



To: Jerald Schnabel  
Castle Aggregate  
File: Third Quarter 2025 Monitoring  
Summary

From: Paul Kos  
Denver, CO 80202  
Date: October 31, 2025

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**Reference: Third Quarter 2025 Geotechnical Monitoring Summary Pikeview Quarry**

## 1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this Third Quarter 2025 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 operated the quarry, which is currently closed and undergoing reclamation. A geotechnical monitoring program was established to monitor the geotechnical performance of the reclaimed slopes during and following reclamation grading. This report presents the geotechnical monitoring results at the site through the Third Quarter of 2025. Continuous monitoring by the robotic survey system began in 2010 and continued through the Third Quarter 2025. 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 Third Quarter 2025 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 site activities and monitor reclamation progress.

### 1.2 MONITORING SUMMARY

Major components of the instrumentation monitoring program are listed in Table 1 and shown on Figures 1 (aerial imagery) and 2 (topography).

**Table 1 Monitoring Frequency**

Monitoring Type	Frequency
Visual inspection	Daily (if work activities that day, Castle Aggregate) and Quarterly (Stantec)
Robotic theodolite/prism	Continuous

Design with community in mind

## 2.0 VISUAL INSPECTIONS

Inspections are completed on working days by site staff prior to work activities and quarterly 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).

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 slopes for any changes.

Stantec conducted visual inspections of the Pikeview Quarry slopes on July 15, 2025 and September 29, 2025. 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 in Figure 3.

The visual observations noted localized features:

- The reclamation slopes contain tall grasses that provide habitat for birds and insects, including bees, lady bugs, and praying mantis (See Photo 1 on Figure 3).
- Water infiltration above a bedrock outcrop eroded a hole in two locations of fill placed against the bedrock. No erosion or debris was observed downhill from the hole. The hole was filled during the Third Quarter (See Photo 3 on Figure 3).
- Settlement cracks previously noted on the upper slopes of the buttress fill remain, and they were similar to previous inspections. The cracks were covered by erosion control blanket and could not be observed in recent inspections (See Photo 5 on Figure 3).
- Settlement cracks were noted along the edges of the terrace benches. These settlement cracks are believed to be related to the topsoil and surficial material consolidating (See Photo 8 on Figure 3).
- Settlement cracks were previously noted on the southern slope adjacent to the main channel. This area on the edge of the buttress is in a fill area between cut areas, and the cracks are believed to be related to the fill settling. The cracks were not located during the Third Quarter inspections.

Visual inspections of the Pikeview Quarry did not reveal any evidence of large-scale instability. No other cracking, bulging, rippling, over-steepening, depressions, slumps, or dry slip-offs were observed.

## 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 32 prisms active in the Third Quarter 2025; two prisms were control points located outside the slope movement area, 4 prisms were located on the slopes surrounding the slope movement area, and 26 prisms were located in the buttress fill area. The prism locations are shown in Figures 1 and 2.



The monitoring software, GeoMos, has been programmed 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. All alerts for potential movement have been attributed to weather, animal activity, equipment operations, vandalism, vegetation blocking the prism (see Photo 4 on Figure 3), or sun glare, and no alerts have been associated with slope movements. Castle Aggregate will notify CDRMS of any alerts caused by slope movement.

The prism monitoring results for transverse and height displacements, period change, and cumulative change are summarized in Table 2. 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 period delta is the most recent reading cumulative delta displacement (horizontal, lateral, and vertical) subtracted from the first reading of the quarter. 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 or when each prism was installed. According to Leica documentation, the survey accuracy is  $+/-4\text{ mm}+1.5\text{ ppm}$  for prisms located greater than 500m from the robotic total station; this equates to an accuracy of  $+/-0.016\text{ ft}$ .

**Table 2 First Quarter 2025 Prism Summary**

Prism ID	Cumulative Transverse Displacement (ft)	Cumulative Height Displacement (ft)	Period Delta (ft)	Cumulative Delta (ft)	Notes
B7200-1	-0.078	0.020	0.006	0.092	
B7200-2	0.005	-0.040	0.008	0.095	
B7200-3	0.266	-0.088	0.011	0.339	
B7300-0	-1.092	-0.380	0.074	1.365	
B7300-1	-0.220	-0.236	0.027	0.527	
B7300-2	0.046	-0.418	0.000	0.480	
B7300-3	0.236	-0.236	-0.039	0.460	
B7300-4	0.316	-0.207	0.029	0.422	
B7400-1	-0.361	-0.974	0.049	1.623	
B7400-2	-0.058	-0.717	0.029	1.336	
B7400-3	0.196	-0.648	0.088	0.852	
B7400-4	0.558	-0.498	0.034	0.860	
B7400-5	0.907	-0.292	0.042	0.960	
B7500-1r	-0.019	-0.060	0.053	0.154	
B7500-2	0.000	-0.312	0.028	0.400	
B7500-3	0.125	-0.272	0.028	0.364	
B7500-4	0.250	-0.265	0.075	0.507	
B7500-5	0.183	-0.292	0.048	0.361	
B7600-5	0.736	-0.560	0.315	1.137	
B7700-1	-0.030	-0.043	-0.006	0.214	
B7700-2	-0.007	0.012	-0.020	0.027	
B7700-3U	-0.019	0.022	-0.009	0.029	
B7700-3L	0.000	0.051	0.020	0.061	
BR4	-0.025	-0.020	0.008	0.067	
CP6	-0.001	-0.009	-0.004	0.018	
CP7	0.096	0.028	0.033	0.100	
NP4	0.032	-0.066	0.011	0.198	
P2	-0.008	-0.002	-0.007	0.009	
P5	0.012	0.006	0.005	0.015	
P25	0.027	0.029	0.009	0.040	
P32R	-0.047	0.012	0.004	0.049	
P33	0.064	-0.016	0.037	0.150	

The data show stable conditions with no or very small settlement movements at each of the 32 prisms. Prisms on the buttress slope continued to record slow and decreasing gradual movement as the fill consolidates under its own weight. A small amount of settlement is common for newly placed compacted fill, and this was recorded by the prisms. Plots of the transverse and height displacements for each prism are included in Appendix A.

## 4.0 RECLAMATION PROGRESS

Castle Aggregate has completed reclamation grading at the Pikeview Quarry. A phased approach is being used to complete the reclamation process (See milestone schedule below).

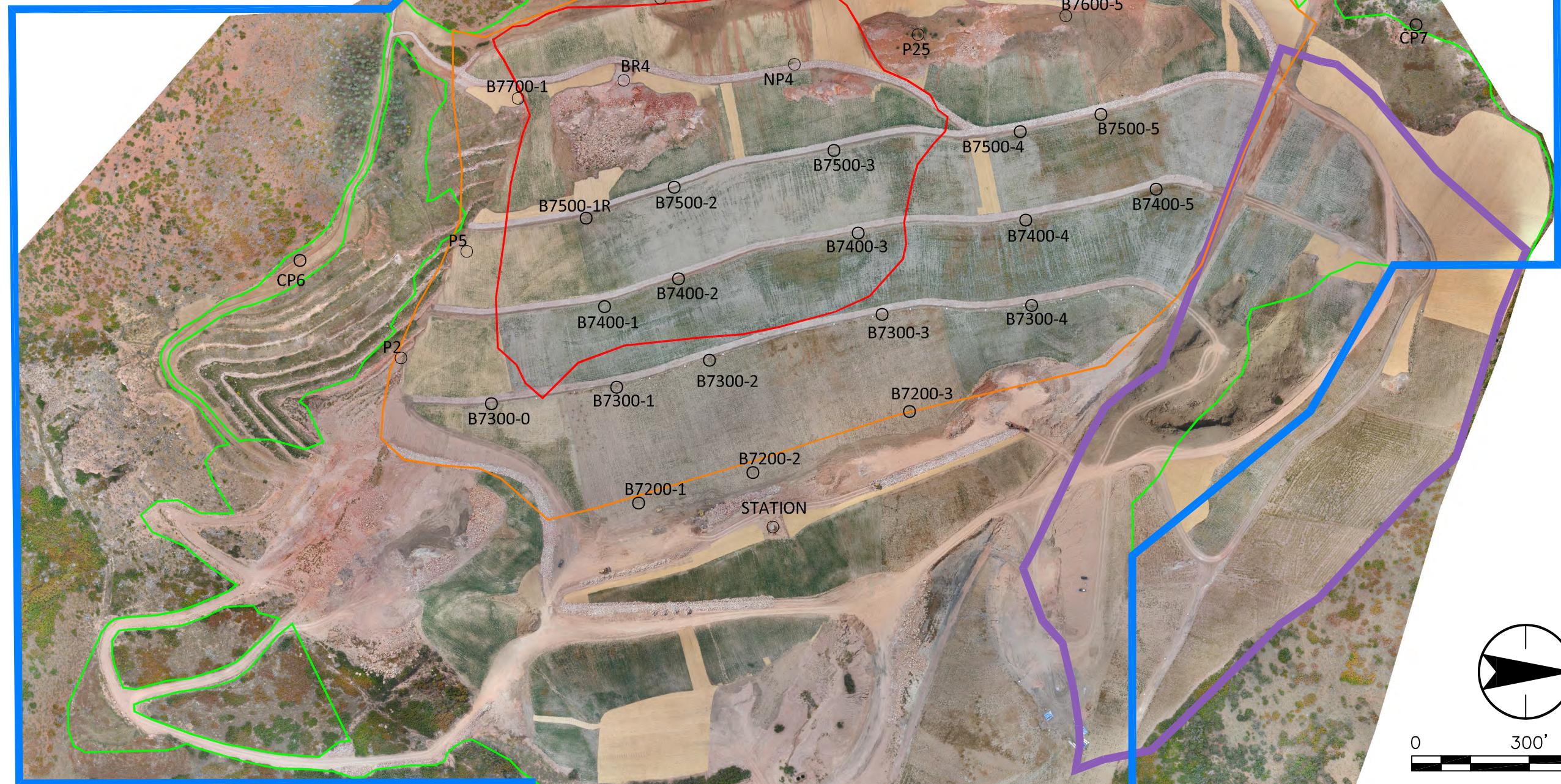
Task/Milestone	Estimated Dates
Phase 1 – RFP Evaluation and Recommendation	Completed July 2021
Phase 2 – Constructor Contract Award	Completed August 2023
Phase 3 – Project Kick-off with successful Contractor	Completed August 2023
Phase 4 – Reclamation Grading	Completed February 2022 to July 2024
Phase 4 – Contractor Demobilize from Site	Completed Summer 2024
Phase 4 – Channel Armoring	Completed January 2025
Phase 4 – Reclamation Planting	Completed February 2025
Phase 5 – Final Revegetation	2024 until acceptance

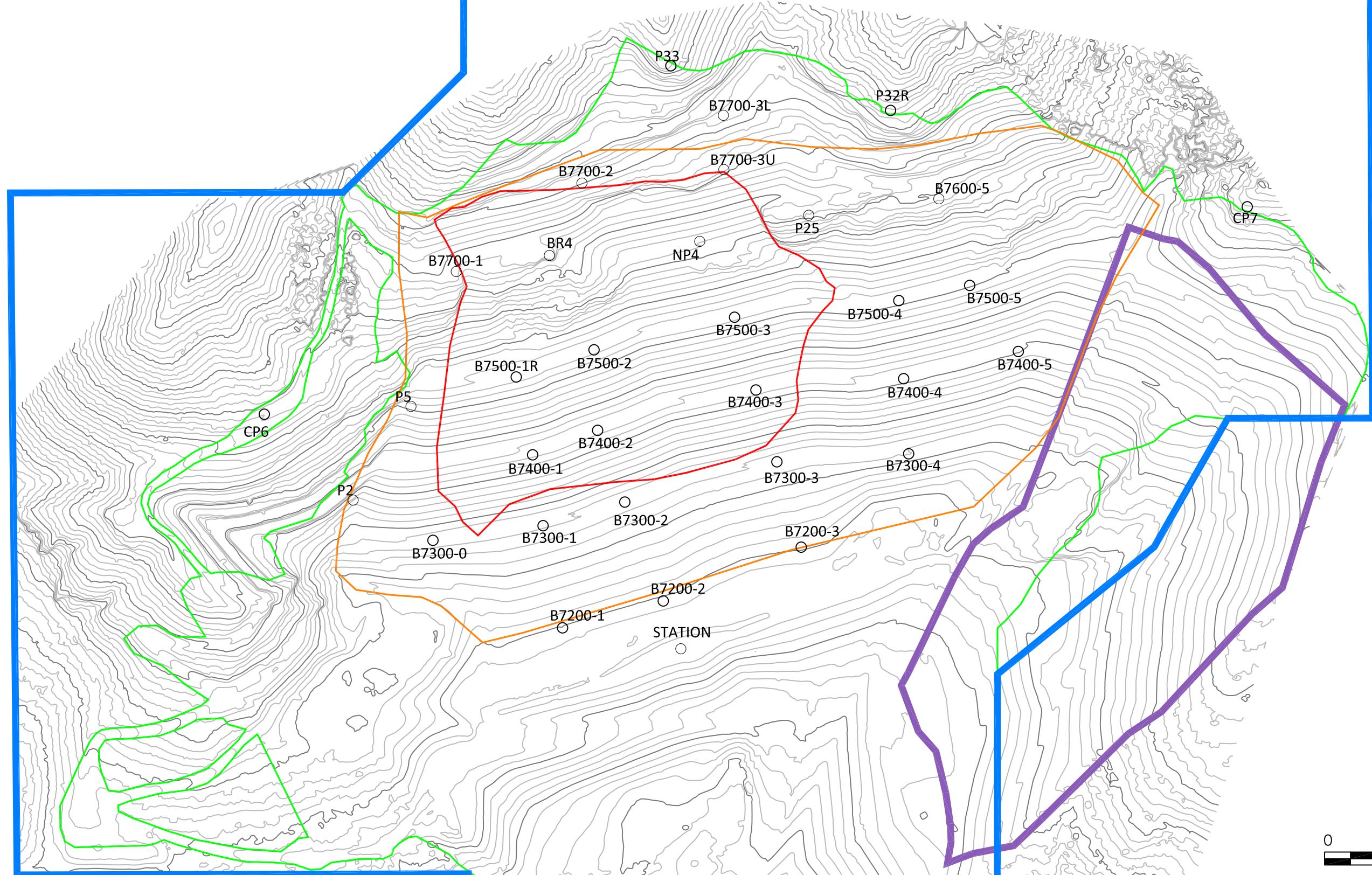
Work performed this quarter and planned for next quarter is limited to geotechnical monitoring and maintenance operations.

## 5.0 CONCLUSIONS

The data collected in the Third Quarter 2025 demonstrate compliance with the reclamation grading plan, and none of the data indicate evidence of any large-scale movements that increase risk to workers or to the public.

- All monitoring should continue at frequencies specified above.
- All alerts shall continue to be taken seriously even if data errors are suspected.
- CDRMS will be notified of any movement alerts not associated with weather or maintenance.



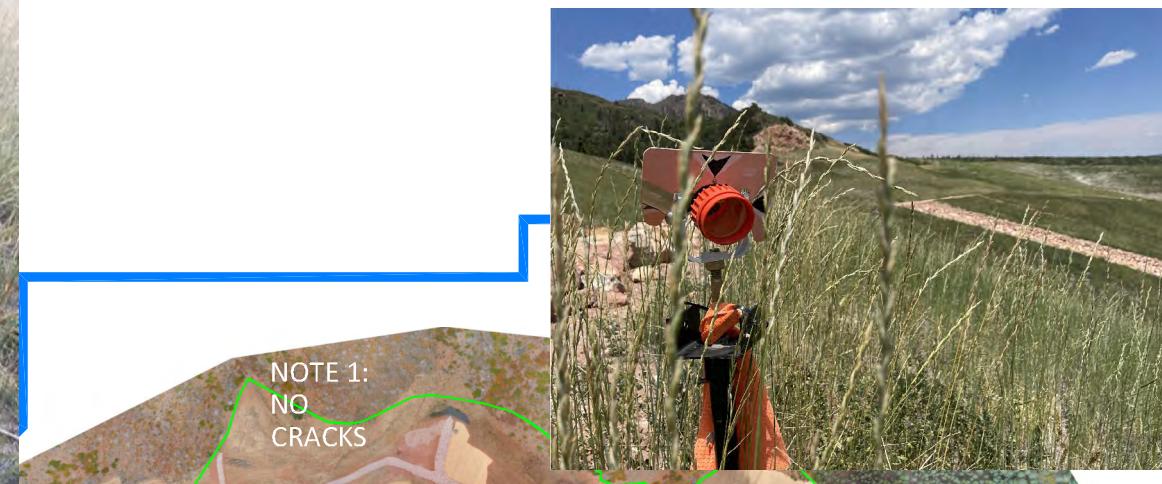




6. VIEW NORTH OF RECLAMATION SLOPES.



5. SETTLEMENT CRACKS.



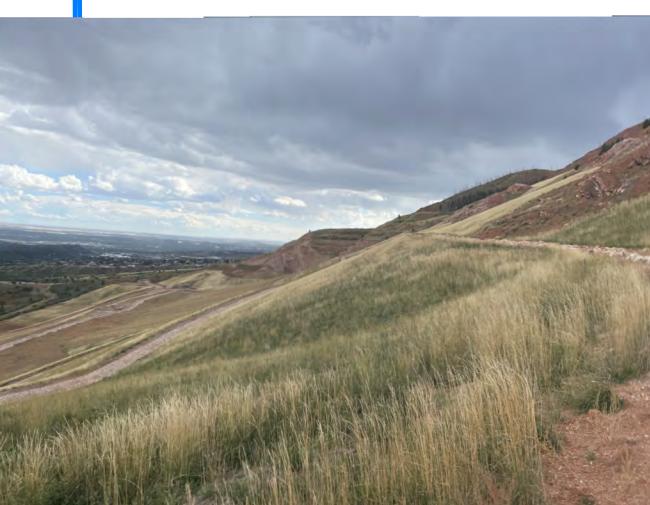
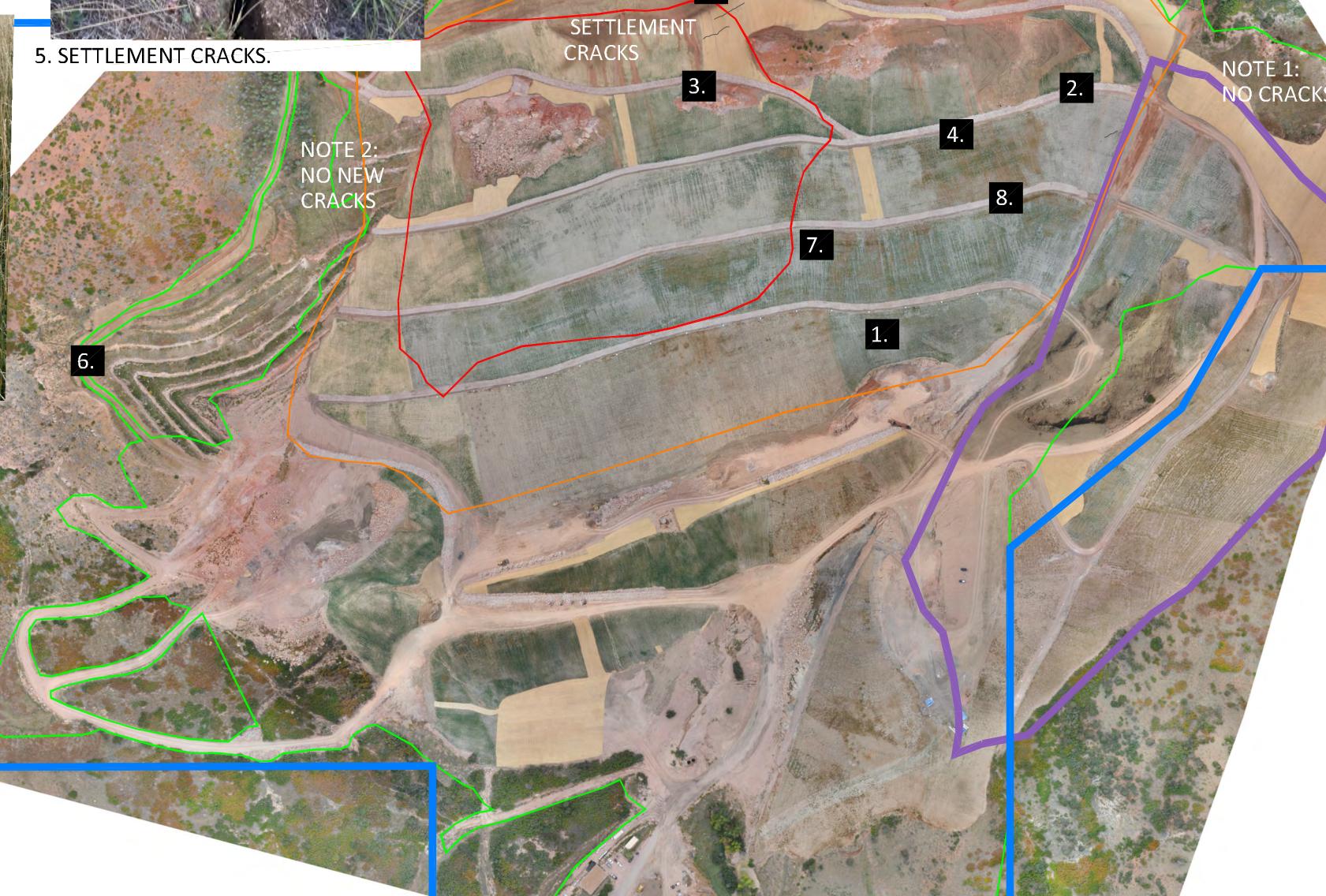
4. GRASSES ESTABLISHED ON SLOPES. OCCASIONALLY BLOCKS PRISM DURING READINGS.



