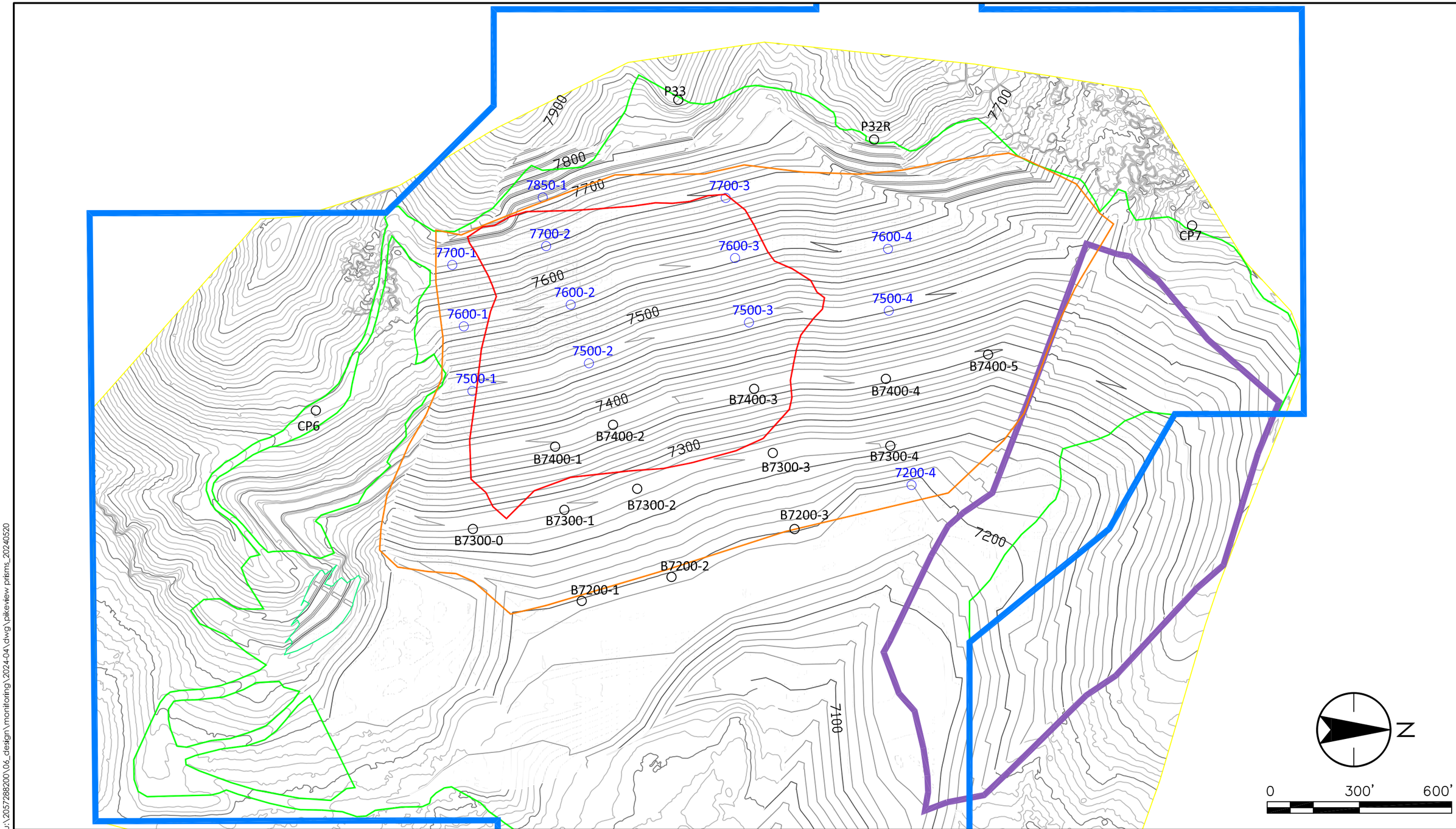
Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
EXISTING PRISMS WITH CURRENT SURFACE

Revision	Date
#	2024.05.20
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
2024.05.20

Drawn By
PK

Figure No.
4

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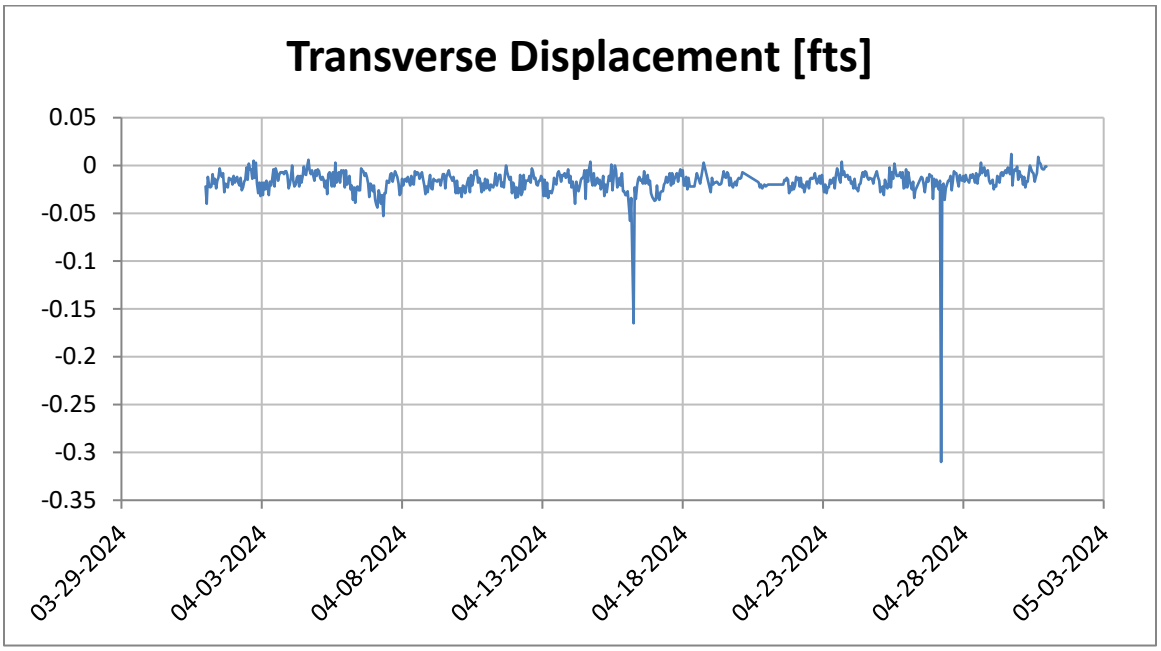
Prism Log

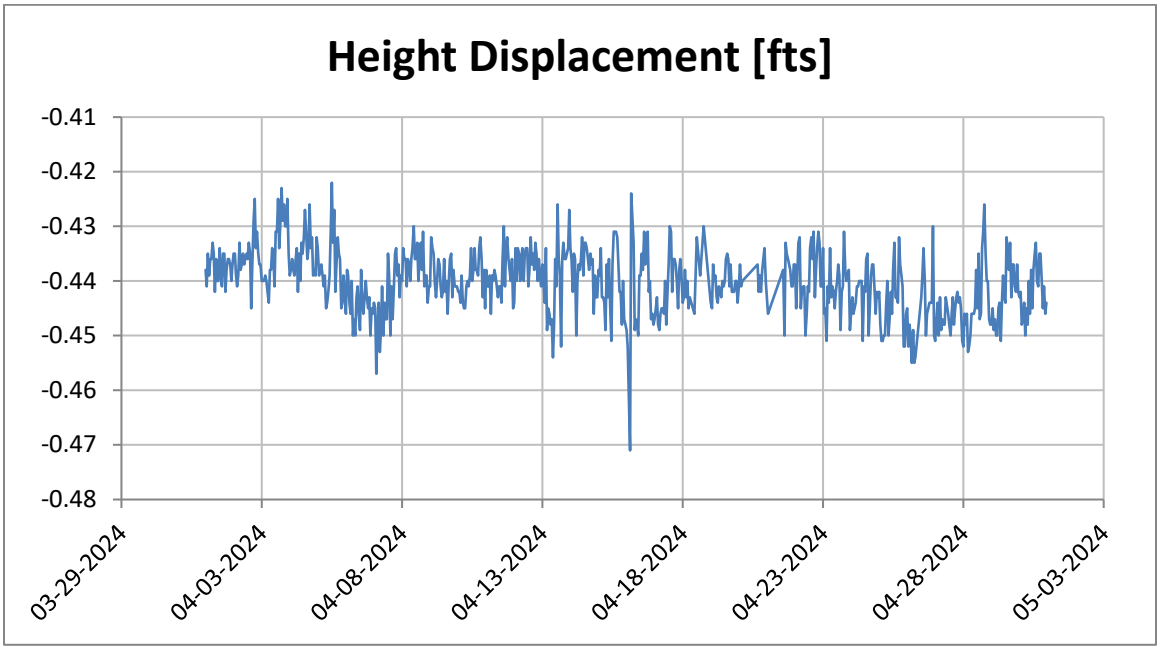
Prism	Date	Action	Comment
CP2	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future.
CP3	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future.
NP1	11-Mar-22	Prism Removed	Reclamation grading to affect prism in near future.
TOE2	11-Mar-22	Prism Removed	Reclamation 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 robotic total 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 robotic total 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 robotic total station relocation.
CP7	20-Jul-22	Prism Added	
CP1	20-Jul-22	Prism Removed	Not in line of sight of robotic total station.
CP4	20-Jul-22	Prism Removed	Not in line of sight of robotic total station.
TOE4	20-Jul-22	Prism Removed	Not in line of sight of robotic total station.
TOE6	20-Jul-22	Prism Removed	Not in line of sight of robotic total station.
TOE5	4-Aug-22	Prism Removed	Out of line of sight of robotic total station.
P63	15-Aug-22	Prism Removed	Out of line of sight of robotic total 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 prism.
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.

Stantec

Prism BR1



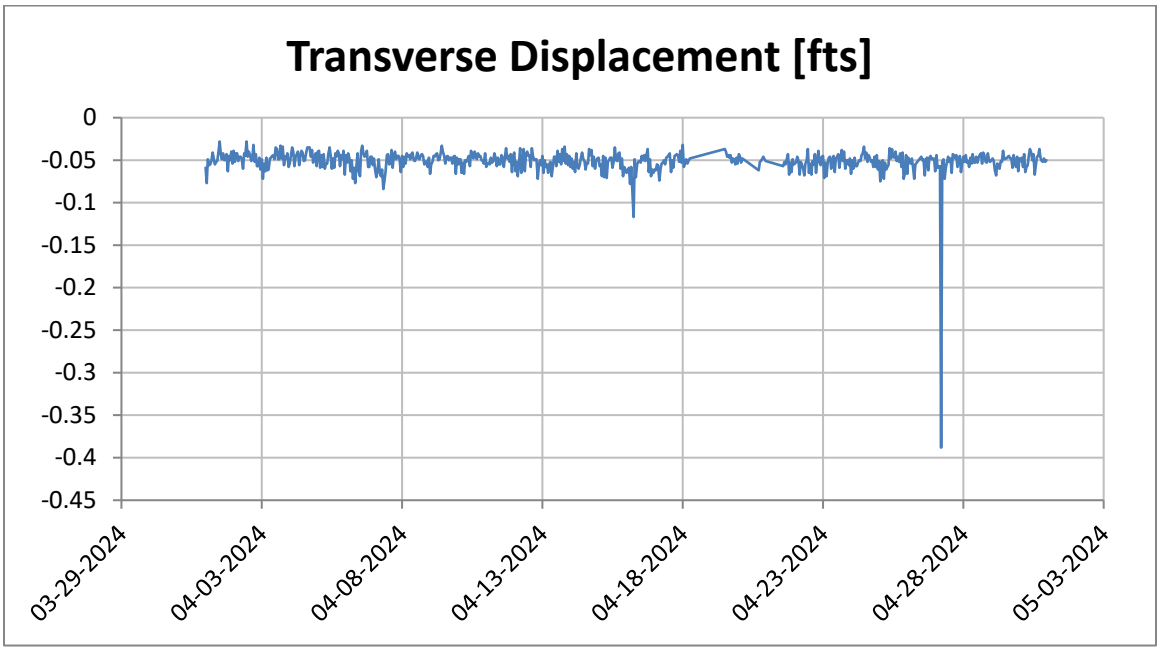


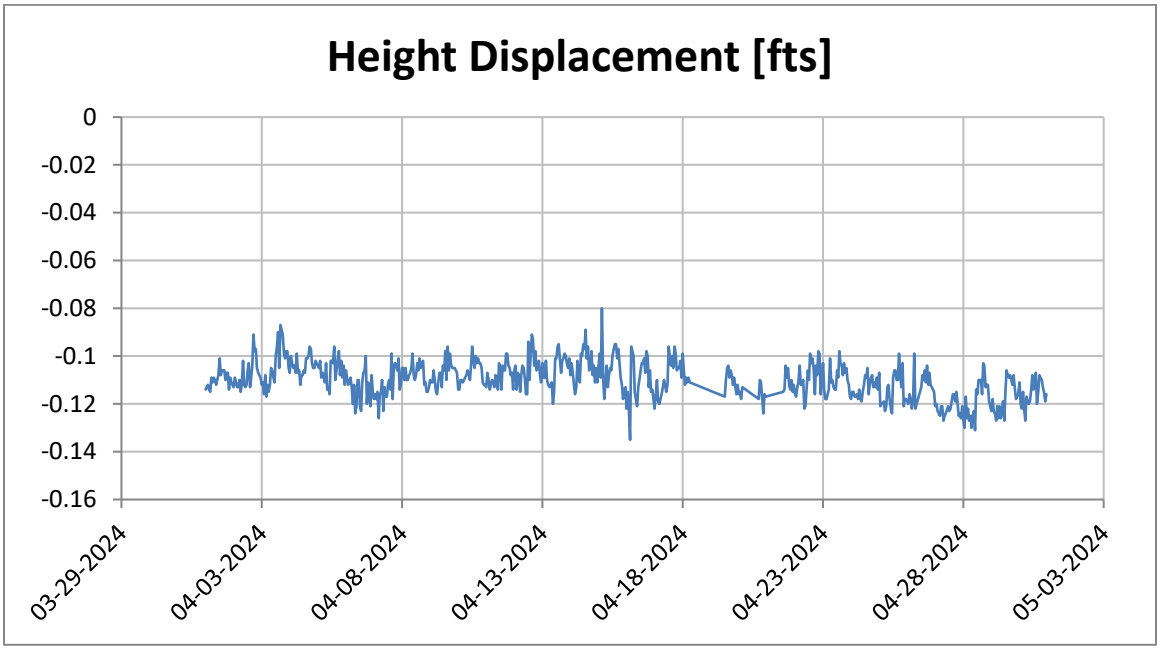
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Prism previously recorded slope creep movements.

