



**Coastal Protection and
Restoration Authority of
Louisiana**



CPRA - Wetlands

CPRA Contract No. 2503-12-17
*"Surveying Services for Coastal Restoration
Projects"*

8 Settlement Plates and LiDAR Topographic
Survey

Whiskey Island Back Barrier Marsh
Creation (TE-50) Project

June 20, 2014



Engineers • Surveyors
Environmental Consultants

**8 Settlement Plates and LiDAR
Topographic Survey**

**Whiskey Island Back Barrier
Marsh Creation (TE-50) Project**

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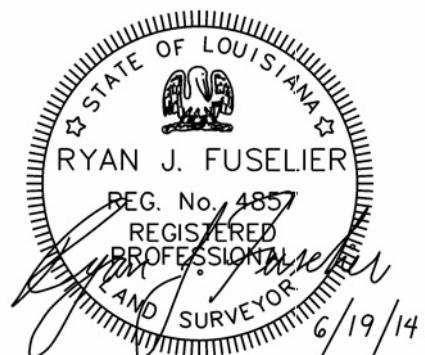
Prepared for:



Coastal Protection and Restoration Authority of Louisiana

**CPRA Contract No. 2503-12-17
“Surveying Services for Coastal Restoration Projects”**

Prepared by:



FENSTERMAKER
Ryan J. Fuselier, P.L.S



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1. Project Description:

C. H. Fenstermaker & Associates, Inc. (Fenstermaker) was contracted by the Coastal Protection and Restoration Authority of Louisiana (CPRA) to provide topographic ground-LiDAR survey services for the entire back barrier marsh area of Whiskey Island located in Terrebonne Parish. Whiskey Island is located within the Isle Dernieres Barrier Island Refuge. This survey is the second survey in a series of three topographic surveys conducted on the Whiskey Island Back Barrier Marsh Creation (TE-50) project and consists of approximately 320 acres.

The services requested consist of Real Time Kinematic (RTK) survey of 8 settlement plates, performing topographic aerial Light Detection and Ranging (LiDAR) survey, and a RTK survey of the TBBSR-SM-01 monument. The elevation data that is collected over the bare ground and through the sparse ground vegetation will be used to evaluate the back barrier creek and pond formation, evolution, and the pre-excavation method.

2. Pre-Planning The GPS Network

Prior to commencement of work, Fenstermaker was required to contact the landowners and secure access agreements. The executed access agreements for the following parties can be found in Appendix B.



<u>Monument</u>	<u>Landowner</u>
TE14-SM-01	Department of Wildlife and Fisheries (State of La.)
TBBSR-SM-01	Department of Wildlife and Fisheries (State of La.)

As per the contract documents, the GPS network plan included five (5) Continuously Operating Reference Stations (CORS) for a static network observation to be observed concurrently with the secondary monument TE14-SM-01 for a minimum of six (6) hours on two (2) different days, through three (3) different satellite constellation geometries (morning-noon-evening). An updated monument data sheet for TE14-SM-01 can be found in Appendix C.



The secondary benchmark (TBBSR-SM-01) was to be observed for a single recorded elevation check each day, and its position updated and referenced for its horizontal position to the North American Horizontal Datum of 1983 (NAD 83) and vertical position to the North American Vertical Datum of 1988 (NAVD 88). *It is to be noted however, that monument TBBSR-SM-01 was significantly disturbed at the time of this survey and an approximate position was recorded to help verify this monument.* Photographs of the disturbed TBBSR-SM-01 monument can be found in Appendix G.

Project Parameters

- Horizontal Datum: NAD 83
- Vertical Datum: NAVD88
- Geoid Model: Geoid 2012a and Geoid 99
- State Plane Zone: Louisiana South 1702
- Units: US Survey Feet and Meter

3. Information on Monument Reconnaissance

As per the contract documents, Fenstermaker began the reconnaissance and observation of monument TE14-SM-01, which was installed by Morris P. Hebert for the Louisiana Department of Natural Resources (LDNR), dated August 2003.

Despite the instability of the marsh, inundation by tides, and GPS aerial obstructions, it was observed by Fenstermaker that the monument still existed in relatively good condition. However, it was noted that the protective plastic housing was partially filled with water, no floating grease sleeve (TSS3) was seen, and there was a lack of packed sand keeping the stainless steel rod from moving horizontally.

4. The GPS Static Survey

The GPS Static Survey utilized four (4) independent CORS stations to observe and adjust two (2) separate days of observations on monument TE14-SM-01 and one (1) day of observation on the aerial LiDAR topographic survey GPS base station.

It was Fenstermaker's intention to include C4G CORS station DEV1, located in the middle of the Gulf of Mexico, as was directed by Mel Guidry with the Operations Branch of Coastal Protection and Restoration Authority. However, data recorded from this observation station was inaccessible during the entirety of this survey, due to a change in ownership of the offshore oil rig on which the station was located. Fenstermaker was made aware that this recommended CORS Station had been offline since the end of 2013, and there is no indication as to when this station may be made available.



A GPS Network Adjustment was made using the best available CORS stations at 0°-15° mask (Contractor's Guide to Minimum Standards calls for 15° mask) and it was determined that the best horizontal and vertical precisions were obtained at a 10° mask. The results of this adjustment can be seen in the Baseline Report below. (See GPS Baseline Network Adjustment Reports in the attached CD for the full report).

As noted previously in Section 2 Pre-Planning and GPS Static Survey, the secondary control monument TE14-SM-01 was to be observed for a minimum of six (6) hours on two (2) different days over 3 different satellite constellation geometries (morning-noon-evening). Fenstermaker's first day of observations (March 27, 2014) began at 8:44am and concluded at 4:20pm, for a total of 7 hours and 32 minutes. The second day of observations (March 28, 2014) began at 8:20am and concluded at 2:30pm for a total of 6 hours and 10 minutes. Photography of the monument can be found in Appendix G.

Due to the limits of seasonal day-light hours, field time on the project, and the time of travel to and from the remote location to the project, the recommended and alternative occupation times as described in the Contractor's Guide for Minimum Standards, could not be followed. Therefore, Fenstermaker was given approval for an exception to the minimum standards and approved by a CPRA representative.

Baseline Processing Report

Observation	From	To	Solution Type	H. Prec. (US survey foot)	V. Prec. (US survey foot)	Geodetic Az.	Ellipsoid Dist. (US survey foot)	ΔHeight (US survey foot)
HOUM - TE14-SM-01 (B17)	HOUM	TE14-SM-01	Fixed	0.018	0.045	190°35'28"	201647.509	-40.540
HOUM - TE14-SM-01 (B18)	HOUM	TE14-SM-01	Fixed	0.018	0.042	190°35'28"	201647.501	-40.543
HOUM - GRIS (B21)	HOUM	GRIS	Fixed	0.013	0.028	115°46'46"	271352.696	-14.163
GRIS - TE14-SM-01 (B22)	GRIS	TE14-SM-01	Fixed	0.028	0.058	254°28'05"	292610.504	-26.369
GRIS - TE14-SM-01 (B23)	GRIS	TE14-SM-01	Fixed	0.028	0.056	254°28'05"	292610.510	-26.393
GRIS - LMCN (B27)	GRIS	LMCN	Fixed	0.011	0.023	269°11'35"	224520.762	2.851
HOUM - LMCN (B28)	HOUM	LMCN	Fixed	0.005	0.015	170°47'48"	124248.011	-11.294
LMCN - TE14-SM-01 (B29)	LMCN	TE14-SM-01	Fixed	0.010	0.035	217°01'37"	94611.855	-29.249



Baseline Processing Report Cont'd

Observation	From	To	Solution Type	H. Prec. (US survey foot)	V. Prec. (US survey foot)	Geodetic Az.	Ellipsoid Dist. (US survey foot)	ΔHeight (US survey foot)
LMCN - TE14-SM-01 (B30)	LMCN	TE14-SM-01	Fixed	0.013	0.031	217°01'38"	94611.840	-29.234
LMCN - 290307 (B35)	LMCN	290307	Fixed	0.018	0.103	213°09'39"	86506.639	-22.720
GRIS - 290307 (B36)	GRIS	290307	Fixed	0.042	0.153	254°32'24"	282470.519	-19.856
HOUM - 290307 (B37)	HOUM	290307	Fixed	0.034	0.116	187°59'49"	197007.615	-34.060
TE14-SM-01 - 290307 (B38)	TE14-SM-01	290307	Fixed	0.013	0.076	72°01'56"	10146.426	6.447
GRIS - FWTR (B44)	GRIS	FWTR	Fixed	0.078	0.104	278°31'31"	754687.996	-5.065
HOUM - FWTR (B45)	HOUM	FWTR	Fixed	0.031	0.086	268°44'43"	502840.015	-19.170
FWTR - TE14-SM-01 (B46)	FWTR	TE14-SM-01	Fixed	0.061	0.164	111°07'22"	501869.244	-21.384
GRIS - FWTR (B48)	GRIS	FWTR	Fixed	0.061	0.088	278°31'31"	754687.933	-5.031
HOUM - FWTR (B49)	HOUM	FWTR	Fixed	0.038	0.057	268°44'43"	502839.994	-19.173
FWTR - TE14-SM-01 (B50)	FWTR	TE14-SM-01	Fixed	0.052	0.119	111°07'22"	501869.244	-21.379

Acceptance Summary

Processed	Passed	Flag	Fail
19	19	0	0



5. The RTK Survey

The RTK Survey was accomplished in two (2) RTK team-efforts; one by foot and another by small ATV. Both teams were instructed to locate and document the eight (8) settlement plates and place 12-15 aerial LiDAR survey targets by or near the settlement plates depending on optimal ground placement.

It is to be noted that Settlement Plate Number 1 was un-recoverable and Settlement Plate number 2 was bent, missing the threaded cap, and disturbed. All of the six (6) settlement plates that were occupied, were observed seven (7) consecutive times, in intervals of two (2) minute satellite observations. Photographs of the settlement plates can be found in Appendix G.

Thirteen (13) aerial targets were placed on open ground for the synchronization of the aerial LiDAR survey. Three (3) RTK observations were recorded on each target to verify positioning. *Photographs of the aerial targets can be found in Appendix G.*

The final results for the two (2) monuments and six (6) settlement plates can be found in the tables below. The complete point list can be found in the CD attached to this report.

Name	Northing NAD83 (US survey foot)	Easting NAD83 (US survey foot)	Elevation NAVD88 (US survey foot Geoid12A)	Elevation NAVD88 (US survey foot Geoid 99)
Settlement Plate-03	201,717.48	3,441,854.33	5.14	5.91
Settlement Plate-04	200,384.34	3,440,721.75	5.49	6.25
Settlement Plate-05	200,706.30	3,443,039.37	5.27	6.04
Settlement Plate-07	199,788.30	3,441,751.35	6.18	6.95
Settlement Plate-08	200,363.33	3,444,482.71	5.78	6.55
Settlement Plate-09	201,471.03	3,444,917.54	6.25	7.02
Monument TE14-SM-01	199,323.18	3,438,609.48	1.09	1.86

Name	Northing NAD83 (Meter)	Easting NAD83 (Meter)	Elevation NAVD88 (Meter Geoid 12A)	Elevation NAVD88 (Meter Geoid 99)
Settlement Plate-03	61,483.61	1,049,079.30	1.57	1.80
Settlement Plate-04	61,077.27	1,048,734.09	1.67	1.91
Settlement Plate-05	61,175.40	1,049,440.50	1.61	1.84
Settlement Plate-07	60,895.59	1,049,047.91	1.88	2.12
Settlement Plate-08	61,070.86	1,049,880.43	1.76	2.00
Settlement Plate-09	61,408.49	1,050,012.97	1.91	2.14
Monument TE14-SM-01	60,753.83	1,048,090.27	0.33	0.57



6. The LiDAR Survey

The LiDAR (Light Detection and Ranging) was collected on the second day of survey from a R22 Beta II/R44 Raven helicopter using a Velodyne HD32 laser scanner mounted on the side of the helicopter flown at approximately 100-foot altitude over the area of Interest for a duration of one (1) hour. A Trimble R8 RTK Geodetic GPS receiver was set up outside of the area of Interest to prevent intrusion of the marsh area and was set to log synchronized GPS satellite data at one (1) second intervals at the same time as the secondary monument TE14-SM-01 was being observed. The LiDAR data was post-processed and corrected to the 15 day precise ephemeris, then filtered for bare earth classification.

7. Equipment used for data collection

Personnel:

- | | |
|-------------------------|--|
| • Project Manager | Toby Lee |
| • Survey Supervisor | Ryan J. Fuselier, PE, PLS |
| • Field Project Manager | Toby Lee |
| • Survey Crew | Jeremy Robin
Jeremy Pefferkorn
Troy Guidry
Joe Fontenot |

Equipment (Static Survey):

- 1 - Trimble 5700 GNSS L1/L2 Geodetic GPS receiver with accessories
- 2 – Trimble R8 RTK Geodetic GPS receivers with accessories
- 1 – 24-foot barge boat with all necessary safety equipment
- 1 – ATV Survey vehicle with relevant support equipment

Equipment (LiDAR Survey):

- 1 – R22 Beta II/R44 Raven helicopter
- 1 – Trimble R8 RTK Geodetic GPS receiver with accessories
- 1 – Velodyne HD32 Laser Scanner

Software (Static Survey):

- Trimble Business Center (GPS Network adjustment software, ver. 3.11)
- Microsoft Word 2003
- Micro Station V8



8. Downloading, Processing and GPS Network Adjustment Procedures

Processing of GPS data followed the five procedures for estimating GPS-derived orthometric heights as outlined on page 6 of "A Contractors Guide to Minimum Standards" by LDNR. Final baselines were processed with the fifteen (15) day precise ephemeris and adjusted accordingly. Included in this report are NGS OPUS solutions (Appendix D), an updated LDNR primary monument for comparison of geoidal differences between Geoid 99 and Geoid 12A, and a chart noting the best averages for each of the (6) settlement plates. Also included are two 22" x 34" plans (Appendix H); the first being the Title Sheet with Layout Map and Limits of Survey shown, and the second showing a color-graduated elevation map illustrating elevations throughout the Limits of Survey using the LiDAR data.



Appendix A

Project Area Map



Figure 5. Location of the Whiskey Island Back Barrier Marsh Creation (TE-50) project Marsh Creation Area Settlement Plates.



Appendix B

Land Access Agreements



BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARHAM
SECRETARY
JIMMY L. ANTHONY
ASSISTANT SECRETARY

February 26, 2014

Toby Lee
Project Manager – Advanced Technology Division
Fenstermaker, Inc.
337-354-0421 office
337-296-4927 cell
toby@fenstermaker.com

Subject: Conditional Permit to Access Whiskey Island of Isle Dernieres Barrier Islands Refuge for Monitoring of Whiskey Island Back Barrier Marsh Creation Project (TE-50)

Dear Mr. Lee:

Thanks for your request to access Whiskey Island of Isle Dernieres Barrier Islands Refuge (IDBIR) for elevation surveys for the Whiskey Island Back Barrier Marsh Creation Project (CWPPRA – TE-50). The Department of Wildlife and Fisheries (LDWF) has no objections to authorizing your activities provided you adhere to the following conditions:

- Access to Whiskey Island of Isle Dernieres Barrier Islands Refuge is permitted from February 27 – March 7, 2014. Access to other islands of the refuge is prohibited. A copy of this permit must be in your possession at any time while on the refuge.
- The use of a helicopter to fly low altitude (50 foot and 150 foot surveys) elevations surveys is permitted for two days during this time period. You are exempt from the 500 foot altitude refuge requirement for the purposes of these surveys.
- The use of one All-terrain vehicle (ATV) is permitted on Whiskey Island. You are permitted to use the ATV for survey purposes, accessing benchmarks, and transporting equipment. Due to concerns of negative impacts, ATV use within the marsh creation portion of the project is prohibited. Only foot traffic is permitted in this area. You are required to access the marsh creation portion of the project via the gulf side of the island. Please minimize impacts to vegetation while traversing the island via ATV. Additionally, please be aware that Piping Plovers and other shorebirds species are present at the refuge during this time of year. Please reduce disturbance to these bird species by minimize the number of ATV trips along the beach (to the maximum extent possible). Airboats are prohibited on the refuge.
- You are permitted to stage equipment and park boats at N29.049809°, W 90.844693°. You are also allowed to stage equipment west of the TBBSR-SM-01 monument near the marsh creation area. Equipment and the ATV may be left overnight on the refuge, but all nighttime activity is prohibited. LDWF is not liable for equipment left overnight on the refuge.
- Please give LDWF a courtesy call or email if your project extends past February 28, 2014 (as per our previous discussion, your crew will be initiating the project on February 27). Please contact me (clejeune@wlf.la.gov or 337-373-0032) or Tyson Crouch (terouch@wlf.la.gov or 337-373-0032). LDWF staff will also be allowed to monitor and/or participate in all activities if desired.
- All rules and regulations pertaining to the refuge must be adhered to except those provisions identified in this permit. See additional pages for general IDBIR regulations.
- LDWF reserves the right to revoke this permit at any point for any reason.
- Permittee is responsible for any damages associated with the project. LDWF will not be responsible for any liabilities associated with the project or permittee's activities.

If you have any questions regarding the conditions and stipulations or the reporting requirements of this permit, please call me or (337) 373-0032.

Sincerely,

Cassidy Lejeune
Biologist Program Manager

Cc: CNR Coastal Ops Staff
Enforcement Division Staff

EXHIBIT C

Louisiana Register Vol. 25, No. 5 May 20, 1999 {PAGE }

DECLARATION OF EMERGENCY
Department of Wildlife and Fisheries
Wildlife and Fisheries Commission

Isles Dernieres Barrier Islands Refuge
(LAC 76:III.321 and 331)

The Wildlife and Fisheries Commission does hereby establish emergency regulations for the management of the Isles Dernieres Barrier Islands Refuge which includes Wine Island, East Island, Trinity Island, Whiskey Island, and Raccoon Island. Formerly, three of these islands, i.e., Wine, Whiskey, and Raccoon Islands, were included within the Terrebonne Barrier Islands Refuge and were regulated under provisions of LAC 76:III.321. By promulgation of this declaration of emergency, the Terrebonne Barrier Islands Refuge regulations found at LAC 76:III.321 are hereby repealed.

A declaration of emergency is necessary to regulate public access to the Isles Dernieres Barrier Islands Refuge in order to ensure that those members of the public utilizing the public use area on Trinity Island enjoy a clean and healthful environment and in order to minimize contact with the numerous species of colonial seabirds that utilize the islands as nesting habitat in the spring and summer months. This declaration of emergency will become effective on May 6, 1999 and shall remain in effect for the maximum period allowed under the Administrative Procedure Act or until adoption of the final rule.

Title 76

WILDLIFE AND FISHERIES

Part III. State Game and Fish Preserves and Sanctuaries

Chapter 3. Particular Game and Fish Preserves and Commission

§321. Terrebonne Barrier Islands Refuge

Repealed.

AUTHORITY NOTE: Promulgated in accordance with R.S. 56:6(18), R.S. 56:761 and R.S. 56:785.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 19:910 (July 1993), repealed LR 25:

§331. Isles Dernieres Barrier Islands Refuge

A. Regulations for Isles Dernieres Barrier Islands Refuge

1. **Regulations for Wine Island, East Island, Whiskey Island, and Raccoon Island**

a. Public access by any means to the exposed land areas, wetlands and interior waterways of these islands is prohibited. Requests to access exposed land

areas, wetlands and interior waterways shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee in the interest of conducting research on fauna and flora, of advancing educational pursuits related to barrier islands, or of planning and implementing island restoration projects.

b. Disturbing, injuring, collecting, or attempting to disturb, injure, or collect any flora, fauna, or other property is prohibited, unless expressly permitted in writing by the Secretary or his designee for the uses provided for in Paragraph 1.a. above.

c. Boat traffic is allowed adjacent to the islands in the open waters of the Gulf and bays; however, boat traffic is prohibited in waterways extending into the interior of the islands or within any land-locked open waters or wetlands of the islands.

d. Fishing from boats along the shore and wade fishing in the surf areas of the islands is allowed.

e. Littering on the islands or in Louisiana waters or wetlands is prohibited.

f. Proposals to conduct oil and gas activities, including seismic exploration, shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee, consistent with provisions of the Act of Donation executed by the Louisiana Land and Exploration Company on July 24, 1997.

2. Regulations for Trinity Island

a. Public access is allowed in a designated public use area. An area approximately 3,000 linear feet by 500 linear feet is designated as a public use area, the boundaries of which will be marked and maintained by the Department. The designated public use area shall extend westward from the western boundary of the servitude area reserved by Louisiana Land and Exploration Company in the Act of Donation a distance of approximately 3,000 linear feet and northward from the southern shoreline within this area by a distance of approximately 500 linear feet. Public recreation such as bird-watching, picnicking, fishing and overnight camping is allowed in this area. Travel on or across this area shall be limited to foot or bicycle traffic only. No use of all-terrain vehicles or other vehicles powered by internal combustion engines or electric motors shall be allowed.

b. Public access to all exposed land areas of Trinity Island, other than the public use area, is prohibited. Requests to access these exposed land areas shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee in the interest of conducting research on fauna and flora, of advancing educational pursuits related to barrier islands or of planning and implementing island restoration projects.

- c. Disturbing, injuring, collecting, or attempting to disturb, injure, or collect any flora, fauna, or other property is prohibited, unless expressly permitted in writing by the Secretary or his designee for the uses provided for in Paragraph 2.b. above.
- d. Any member of the public utilizing the designated public use area shall be required to have a portable waste disposal container to collect all human wastes and to remove same upon leaving the island. Discharge of human wastes, including that within the disposal container, onto the island or into Louisiana waters or wetlands is prohibited.
- e. Littering on the island or in Louisiana waters or wetlands is prohibited.
- f. Carrying, possessing, or discharging firearms, fireworks, or explosives in the designated public use area is prohibited.
- g. Boat traffic is allowed adjacent to the island in open waters of the Gulf and bays and within the man-made canal commonly known as California Canal for its entire length to its terminus at the bulkhead on the western end of the canal. No boat traffic is allowed in other man-made or natural waterways extending into the interior of the island or in any land-locked open waters or wetlands of the island.
- h. Fishing from boats or wade fishing in the surf areas of the island is allowed.
- i. Houseboats may be moored in designated areas along the California Canal. An annual permit shall be required to moor a houseboat in the canal. The required permit may be obtained from the Department of Wildlife and Fisheries New Iberia Office.
- j. Proposals to conduct oil and gas activities, including seismic exploration, shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee, consistent with provisions of the Act of Donation executed by the Louisiana Land and Exploration Company on July 24, 1997.

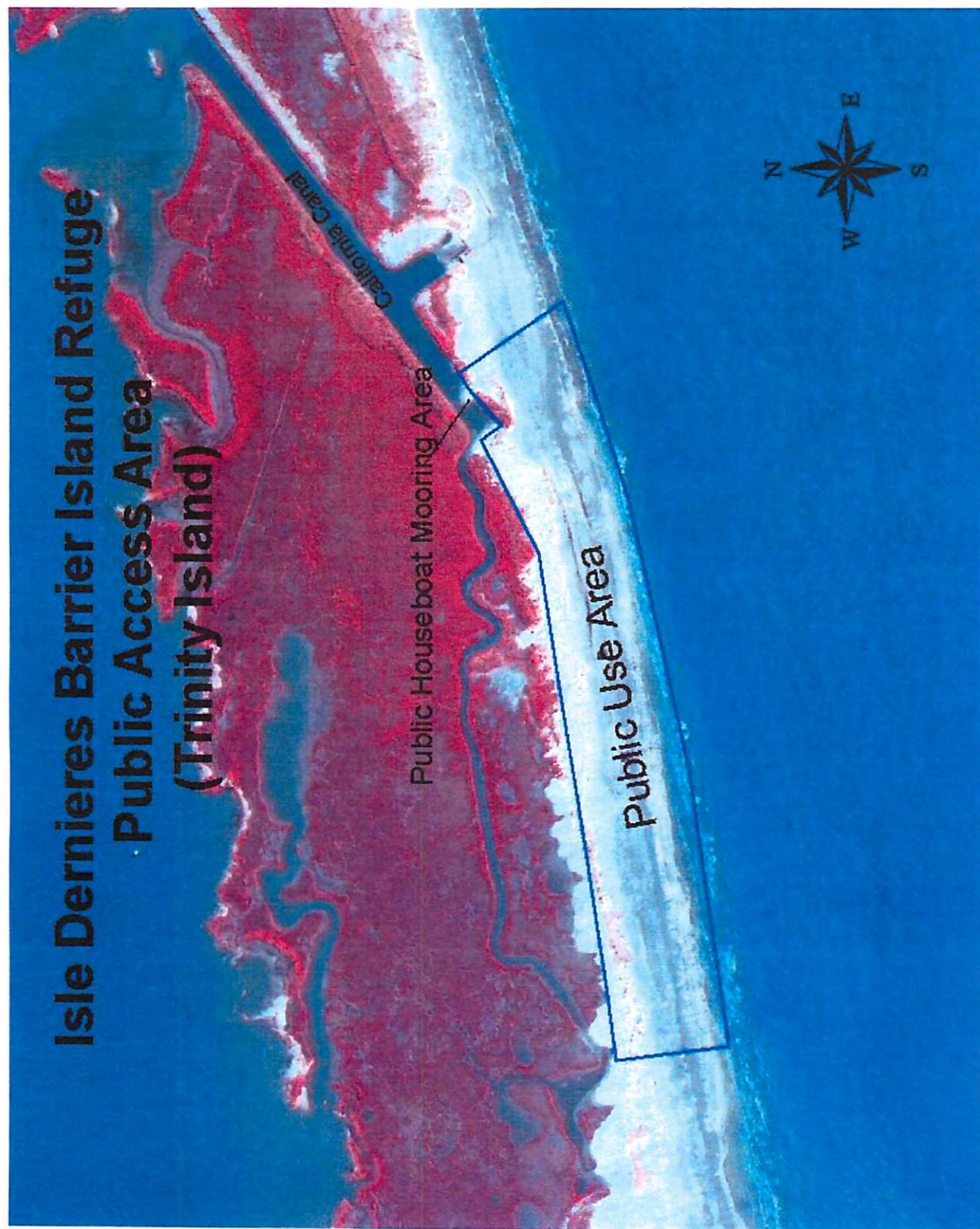
B. Violation of any provision of these regulations shall be considered a Class Two Violation, as described in R.S. 56:115(D), 56:764, and 56:787.

AUTHORITY NOTE: Promulgated in accordance with R.S. 56:6(18), R.S. 56:109, and R.S. 56:781 et seq.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 25:

Bill A. Busbice, Jr.
Chairman

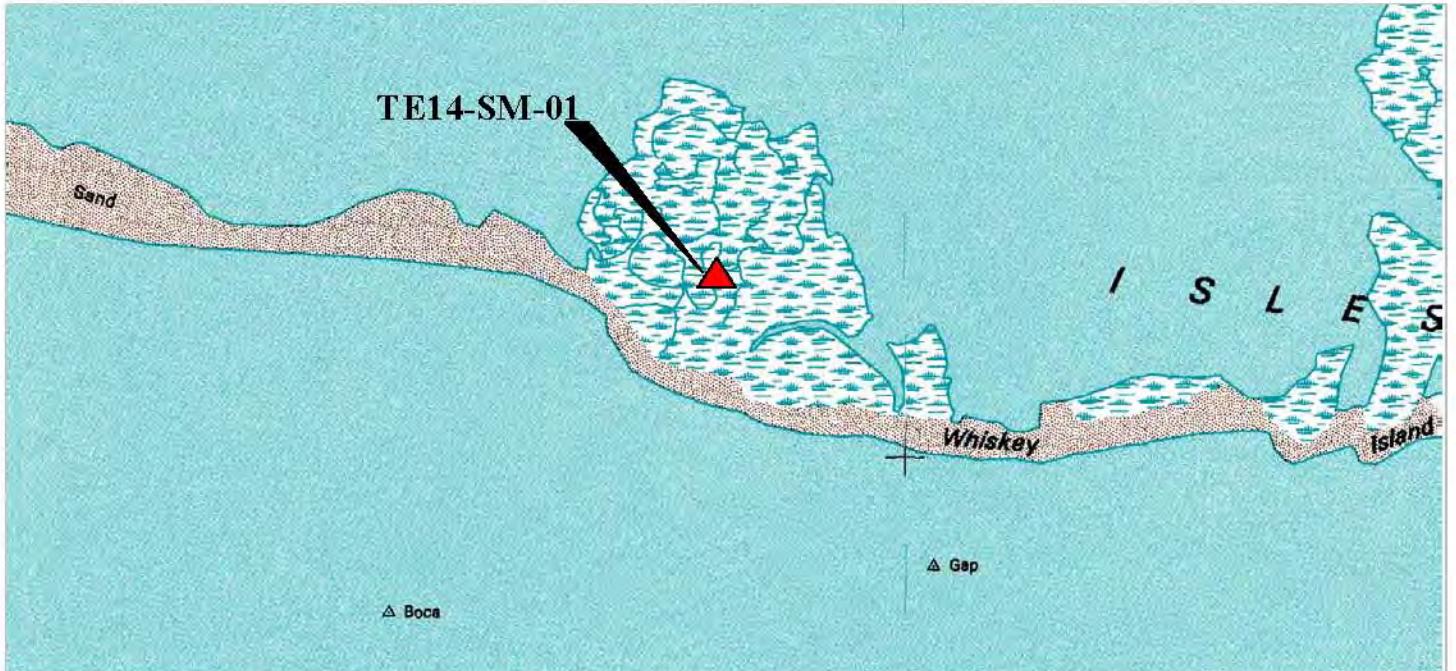
9905#041





Appendix C

Monument Data Sheets



VICINITY MAP

Scale: 1" = 2000'

Reproduced from USC&GS "Central Isles Dernieres, La" Quadrangle

Station Name: "TE14-SM-01"

Location: Located on the south side of Whiskey Island in Isles Demieres, approximately 23 miles southwest of Cocodrie , Louisiana.

Monument Description: NGS style floating sleeve monument; datum point set on 9/16" stainless steel sectional rods driven 108 feet to refusal, set in sand filled 6" PVC pipe with access cover set in concrete.

Stamping: TE14-SM-01

Installation Date: August 2003 **Date of Survey:** September 2003

Monument Established By: Morris P. Hebert, Inc.

For: Louisiana Department of Natural Resources, CRD

Adjusted NAD 83 Geodetic Position

Lat. 29°02'49.70646" N

Long. 90°50'22.54602" W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 199,323.20

E= 3,438,609.45

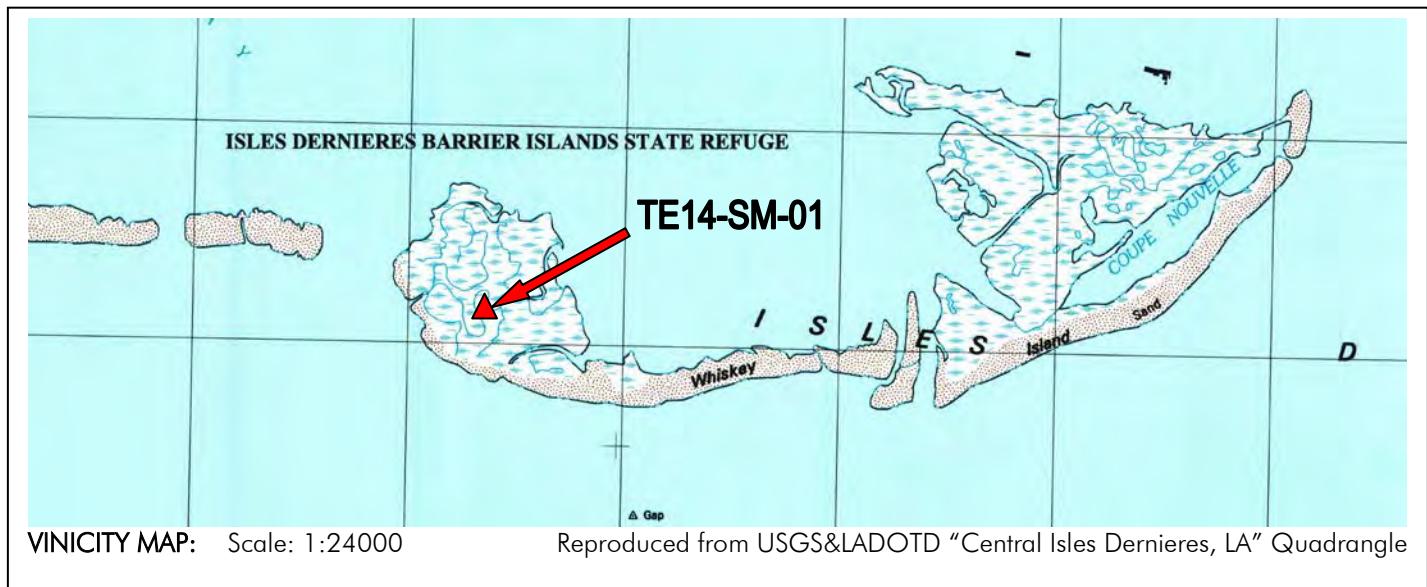
Adjusted NAVD88 Height

Elevation = 2.29 feet (0.698 Mtrs)

Ellipsoid Height = -23.542 Mtrs.

Geoid99 Height = -24.239 Mtrs.





Station Name: "TE14-SM-01"

Location: Located on the South side of Whiskey Island in Isles Dernieres, approximately 23 miles southwest of Cocodrie, LA

Monument Description: NGS style floating sleeve monument; datum point set on 9/16" stainless steel sectional rods driven 108 feet to refusal, set in sand filled 6" PVC pipe with access cover set in concrete.

Stamping: TE14-SM-01

Installation Date: August 2003 **Date of Survey:** February 2014

Monument Established By: Morris P. Hebert, Inc.

For: Louisiana Department of Natural Resources, CRD

Adjusted NAD 83 Geodetic Position

Lat. 29°02'49.70619"

Long. 90°50'22.54575"

Adjusted NAD 83 Datum LSZ (1702) FEET

N= 199,323.18

E= 3,438,609.48

Adjusted NAVD 88 Height (Geoid12A)

Elevation = 1.09 USfeet (0.332 meters)

Ellipsoid Height = -23.673 meters

Geoid12A Height = -24.005 meters

Adjusted NAVD 88 Height (Geoid99)

Elevation = 1.86 USfeet (0.566 meters)

Ellipsoid Height = -23.673 meters

Geoid99 Height = -24.239 meters





Appendix D

NGS OPUS Solutions

Toby Lee

From: opus <opus@ngs.noaa.gov>
Sent: Thursday, March 06, 2014 2:45 PM
To: Toby Lee
Subject: OPUS solution : 82920590.14o OP1394138650277
Attachments: 82920590.14o.xml

FILE: 82920590.14o OP1394138650277

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: toby@fenstermaker.com DATE: March 06, 2014
RINEX FILE: 82920590.14o TIME: 20:44:50 UTC

SOFTWARE: page5 1209.04 master52.pl 022814 START: 2014/02/28 14:19:00
EPHEMERIS: igr17815.eph [rapid] STOP: 2014/02/28 20:24:00
NAV FILE: brdc0590.14n OBS USED: 13739 / 13888 : 99%
ANT NAME: TRM55971.00 NONE # FIXED AMB: 50 / 52 : 96%
ARP HEIGHT: 2.000 OVERALL RMS: 0.011(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.1609)

X: -81768.952(m) 0.004(m) -81769.717(m) 0.004(m)
Y: -5579683.425(m) 0.007(m) -5579681.918(m) 0.007(m)
Z: 3078458.447(m) 0.001(m) 3078458.260(m) 0.001(m)

LAT: 29 2 49.70621 0.003(m) 29 2 49.72448 0.003(m)
E LON: 269 9 37.45400 0.004(m) 269 9 37.42491 0.004(m)
W LON: 90 50 22.54600 0.004(m) 90 50 22.57509 0.004(m)
EL HGT: -23.681(m) 0.007(m) -25.079(m) 0.007(m)
ORTHO HGT: 0.325(m) 0.016(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES UTM (Zone 15) SPC (1702 LA S)

Northing (Y) [meters] 3215134.517 60753.826
Easting (X) [meters] 710354.185 1048090.259
Convergence [degrees] 1.04932482 0.24687488
Point Scale 1.00014606 1.00006314
Combined Factor 1.00014978 1.00006686

US NATIONAL GRID DESIGNATOR: 15RYN1035415134(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DH7121	GRIS GRAND ISLE CORS ARP	N291555.883	W0895726.262	89186.9
DK3579	CAMR CAMERON PARISH CT CORS ARP	N294754.577	W0931930.380	255141.5
DG5315	HOUUM HOUUMA CORS ARP	N293532.109	W0904324.988	61461.9

NEAREST NGS PUBLISHED CONTROL POINT

AU3067	GAP	N290219.579	W0904957.077	1158.4
--------	-----	-------------	--------------	--------

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

Toby Lee

From: opus <opus@ngs.noaa.gov>
Sent: Thursday, March 06, 2014 2:44 PM
To: Toby Lee
Subject: OPUS solution : 82920580.14o OP1394138523599
Attachments: 82920580.14o.xml

FILE: 82920580.14o OP1394138523599

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values.

For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: toby@fenstermaker.com DATE: March 06, 2014
RINEX FILE: 82920580.14o TIME: 20:44:00 UTC

SOFTWARE: page5 1209.04 master91.pl 022814 START: 2014/02/27 14:44:00
EPHEMERIS: igr17814.eph [rapid] STOP: 2014/02/27 22:48:00
NAV FILE: brdc0580.14n OBS USED: 18804 / 19070 : 99%
ANT NAME: TRM55971.00 NONE # FIXED AMB: 65 / 70 : 93%
ARP HEIGHT: 2.000 OVERALL RMS: 0.012(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.1583)

X: -81768.952(m) 0.004(m) -81769.717(m) 0.004(m)
Y: -5579683.422(m) 0.012(m) -5579681.915(m) 0.012(m)
Z: 3078458.448(m) 0.007(m) 3078458.261(m) 0.007(m)

LAT: 29 2 49.70628 0.001(m) 29 2 49.72456 0.001(m)
E LON: 269 9 37.45400 0.004(m) 269 9 37.42491 0.004(m)
W LON: 90 50 22.54600 0.004(m) 90 50 22.57509 0.004(m)
EL HGT: -23.683(m) 0.014(m) -25.081(m) 0.014(m)
ORTHO HGT: 0.323(m) 0.026(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 15) SPC (1702 LA S)

Northing (Y) [meters] 3215134.519 60753.828
Easting (X) [meters] 710354.184 1048090.259
Convergence [degrees] 1.04932482 0.24687488
Point Scale 1.00014606 1.00006314
Combined Factor 1.00014978 1.00006686

US NATIONAL GRID DESIGNATOR: 15RYN1035415134(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG5315	HOUM HOUMA CORS ARP	N293532.109	W0904324.988	61461.9
DK3579	CAMR CAMERON PARISH CT CORS ARP	N294754.577	W0931930.380	255141.5
DH7121	GRIS GRAND ISLE CORS ARP	N291555.883	W0895726.262	89186.9

NEAREST NGS PUBLISHED CONTROL POINT

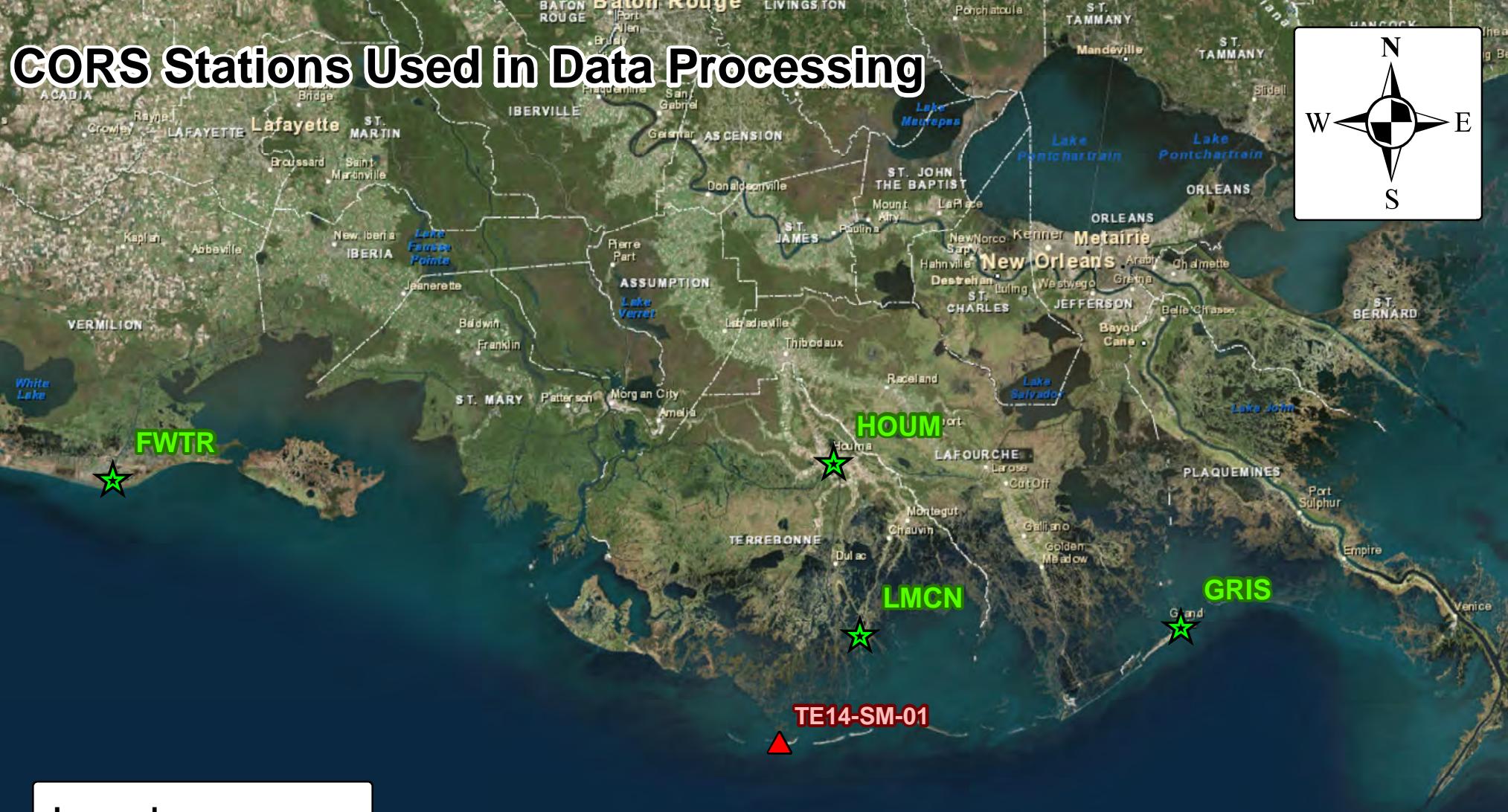
AU3067	GAP	N290219.579	W0904957.077	1158.4
--------	-----	-------------	--------------	--------

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.



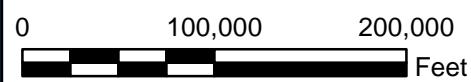
Appendix E

TGO Network Adjustment Reports



Legend

- ★ Primary CORS Stations
- ▲ TE14-SM-01





Project Information		Coordinate System	
Name:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier.vce	Name:	US State Plane 1983
Size:	1 MB	Datum:	NAD 1983 (Conus)
Modified:	3/28/2014 1:59:11 PM (UTC:-5)	Zone:	Louisiana South 1702
Time zone:	Central Standard Time	Geoid:	GEOID12A (Conus)
Reference number:		Vertical datum:	
Description:			

Baseline Processing Report

Processing Summary

Observation	From	To	Solution Type	H. Prec. (US survey foot)	V. Prec. (US survey foot)	Geodetic Az.	Ellipsoid Dist. (US survey foot)	ΔHeight (US survey foot)
HOUM --- TE14-SM-01 (B17)	HOUM	TE14-SM-01	Fixed	0.018	0.045	190°35'28"	201647.509	-40.540
HOUM --- TE14-SM-01 (B18)	HOUM	TE14-SM-01	Fixed	0.018	0.042	190°35'28"	201647.501	-40.543
HOUM --- GRIS (B21)	HOUM	GRIS	Fixed	0.013	0.028	115°46'46"	271352.696	-14.163
GRIS --- TE14-SM-01 (B22)	GRIS	TE14-SM-01	Fixed	0.028	0.058	254°28'05"	292610.504	-26.369
GRIS --- TE14-SM-01 (B23)	GRIS	TE14-SM-01	Fixed	0.028	0.056	254°28'05"	292610.510	-26.393
GRIS --- LMCN (B27)	GRIS	LMCN	Fixed	0.011	0.023	269°11'35"	224520.762	2.851
HOUM --- LMCN (B28)	HOUM	LMCN	Fixed	0.005	0.015	170°47'48"	124248.011	-11.294
LMCN --- TE14-SM-01 (B29)	LMCN	TE14-SM-01	Fixed	0.010	0.035	217°01'37"	94611.855	-29.249



LMCN --- TE14-SM-01 (B30)	LMCN	TE14-SM-01	Fixed	0.013	0.031	217°01'38"	94611.840	-29.234
LMCN --- 290307 (B35)	LMCN	290307	Fixed	0.018	0.103	213°09'39"	86506.639	-22.720
GRIS --- 290307 (B36)	GRIS	290307	Fixed	0.042	0.153	254°32'24"	282470.519	-19.856
HOUM --- 290307 (B37)	HOUM	290307	Fixed	0.034	0.116	187°59'49"	197007.615	-34.060
TE14-SM-01 --- 290307 (B38)	TE14-SM-01	290307	Fixed	0.013	0.076	72°01'56"	10146.426	6.447
GRIS --- FWTR (B44)	GRIS	FWTR	Fixed	0.078	0.104	278°31'31"	754687.996	-5.065
HOUM --- FWTR (B45)	HOUM	FWTR	Fixed	0.031	0.086	268°44'43"	502840.015	-19.170
FWTR --- TE14-SM-01 (B46)	FWTR	TE14-SM-01	Fixed	0.061	0.164	111°07'22"	501869.244	-21.384
GRIS --- FWTR (B48)	GRIS	FWTR	Fixed	0.061	0.088	278°31'31"	754687.933	-5.031
HOUM --- FWTR (B49)	HOUM	FWTR	Fixed	0.038	0.057	268°44'43"	502839.994	-19.173
FWTR --- TE14-SM-01 (B50)	FWTR	TE14-SM-01	Fixed	0.052	0.119	111°07'22"	501869.244	-21.379

Acceptance Summary

Processed	Passed	Flag	Fail
19	19	0	0



HOUM - TE14-SM-01 (8:19:09 AM-2:24:14 PM) (S11)

Baseline observation: HOUM ---
TE14-SM-
01 (B17)

Processed: 4/2/2014
10:00:14
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.018 ft

Vertical precision: 0.045 ft

RMS: 0.017 ft

Maximum PDOP: 3.197

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
8:21:29
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
2:24:14
PM
(Local:
UTC-6hr)

Processing duration: 06:02:45

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	HOUM
-------	------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.175 ft	Latitude	N29°02'49.70618"	Latitude	N29°02'49.70617"
Easting	3438609.471 ft	Longitude	W90°50'22.54584"	Longitude	W90°50'22.54584"
Elevation	1.037 ft	Height	-77.721 ft	Height	-77.722 ft

Vector					
ΔNorthing	-198406.158 ft	NS Fwd Azimuth	190°35'28"	ΔX	-38284.204 ft
ΔEasting	-36009.484 ft	Ellipsoid Dist.	201647.509 ft	ΔY	-96520.712 ft
ΔElevation	-44.314 ft	ΔHeight	-40.540 ft	ΔZ	-172856.154 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.007 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.006 ft
σ ΔEasting	0.006 ft	σ Ellipsoid Dist.	0.007 ft	σ ΔY	0.021 ft
σ ΔElevation	0.023 ft	σ ΔHeight	0.023 ft	σ ΔZ	0.012 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000030282		
Y	-0.0000009141	0.0000405096	
Z	0.0000009135	-0.0000170588	0.0000128842

Occupations

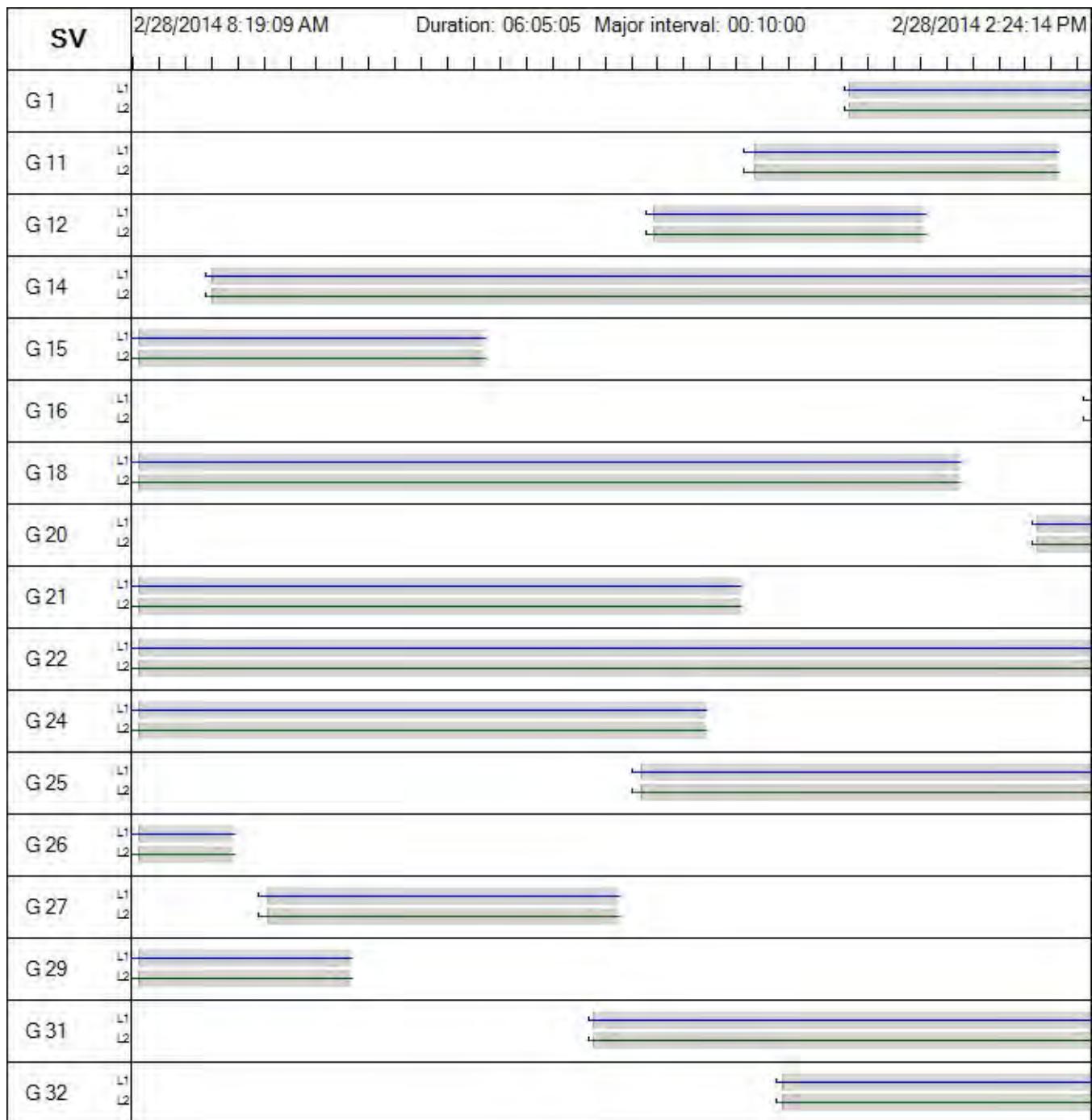
	From	To
Point ID:	HOUM	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920590.T02
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	4646125537	5040K18292
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2
Antenna serial number:	-----	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Antenna Phase Center	Bottom of antenna mount

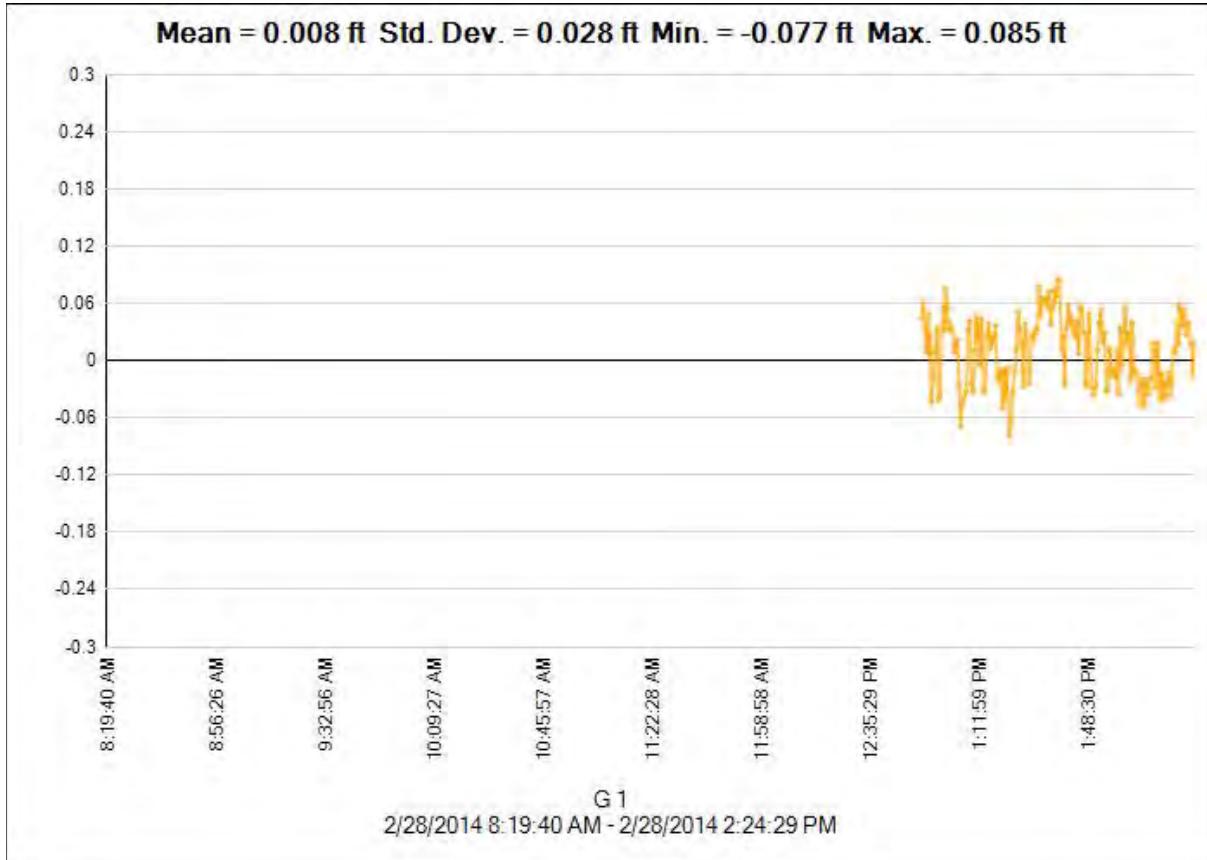


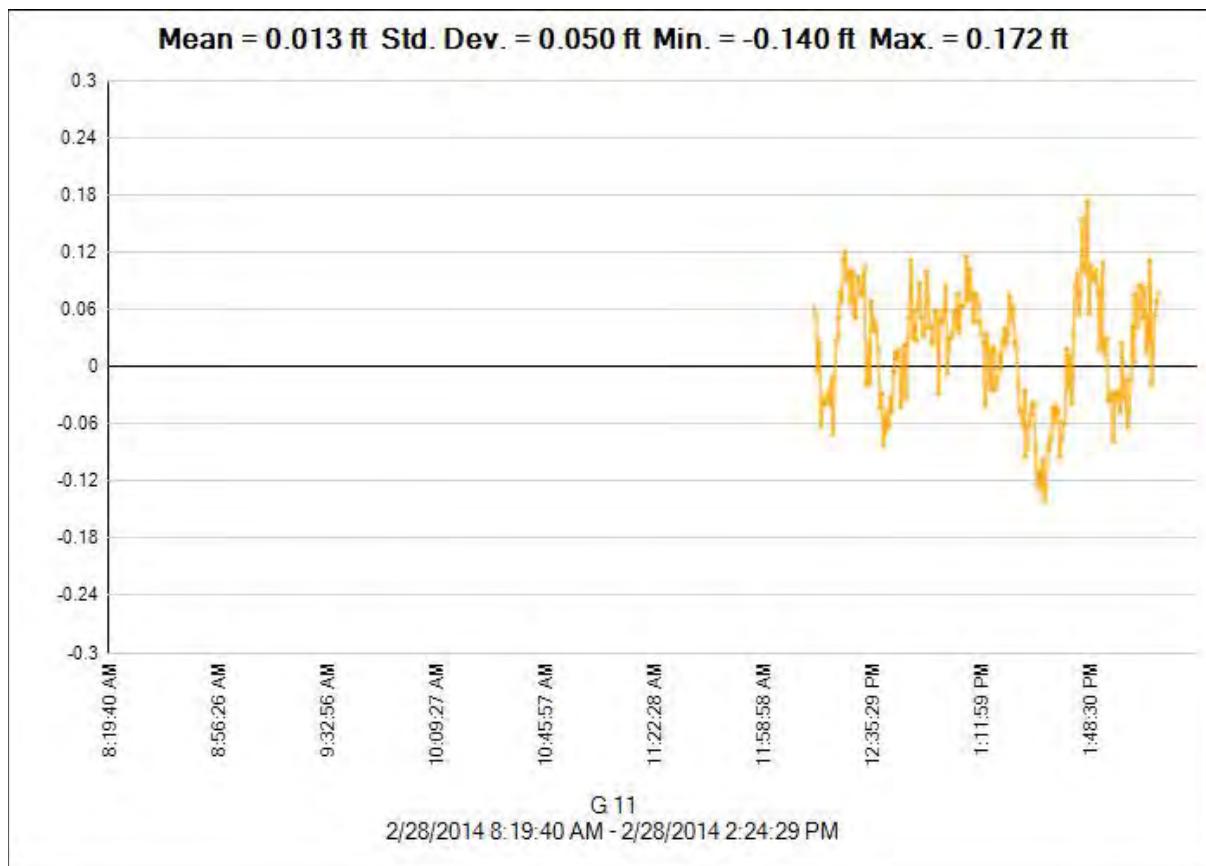
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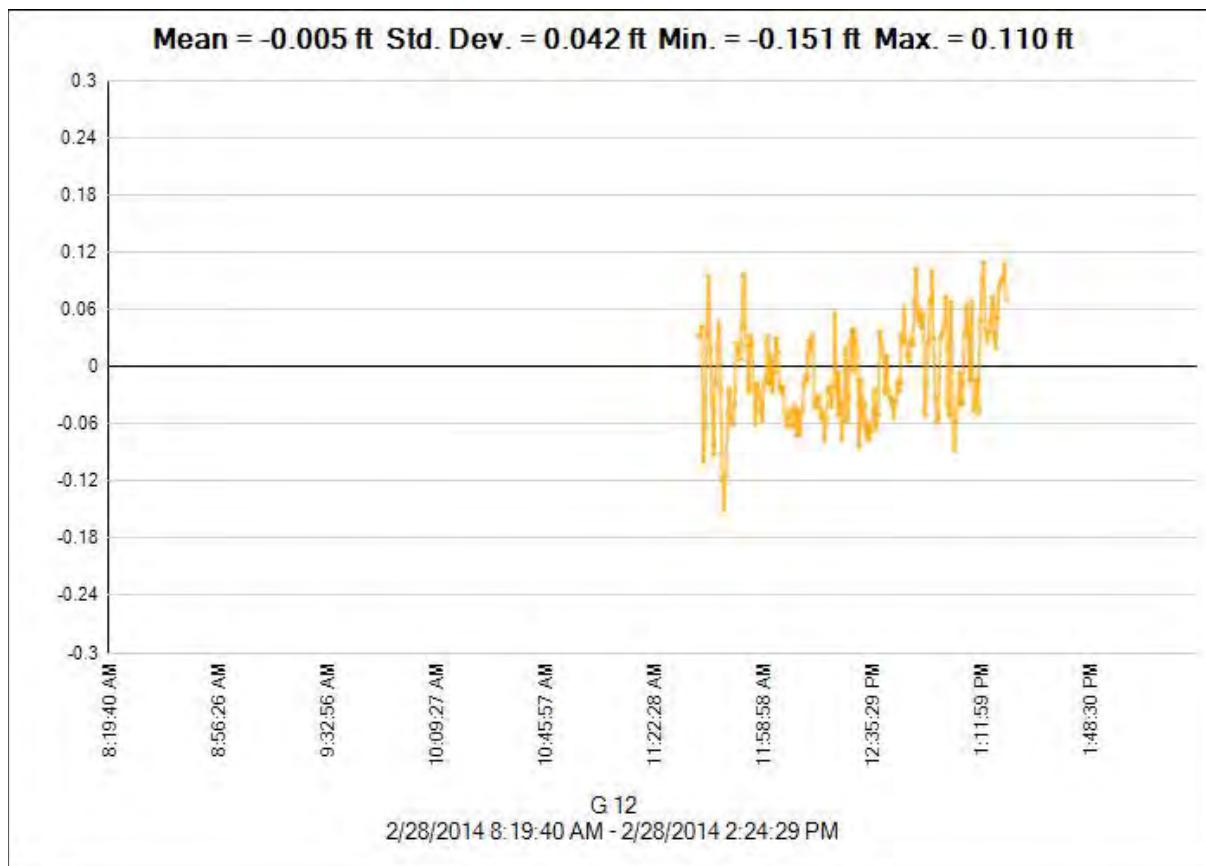