3. EROSION HOLE (PHOTO FROM JULY). FILLED BY SEPTEMBER.



7. GRASSES ESTABLISHED ON SLOPES.



2. VIEW NORTH ACROSS RECLAIMED SLOPE.



1. PRAYING MANTIS ON RECLAIMED SLOPE.



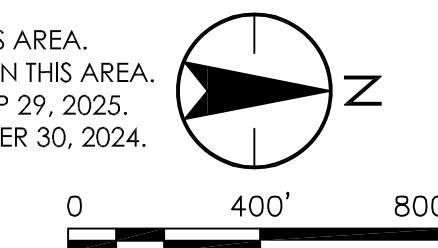
8. SETTLEMENT CRACKS ON EDGE OF BENCH.

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 JUL 15 AND SEP 29, 2025.
4. AERIAL IMAGE FROM SEPTEMBER 30, 2024.



Client/Project

CASTLE AGGREGATE  
PIKEVIEW QUARRY SLOPE  
MONITORING

Project No.  
2057288200

Title

OBSERVATIONS FROM  
THIRD QUARTER  
INSPECTIONS

Revision  
#

Drawn By  
PK

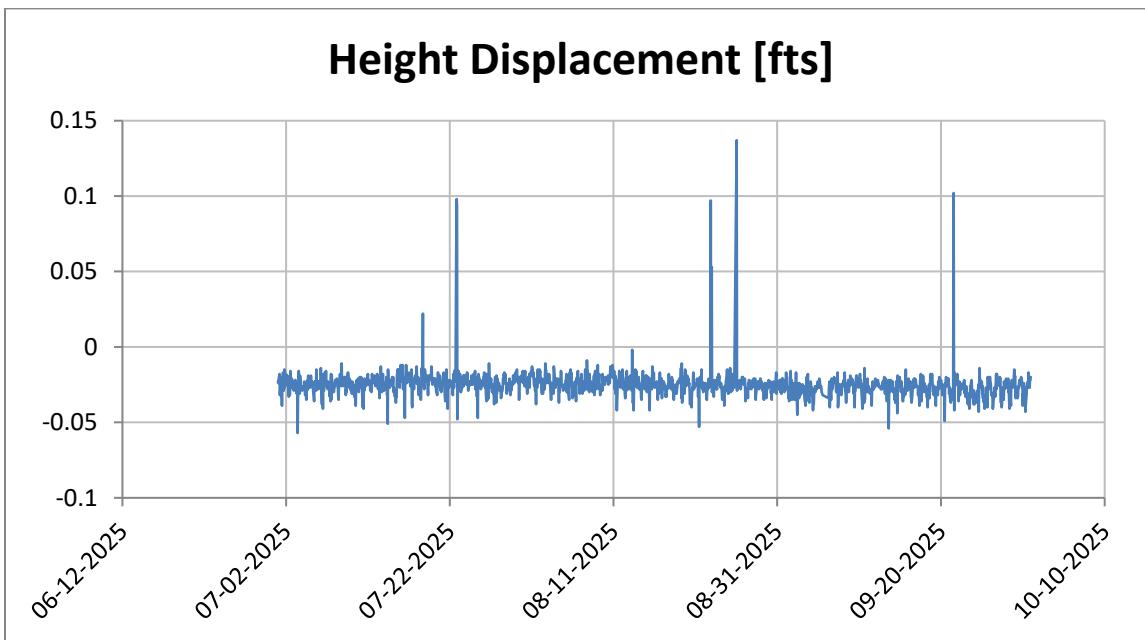
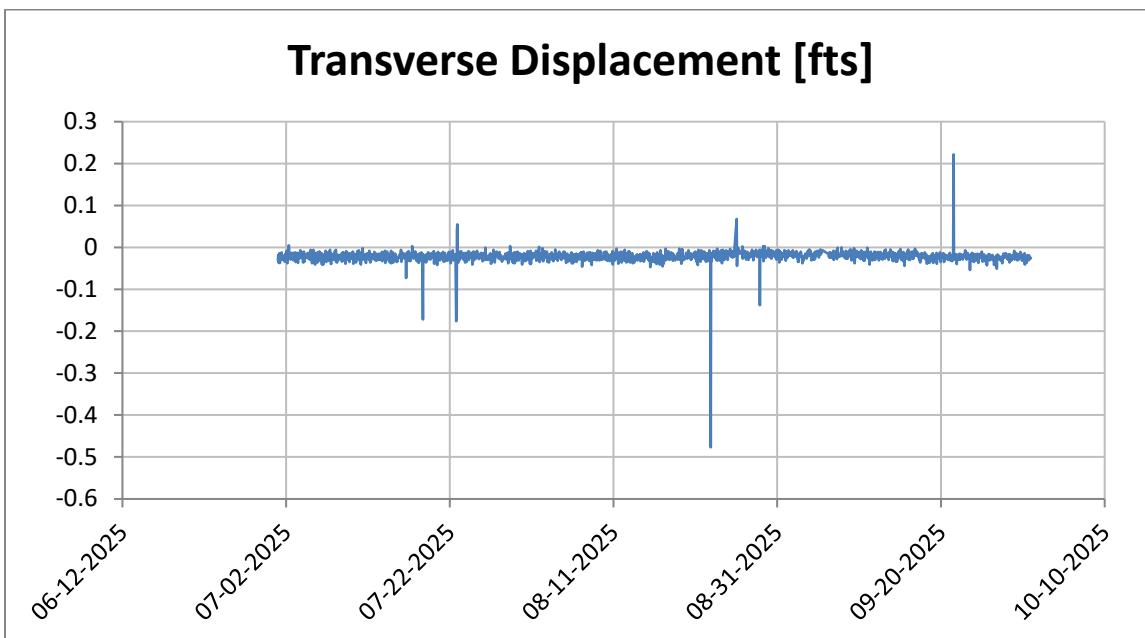
Date  
2025.10.31

Figure No.  
3

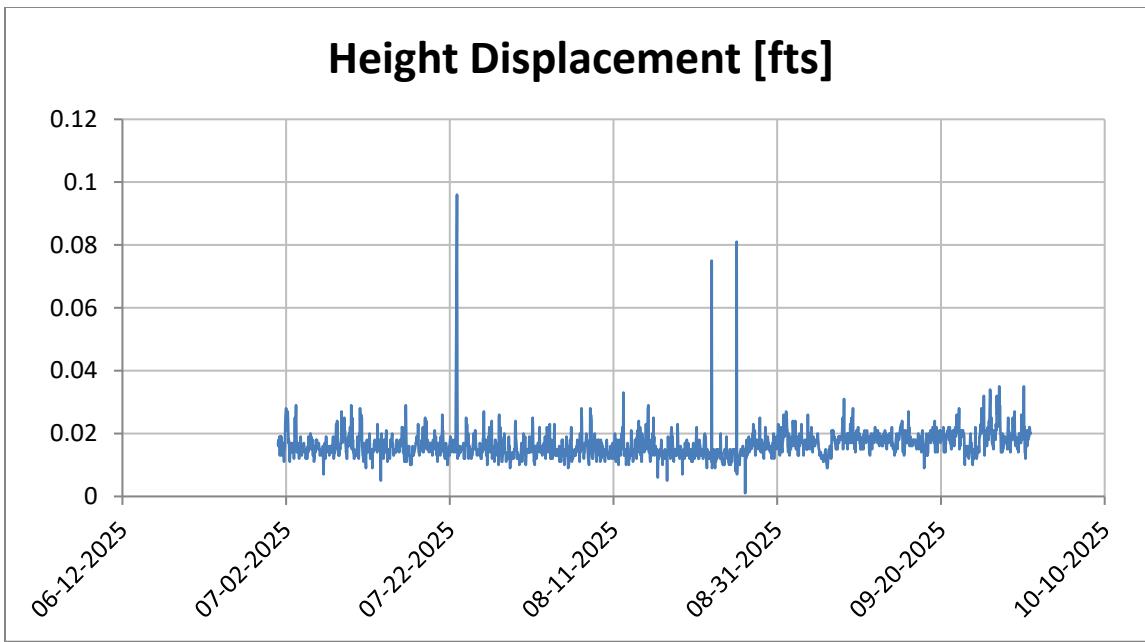
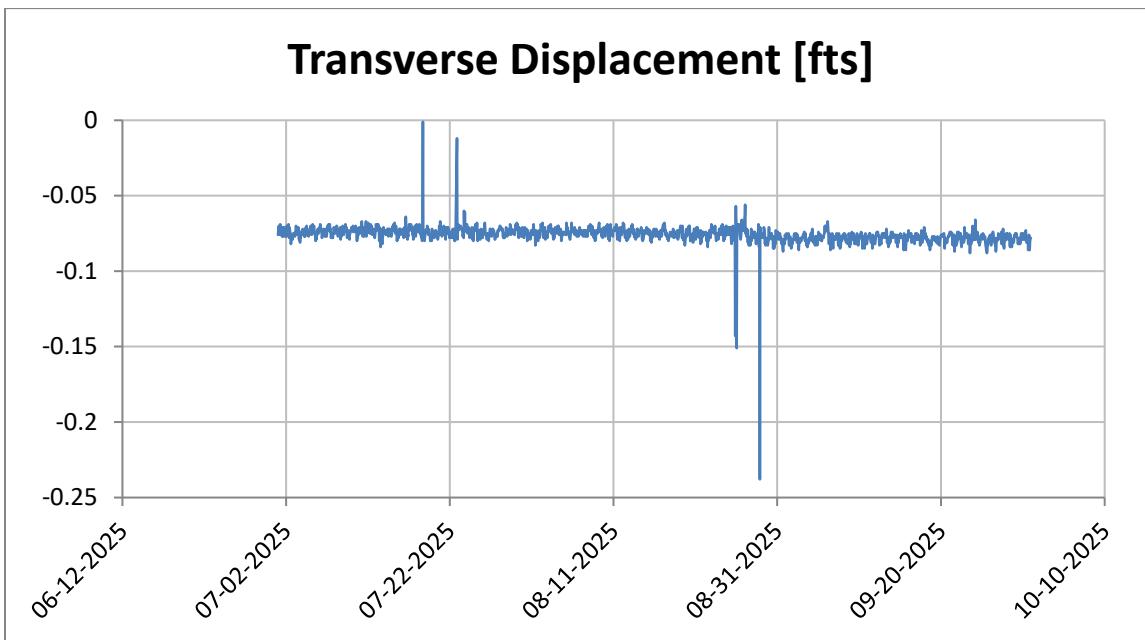


# Appendix A

Third Quarter 2025 Prism Survey

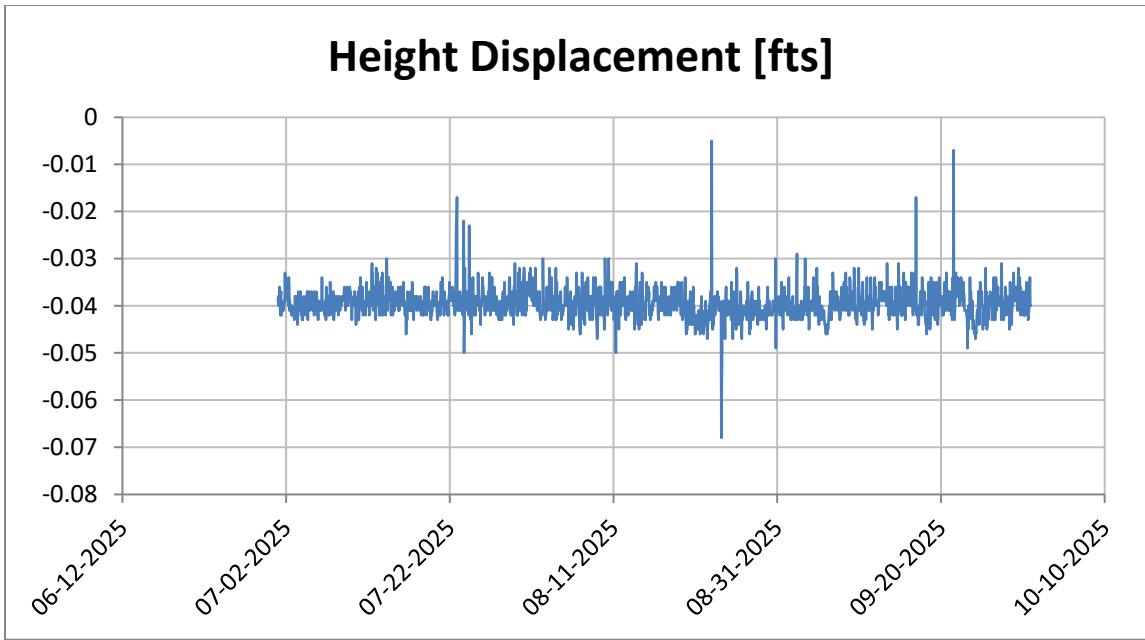
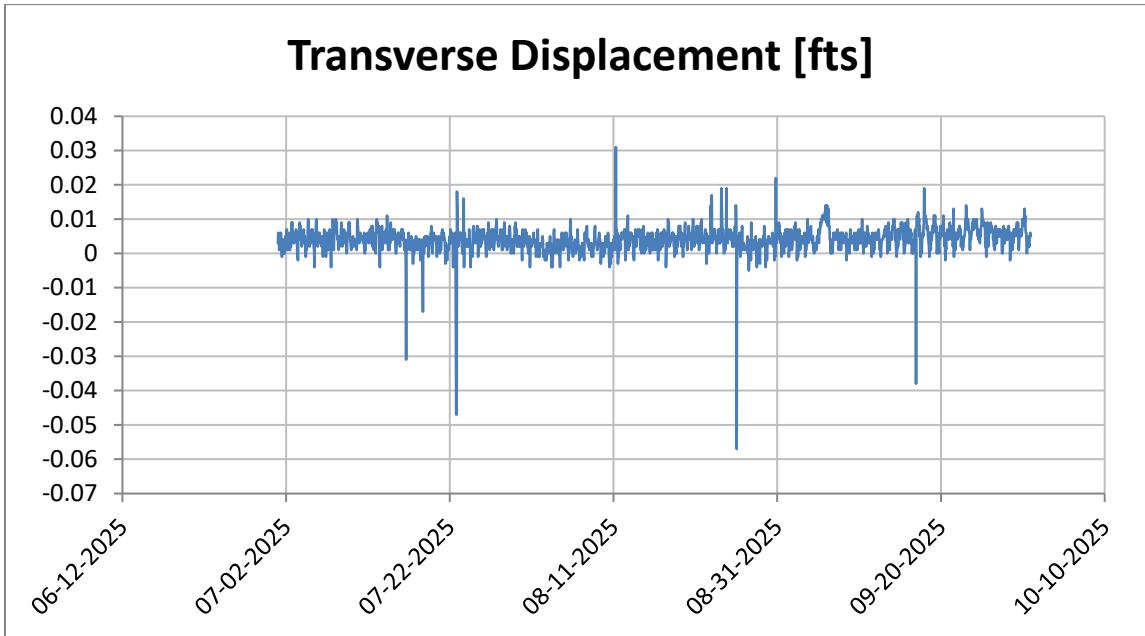
**Prism BR4****Notes:**

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.

**Prism B7200-1****Notes:**

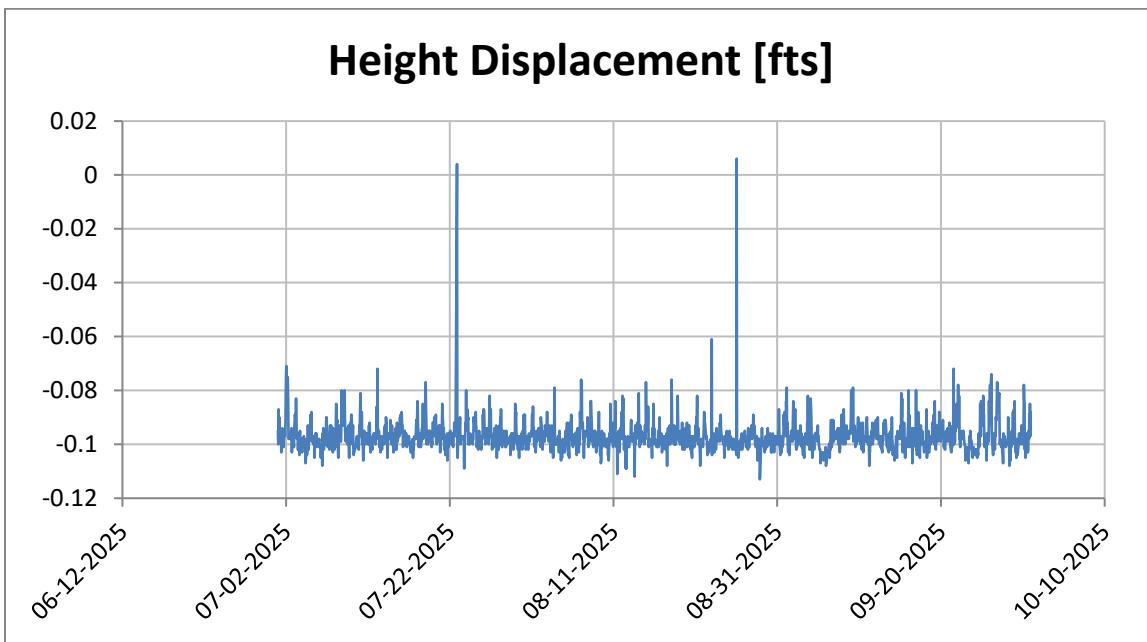
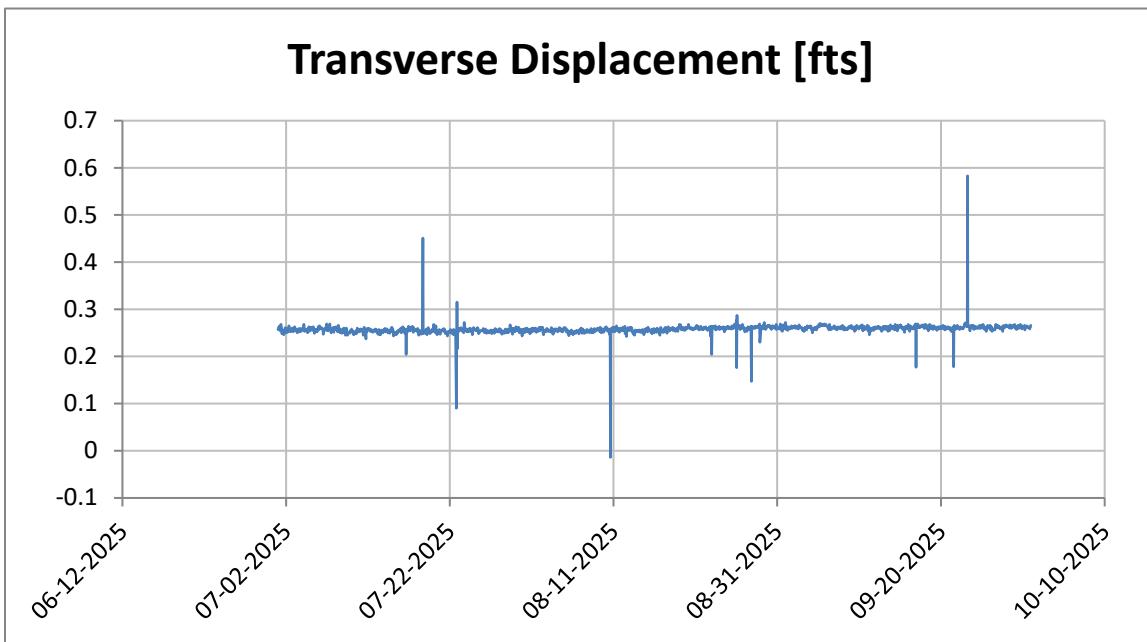
1. Survey accuracy is  $\pm 0.016$  feet.
2. Alert threshold is  $\pm 0.35$  feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