Stantec

Prism BR3



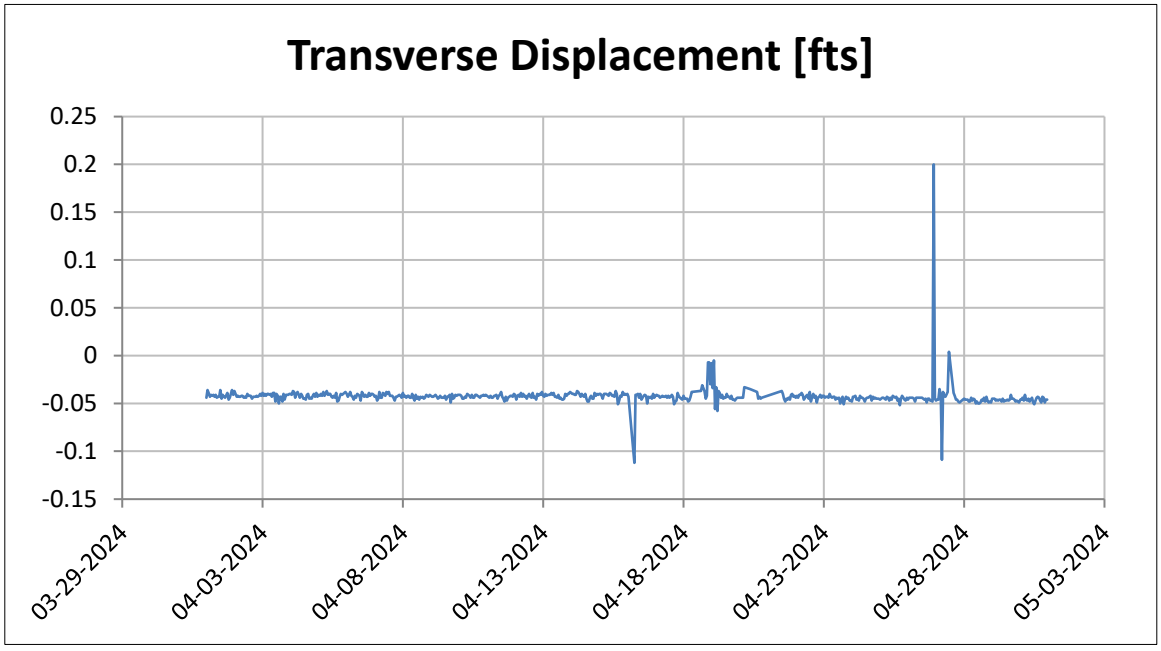


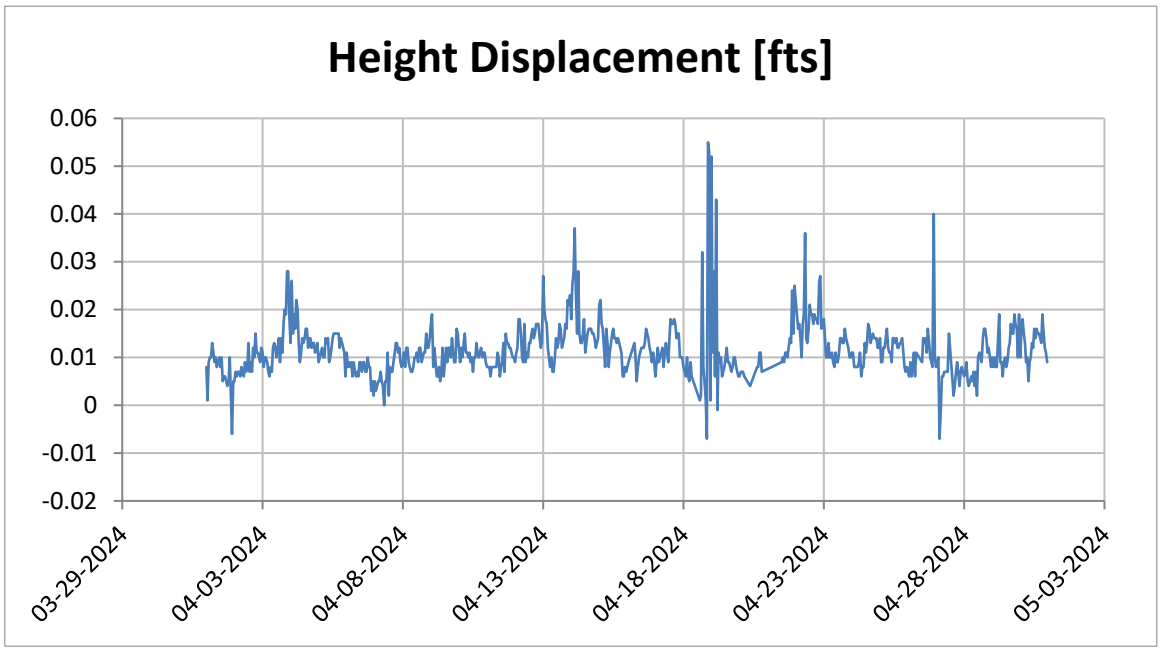
Notes:

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 total 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



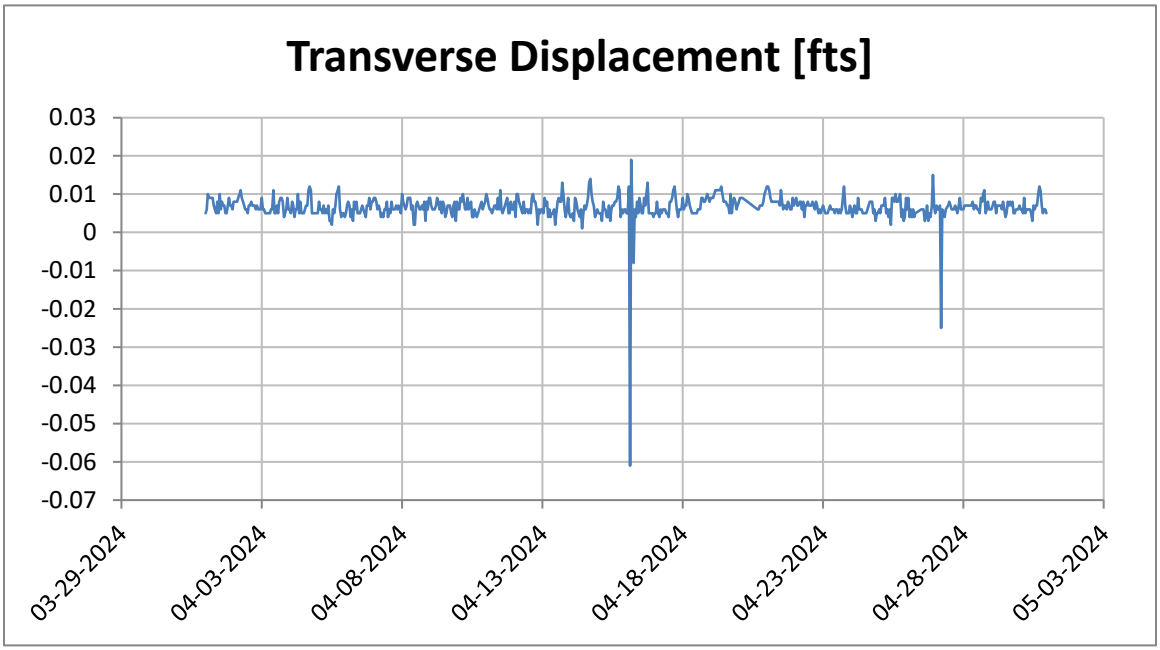


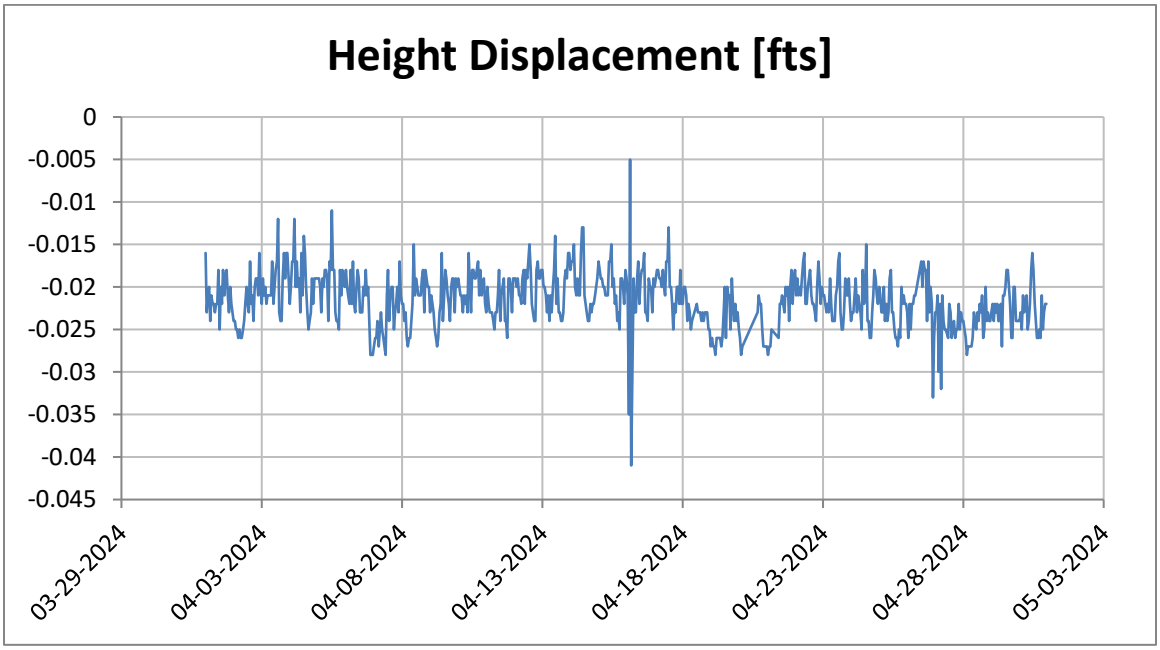
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7200-2



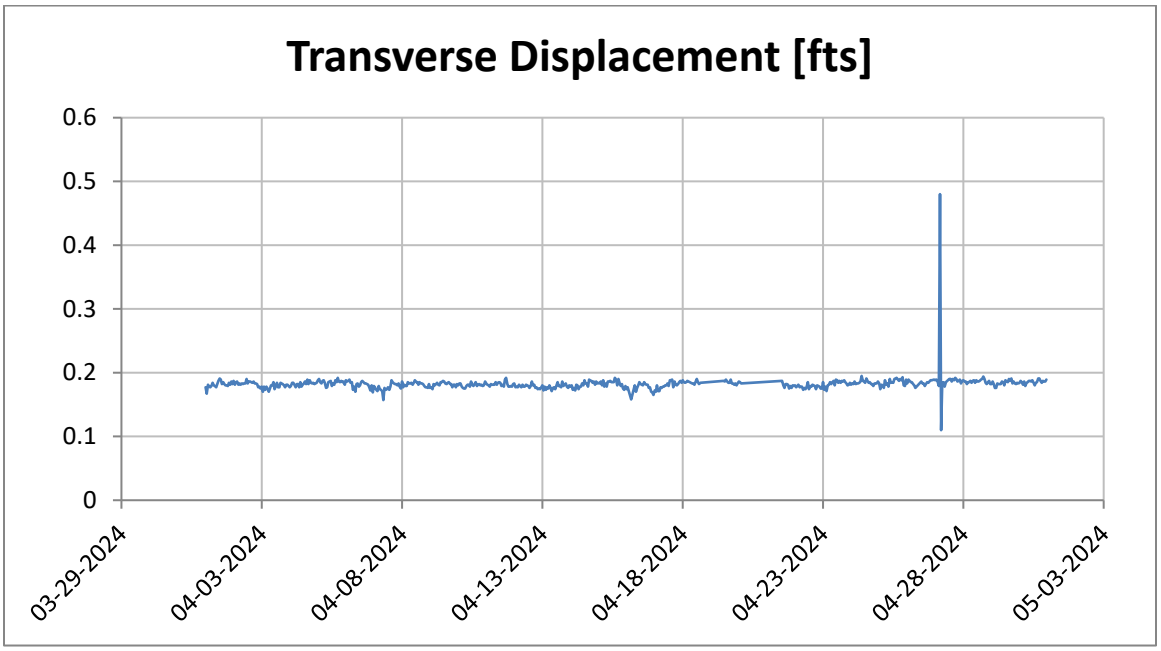


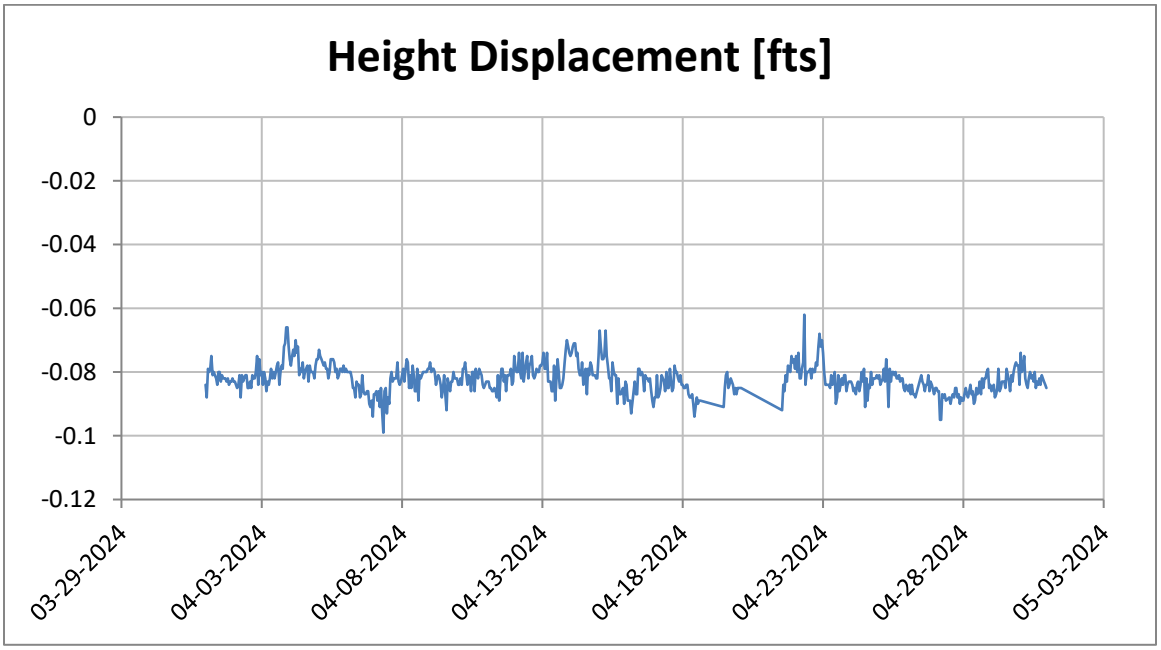
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7200-3



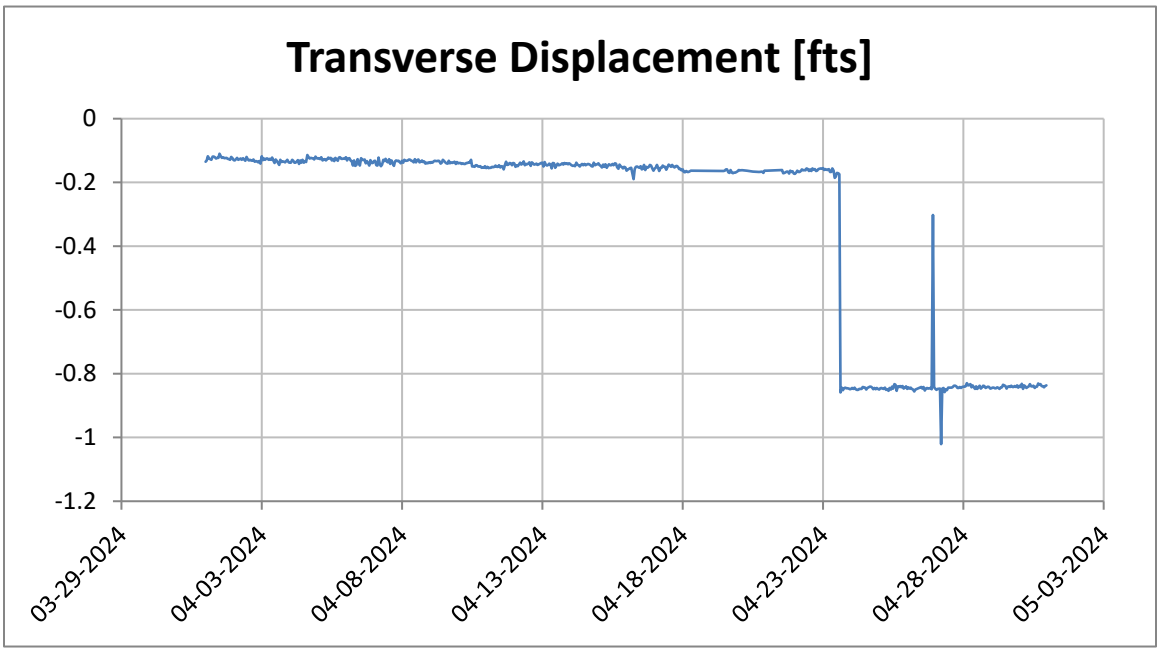


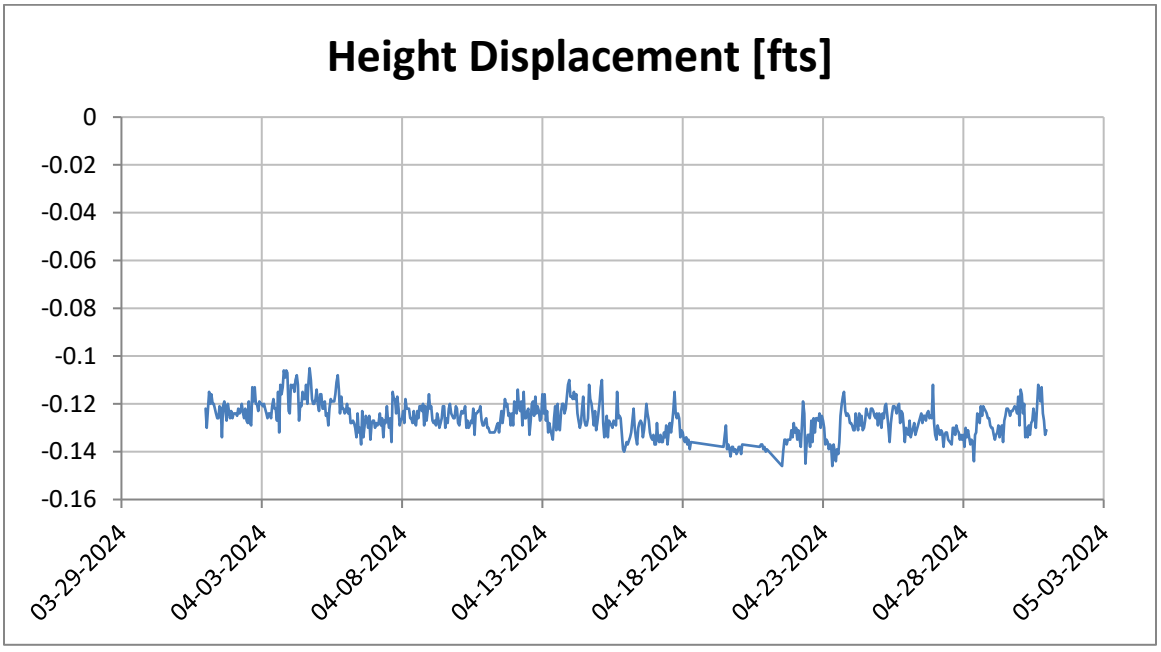
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7300-0