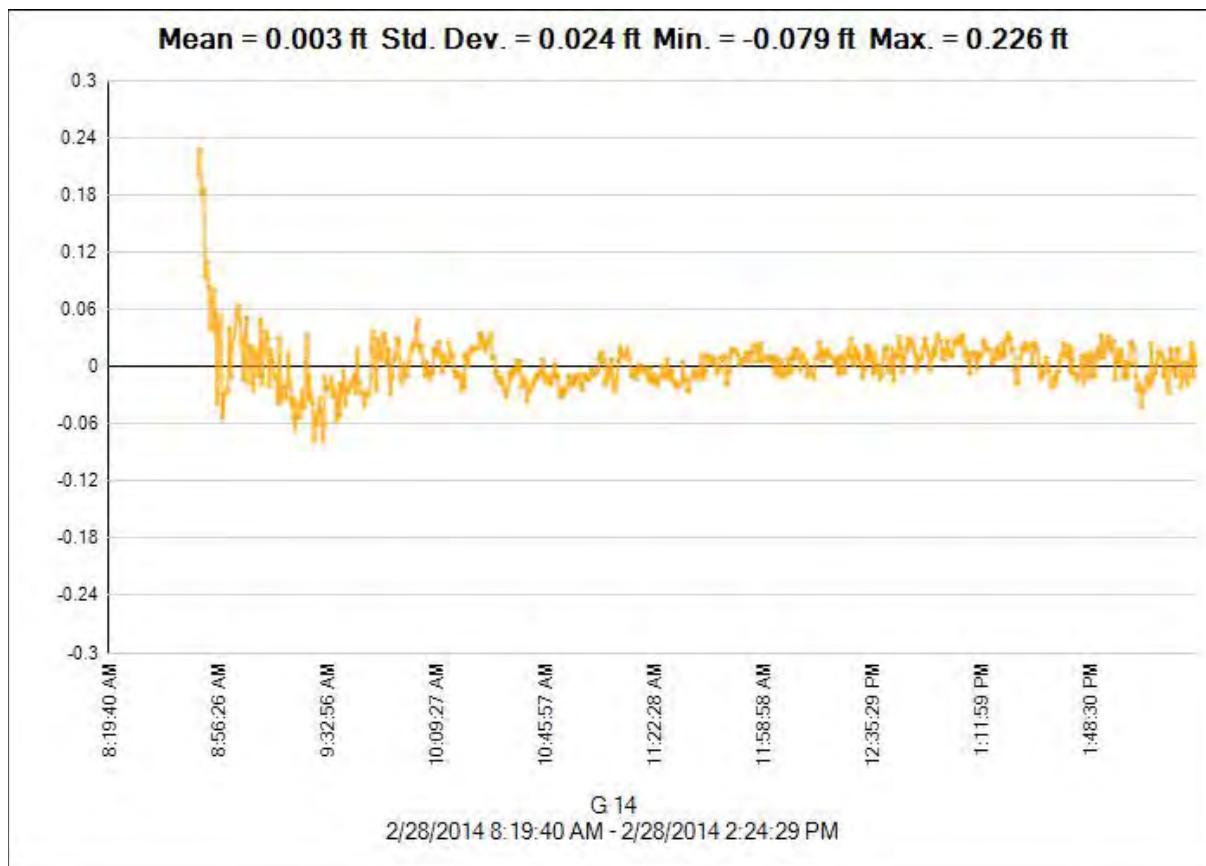


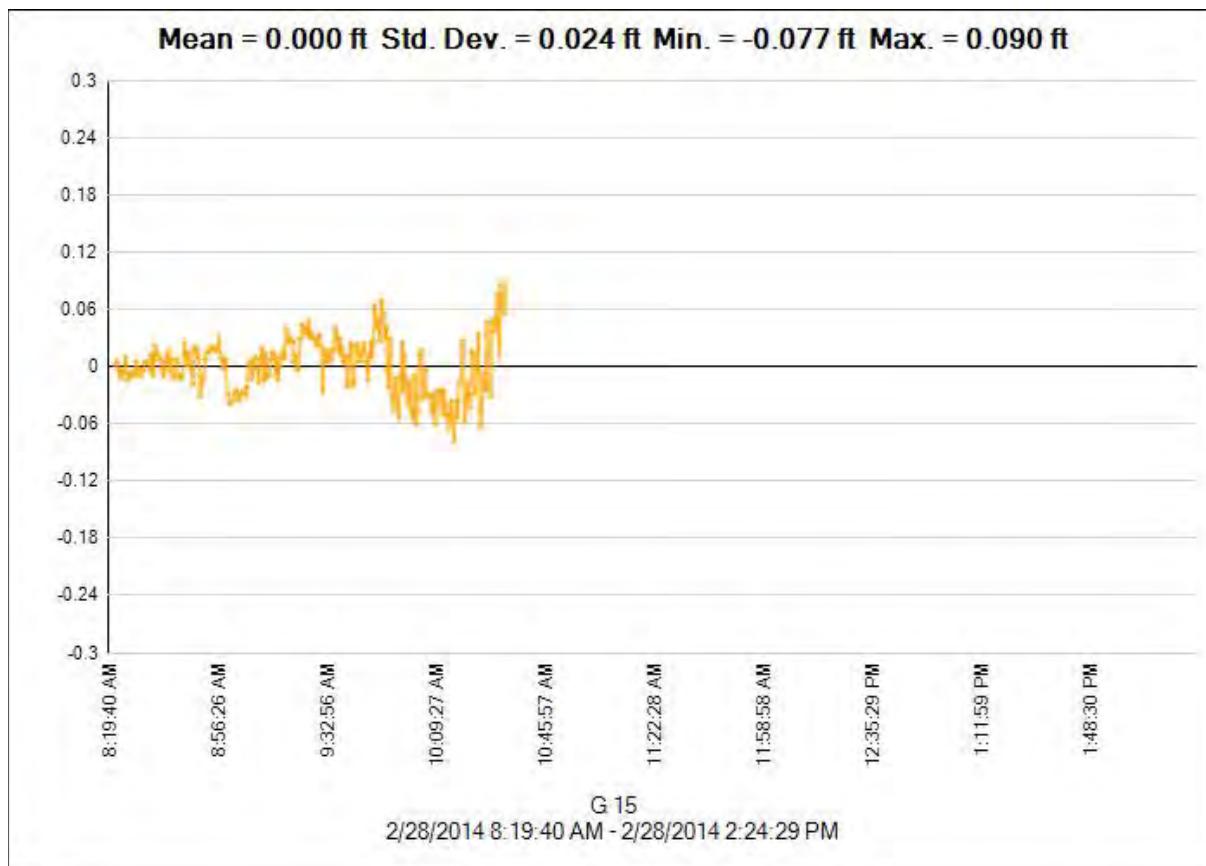
Residuals

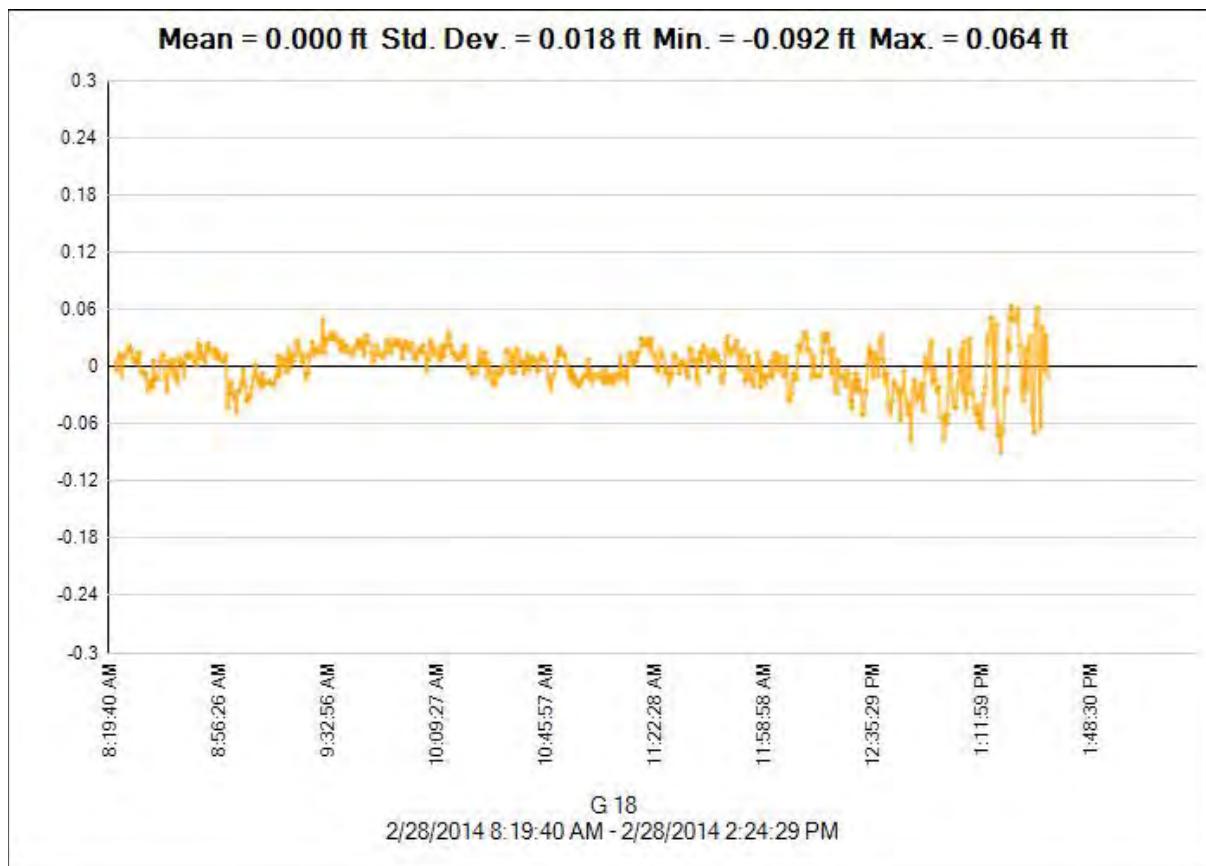


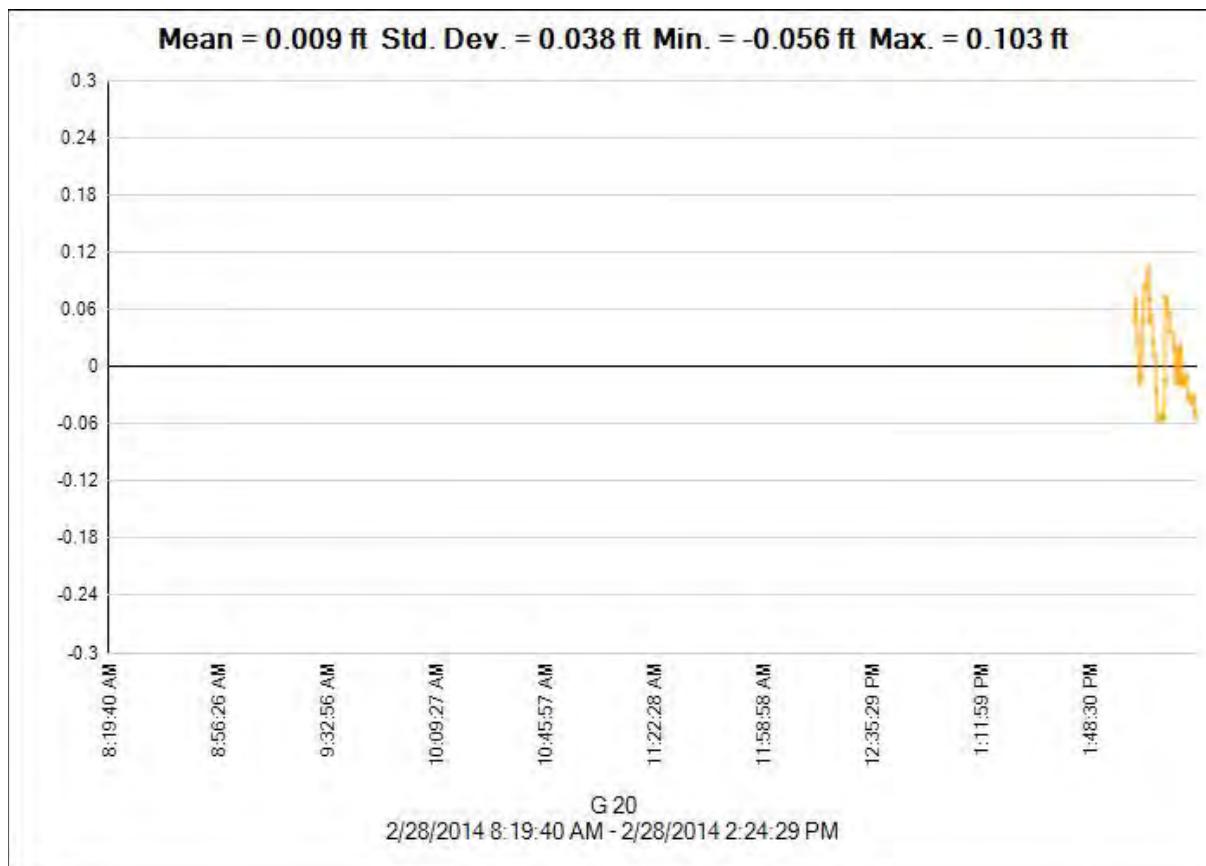


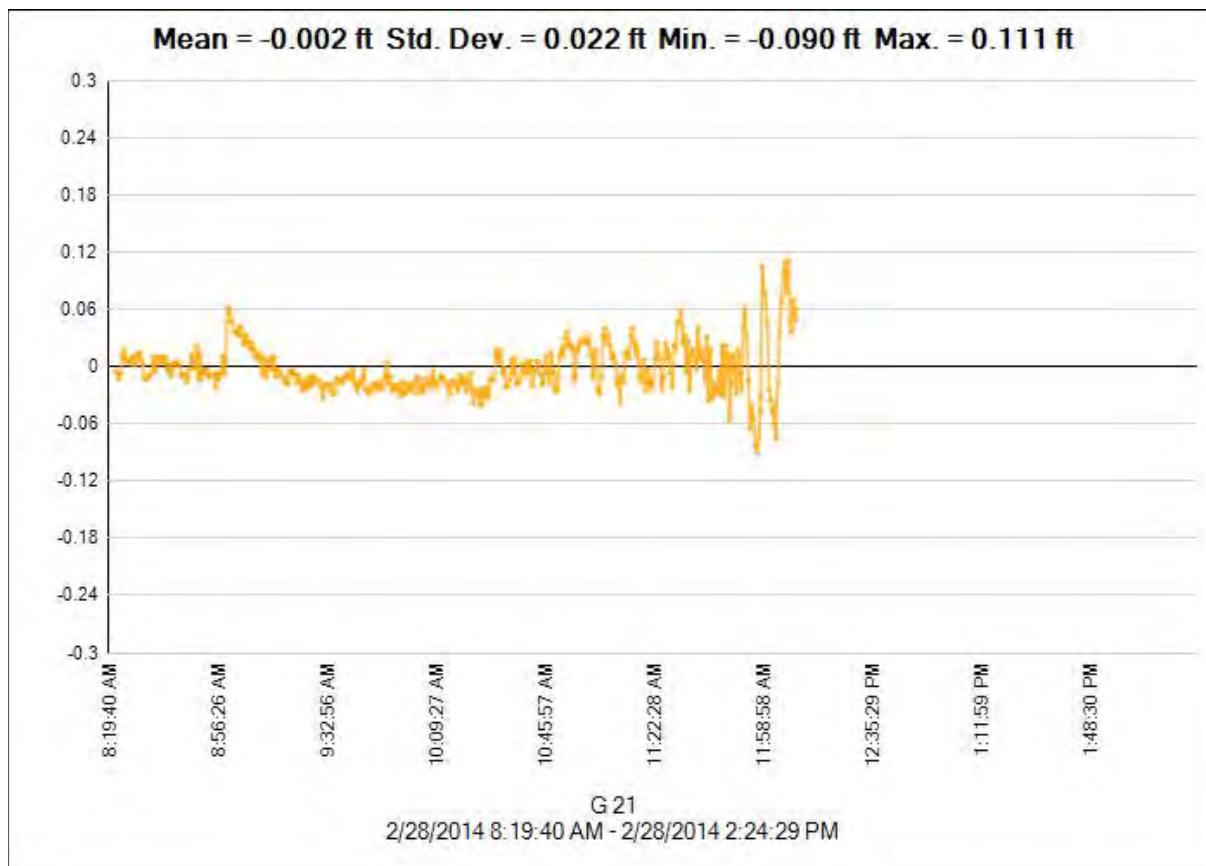


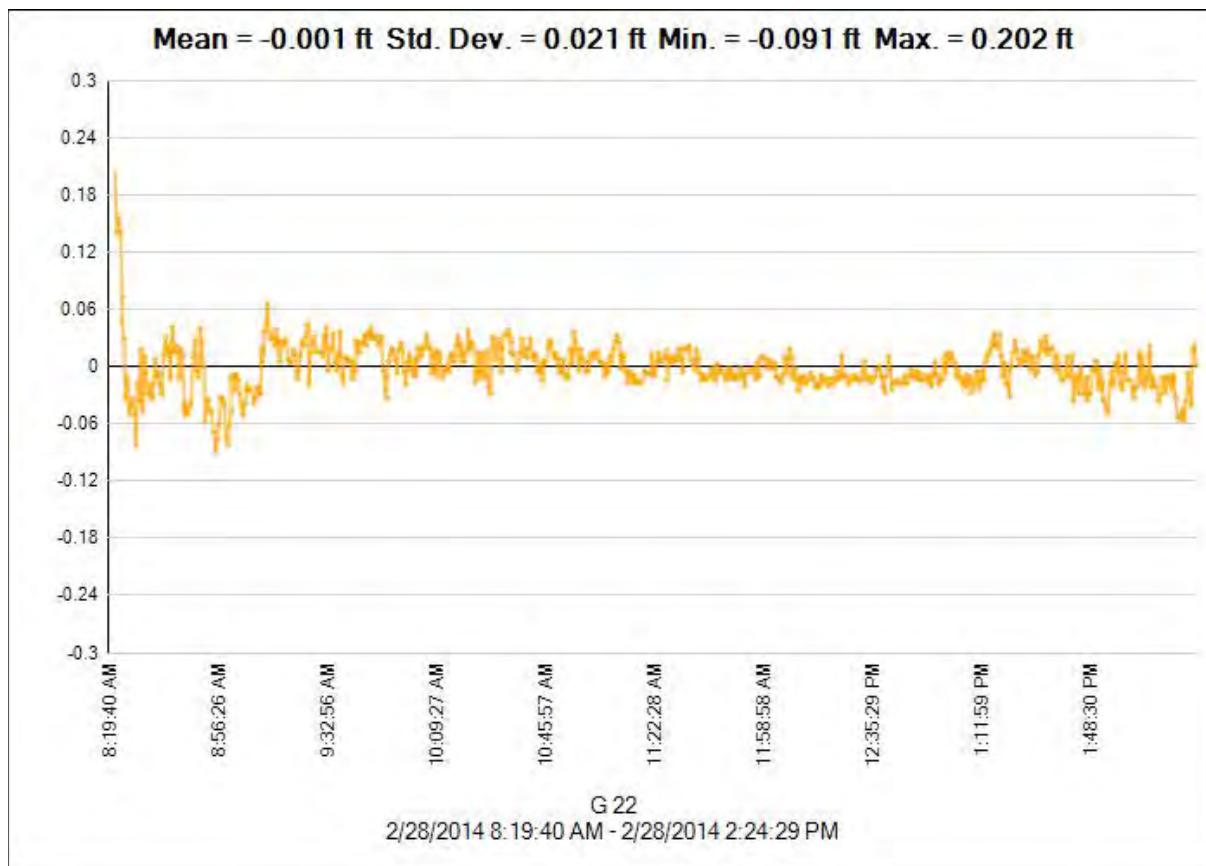


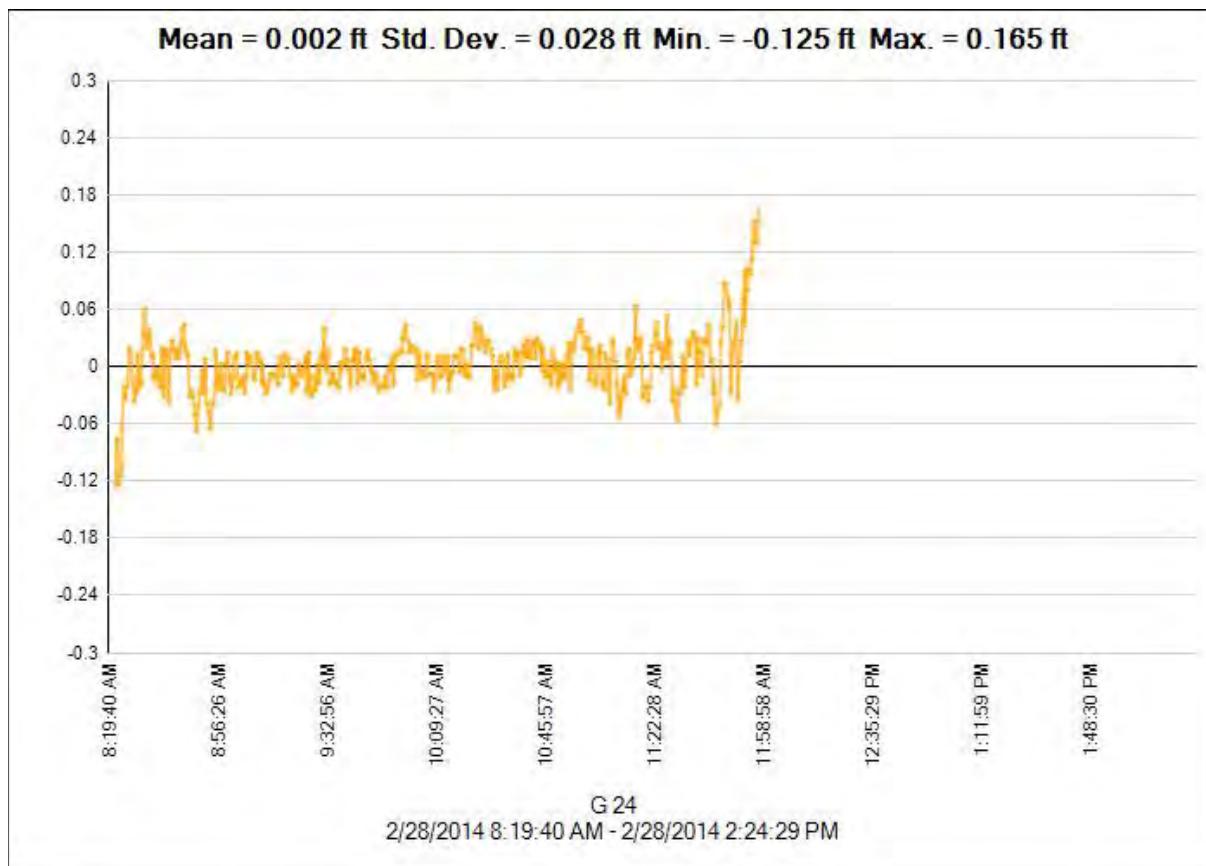


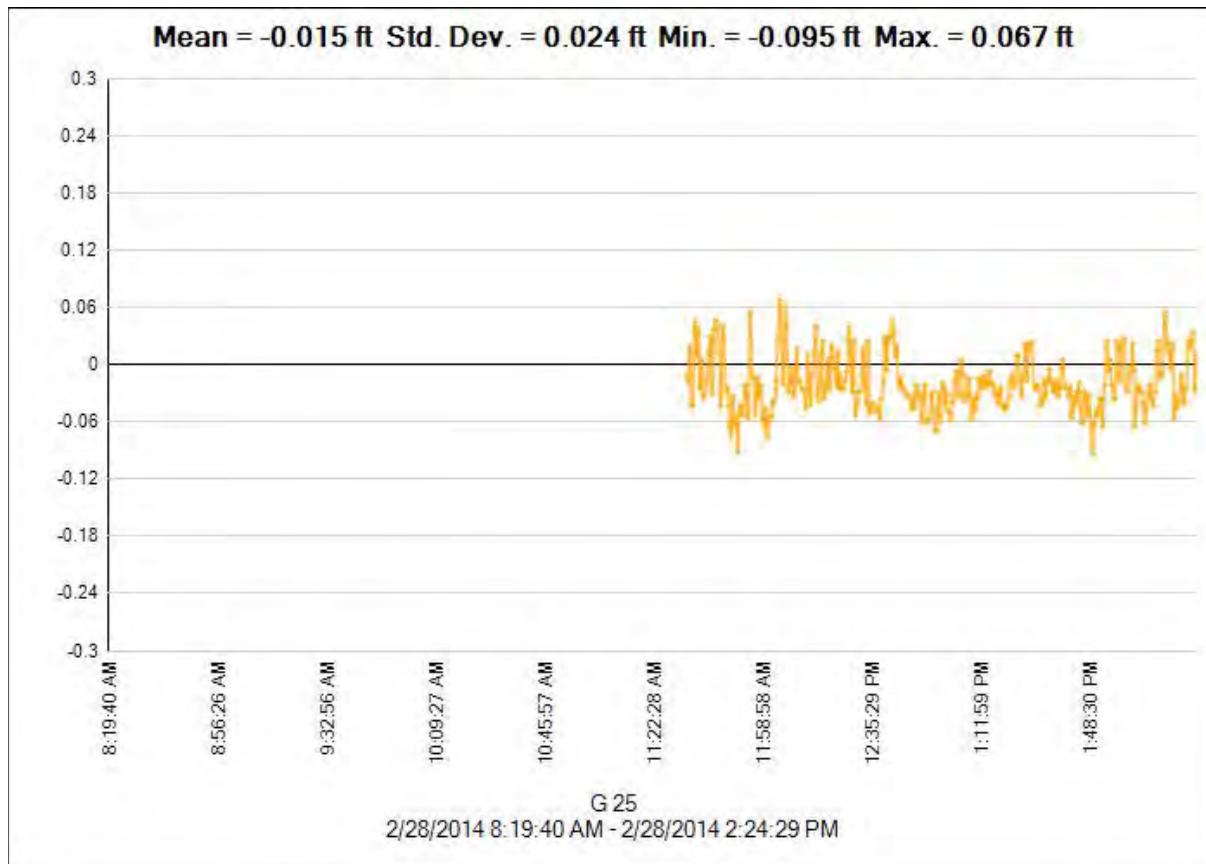


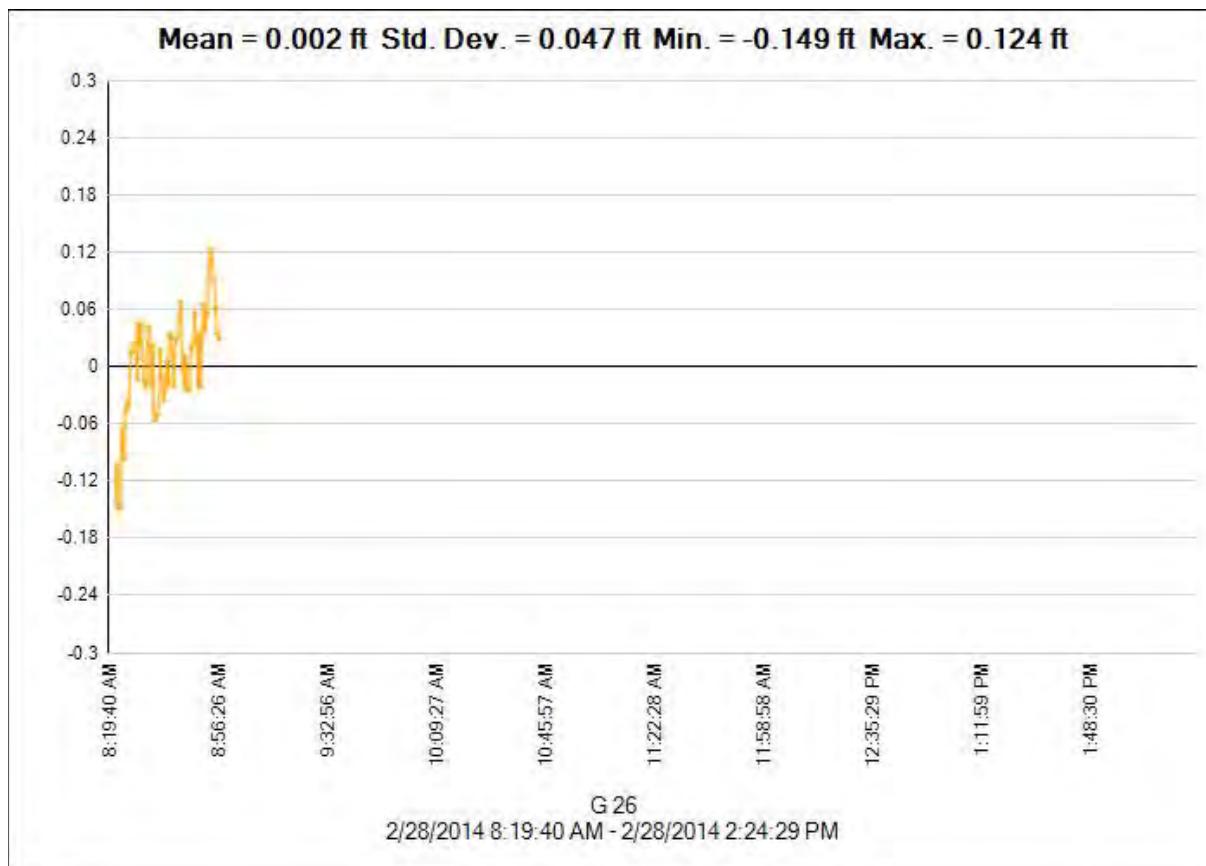


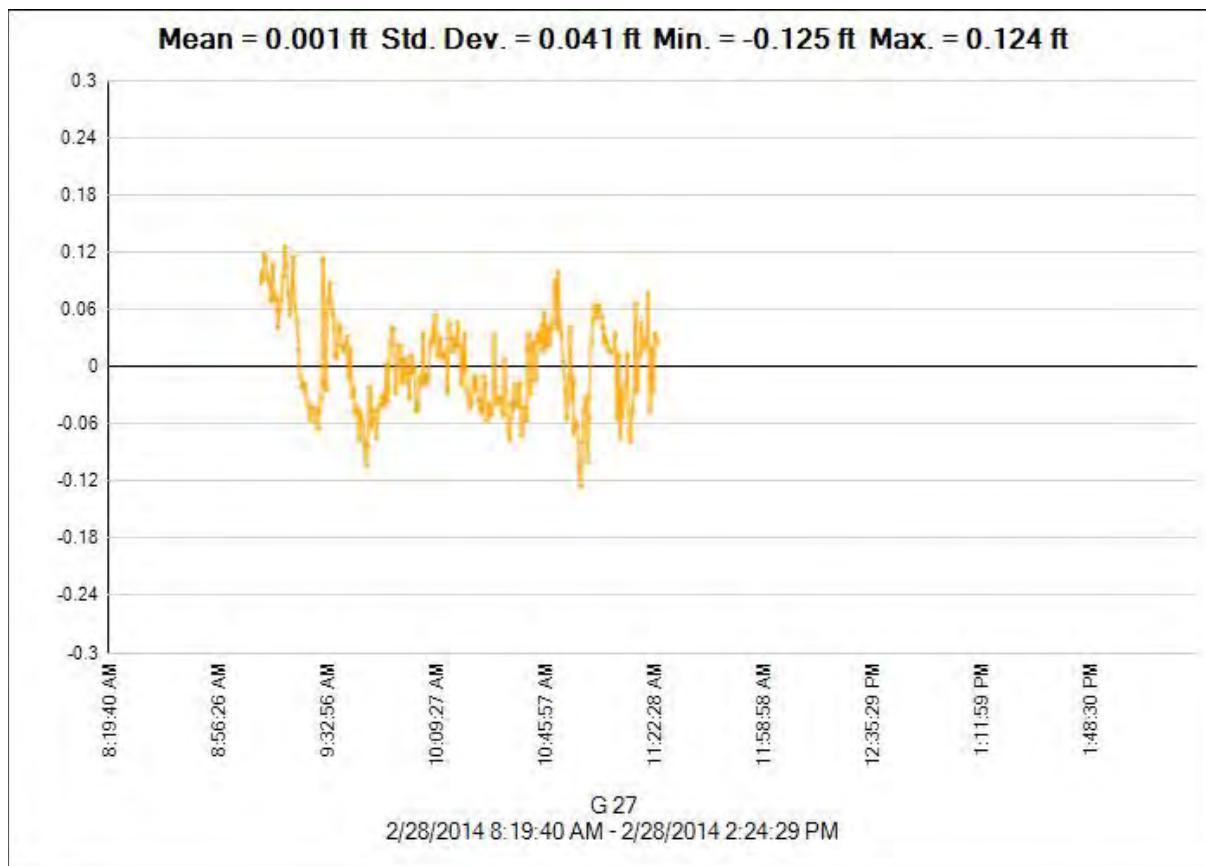


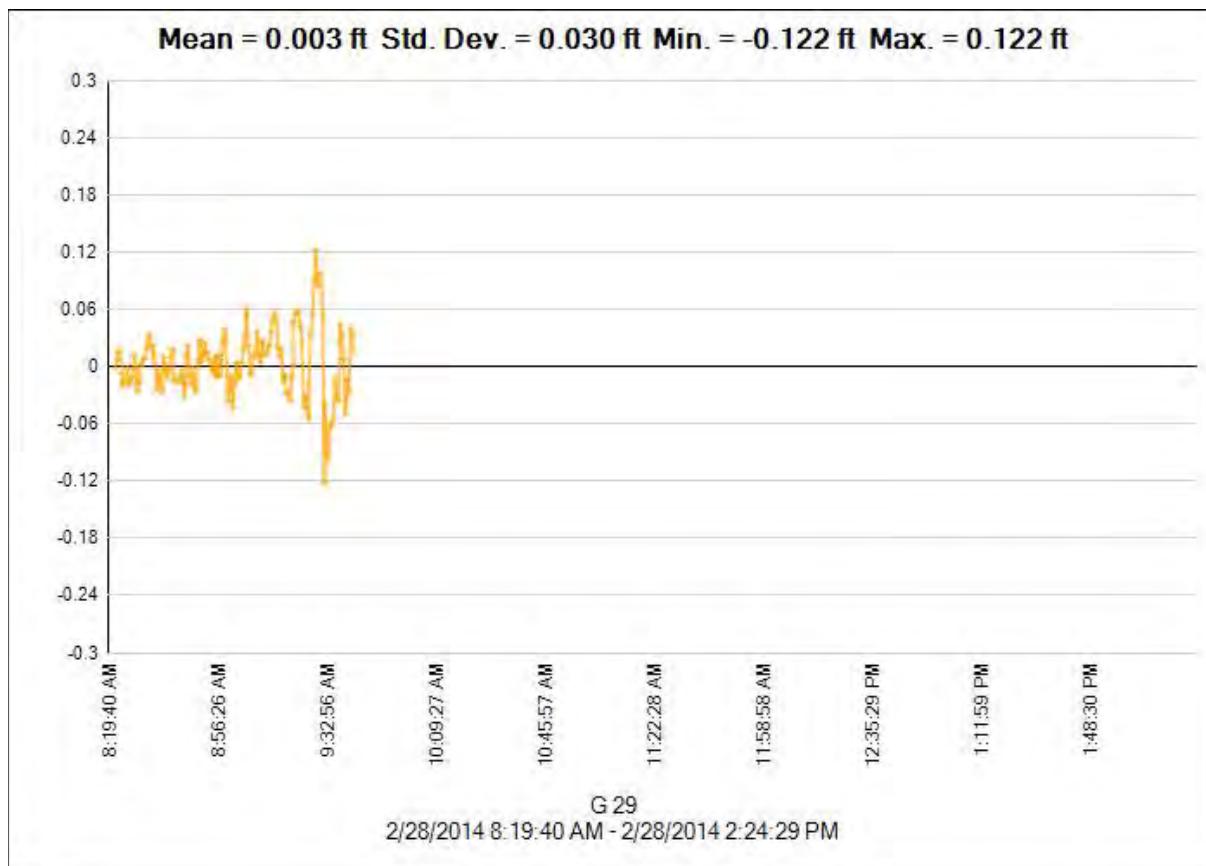


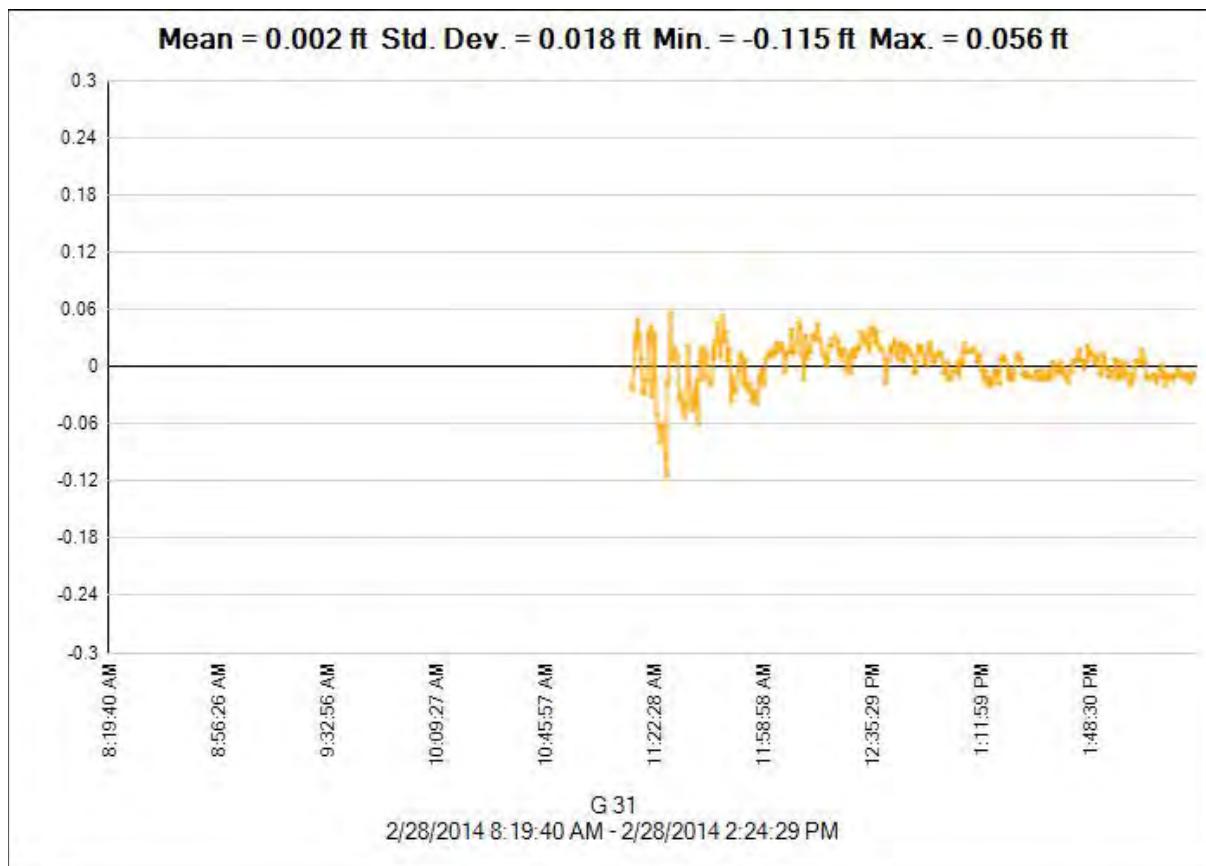


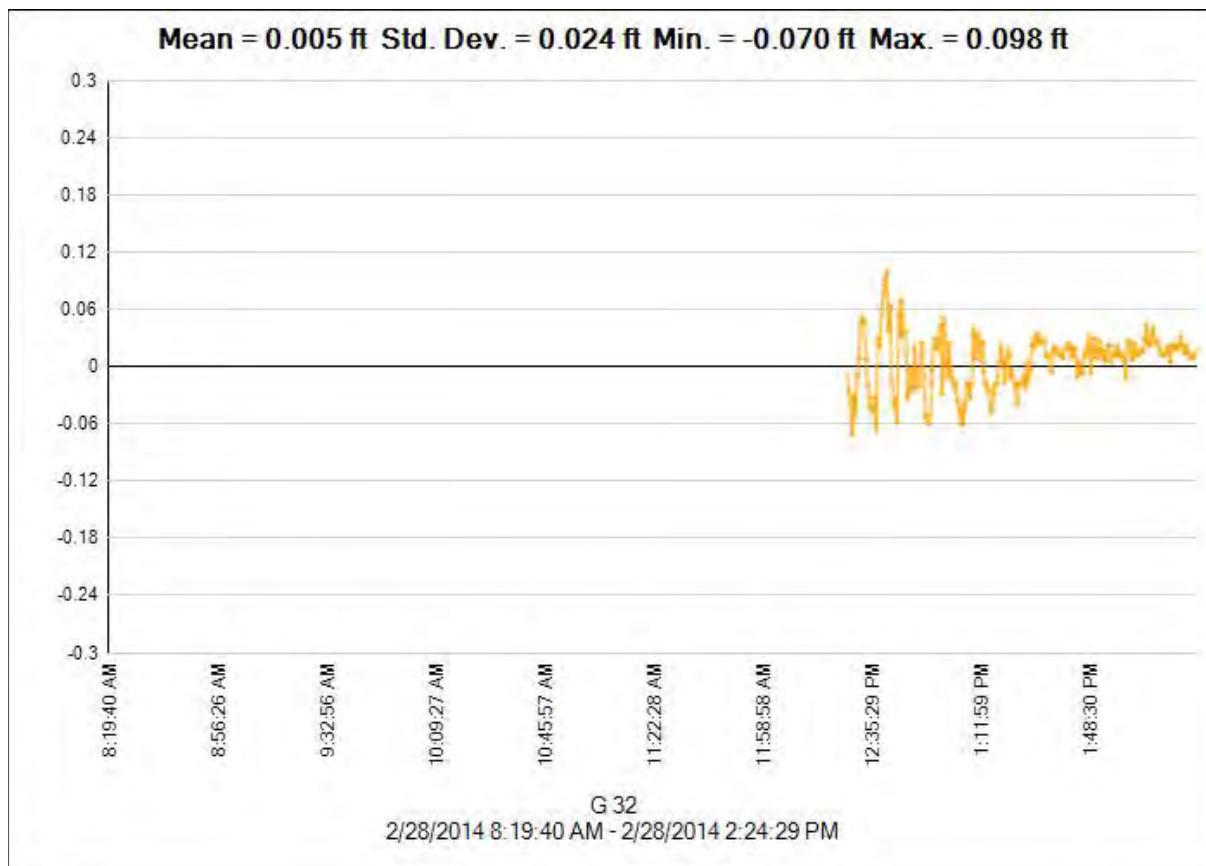














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





HOUM - TE14-SM-01 (8:44:37 AM-4:48:15 PM) (S10)

Baseline observation: HOUM ---
TE14-SM-
01 (B18)

Processed: 4/2/2014
10:00:06
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.018 ft

Vertical precision: 0.042 ft

RMS: 0.014 ft

Maximum PDOP: 2.981

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:46:59
AM
(Local:
UTC-6hr)

Processing stop time: 2/27/2014
4:48:14
PM
(Local:
UTC-6hr)

Processing duration: 08:01:15

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	HOUM
-------	------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.183 ft	Latitude	N29°02'49.70626"	Latitude	N29°02'49.70626"
Easting	3438609.465 ft	Longitude	W90°50'22.54591"	Longitude	W90°50'22.54591"
Elevation	1.034 ft	Height	-77.724 ft	Height	-77.724 ft

Vector					
ΔNorthing	-198406.149 ft	NS Fwd Azimuth	190°35'28"	ΔX	-38284.210 ft
ΔEasting	-36009.490 ft	Ellipsoid Dist.	201647.501 ft	ΔY	-96520.705 ft
ΔElevation	-44.317 ft	ΔHeight	-40.543 ft	ΔZ	-172856.147 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.006 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.007 ft
σ ΔEasting	0.007 ft	σ Ellipsoid Dist.	0.006 ft	σ ΔY	0.019 ft
σ ΔElevation	0.021 ft	σ ΔHeight	0.021 ft	σ ΔZ	0.011 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000049928		
Y	0.0000011854	0.0000341816	
Z	-0.0000000362	-0.0000163497	0.0000119742

Occupations

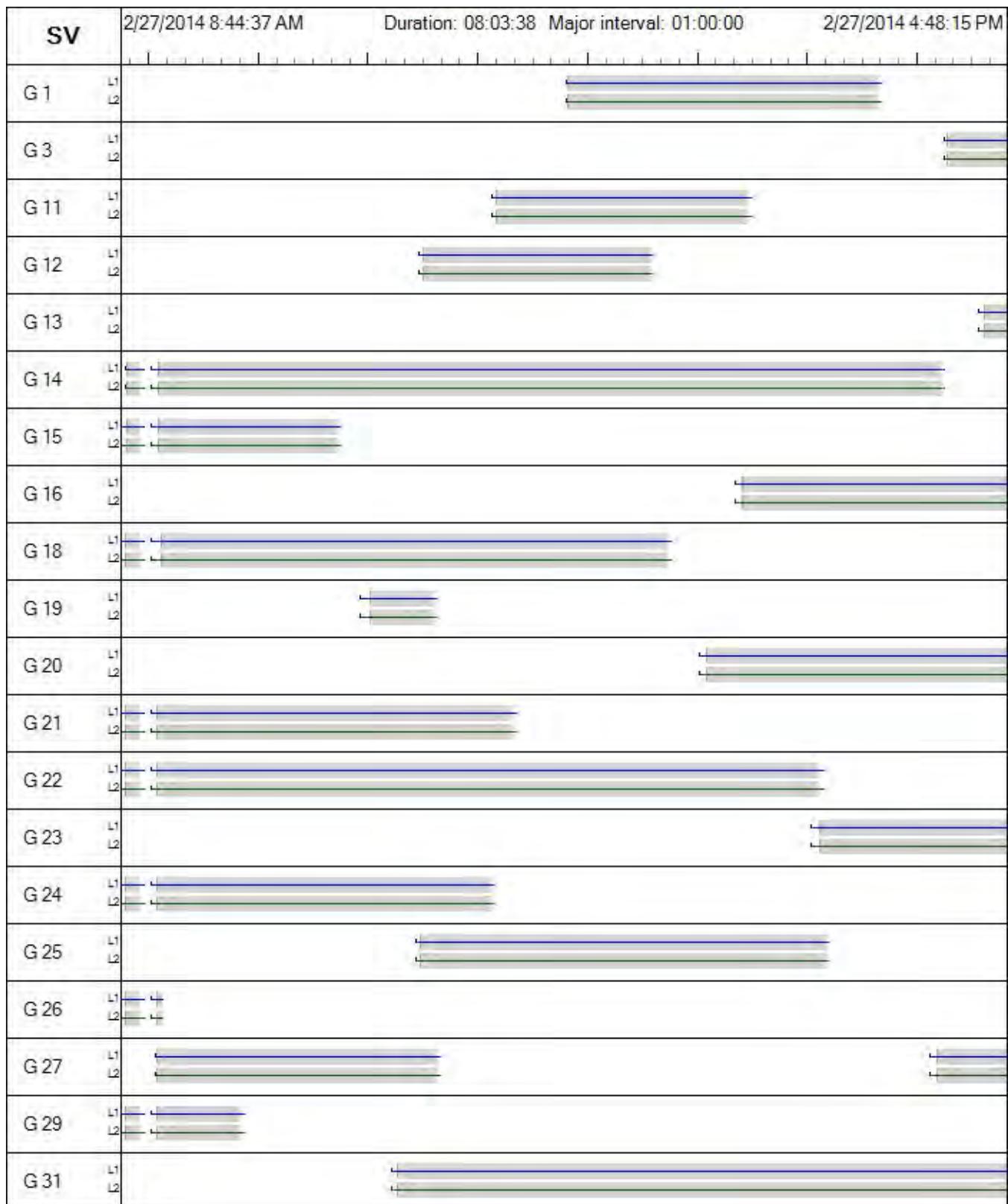
	From	To
Point ID:	HOUM	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920580.T02
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	4646125537	5040K18292
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2
Antenna serial number:	-----	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Antenna Phase Center	Bottom of antenna mount