## Prism B7200-2

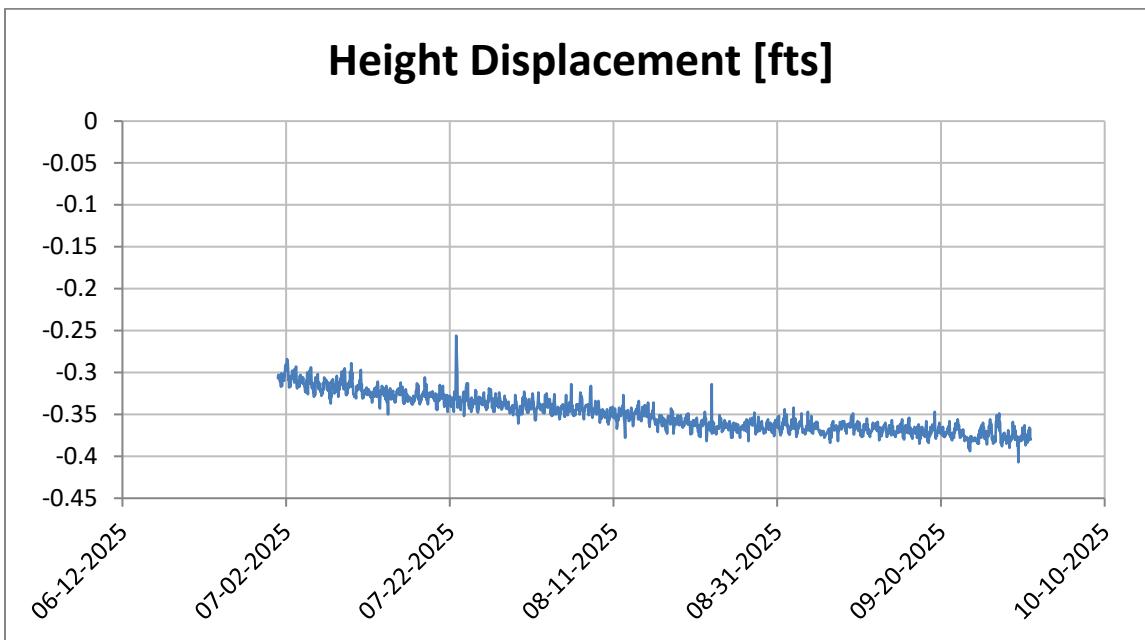
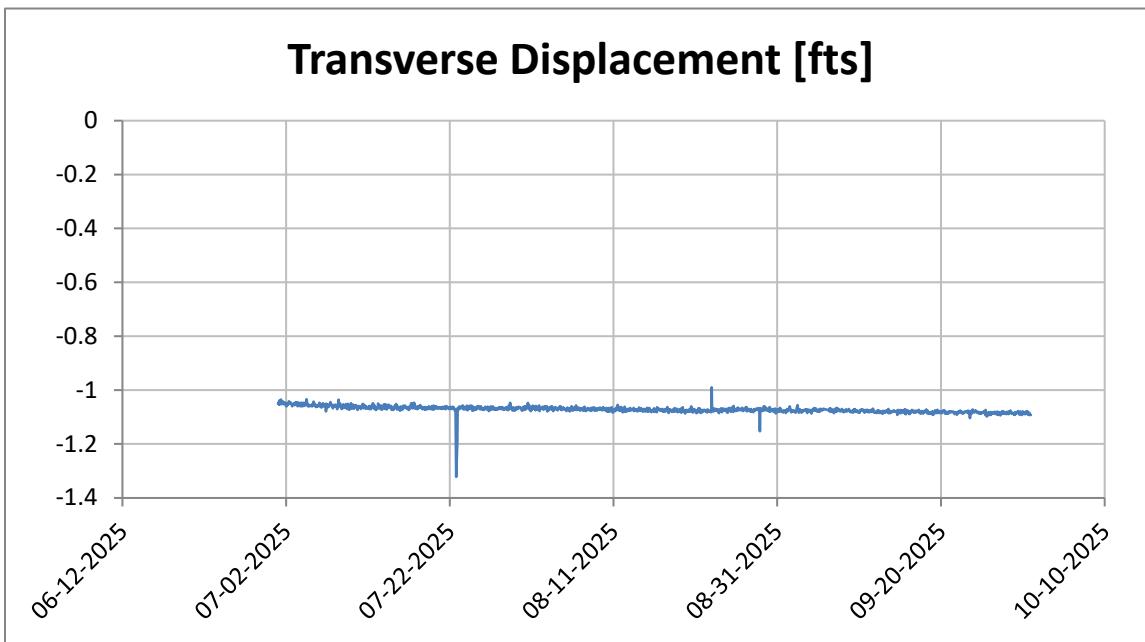


Notes:

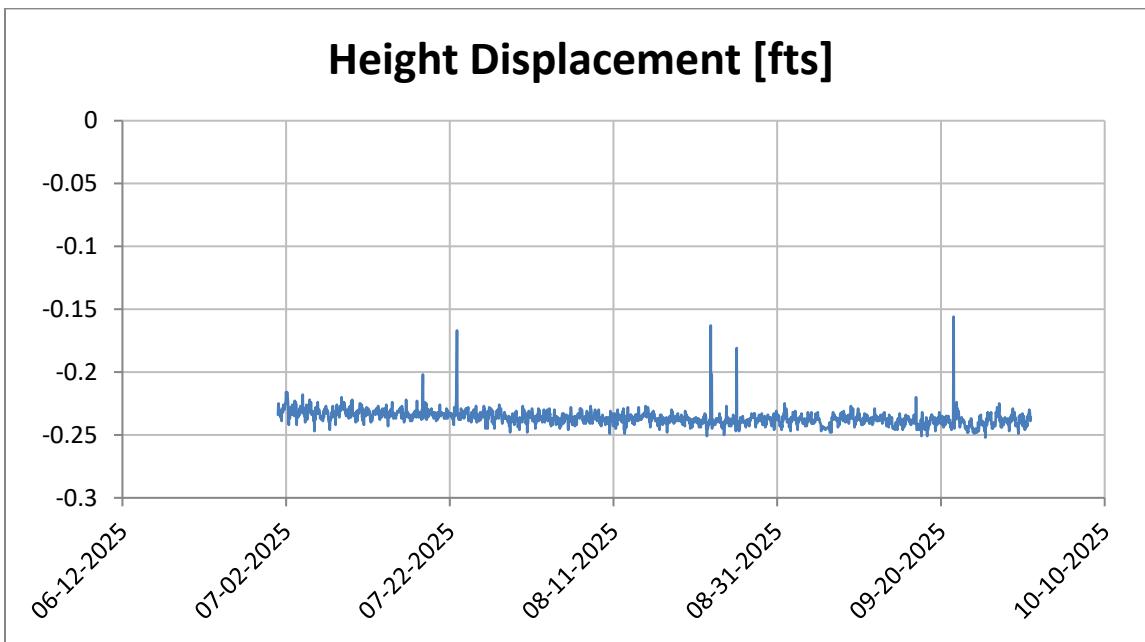
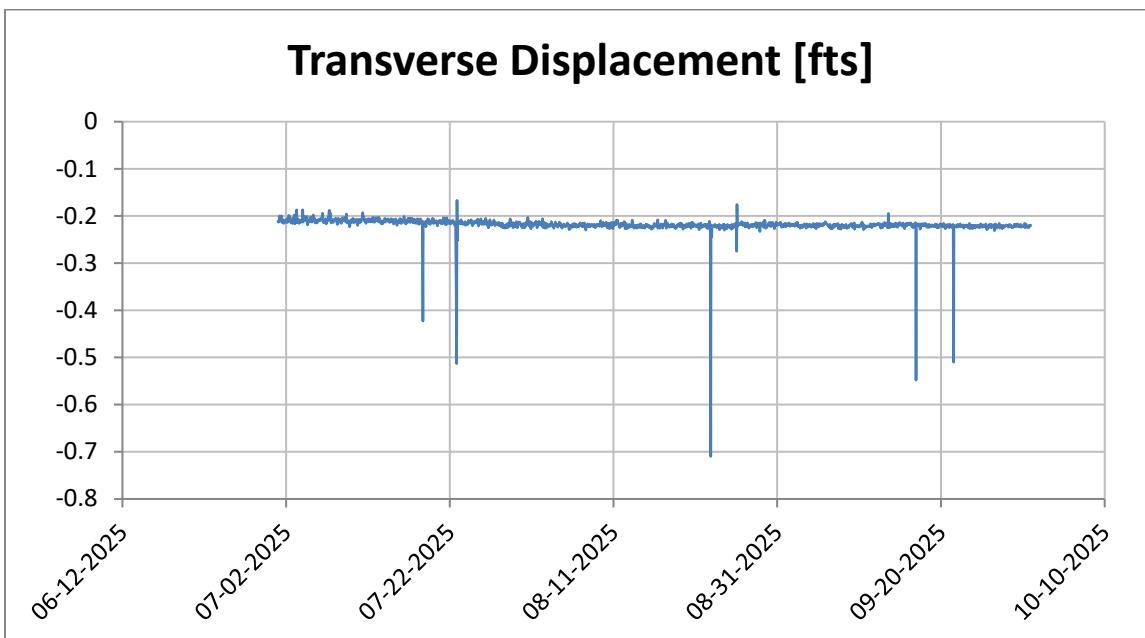
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**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.

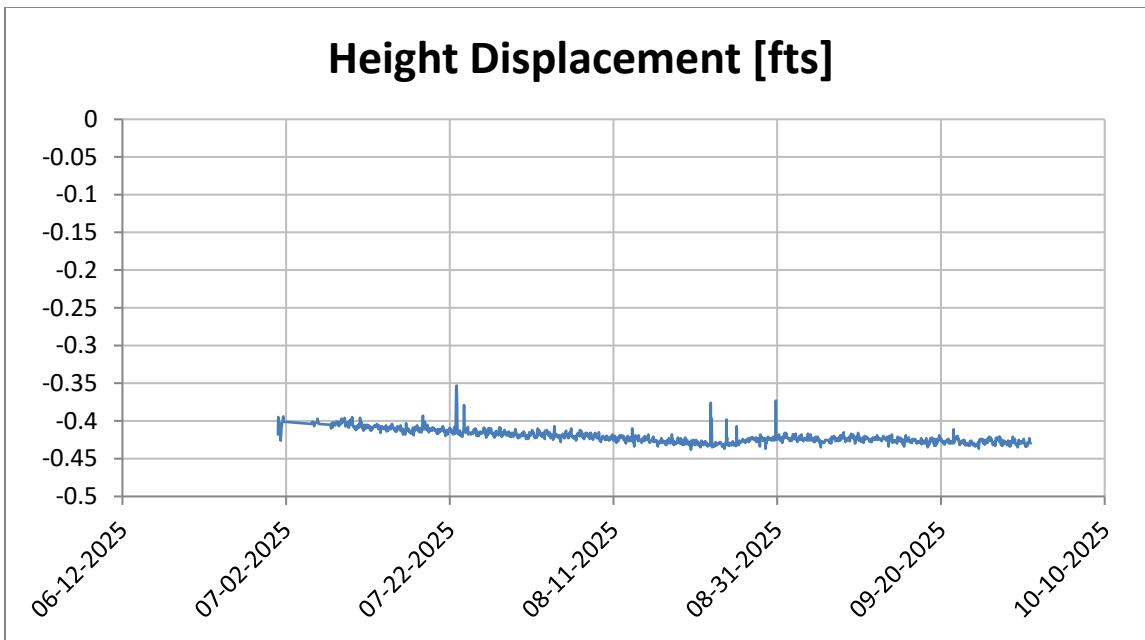
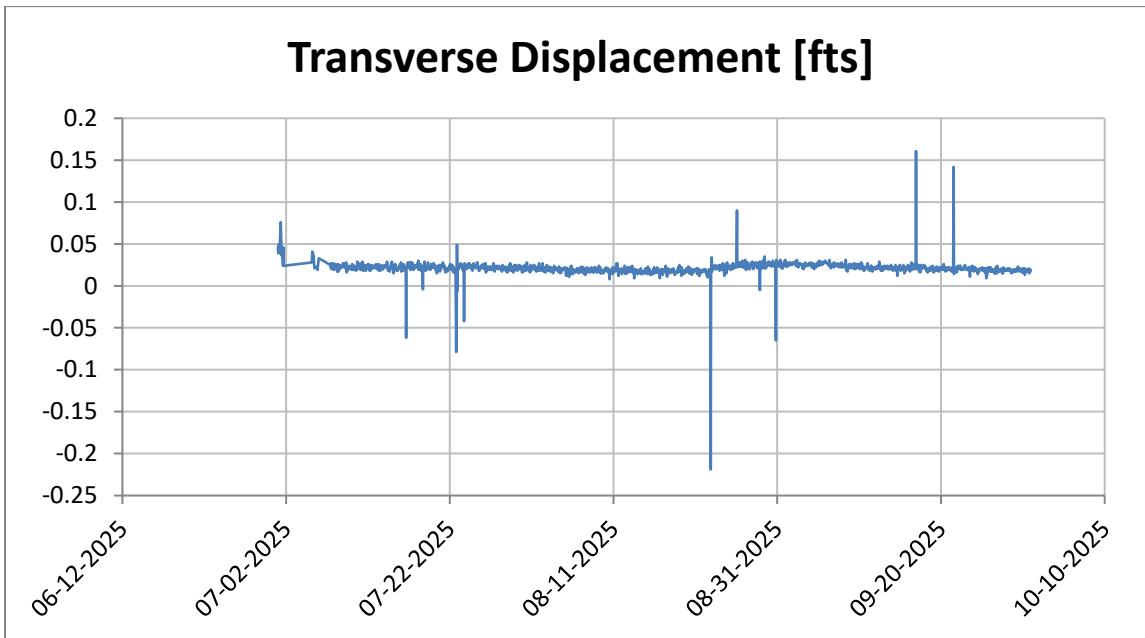
**Prism B7300-0****Notes:**

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.

**Prism B7300-1****Notes:**

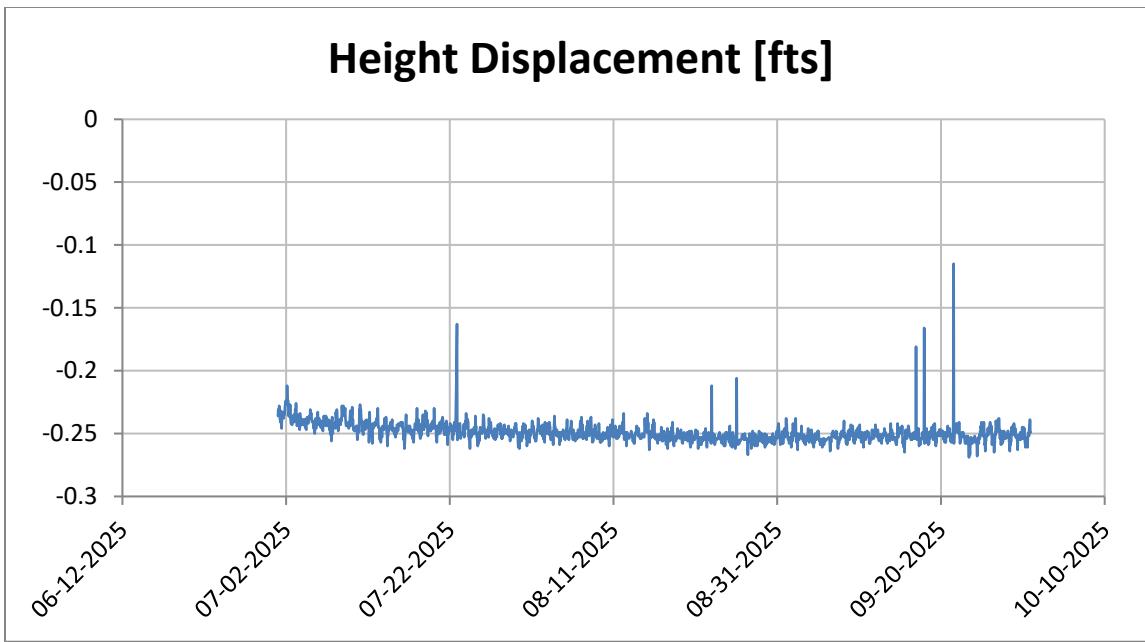
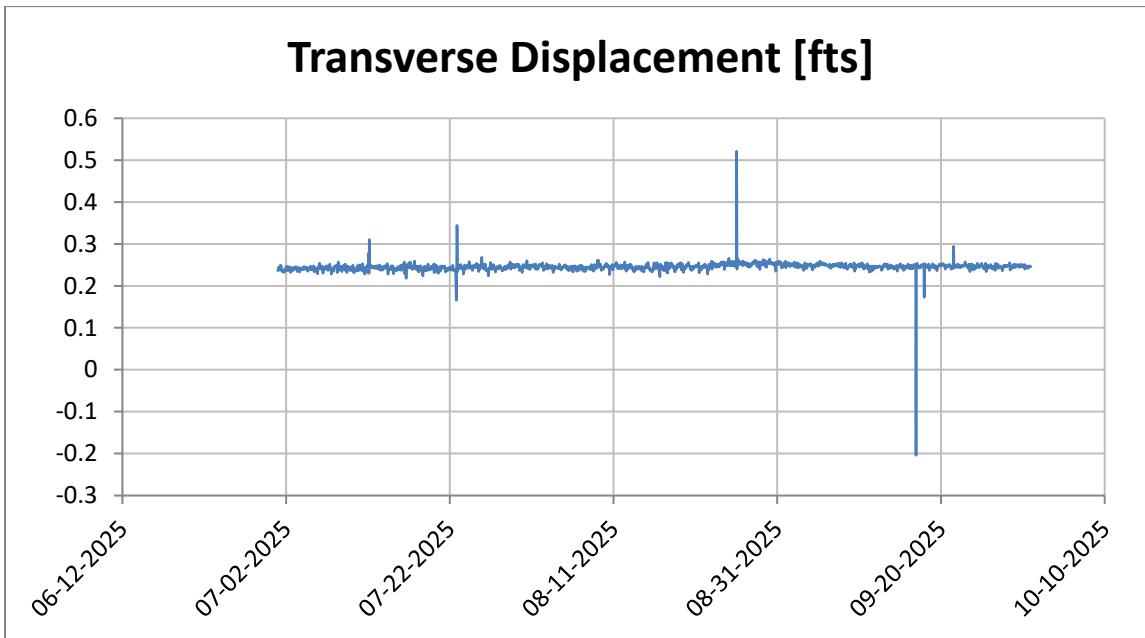
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
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## Prism B7300-2



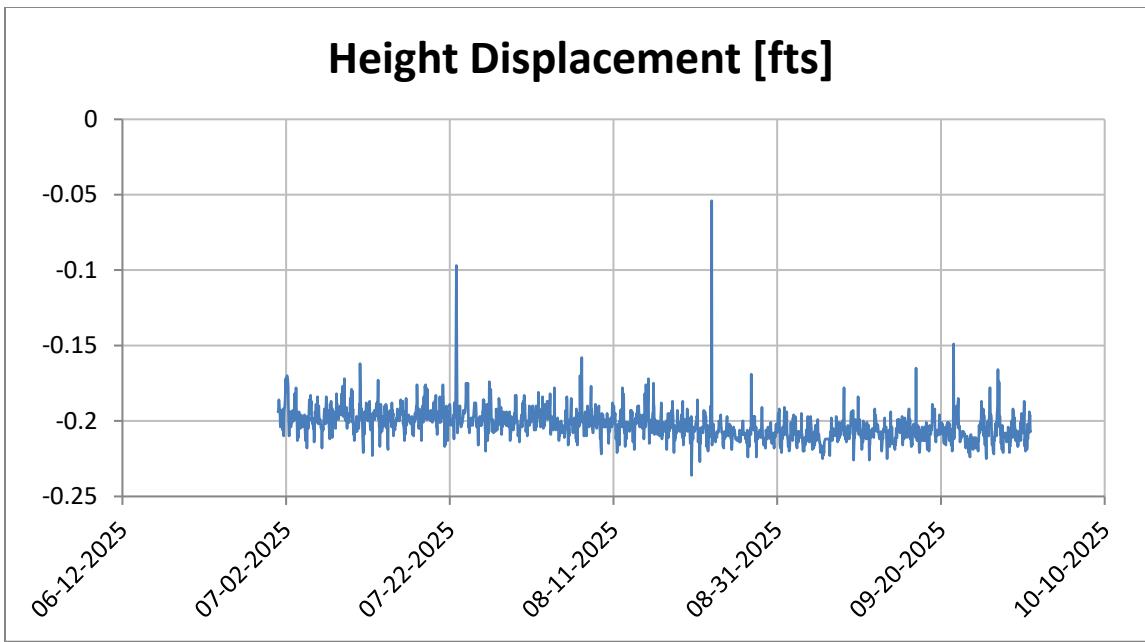
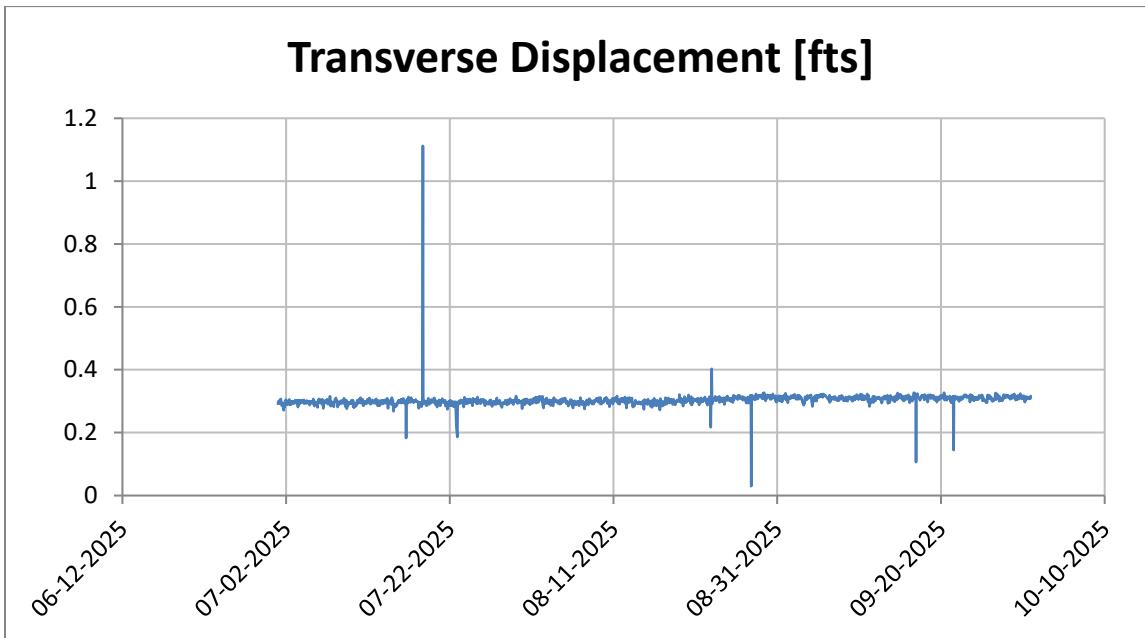
#### Notes:

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.