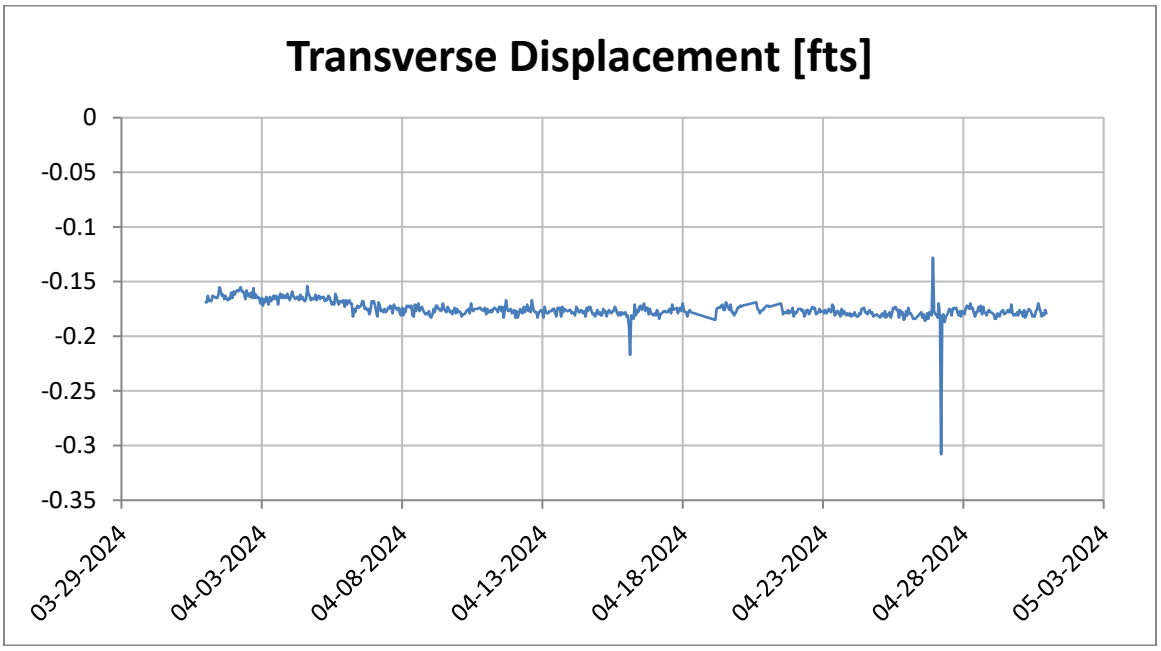


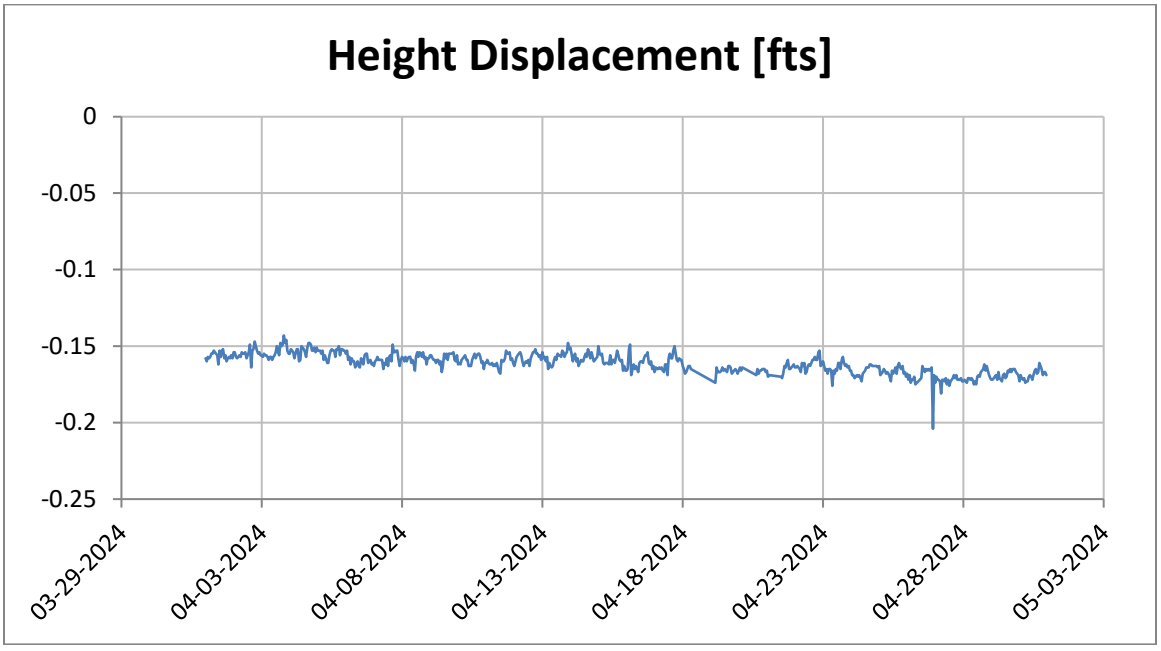
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Data shift believed to be caused by revegetation operations impacting the prism.

Stantec

Prism B7300-1



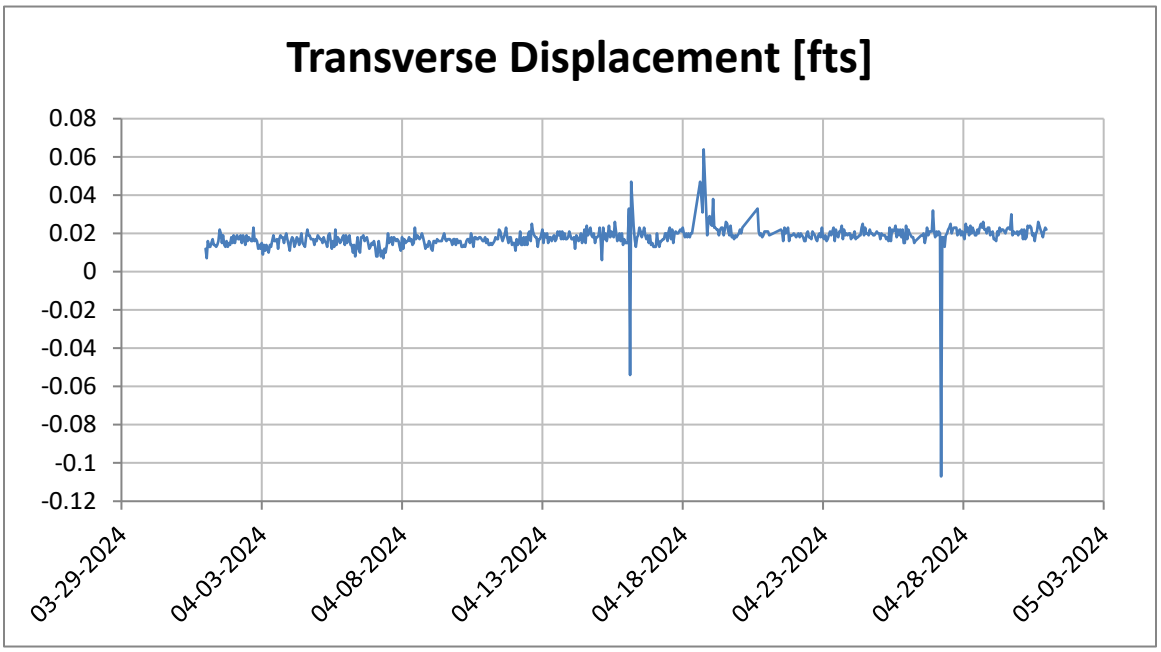


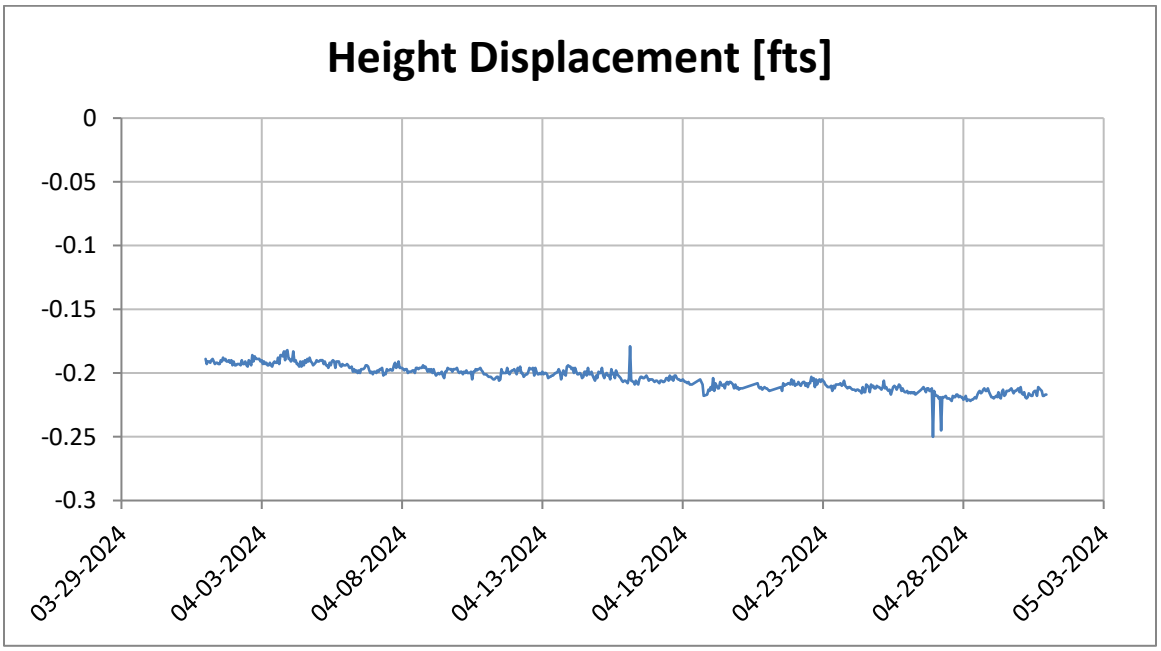
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7300-2



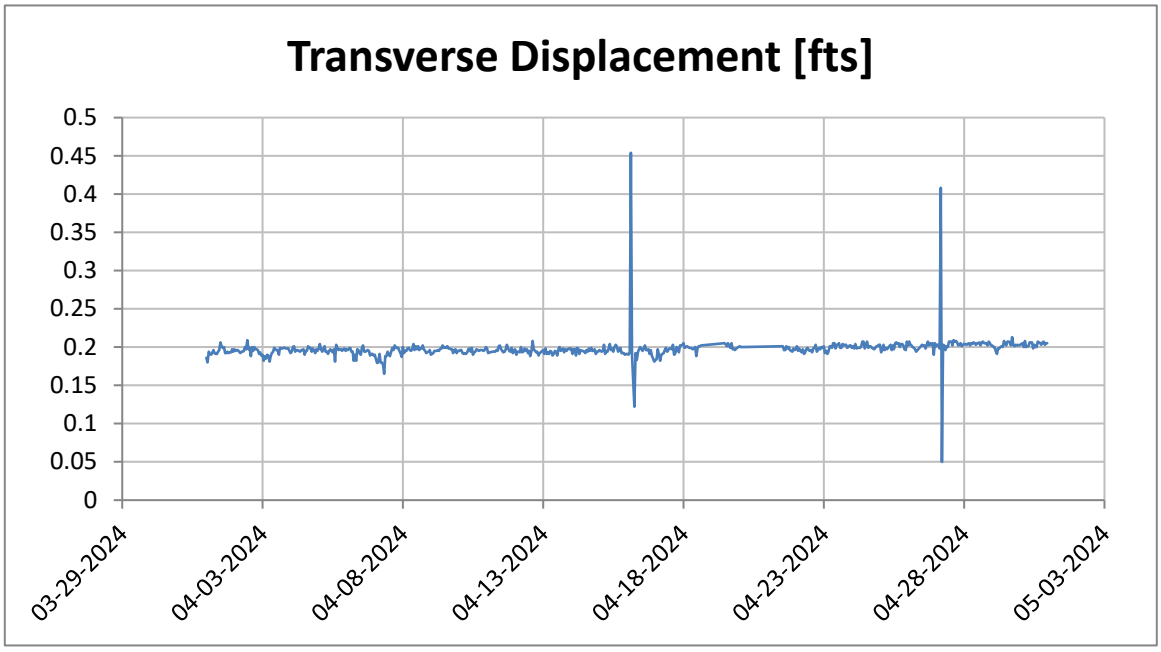


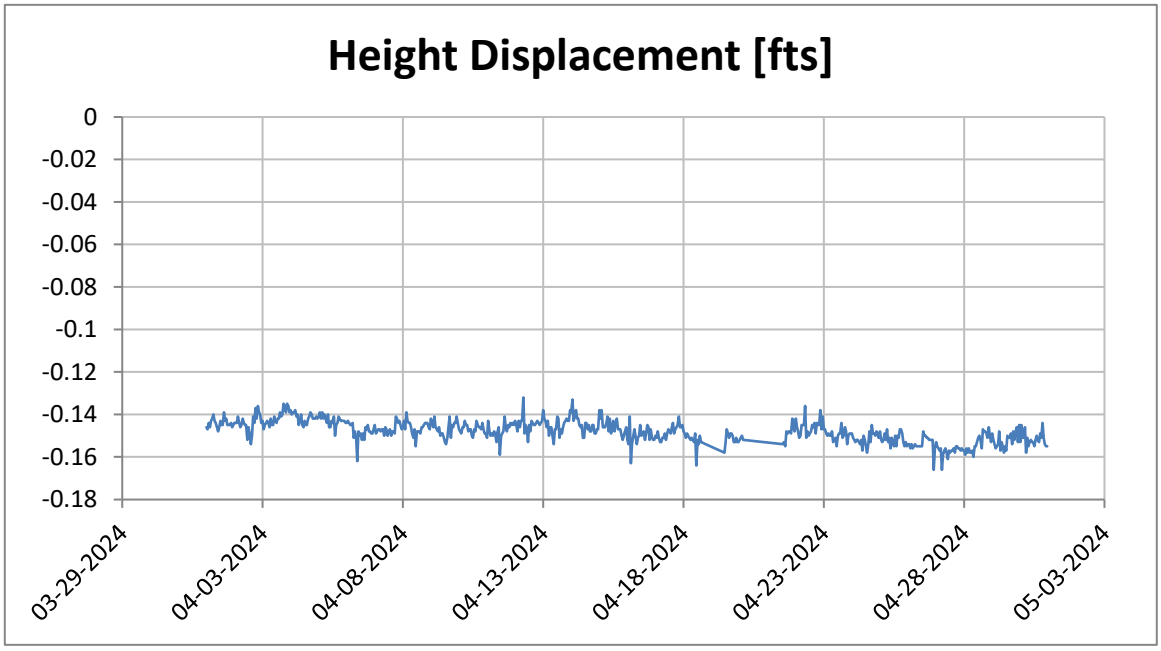
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7300-3