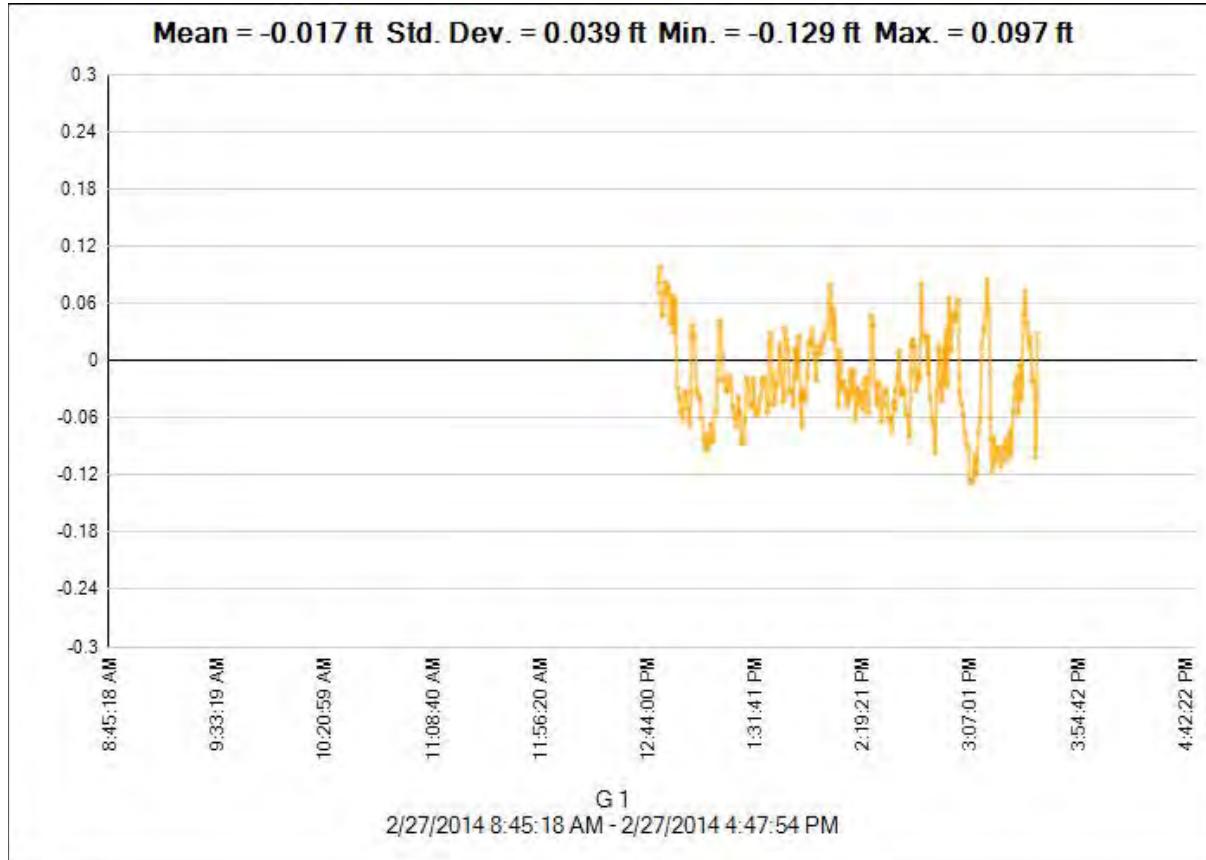
Tracking Summary

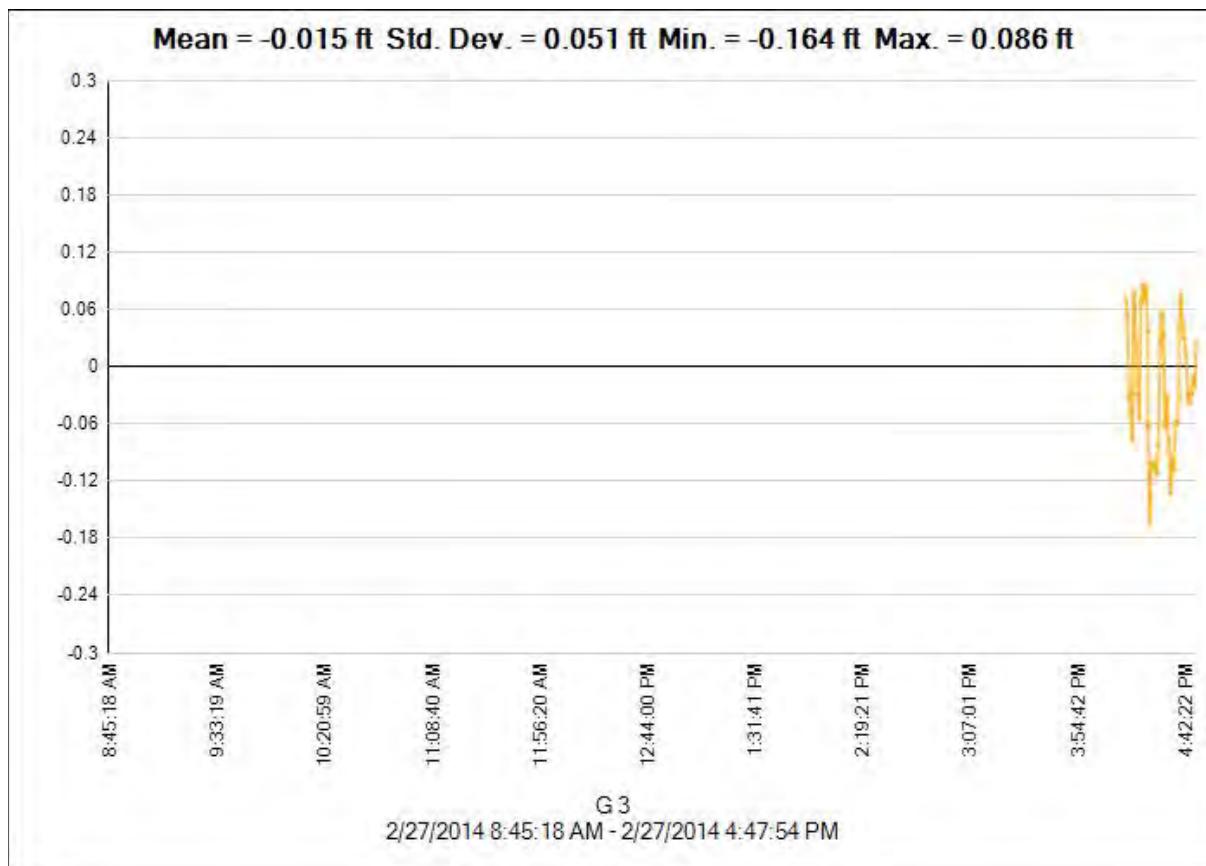


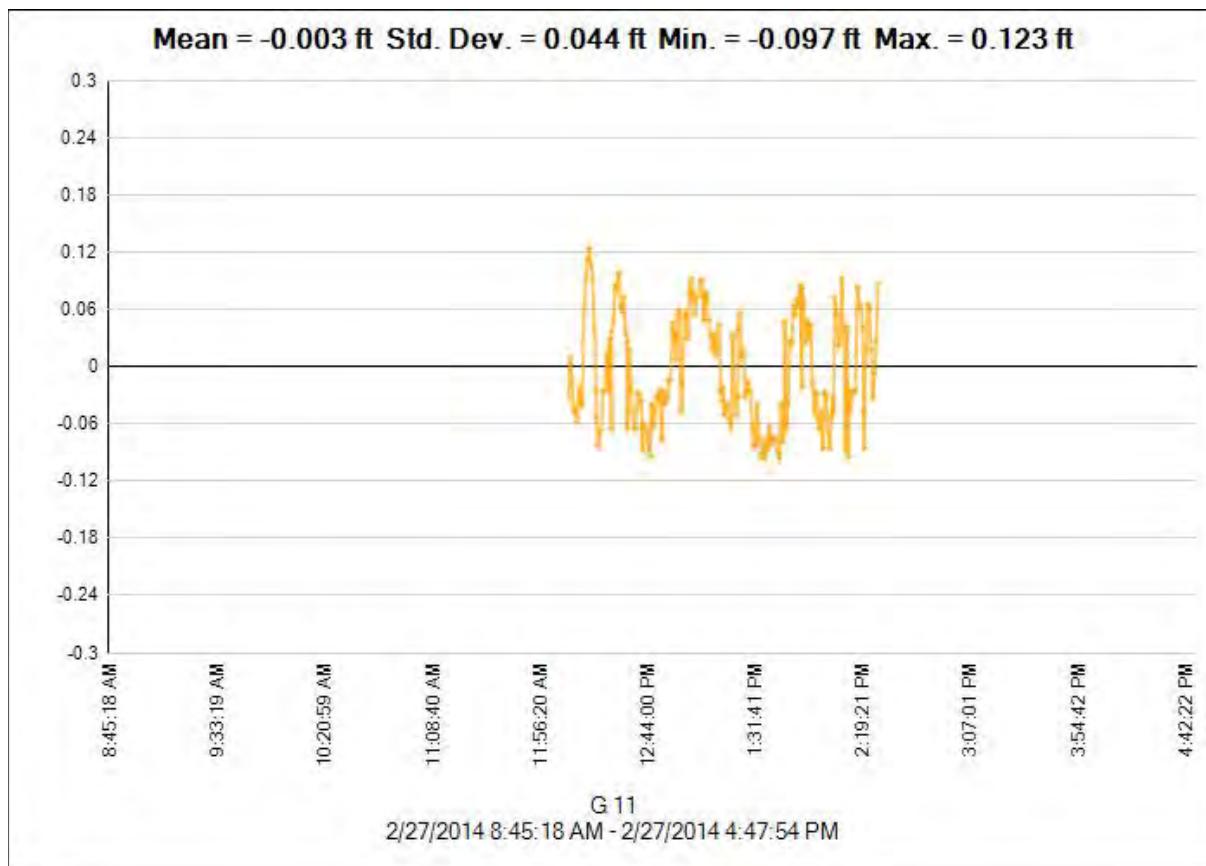


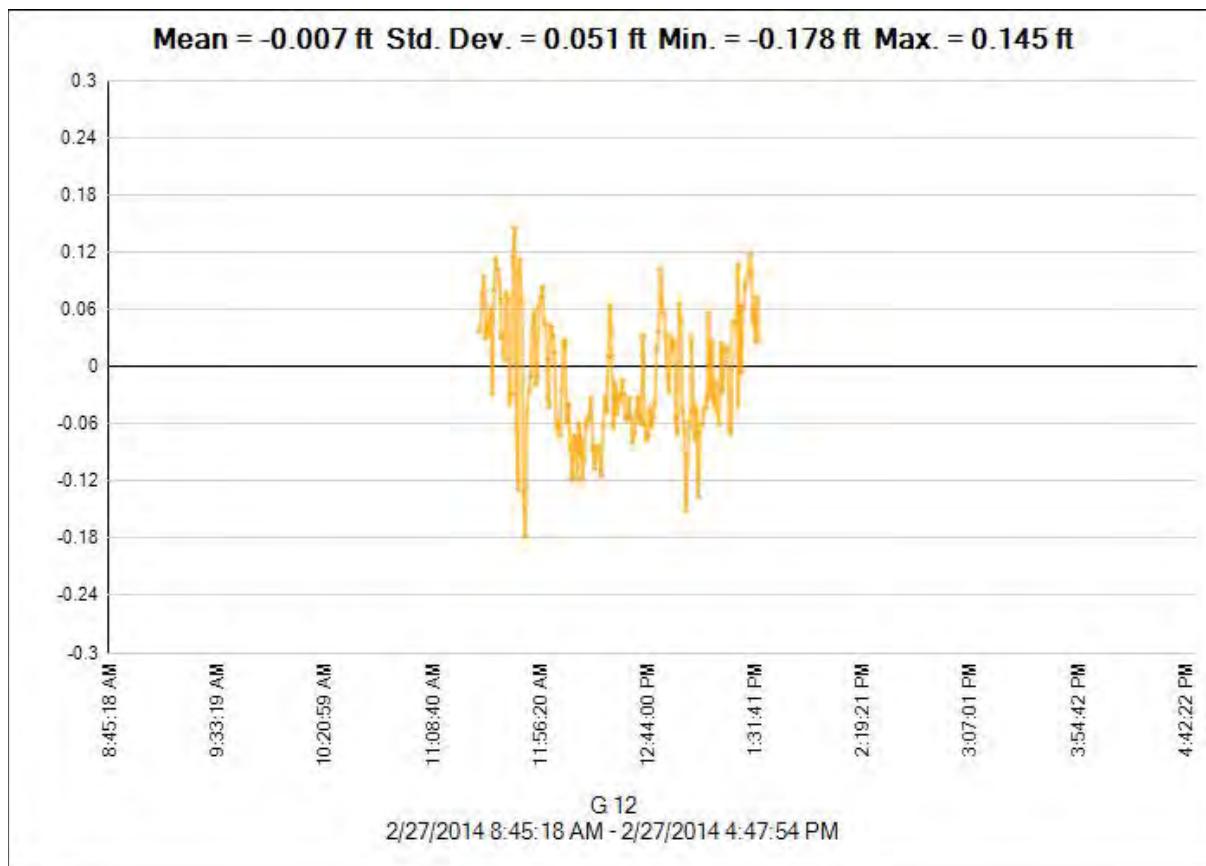


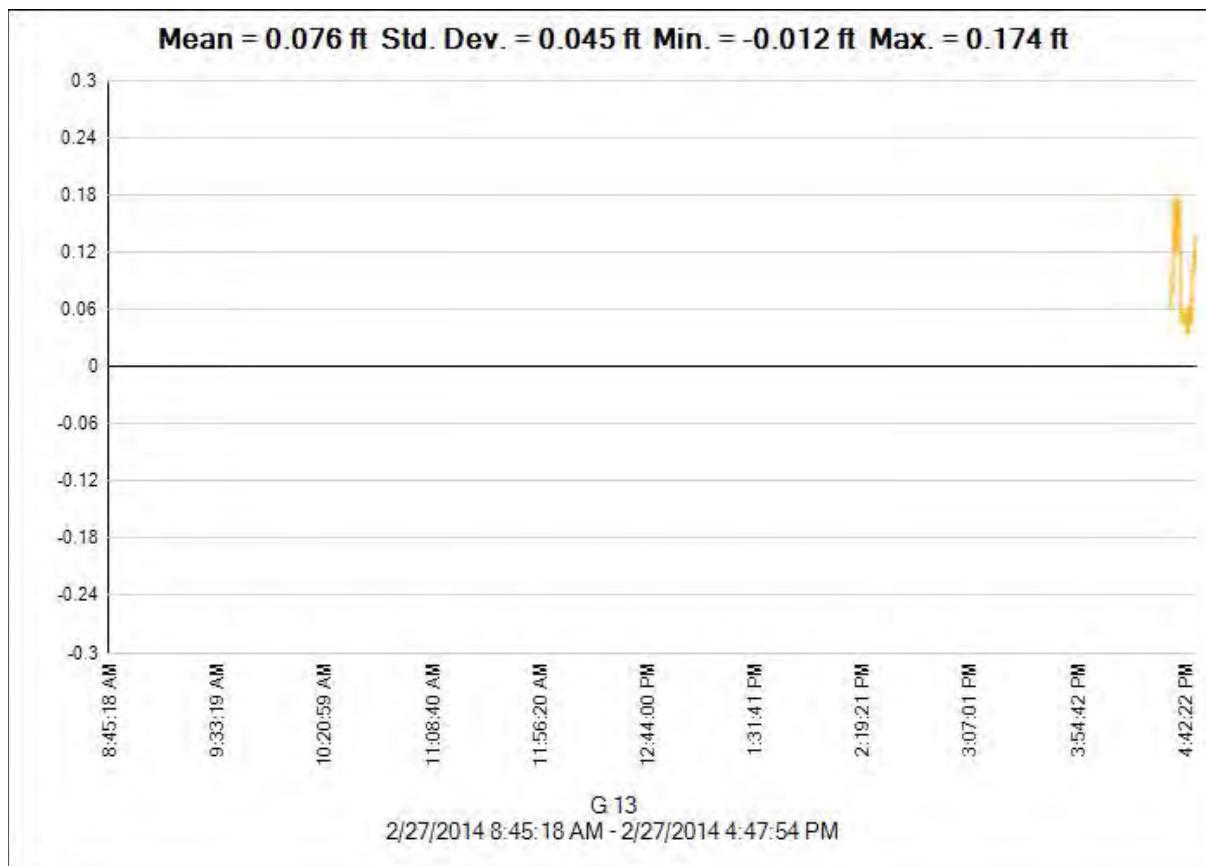
Residuals

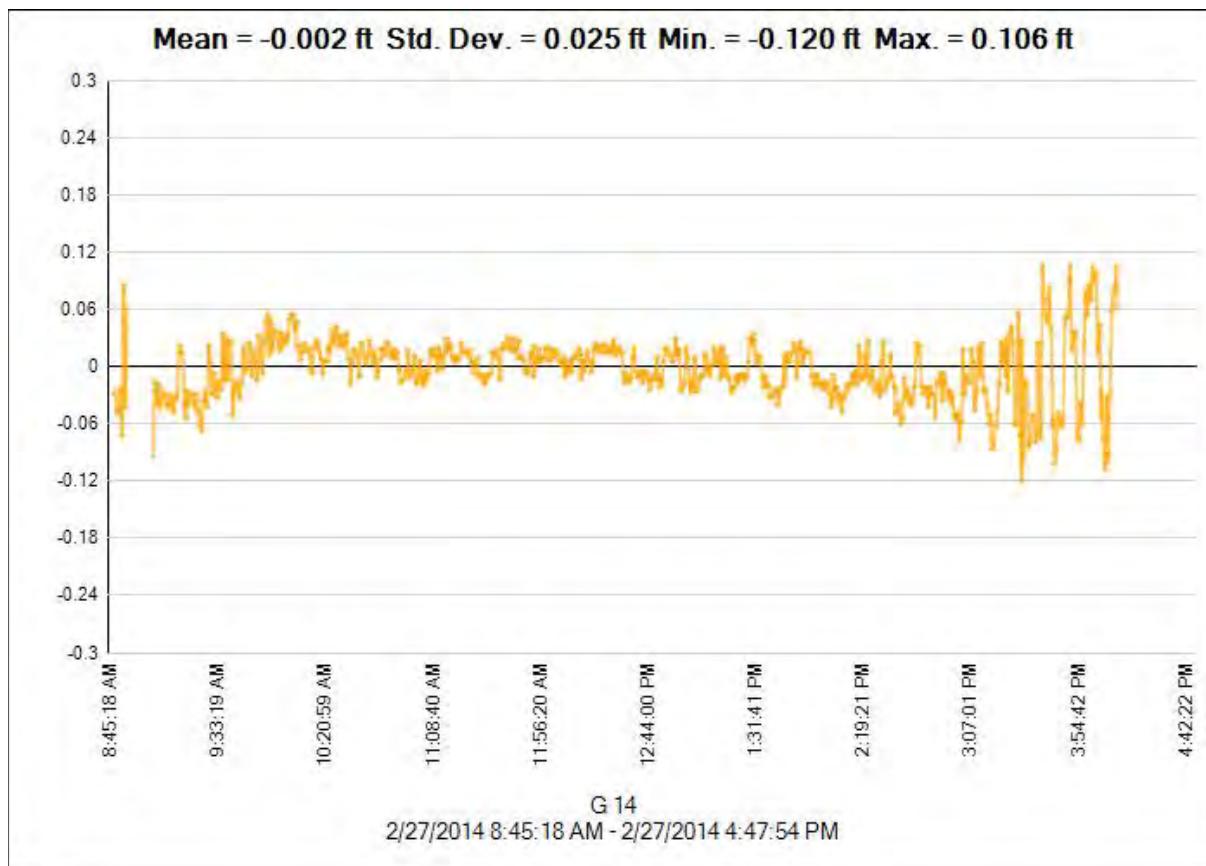


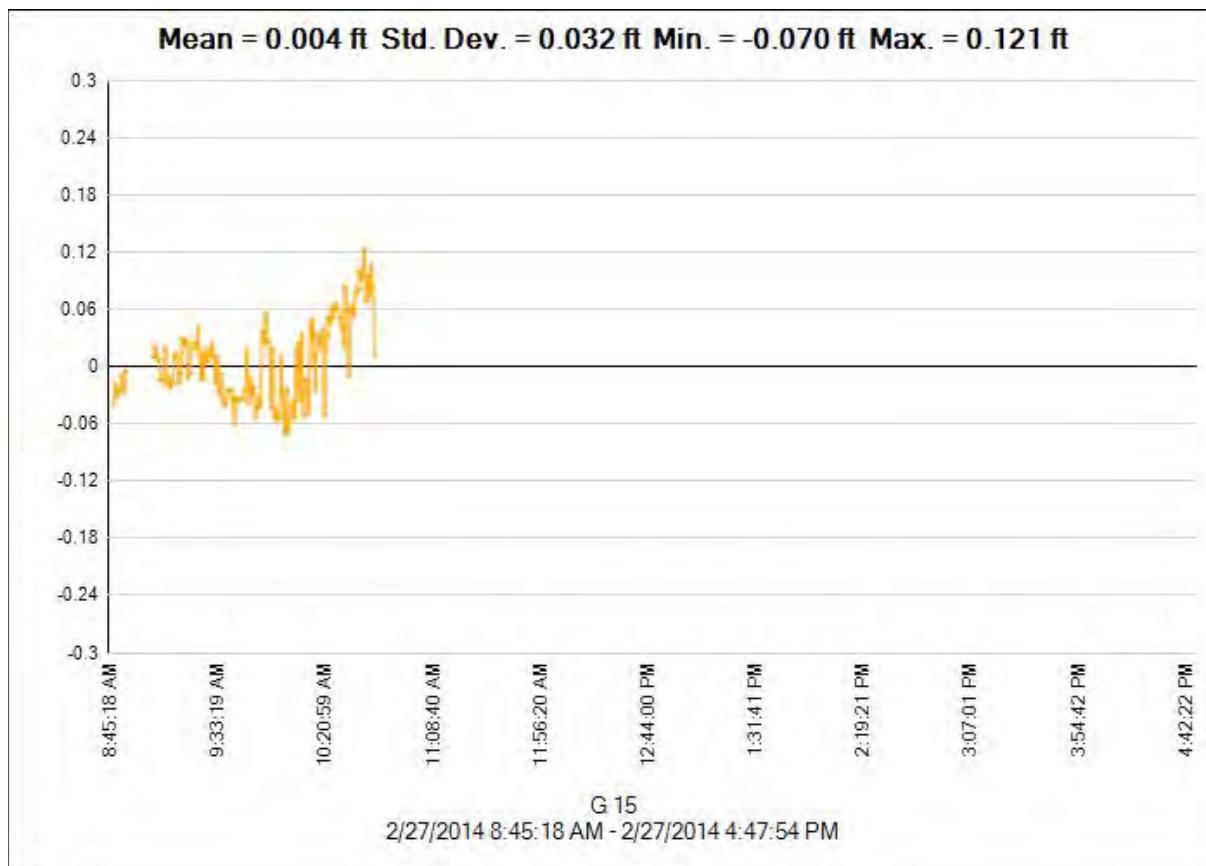


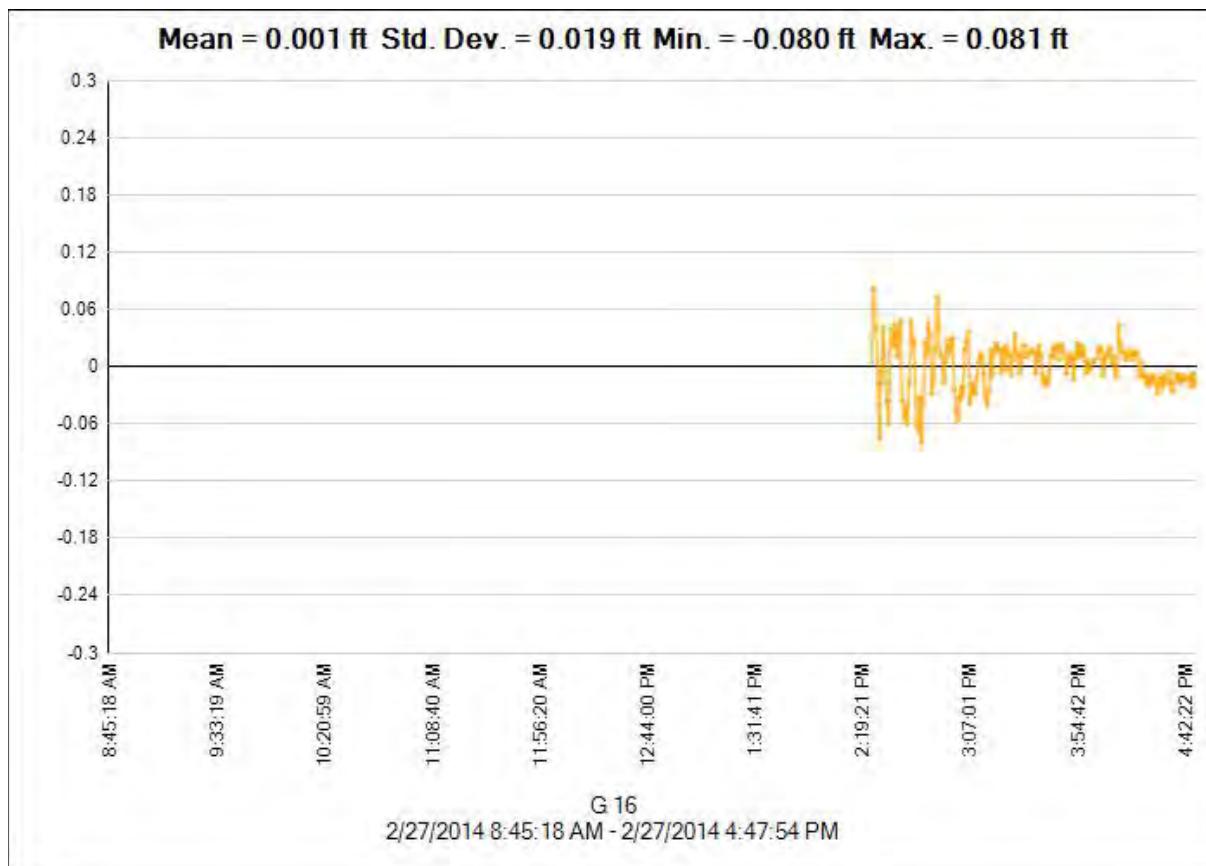


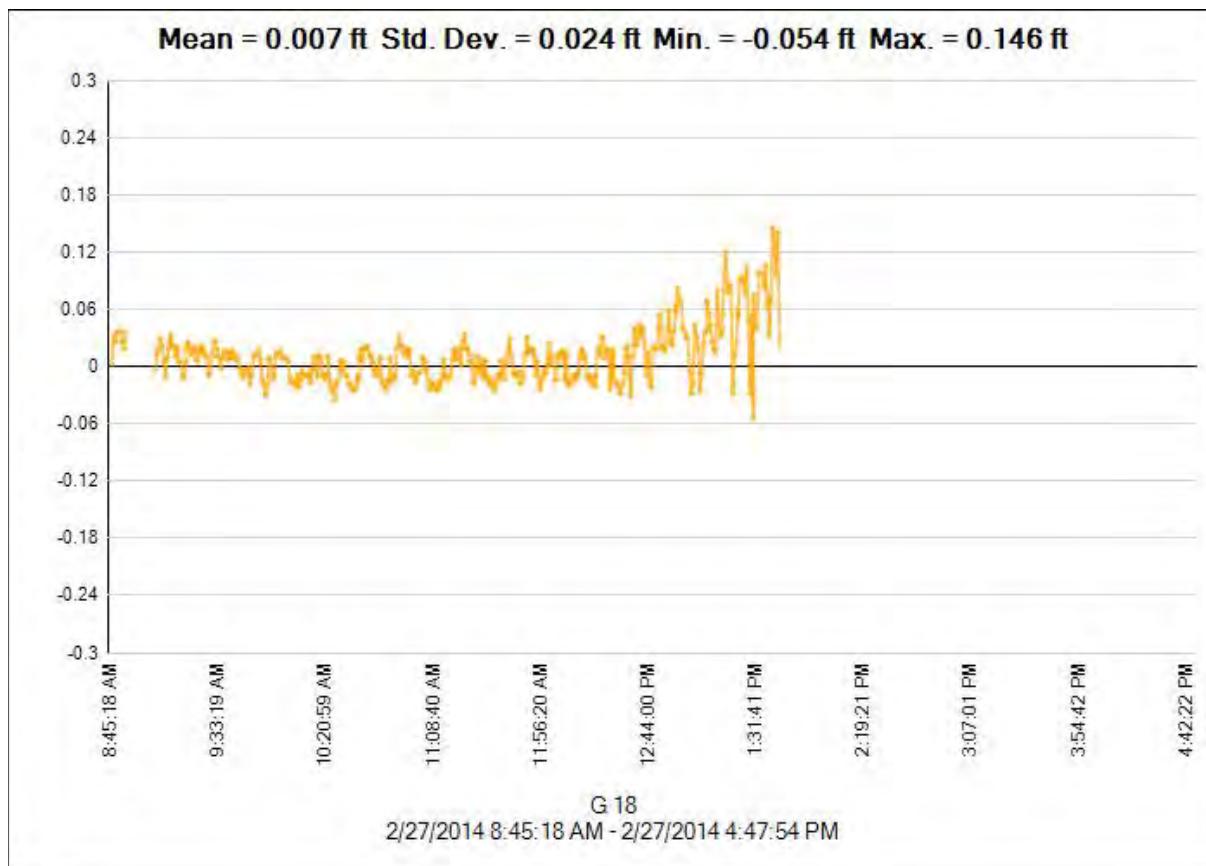


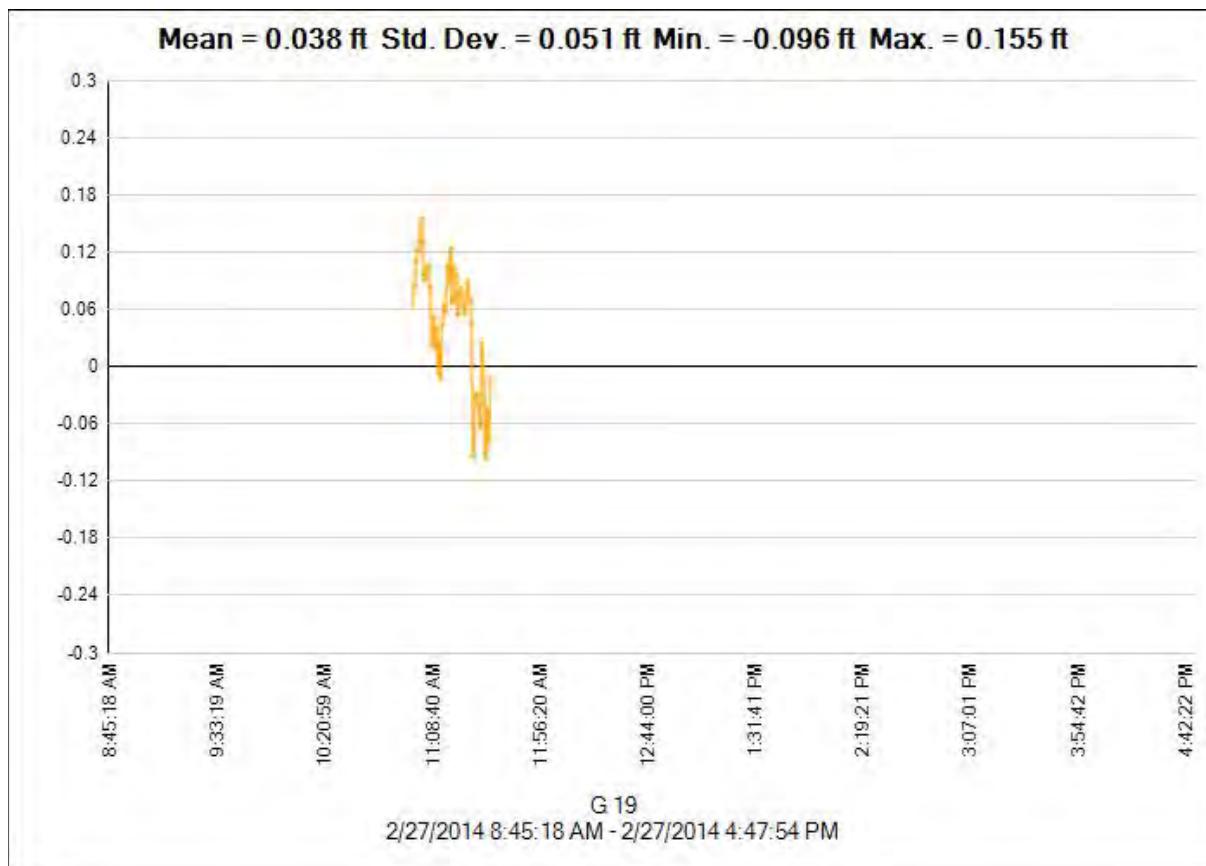


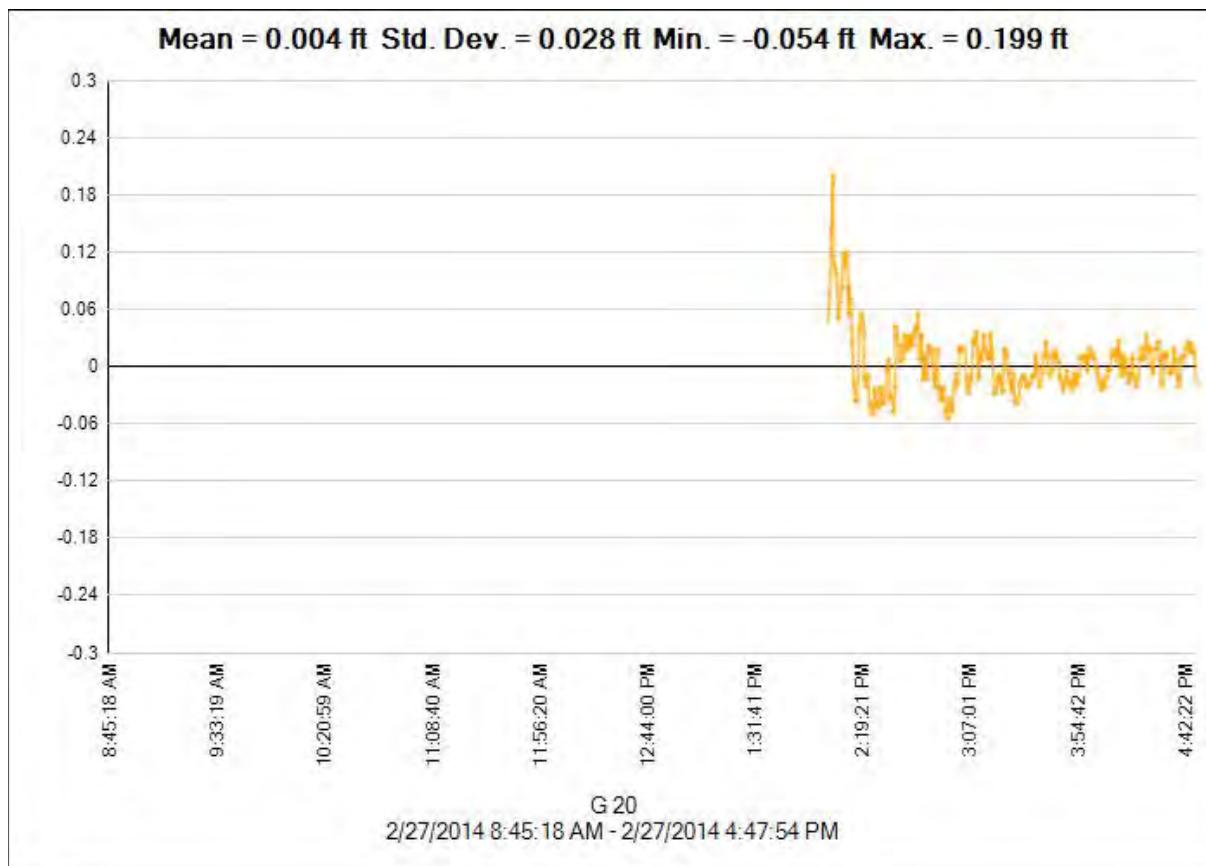


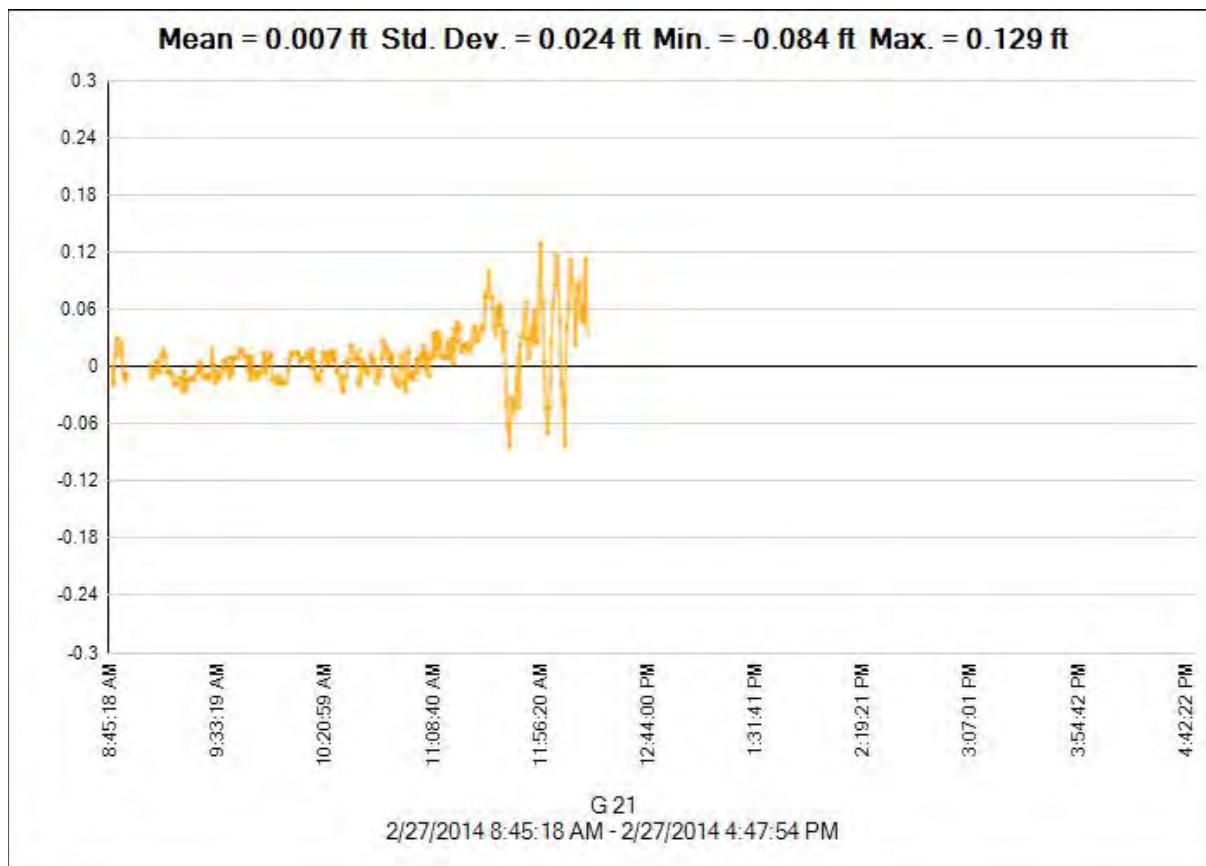


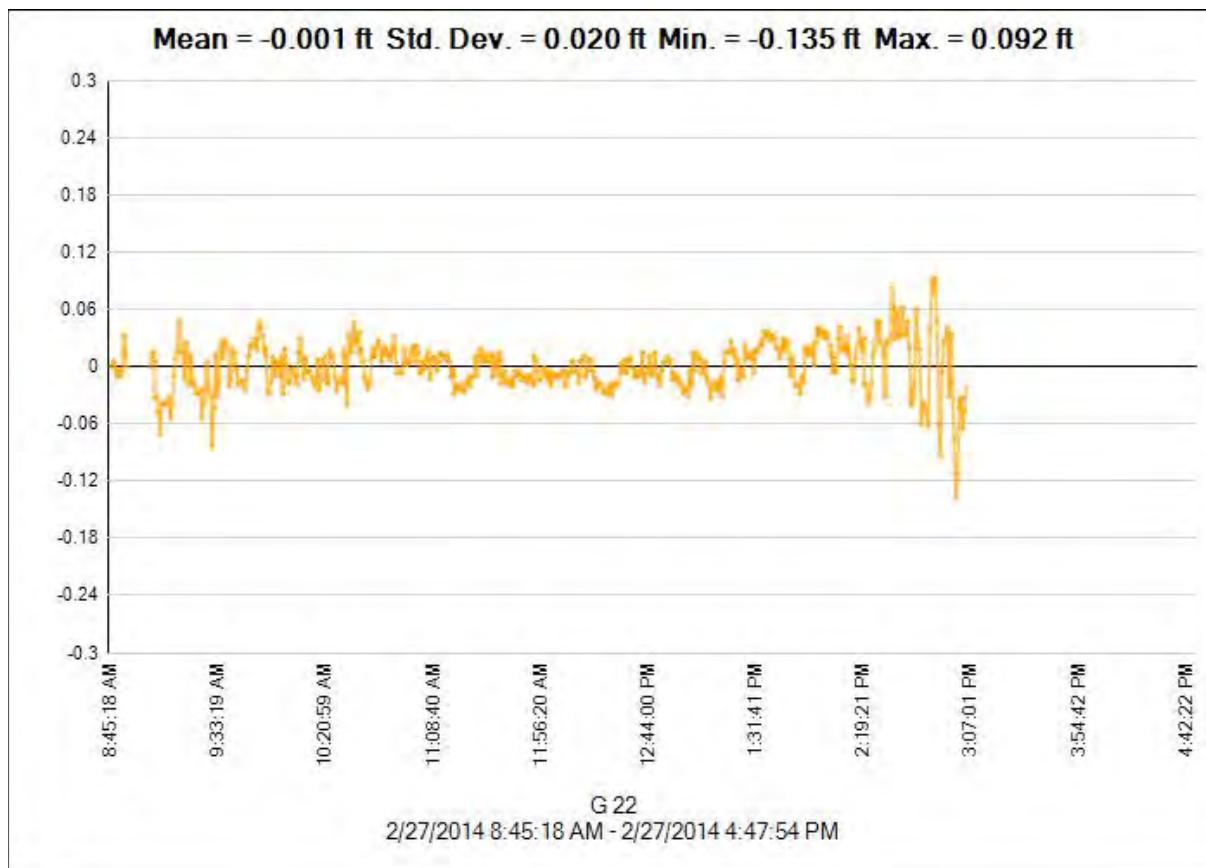


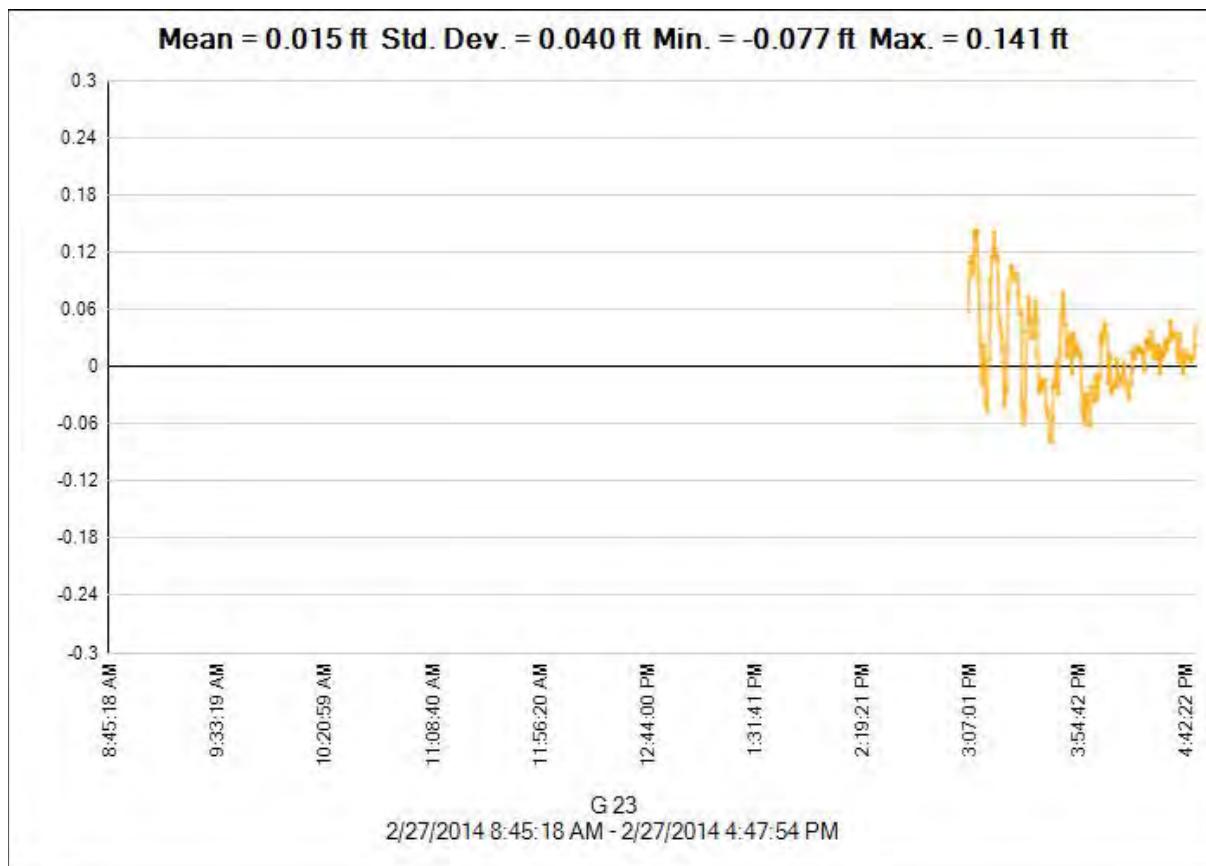


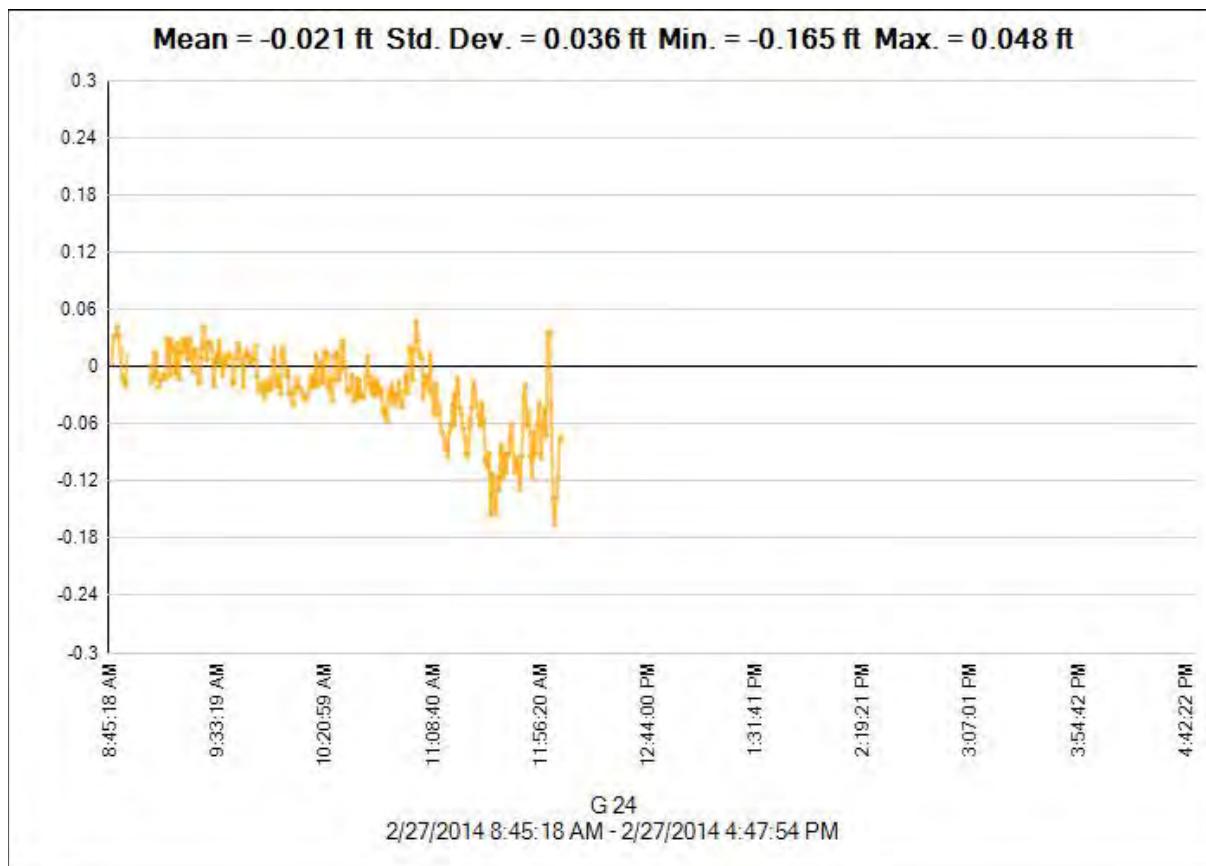


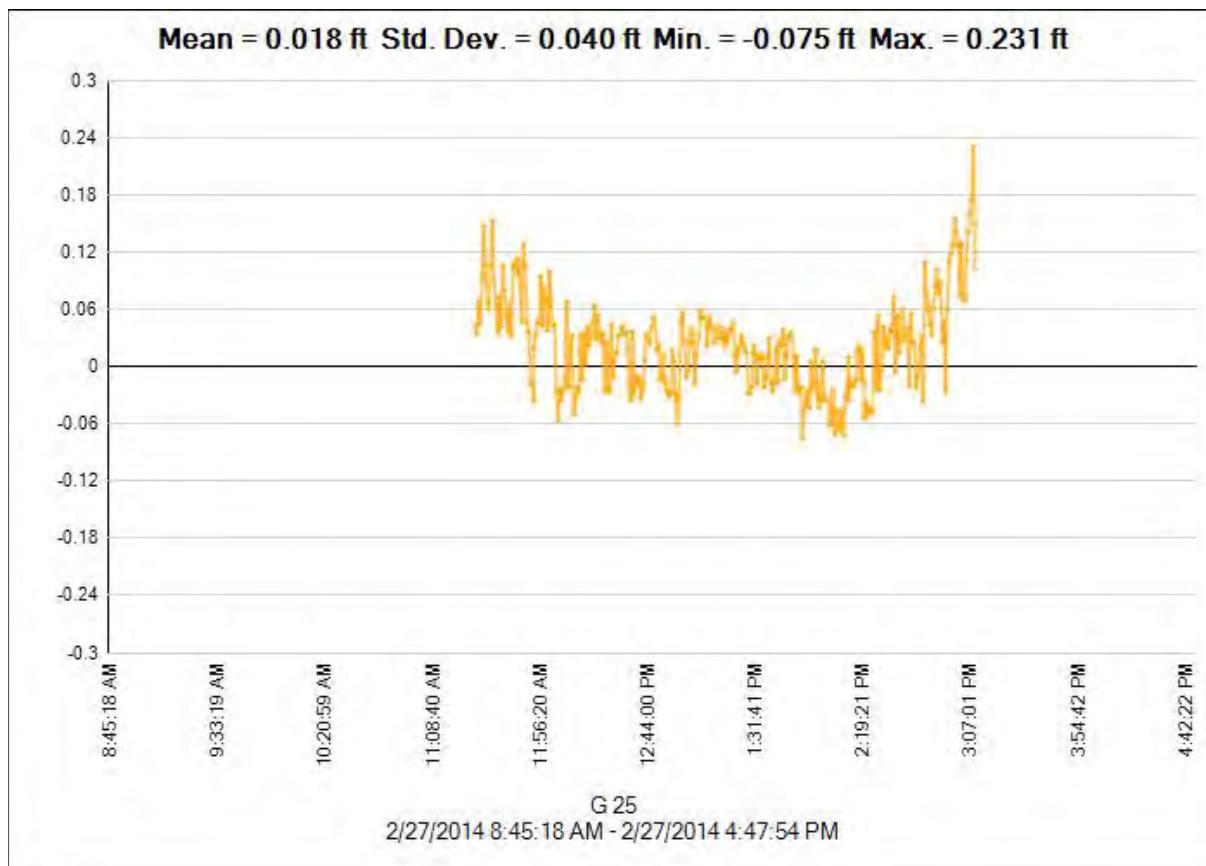


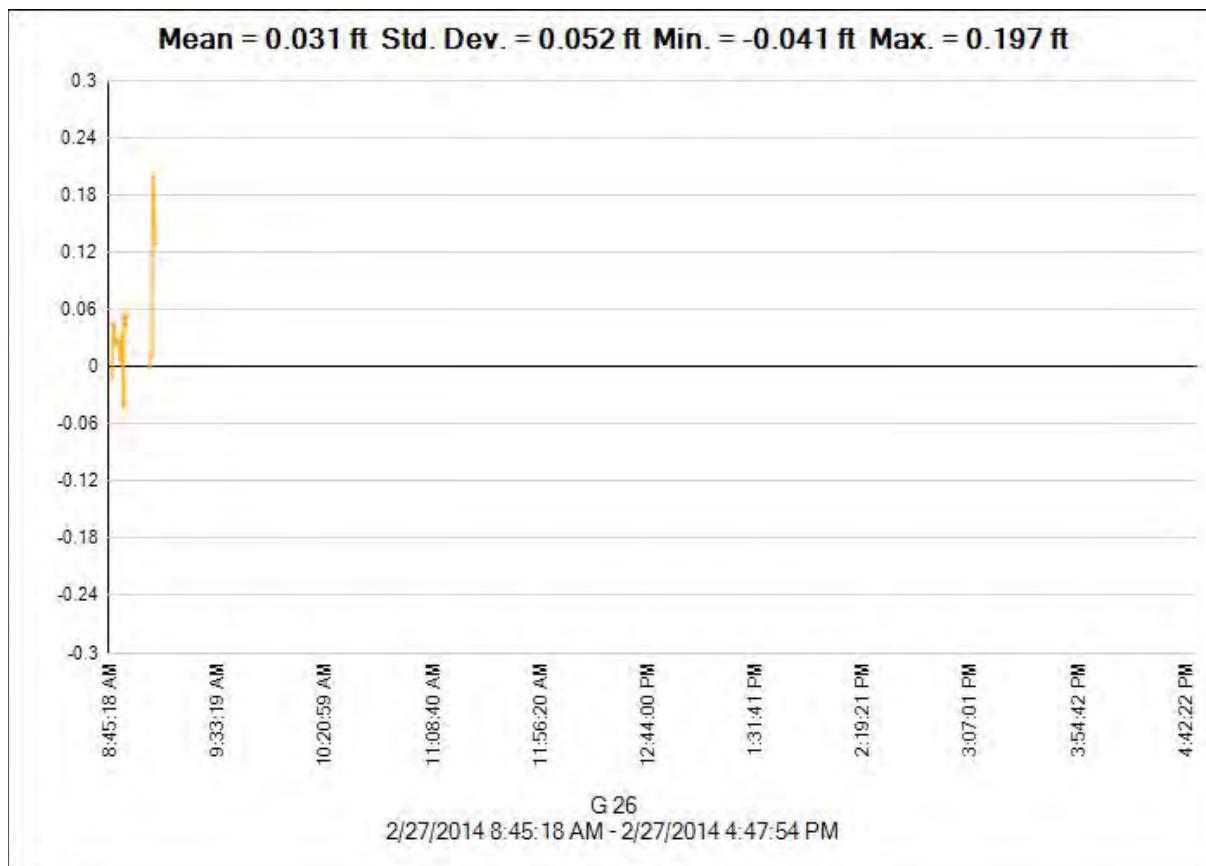


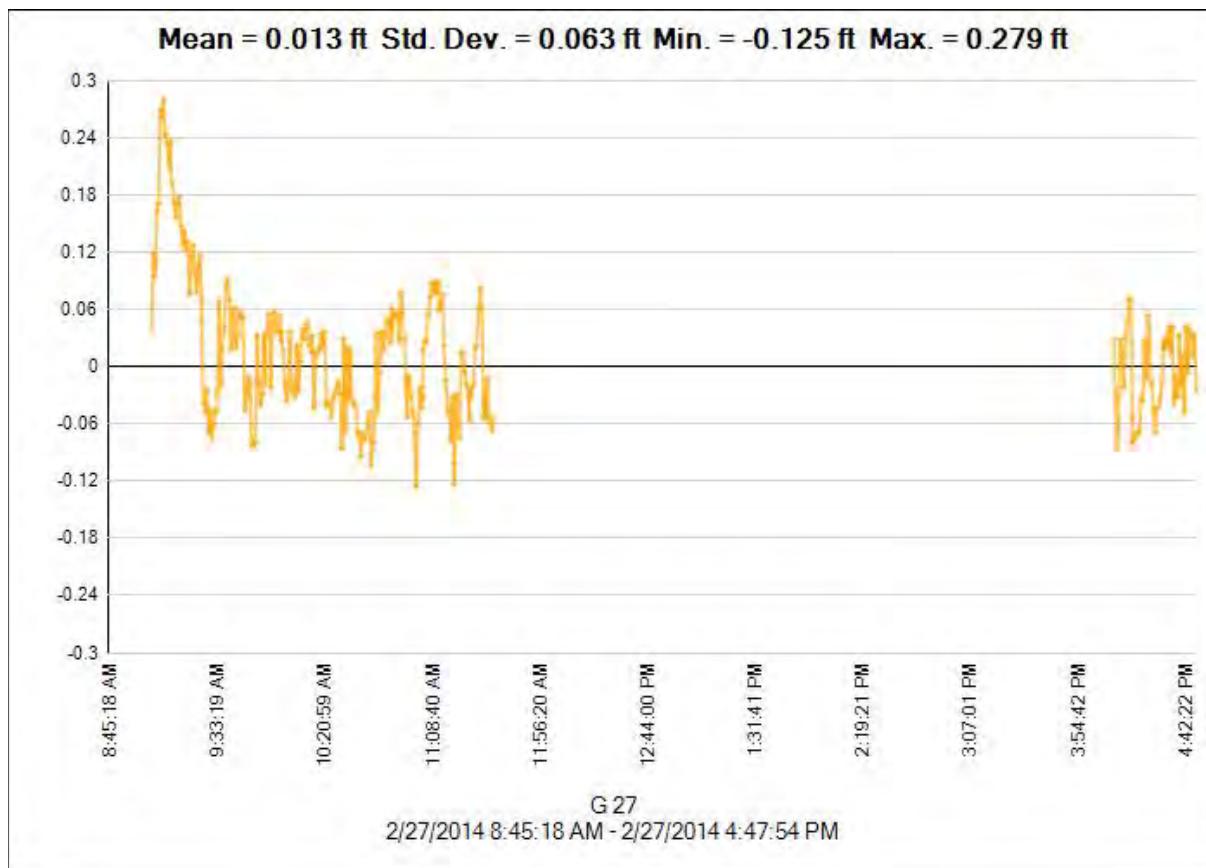


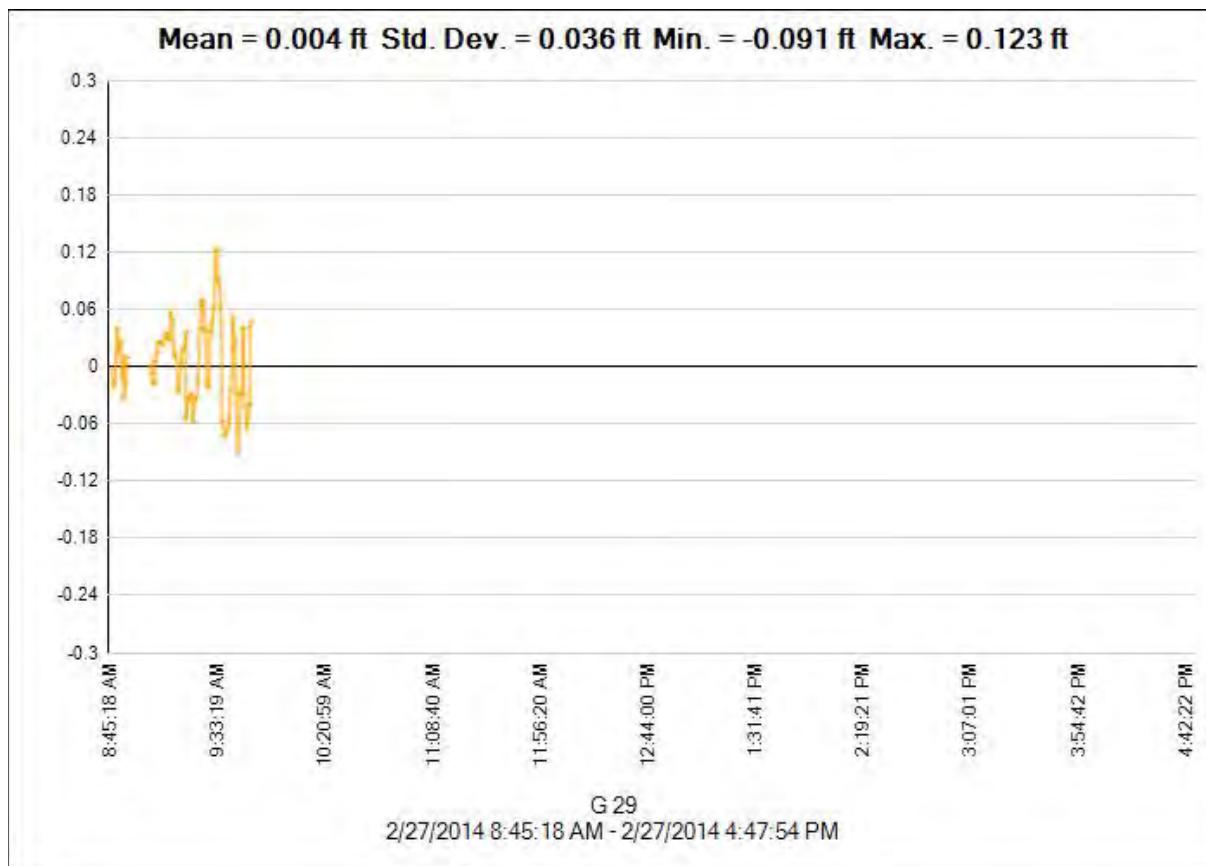


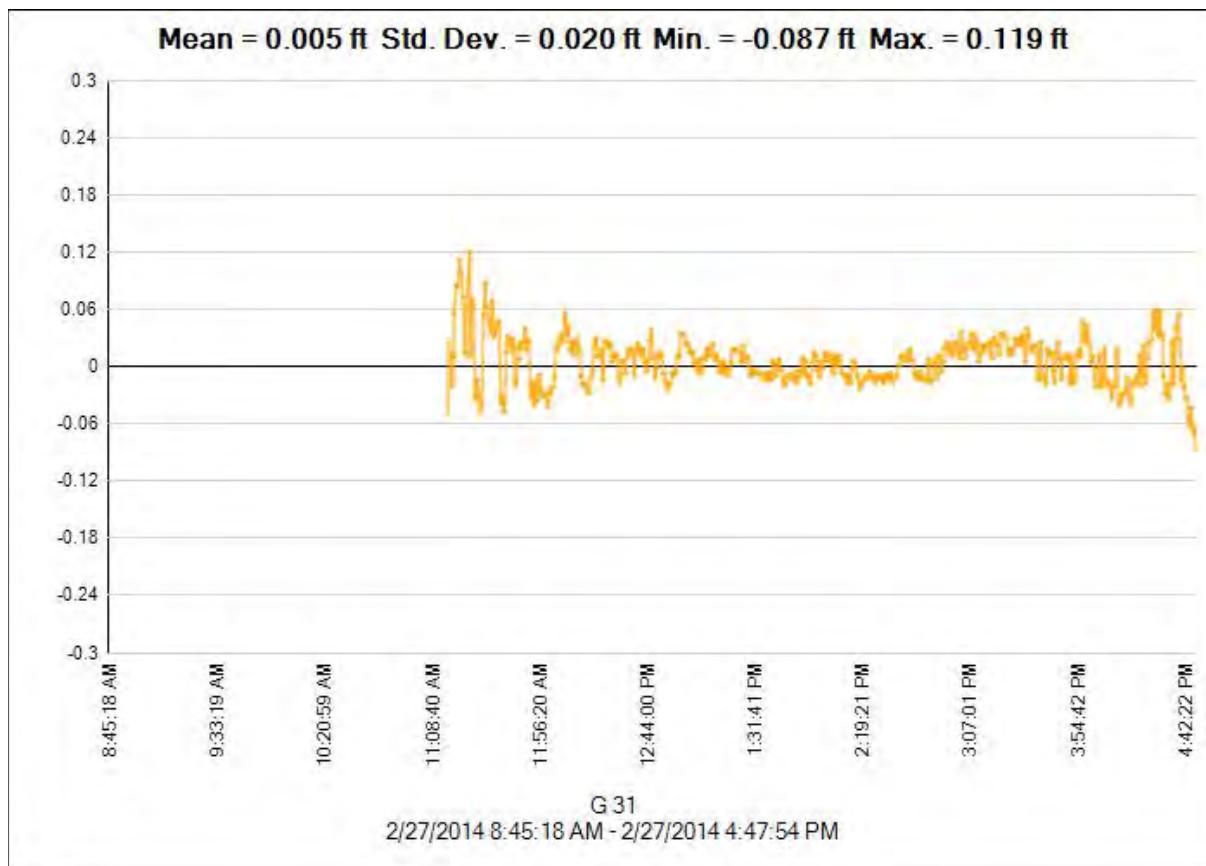


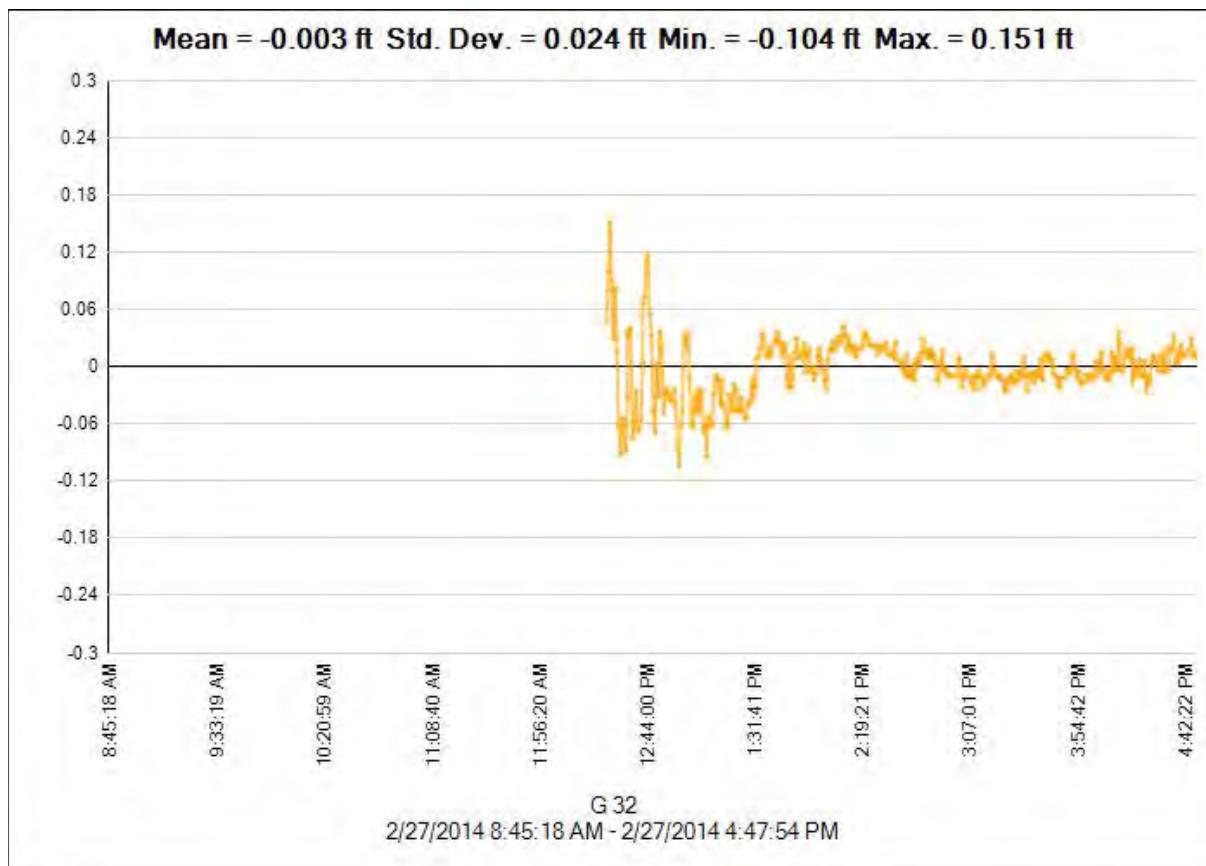














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





HOUN - GRIS (7:59:44 AM-2:59:44 PM) (S12)

Baseline observation: HOUN ---
GRIS
(B21)

Processed: 4/2/2014
10:00:26
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.013 ft

Vertical precision: 0.028 ft

RMS: 0.018 ft

Maximum PDOP: 9.212

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:07:44
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
2:59:44
PM
(Local:
UTC-6hr)

Processing duration: 1.06:52:00

Processing interval: Use all
data

Vector Components (Mark to Mark)

From:	HOUN
-------	------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	GRIS				
Grid		Local		Global	
Northing	281033.481 ft	Latitude	N29°15'55.88307"	Latitude	N29°15'55.88307"
Easting	3719590.184 ft	Longitude	W89°57'26.26225"	Longitude	W89°57'26.26225"
Elevation	27.316 ft	Height	-51.345 ft	Height	-51.345 ft

Vector					
ΔNorthing	-116695.851 ft	NS Fwd Azimuth	115°46'46"	ΔX	243602.962 ft
ΔEasting	244971.229 ft	Ellipsoid Dist.	271352.696 ft	ΔY	-59814.839 ft
ΔElevation	-18.034 ft	ΔHeight	-14.163 ft	ΔZ	-103492.630 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.003 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.005 ft
σ ΔEasting	0.005 ft	σ Ellipsoid Dist.	0.005 ft	σ ΔY	0.013 ft
σ ΔElevation	0.014 ft	σ ΔHeight	0.014 ft	σ ΔZ	0.007 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000024188		
Y	-0.0000002808	0.0000146700	
Z	-0.0000001180	-0.0000072917	0.0000047107

Occupations

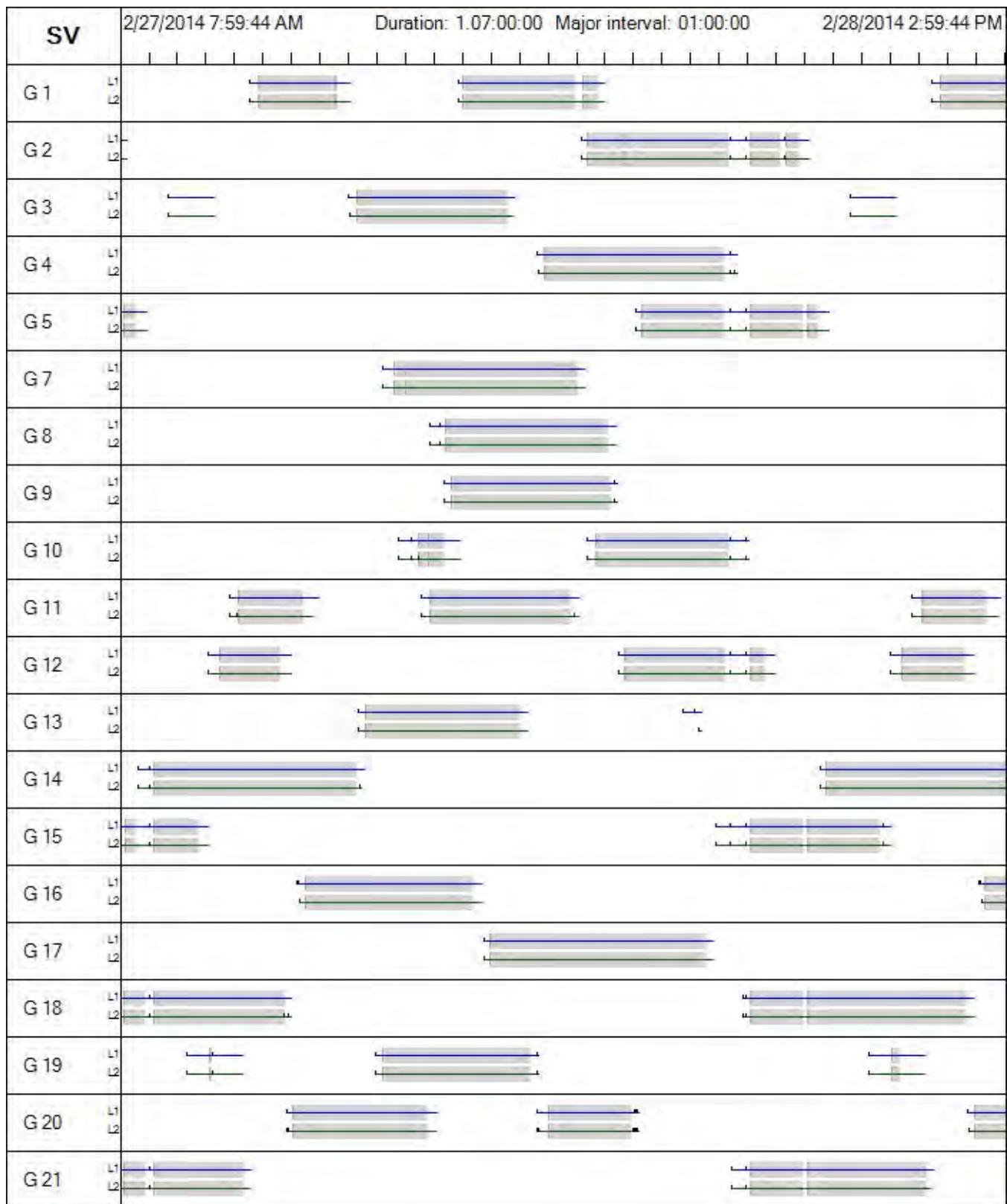
	From	To
Point ID:	HOUM	GRIS



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o
Receiver type:	NetRS	NetR9
Receiver serial number:	4646125537	5201K41142
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2 RoHS
Antenna serial number:	-----	5000117437
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Antenna Phase Center	Bottom of antenna mount