**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.

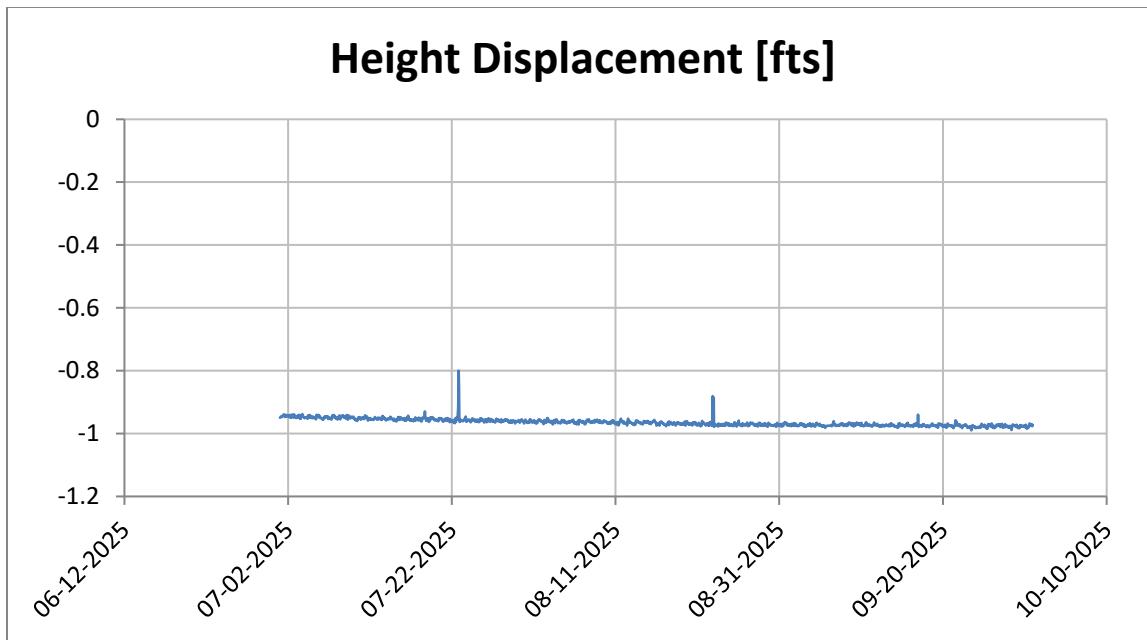
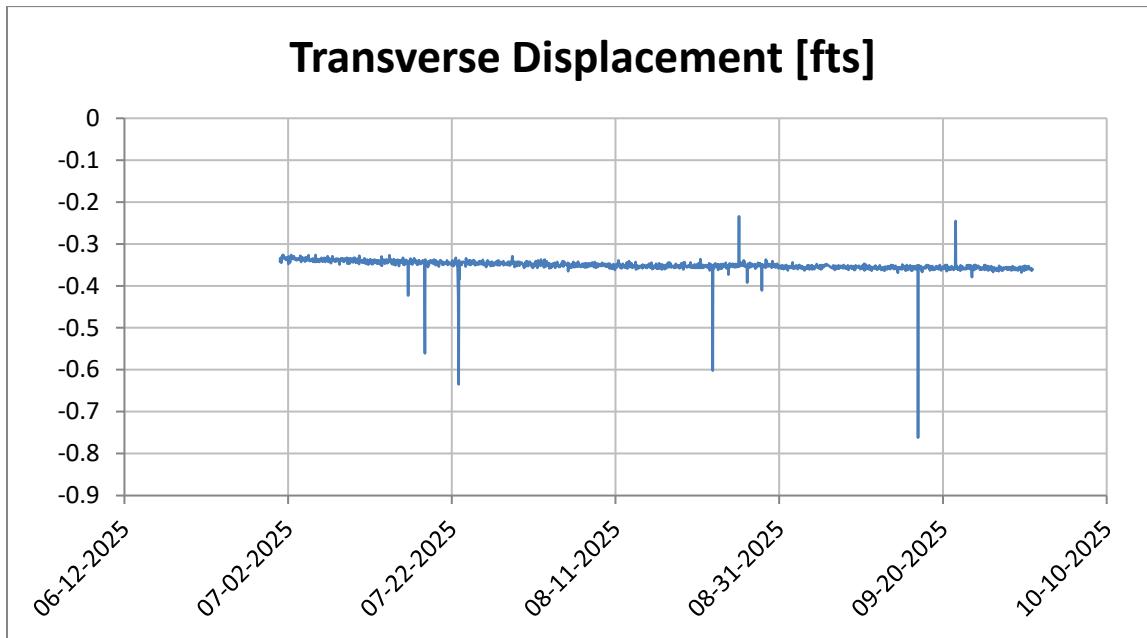
## Prism B7300-4



#### 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.

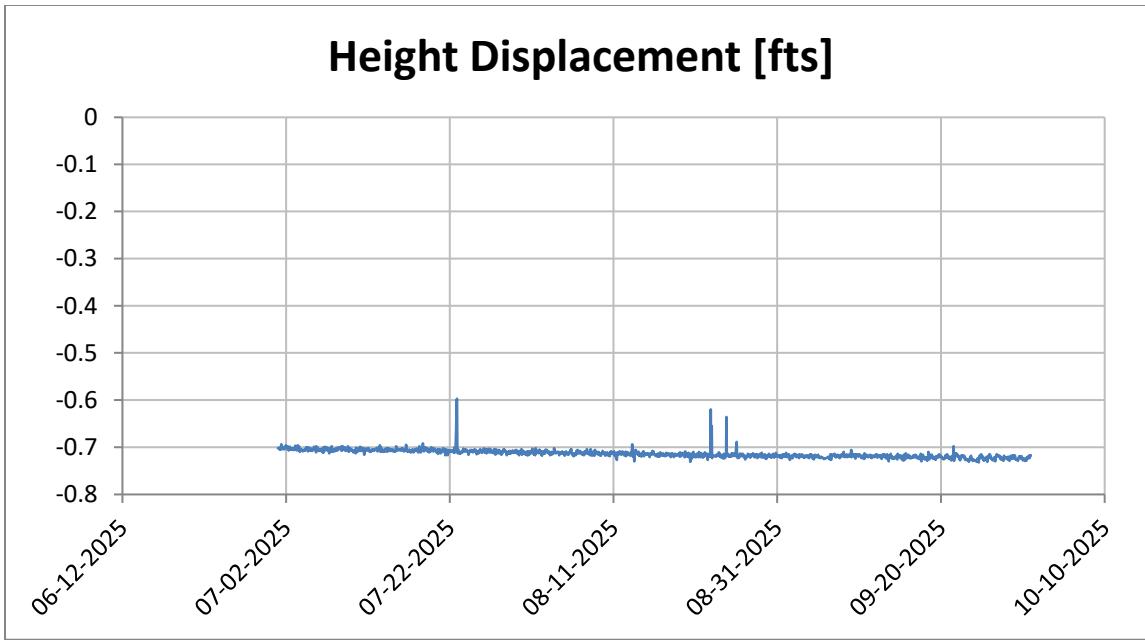
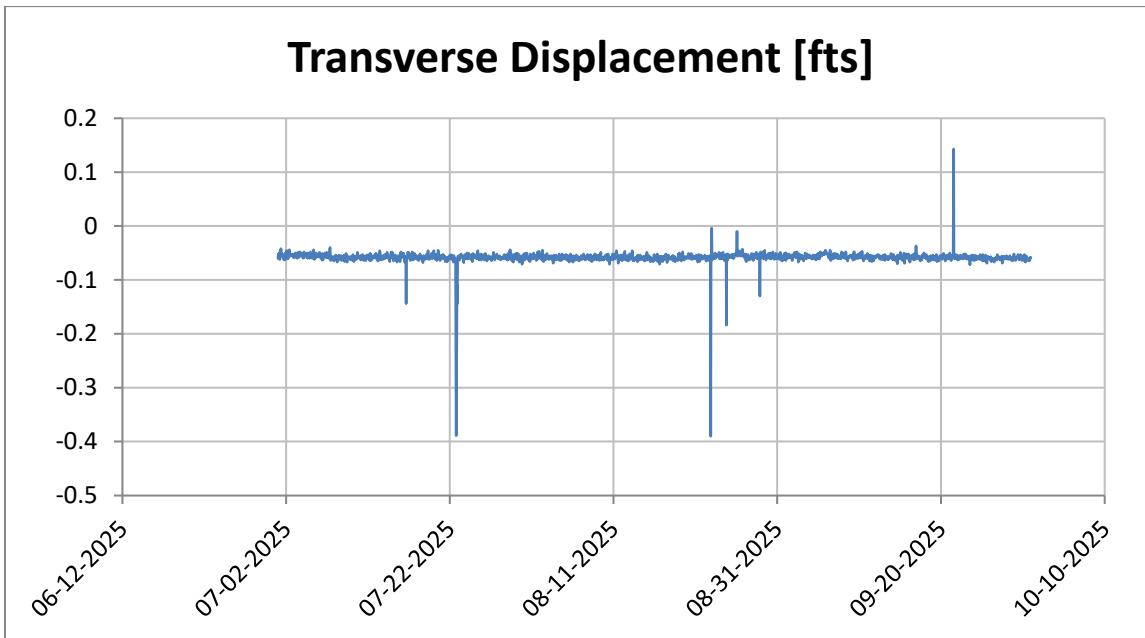
## Prism B7400-1



#### Notes:

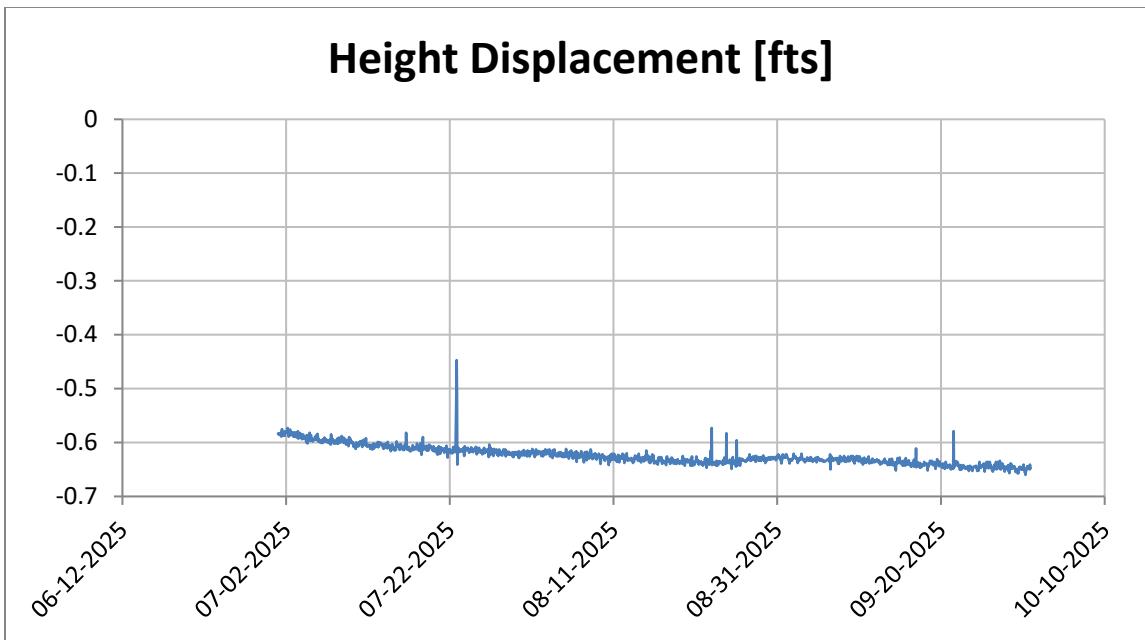
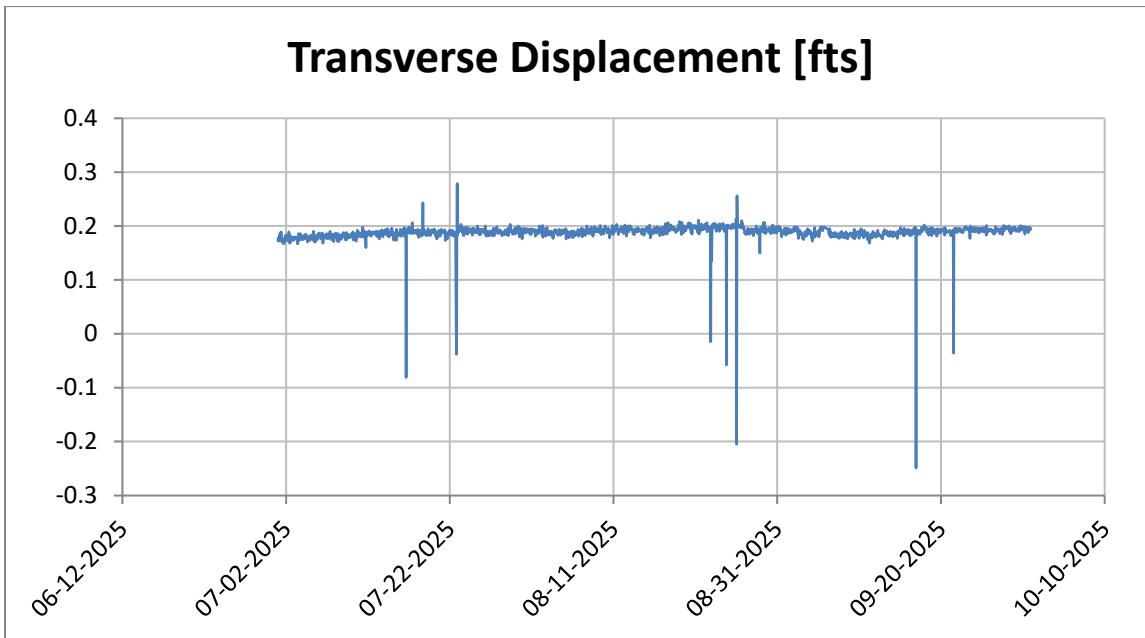
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

## Prism B7400-2

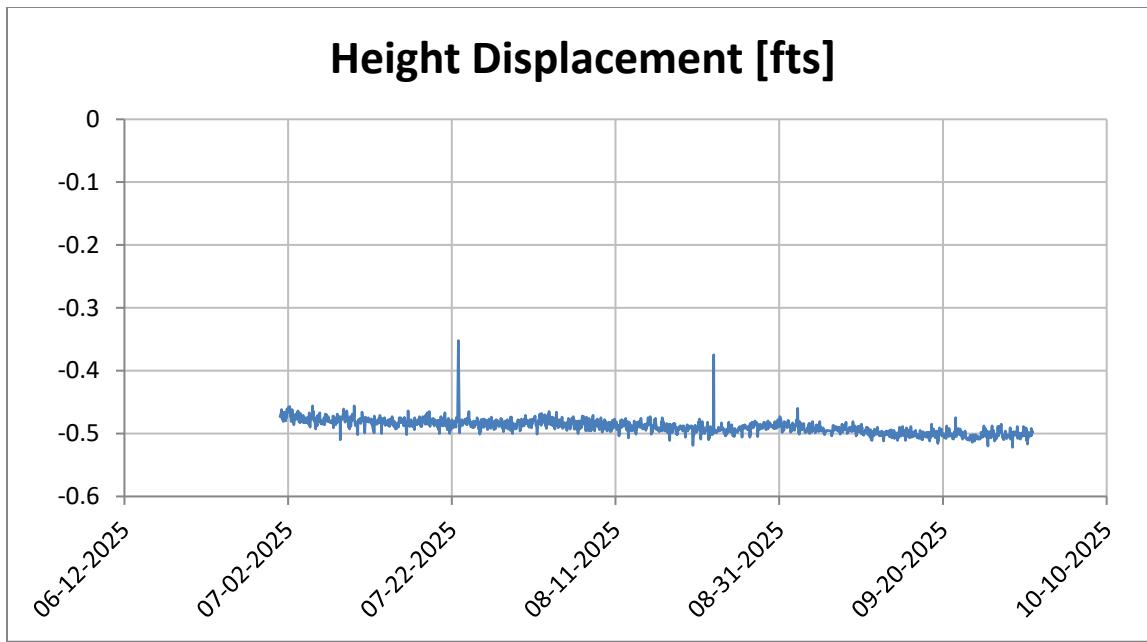
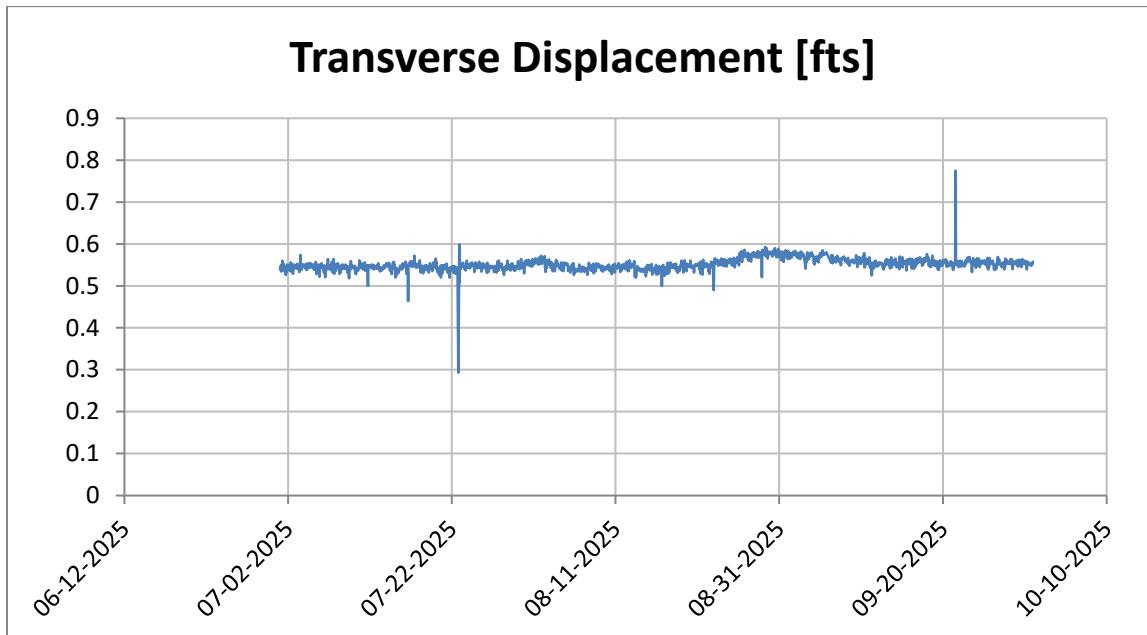


Notes:

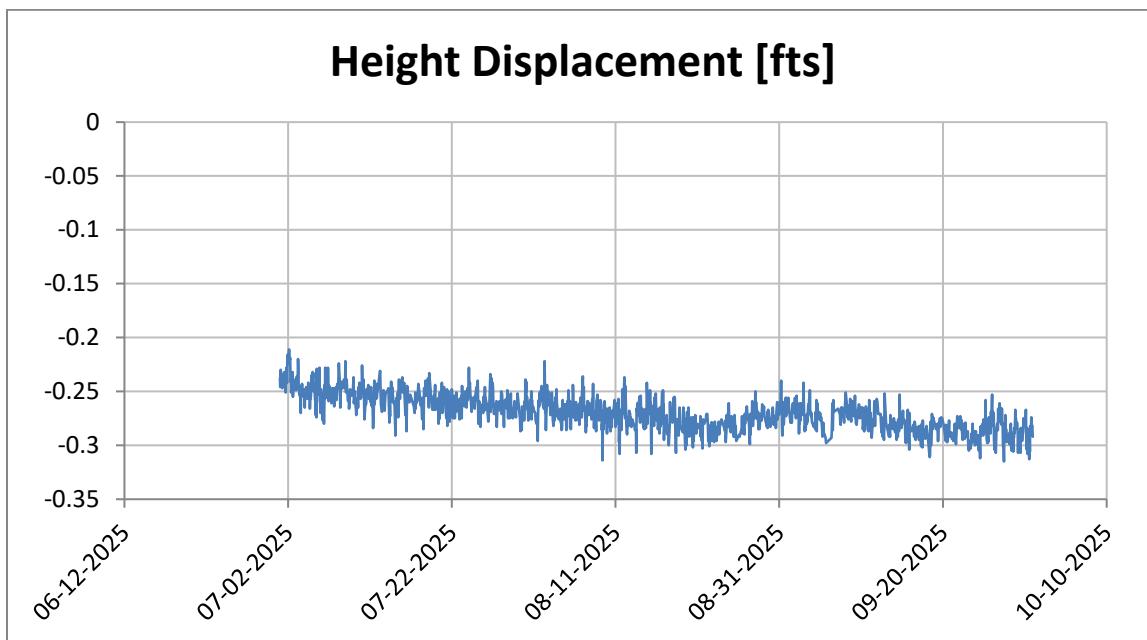
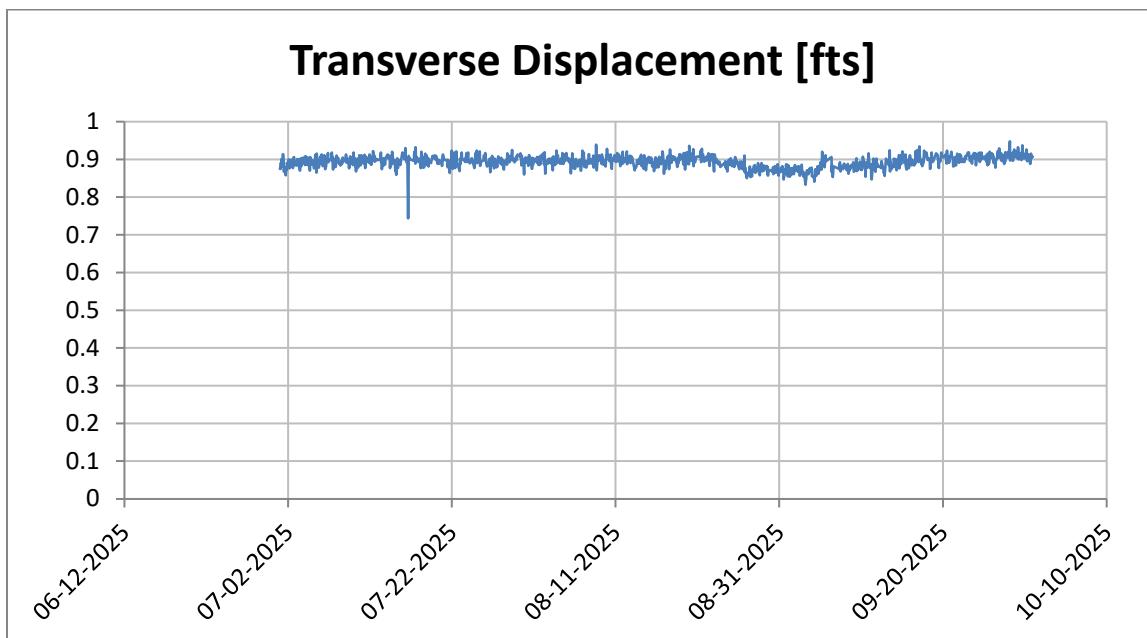
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**Prism B7400-3****Notes:**