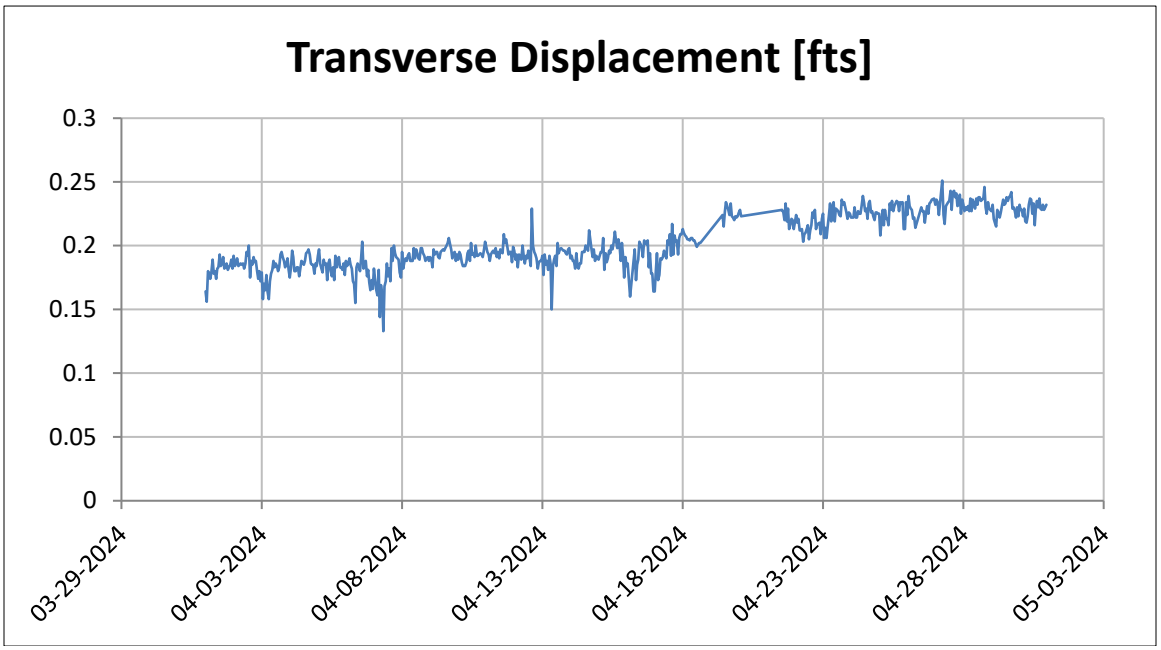


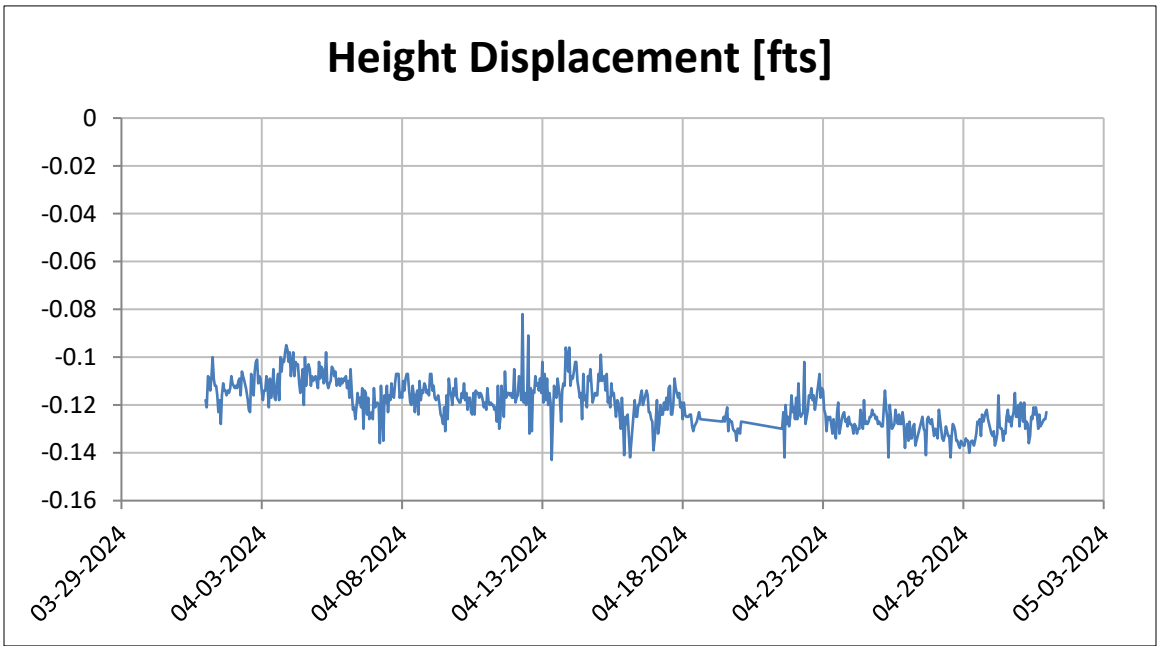
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism B7300-4



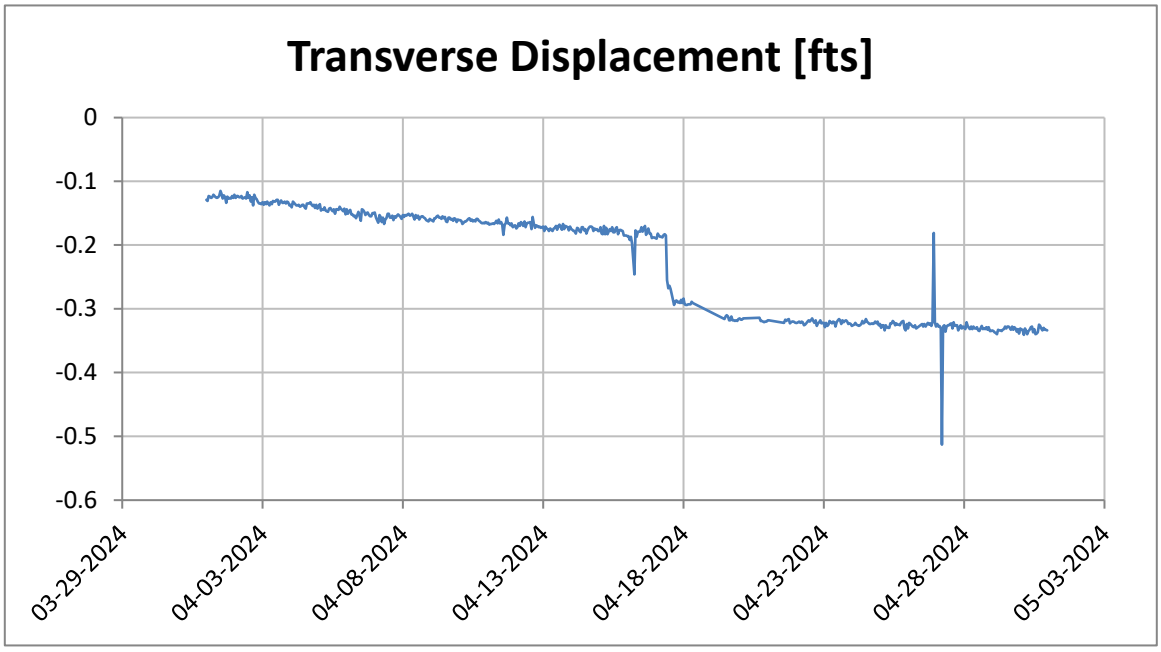


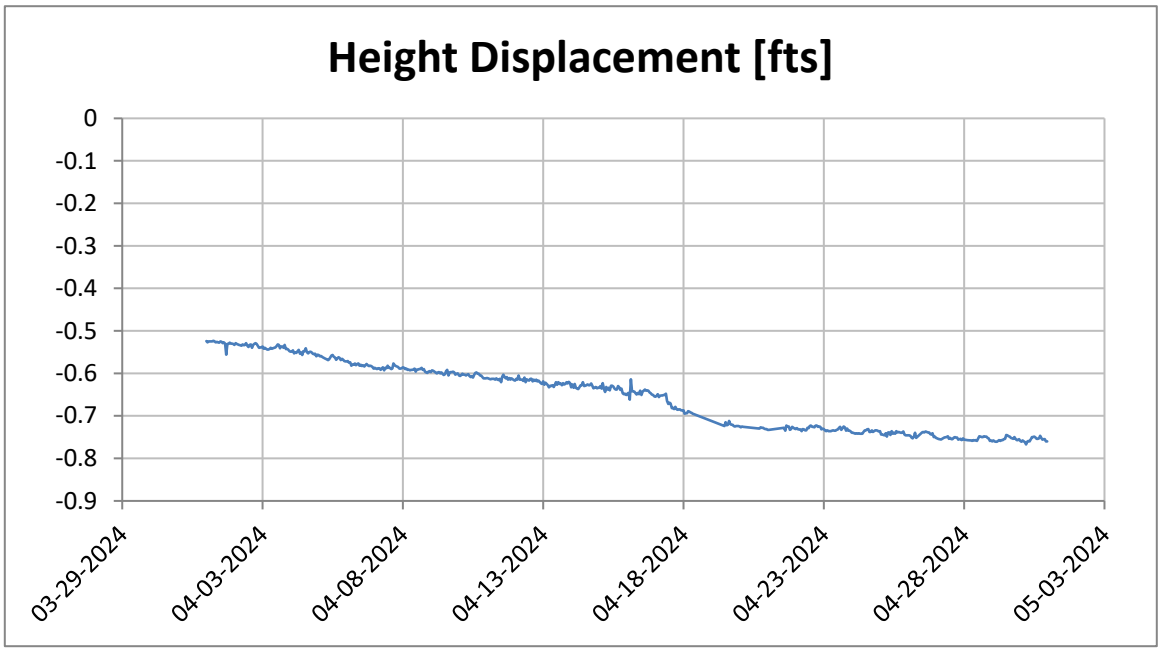
Notes:

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 total 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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Movement believed to be settlement of the compacted fill.
6. Data shift believed to be caused by revegetation operations impacting the prism

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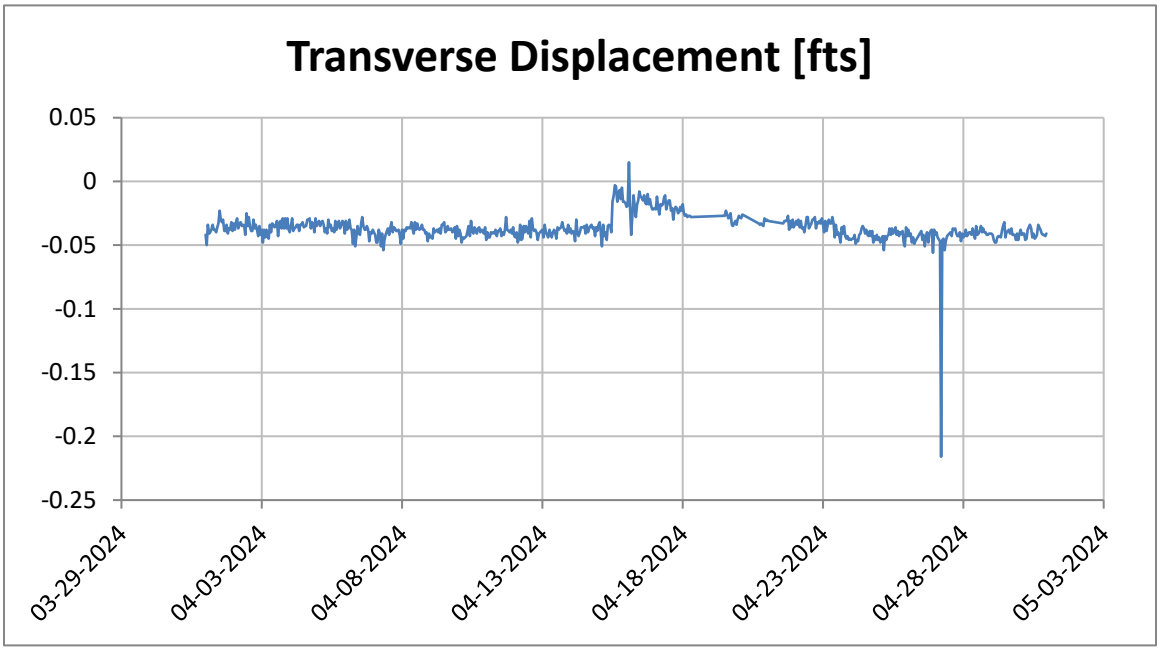
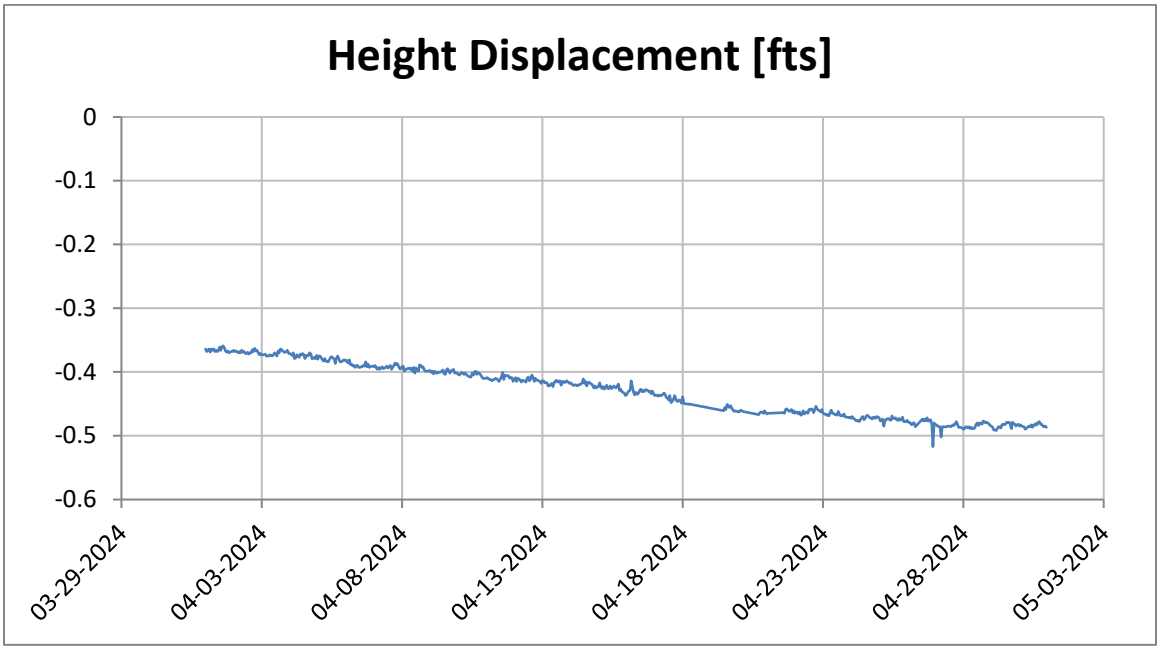
Stantec