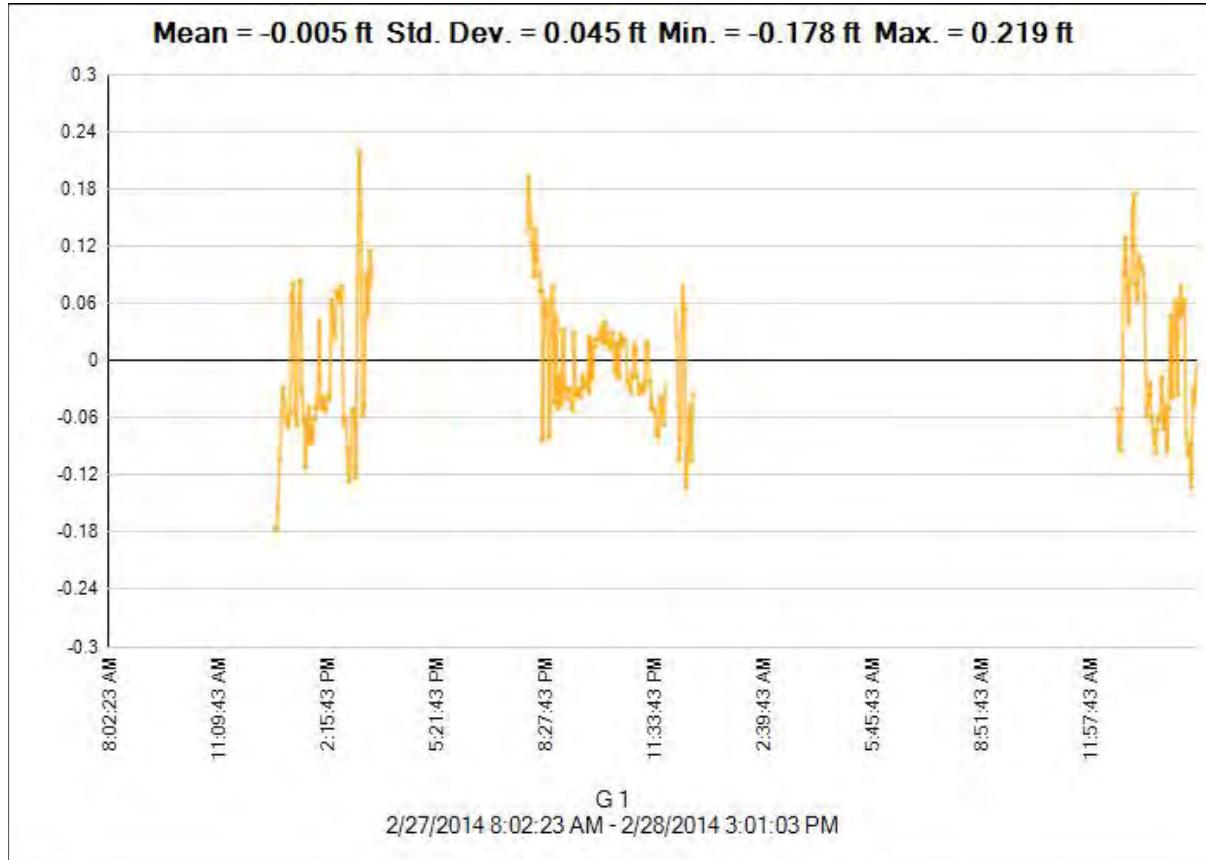
Tracking Summary

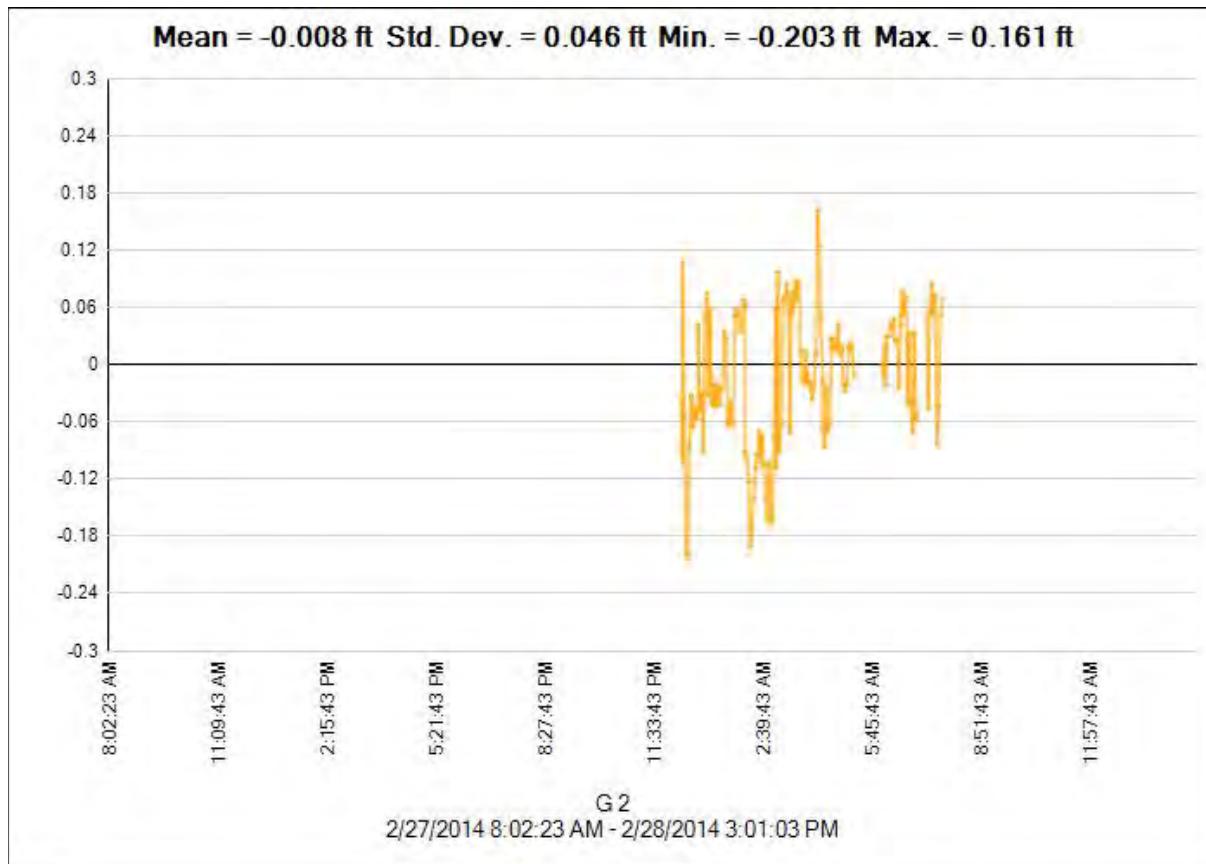


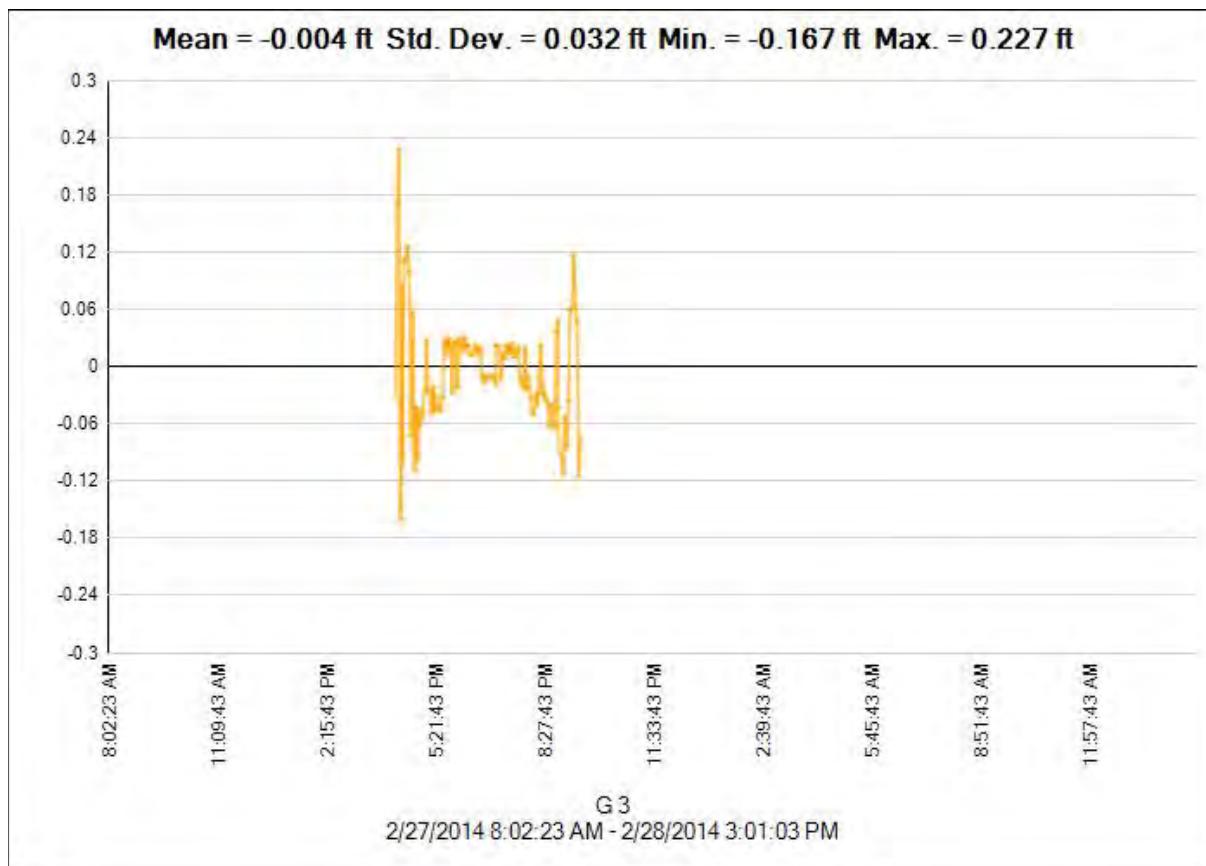


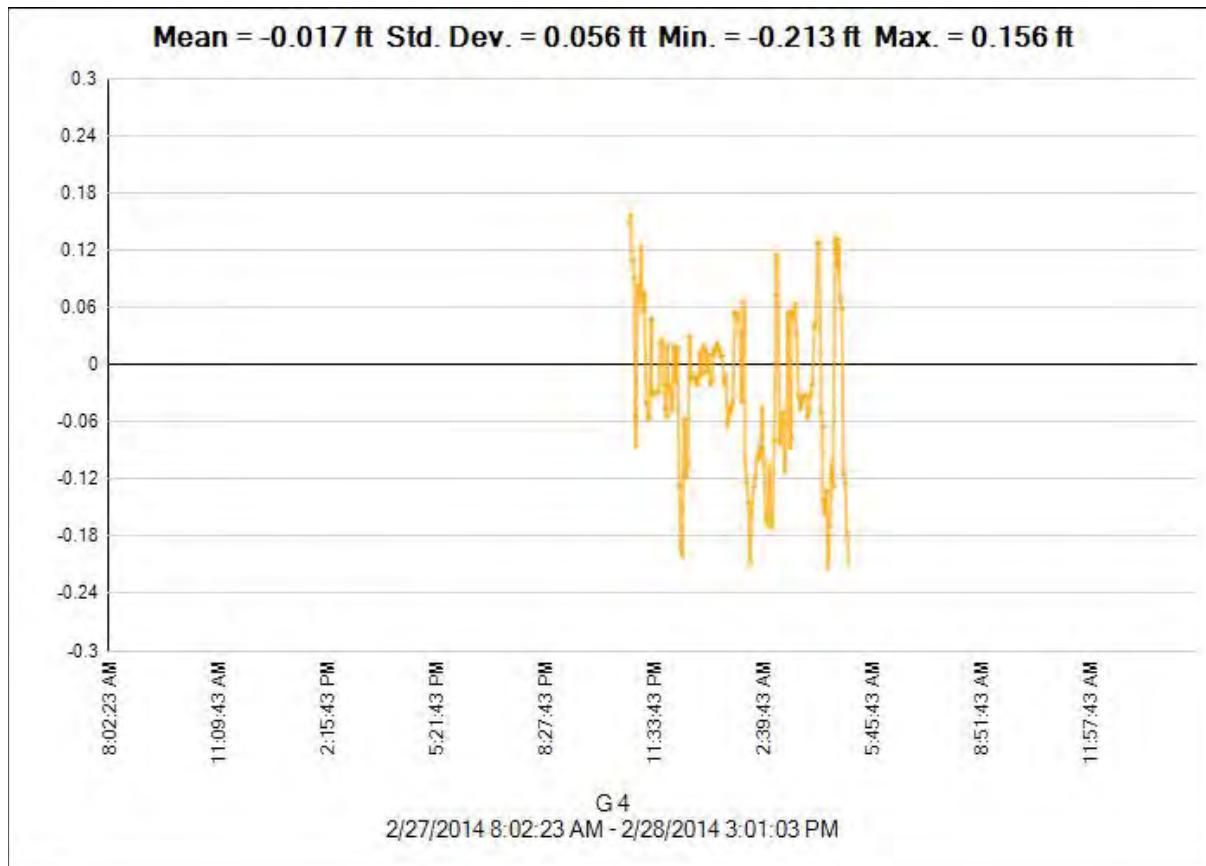


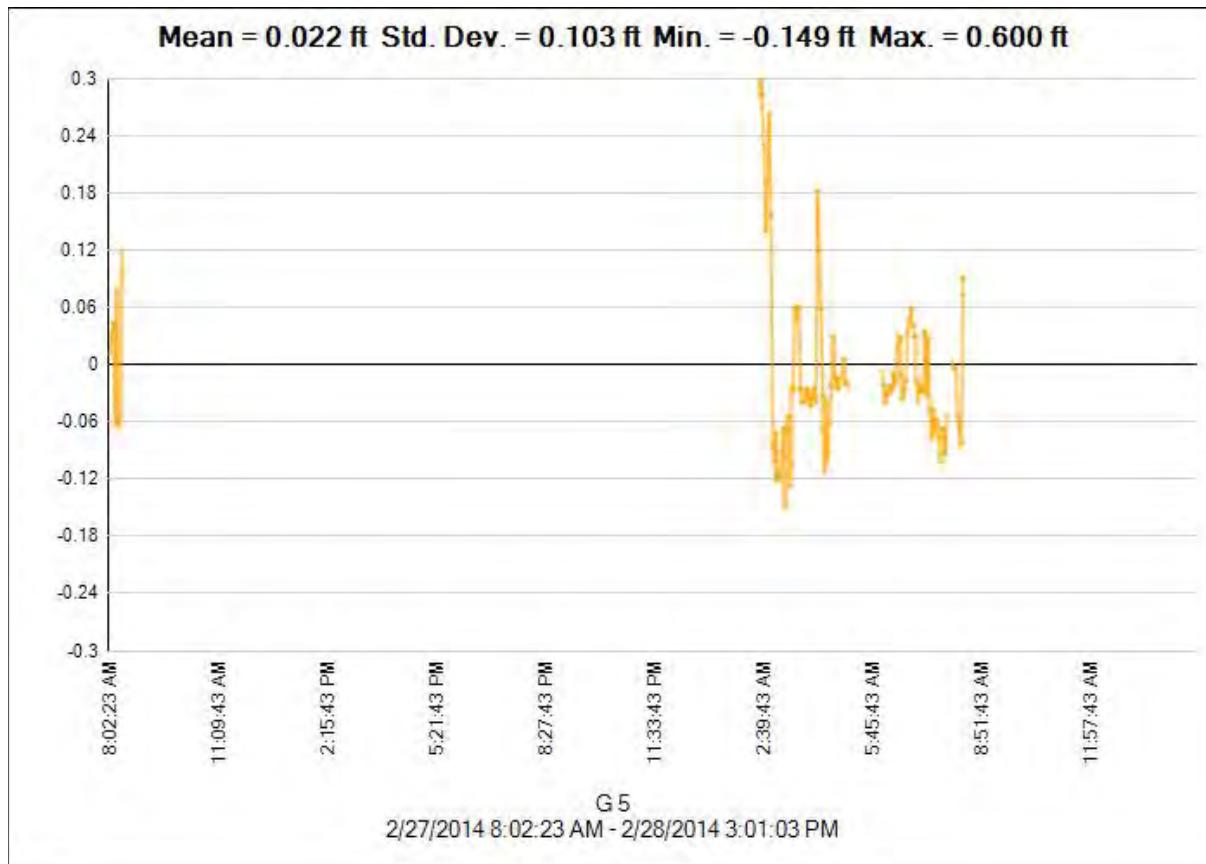
Residuals

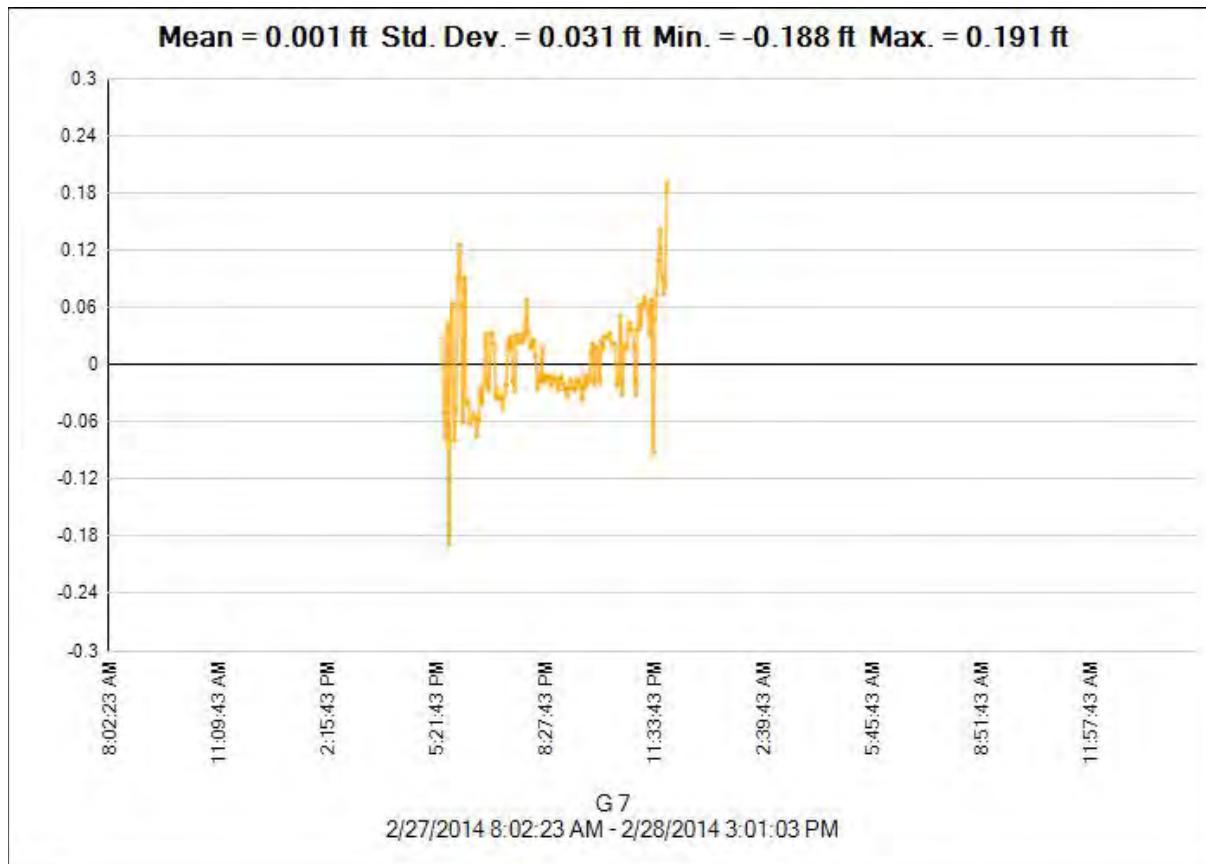


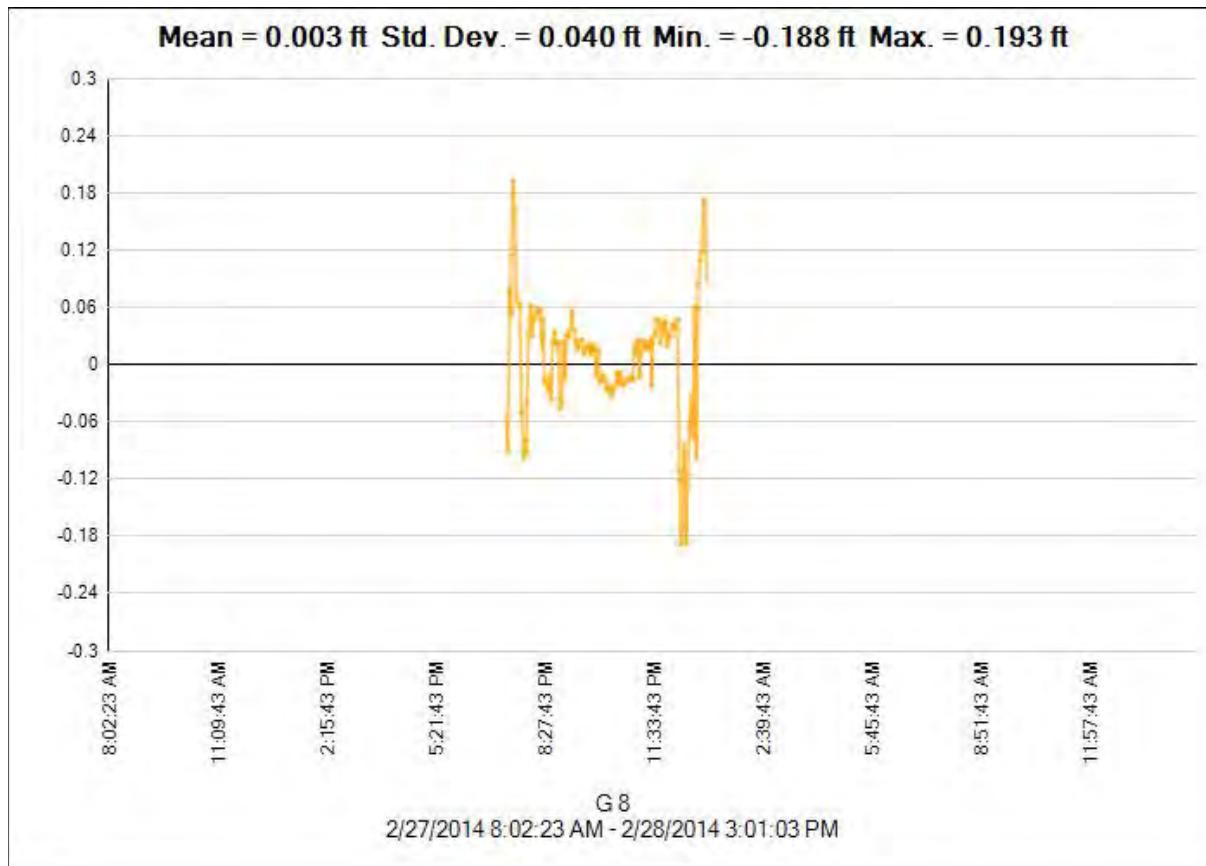


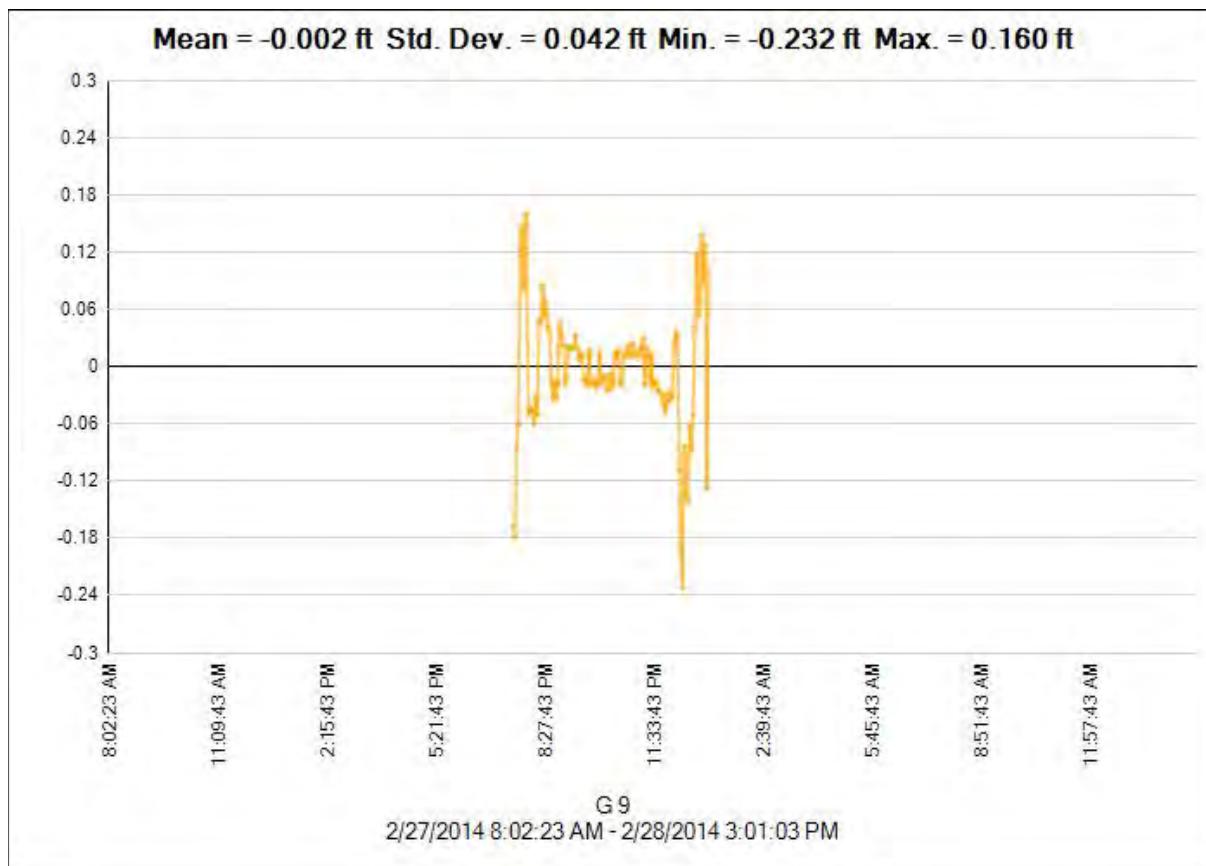


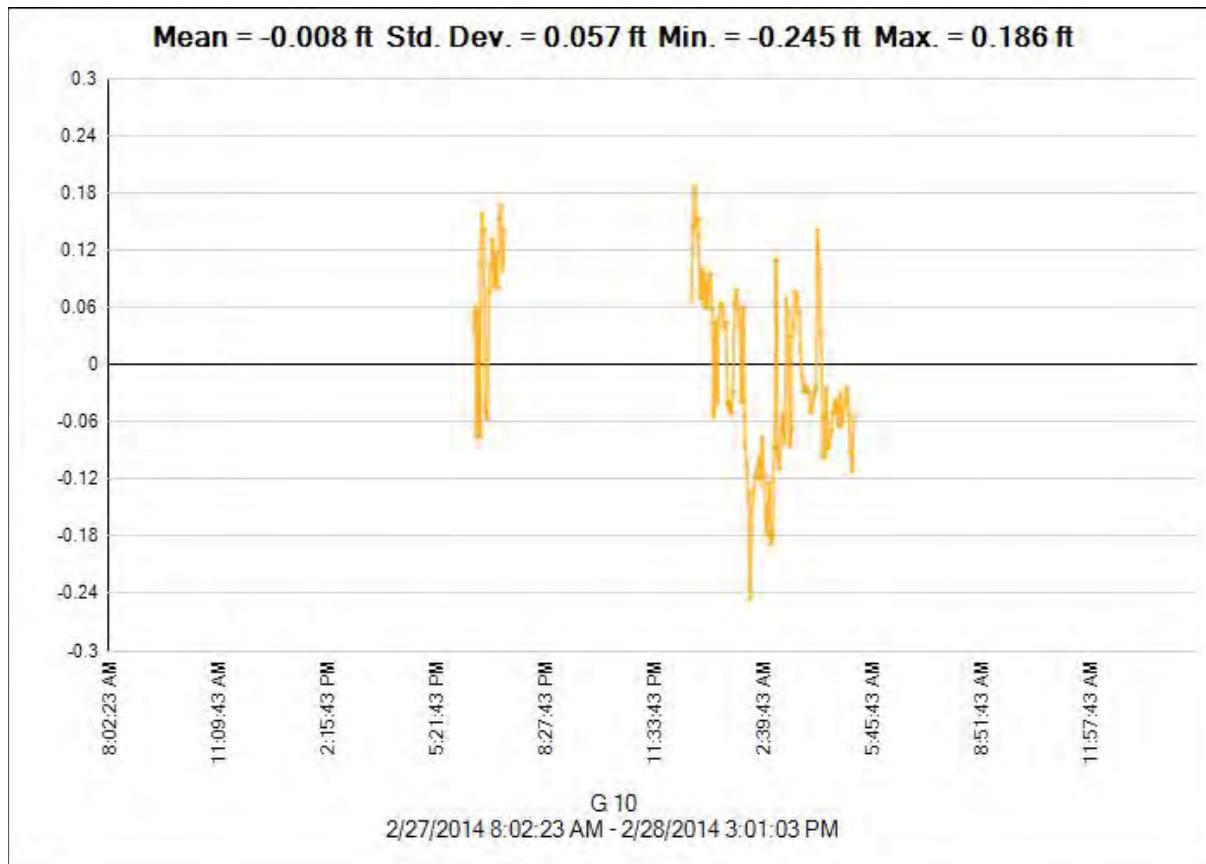


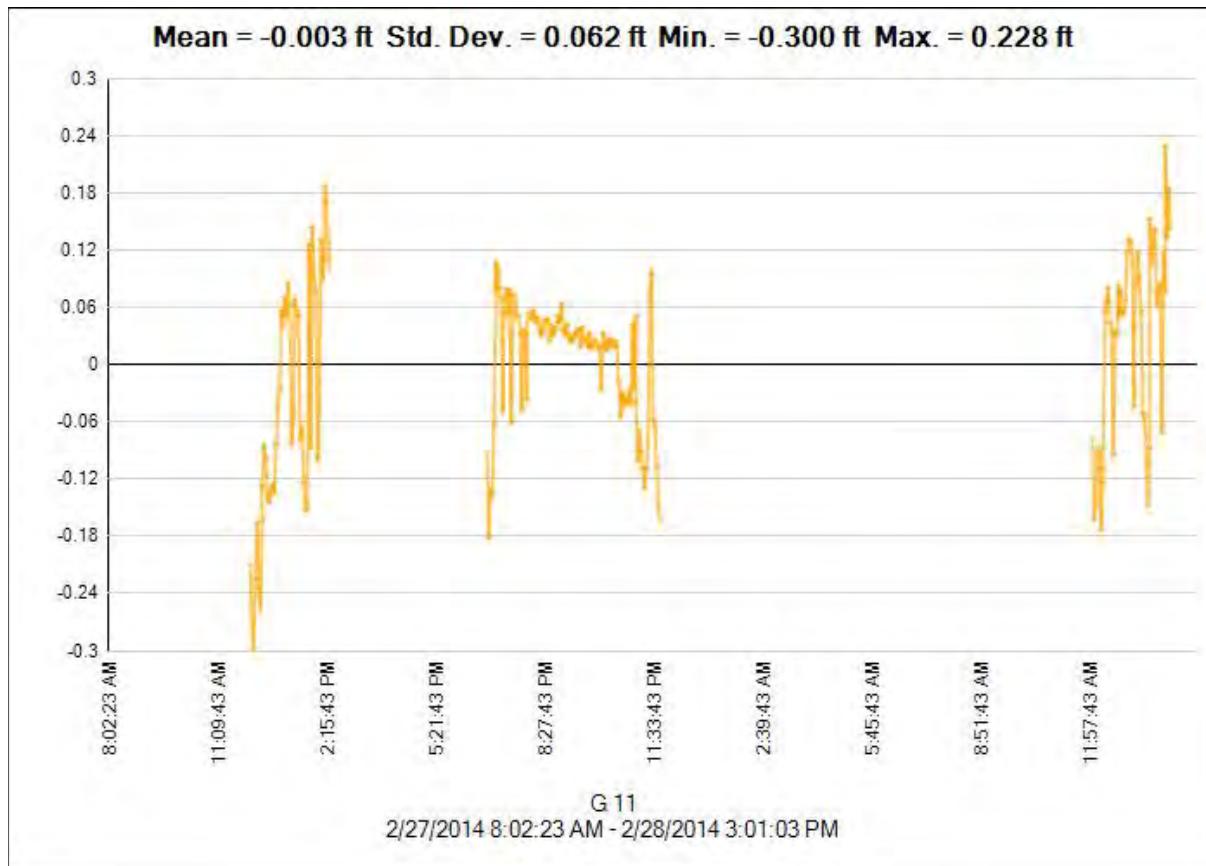


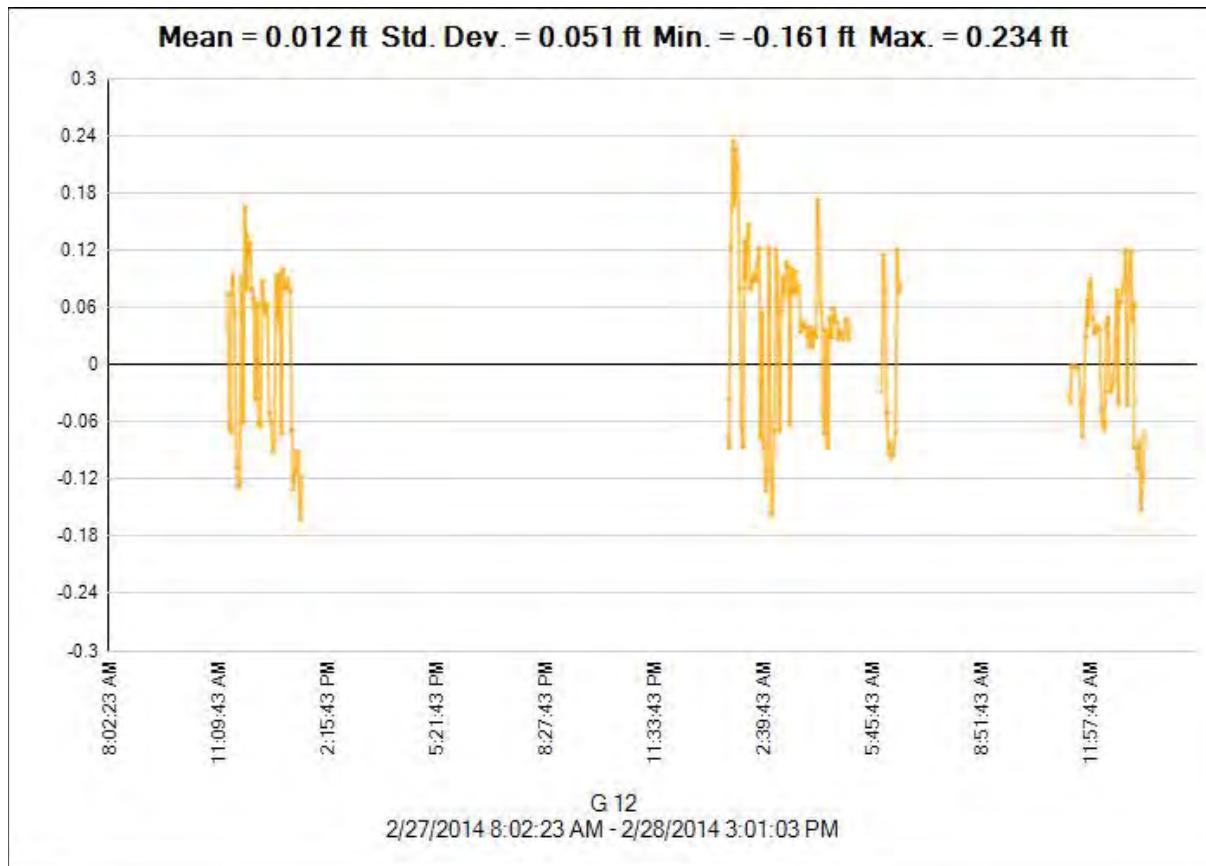


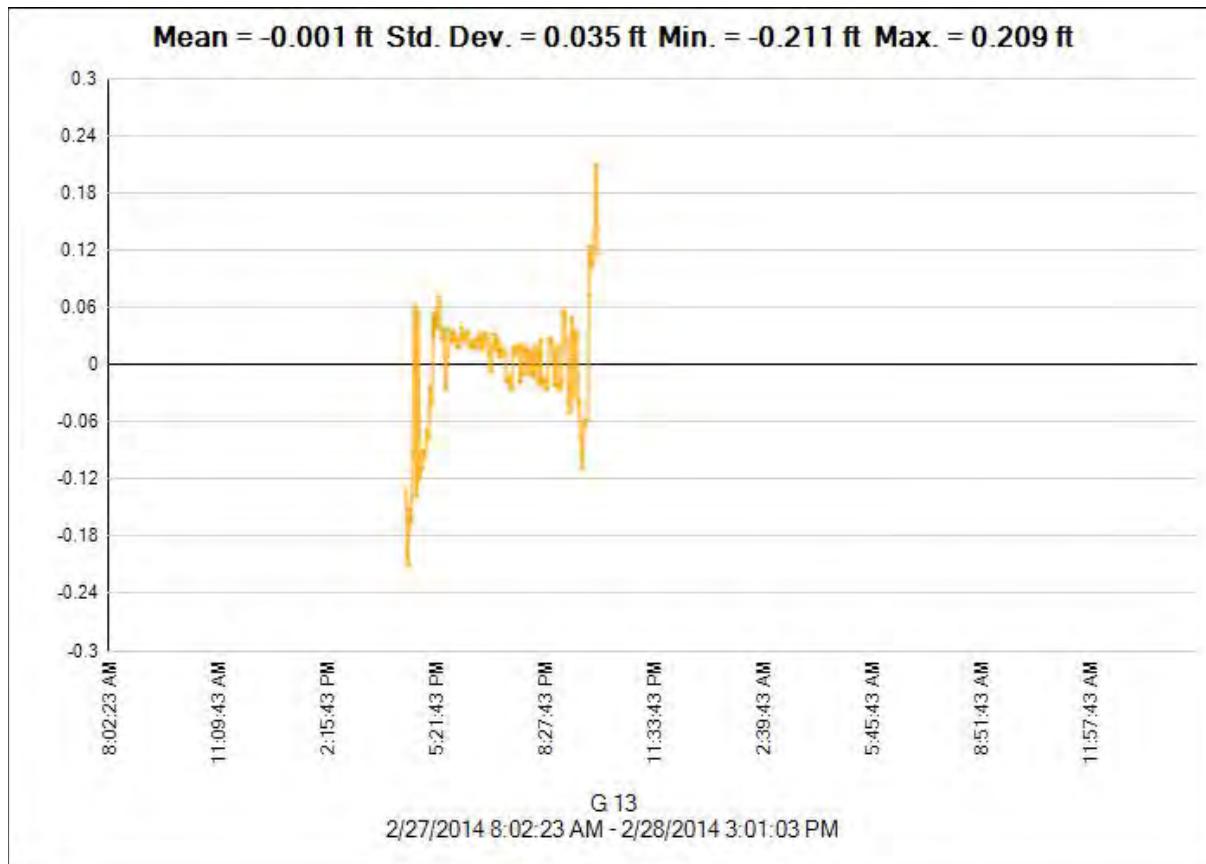


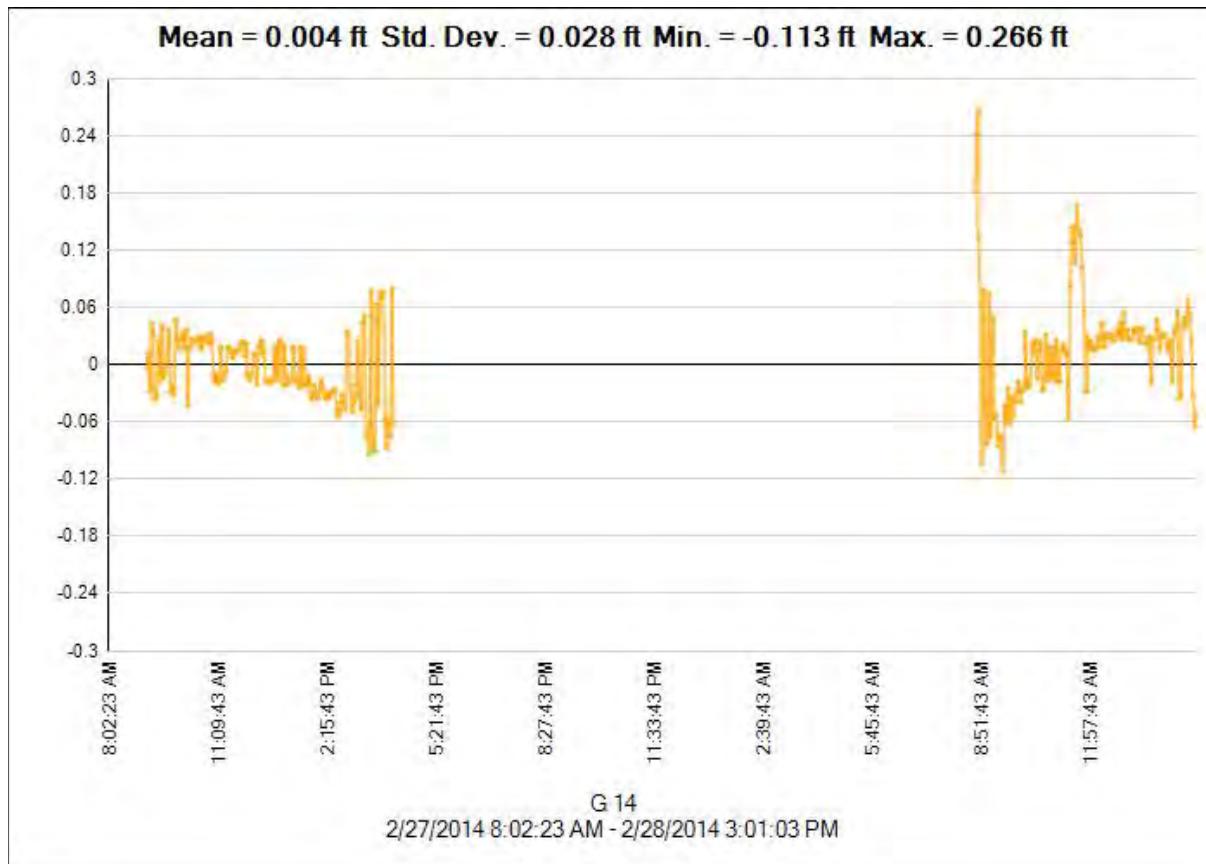


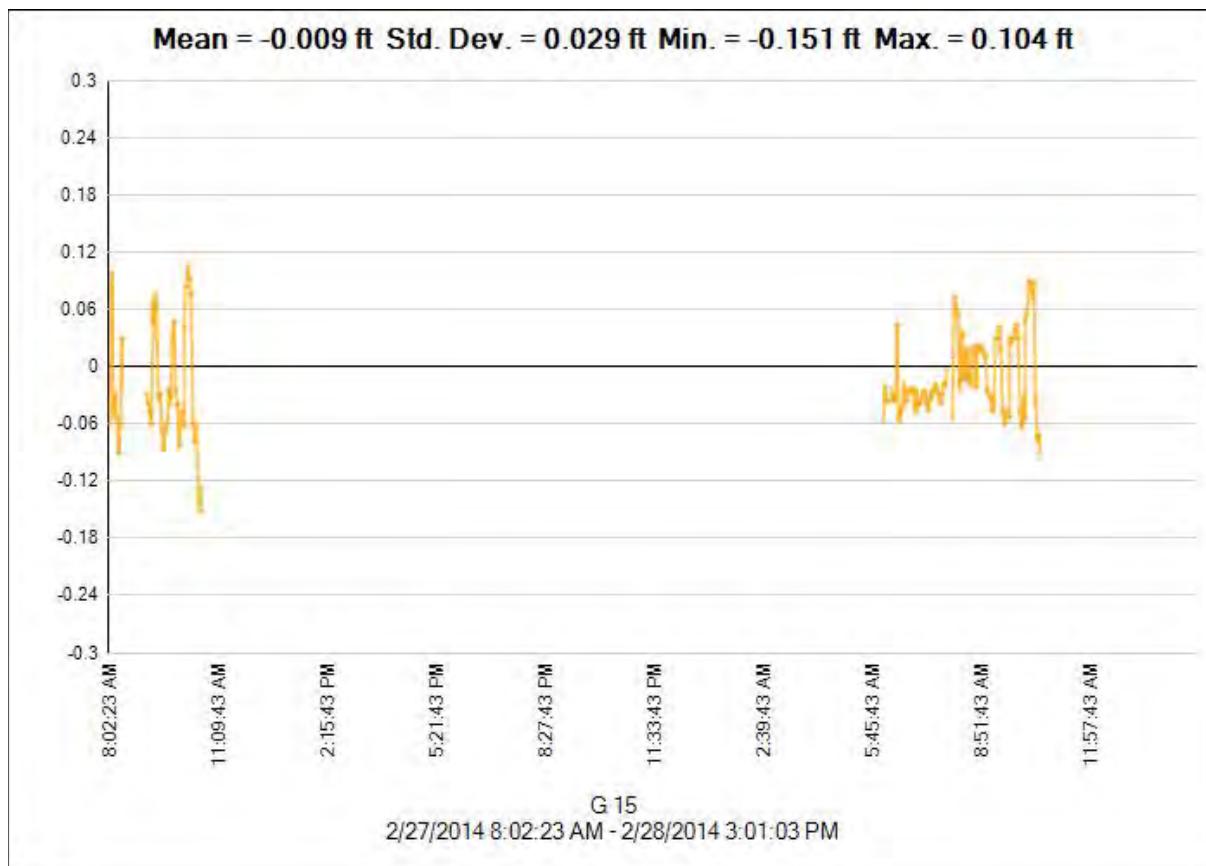


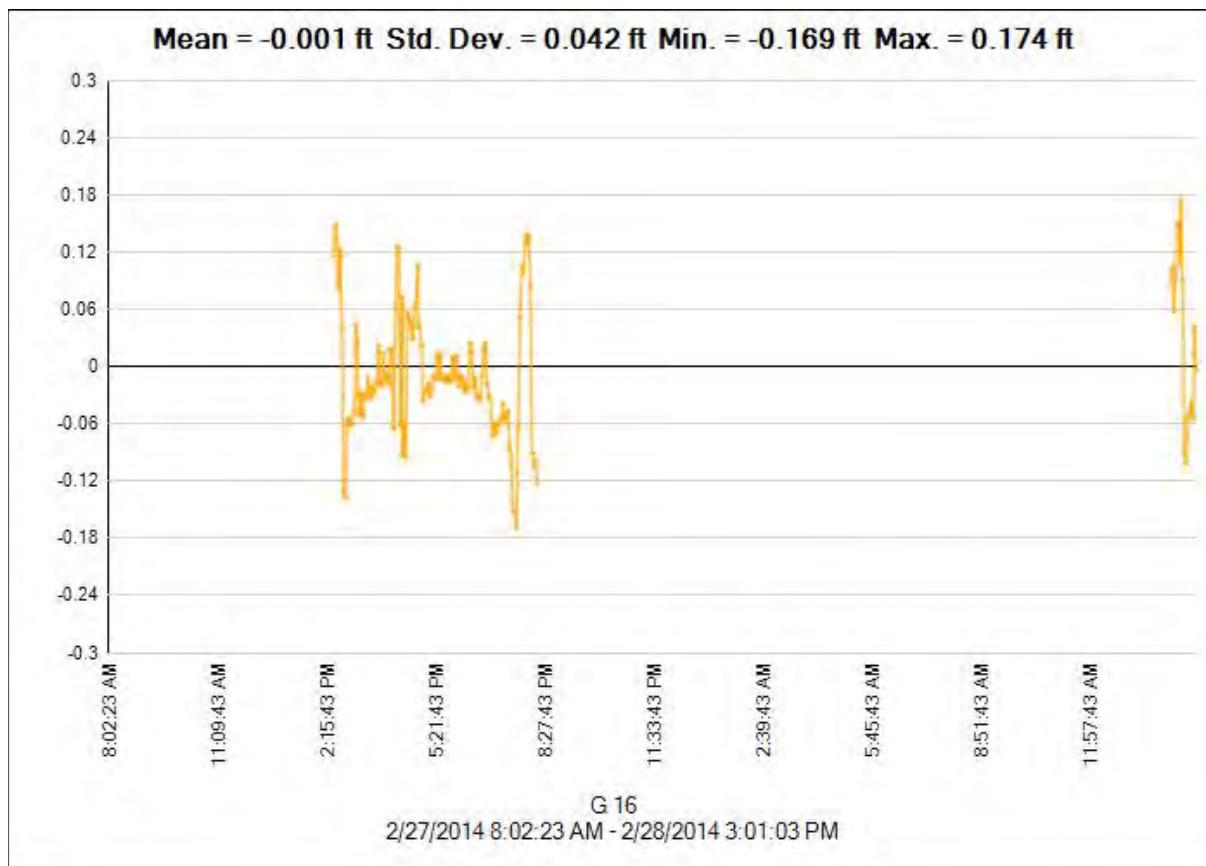


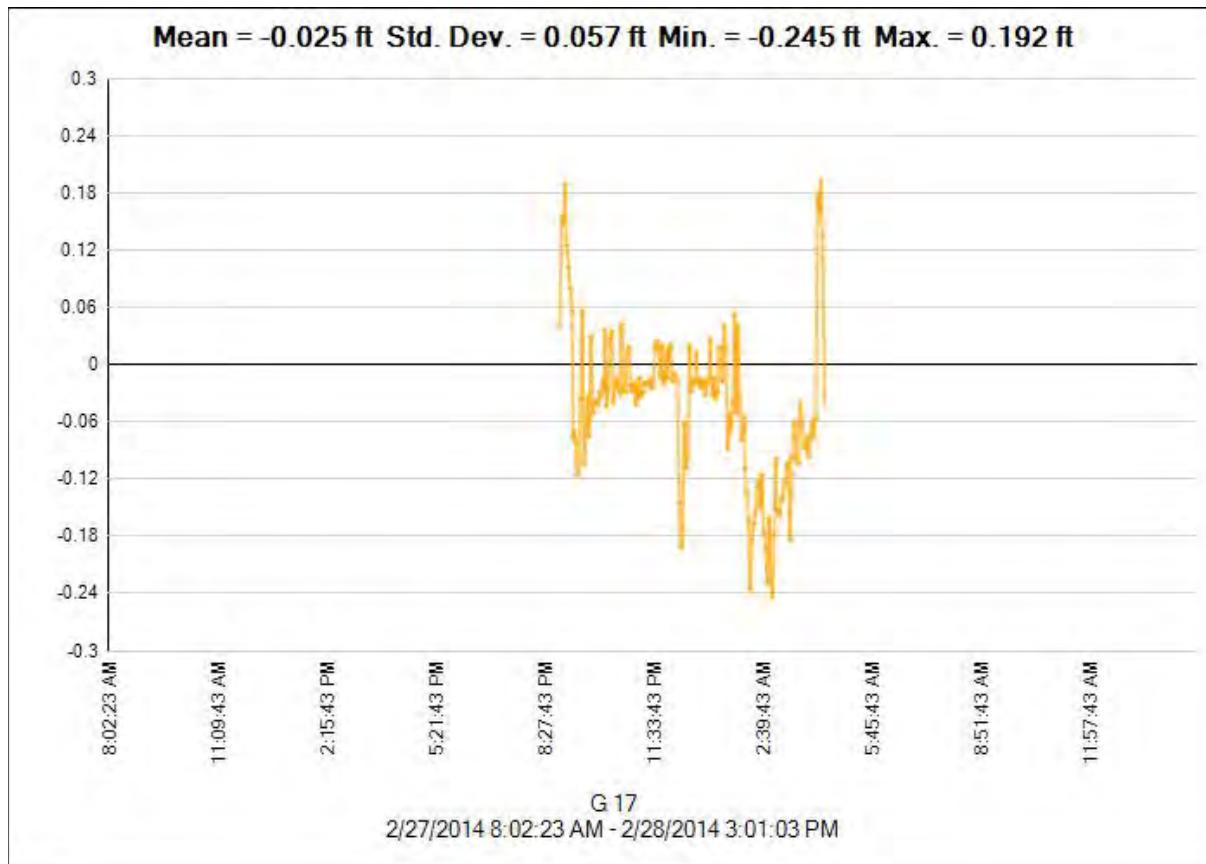


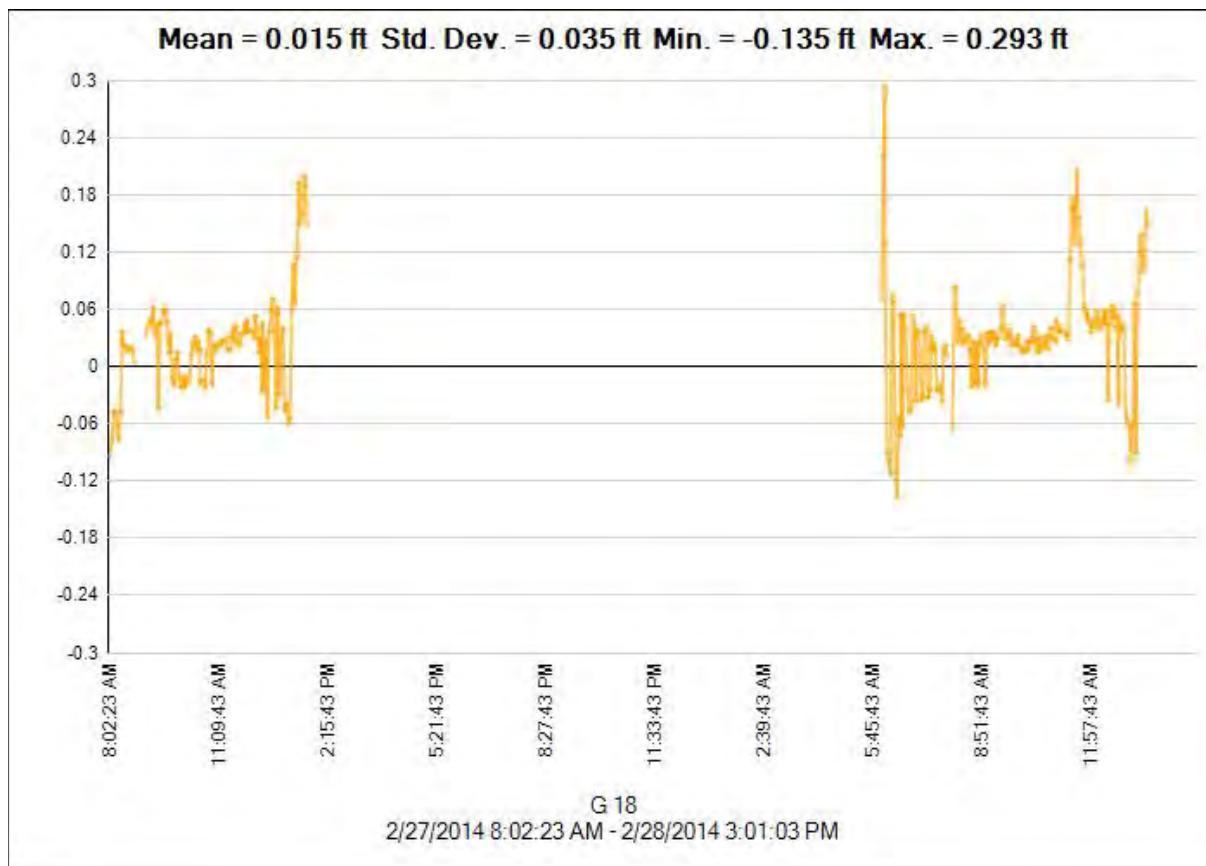


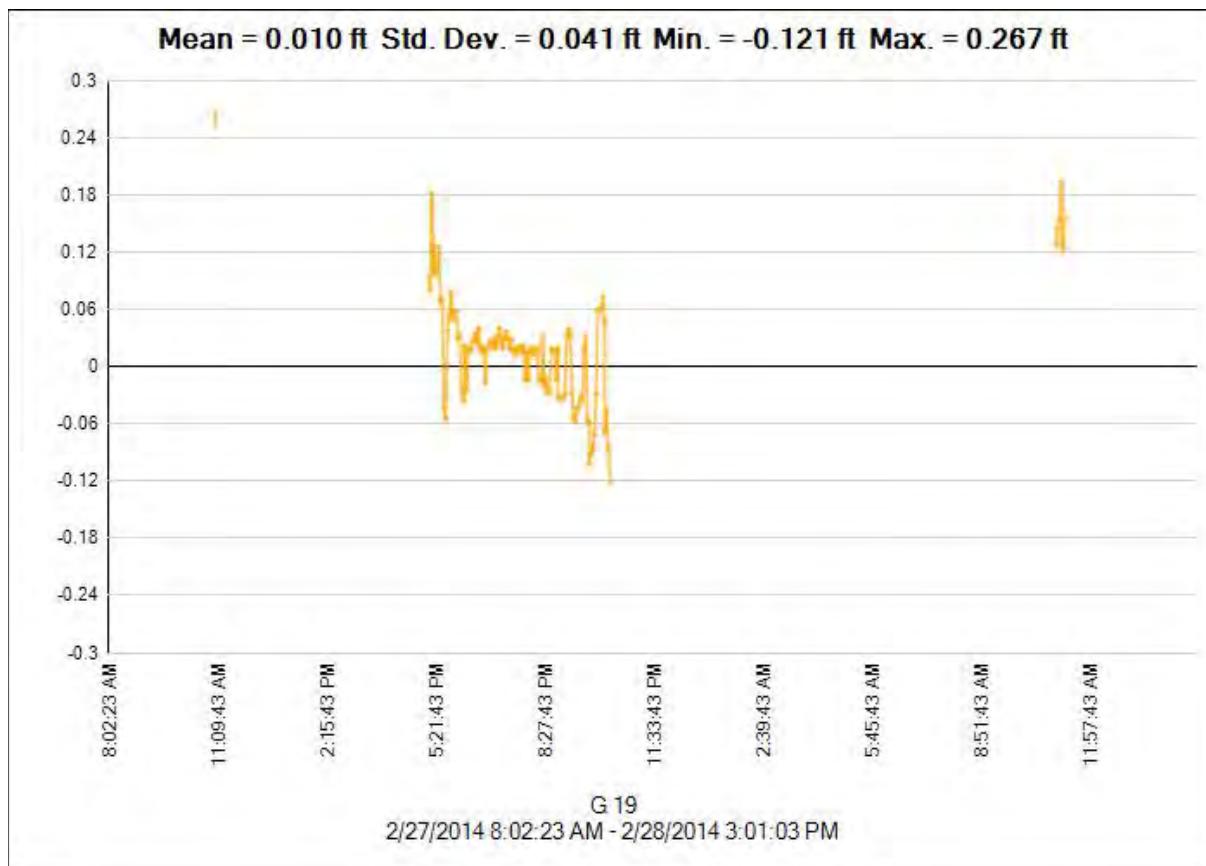


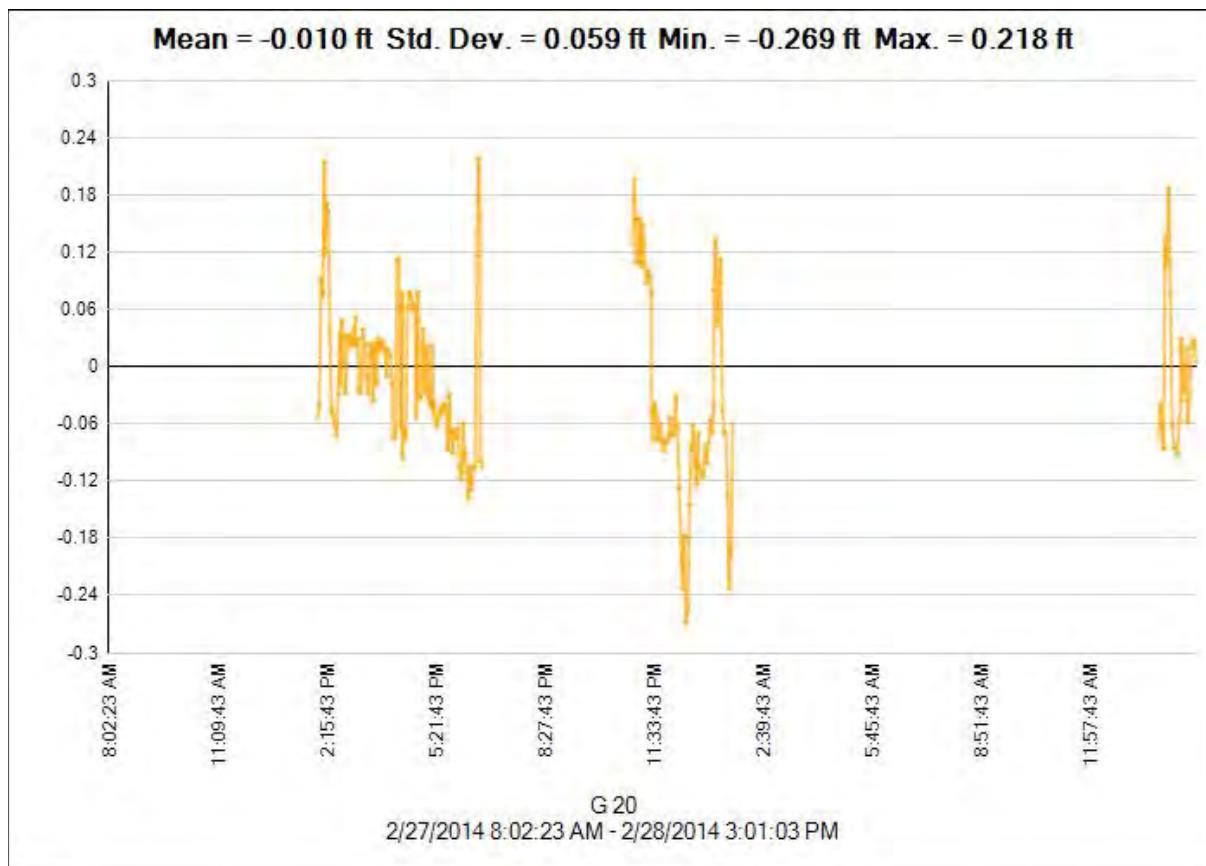


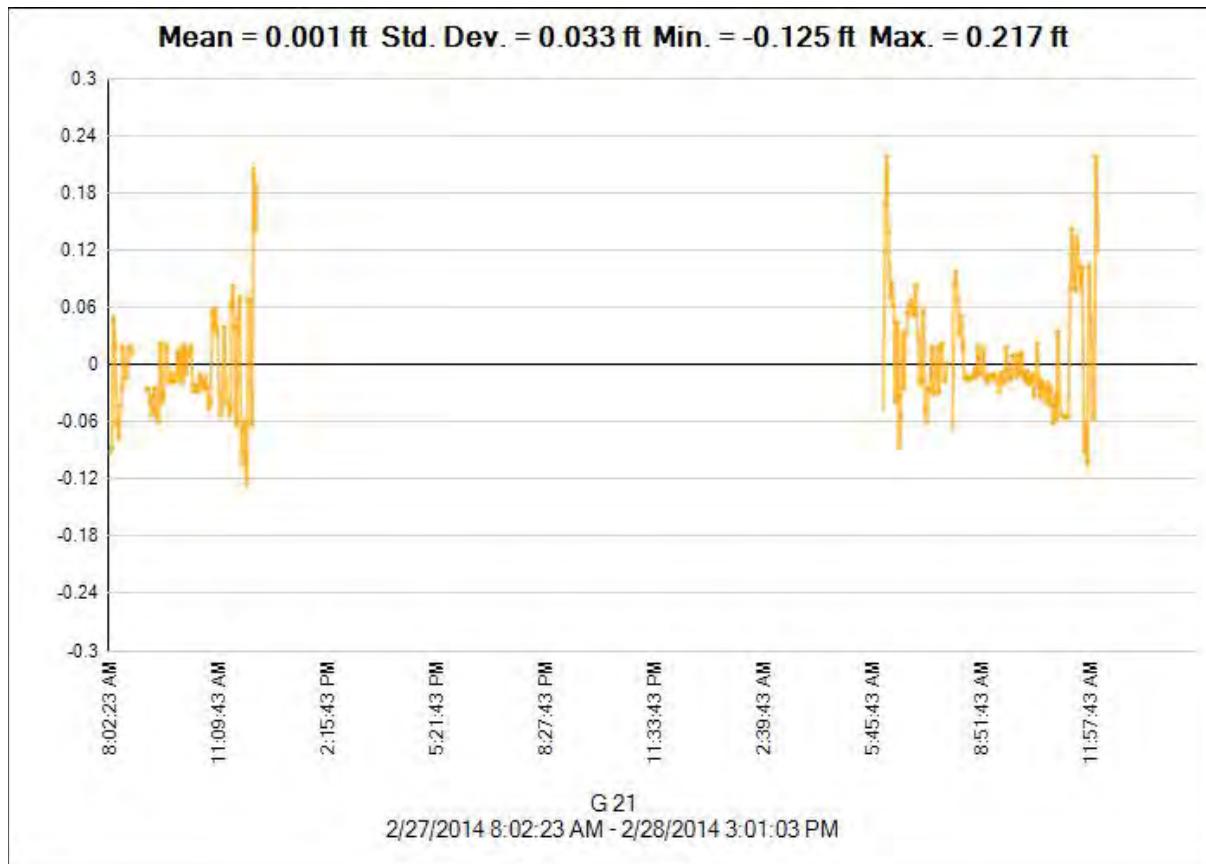


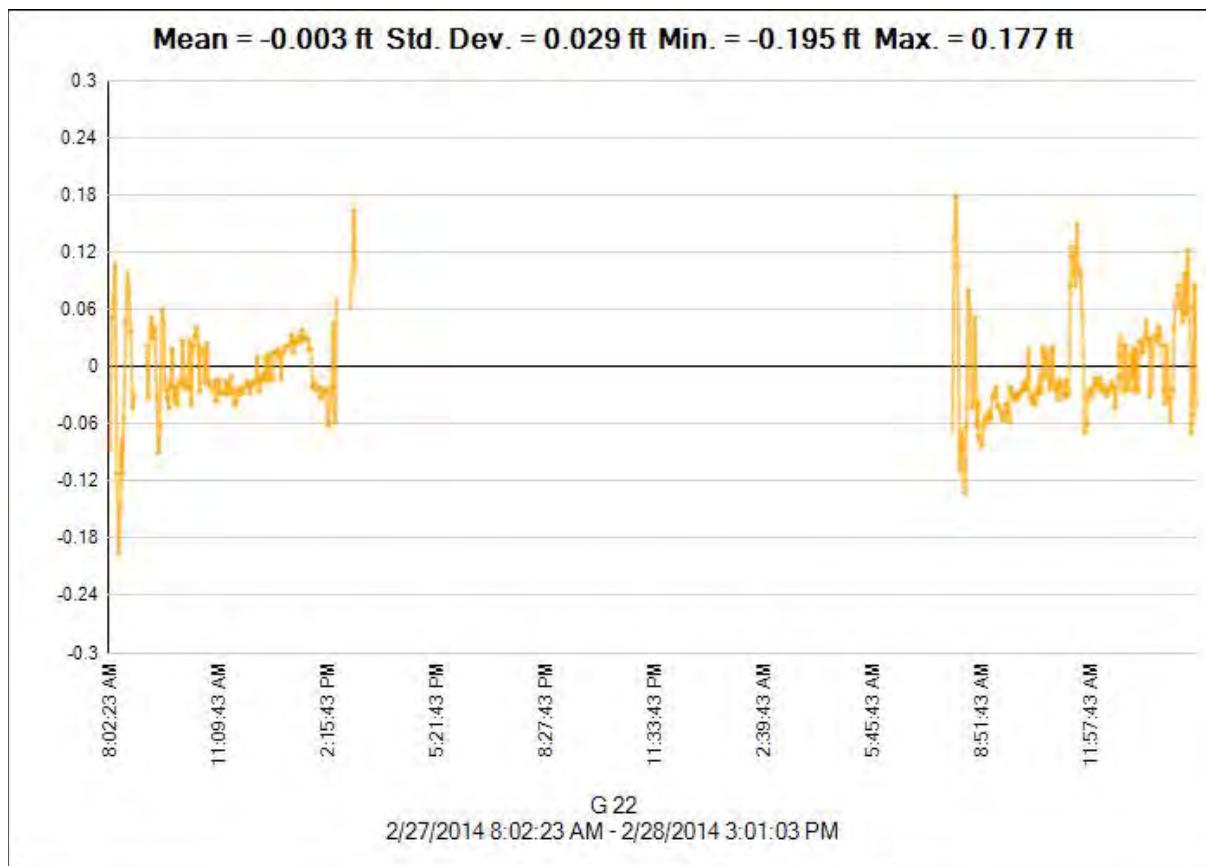


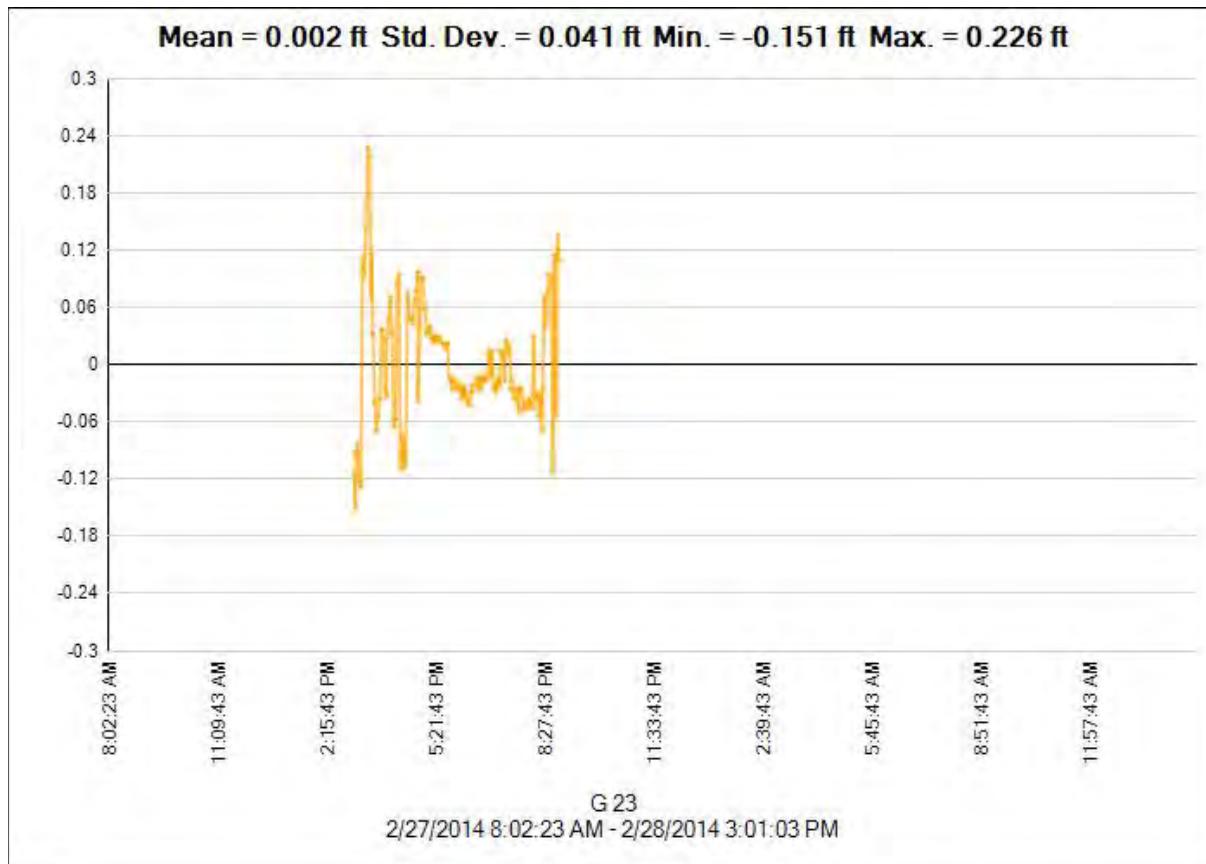


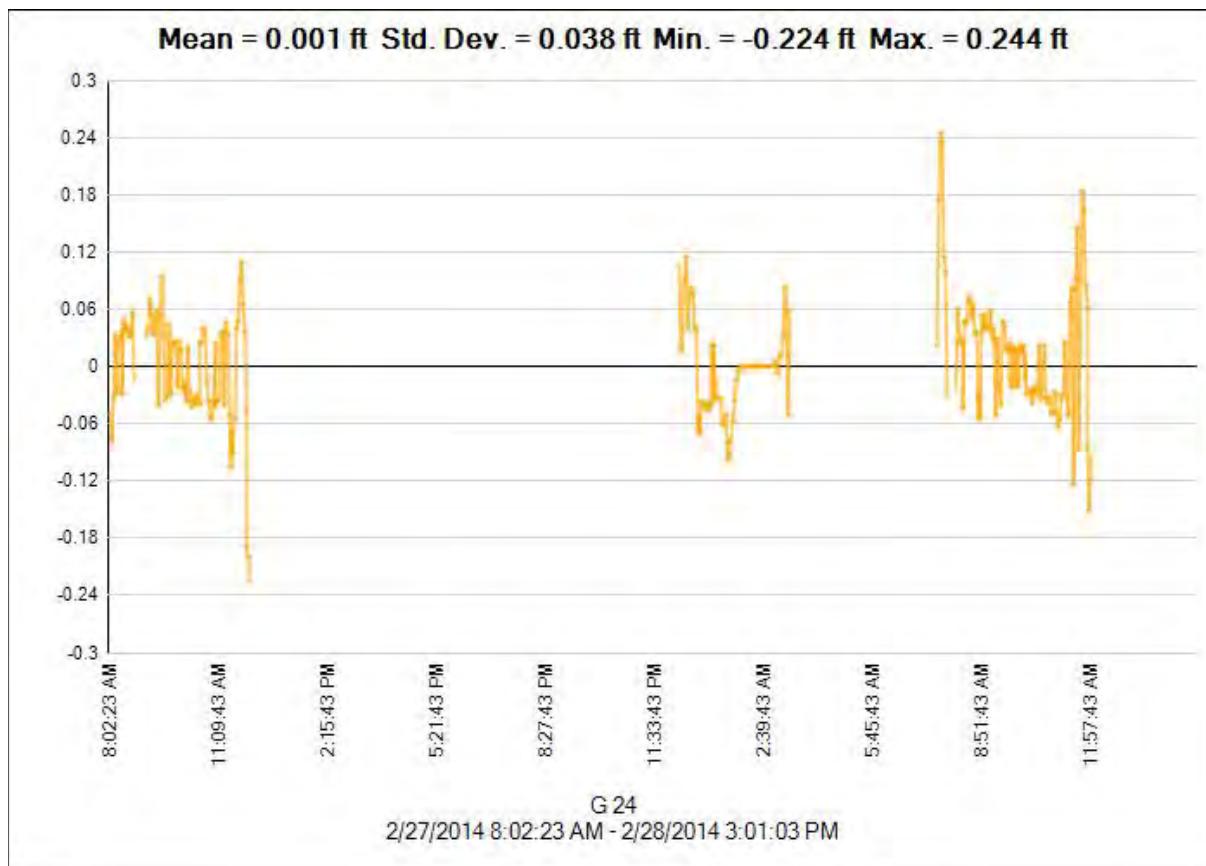


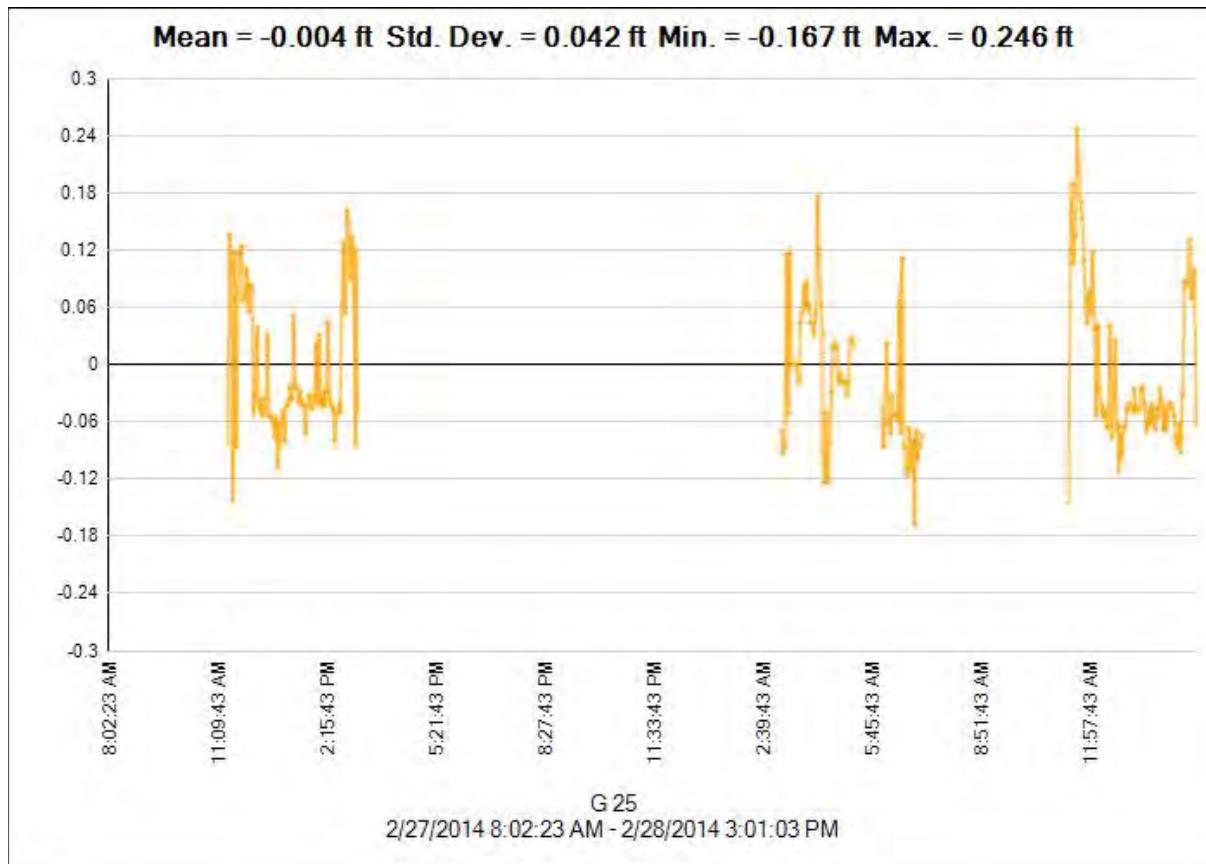


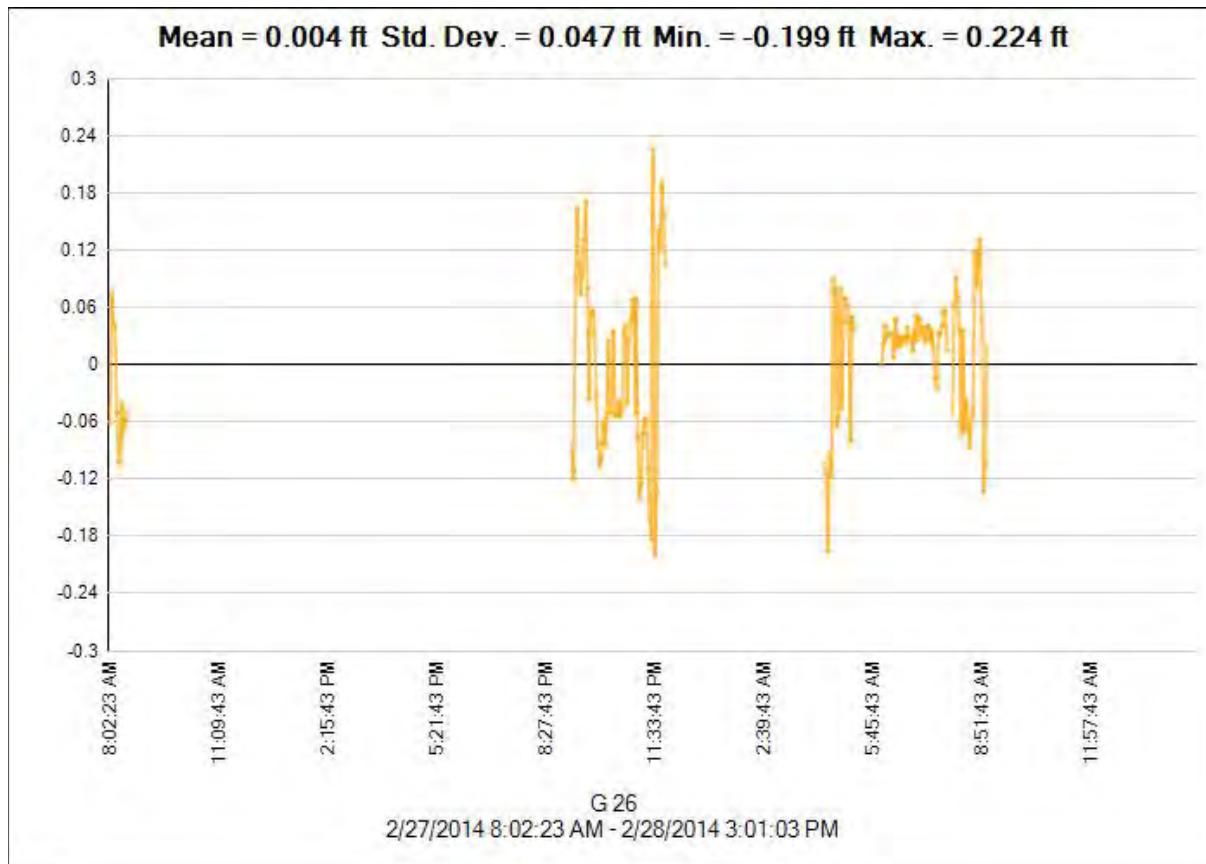


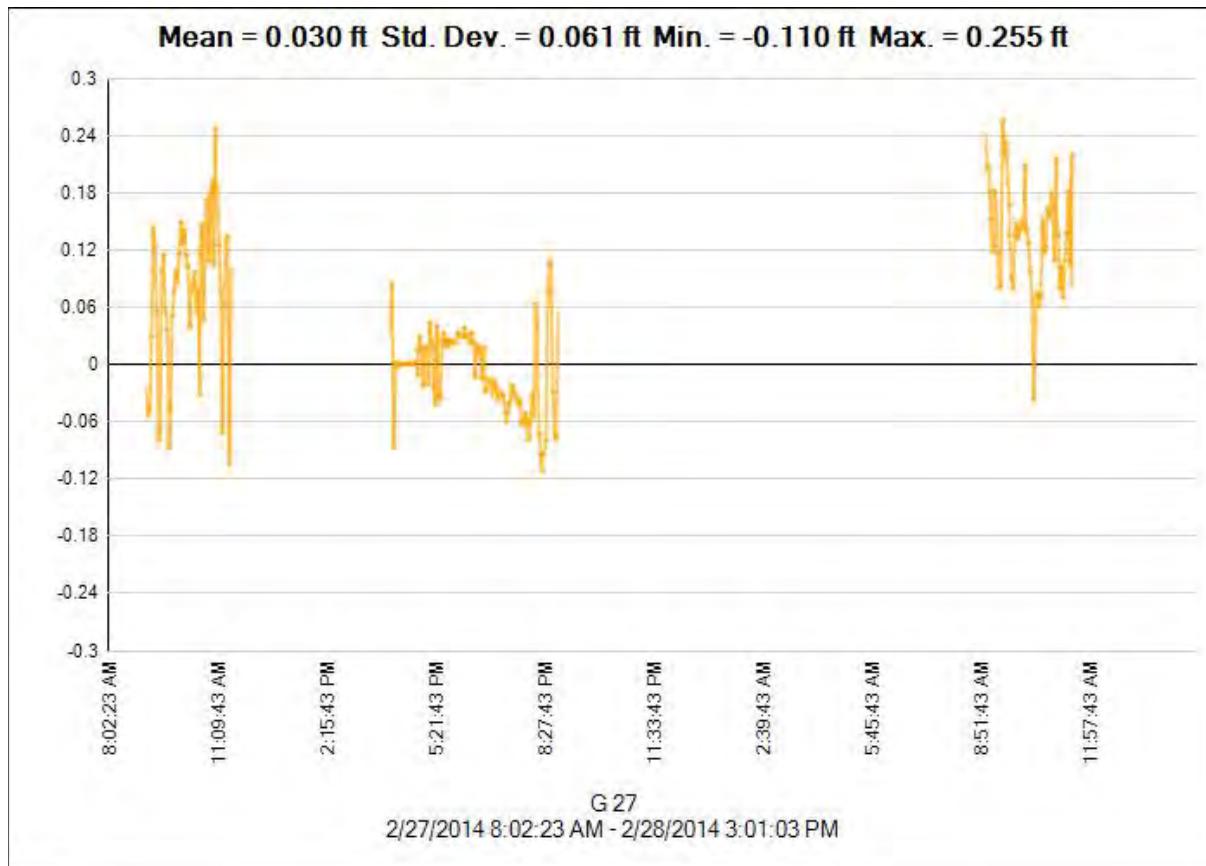


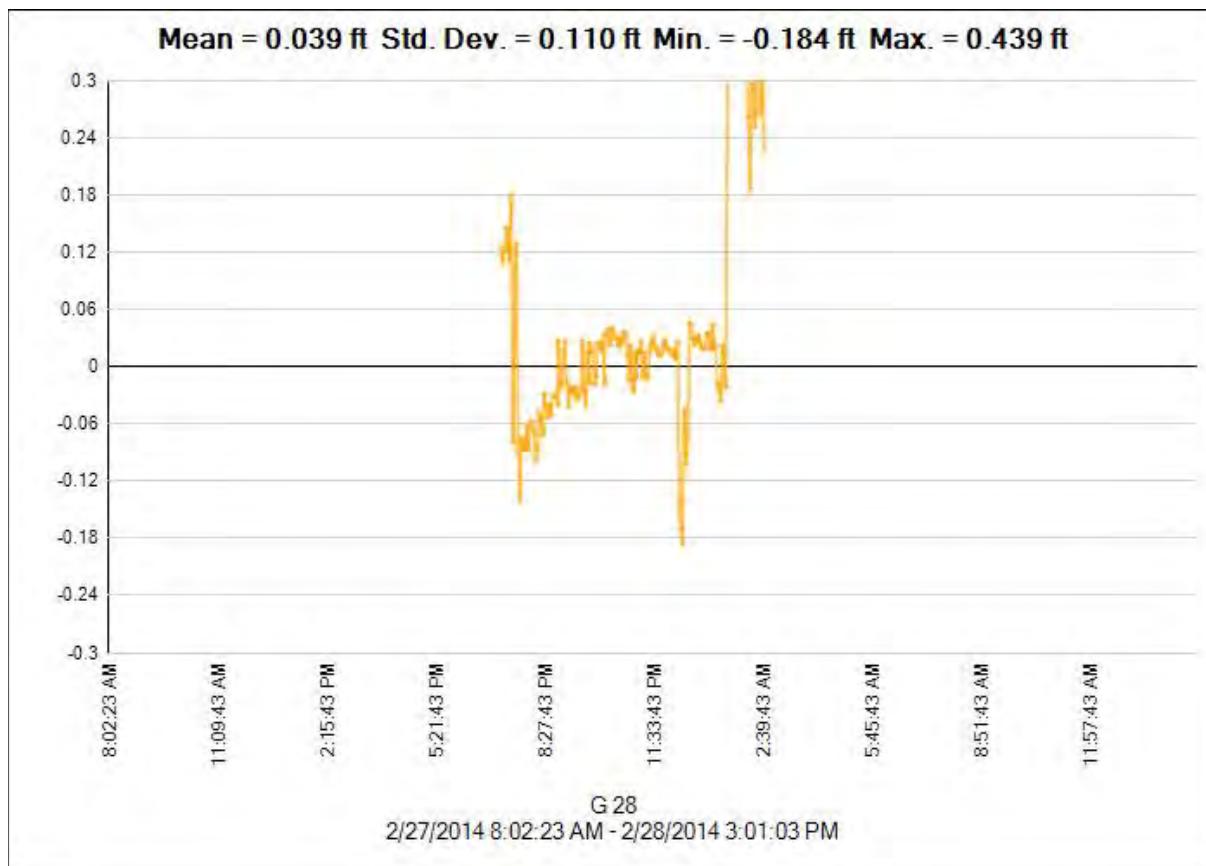


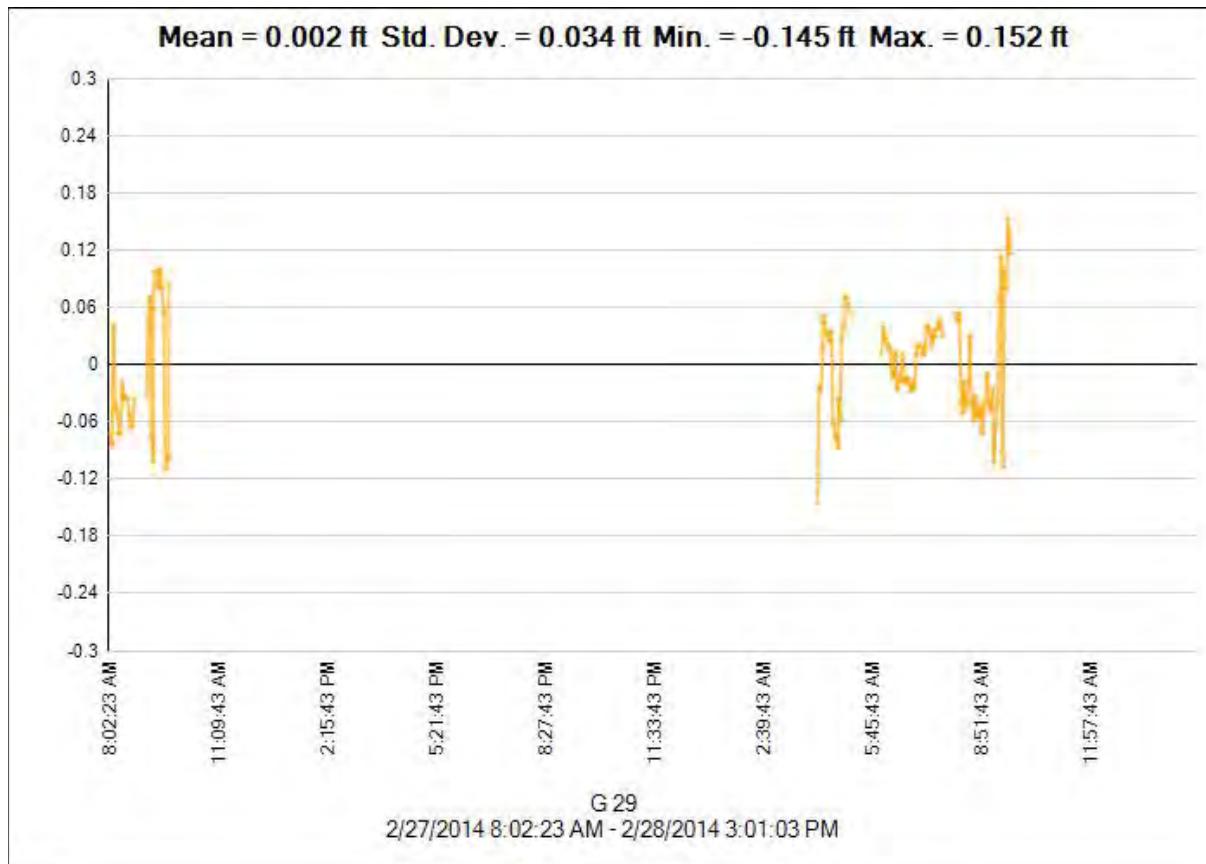


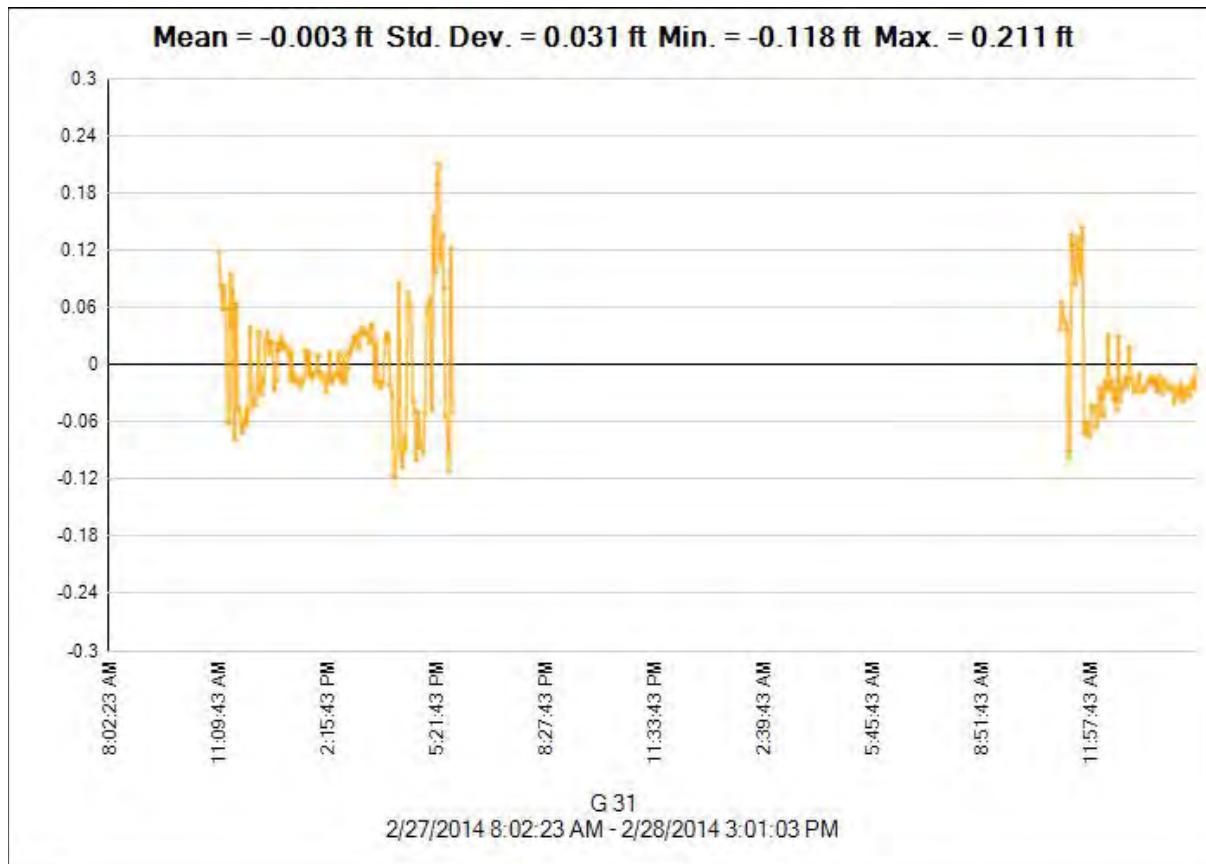


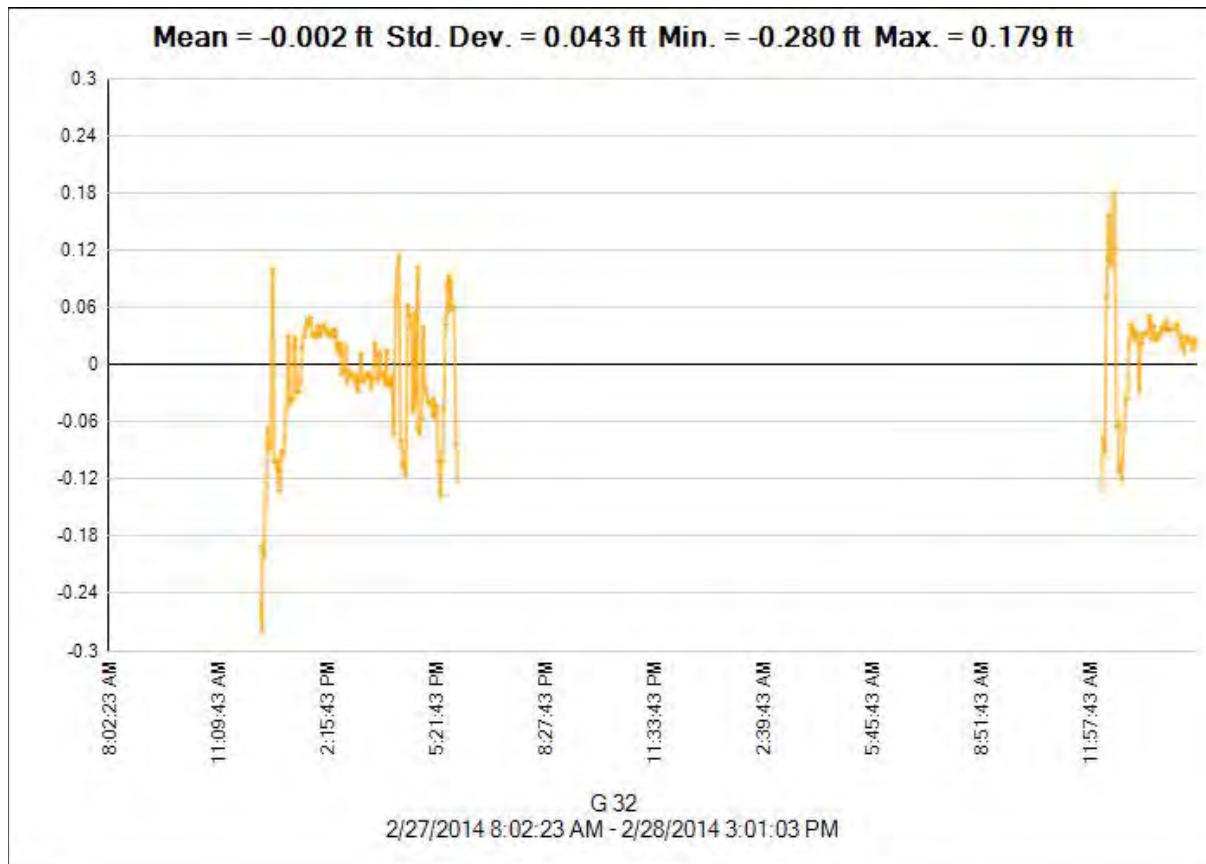














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





GRIS - TE14-SM-01 (8:19:09 AM-2:24:14 PM) (S14)

Baseline observation: GRIS ---
TE14-SM-
01 (B22)

Processed: 4/2/2014
10:00:58
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.028 ft

Vertical precision: 0.058 ft

RMS: 0.018 ft

Maximum PDOP: 3.197

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
8:22:14
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
2:24:14
PM
(Local:
UTC-6hr)

Processing duration: 06:02:00

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	GRIS
-------	------



Grid		Local		Global	
Northing	281033.474 ft	Latitude	N29°15'55.88300"	Latitude	N29°15'55.88300"
Easting	3719590.183 ft	Longitude	W89°57'26.26226"	Longitude	W89°57'26.26226"
Elevation	27.375 ft	Height	-51.286 ft	Height	-51.286 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.174 ft	Latitude	N29°02'49.70617"	Latitude	N29°02'49.70617"
Easting	3438609.482 ft	Longitude	W90°50'22.54572"	Longitude	W90°50'22.54572"
Elevation	1.103 ft	Height	-77.655 ft	Height	-77.656 ft

Vector					
ΔNorthing	-81710.300 ft	NS Fwd Azimuth	254°28'05"	ΔX	-281887.155 ft
ΔEasting	-280980.701 ft	Ellipsoid Dist.	292610.504 ft	ΔY	-36705.877 ft
ΔElevation	-26.272 ft	ΔHeight	-26.369 ft	ΔZ	-69363.515 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.008 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.011 ft
σ ΔEasting	0.011 ft	σ Ellipsoid Dist.	0.012 ft	σ ΔY	0.027 ft
σ ΔElevation	0.029 ft	σ ΔHeight	0.029 ft	σ ΔZ	0.015 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000117509		
Y	0.0000007614	0.0000657691	
Z	0.0000022790	-0.0000294831	0.0000201497