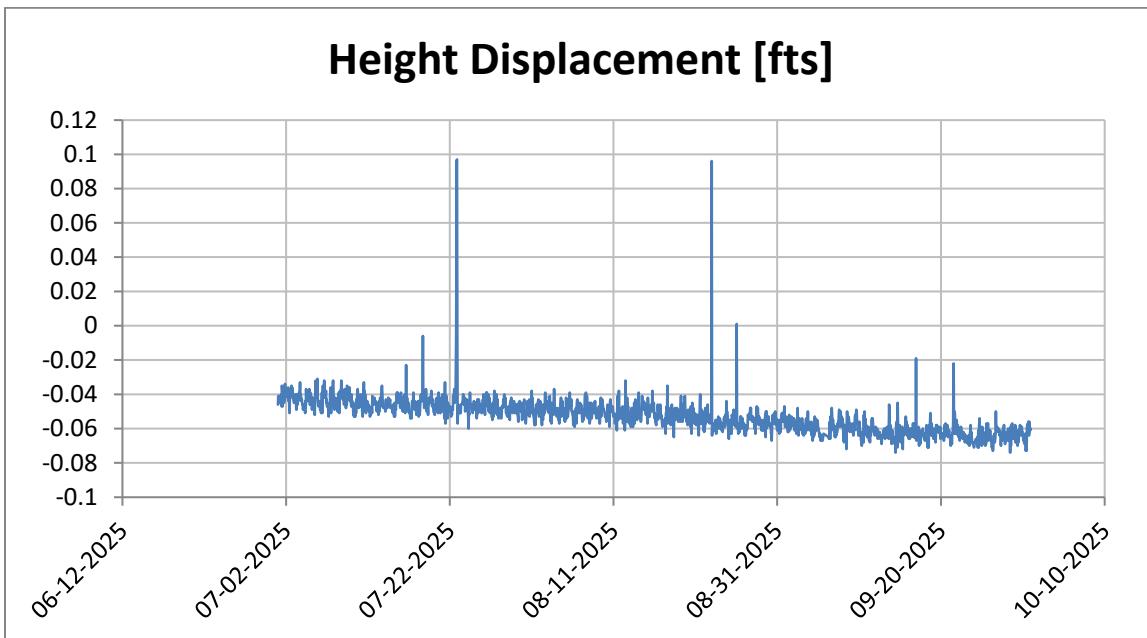
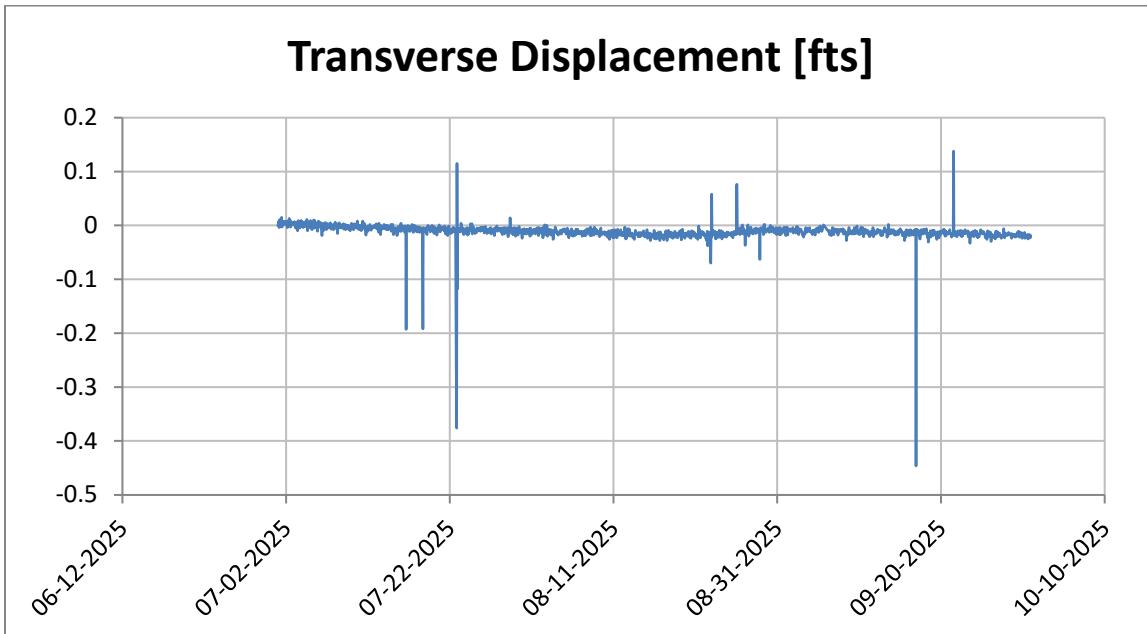
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**Prism B7400-4****Notes:**

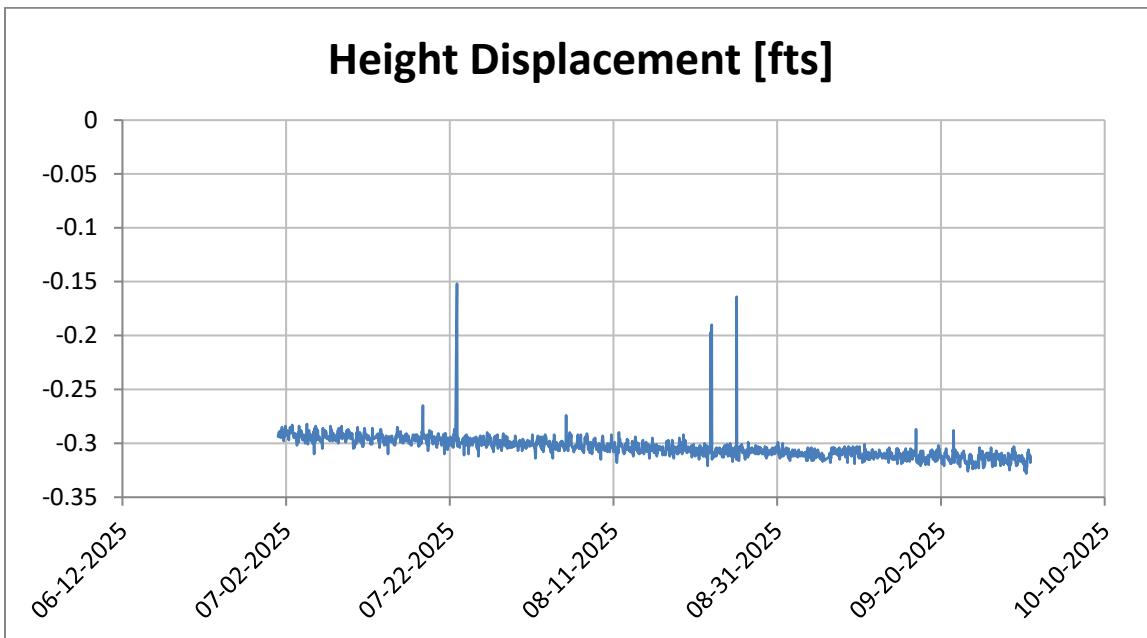
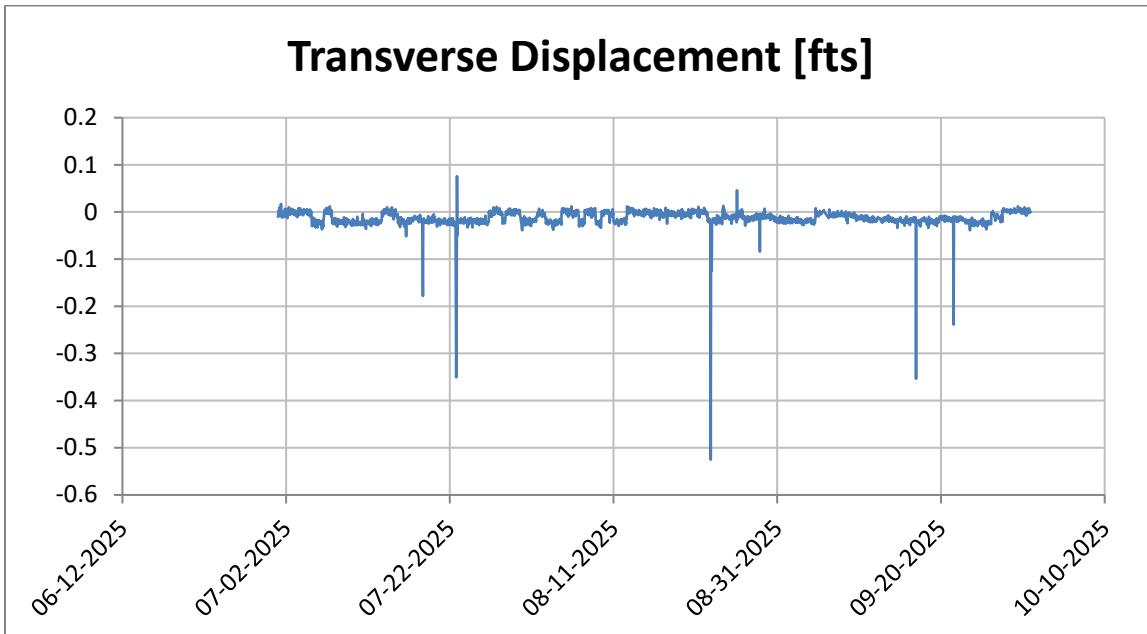
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**Prism B7400-5****Notes:**

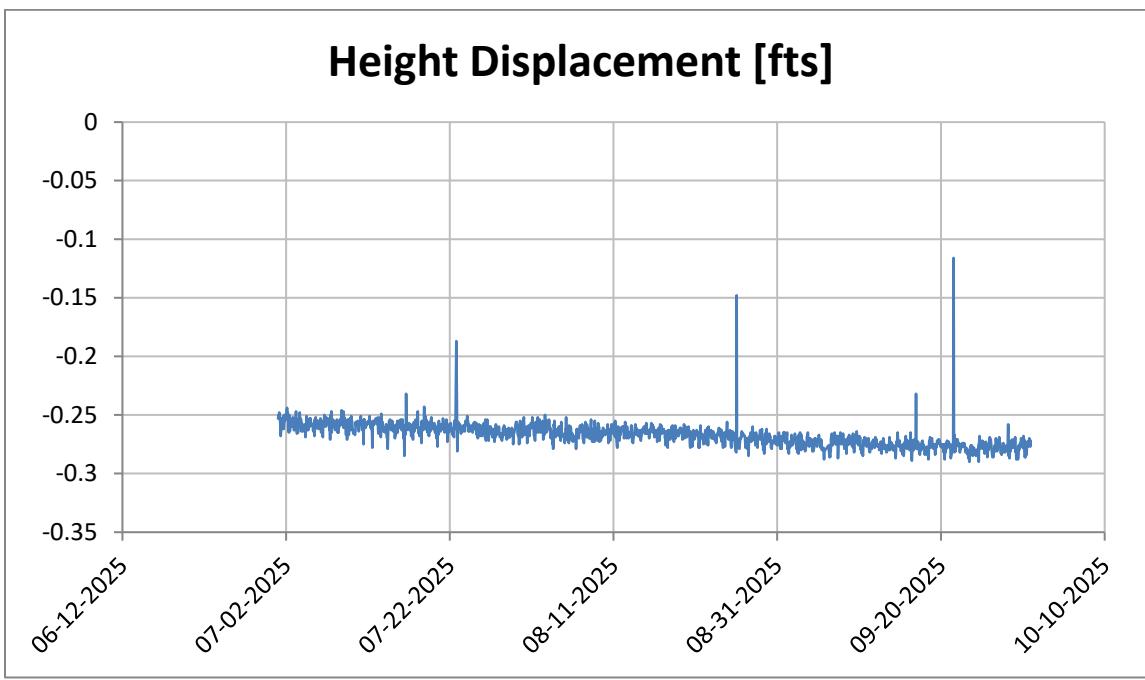
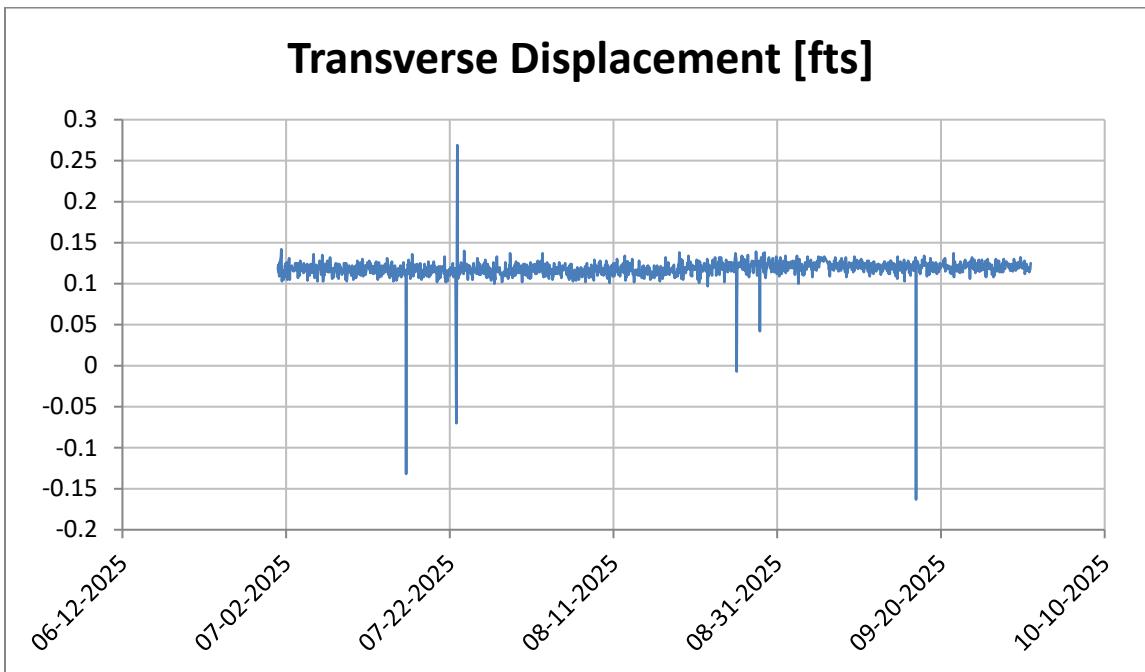
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2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**B7500-1R****Notes:**

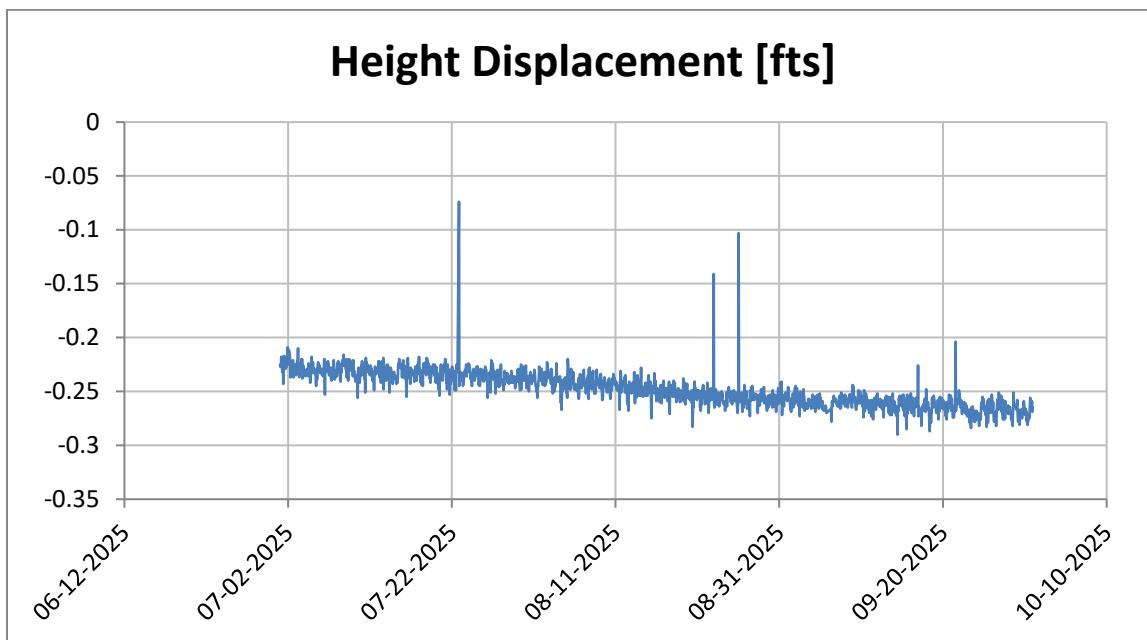
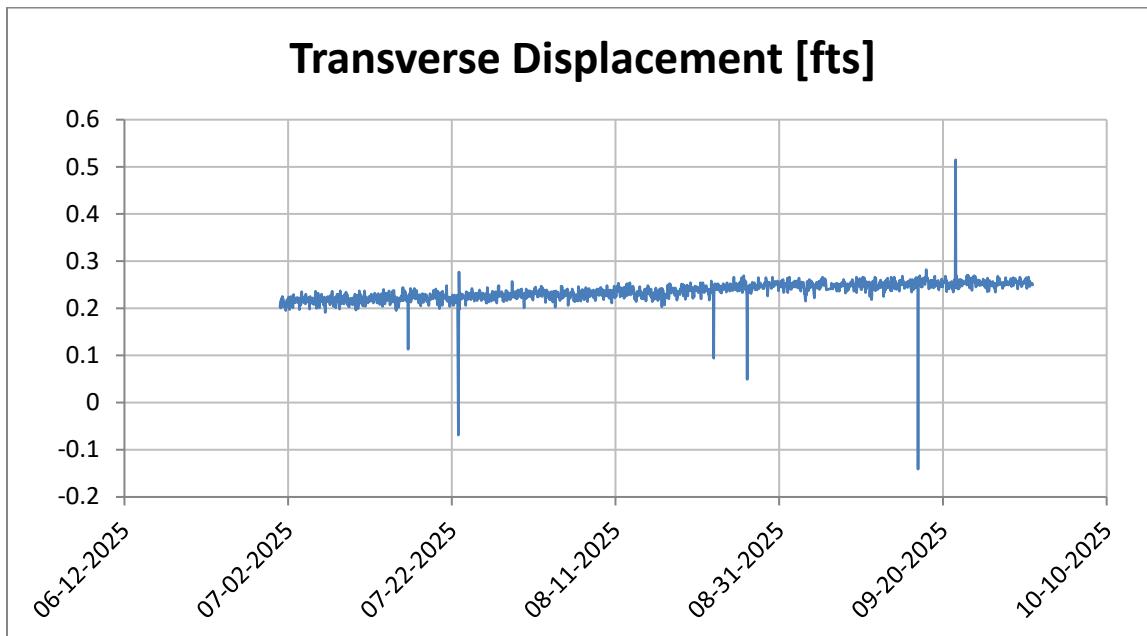
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2. Alert threshold is +/-0.35 feet.
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4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**Notes:**