Prism B7400-2



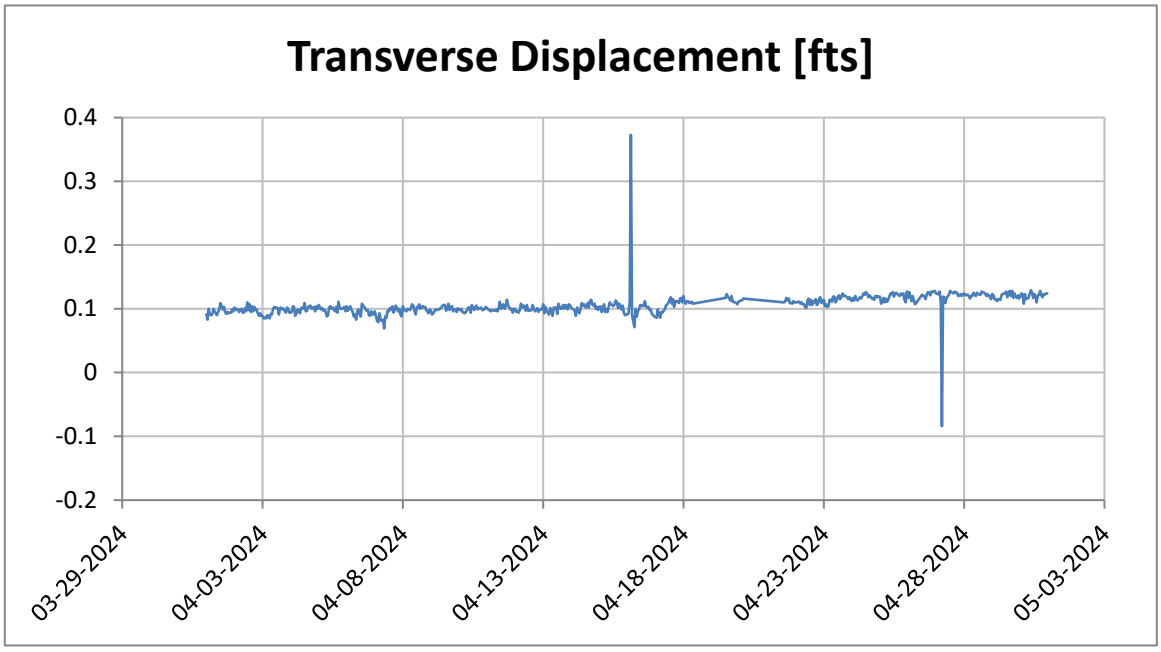


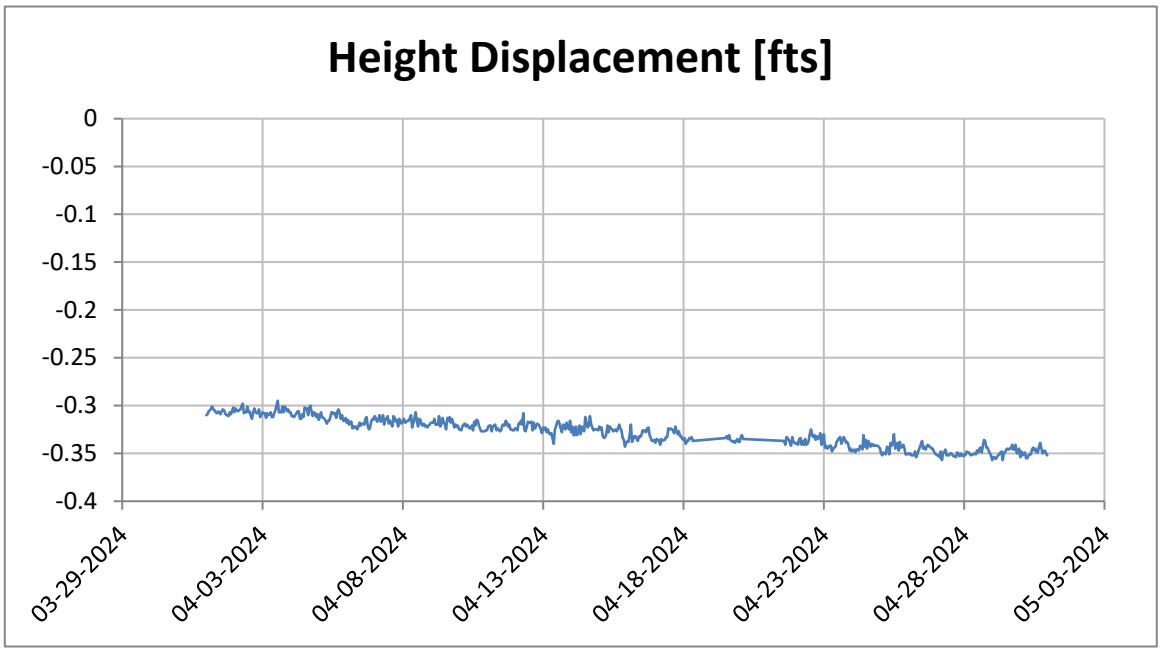
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Movement believed to be settlement of the compacted fill.

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Movement believed to be settlement of the compacted fill.

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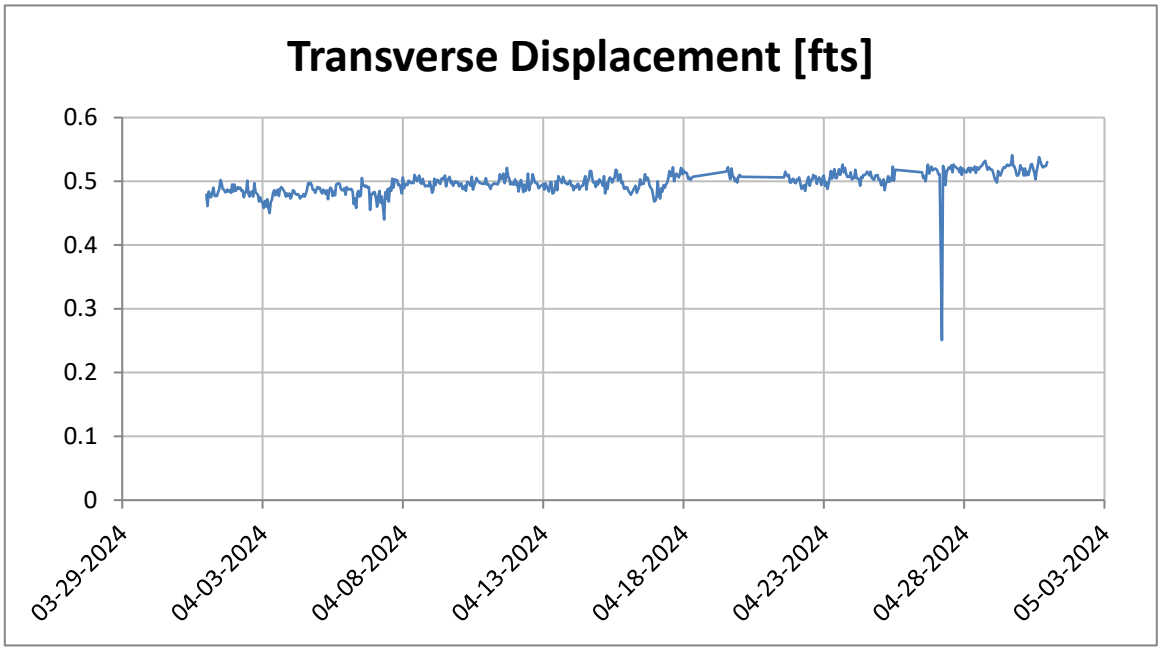
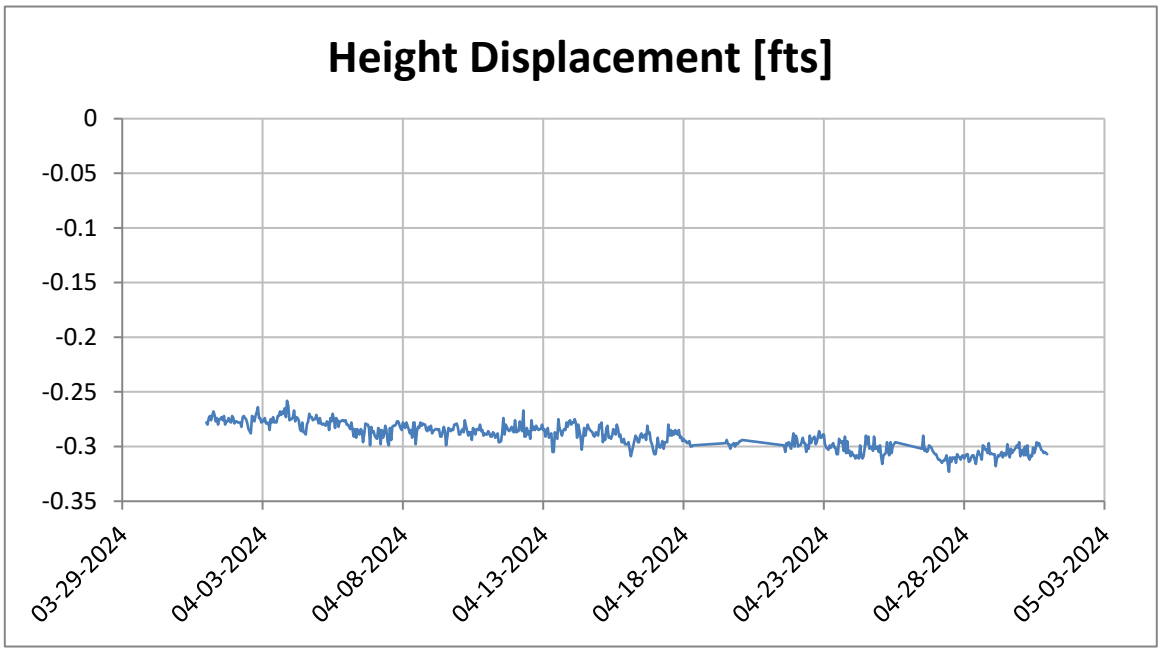
Stantec

Prism B7400-4



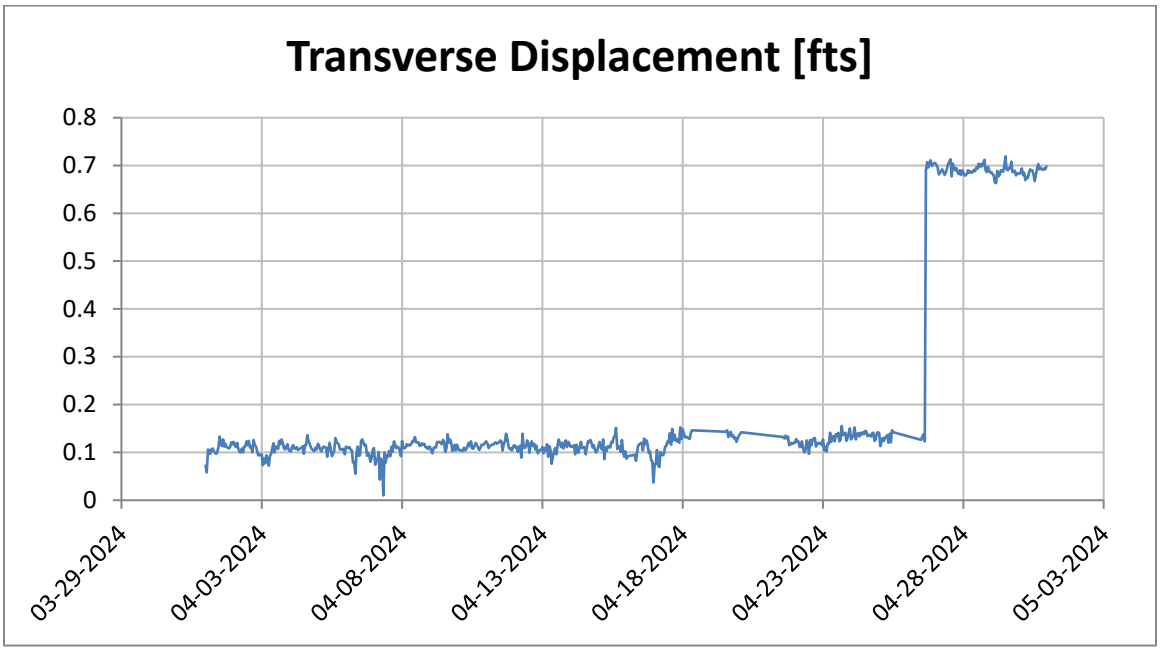


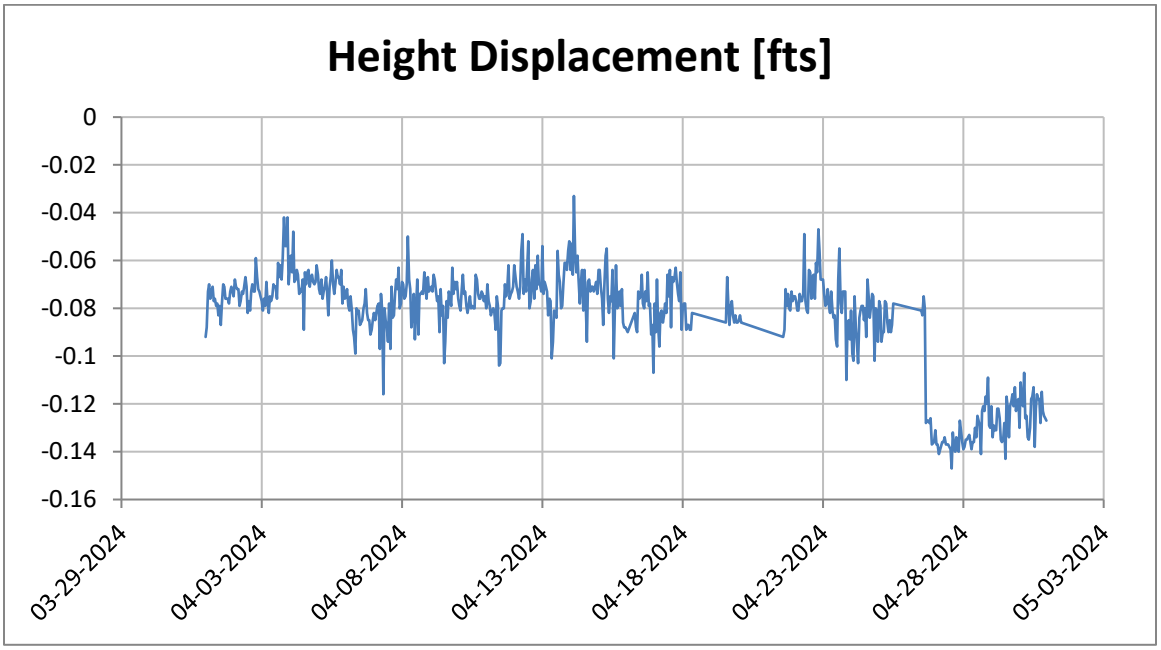
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Movement believed to be settlement of the compacted fill.

Stantec

Prism B7400-5



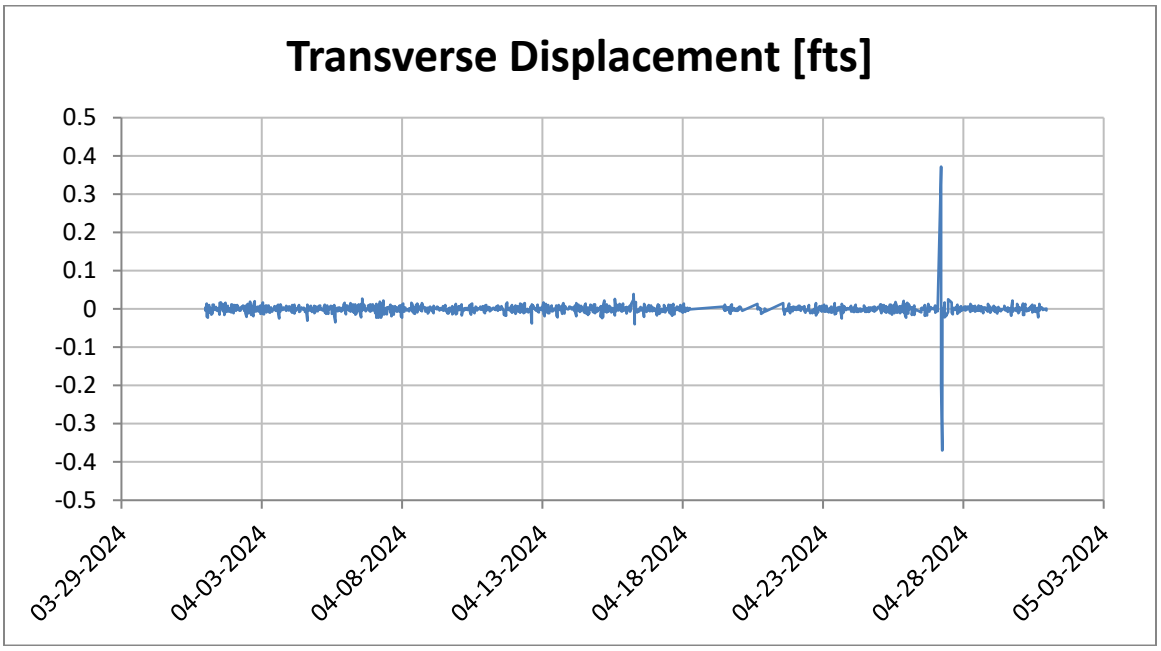


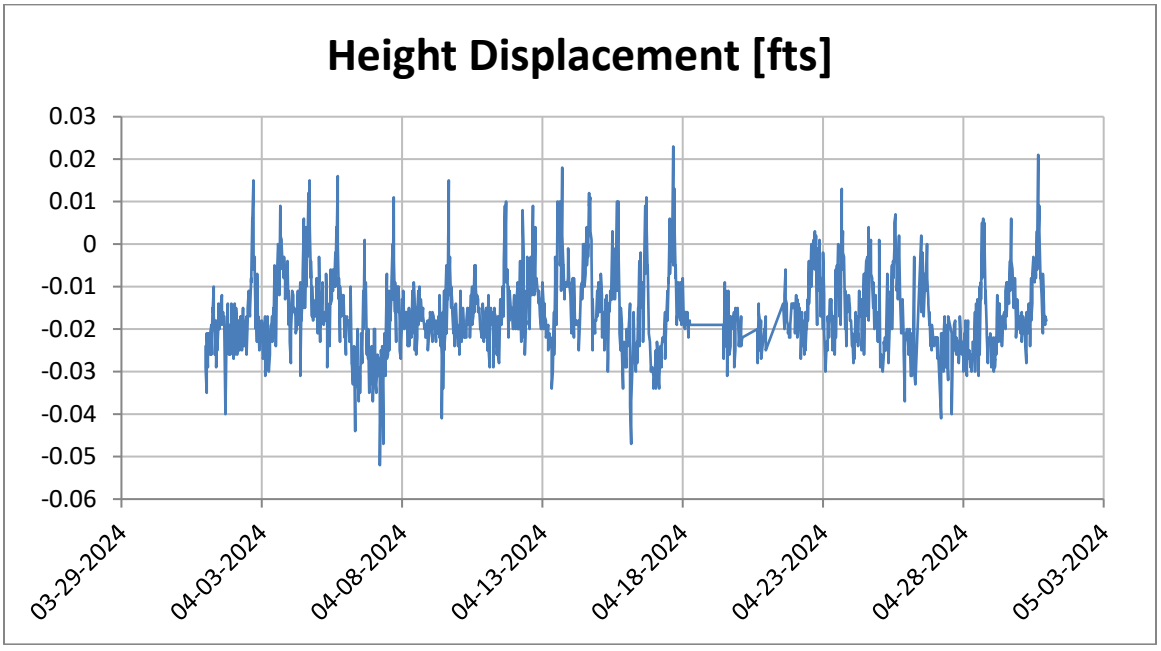
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Data shift believed to be caused by revegetation operations impacting the prism.