Occupations

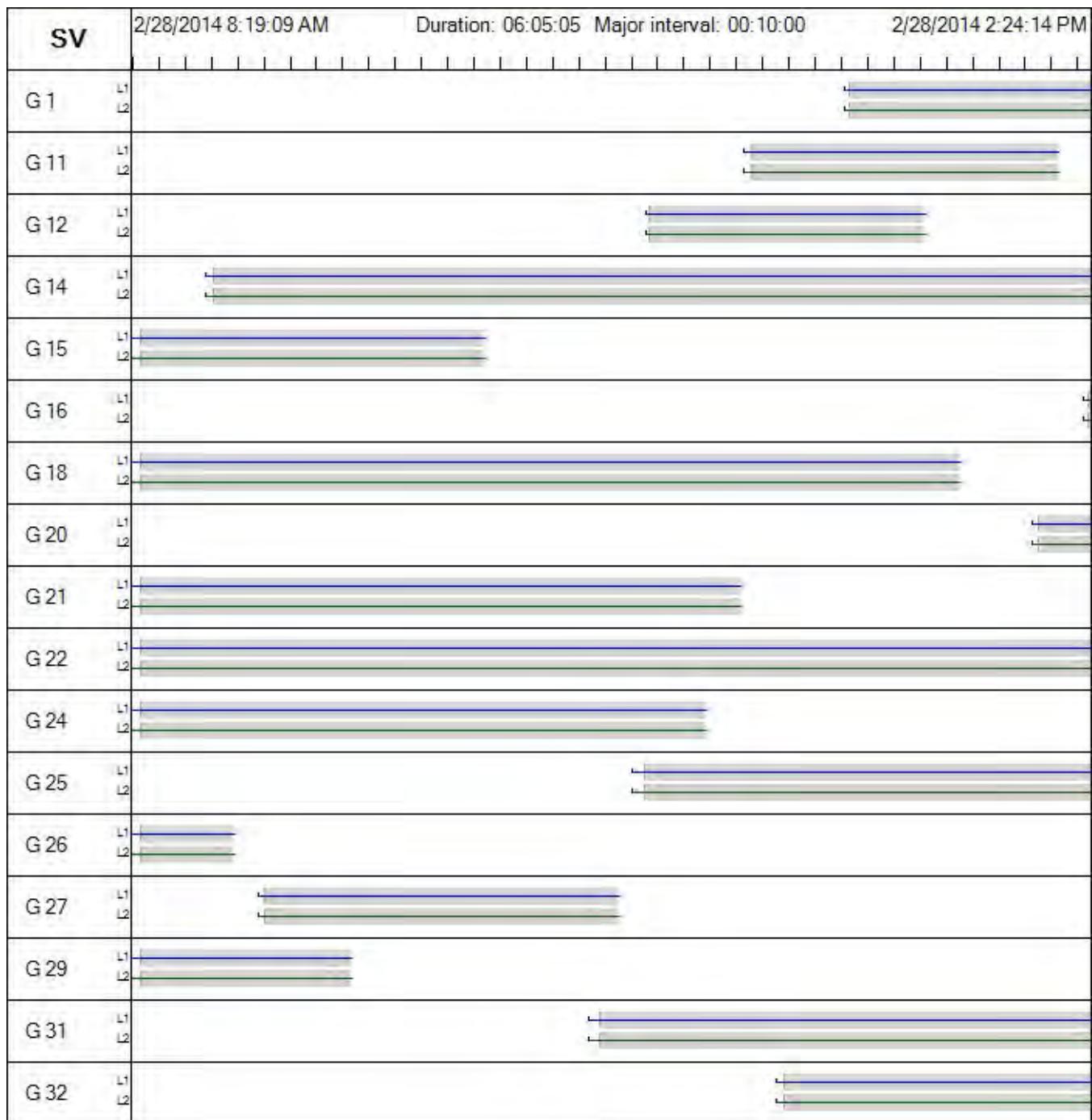
	From	To
Point ID:	GRIS	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920590.T02
Receiver type:	NetR9	R7 GNSS
Receiver serial number:	5201K41142	5040K18292
Antenna type:	Zephyr Geodetic 2 RoHS	Zephyr Geodetic 2
Antenna serial number:	5000117437	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount

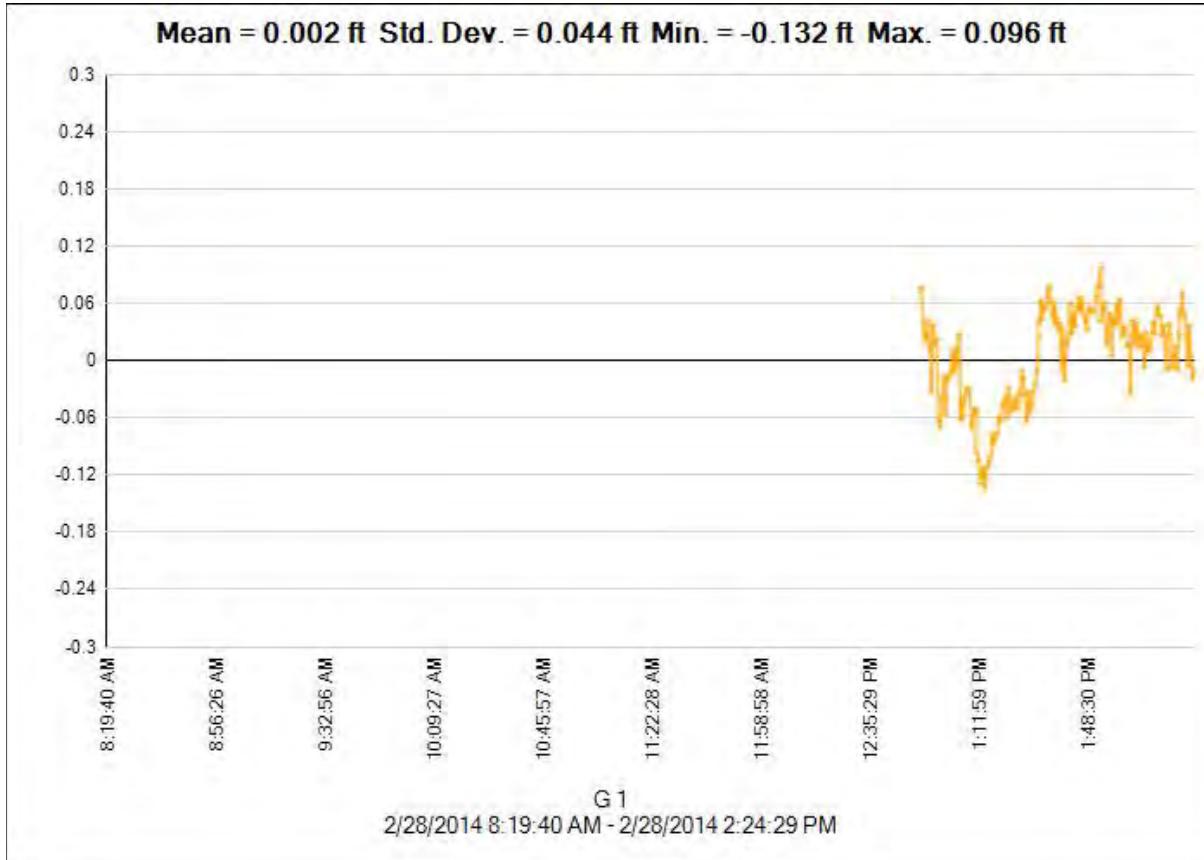


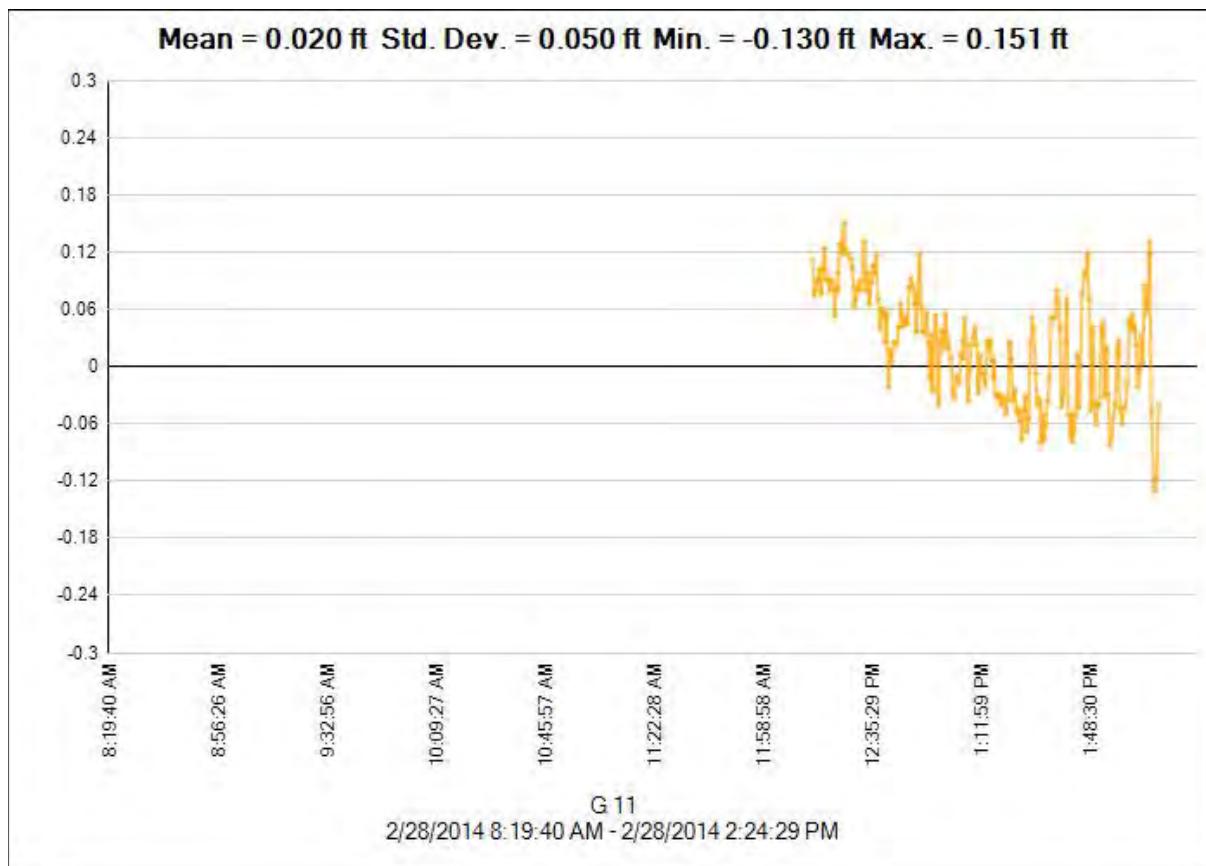
Tracking Summary

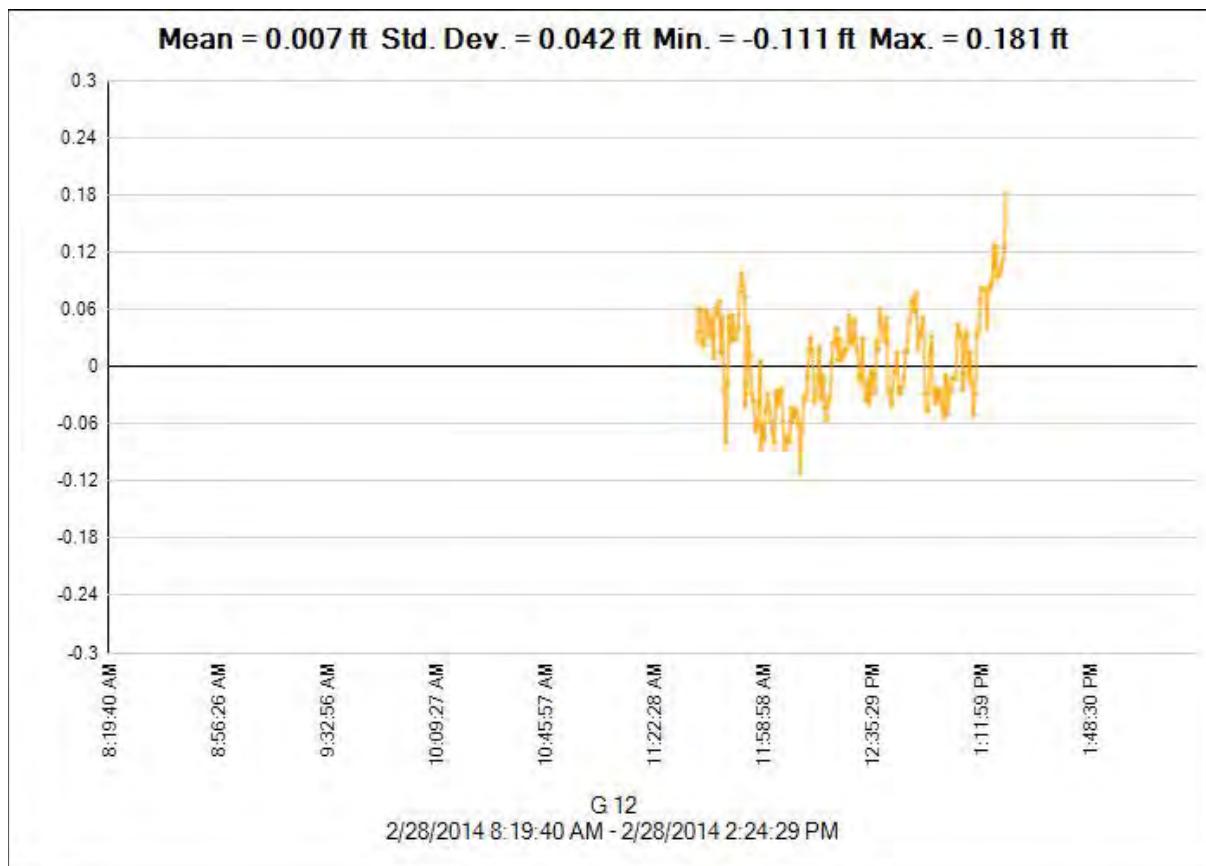


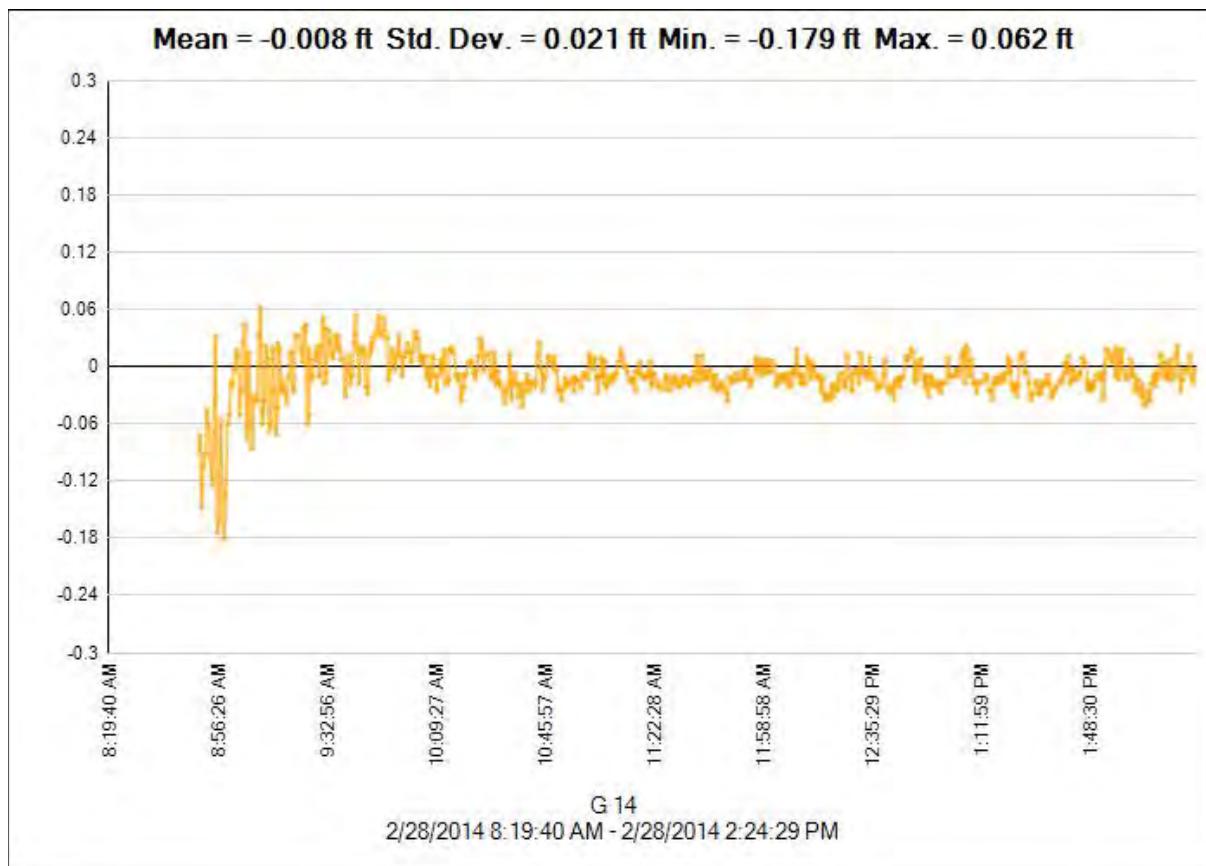


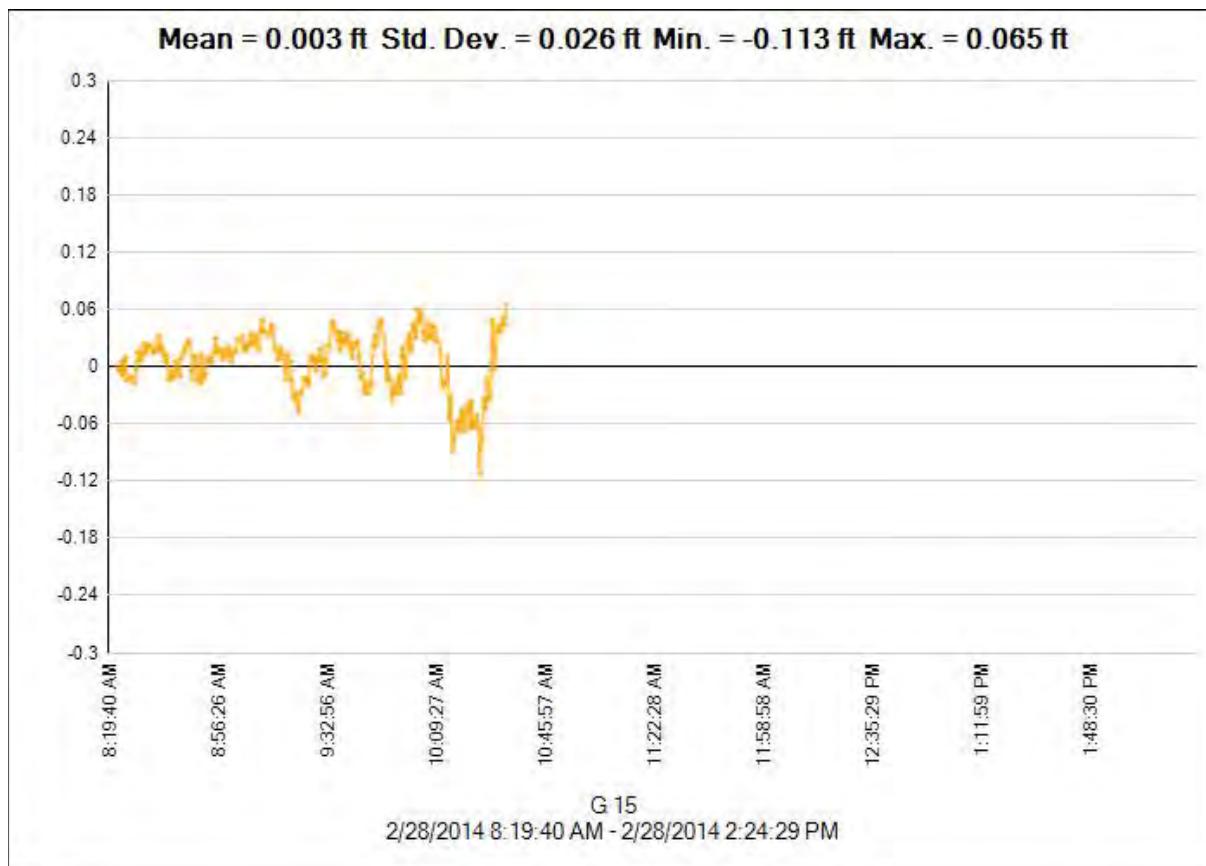
Residuals

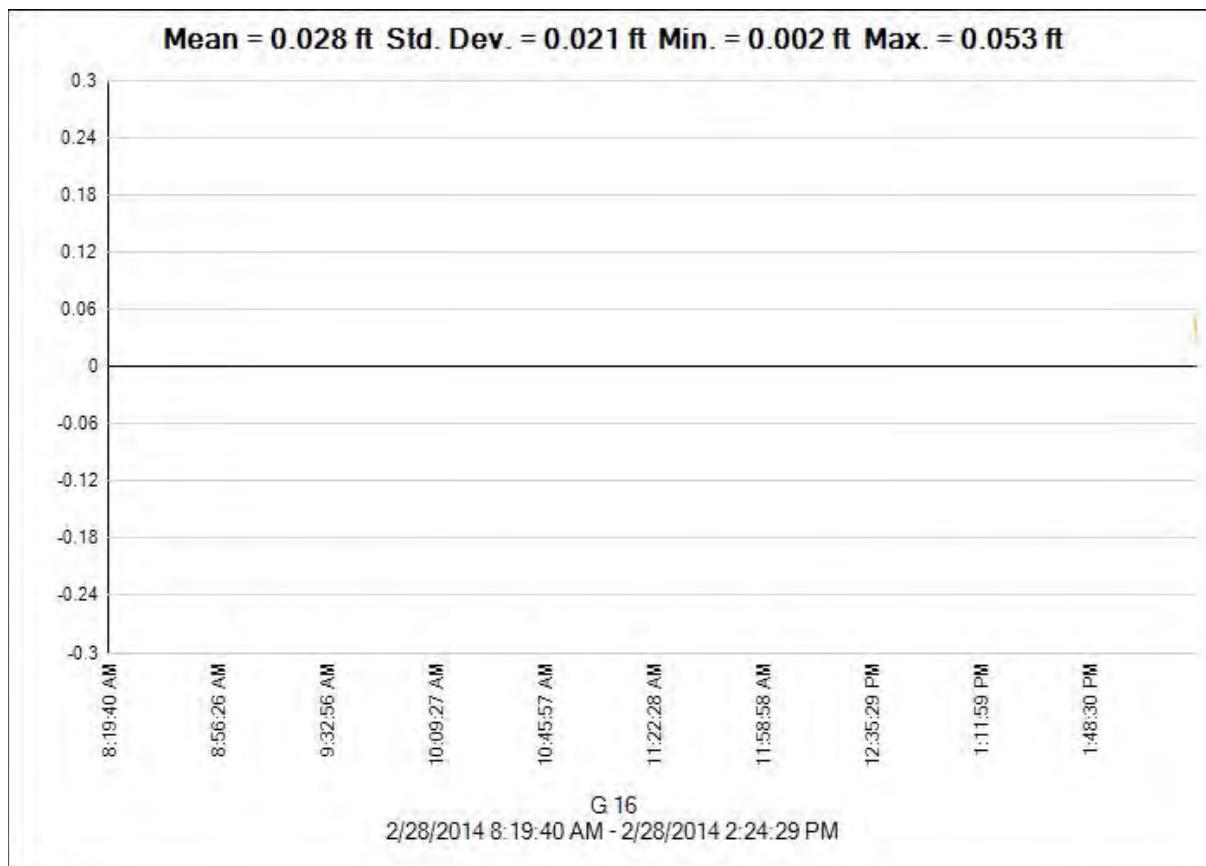


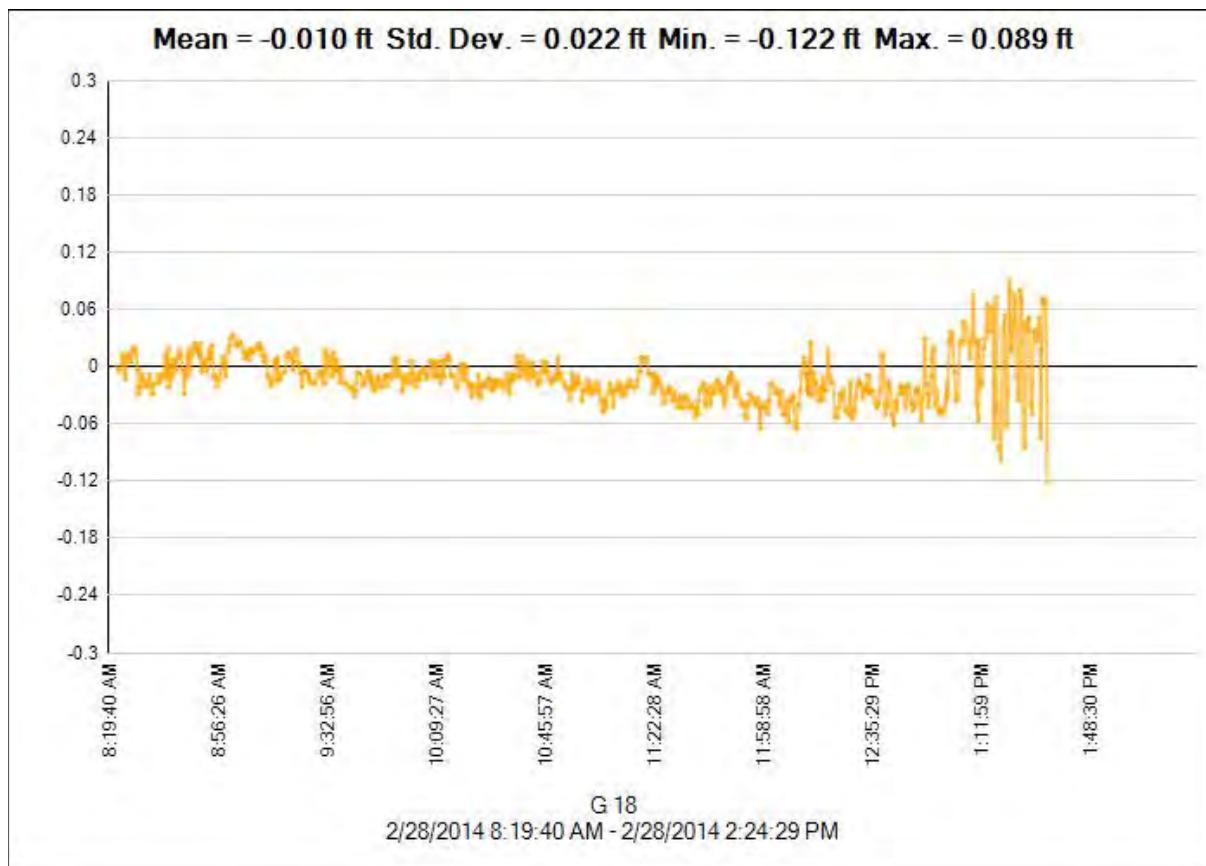


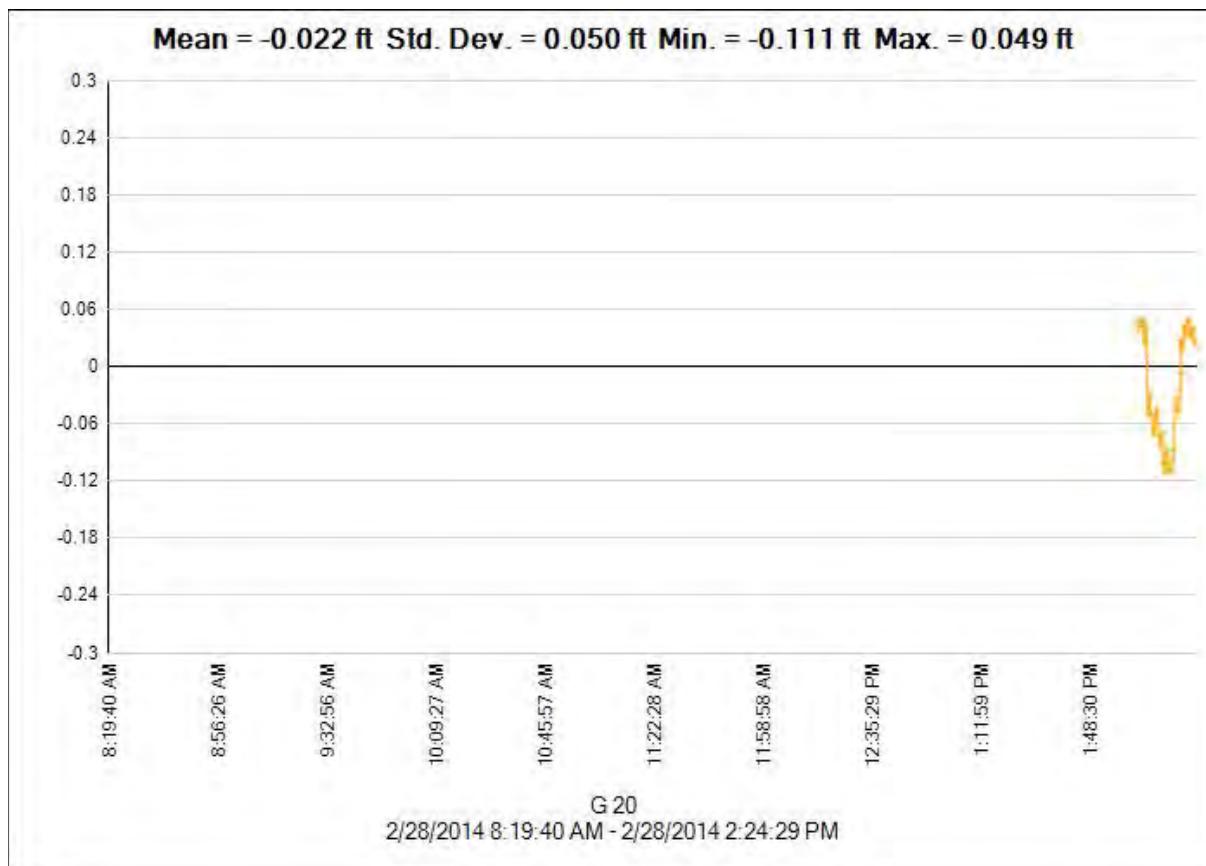


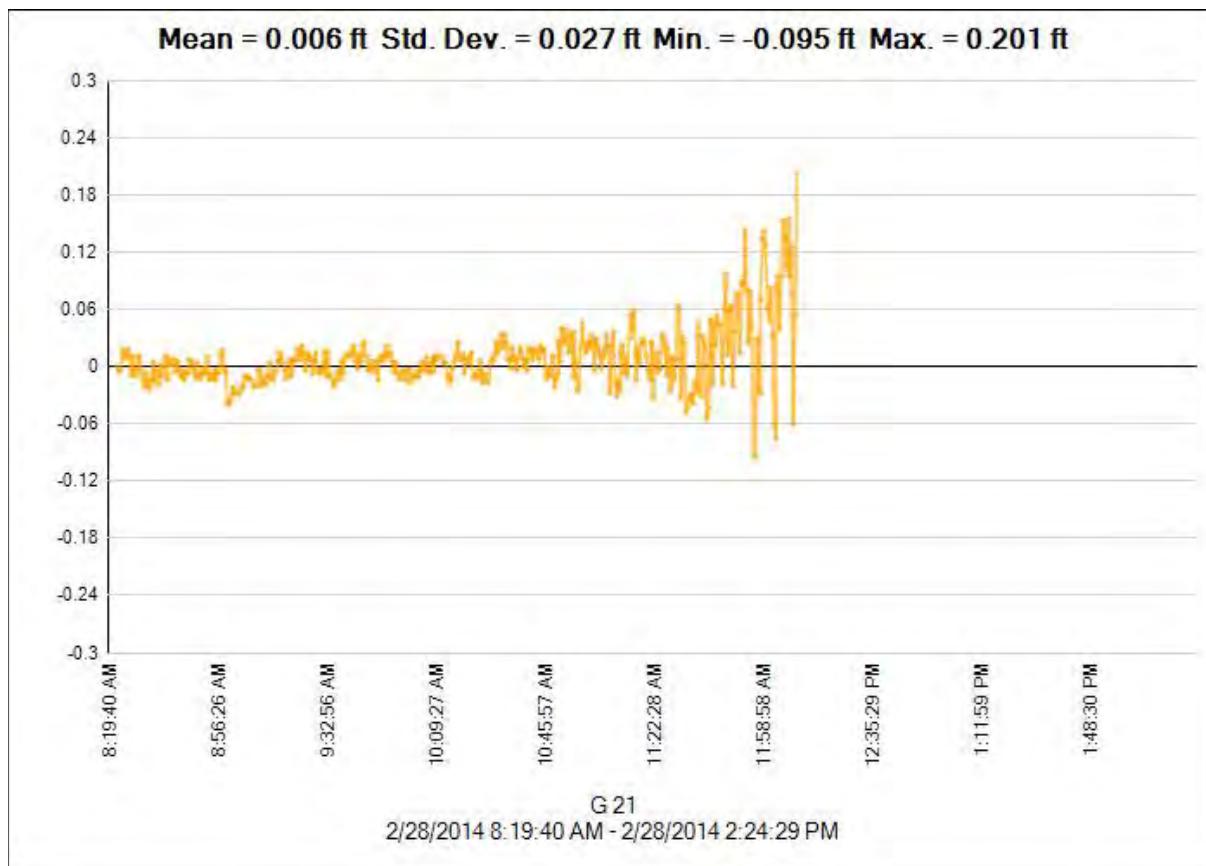


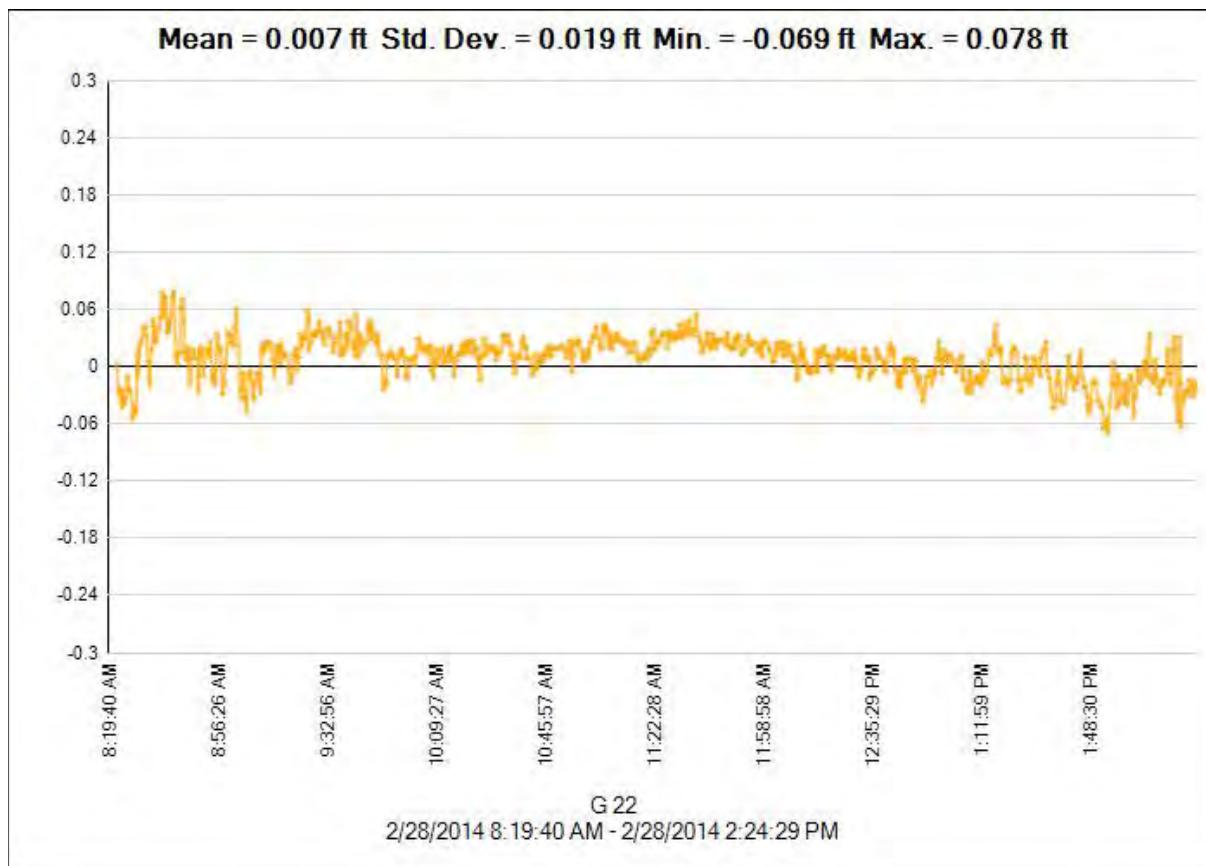


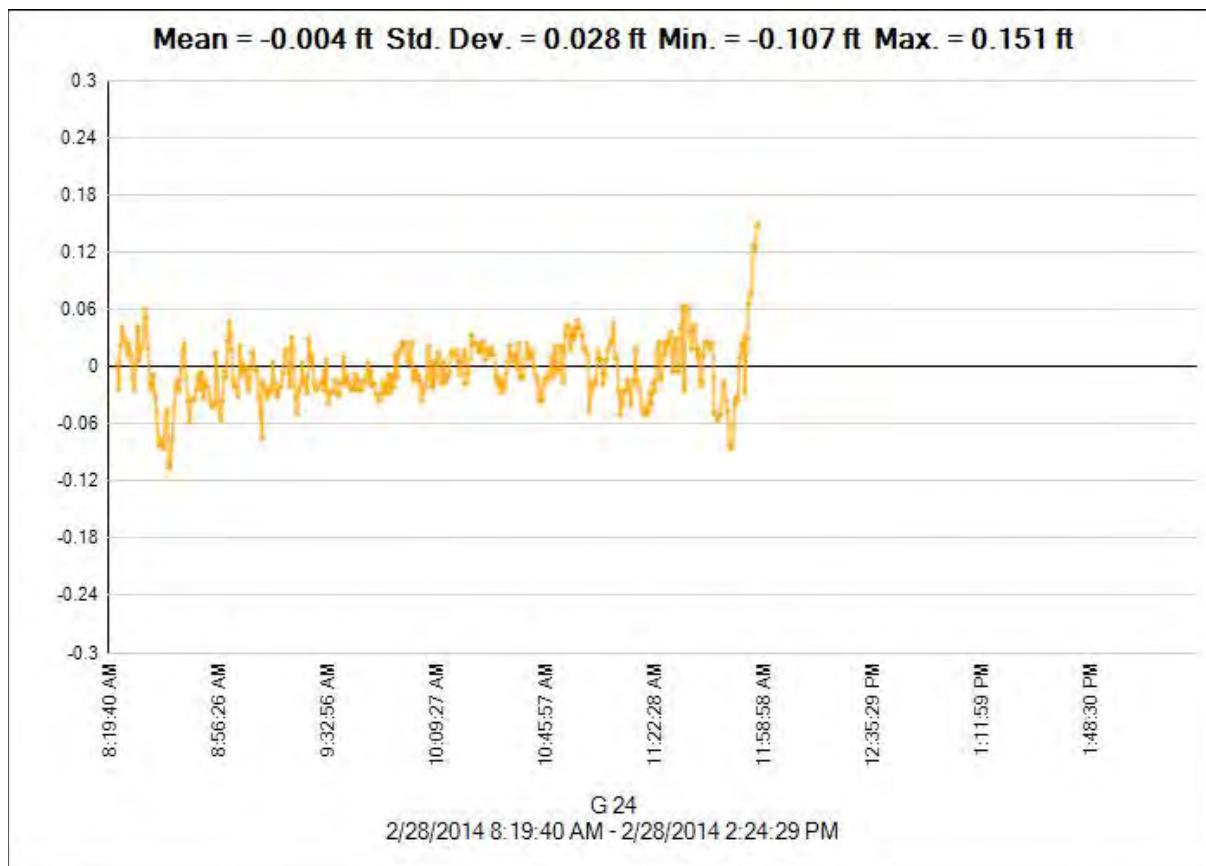


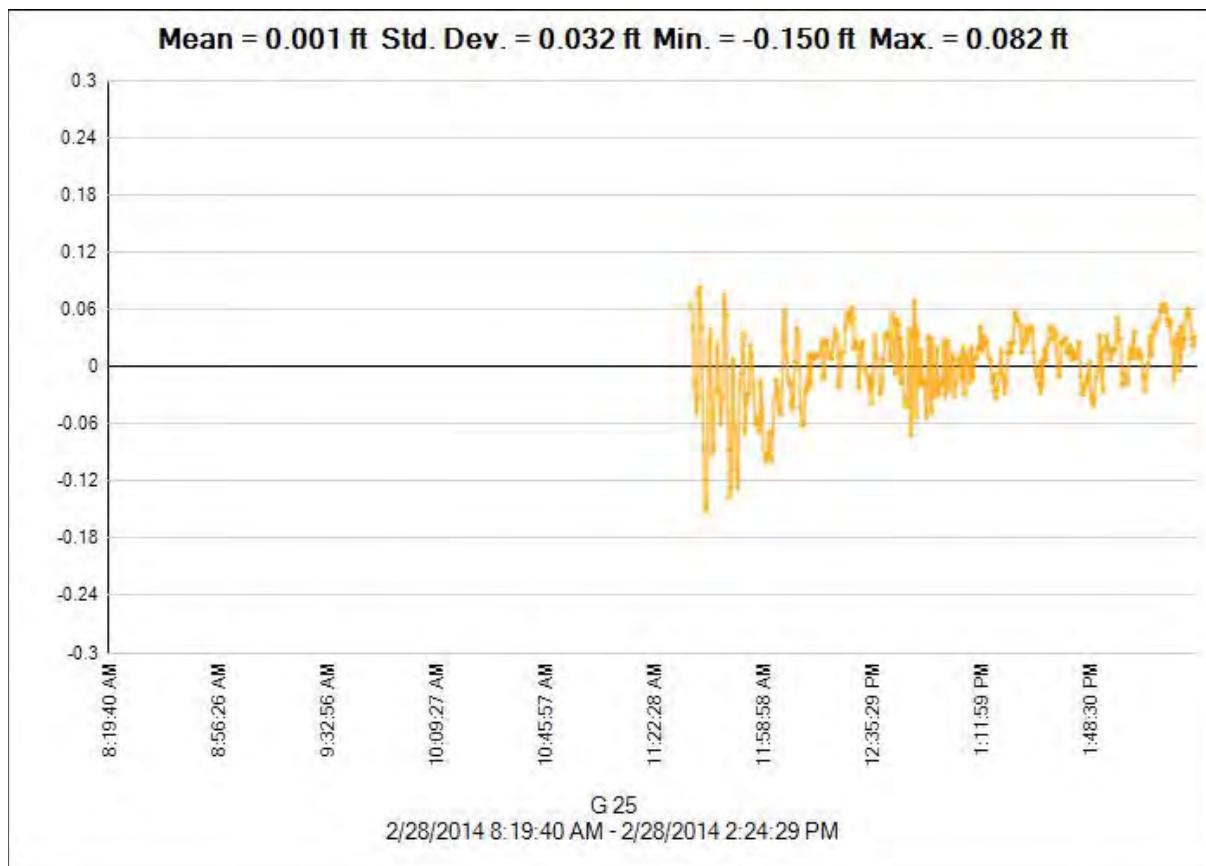


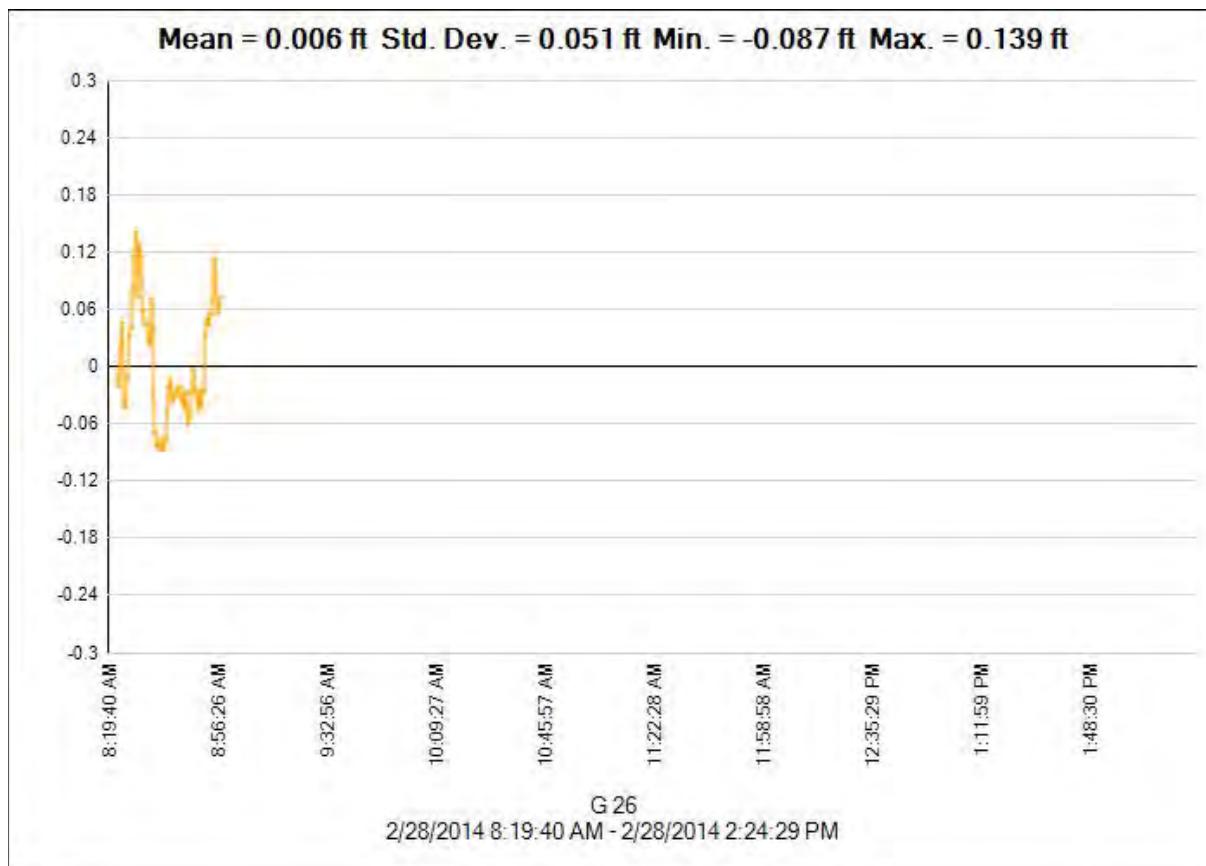


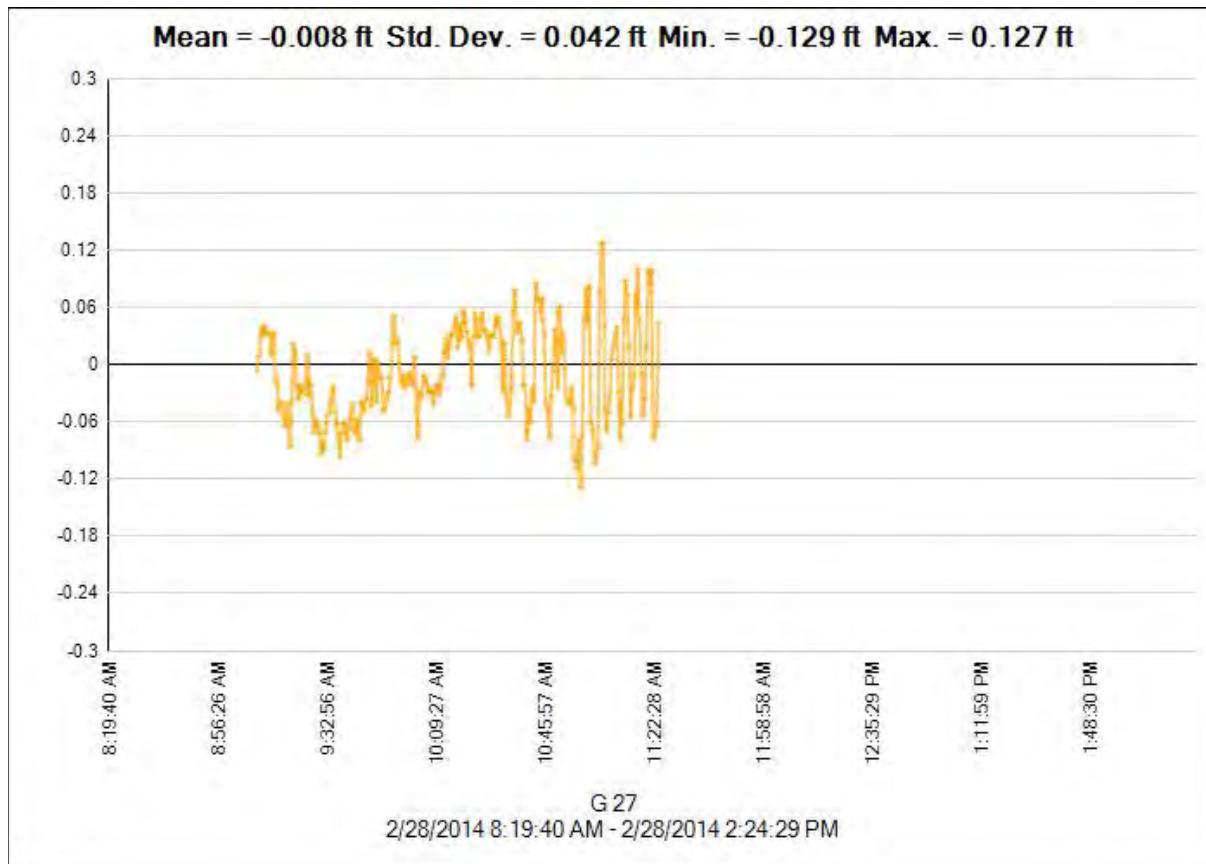


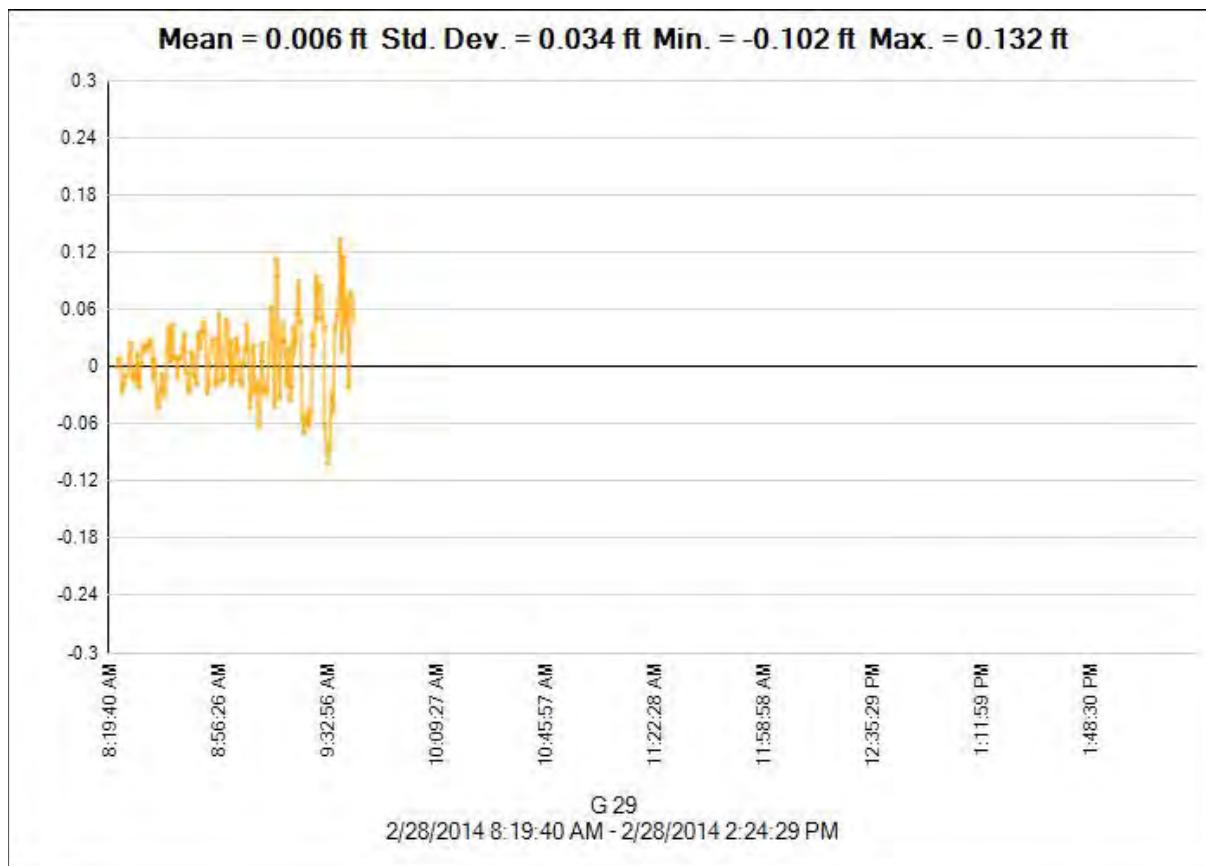


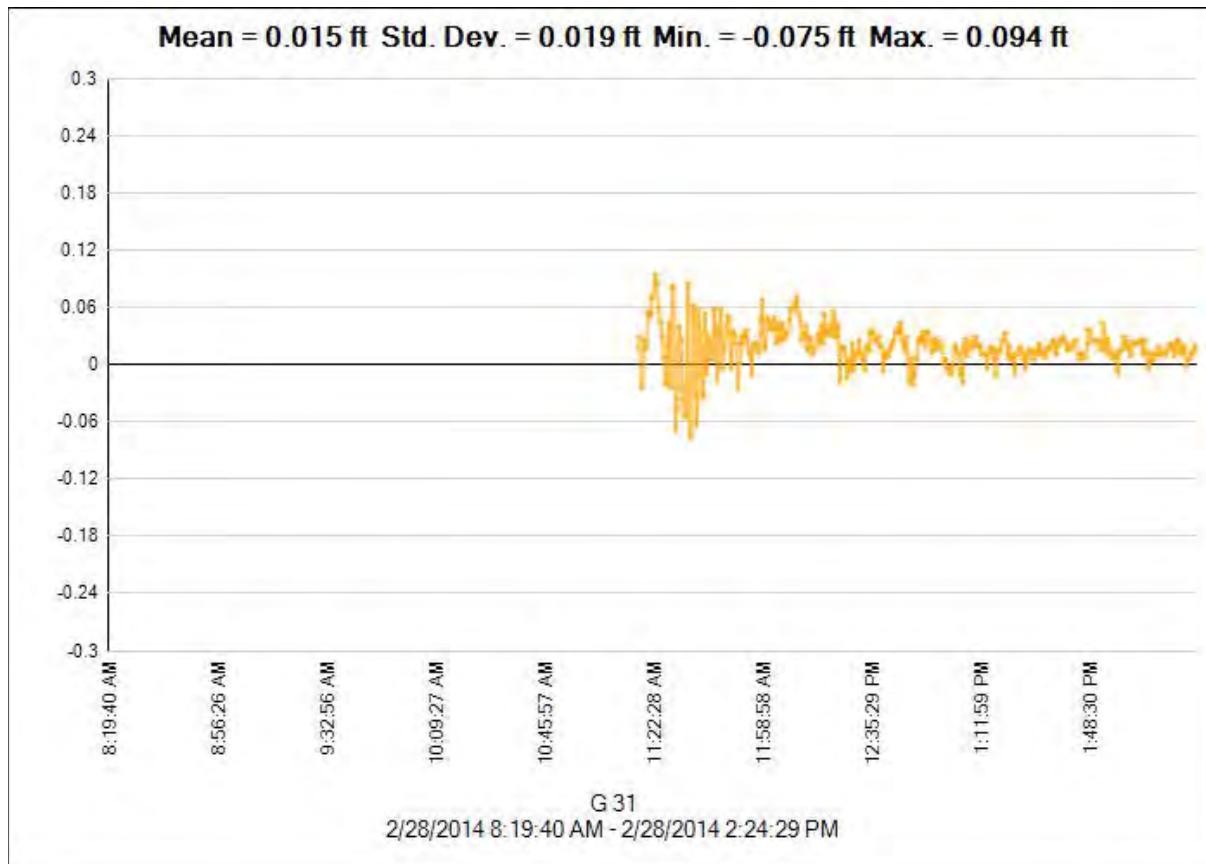


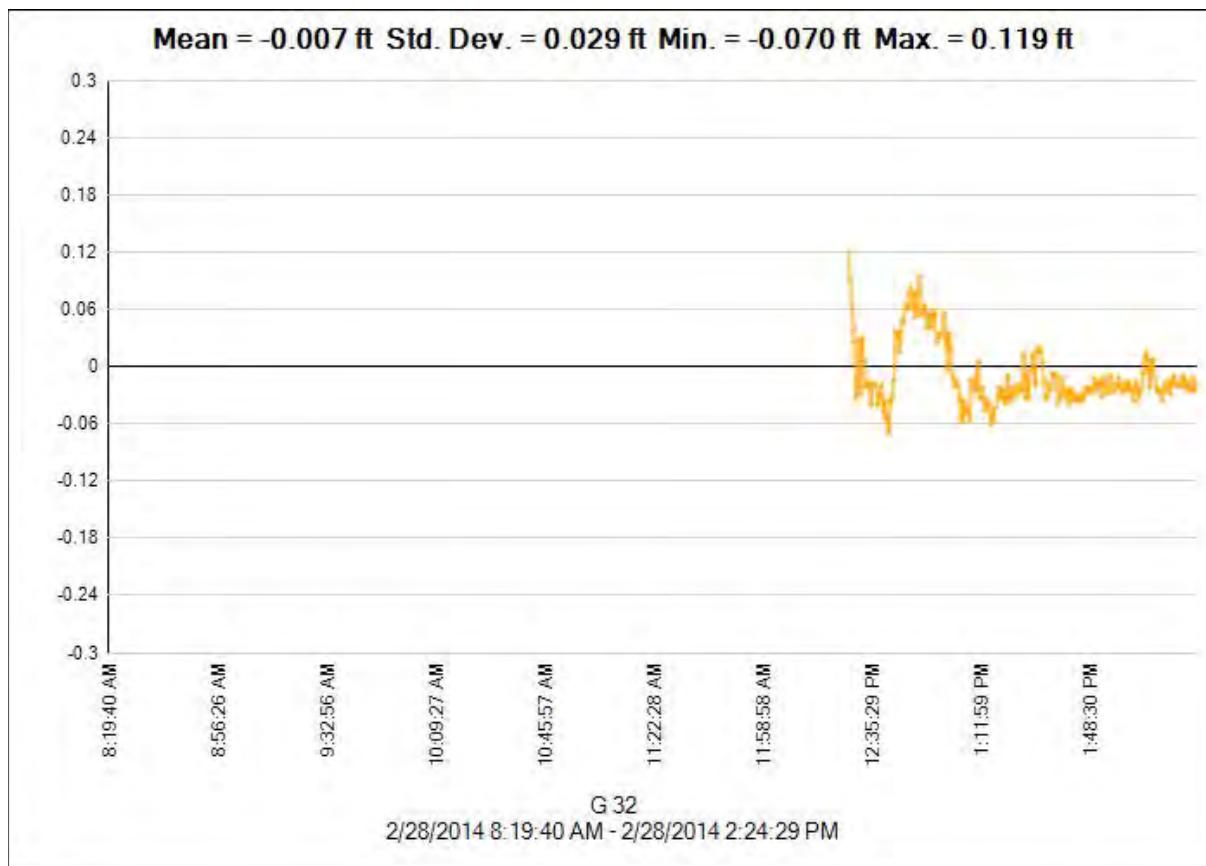














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





GRIS - TE14-SM-01 (8:44:37 AM-4:48:15 PM) (S13)

Baseline observation: GRIS ---
TE14-SM-
01 (B23)

Processed: 4/2/2014
10:00:52
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.028 ft

Vertical precision: 0.056 ft

RMS: 0.010 ft

Maximum PDOP: 1.863

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:47:14
AM
(Local:
UTC-6hr)

Processing stop time: 2/27/2014
4:48:14
PM
(Local:
UTC-6hr)

Processing duration: 08:01:00

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	GRIS
-------	------



Grid		Local		Global	
Northing	281033.474 ft	Latitude	N29°15'55.88300"	Latitude	N29°15'55.88300"
Easting	3719590.183 ft	Longitude	W89°57'26.26226"	Longitude	W89°57'26.26226"
Elevation	27.375 ft	Height	-51.286 ft	Height	-51.286 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.177 ft	Latitude	N29°02'49.70620"	Latitude	N29°02'49.70619"
Easting	3438609.475 ft	Longitude	W90°50'22.54579"	Longitude	W90°50'22.54579"
Elevation	1.079 ft	Height	-77.679 ft	Height	-77.679 ft

Vector					
ΔNorthing	-81710.297 ft	NS Fwd Azimuth	254°28'05"	ΔX	-281887.161 ft
ΔEasting	-280980.707 ft	Ellipsoid Dist.	292610.510 ft	ΔY	-36705.855 ft
ΔElevation	-26.295 ft	ΔHeight	-26.393 ft	ΔZ	-69363.524 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.006 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.011 ft
σ ΔEasting	0.011 ft	σ Ellipsoid Dist.	0.011 ft	σ ΔY	0.025 ft
σ ΔElevation	0.028 ft	σ ΔHeight	0.028 ft	σ ΔZ	0.014 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000114447		
Y	0.0000016871	0.0000592072	
Z	0.0000010003	-0.0000297233	0.0000190450

Occupations

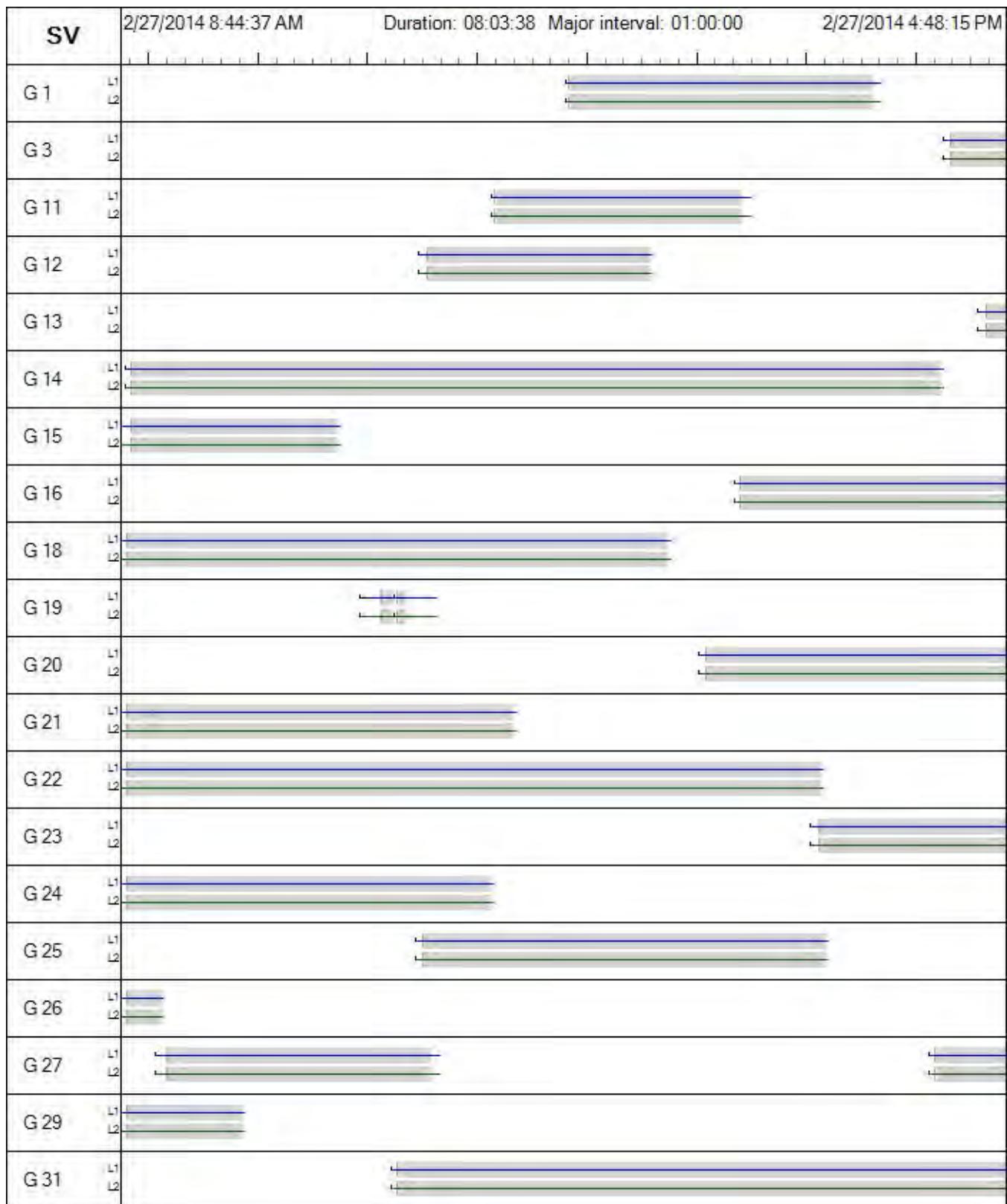
	From	To
Point ID:	GRIS	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920580.T02
Receiver type:	NetR9	R7 GNSS
Receiver serial number:	5201K41142	5040K18292
Antenna type:	Zephyr Geodetic 2 RoHS	Zephyr Geodetic 2
Antenna serial number:	5000117437	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount