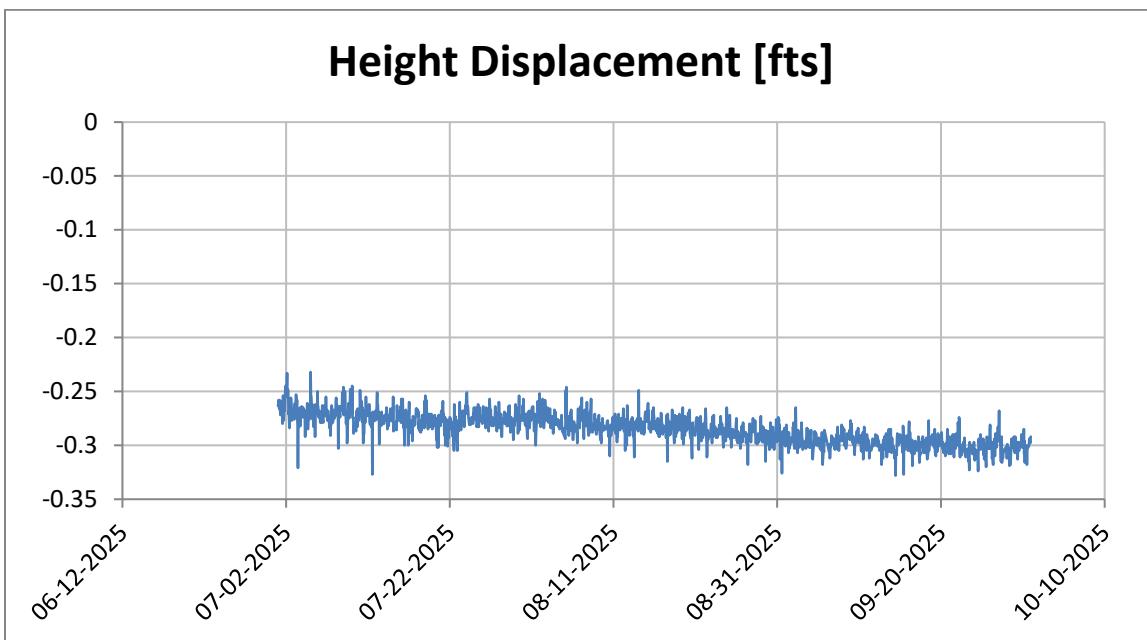
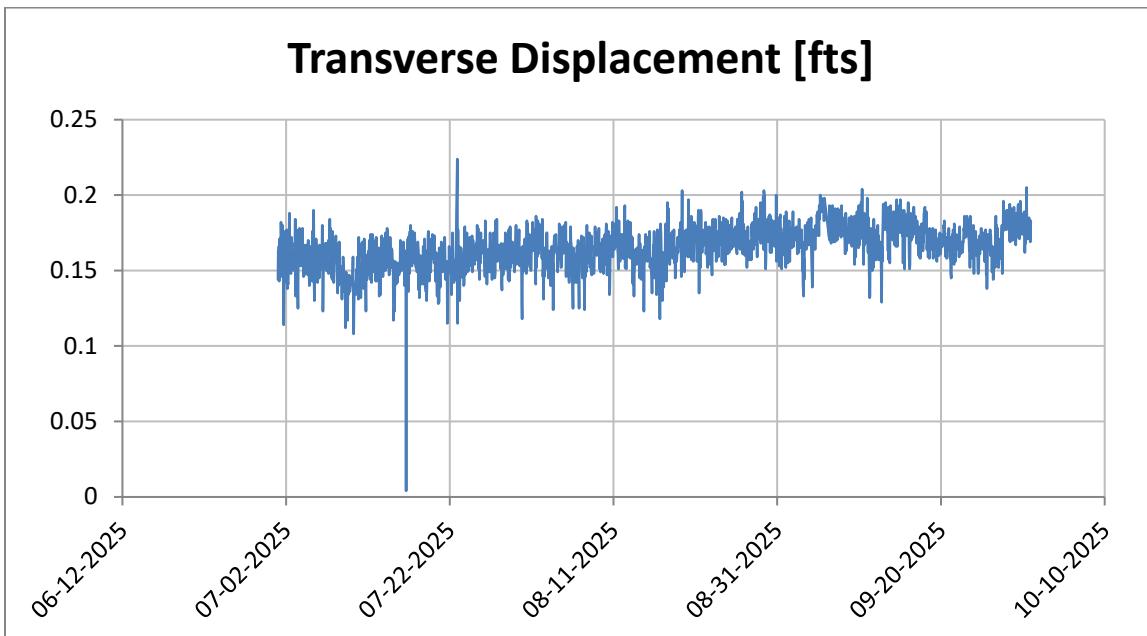
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

**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.

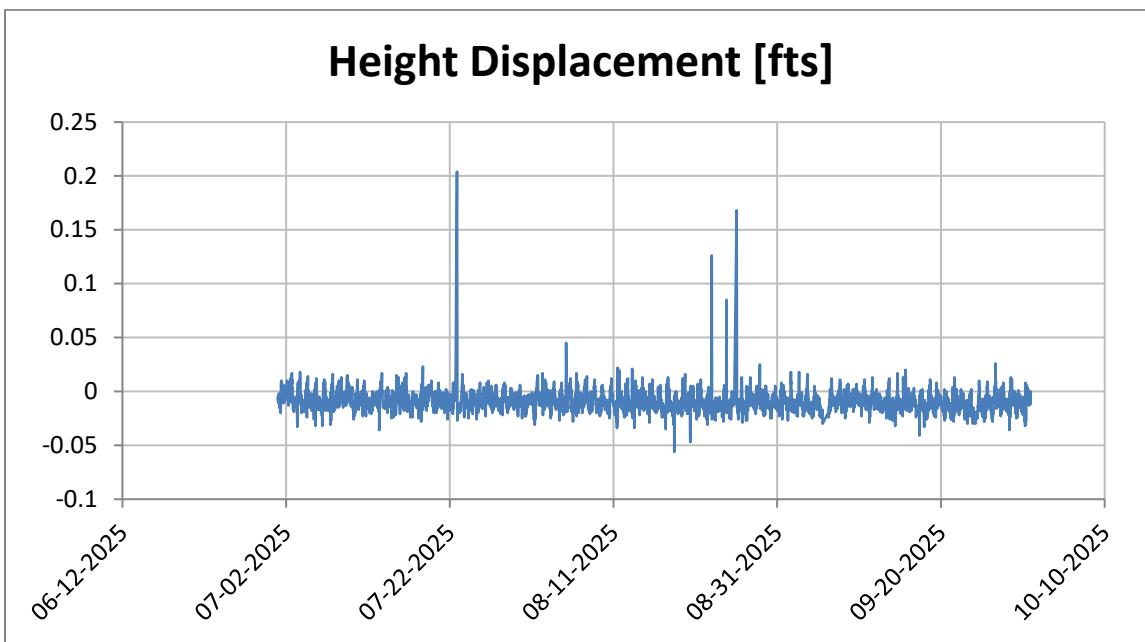
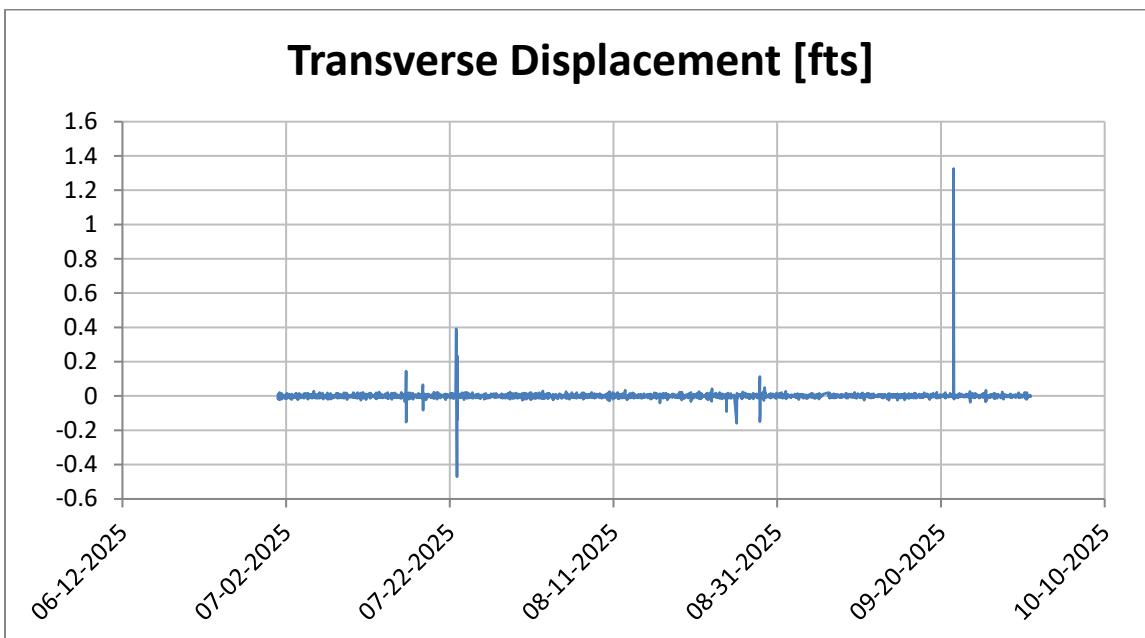
**Notes:**

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.

**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

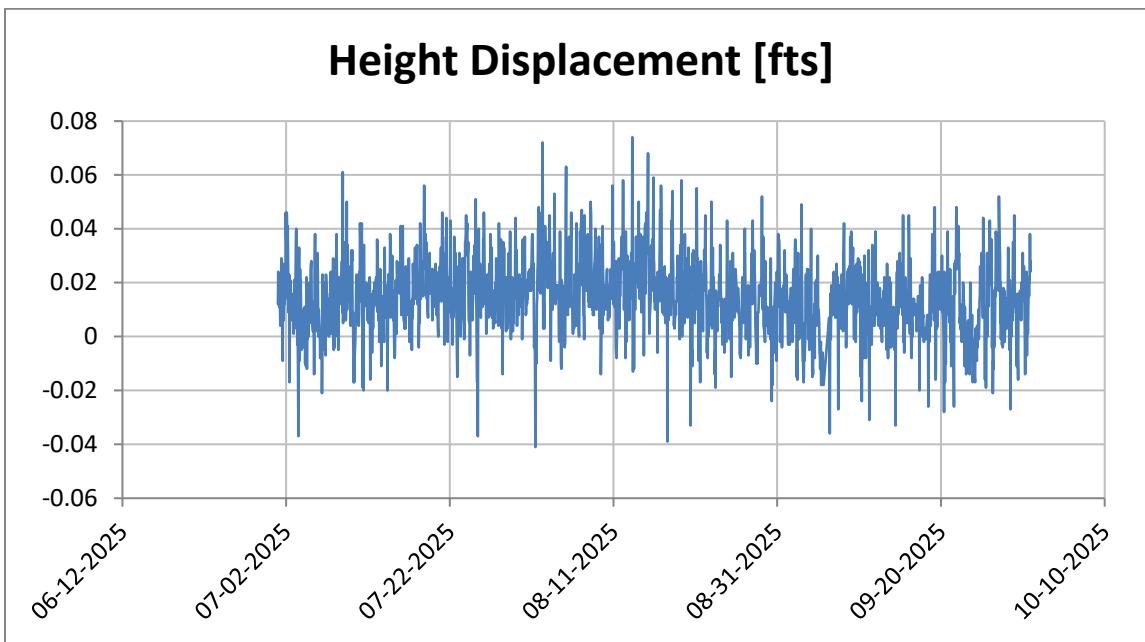
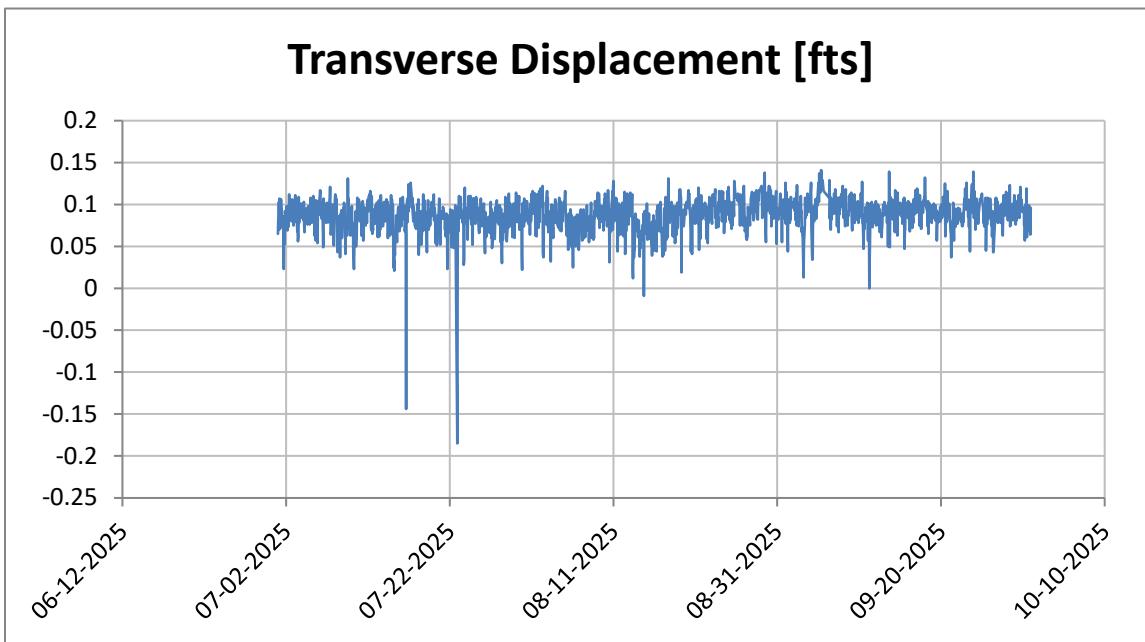
## Prism CP6



#### 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.

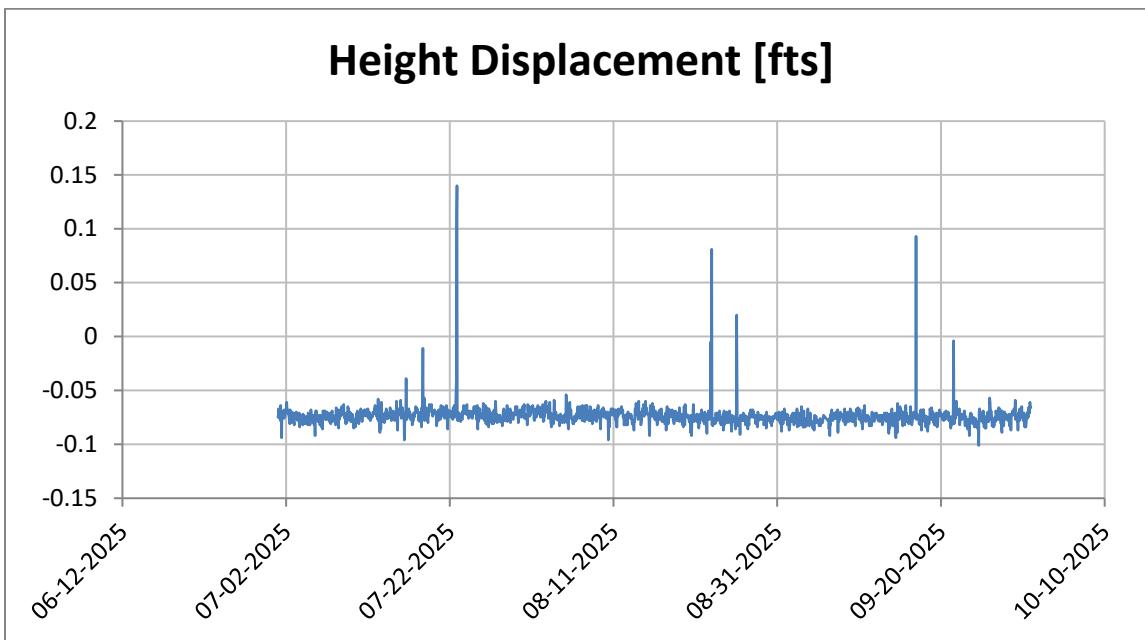
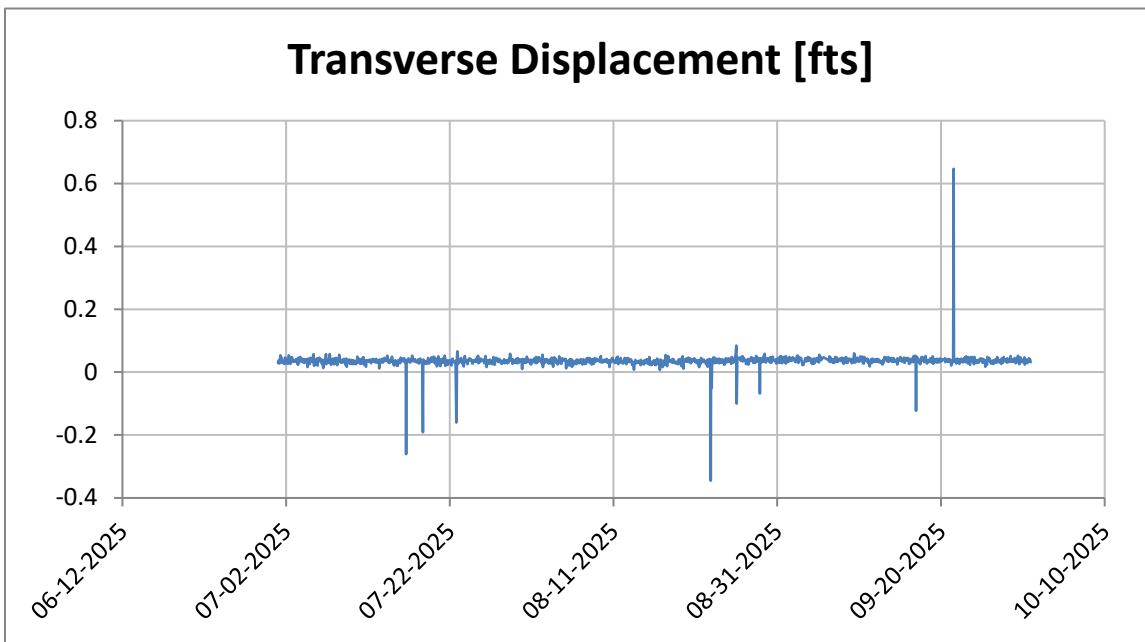
## Prism CP7



#### 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.

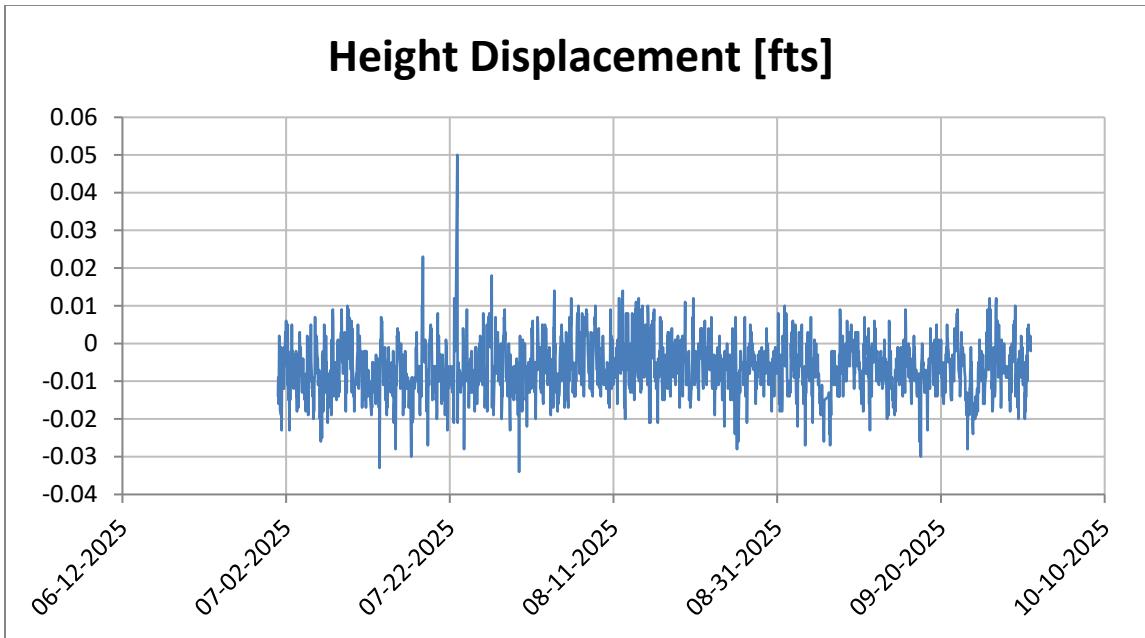
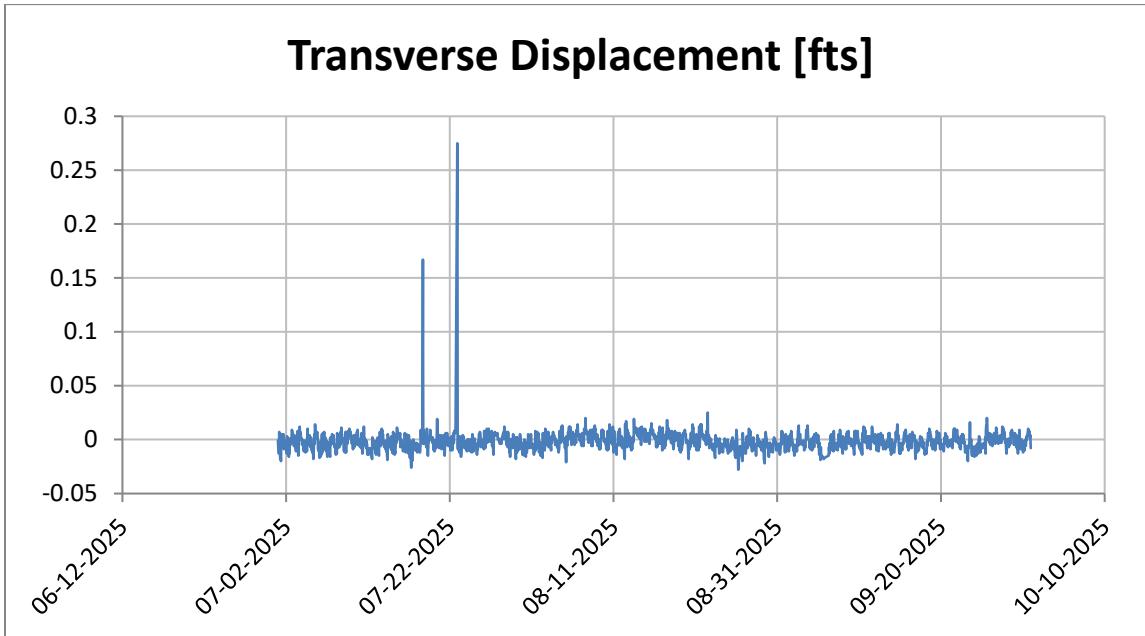
## Prism NP4