Stantec

Prism CP6



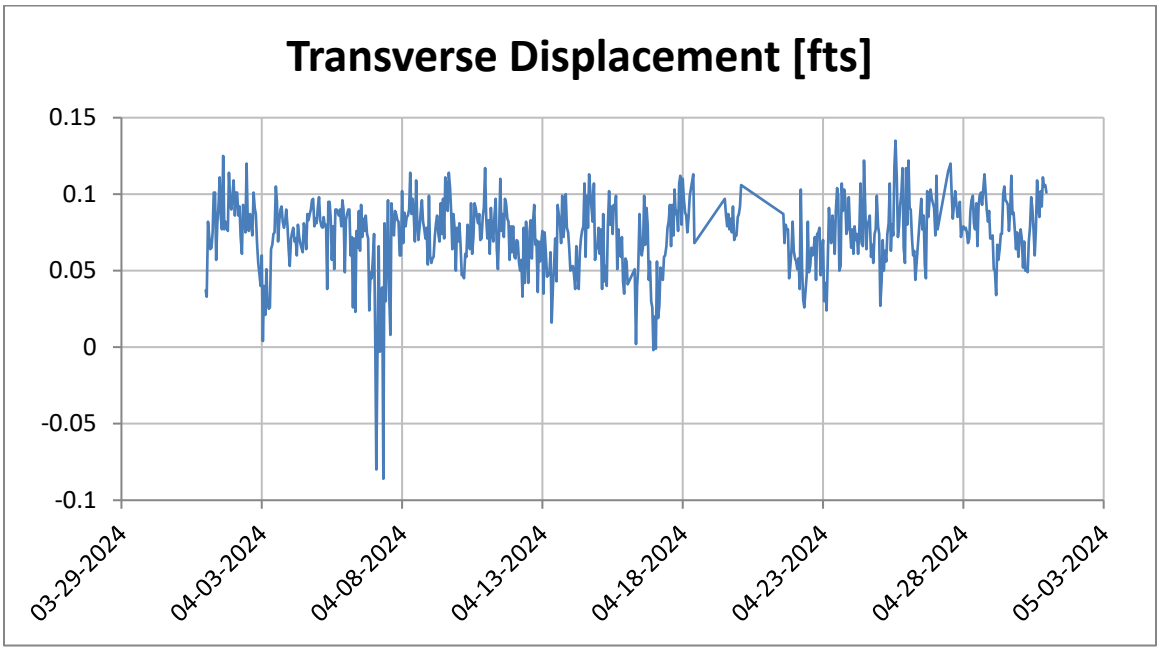


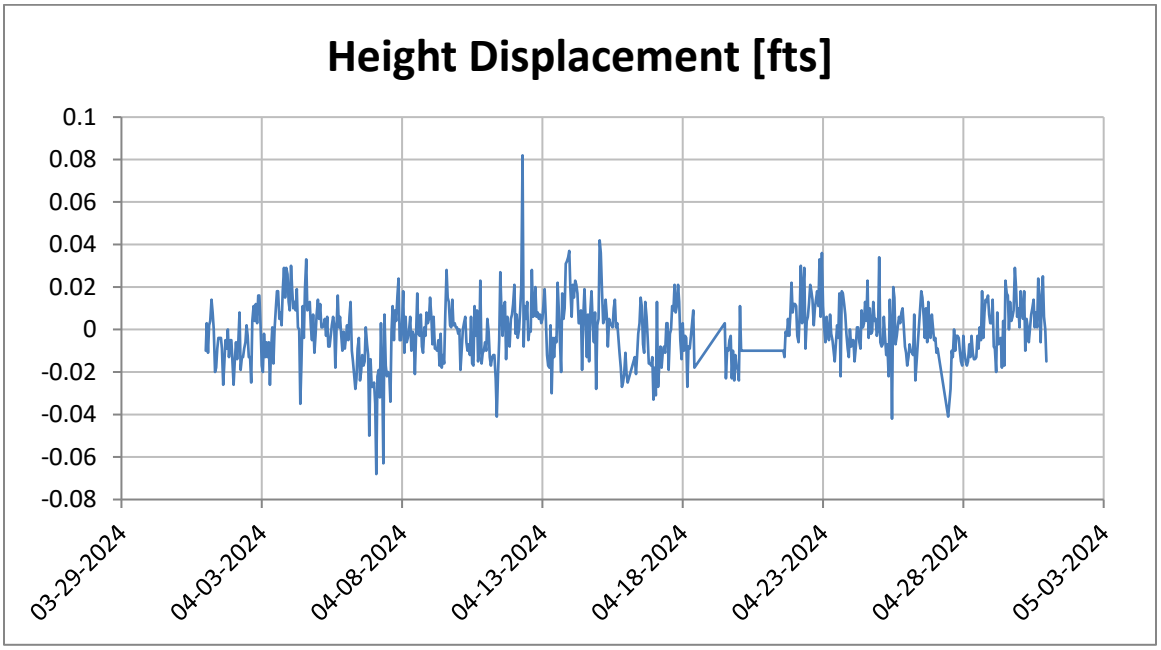
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism CP7



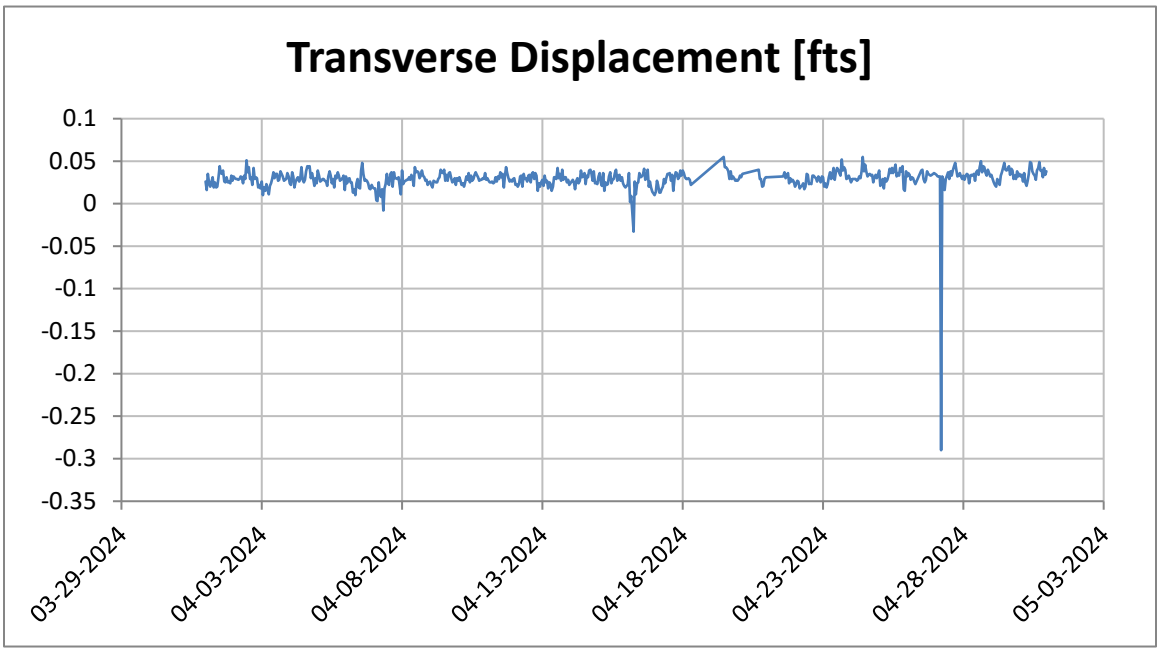


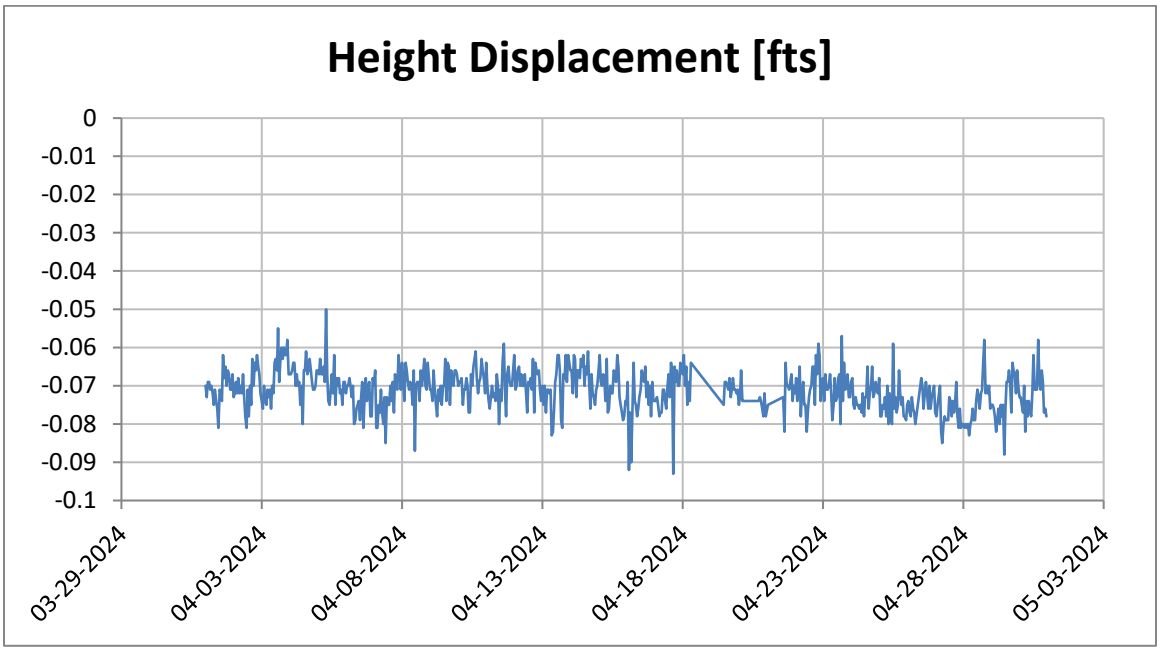
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

Prism NP4



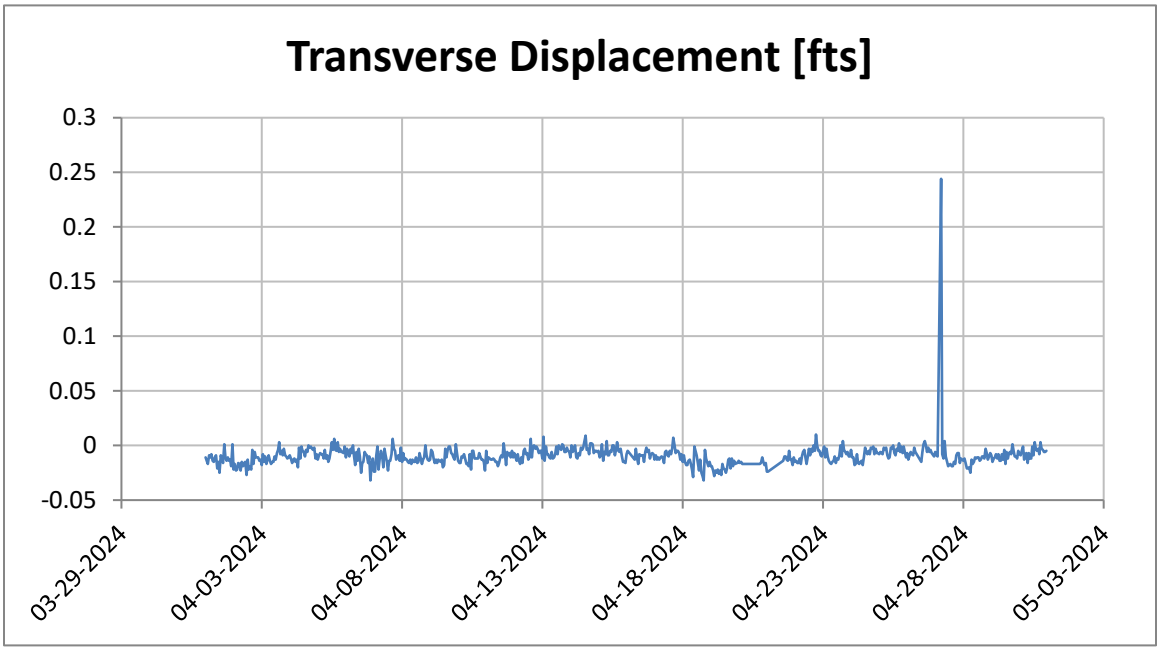


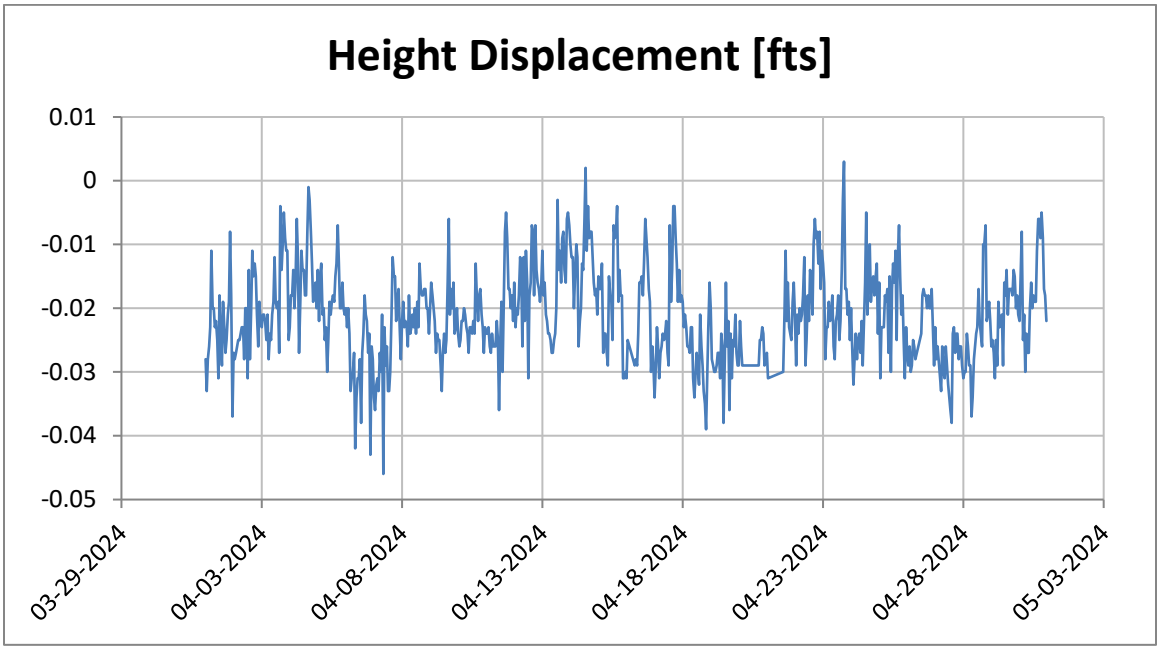
Notes:

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 total 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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Regression limit received on April 27.