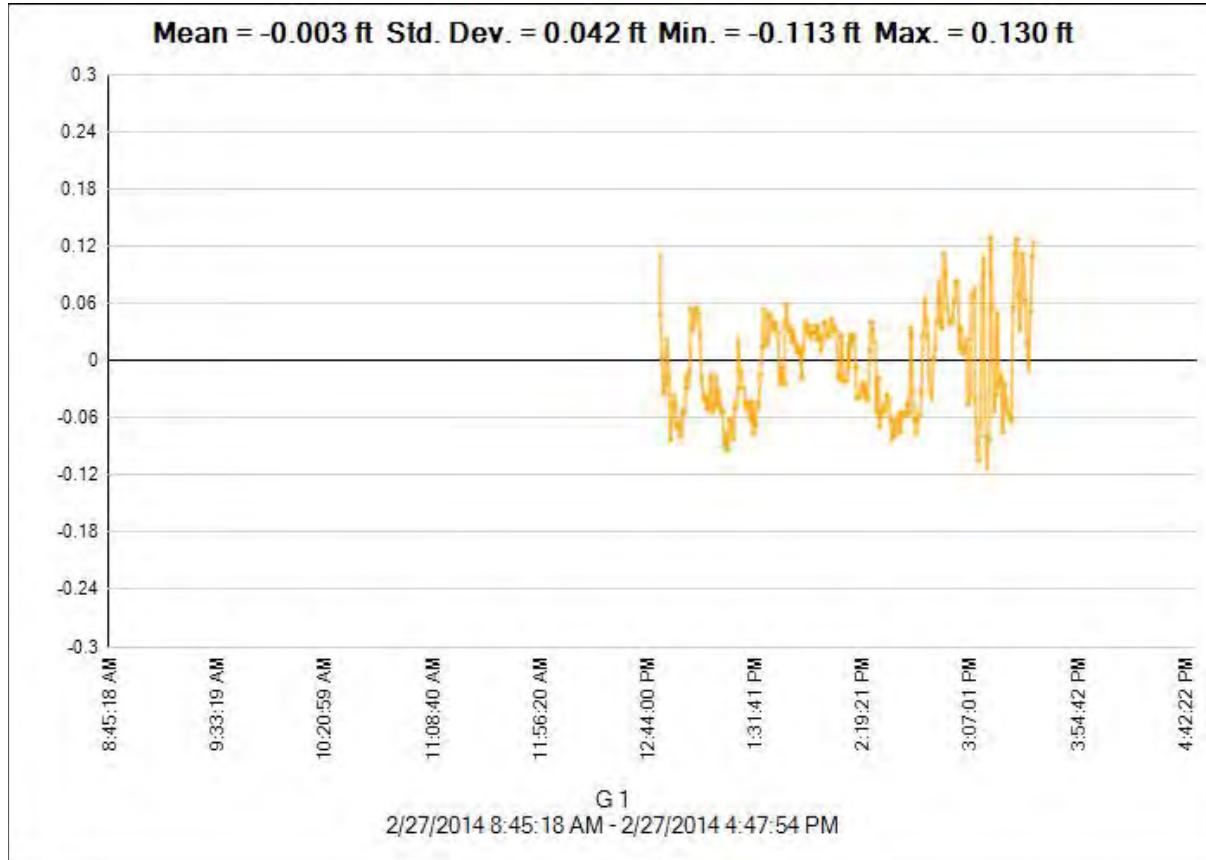
Tracking Summary

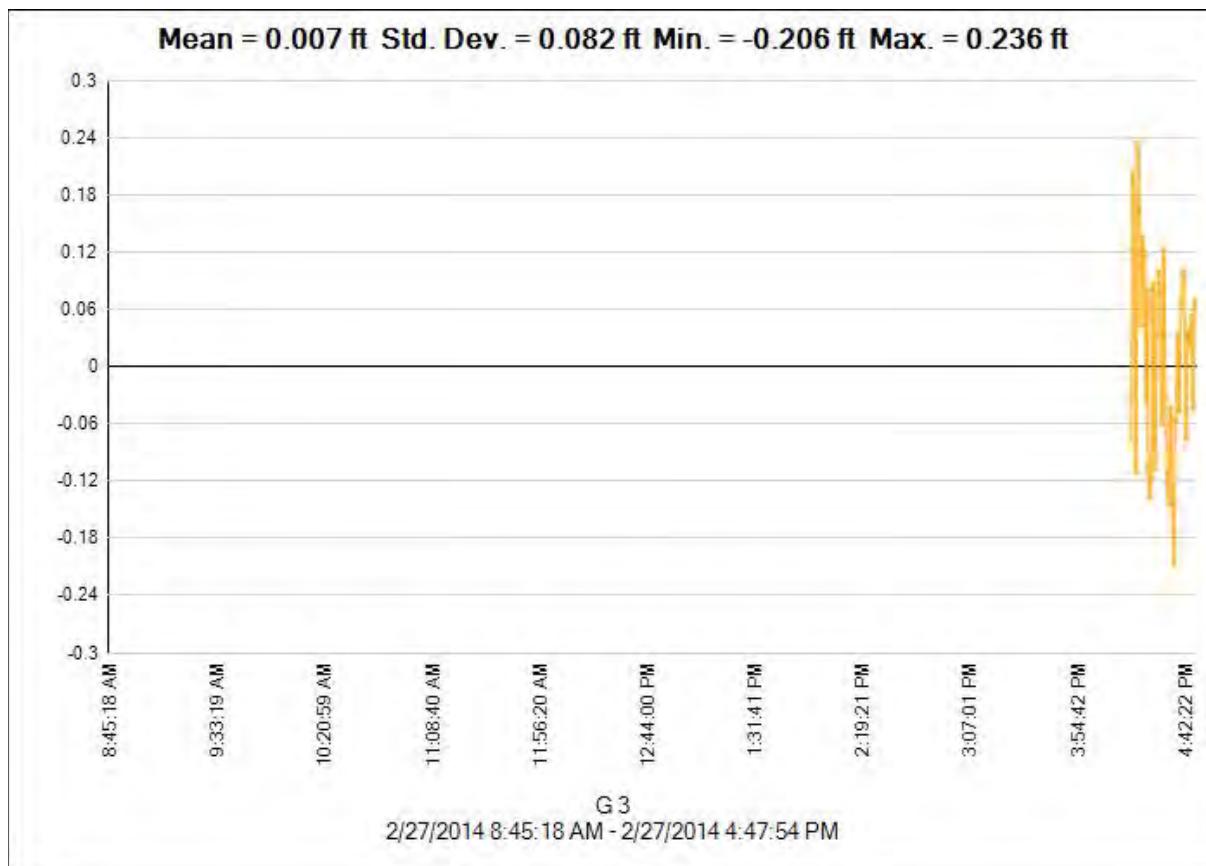


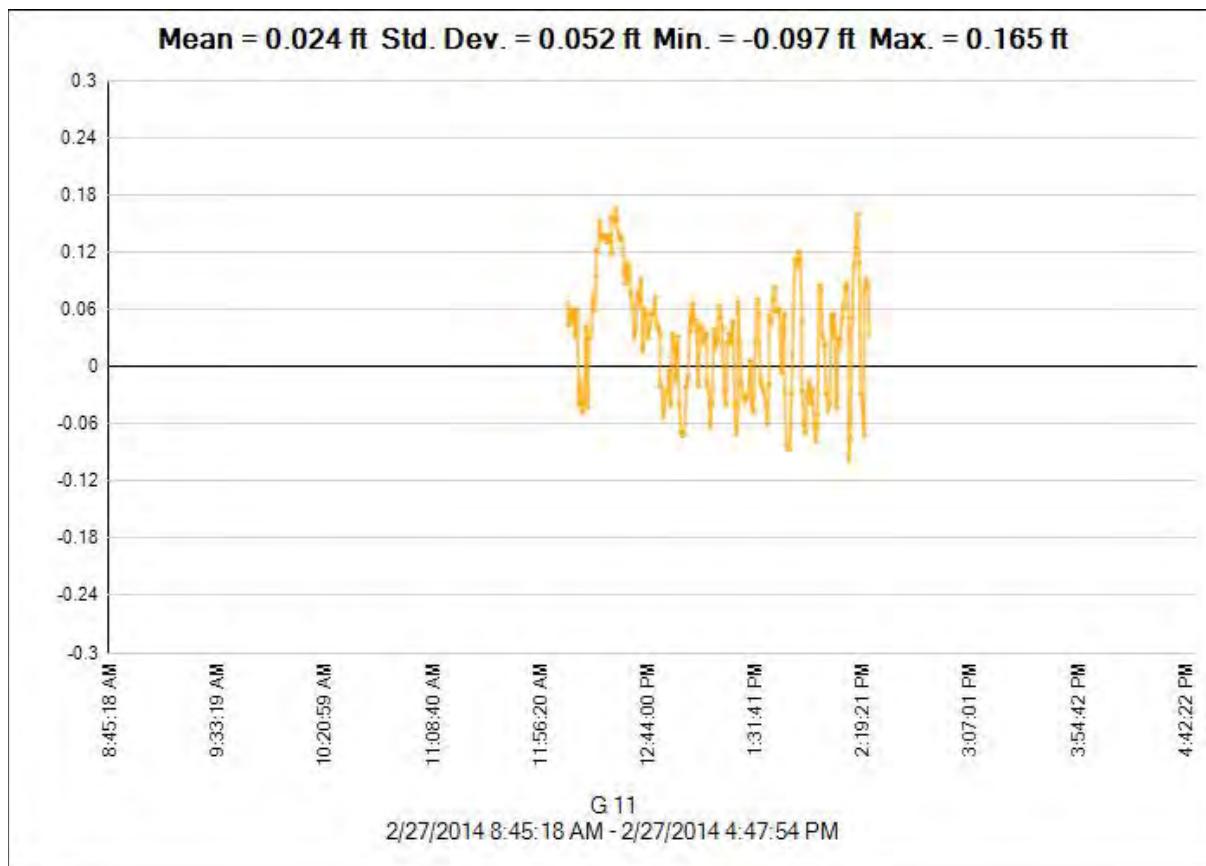


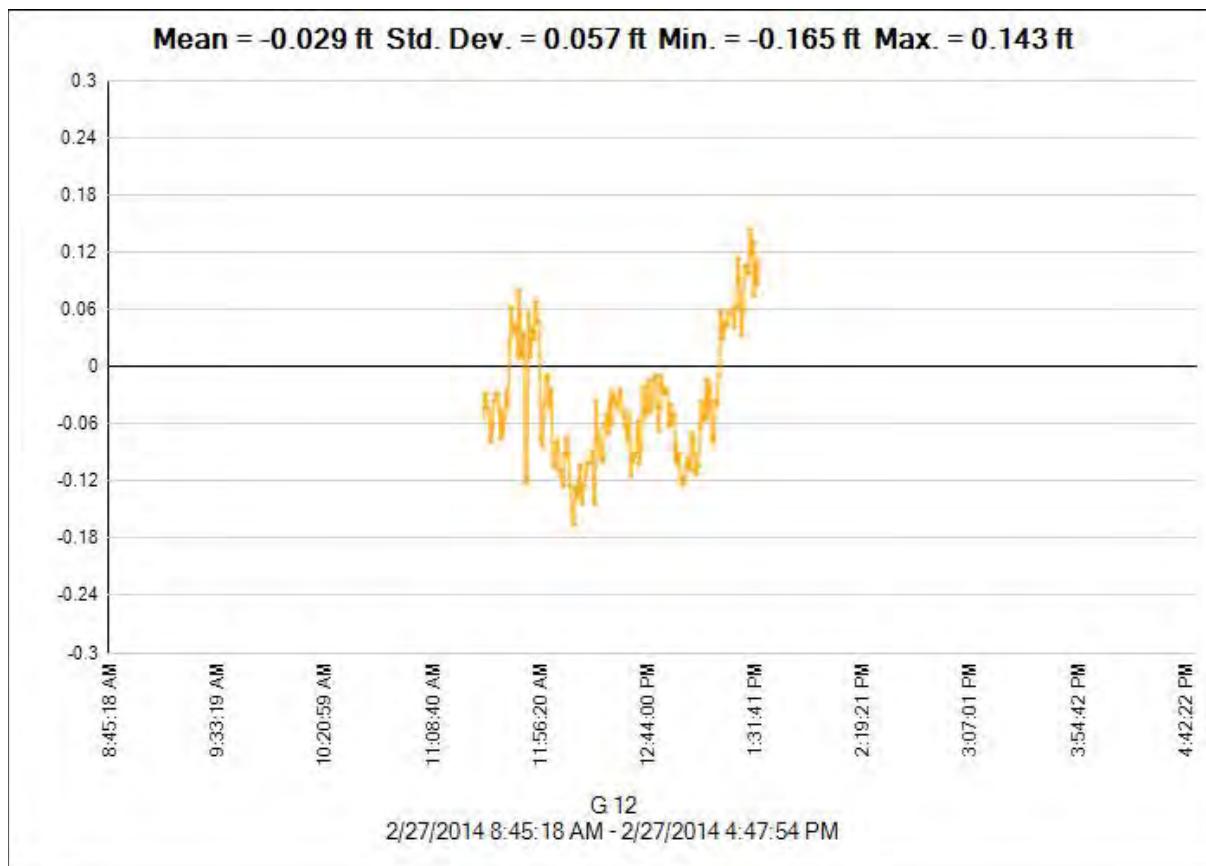


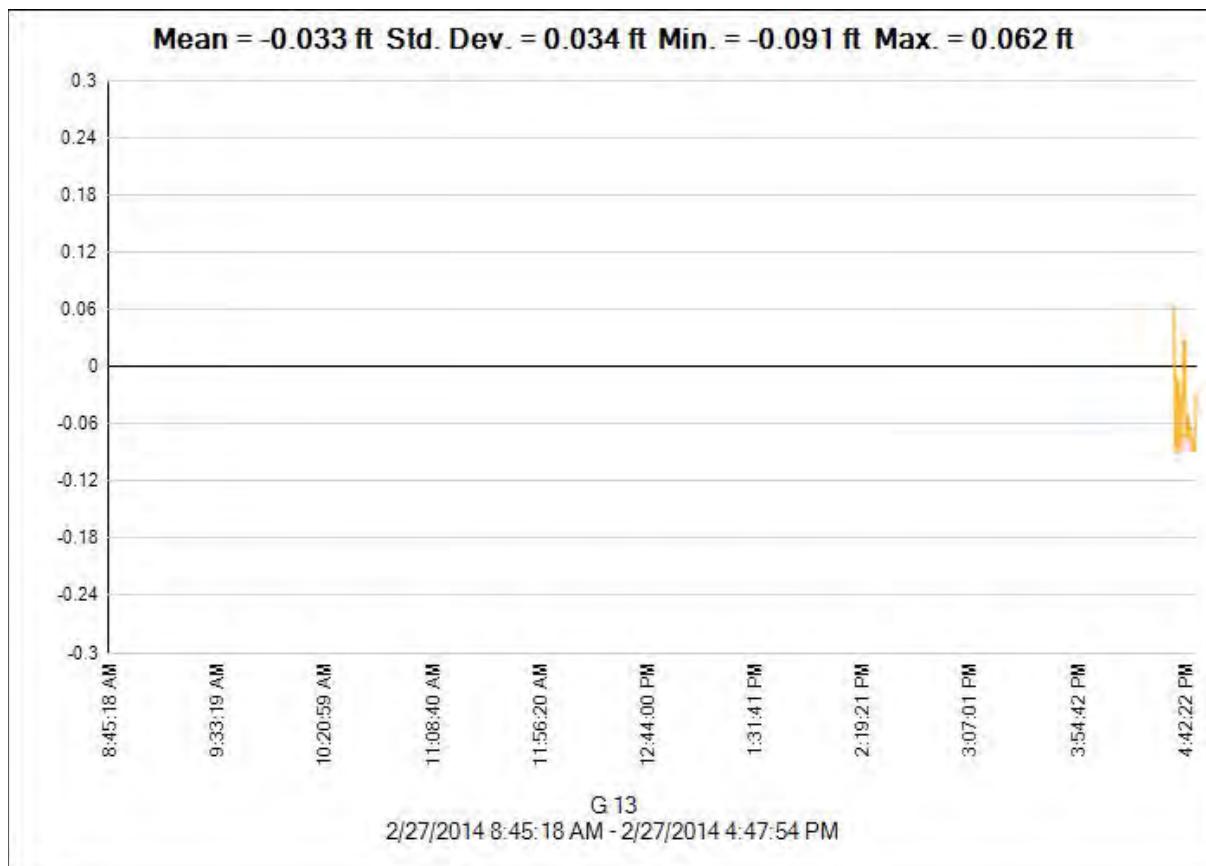
Residuals

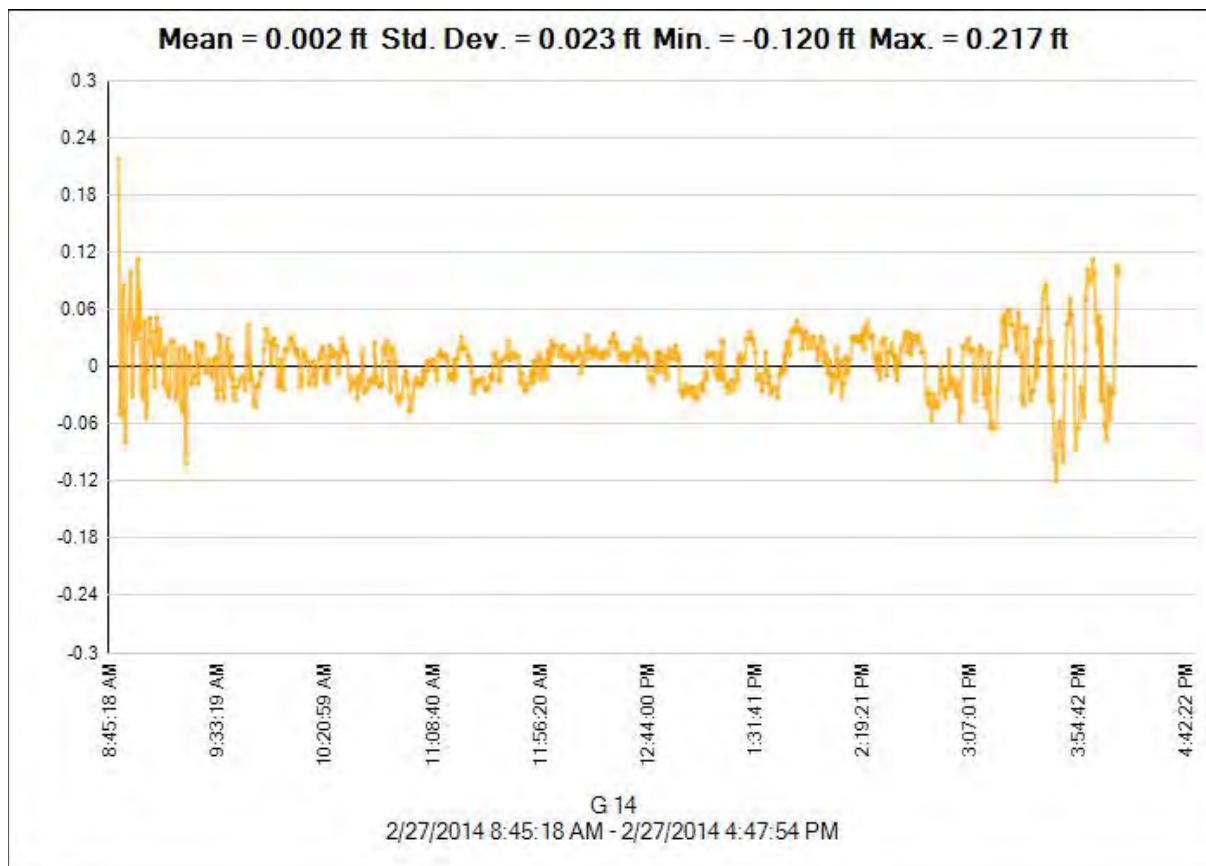


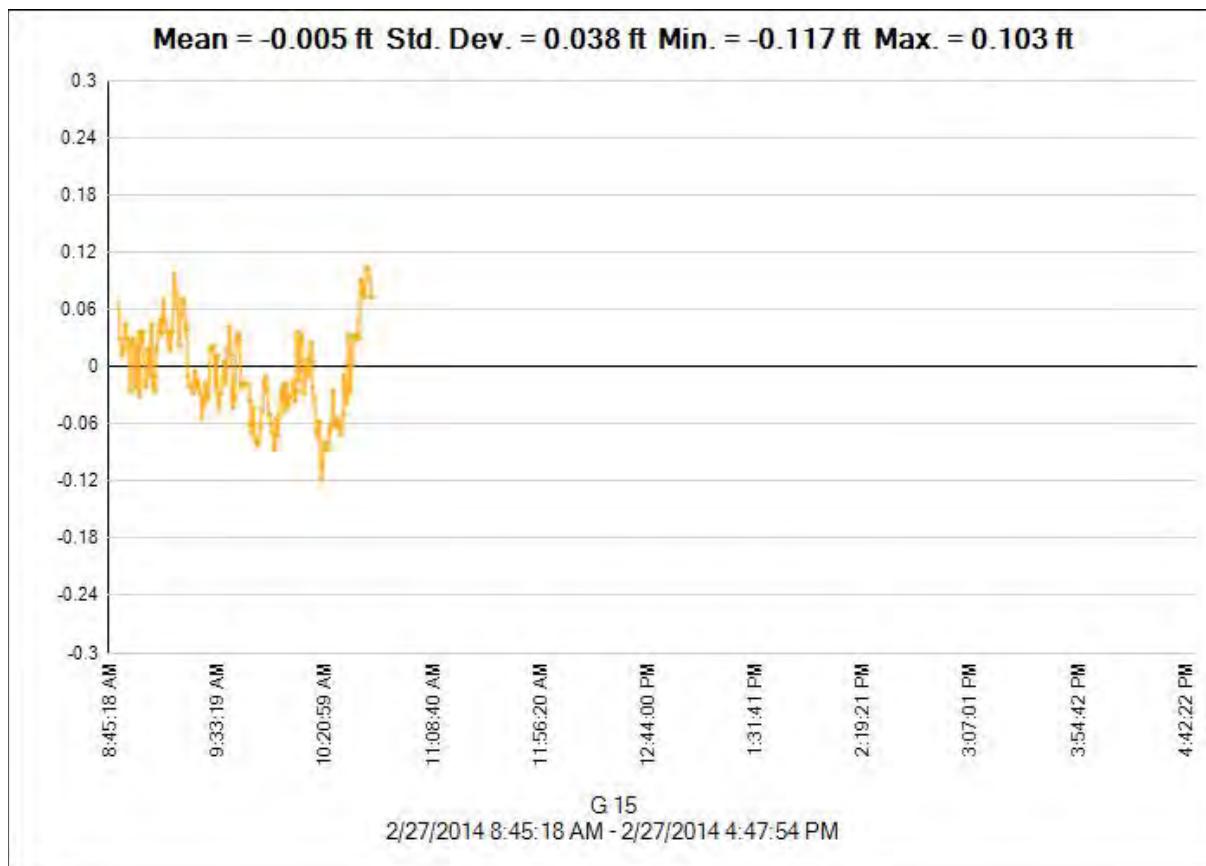


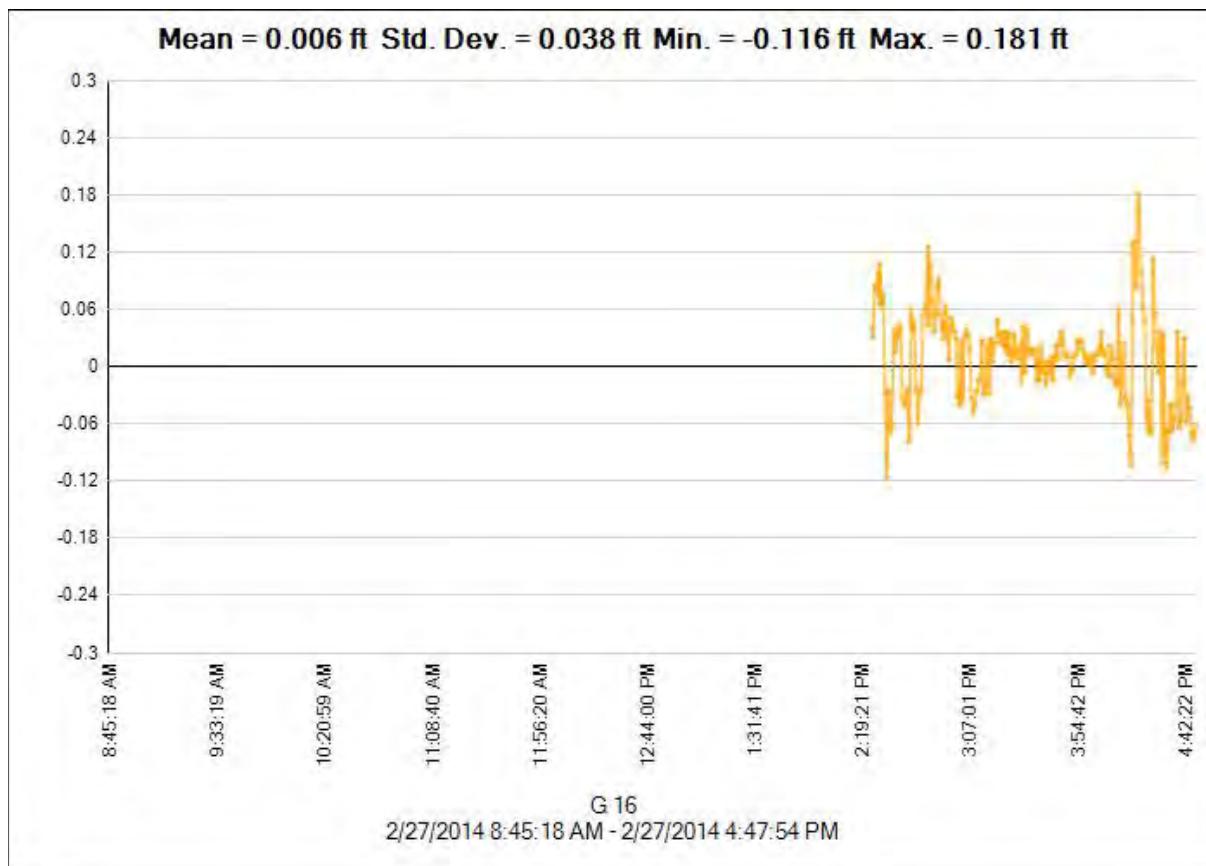


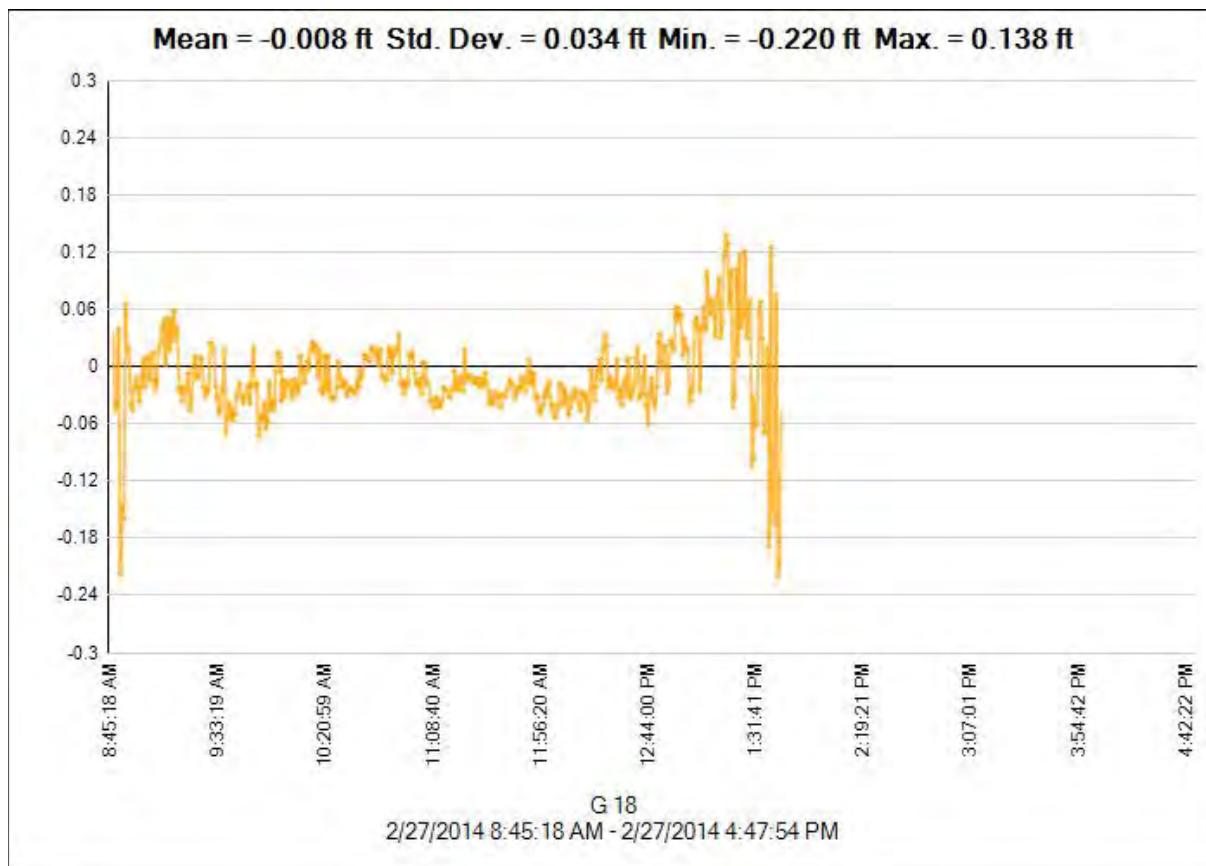


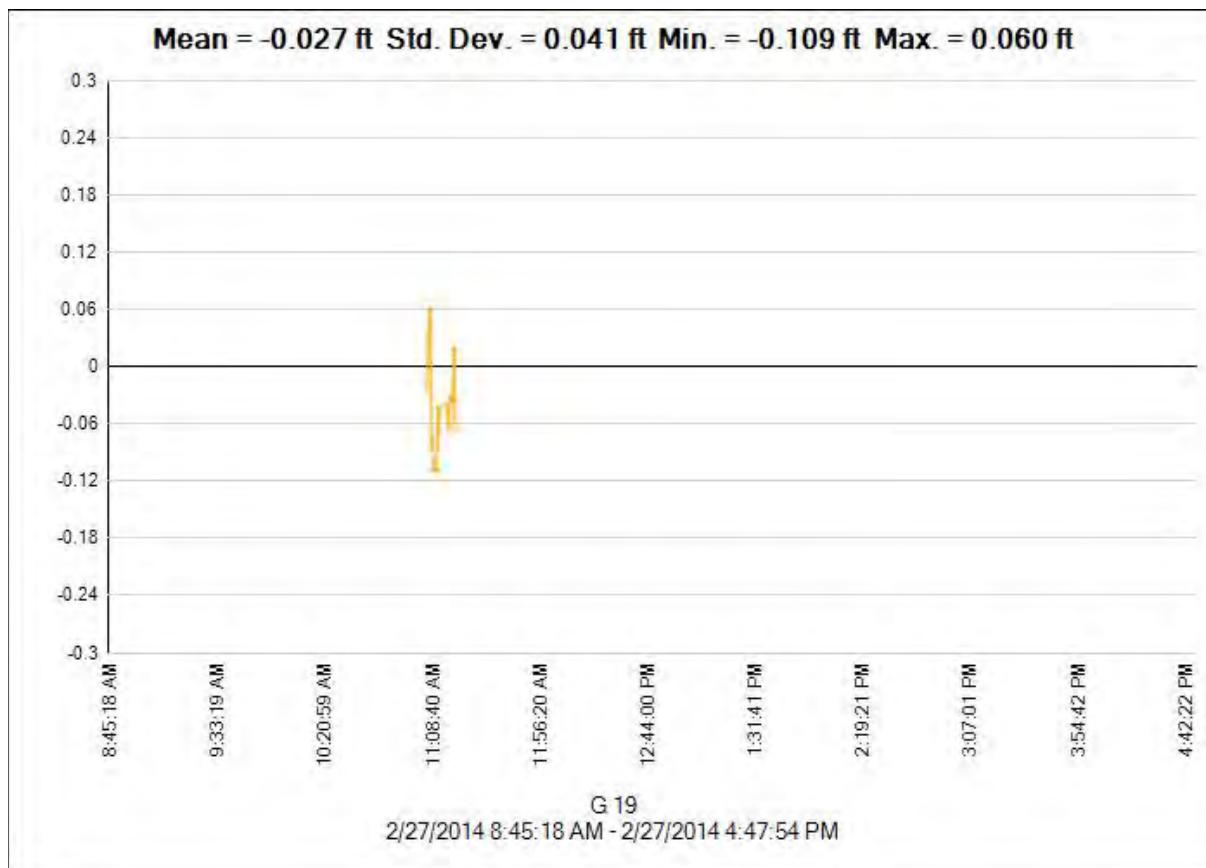


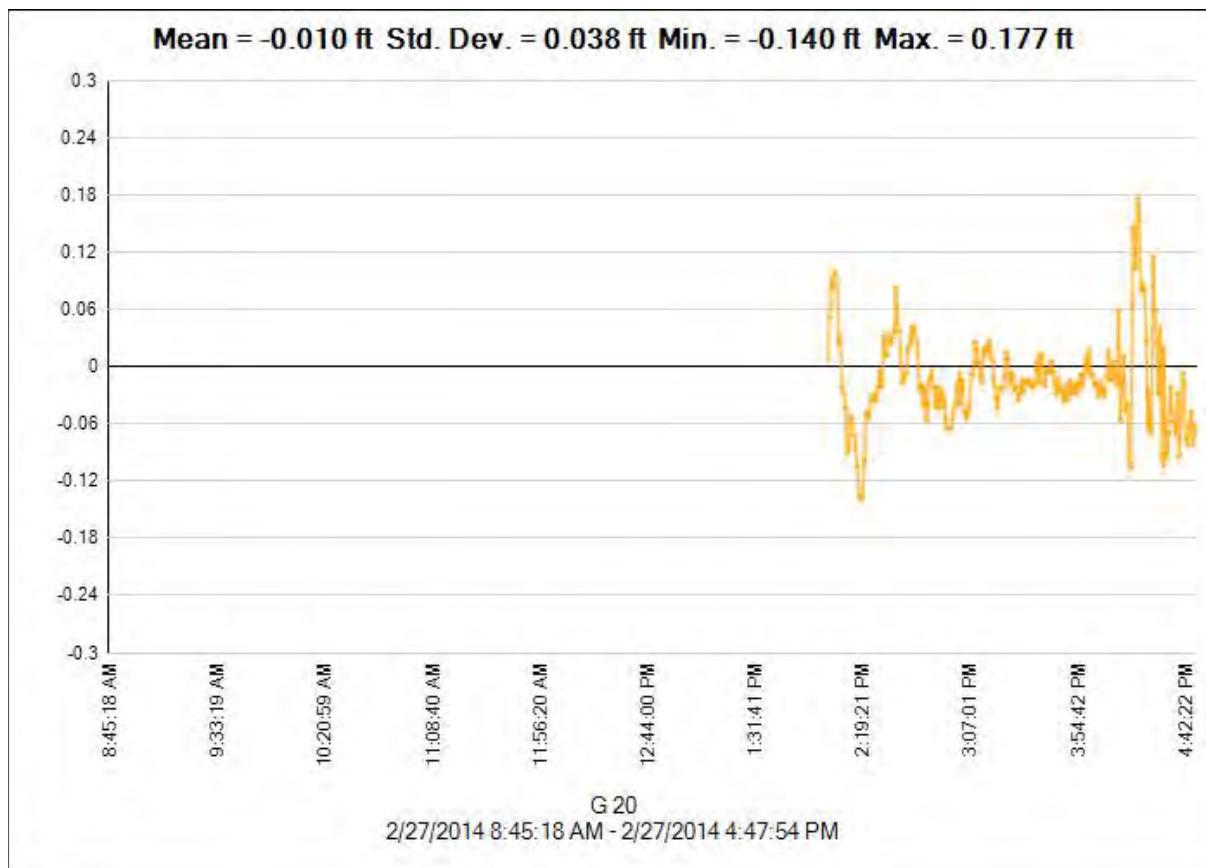


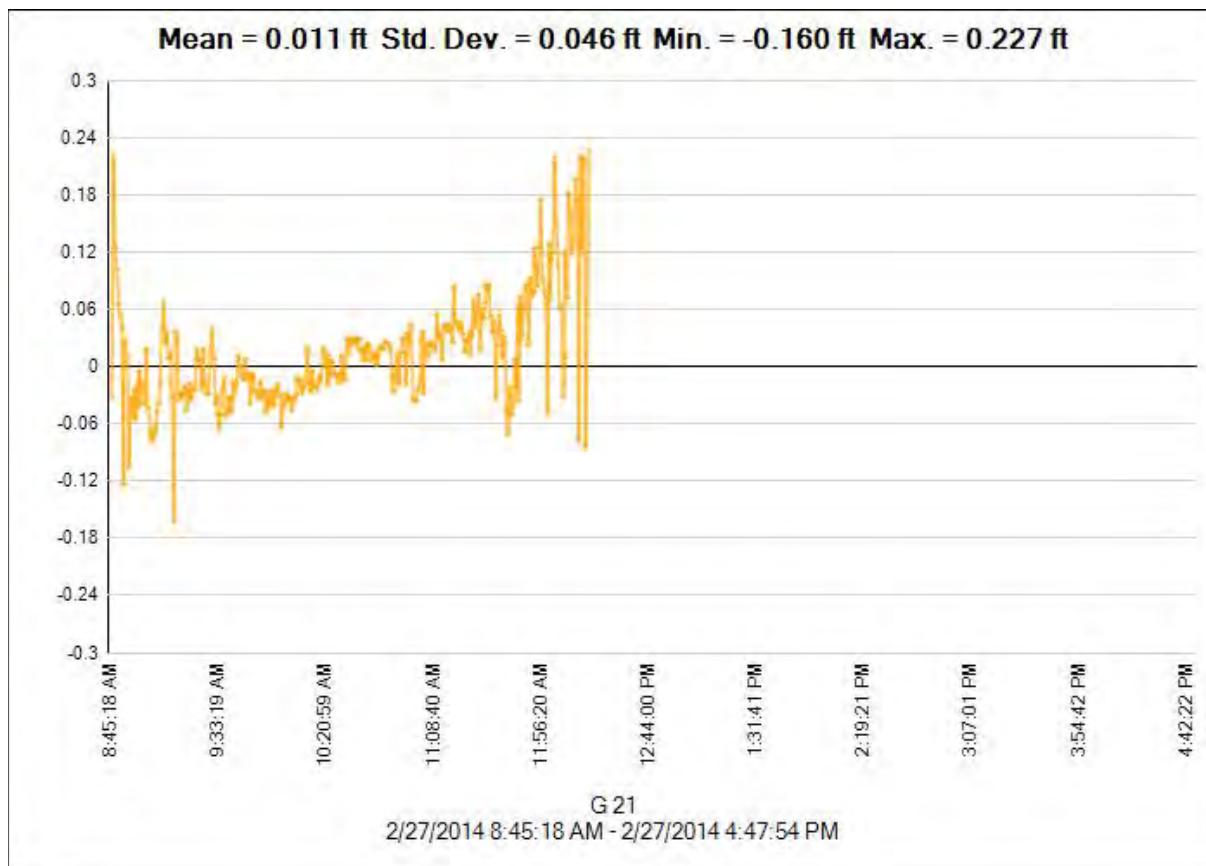


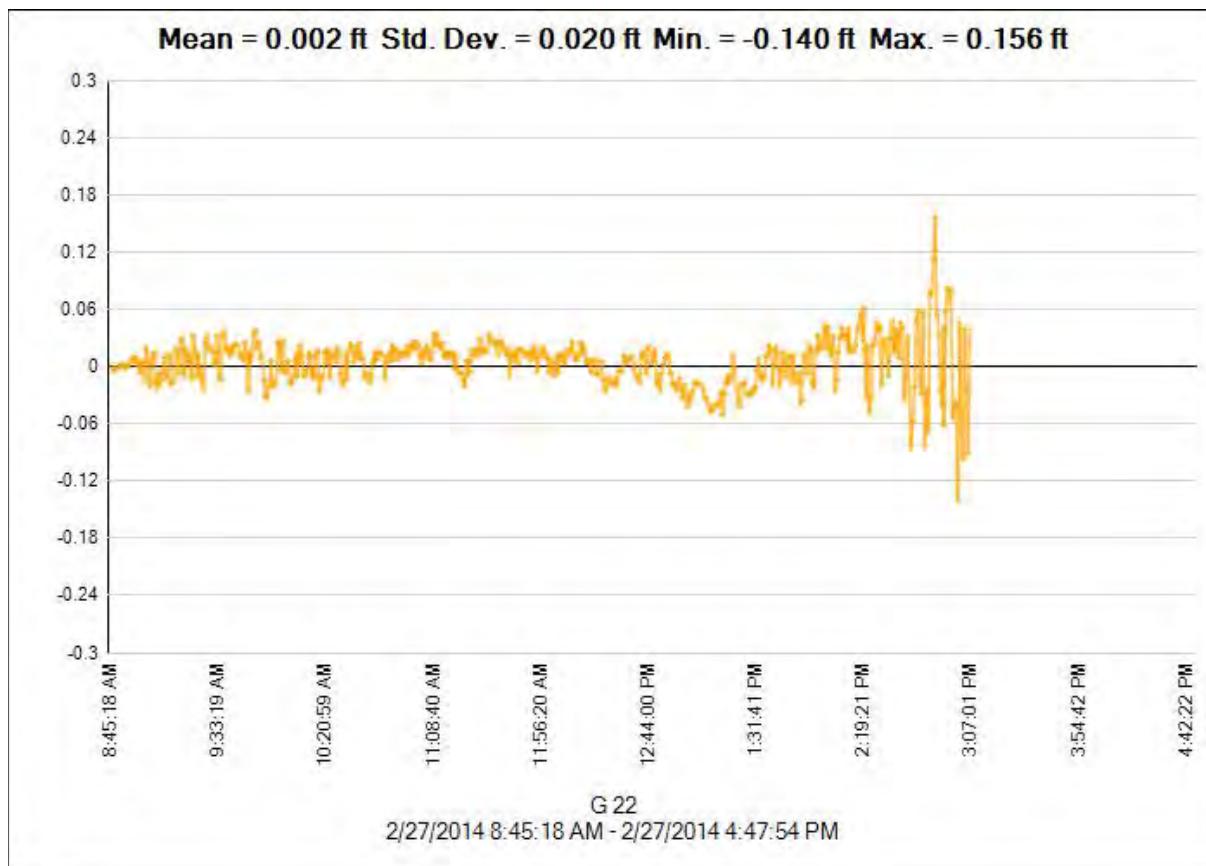


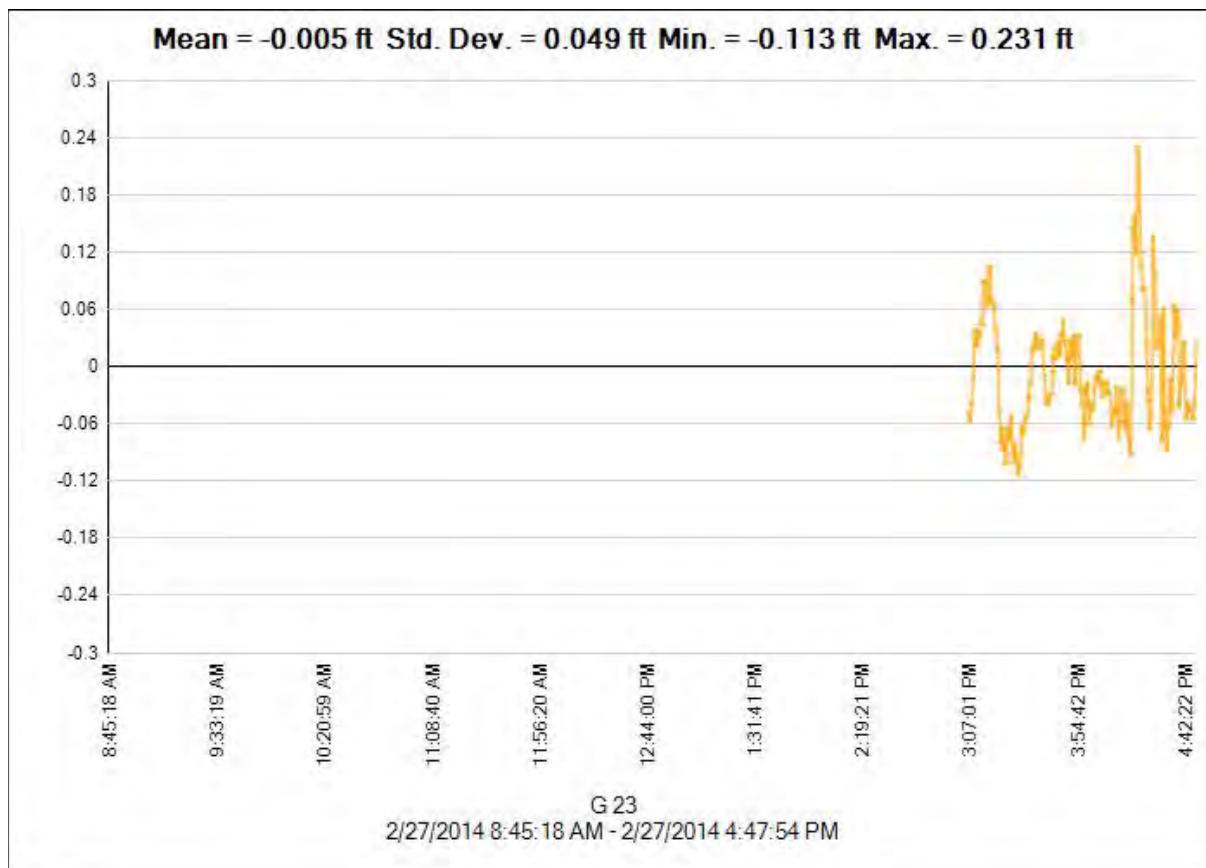


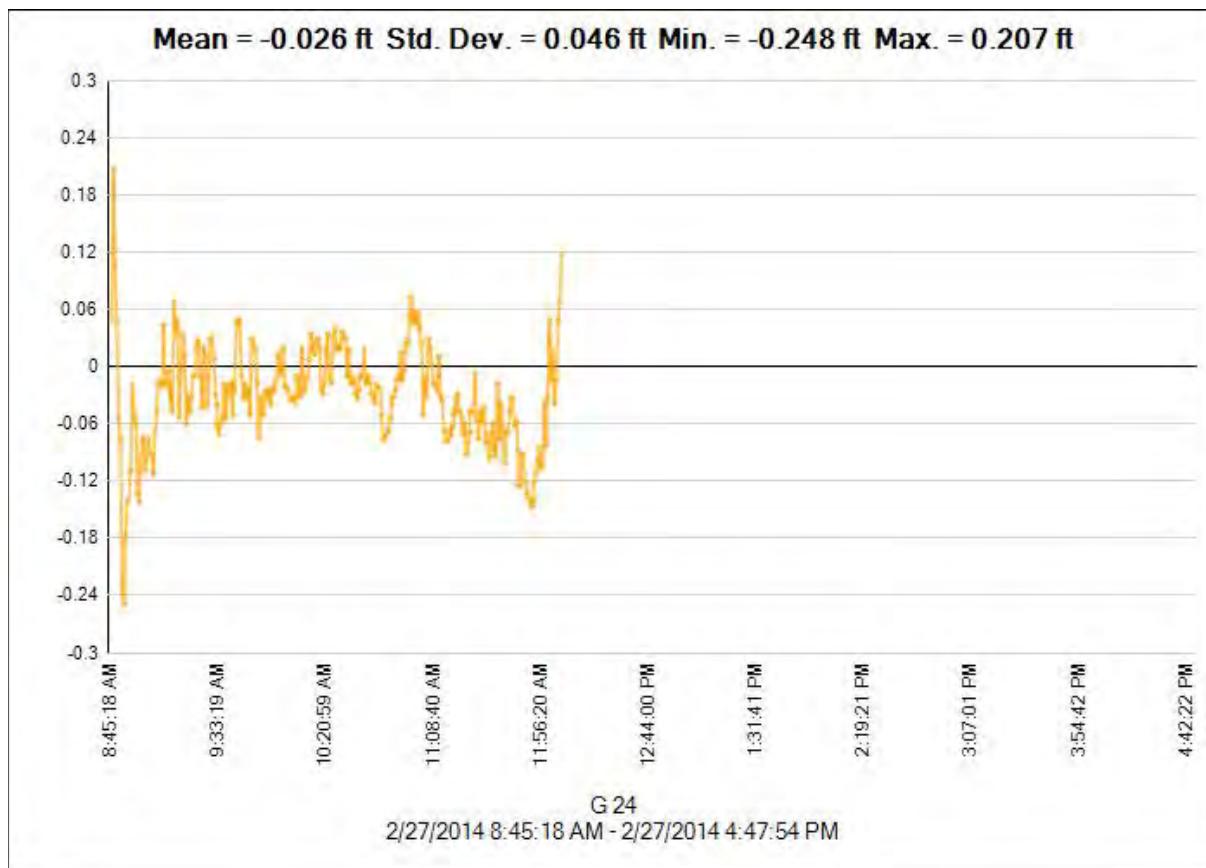


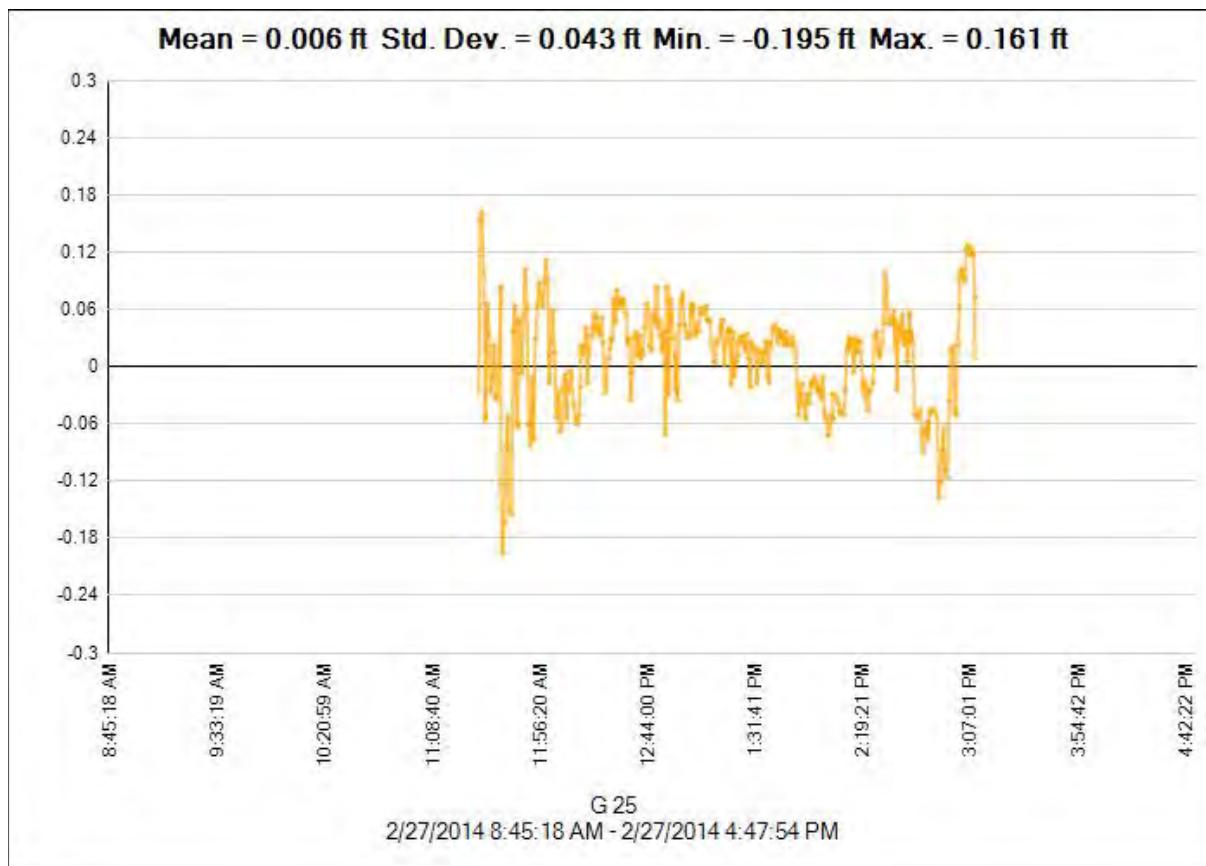


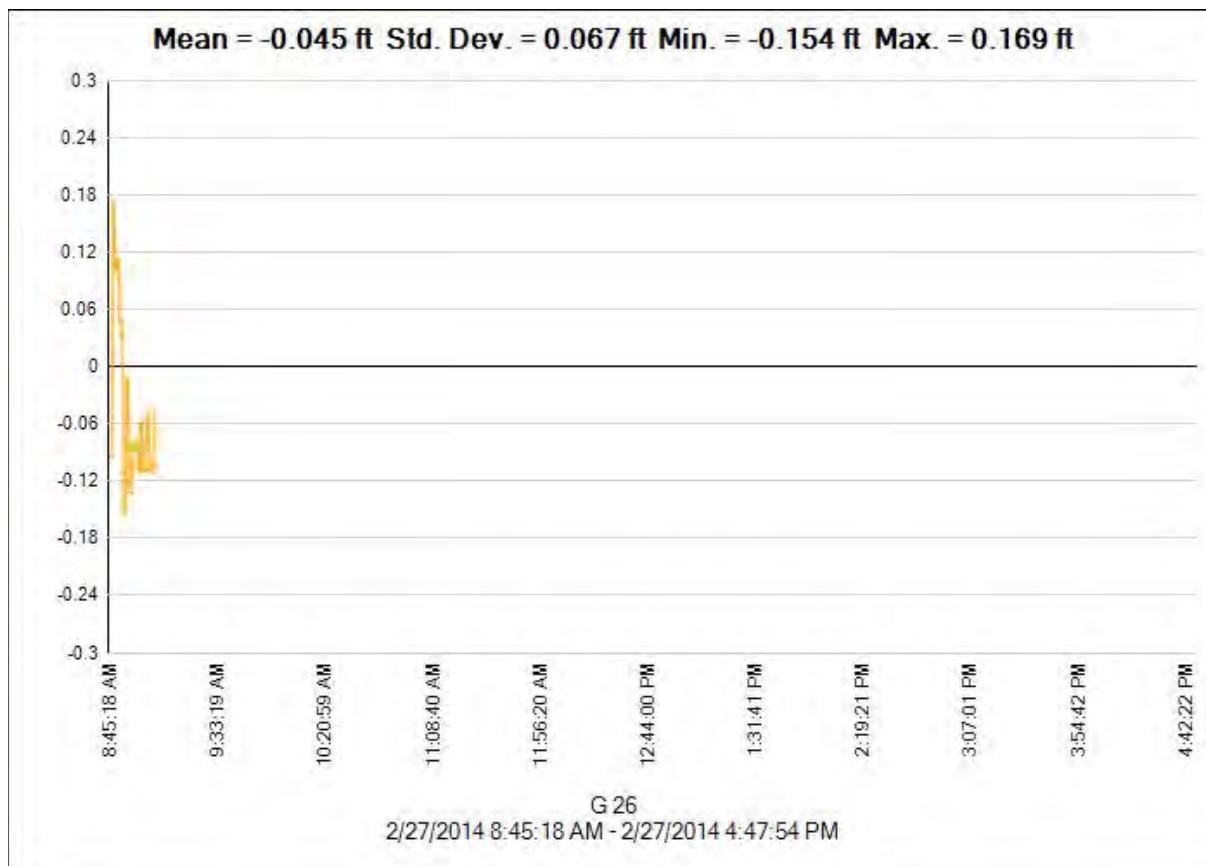


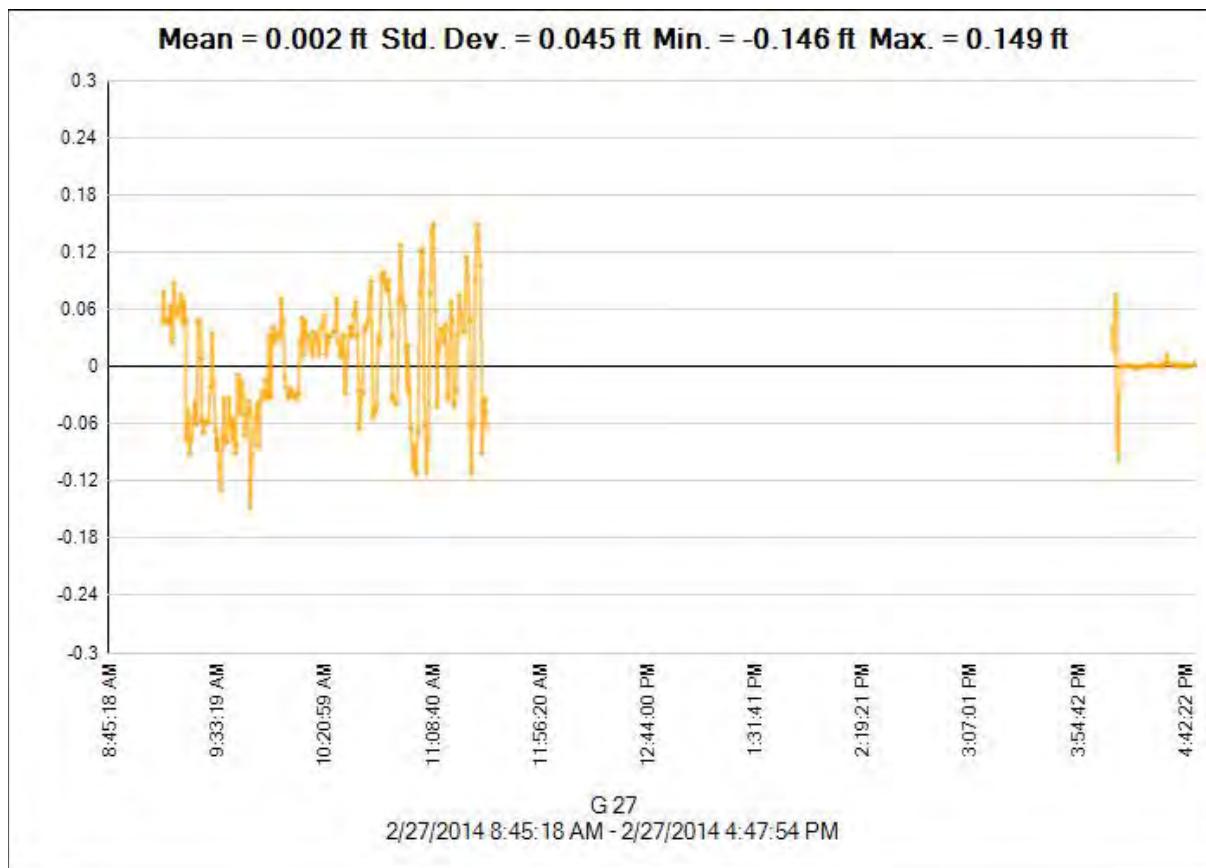


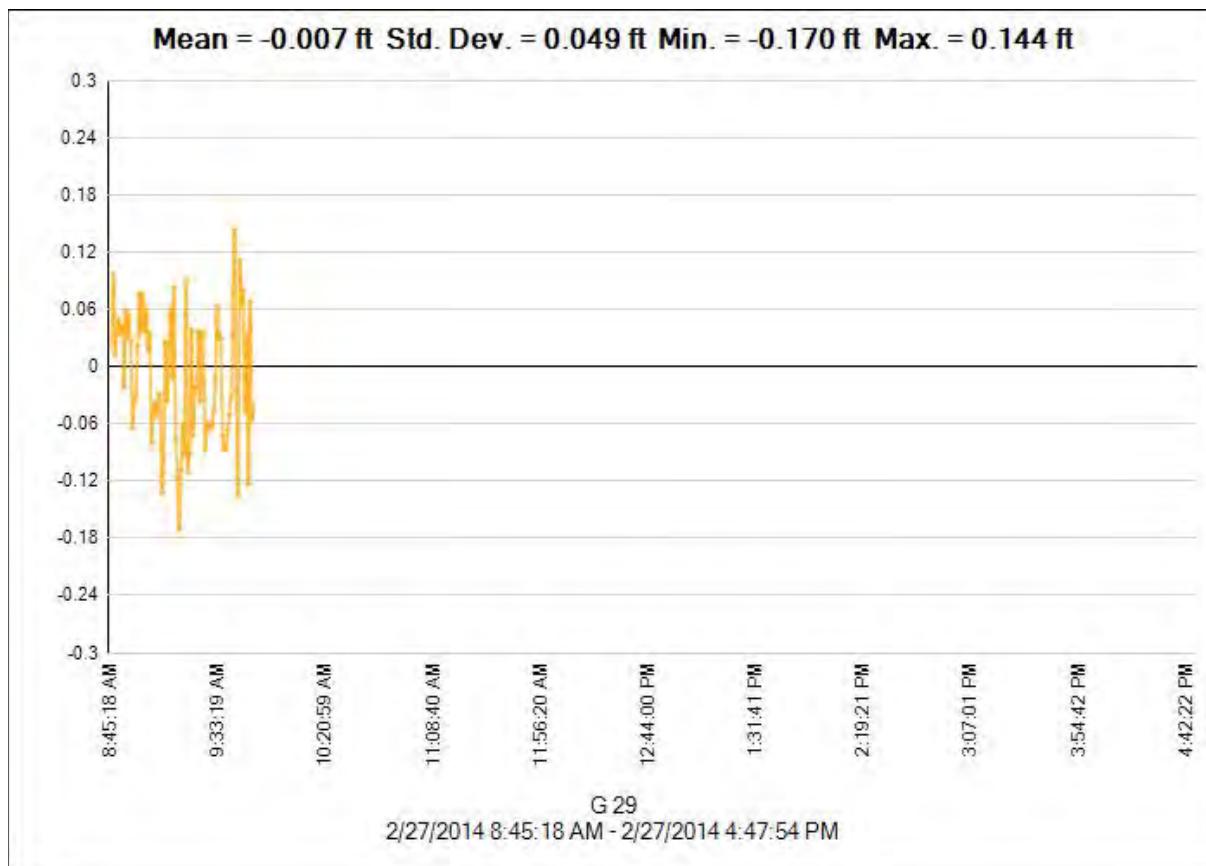


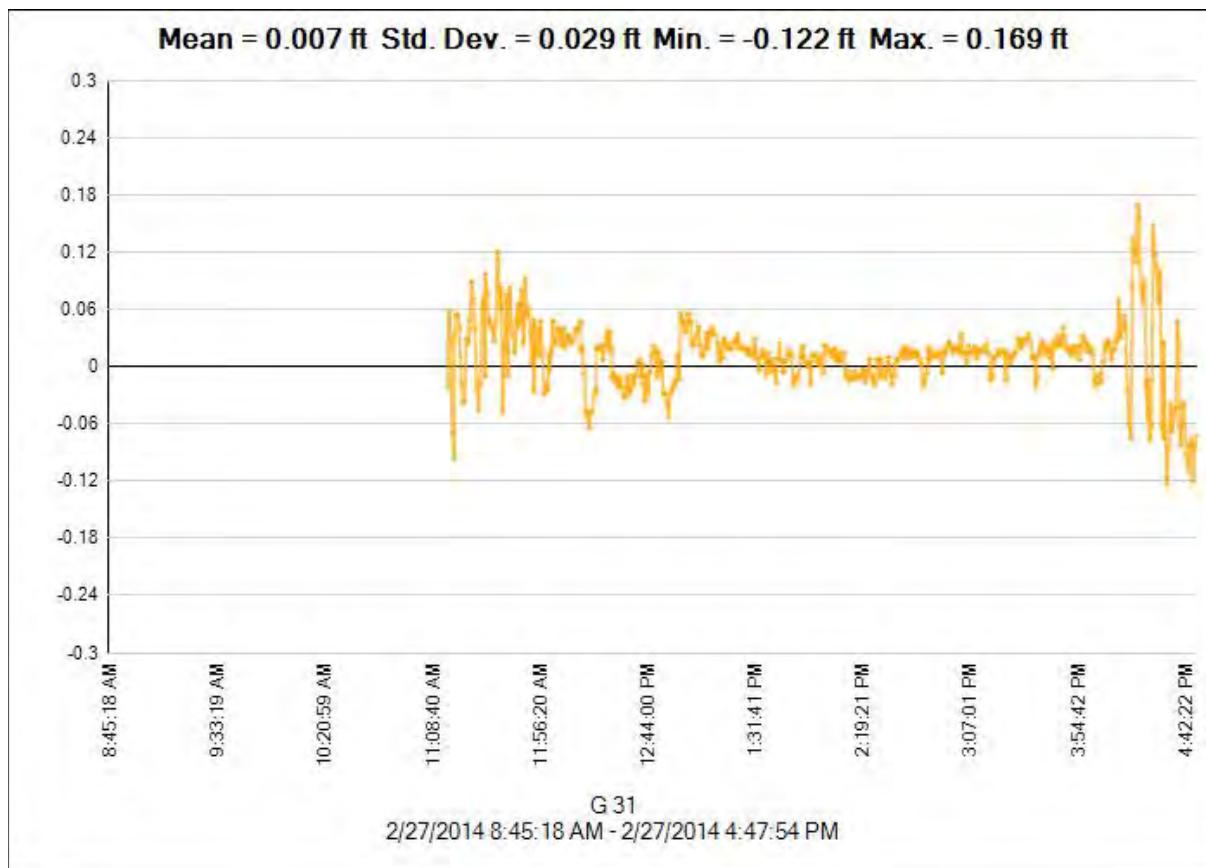


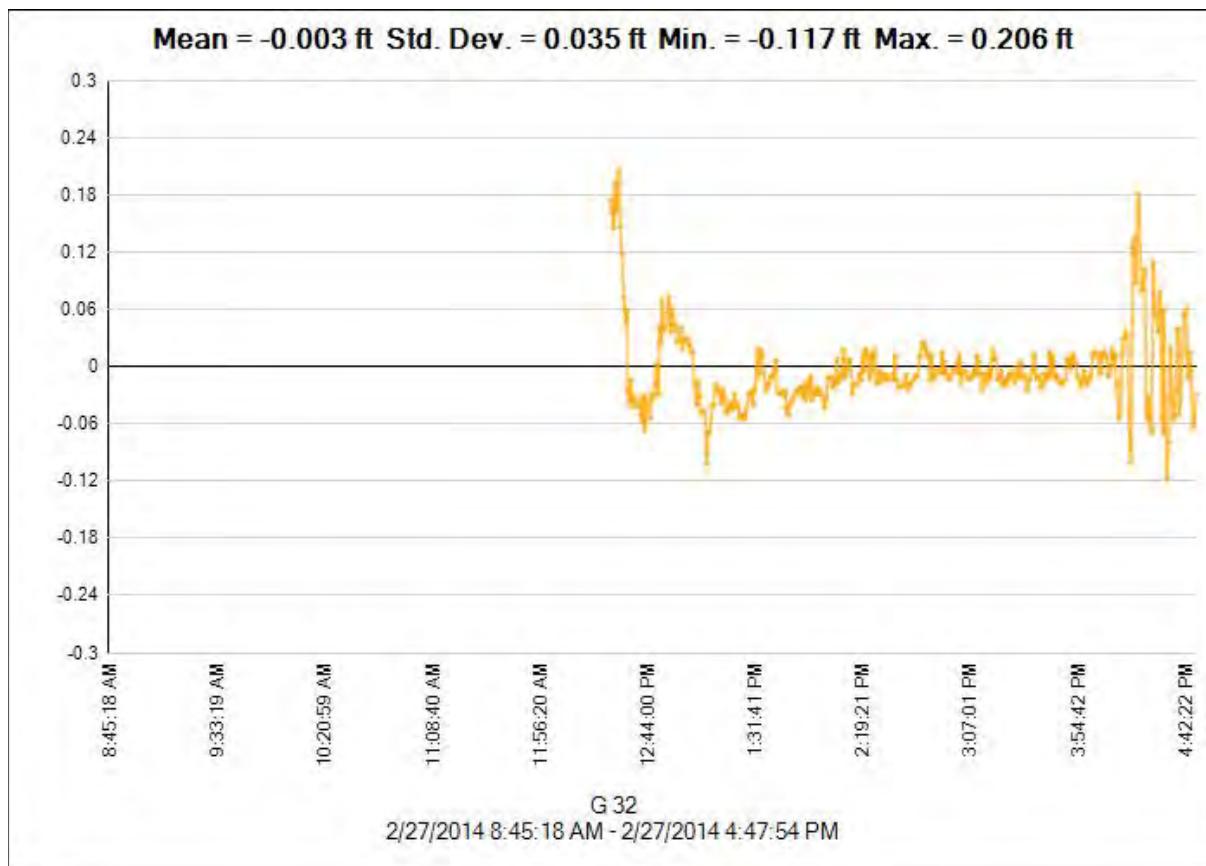


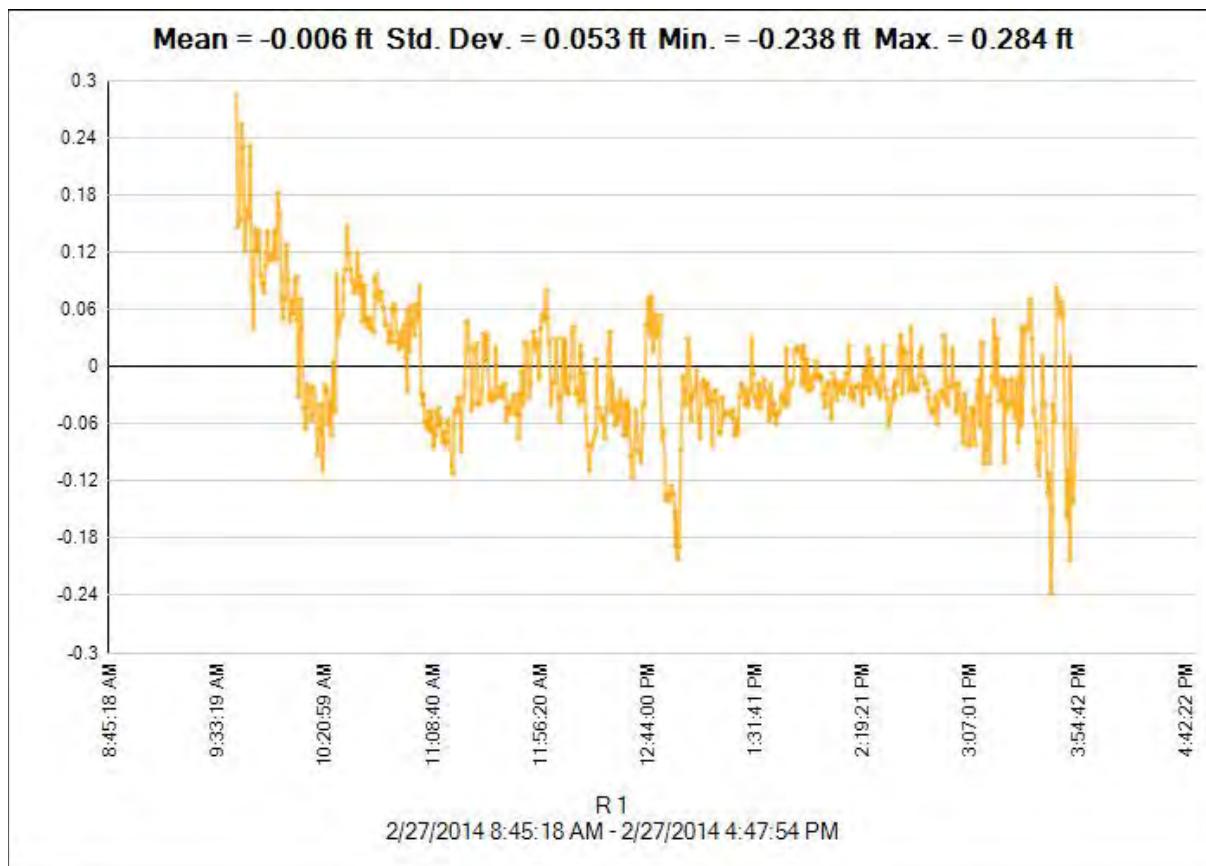


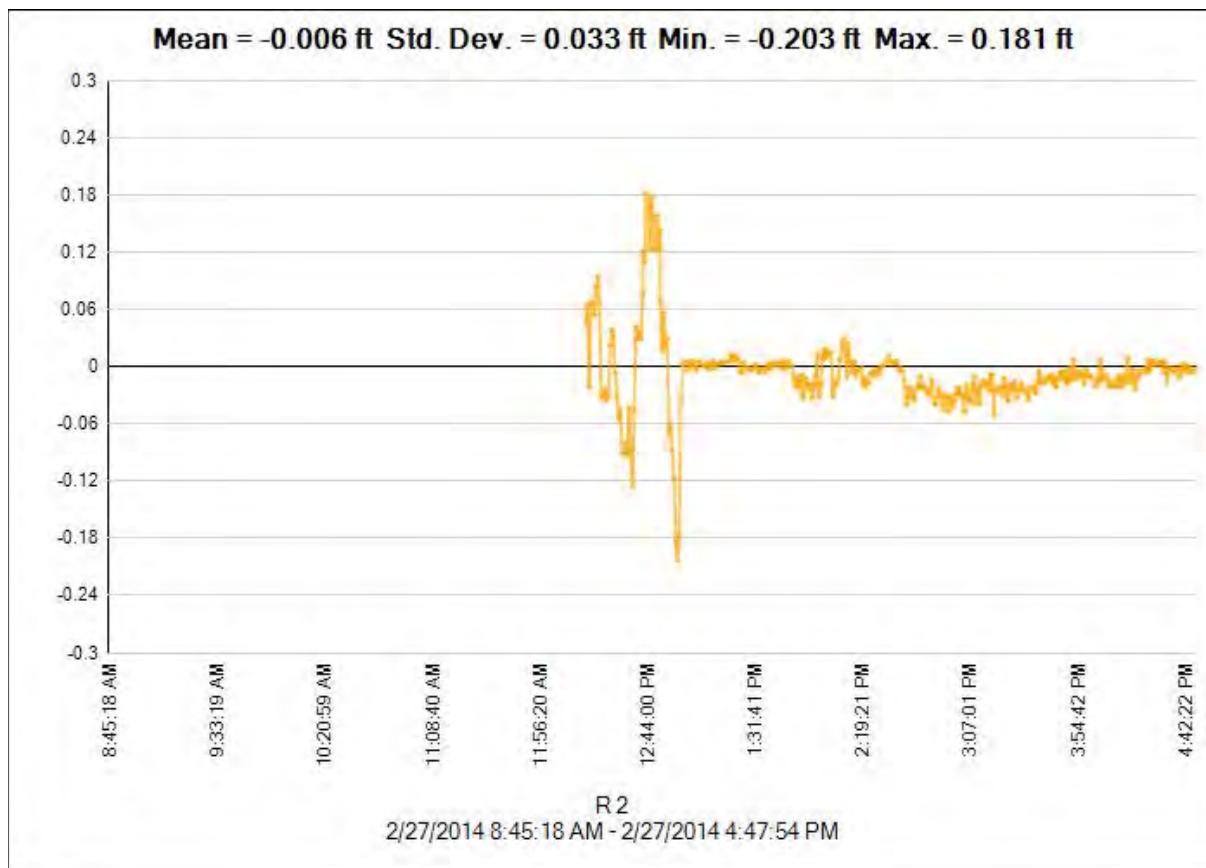


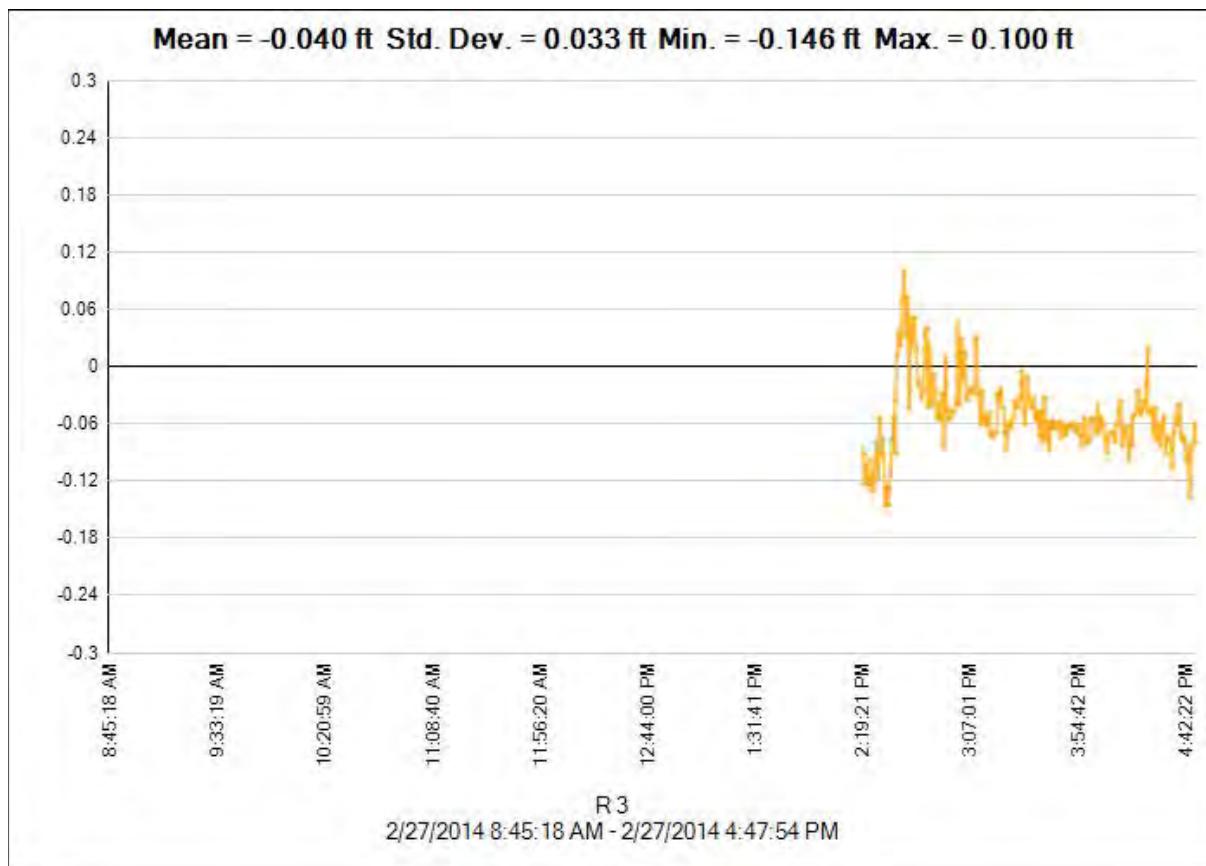


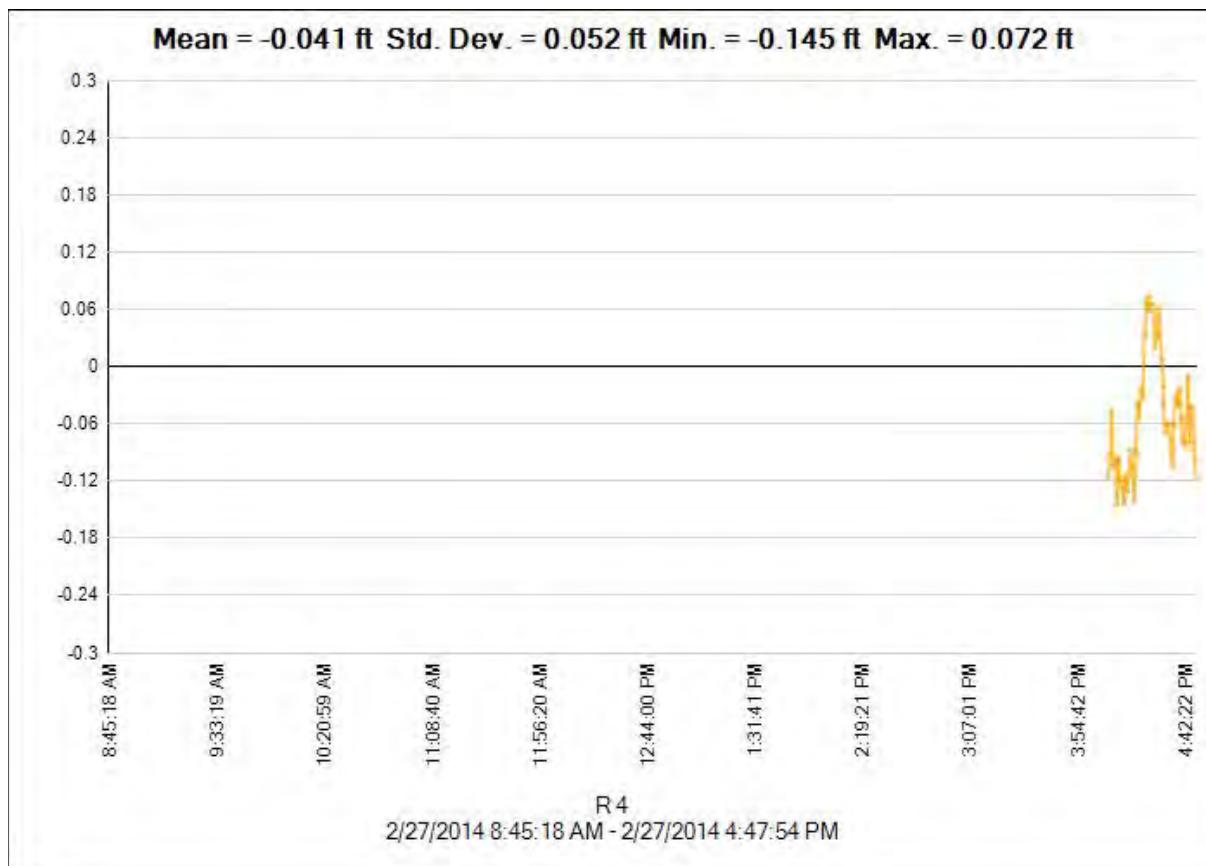


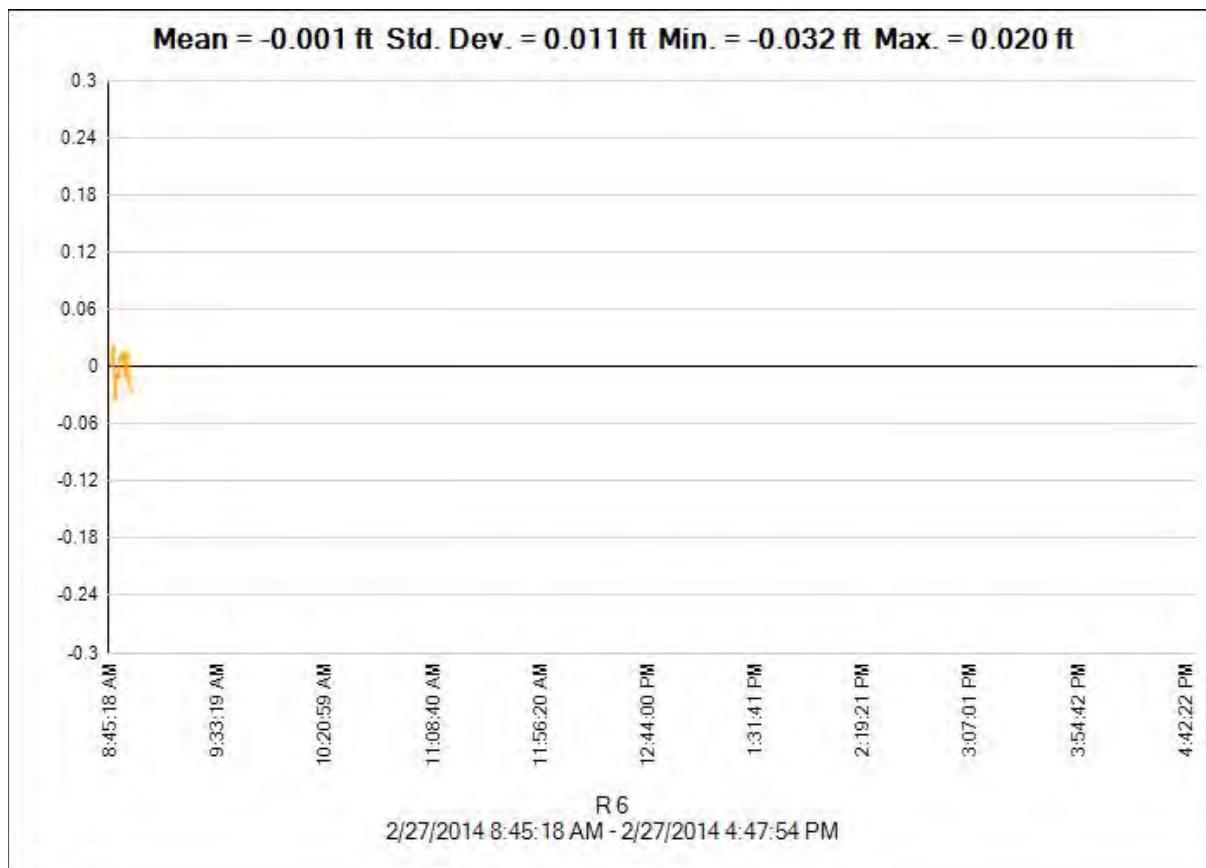


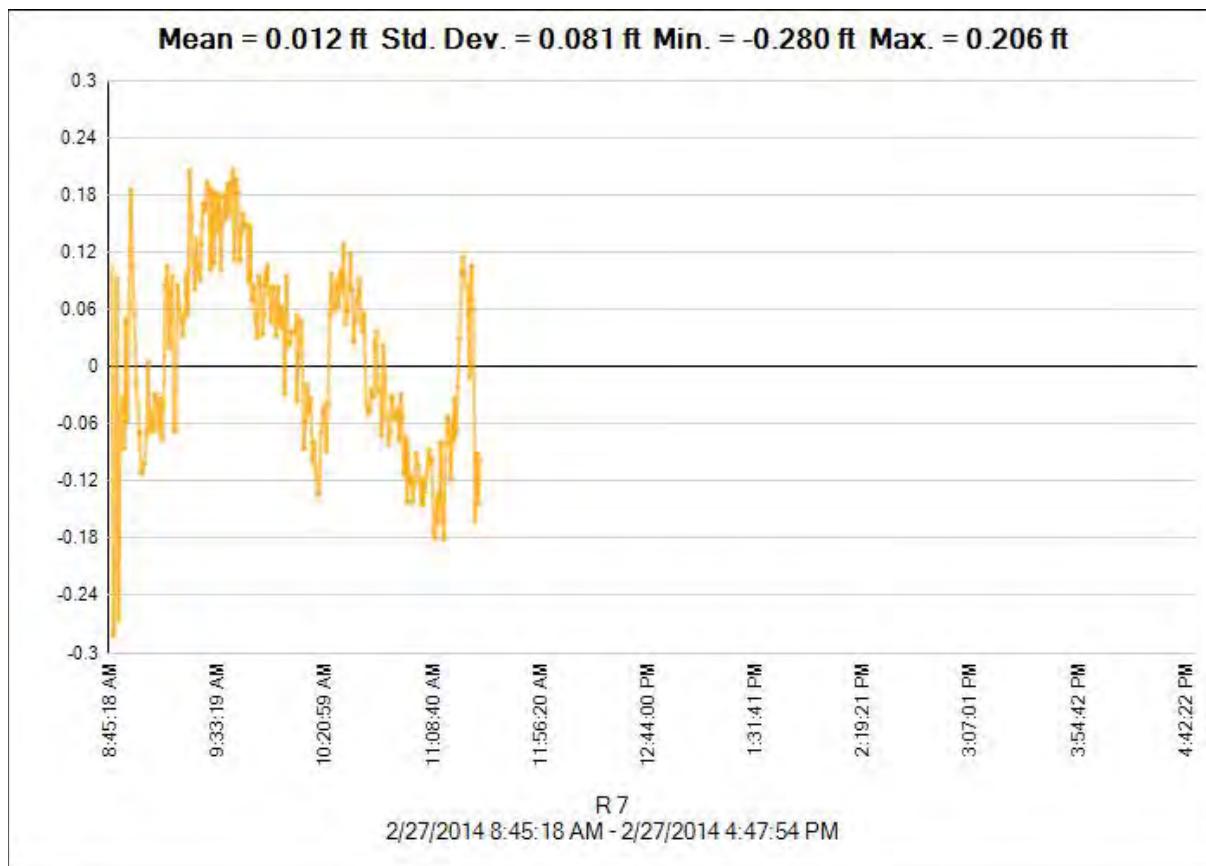


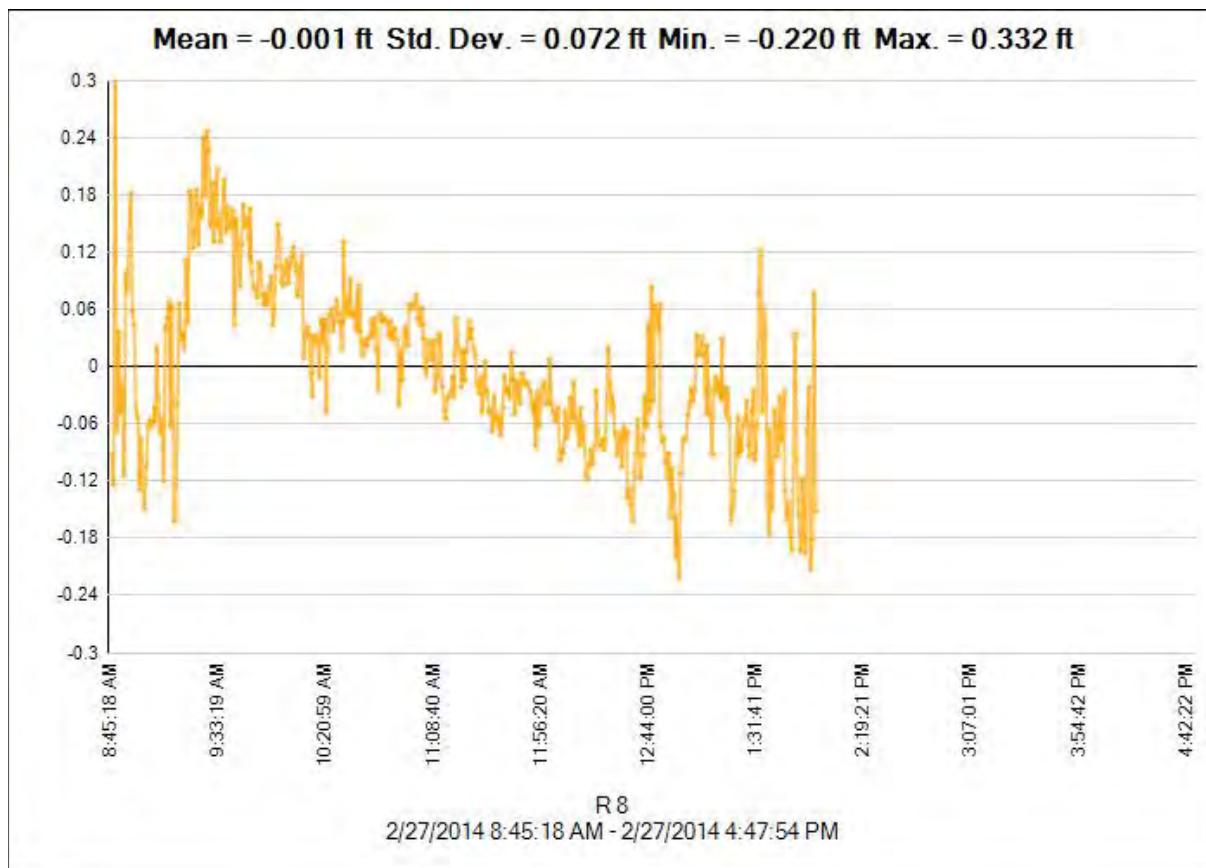


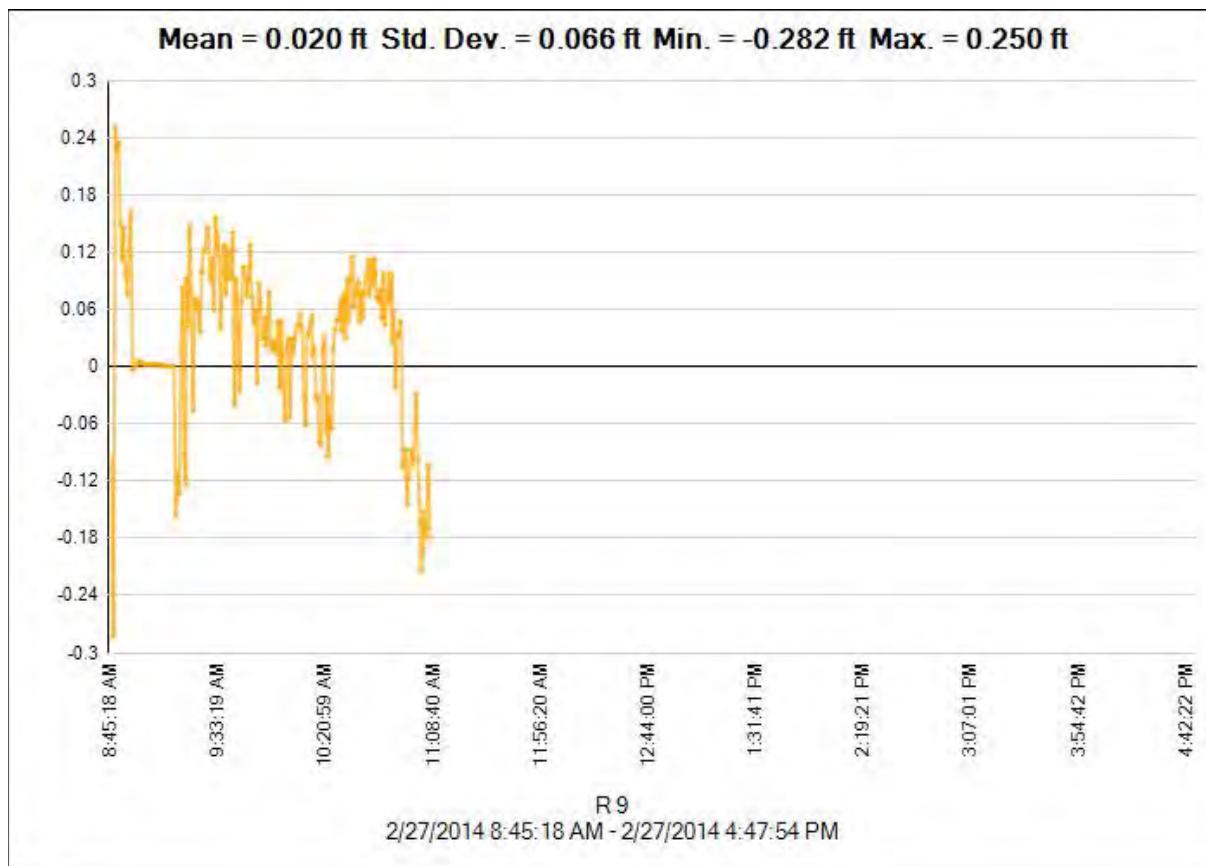


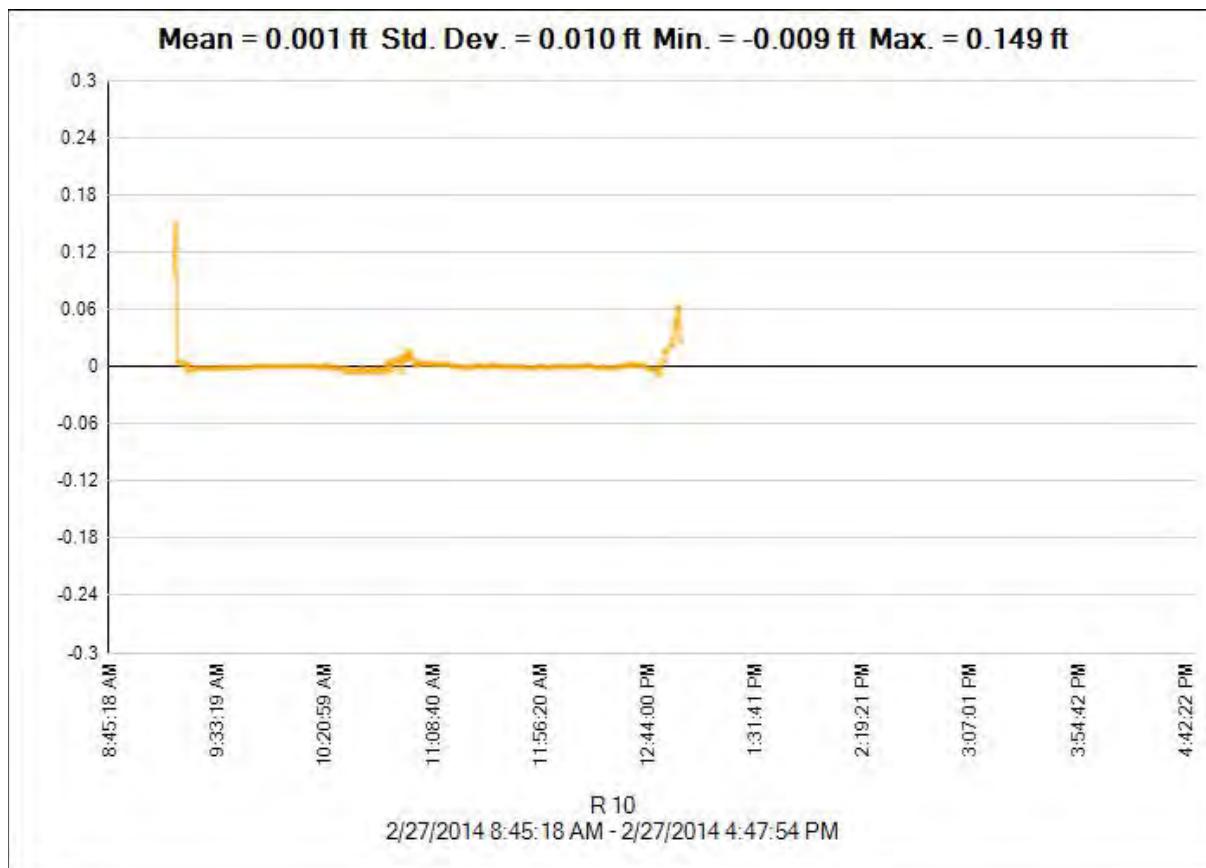


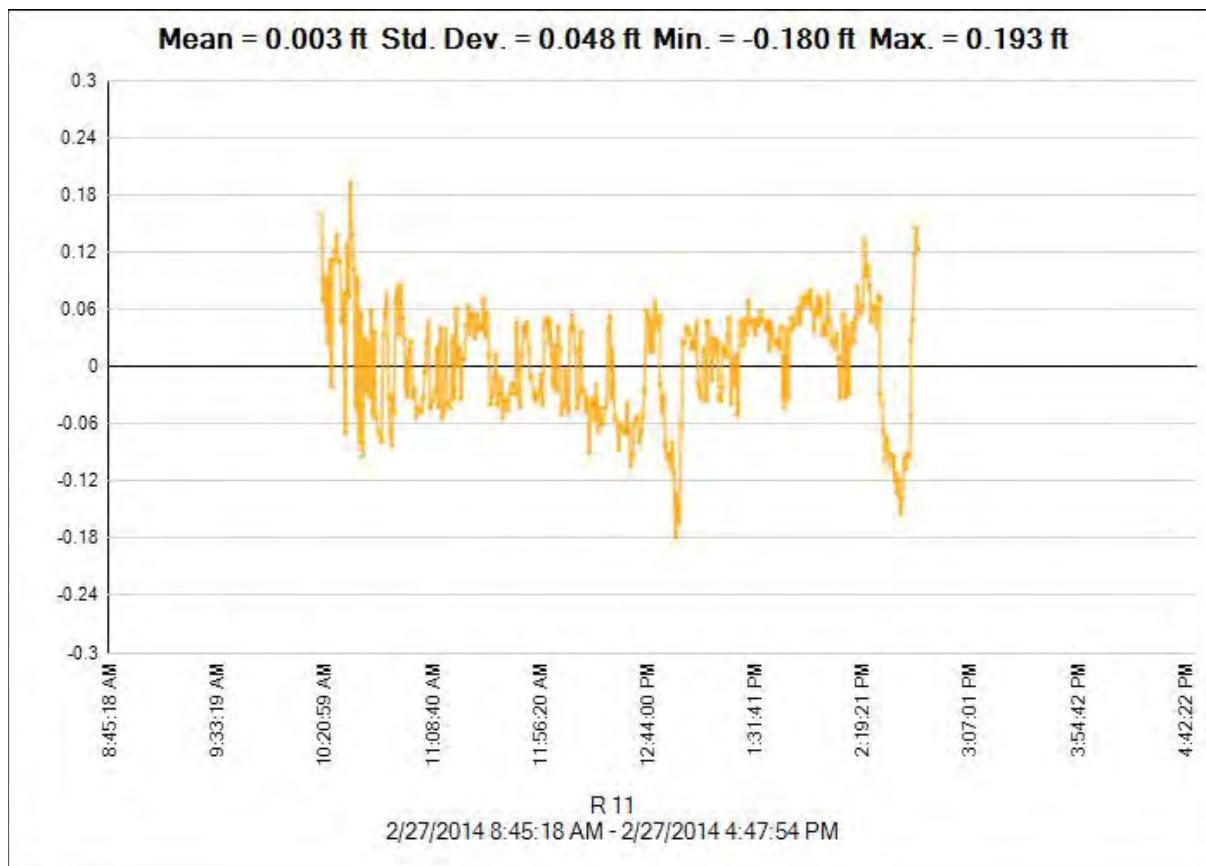


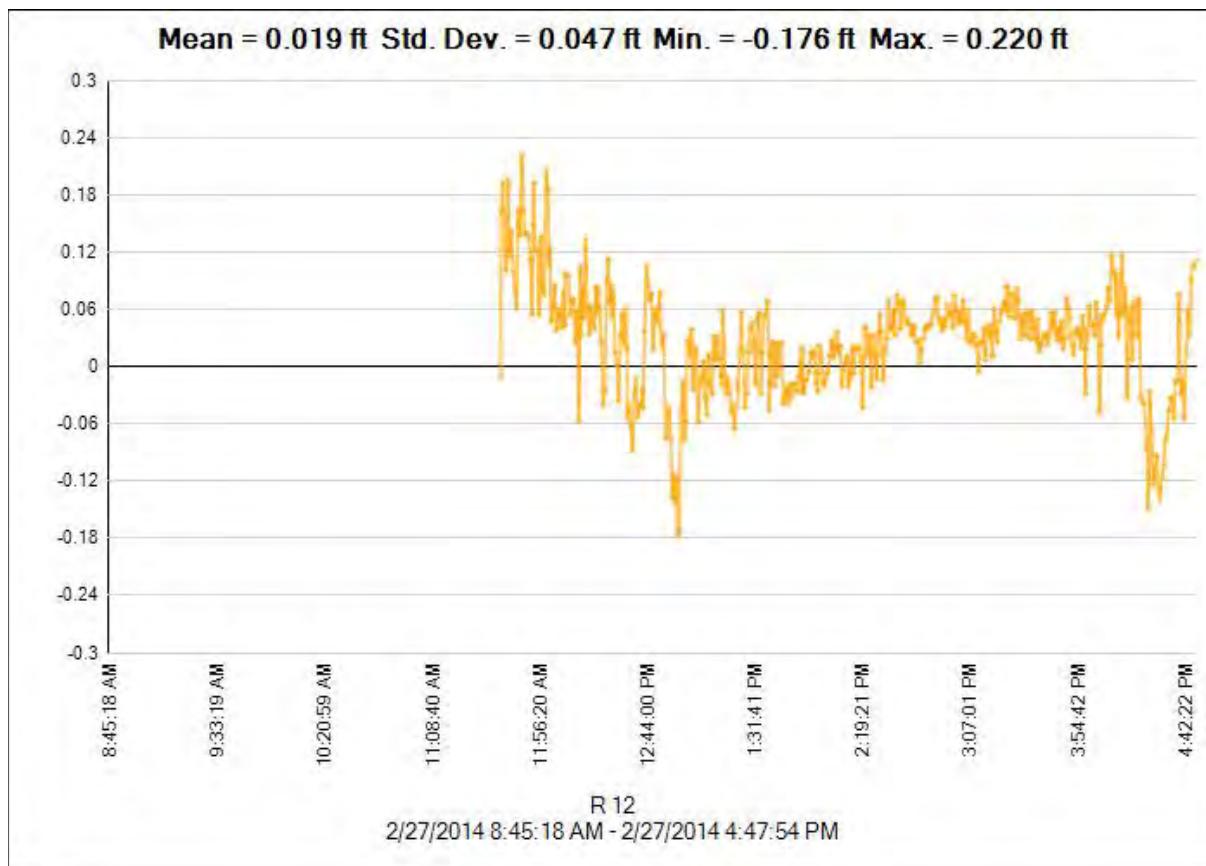


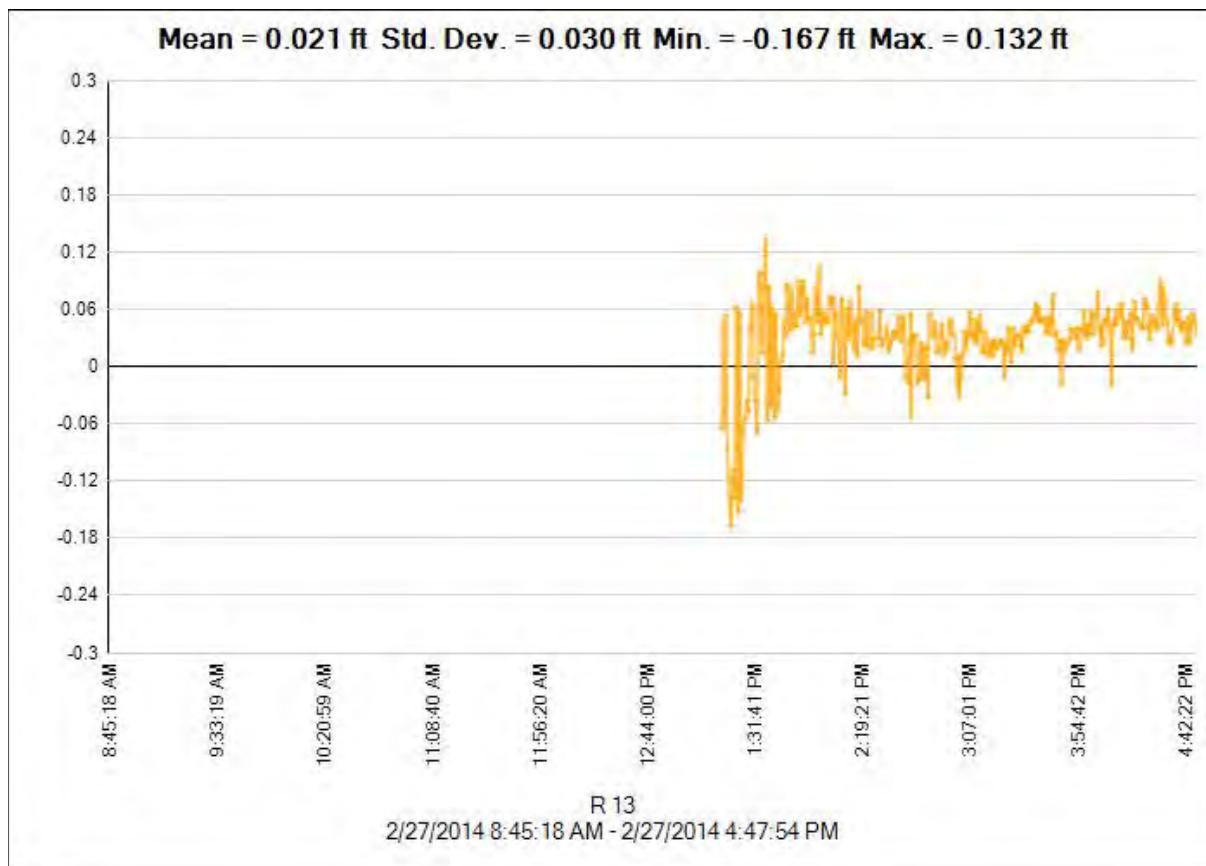


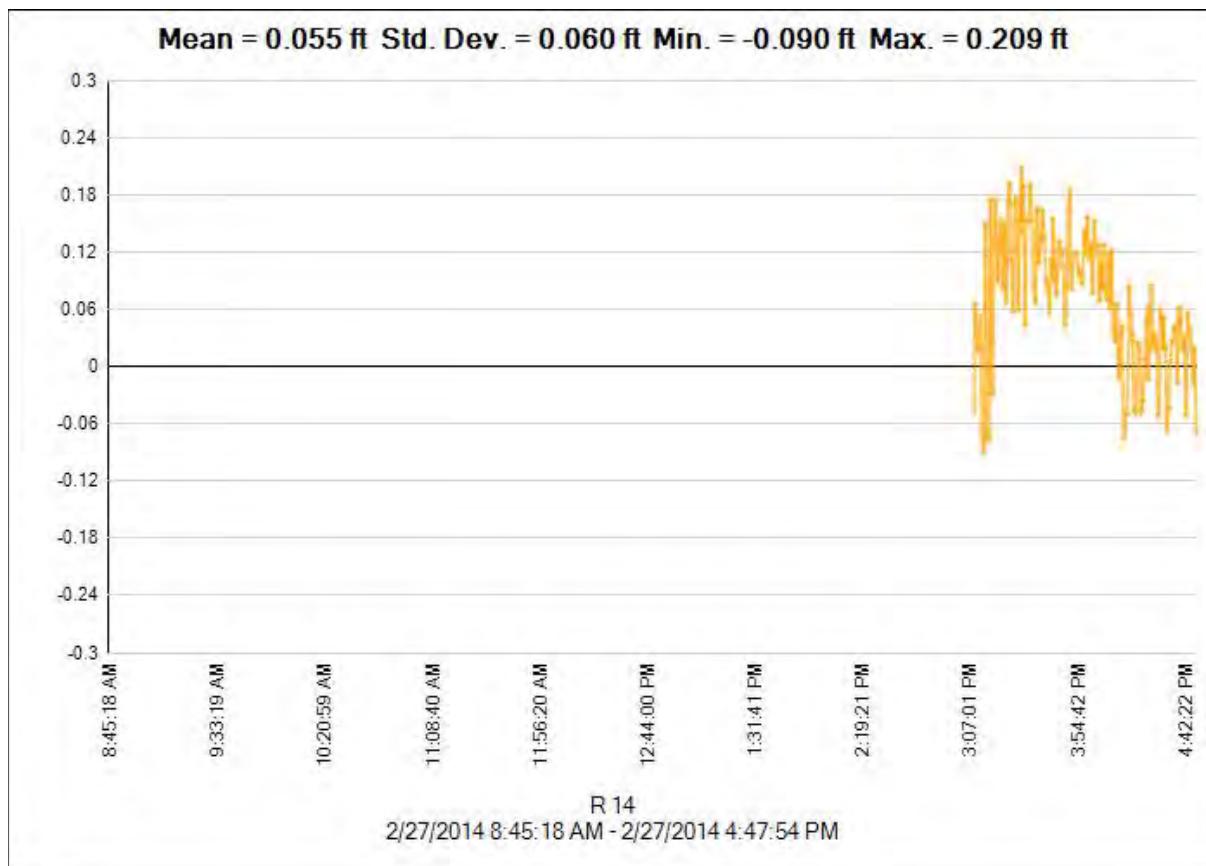


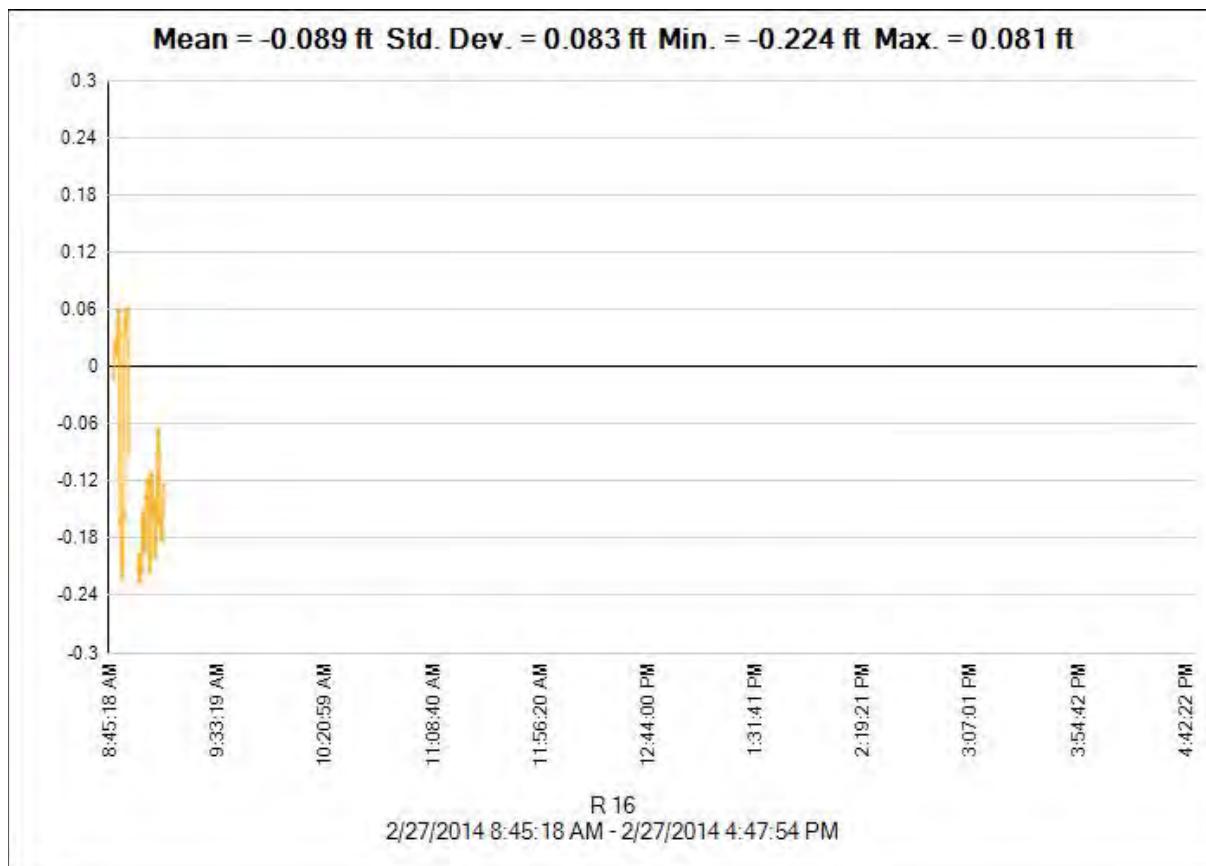


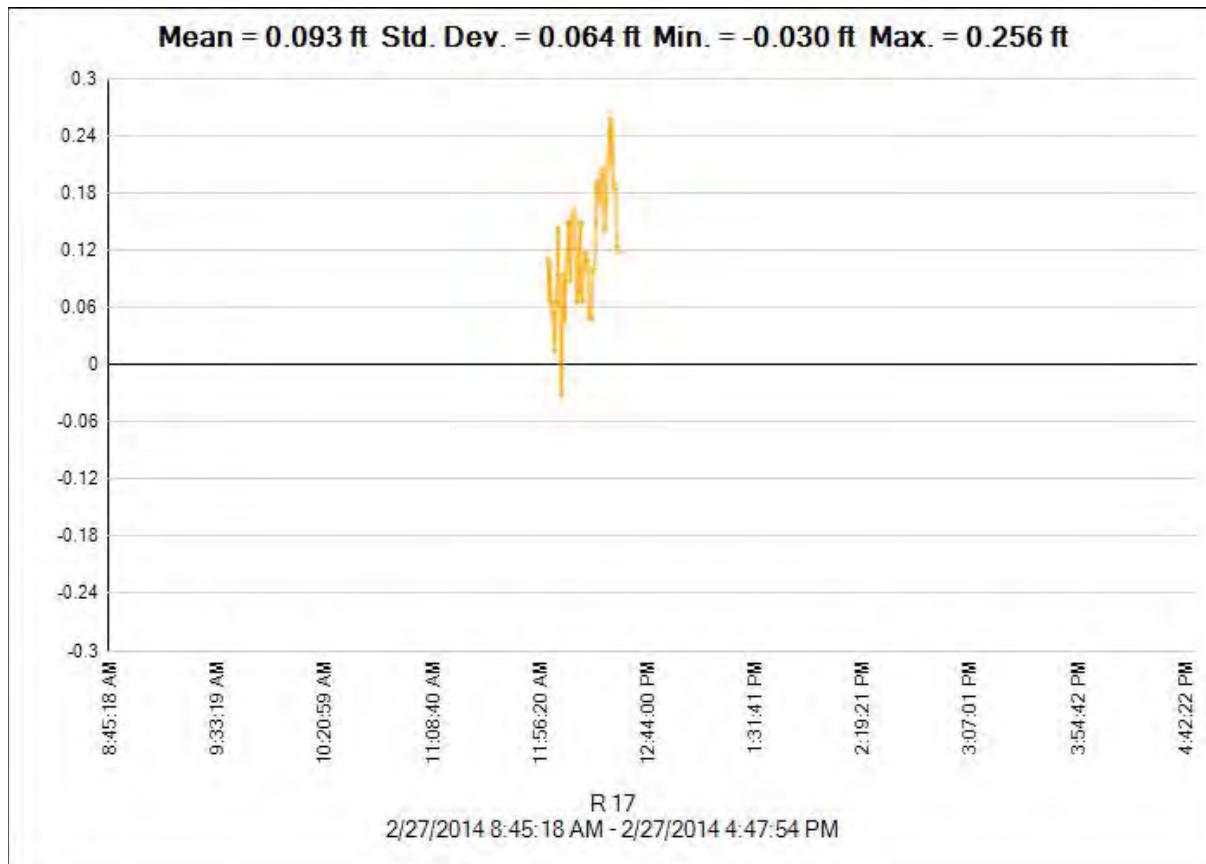


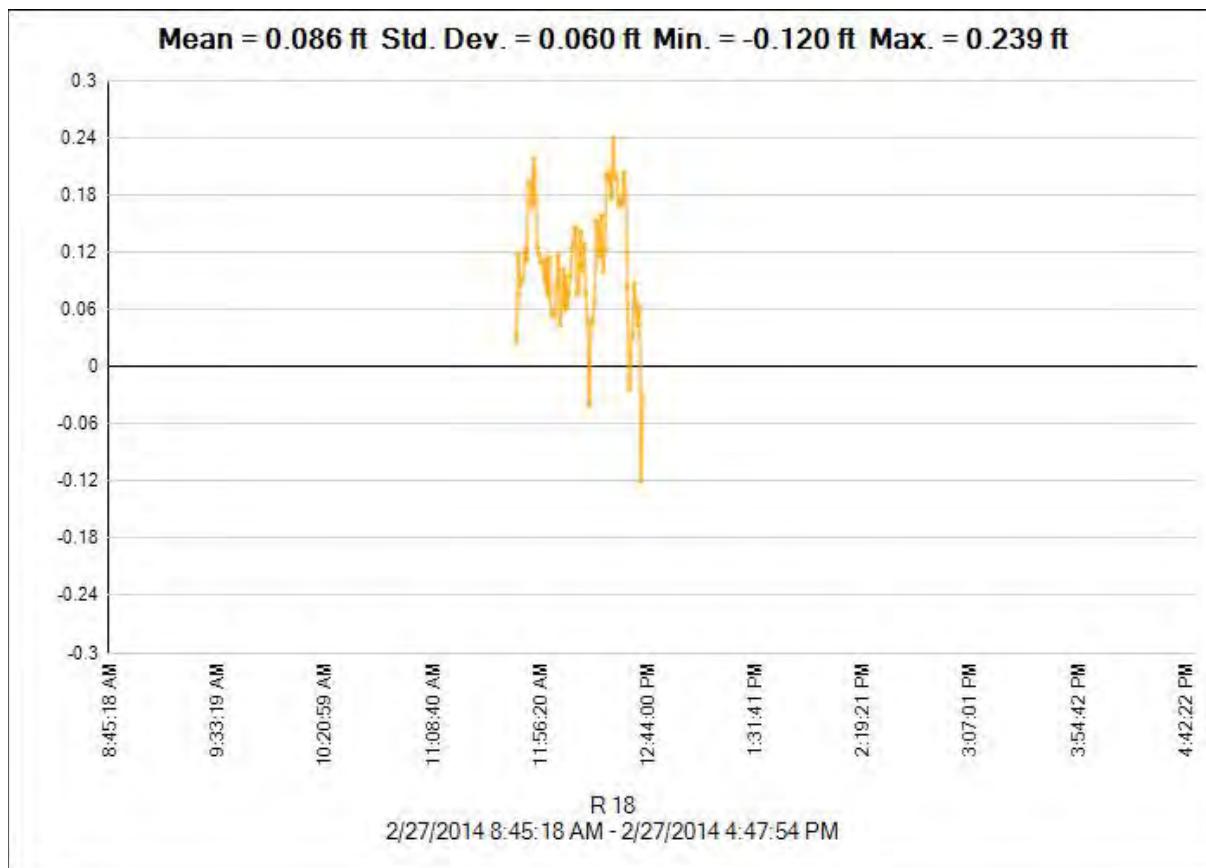


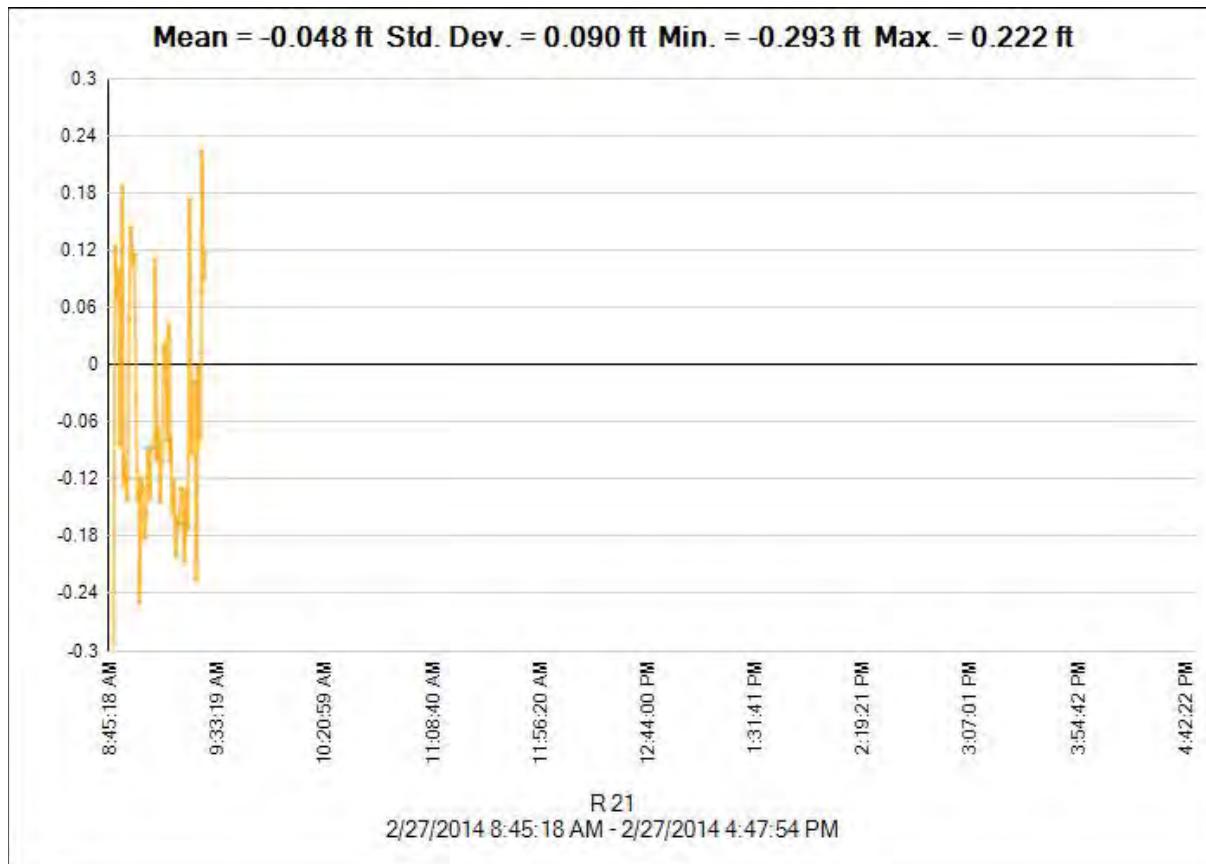


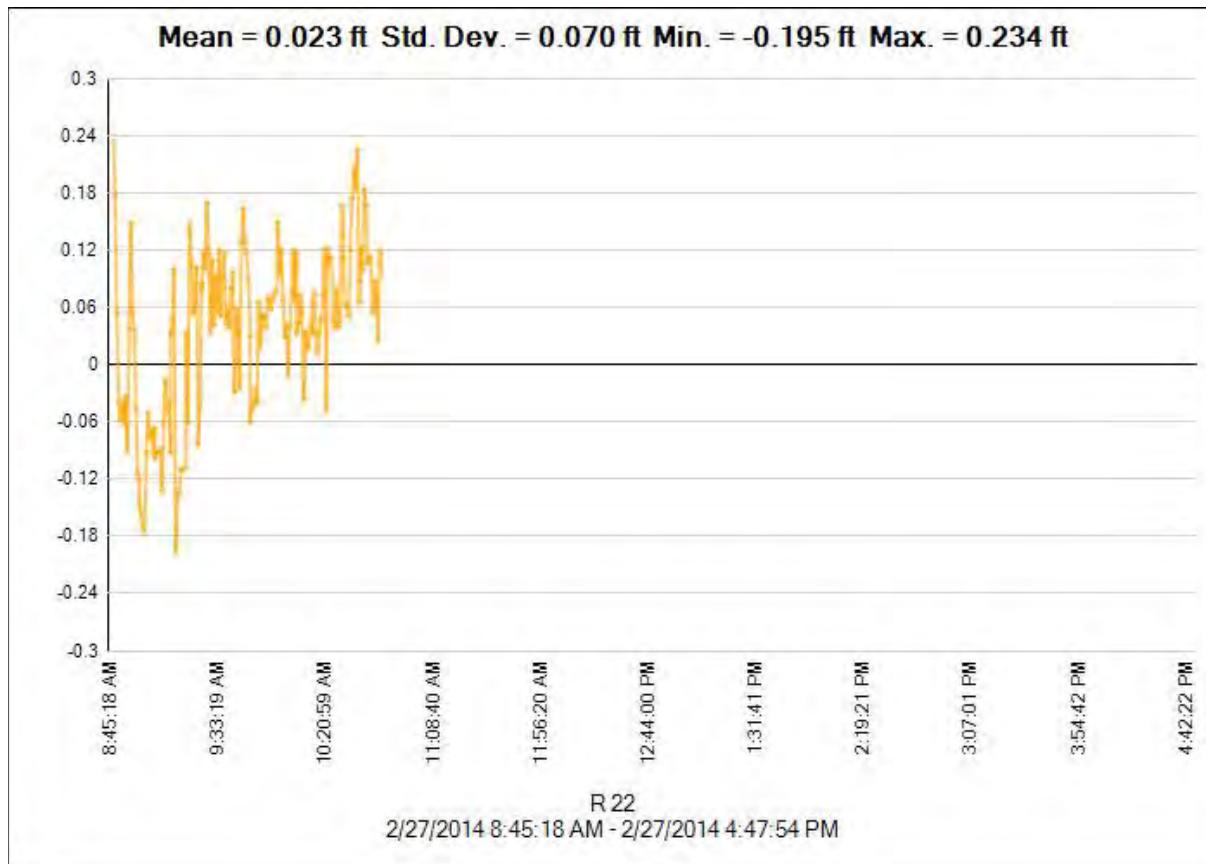


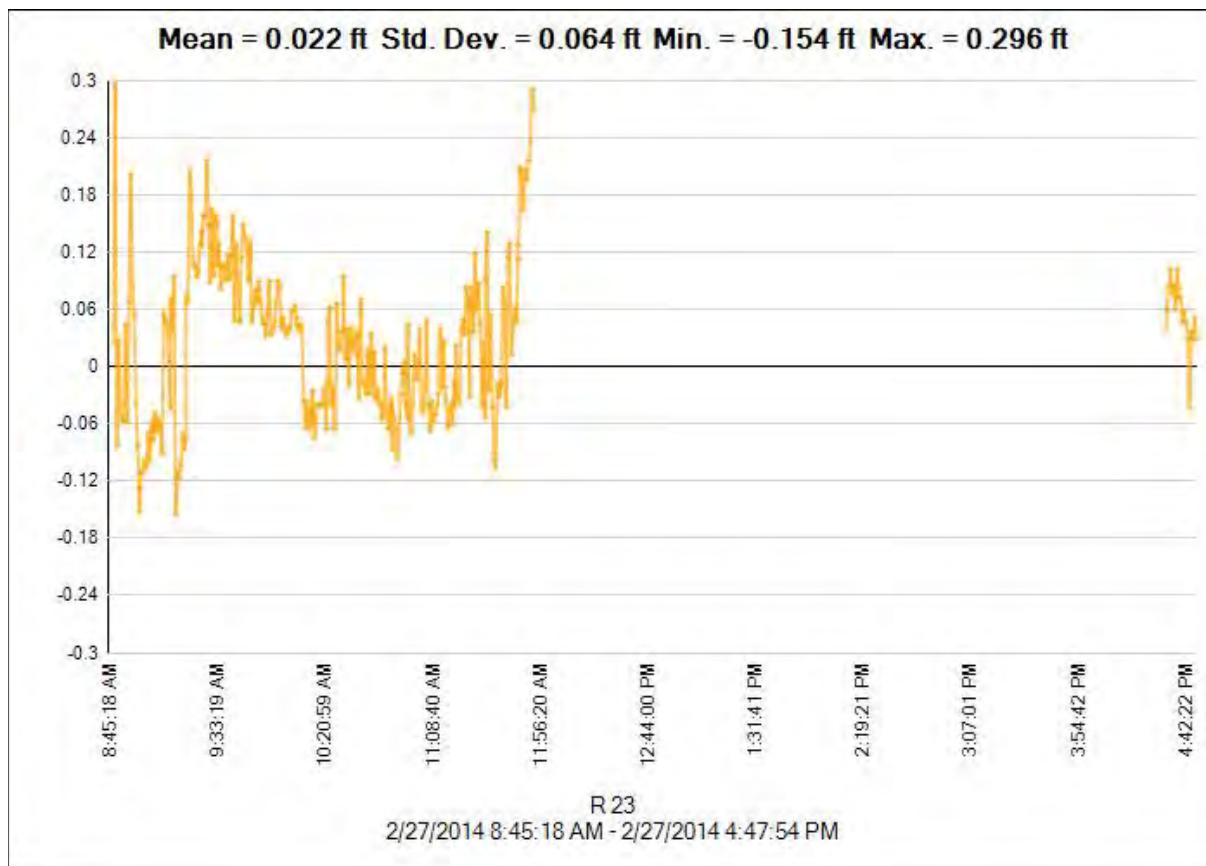


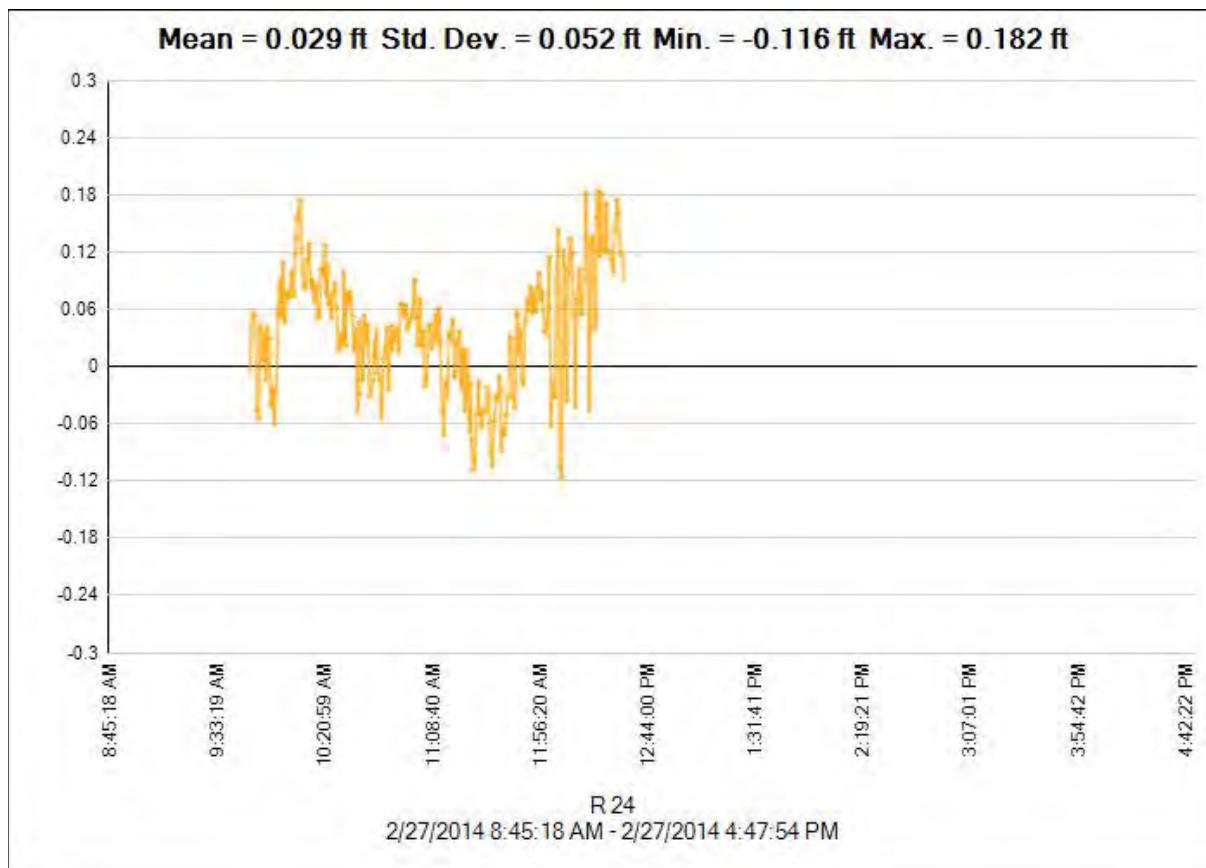














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





GRIS - LMCN (7:59:44 AM-2:59:44 PM) (S15)