#### 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.

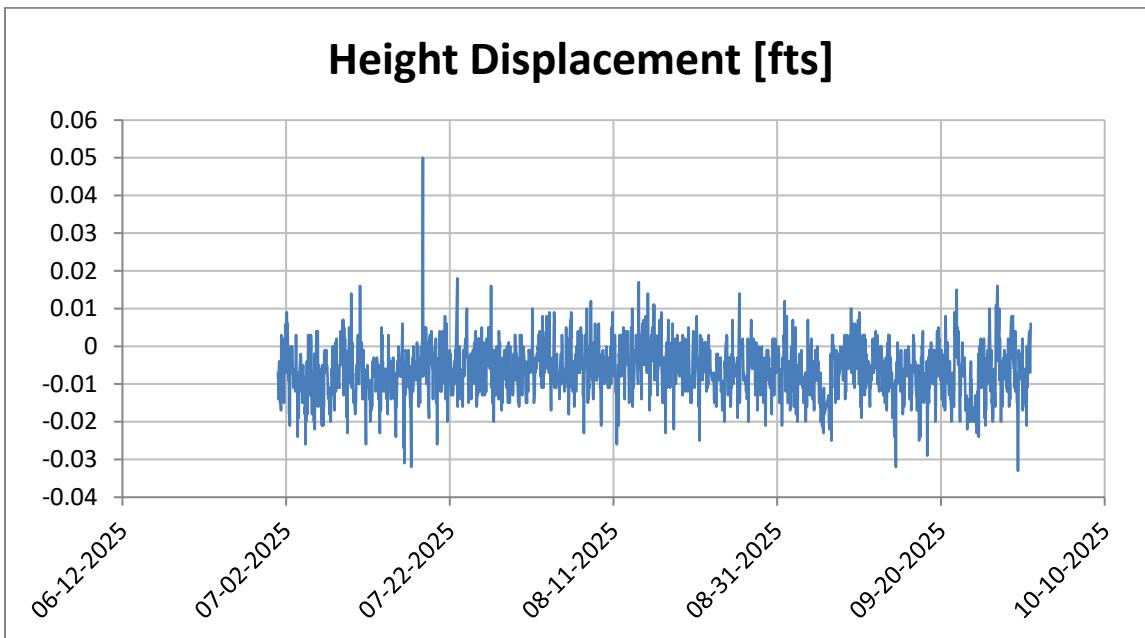
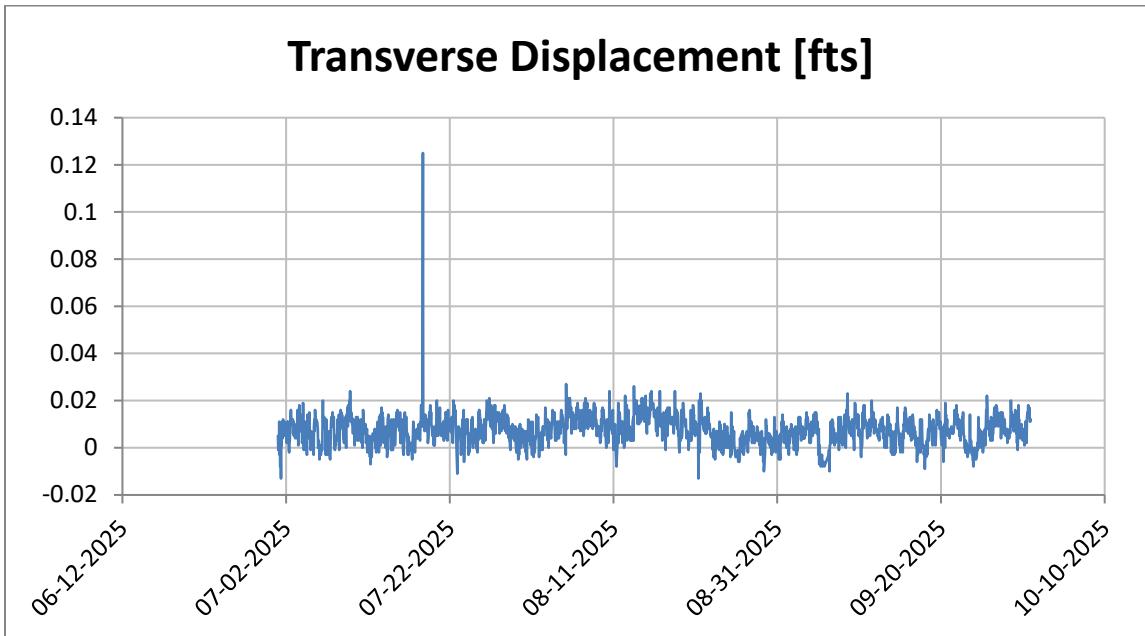
## Prism P2



#### Notes:

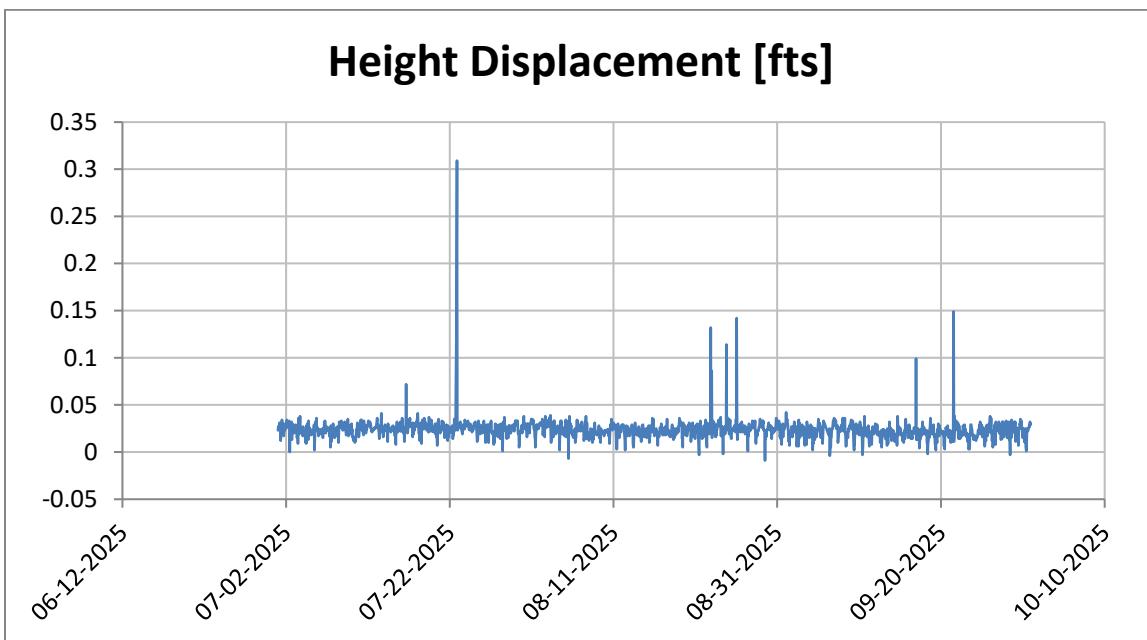
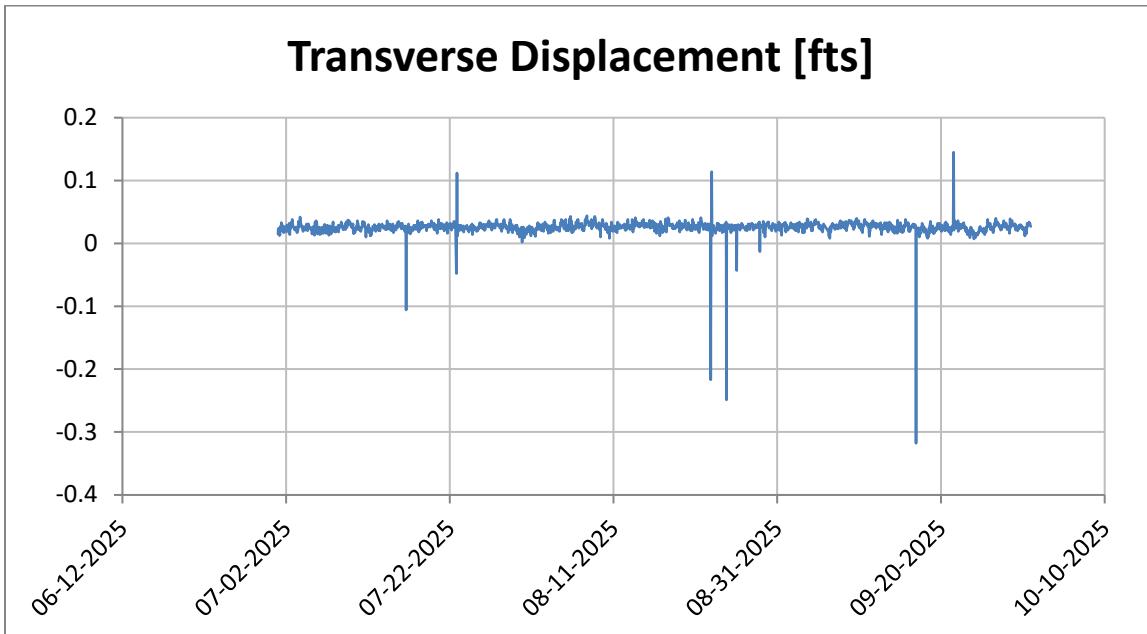
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

## Prism P5

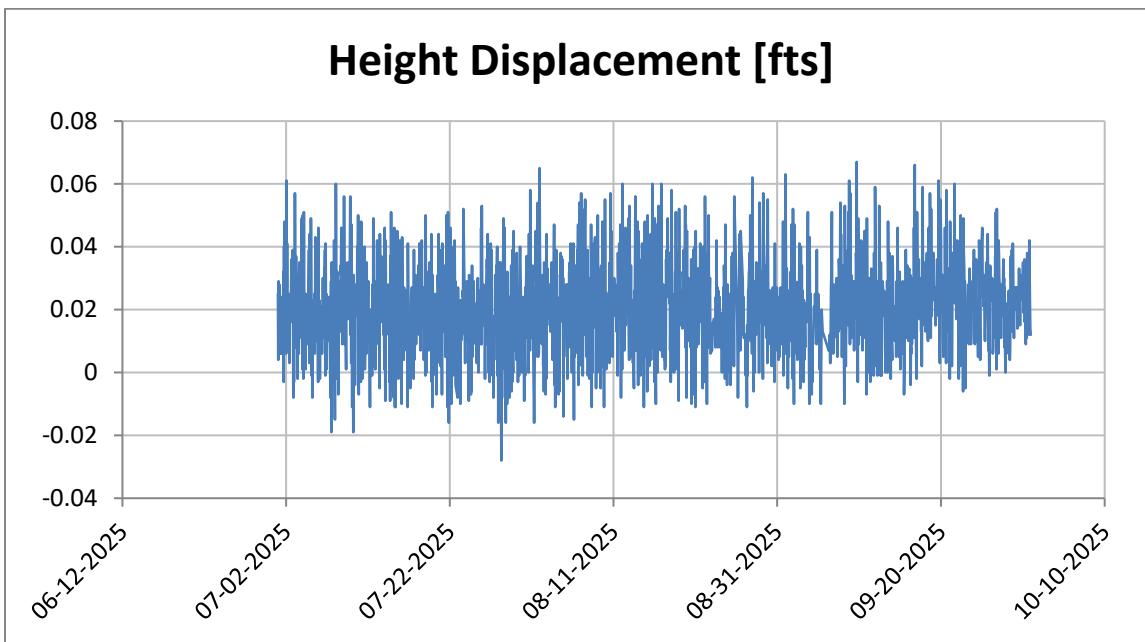
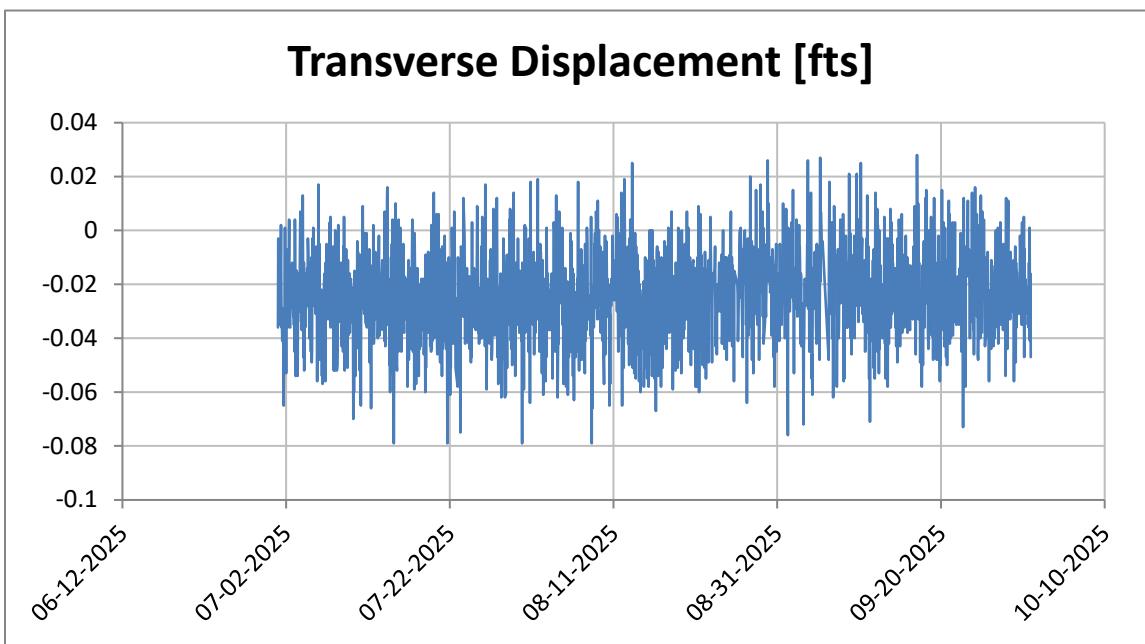


#### Notes:

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.

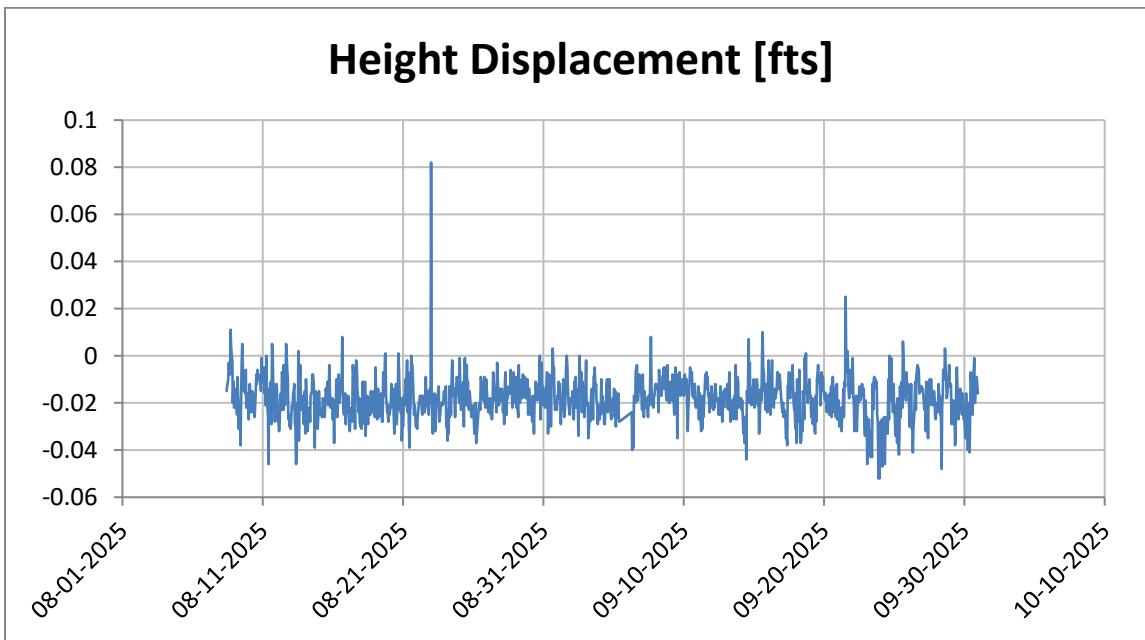
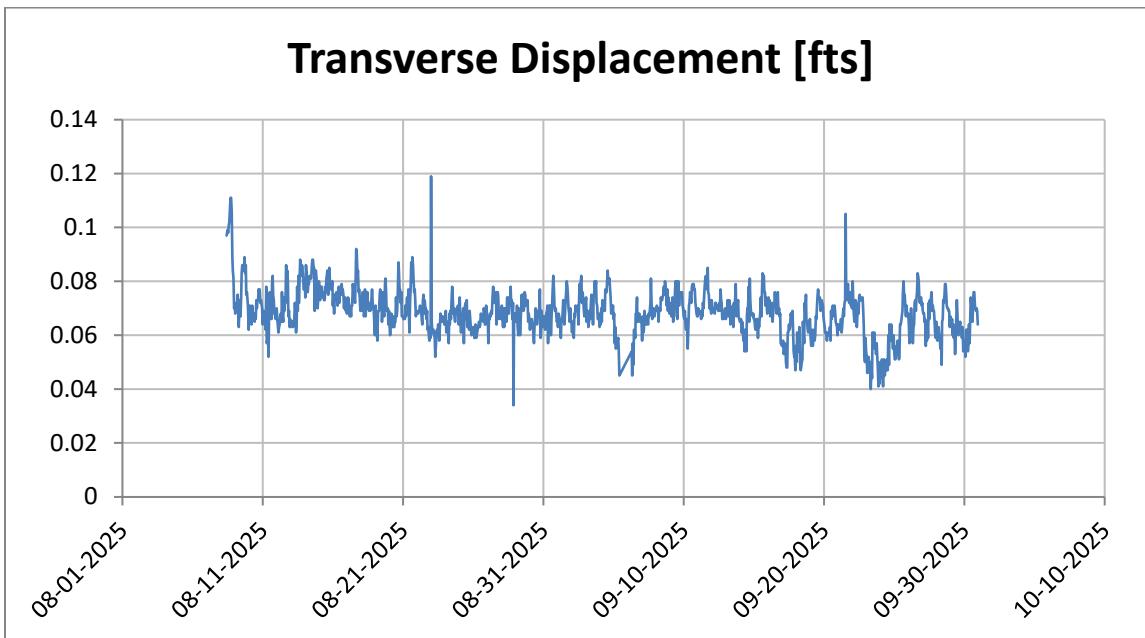
**Prism P25****Notes:**

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.