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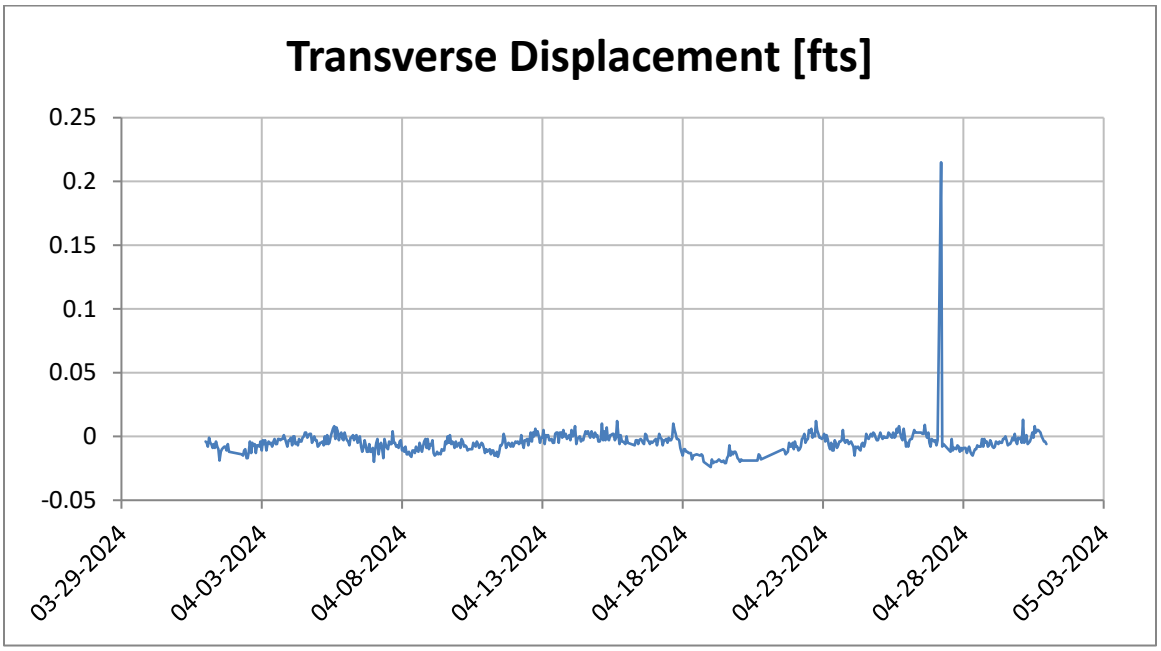
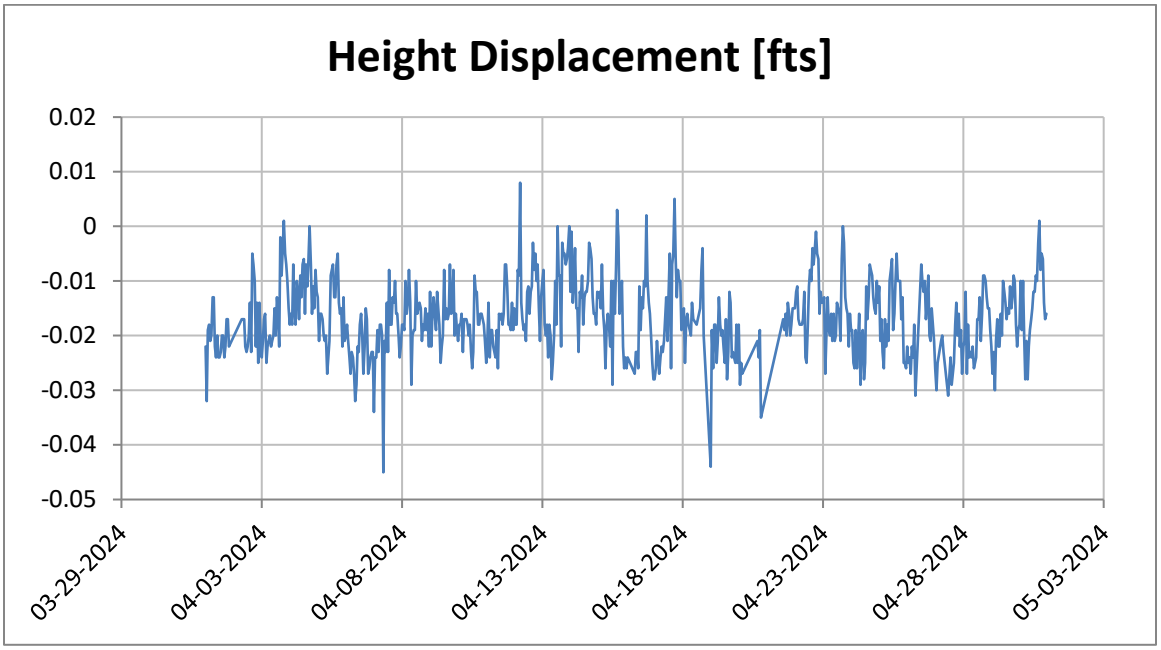
Stantec

Prism P5



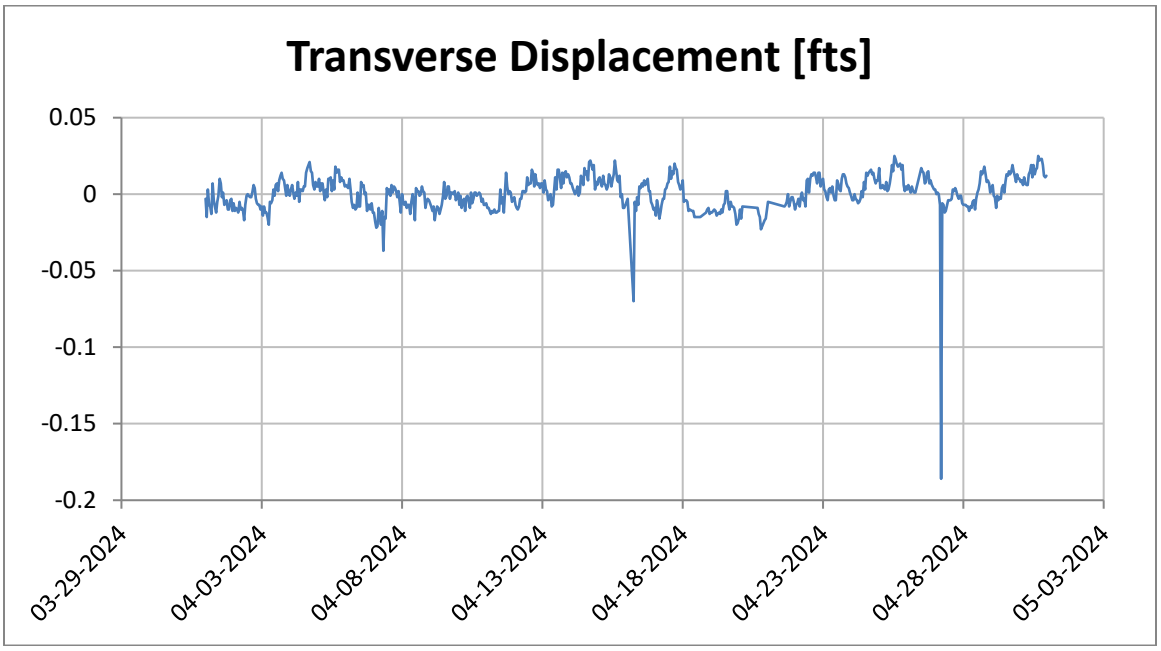


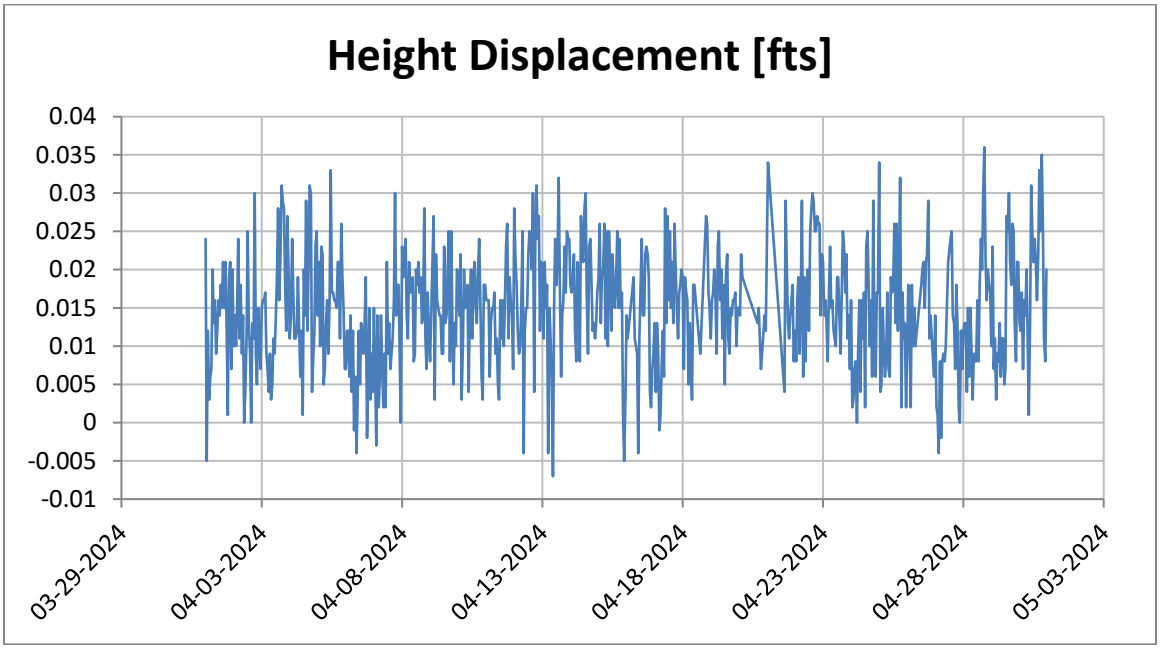
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Regression limit received on April 27.

Stantec

Prism P25



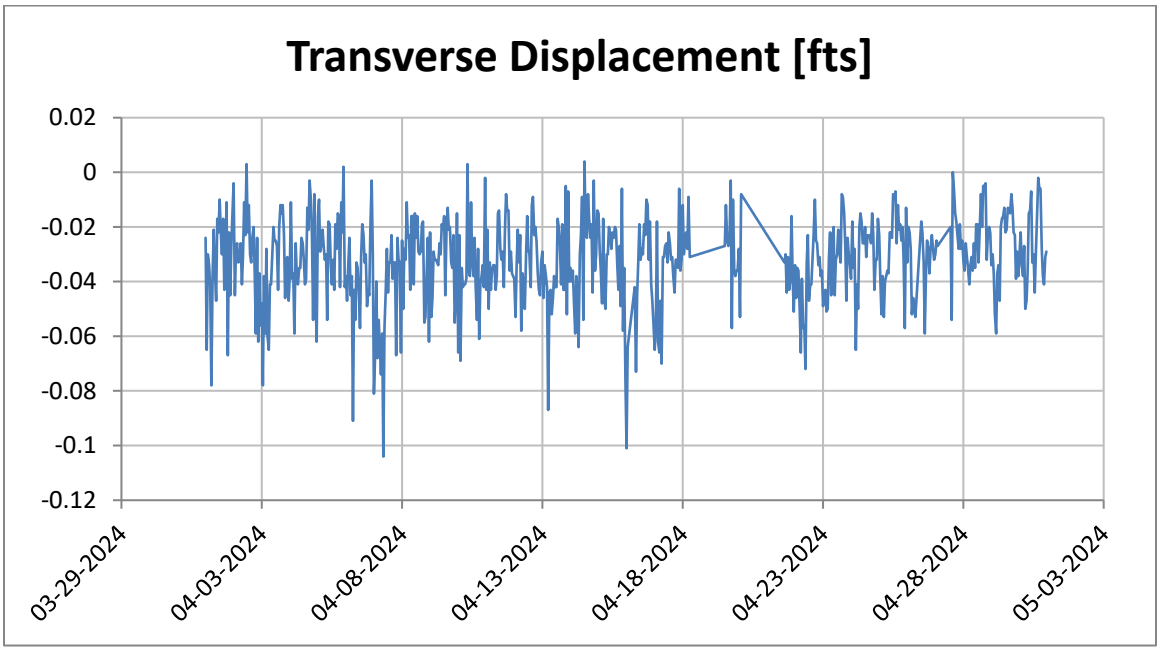


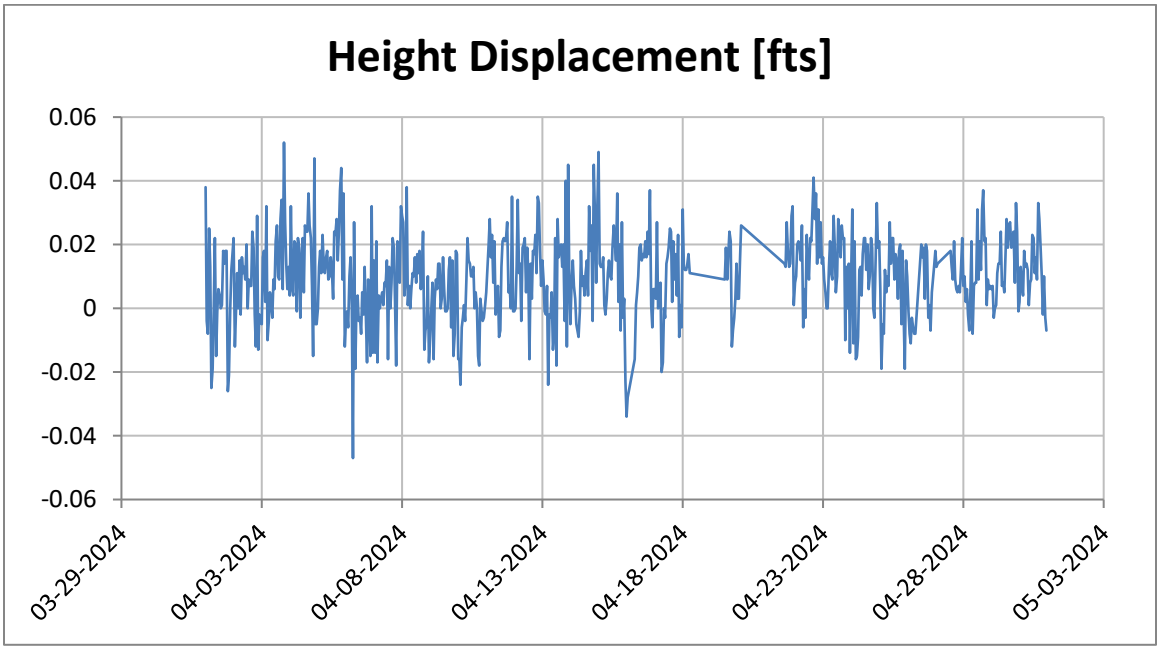
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Regression limits received on April 16 and 27.

Stantec

Prism P32R



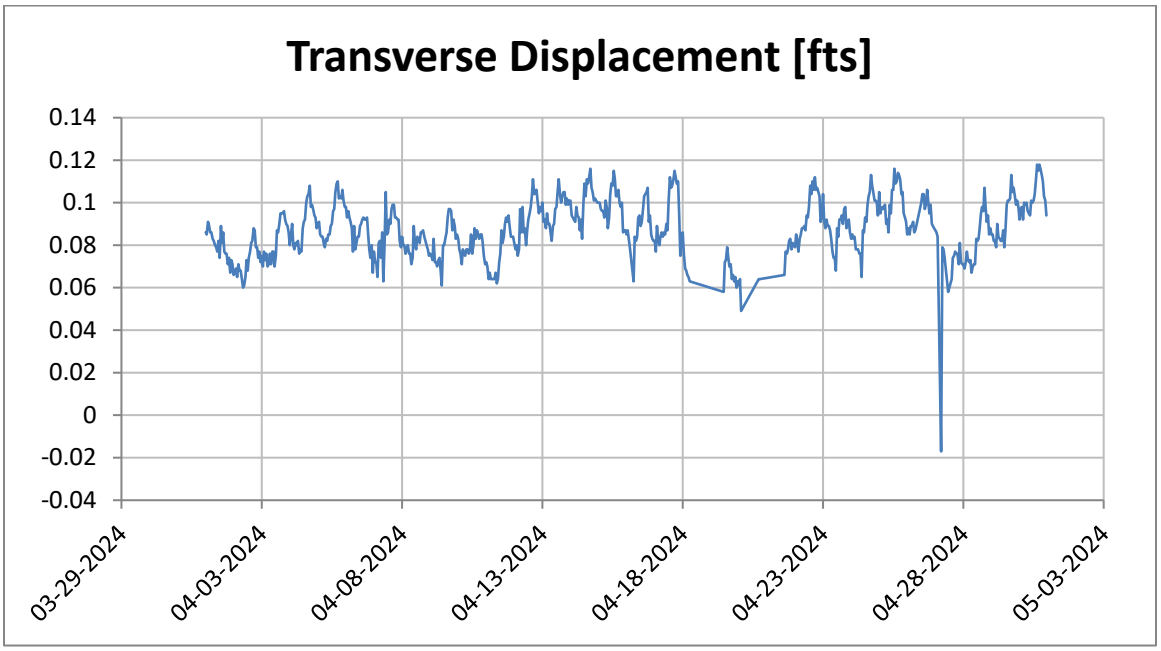


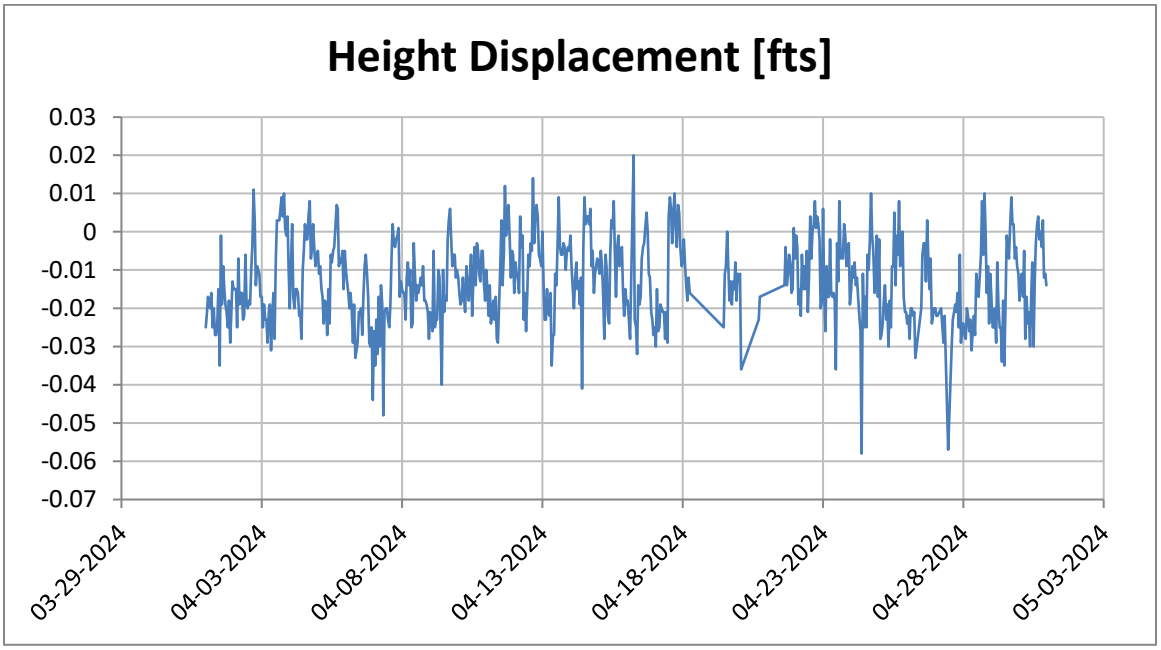
Notes:

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

Stantec

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 total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. Regression limits received on April 16 and 27.

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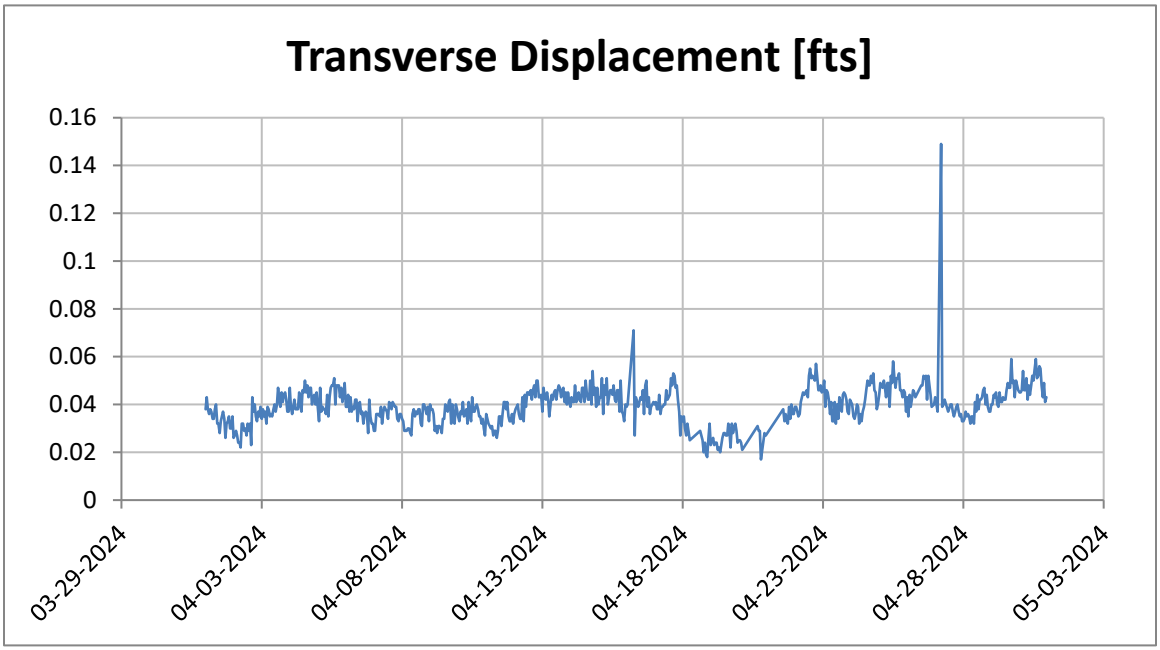
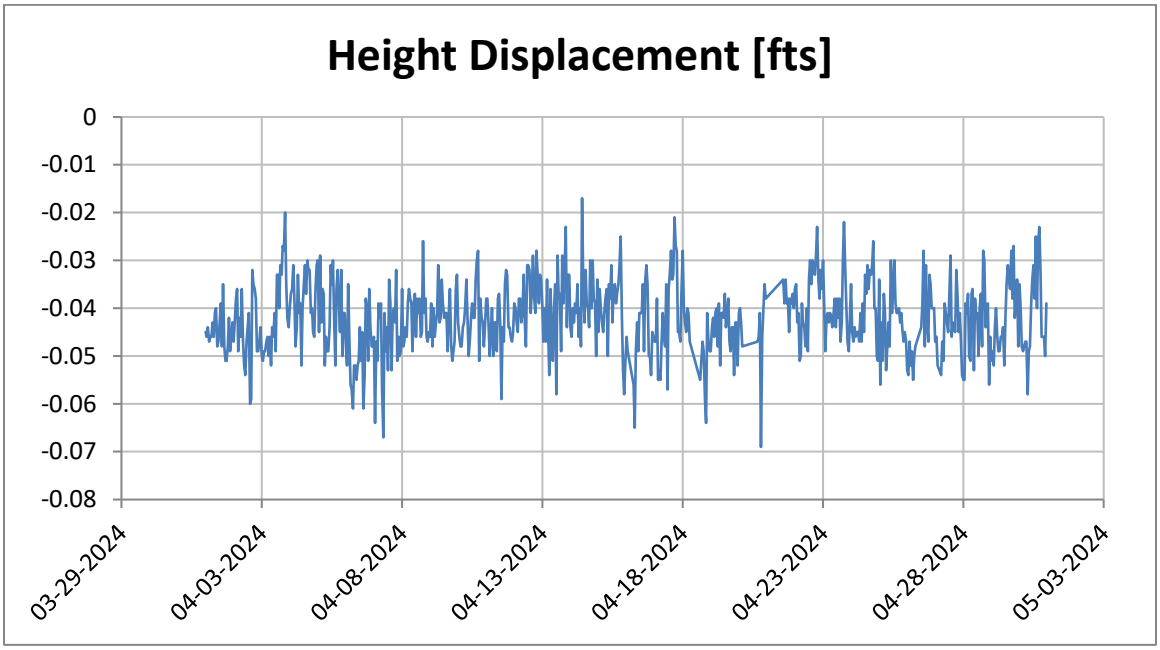
Stantec

Prism P70



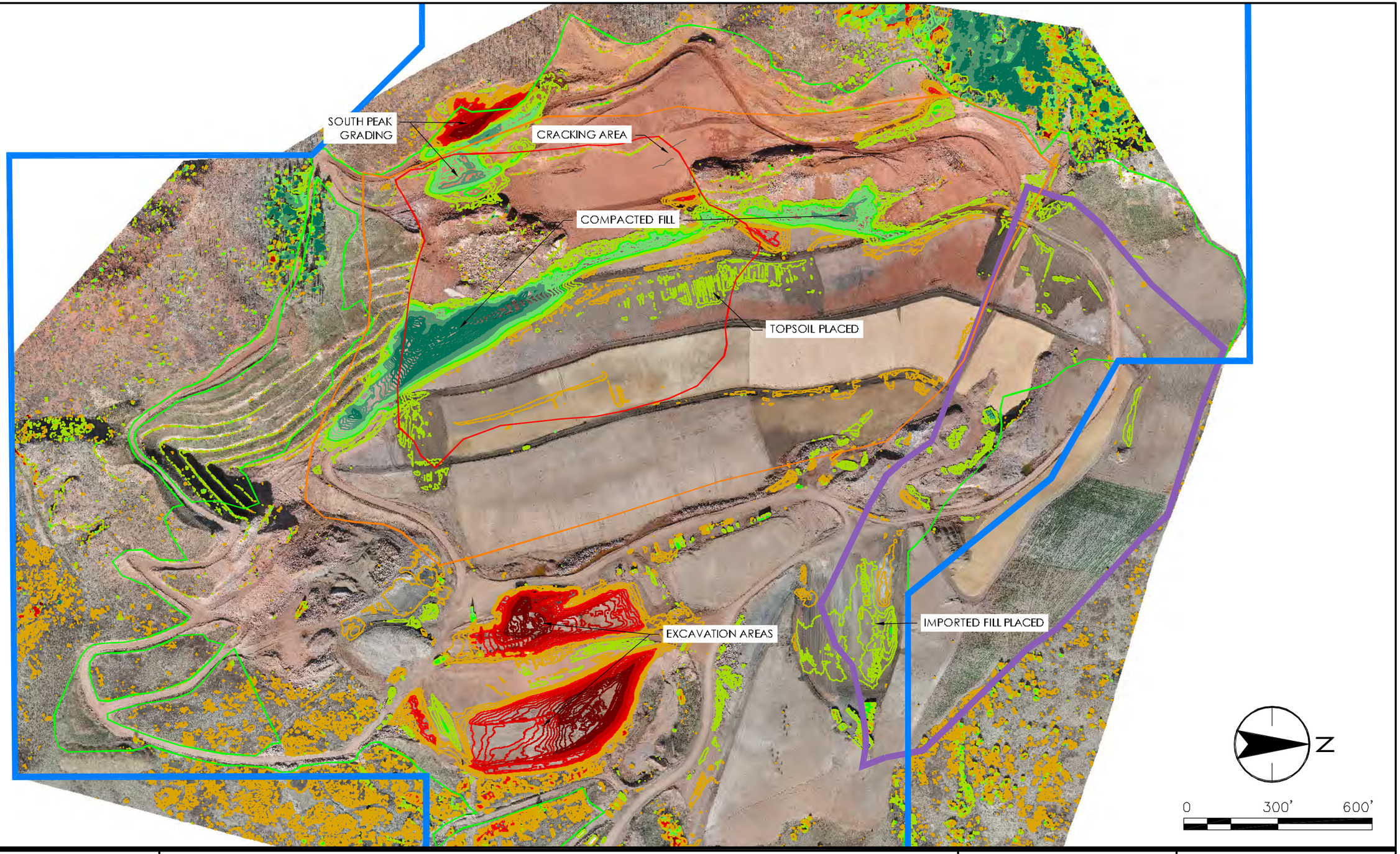


Notes:

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 total 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 03/28/2024 TO 05/02/2024

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
COMPARISON OF RECENT AND PREVIOUS SURVEYS

Revision	Date
#	2024.05.20
Drawn By	Figure No.
PK	5

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. THERE WAS NO TEST 1063 OR 1085.
2. TEST 1067 IS A RETEST OF 1063.
3. TESTS 1089 AND 1090 ARE BELOW AND ABOVE THE CRACKING AREA.

N

0 150' 300'

Client/Project
CASTLE AGGREGATE

PIKEVIEW QUARRY SLOPE MONITORING

Project No.
2057288200

Title
COMPACTION TEST LOCATIONS

Revision
#

Date
2024.05.20

Drawn By
PK

Figure No.
6

Stantec

Compaction Testing Log

Test No.	Date	Elevation (ft)	Northing (ft)	Easting (ft)	Wet Density (pcf)	Moisture Content (%)	Dry Density (pcf)	Compaction (%)
1055	1-Apr-24	7443	1401357	3173015.5	137.8	7.3	128.4	105
1056	1-Apr-24	7443	1401313.6	3172981.1	134.1	3.3	129.4	106
1057	1-Apr-24	7435	1401249.6	3173007.3	131.6	5.7	124.5	101
1058	1-Apr-24	7433	1401263.8	3173066.2	134.7	7.7	125.1	102
1059	3-Apr-24	7448	1401319.5	3173080.2	129.2	3.2	125.2	102
1060	3-Apr-24	7447	1401254.9	3172919.6	126	7.7	117	95
1061	3-Apr-24	7441	1401214.7	3173035.3	125.3	9.1	114.9	94
1062	3-Apr-24	7434	1401207.5	3173039.9	136	11.5	122	99
1063	5-Apr-24	7456	1401410.2	3172963.4	122.4	19.1	102.8	84
1067	8-Apr-24				141.6	8.6	130.4	106
1064	5-Apr-24	7454	1401311.2	3172955.6	117.7	4.6	112.5	92
1065	5-Apr-24	7452	1401262	3172970.7	126	3.4	121.8	99
1066	5-Apr-24	7448	1401248.7	3173049.1	119.9	6.7	112.4	92
1068	10-Apr-24	7463	1401835.7	3172779.6	138.1	10.4	125.1	102
1069	10-Apr-24	7463	1401342.6	3172963.3	140.4	9.5	128.2	104
1070	10-Apr-24	7461	1401289.4	3173004.1	125.6	12.3	111.8	91
1071	12-Apr-24	7472	1401214.3	3172995.6	141.3	7.5	131.4	107
1072	12-Apr-24	7473	1401253.4	3172954	141.1	6.7	132.2	108
1073	12-Apr-24	7471	1401215.9	3172970.7	141.9	7.3	132.3	108
1074	15-Apr-24	7478	1401238.8	3172941.1	125.1	6.9	117	95
1075	15-Apr-24	7479	1401186.8	3172943.7	126.2	11	113.7	93
1076	15-Apr-24	7478	1401205.2	3172975.7	129.5	4.3	124.2	101
1077	19-Apr-24	7446	1402754.8	3172669.5	135.9	7.8	126.1	103
1078	19-Apr-24	7450	1402581.7	3172717.8	133.1	6.9	124.5	101
1079	19-Apr-24	7478	1401236.9	3172951.2	137	9.9	124.7	102
1080	22-Apr-24	7481	1402461.8	3172665.3	130.4	8.1	120.6	98
1081	22-Apr-24	7498	1401861.1	3172766.3	149.4	8.2	138.1	112
1082	22-Apr-24	7490	1401609.5	3172812.8	138.7	15	120.6	98
1083	24-Apr-24	7505	1402205.8	3172660	148.7	6.1	140.2	114
1084	24-Apr-24	7504	1402138.4	3172656.2	150.1	7.7	139.4	114
1086	1-May-24	7446	1402756.8	3172683.4	144.3	6.3	135.8	111
1087	1-May-24	7453	1402399.0	3172783.2	147.5	8.8	135.6	110
1088	1-May-24	7455	1402325.8	3172796.6	130.7	14.7	113.9	93
1089	1-May-24	7680	1401890	3172500	131.0	7.0	122.4	100
1090	1-May-24	7670	1401890	3172470	122.6	3.1	118.9	97

Notes:

- A total 3,404,000 yd3 had been placed and compacted. This requires at least 681 compaction tests and 1,118 tests have been taken.
- April survey was conducted on May 2, 2024; therefore, the compaction tests from May 1 were included in this report.
- Test 1063 did not meet the compaction requirements, but retest 1067 did meet them. Test 1063 has not been included in the test total count.
- Locations for Test 1089 and Test 1090 are approximate.
- There is no test 1085.