**Prism P32R****Notes:**

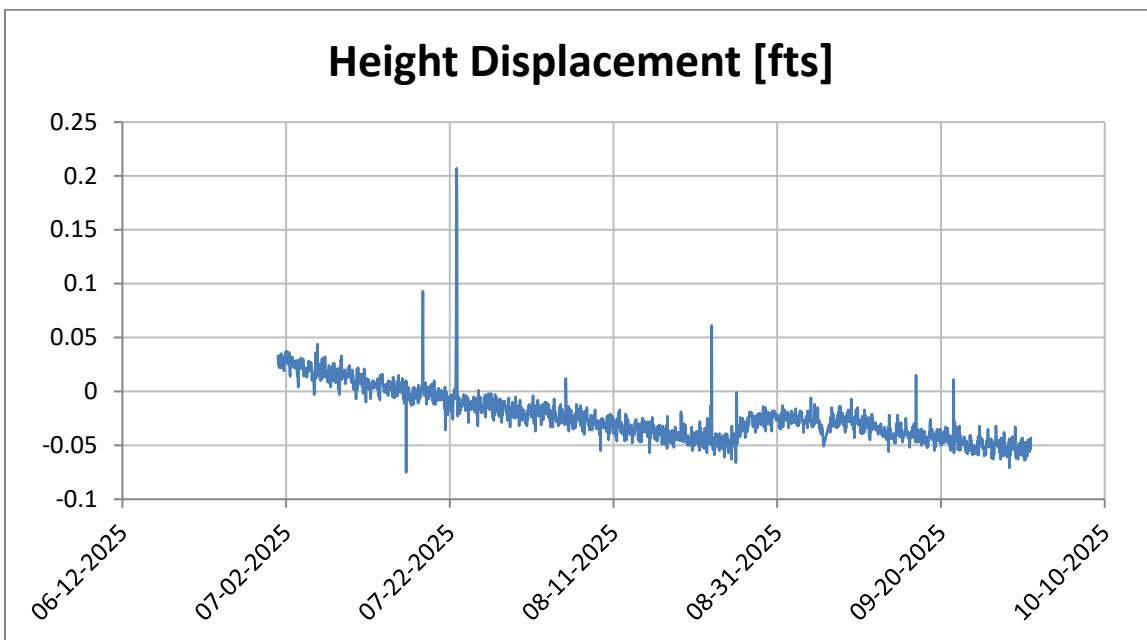
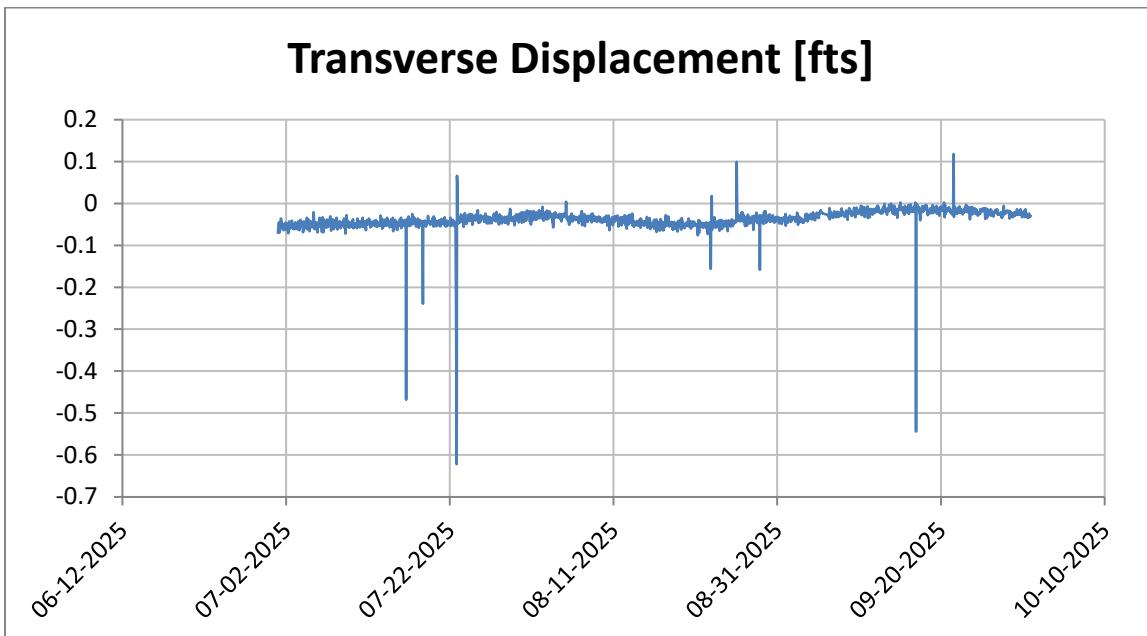
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

## Prism P33

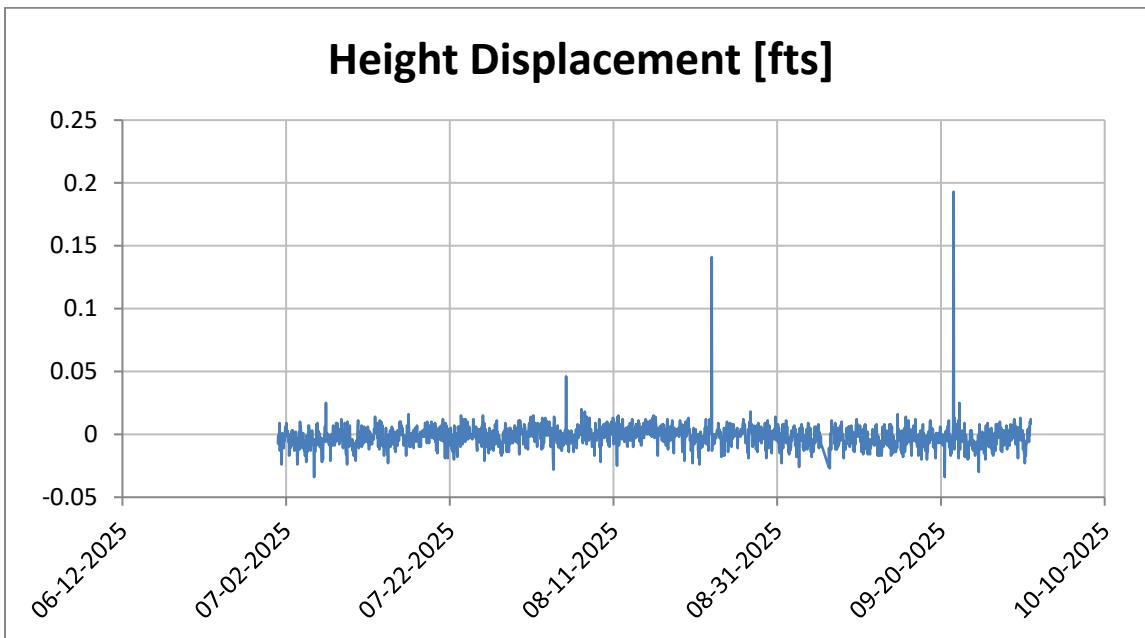
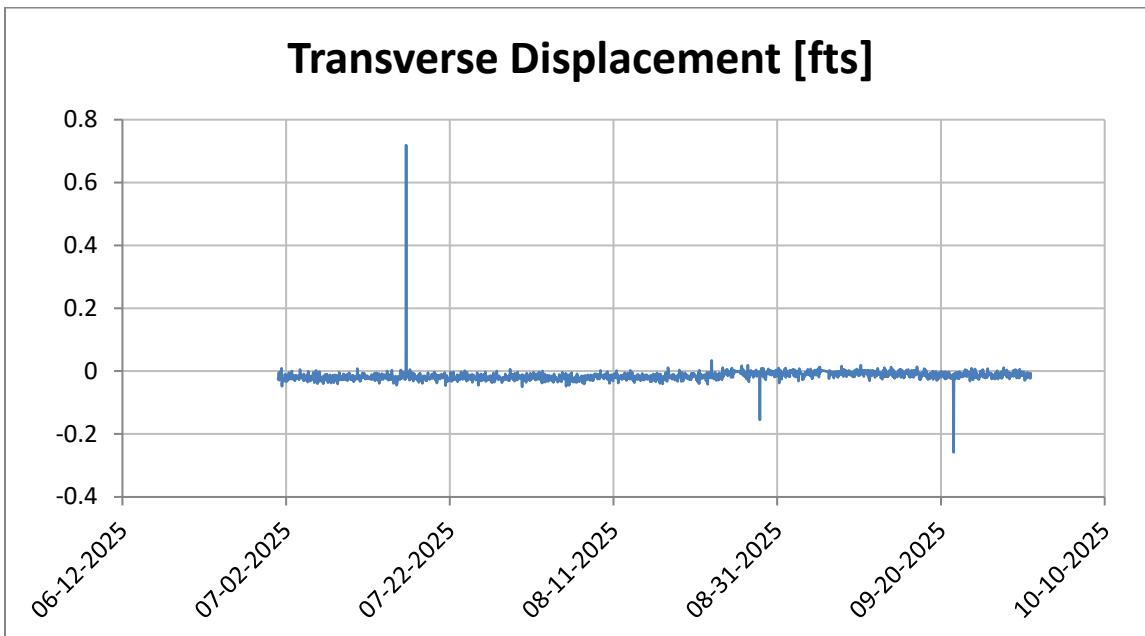


#### Notes:

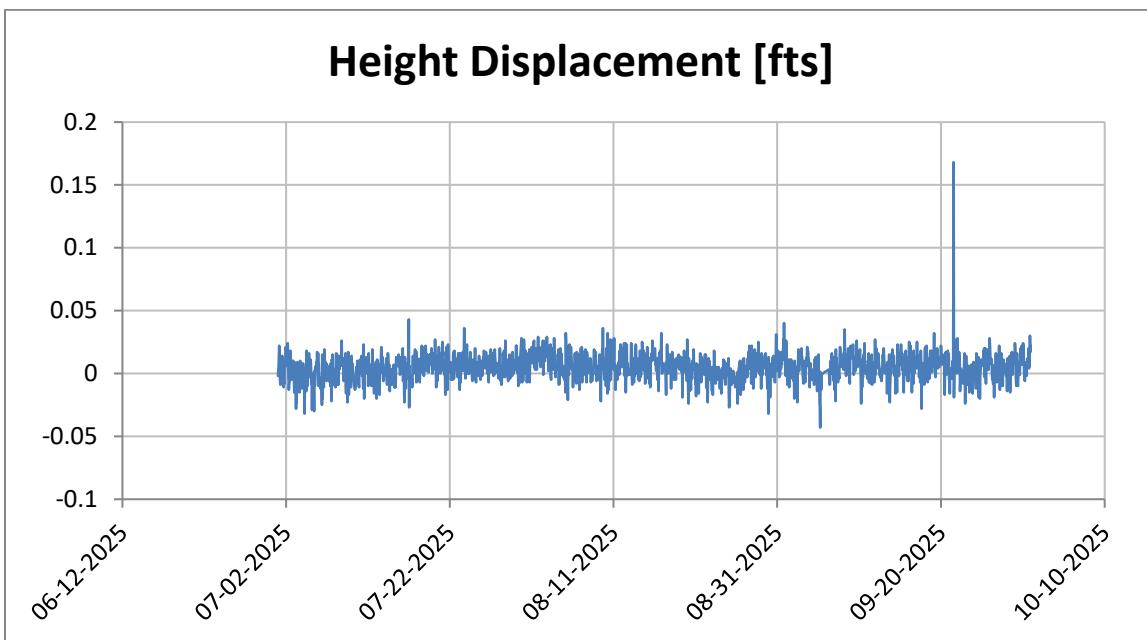
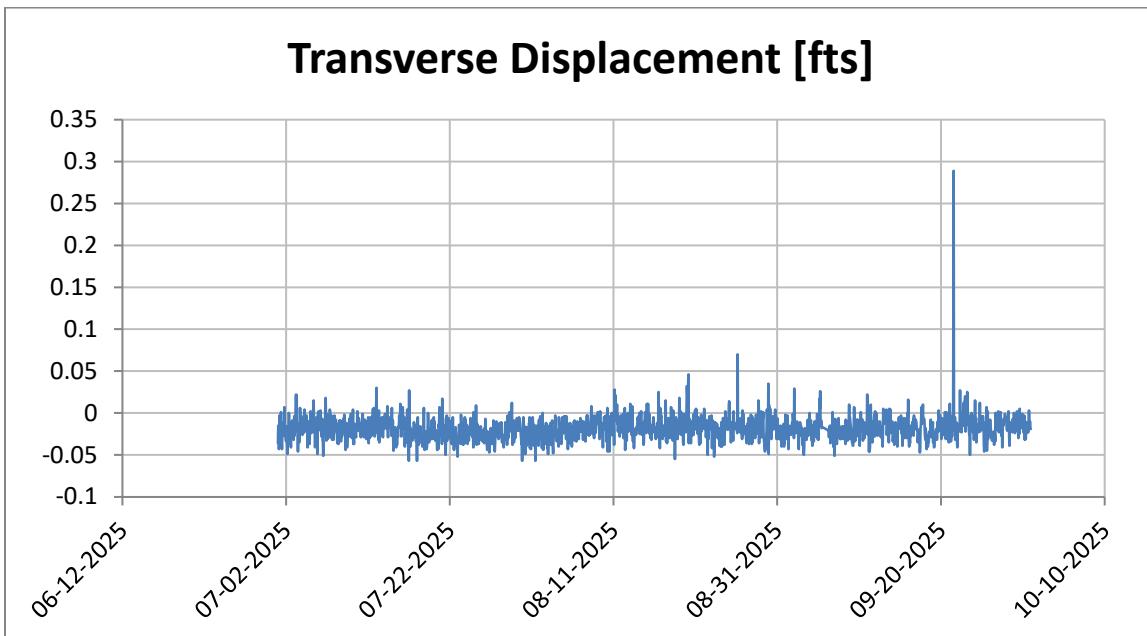
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.
5. No readings June 25 to August 8 due to prism vandalism.

**Prism B7700-1****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.

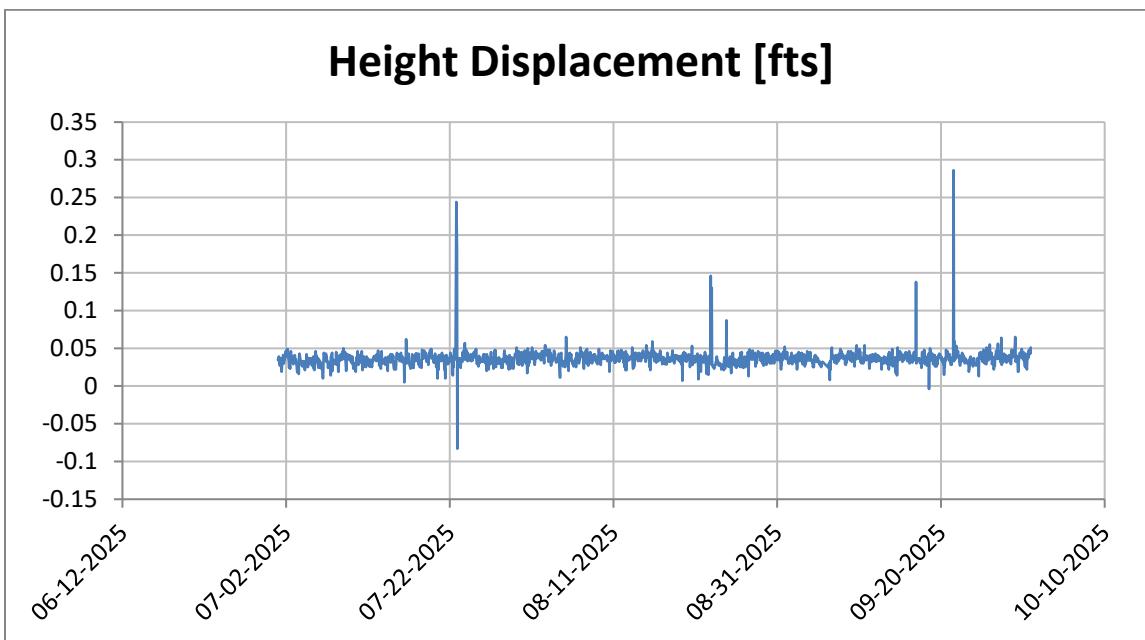
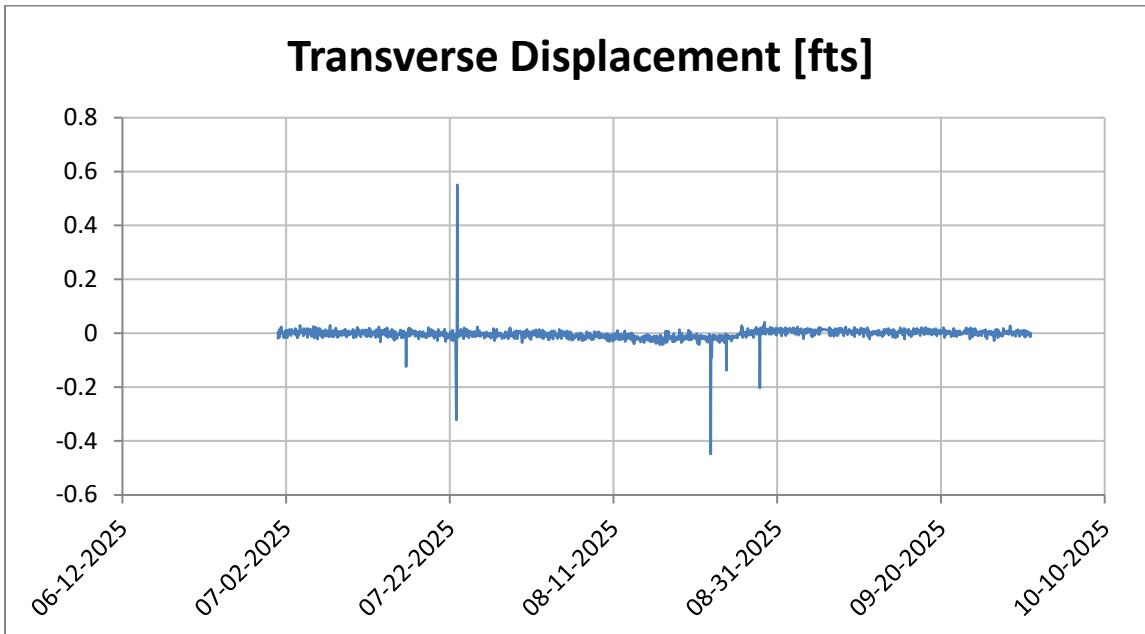
**Prism B7700-2****Notes:**

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.

**Prism B7700-3U****Notes:**

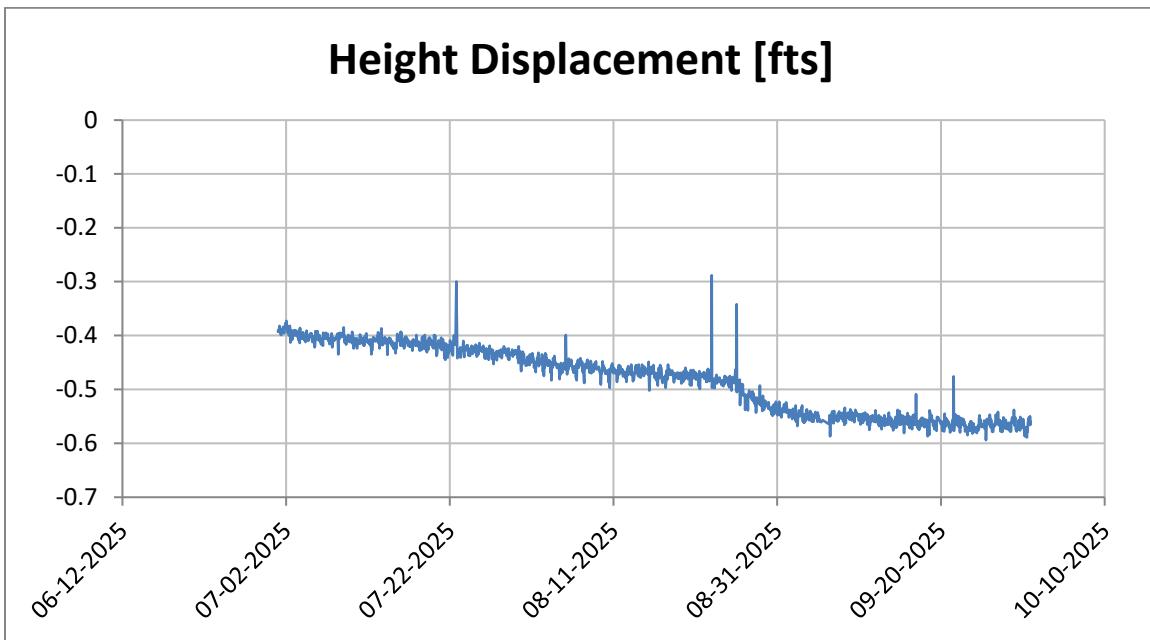
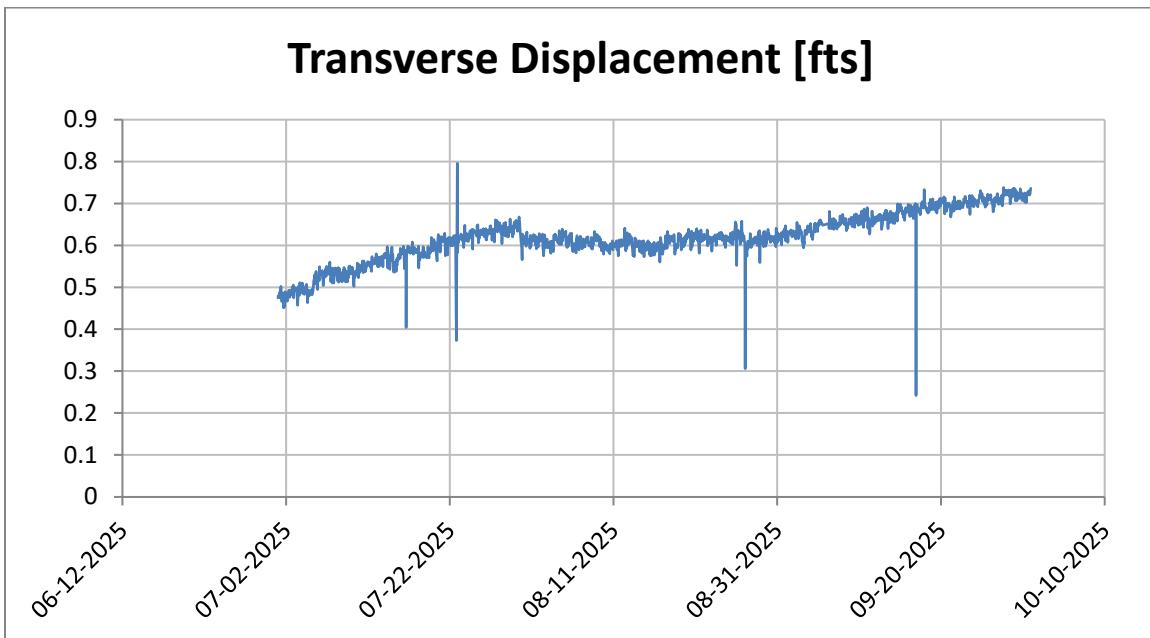
1. Survey accuracy is +/-0.016 feet.
2. Alert threshold is +/-0.35 feet.
3. Transverse displacement is in the horizontal direction. Positive direction means closer to the robotic total station.
4. Height displacement is in the vertical direction. Positive direction means higher in elevation.

## Prism B7700-3L



#### 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.

**Prism B7600-5****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.