Baseline observation: GRIS ---
LMCN
(B27)

Processed: 4/2/2014
10:01:00
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.011 ft

Vertical precision: 0.023 ft

RMS: 0.012 ft

Maximum PDOP: 5.702

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:10:59
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
2:59:44
PM
(Local:
UTC-6hr)

Processing duration: 1:06:48:45

Processing interval: Use all
data

Vector Components (Mark to Mark)

From:	GRIS
-------	------



Grid		Local		Global	
Northing	281033.474 ft	Latitude	N29°15'55.88300"	Latitude	N29°15'55.88300"
Easting	3719590.183 ft	Longitude	W89°57'26.26226"	Longitude	W89°57'26.26226"
Elevation	27.375 ft	Height	-51.286 ft	Height	-51.286 ft

To:	LMCN				
Grid		Local		Global	
Northing	275191.078 ft	Latitude	N29°15'17.90412"	Latitude	N29°15'17.90411"
Easting	3495143.520 ft	Longitude	W90°39'40.65184"	Longitude	W90°39'40.65184"
Elevation	31.615 ft	Height	-48.435 ft	Height	-48.435 ft

Vector					
ΔNorthing	-5842.396 ft	NS Fwd Azimuth	269°11'35"	ΔX	-224493.239 ft
ΔEasting	-224446.662 ft	Ellipsoid Dist.	224520.762 ft	ΔY	-665.737 ft
ΔElevation	4.240 ft	ΔHeight	2.851 ft	ΔZ	-3345.482 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.002 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.004 ft
σ ΔEasting	0.004 ft	σ Ellipsoid Dist.	0.004 ft	σ ΔY	0.010 ft
σ ΔElevation	0.012 ft	σ ΔHeight	0.012 ft	σ ΔZ	0.006 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000017464		
Y	-0.0000000176	0.0000099011	
Z	0.0000000897	-0.0000051231	0.0000031969

Occupations

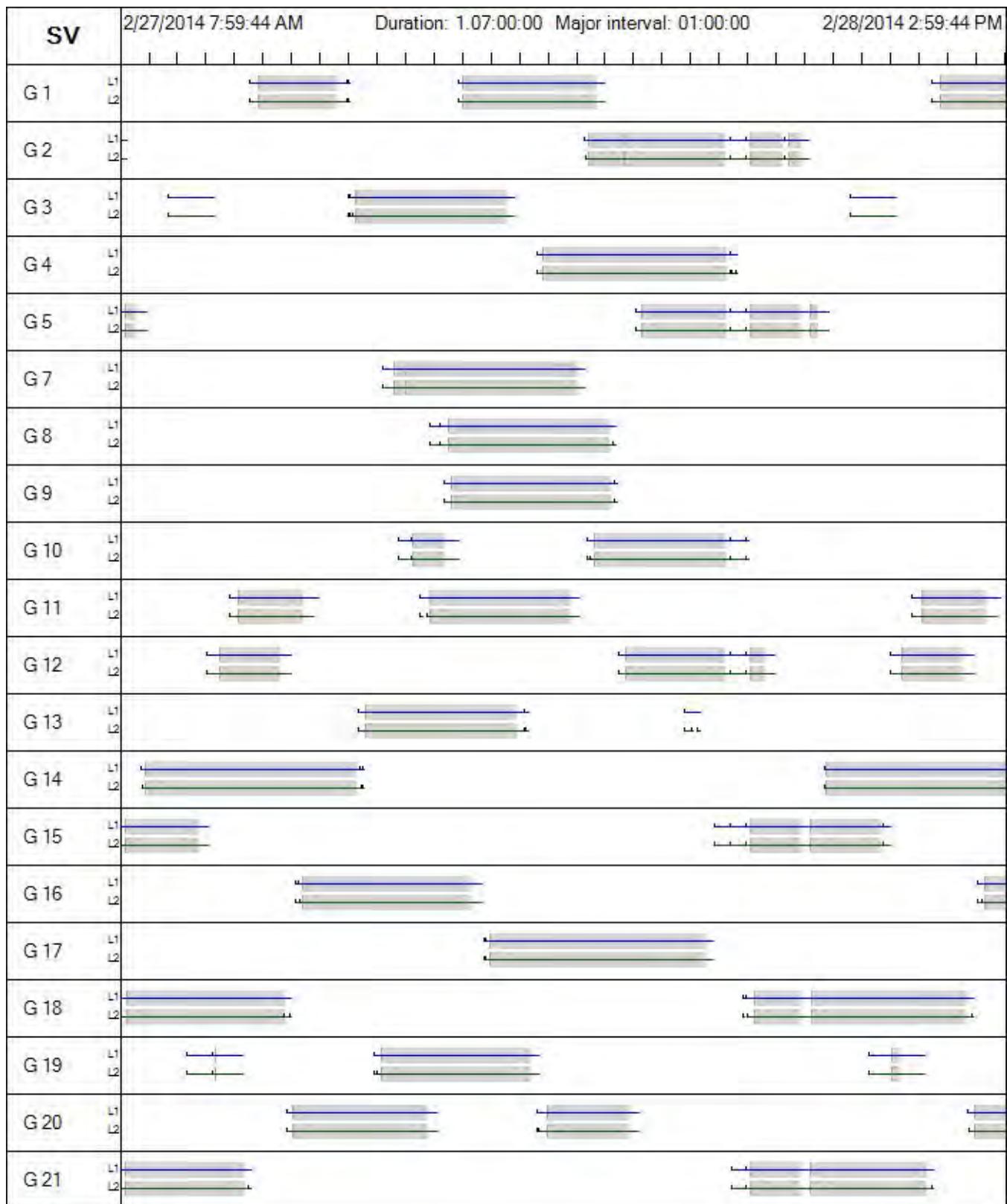
	From	To
Point ID:	GRIS	LMCN



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\lmcn0580_0.14o
Receiver type:	NetR9	NetRS
Receiver serial number:	5201K41142	4508245724
Antenna type:	Zephyr Geodetic 2 RoHS	Zephyr Geodetic
Antenna serial number:	5000117437	60104388
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount



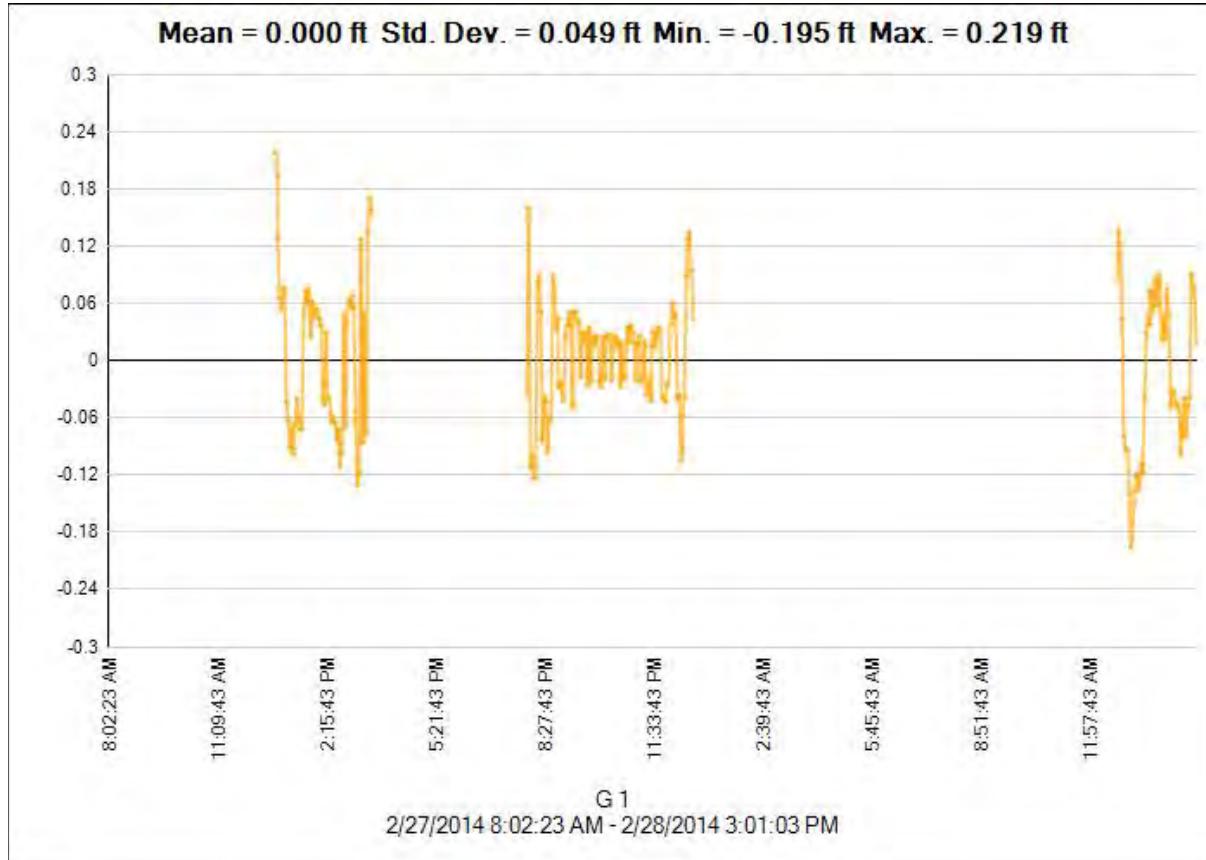
Tracking Summary

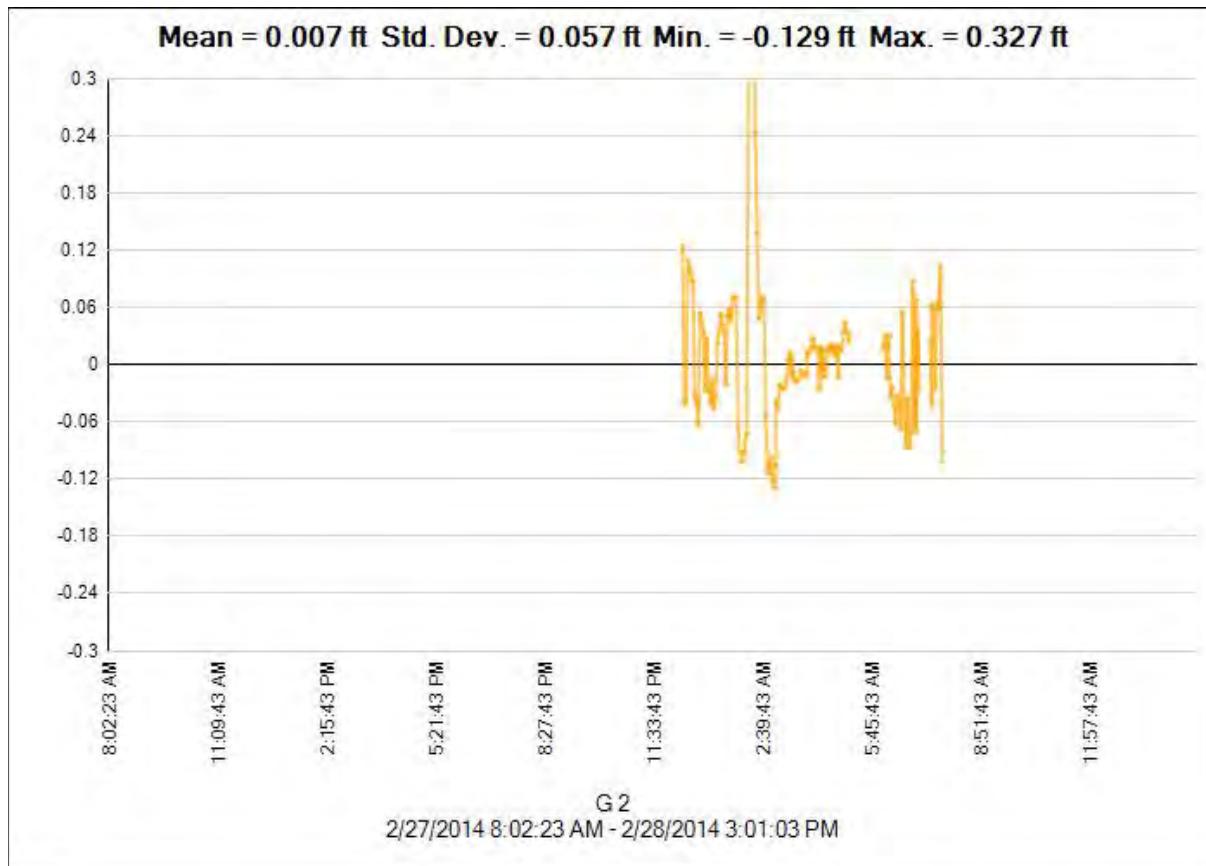


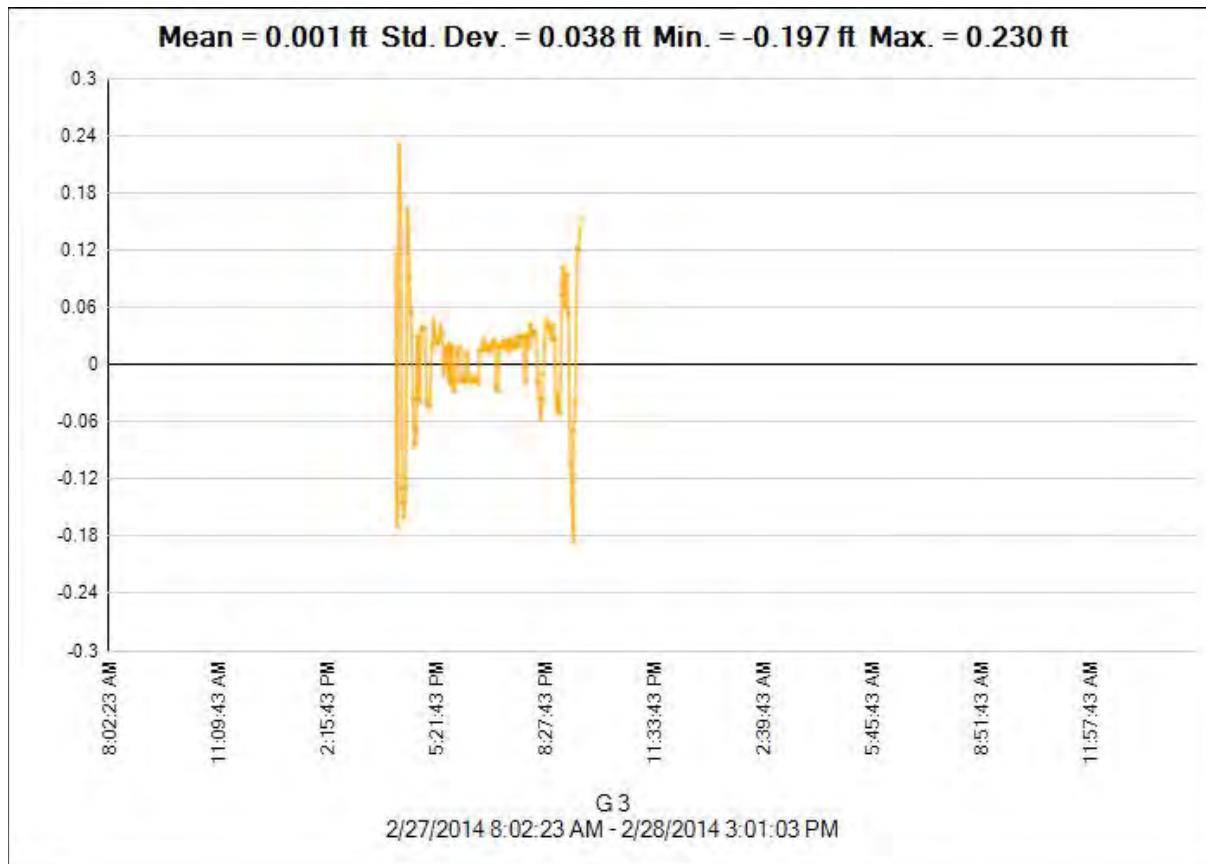


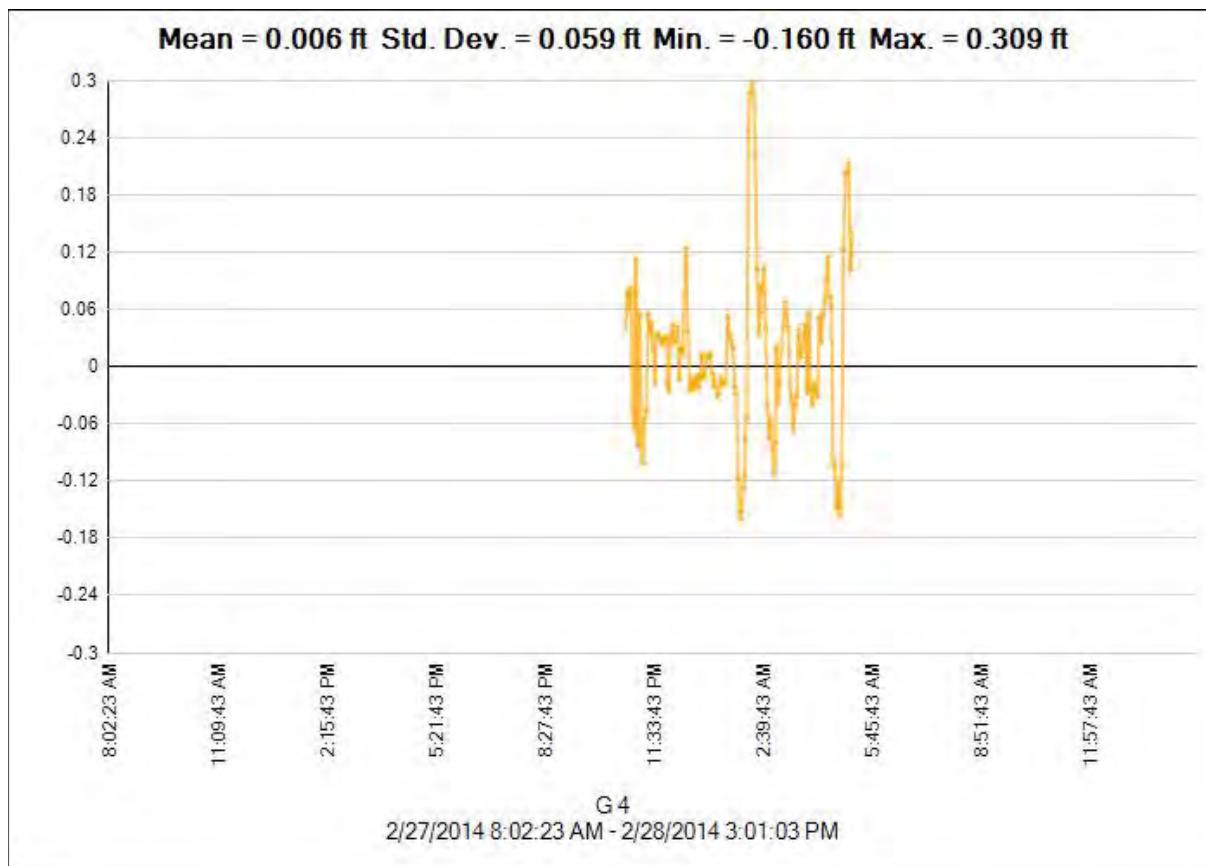


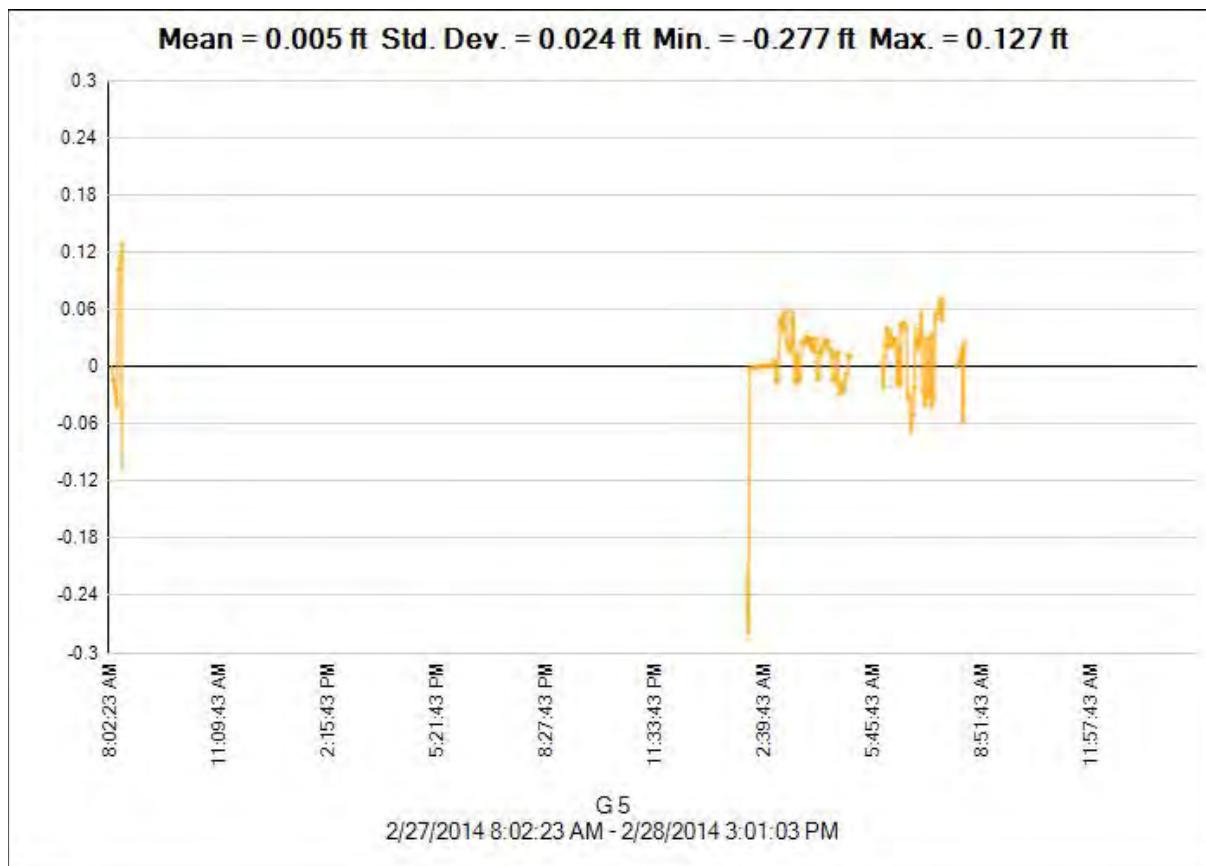
Residuals

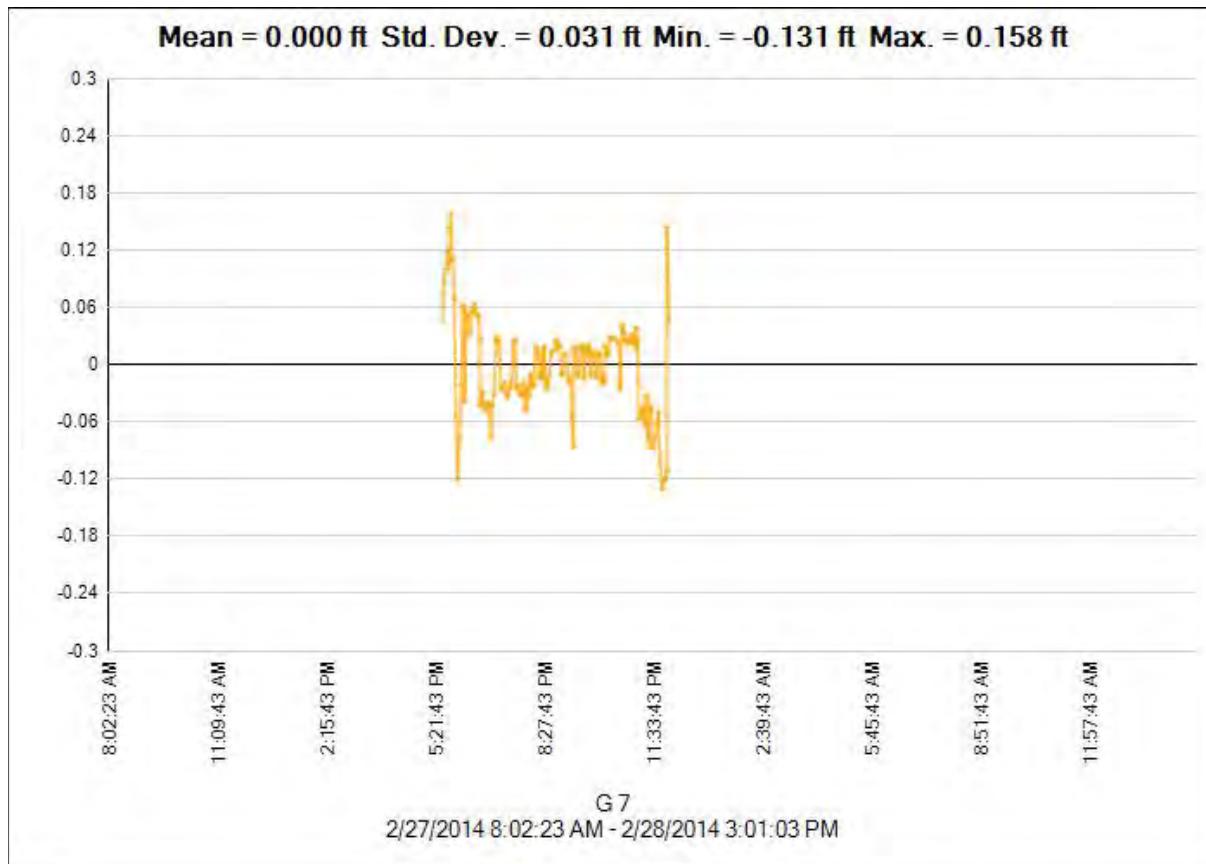


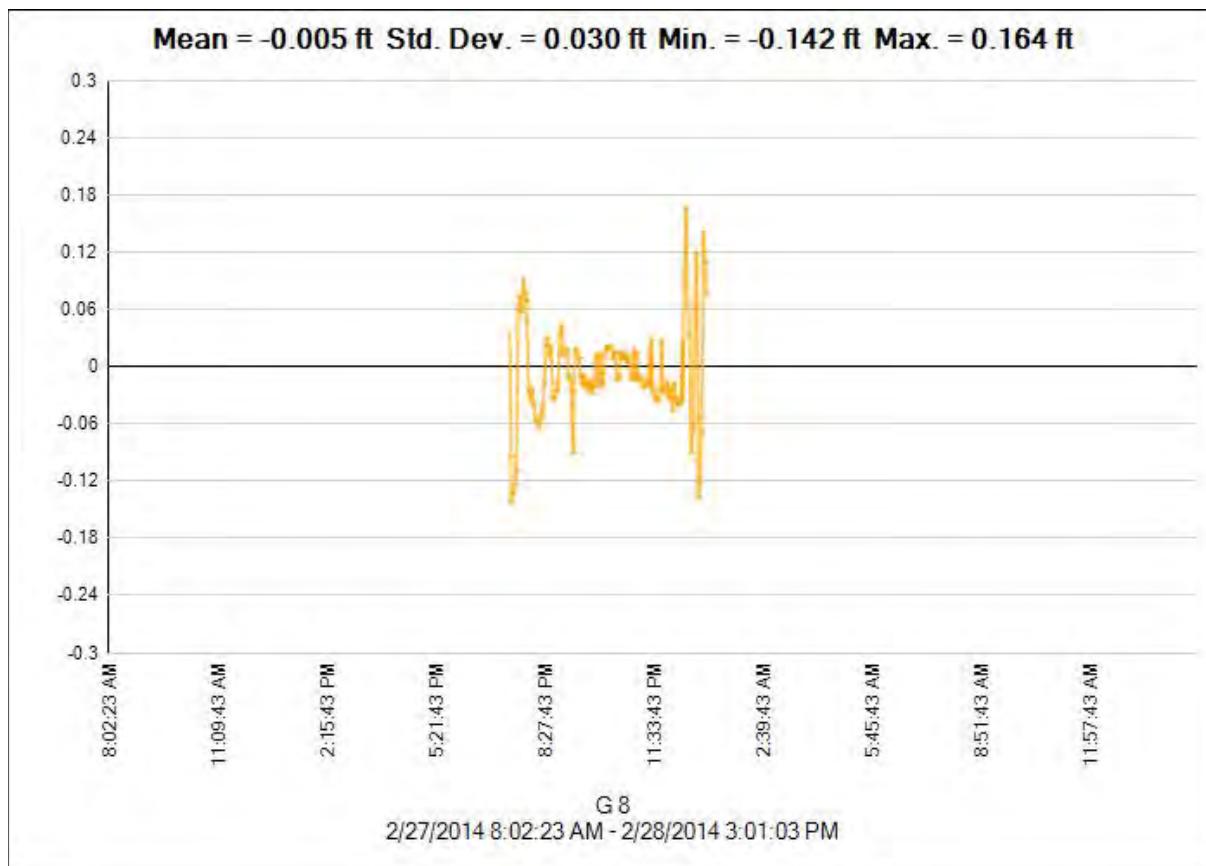


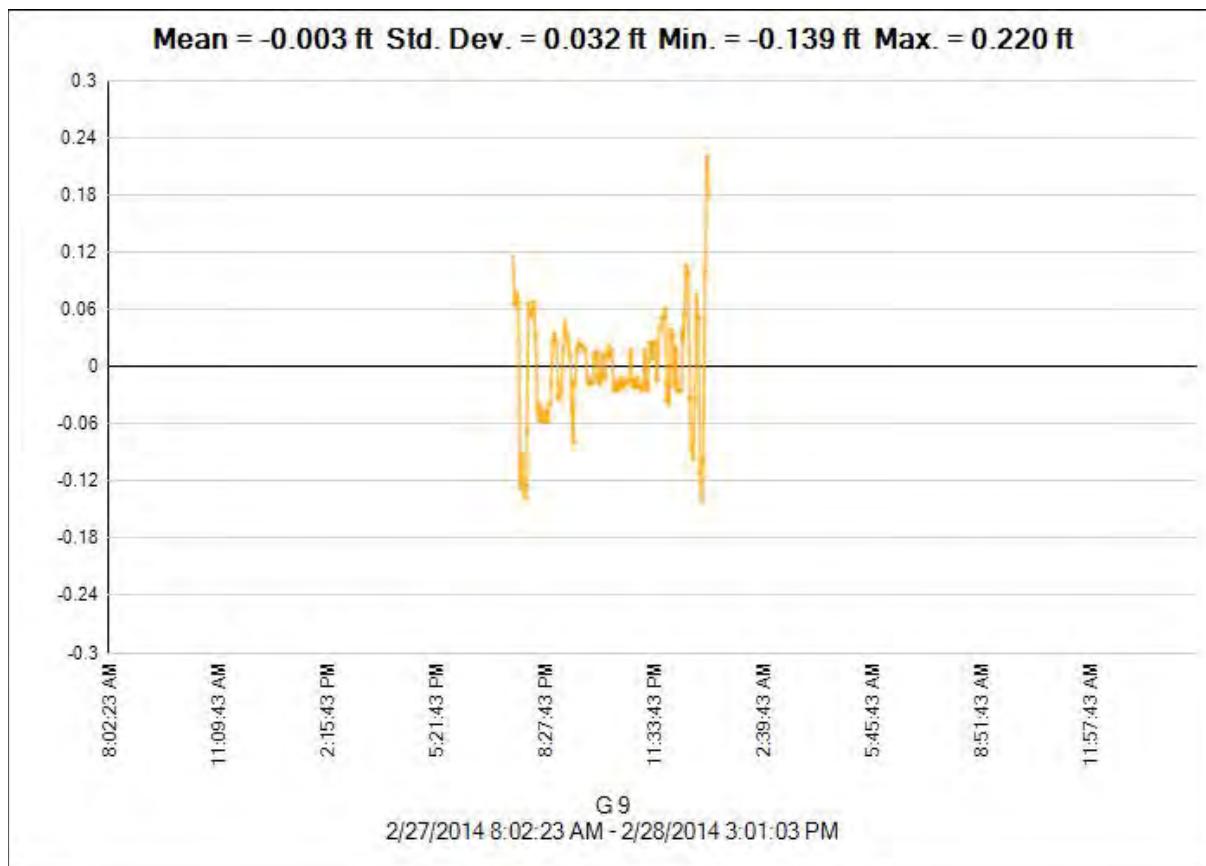


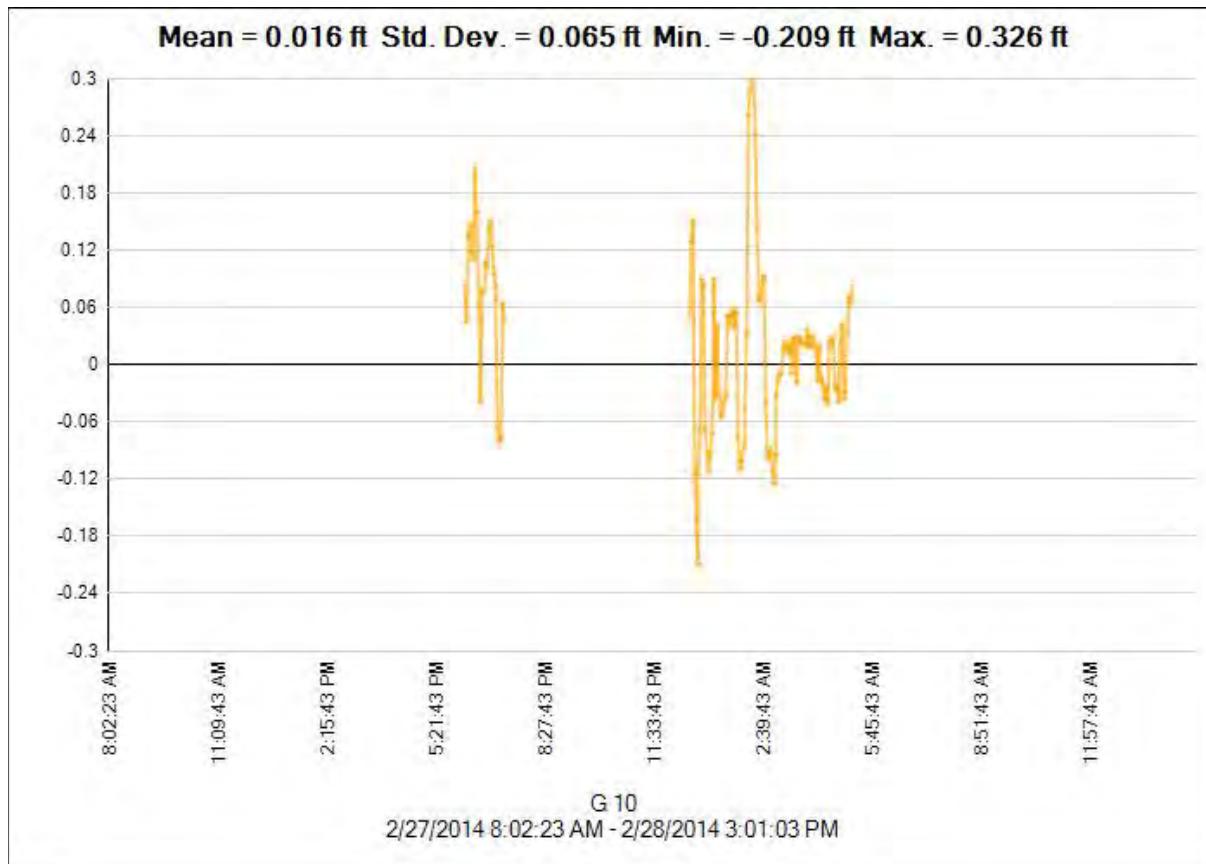


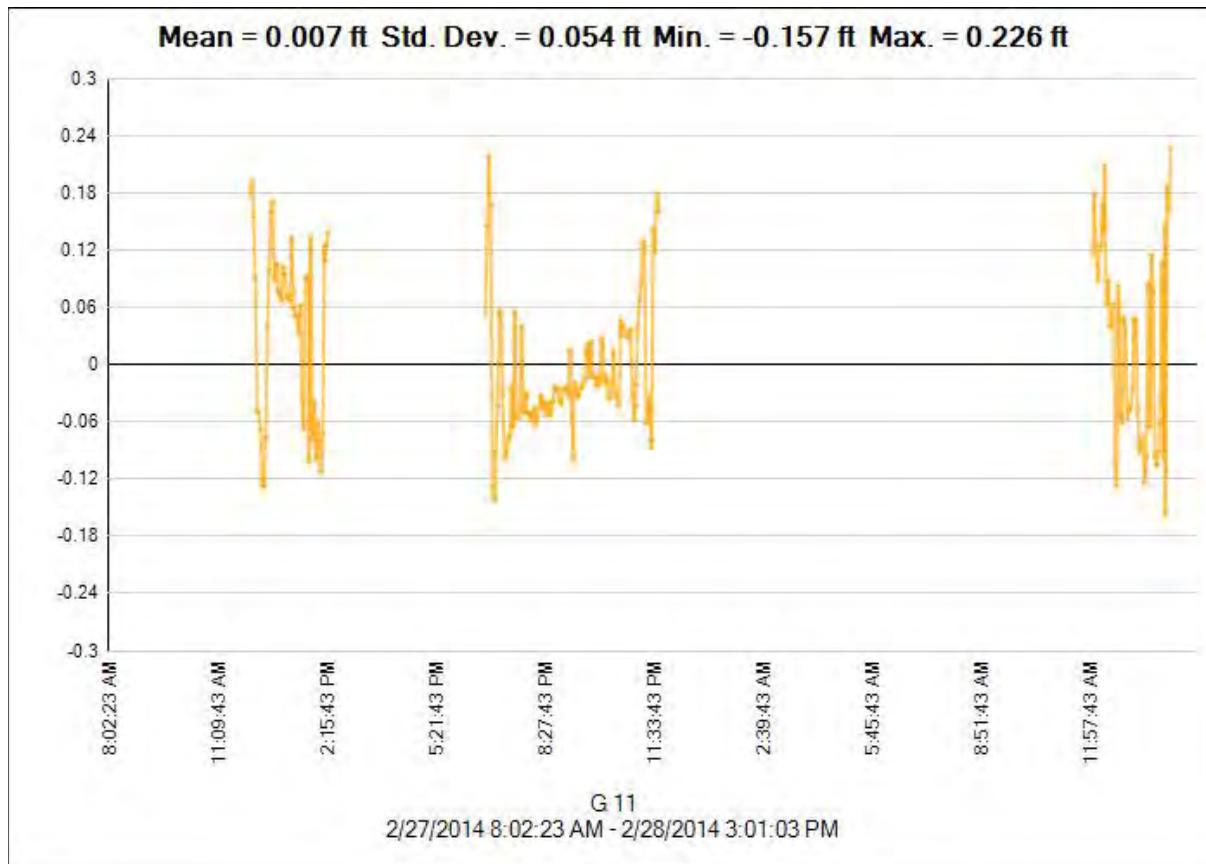


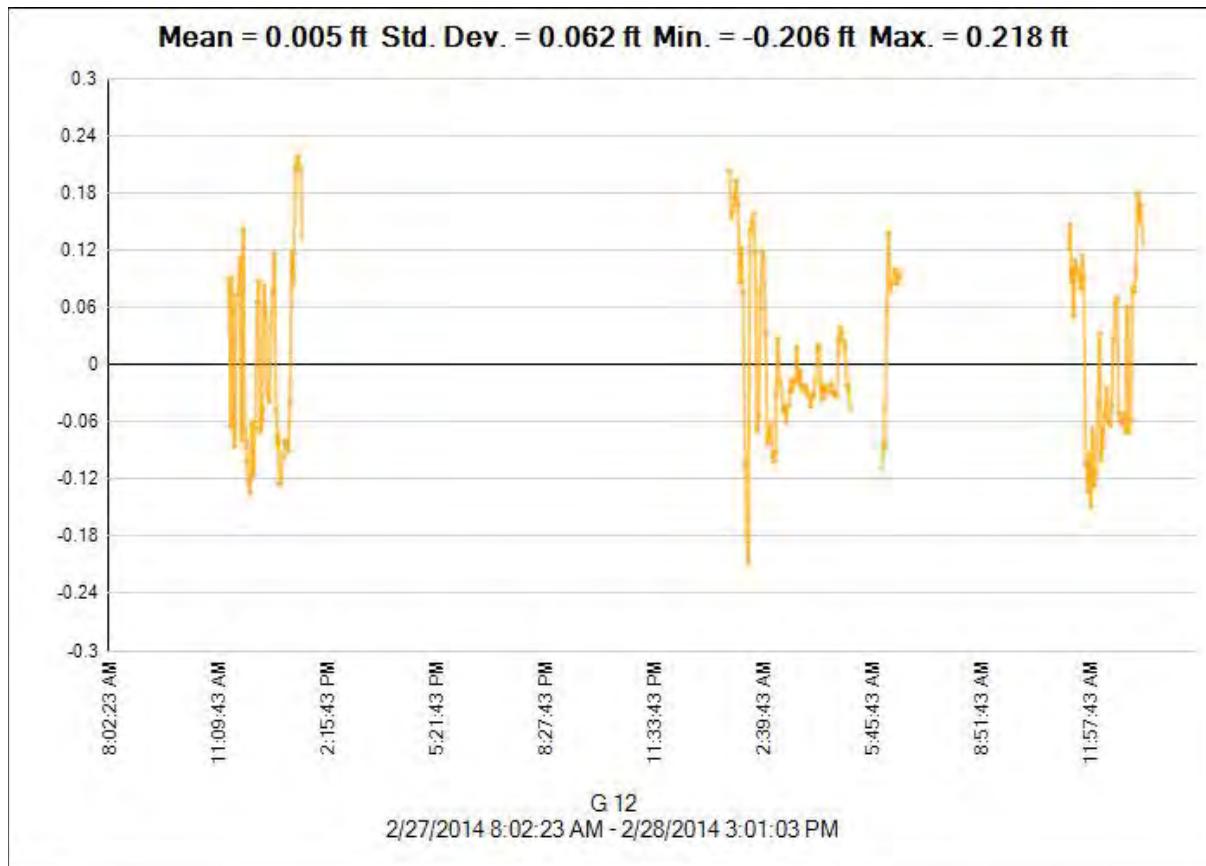


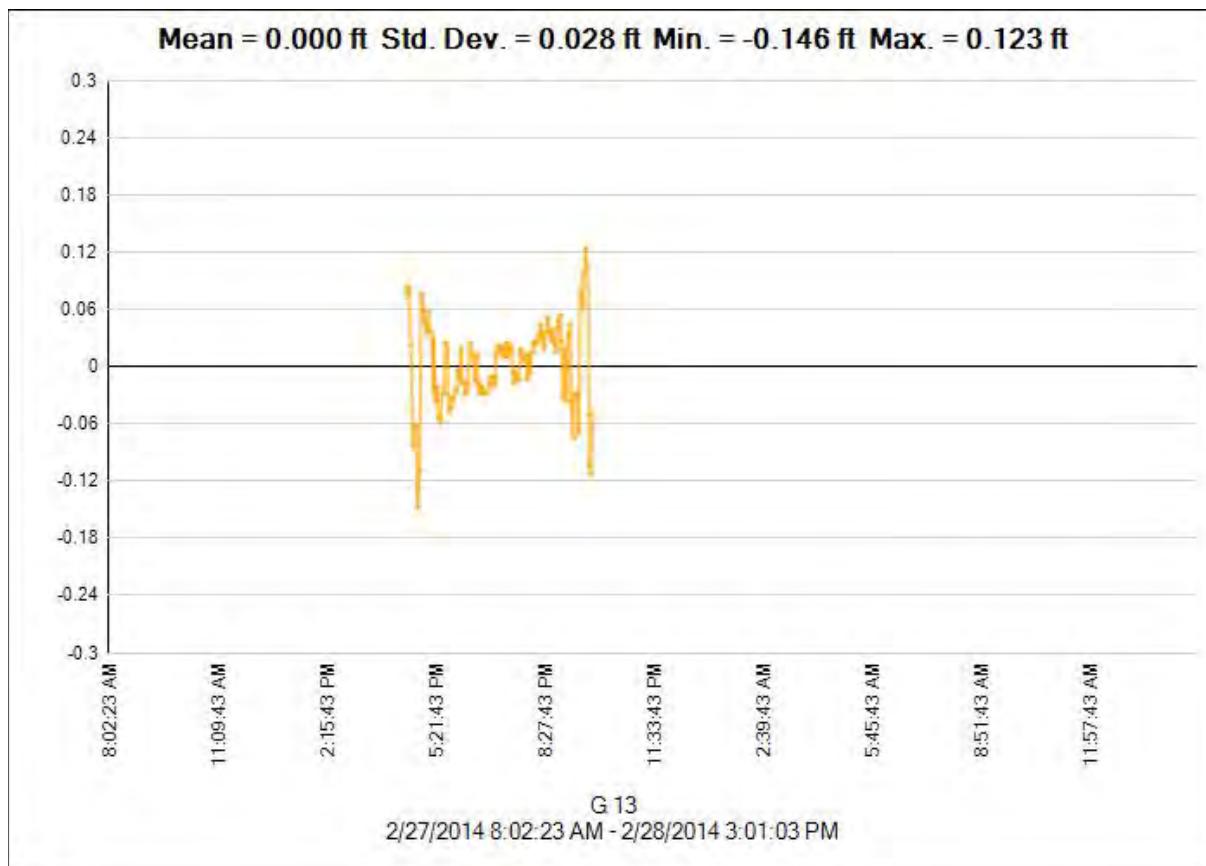


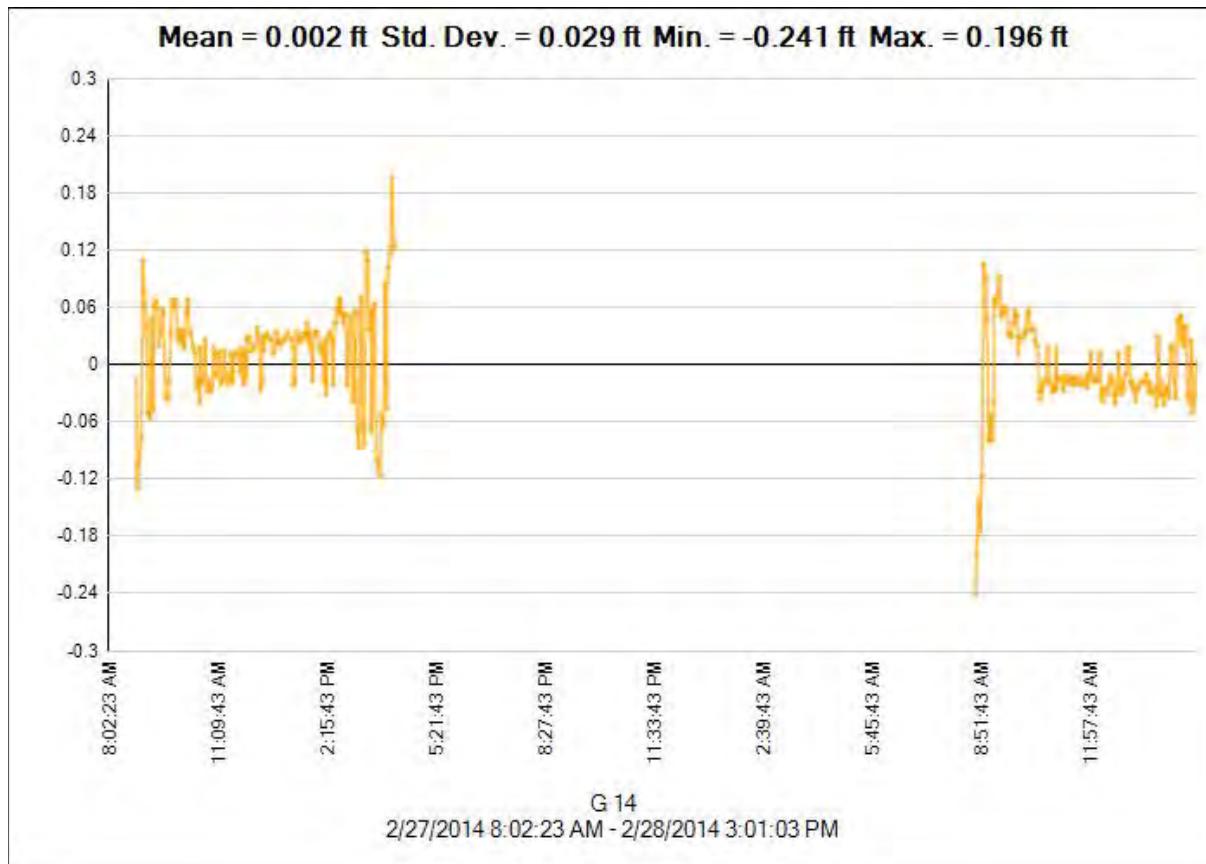


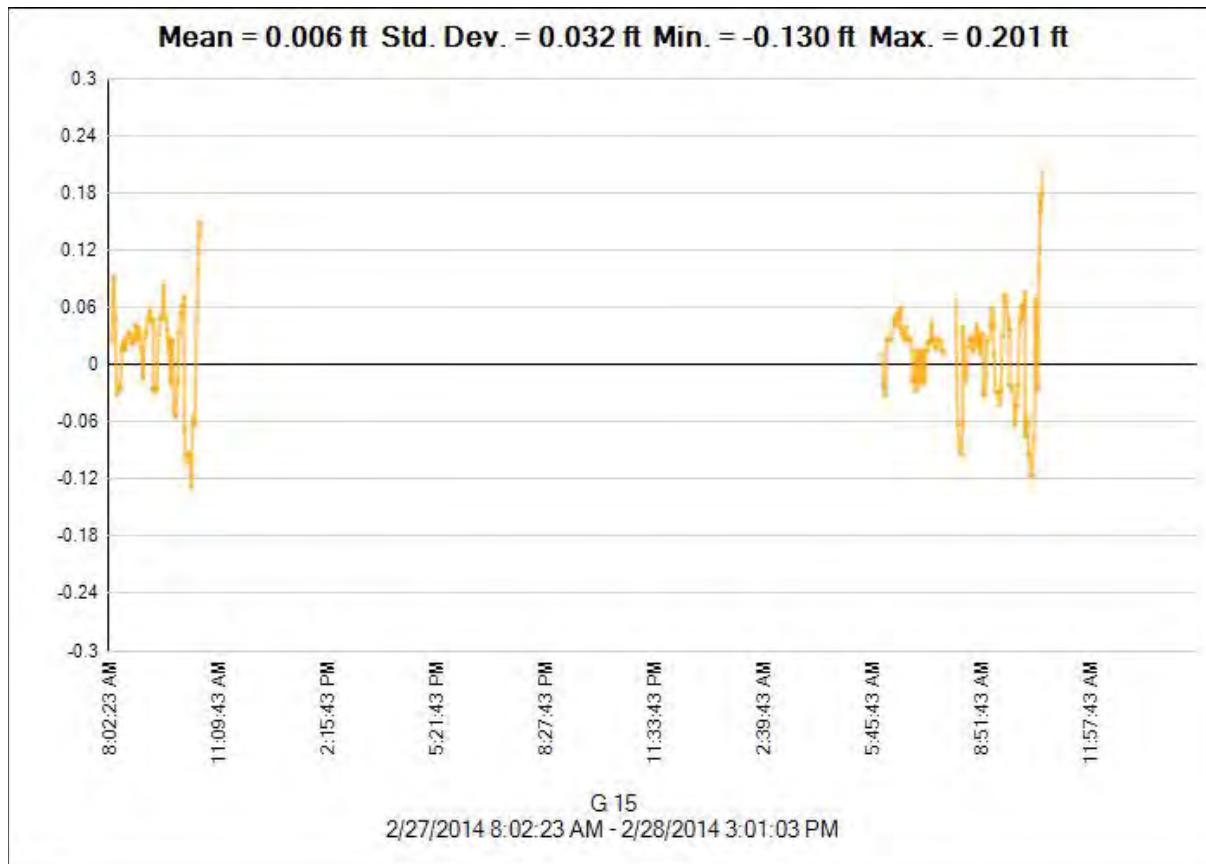


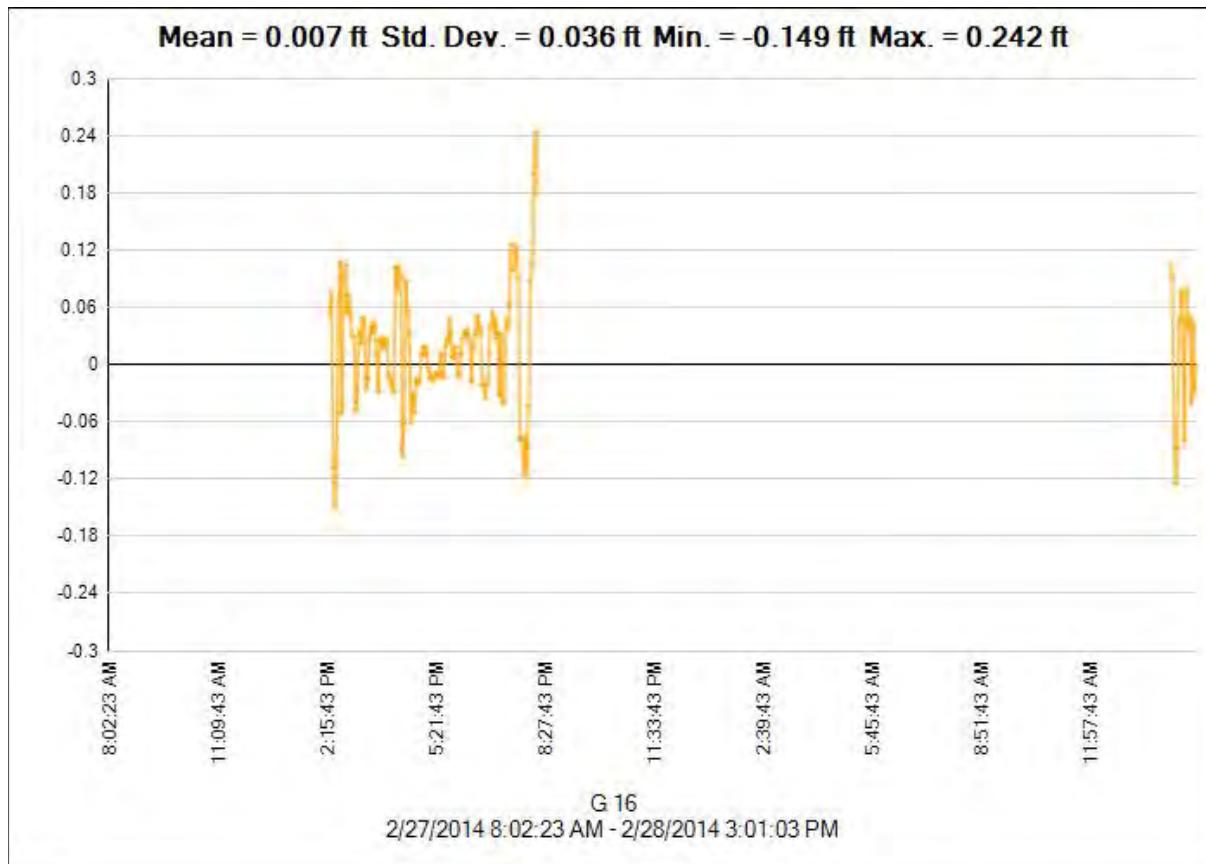


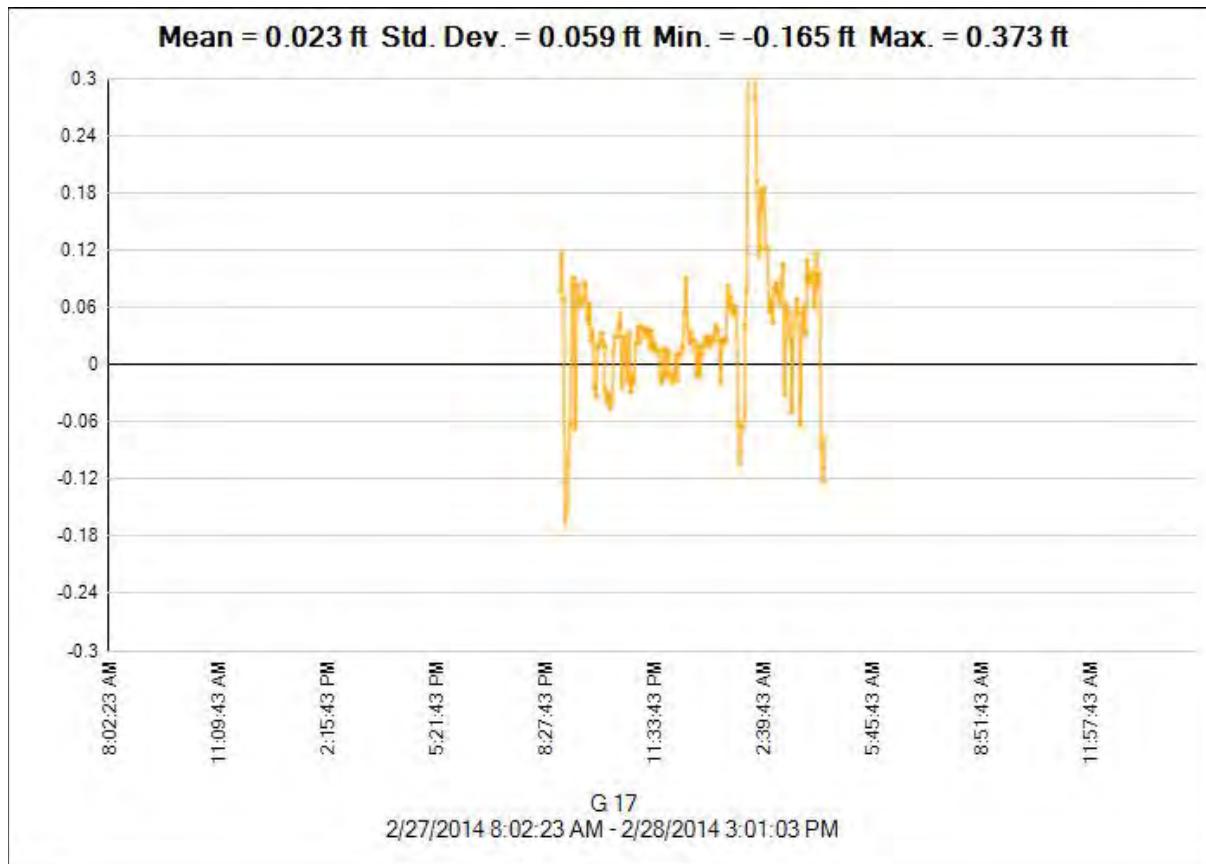


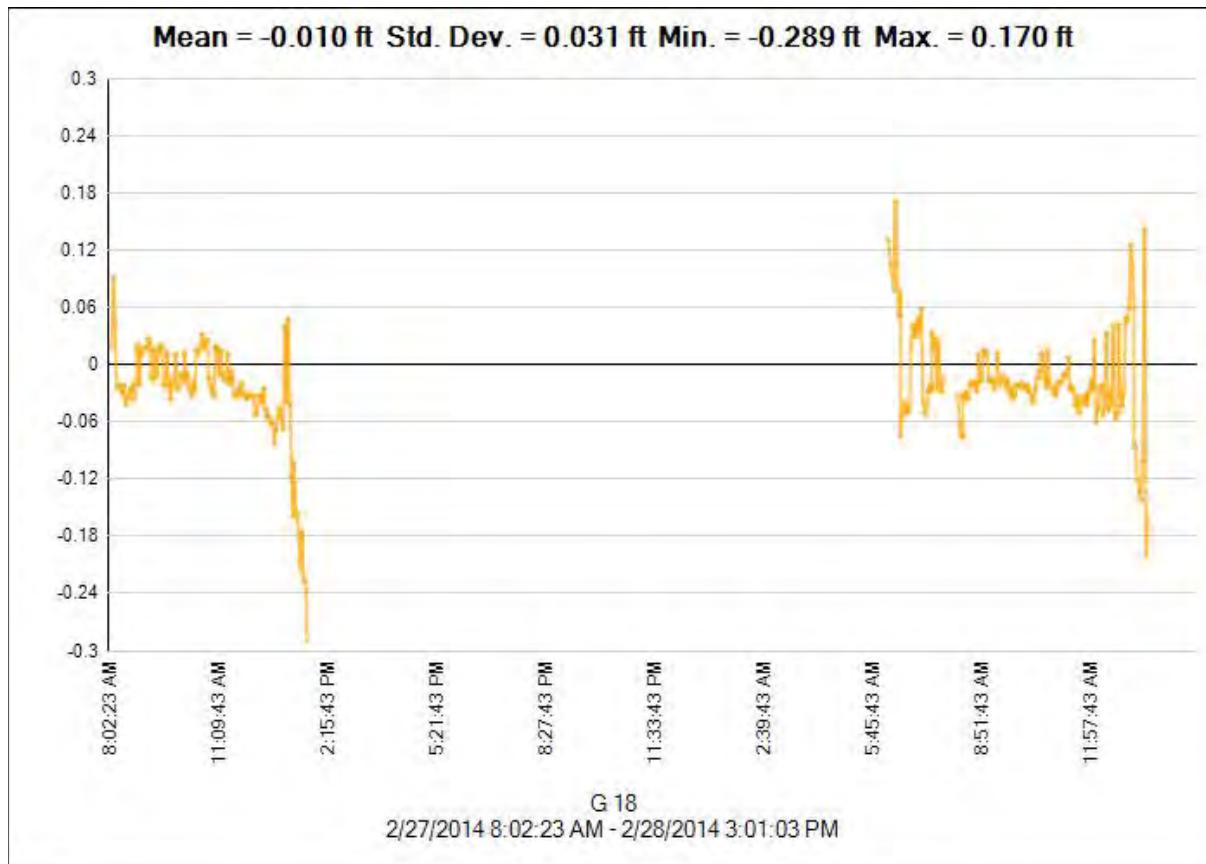


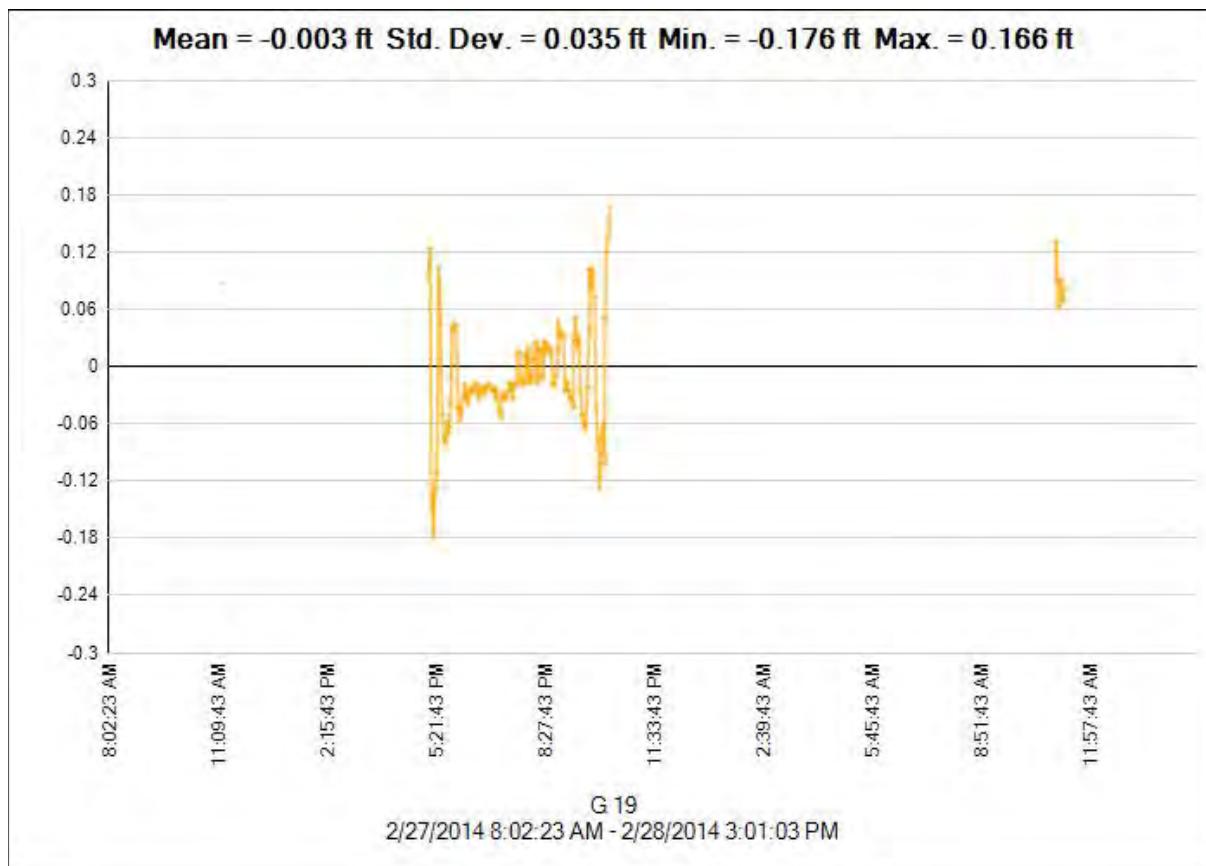


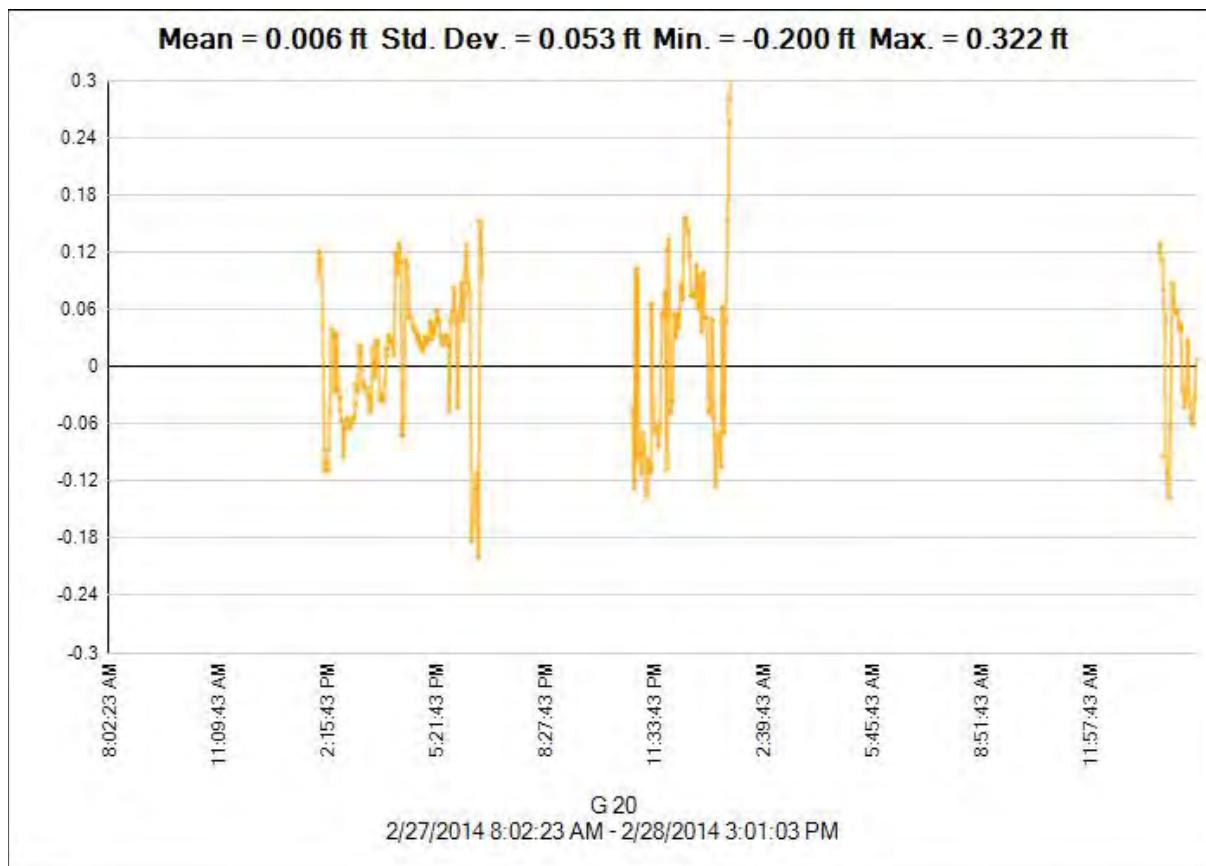


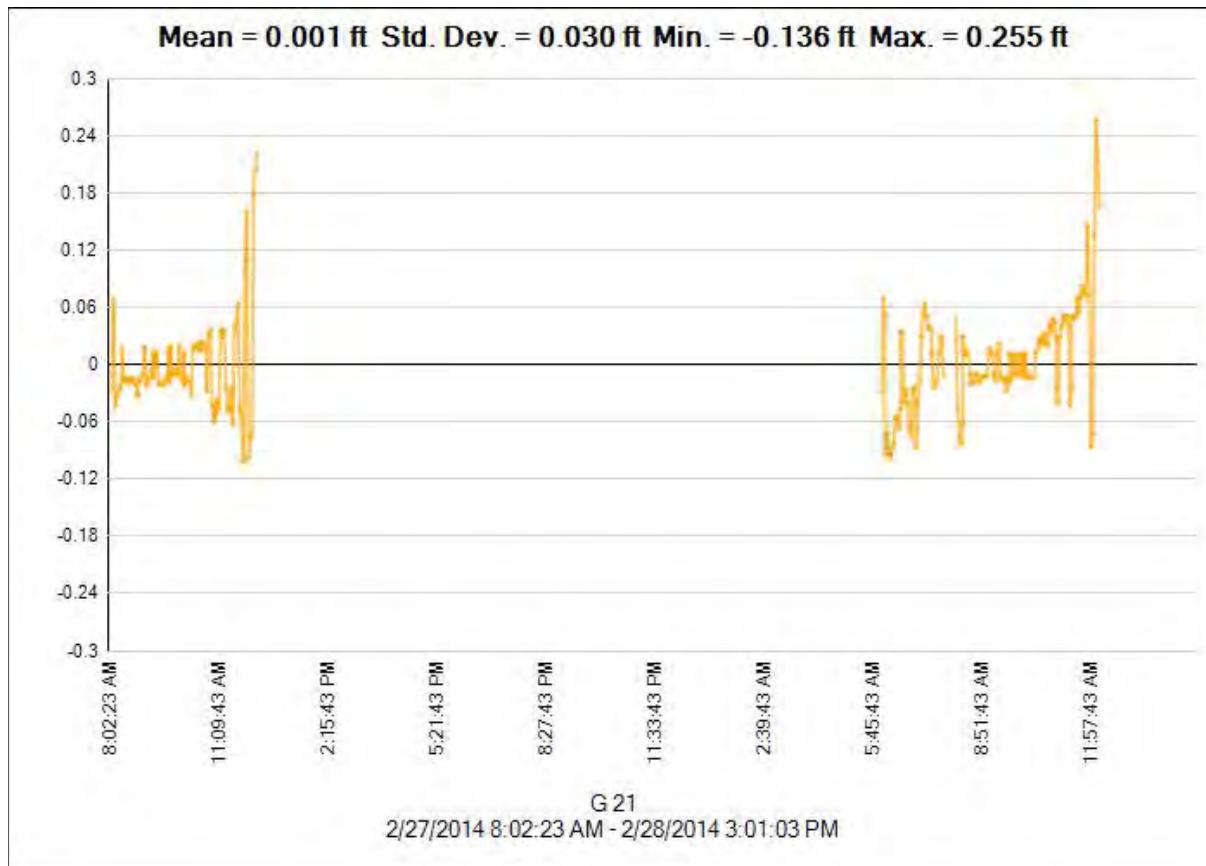


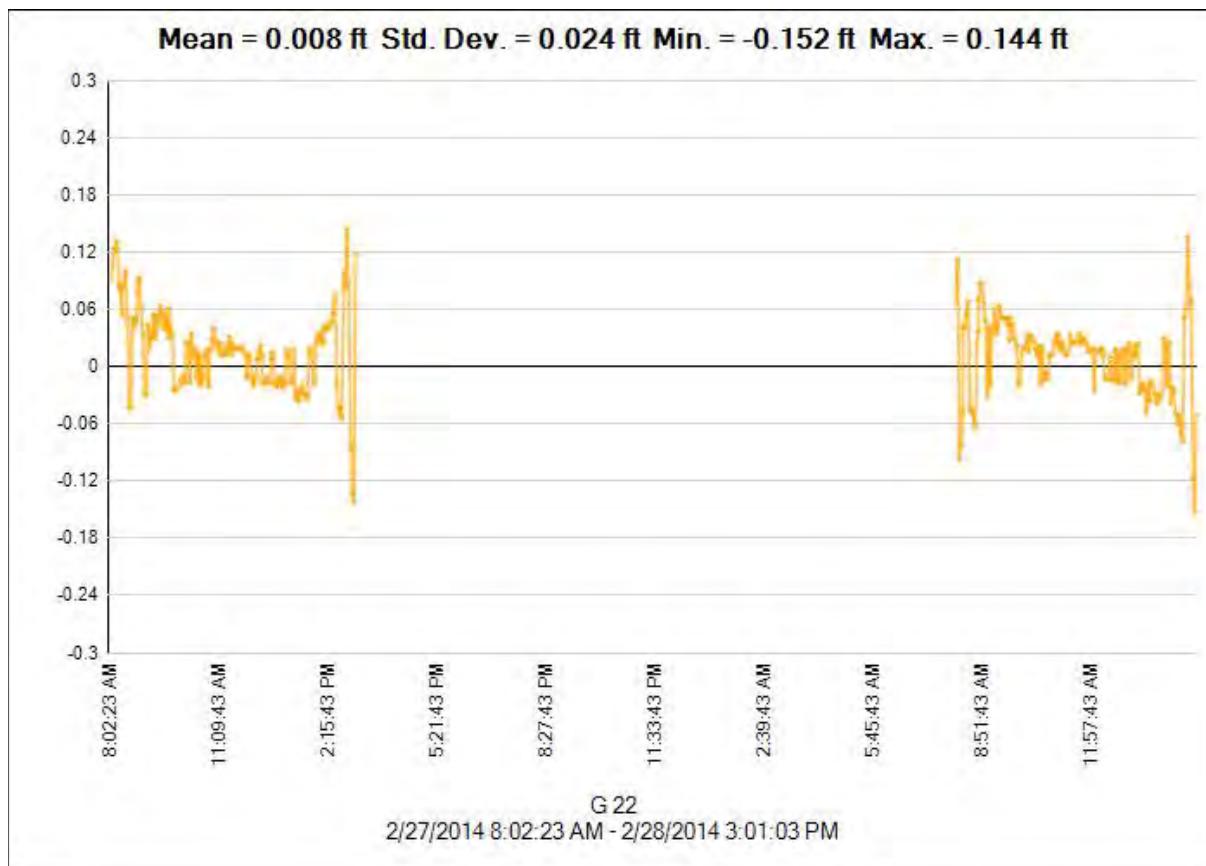


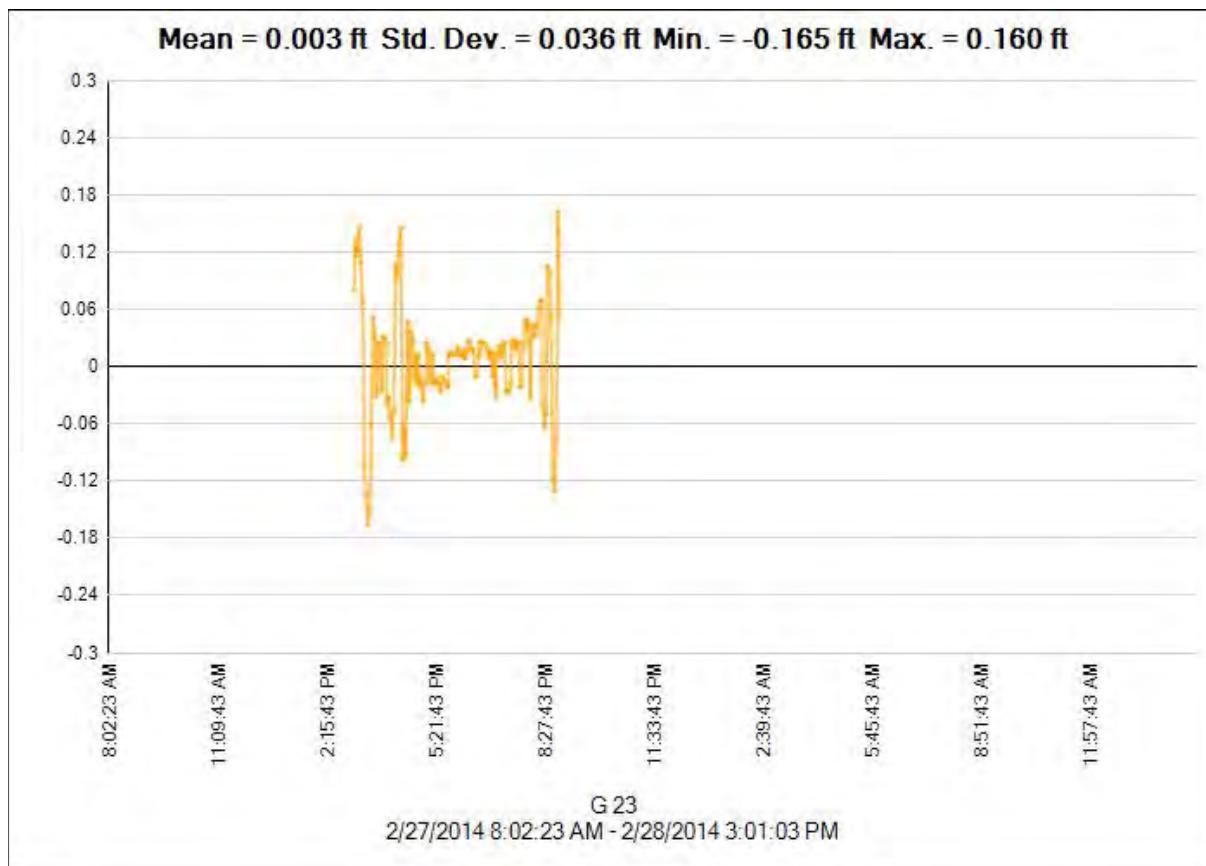


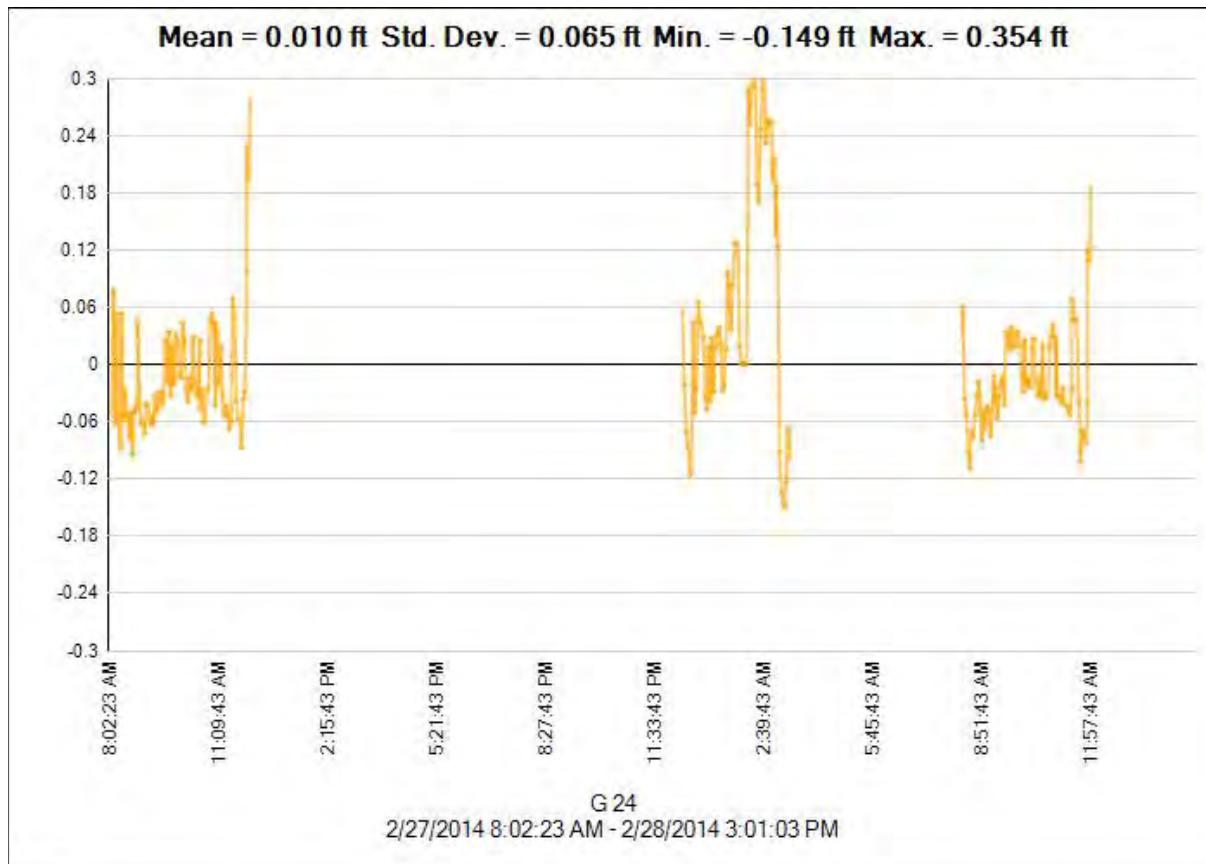


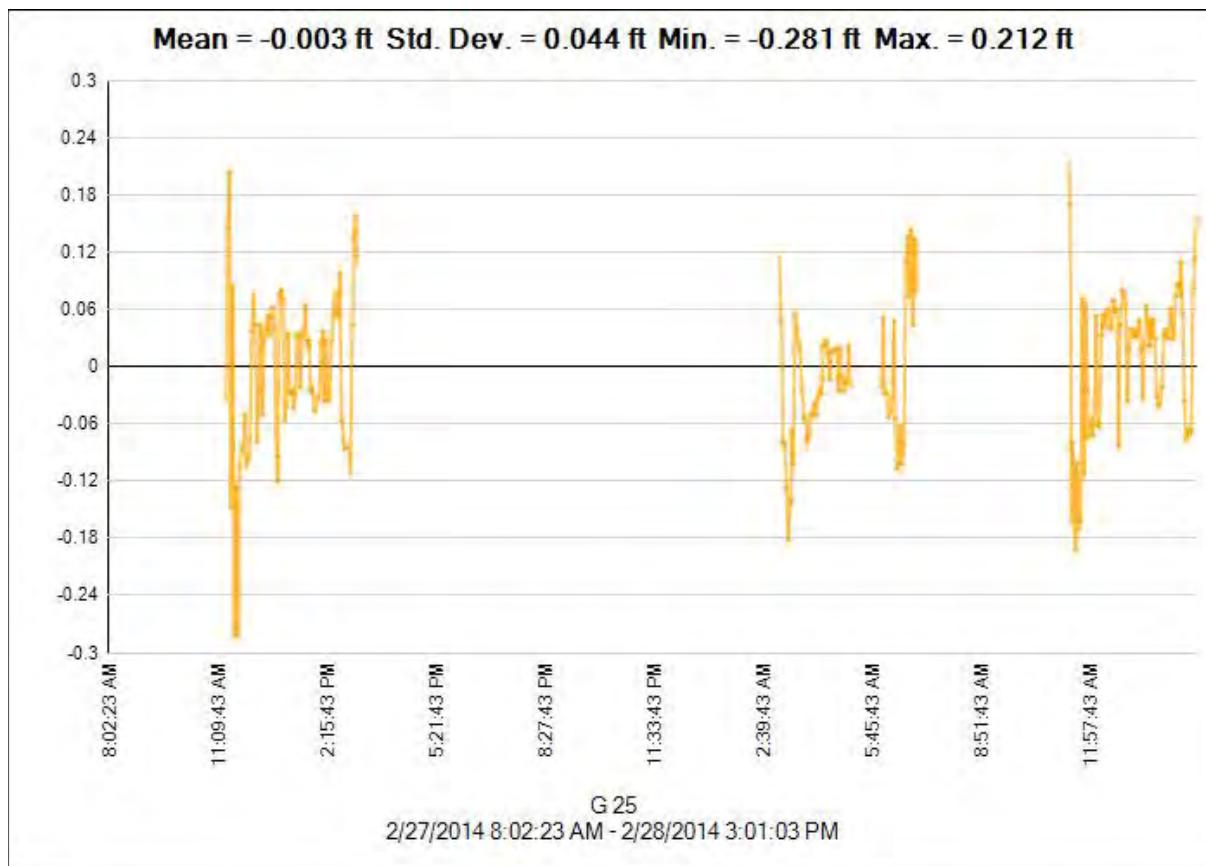


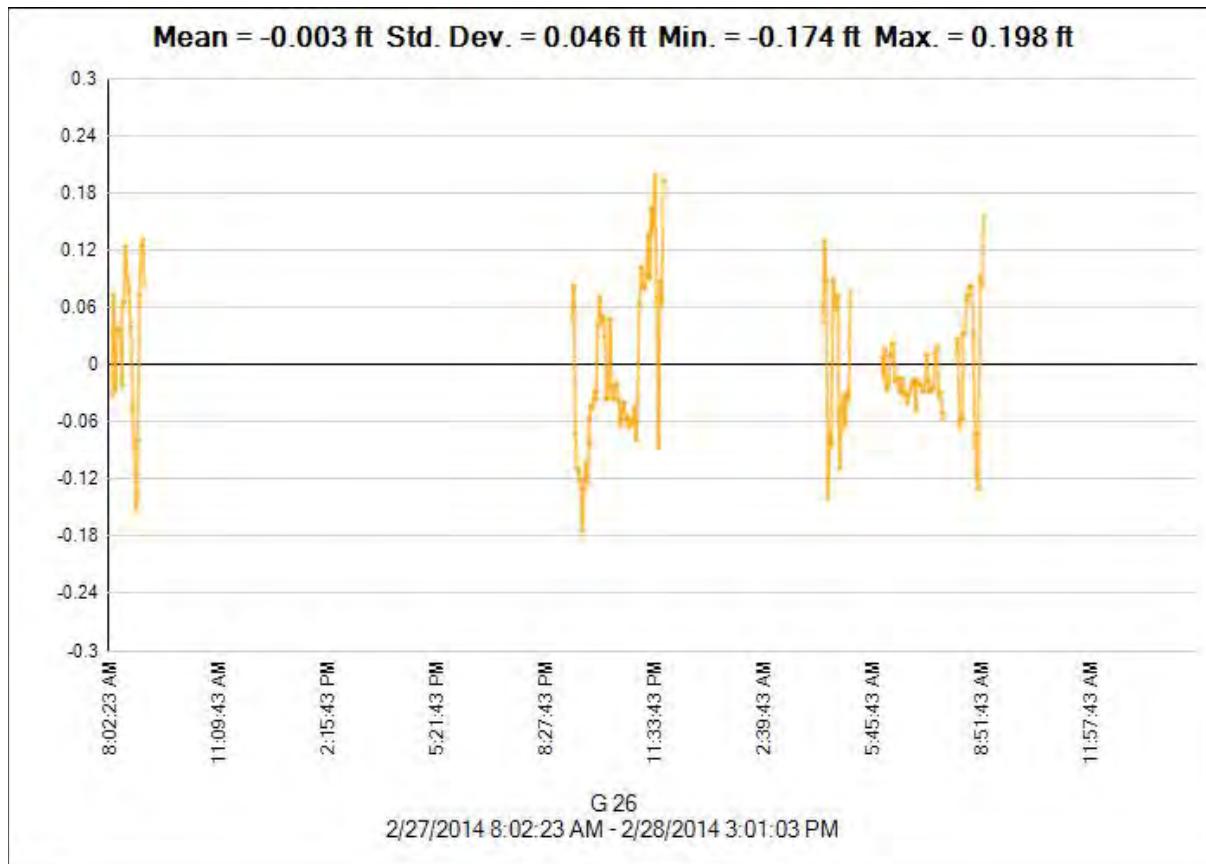


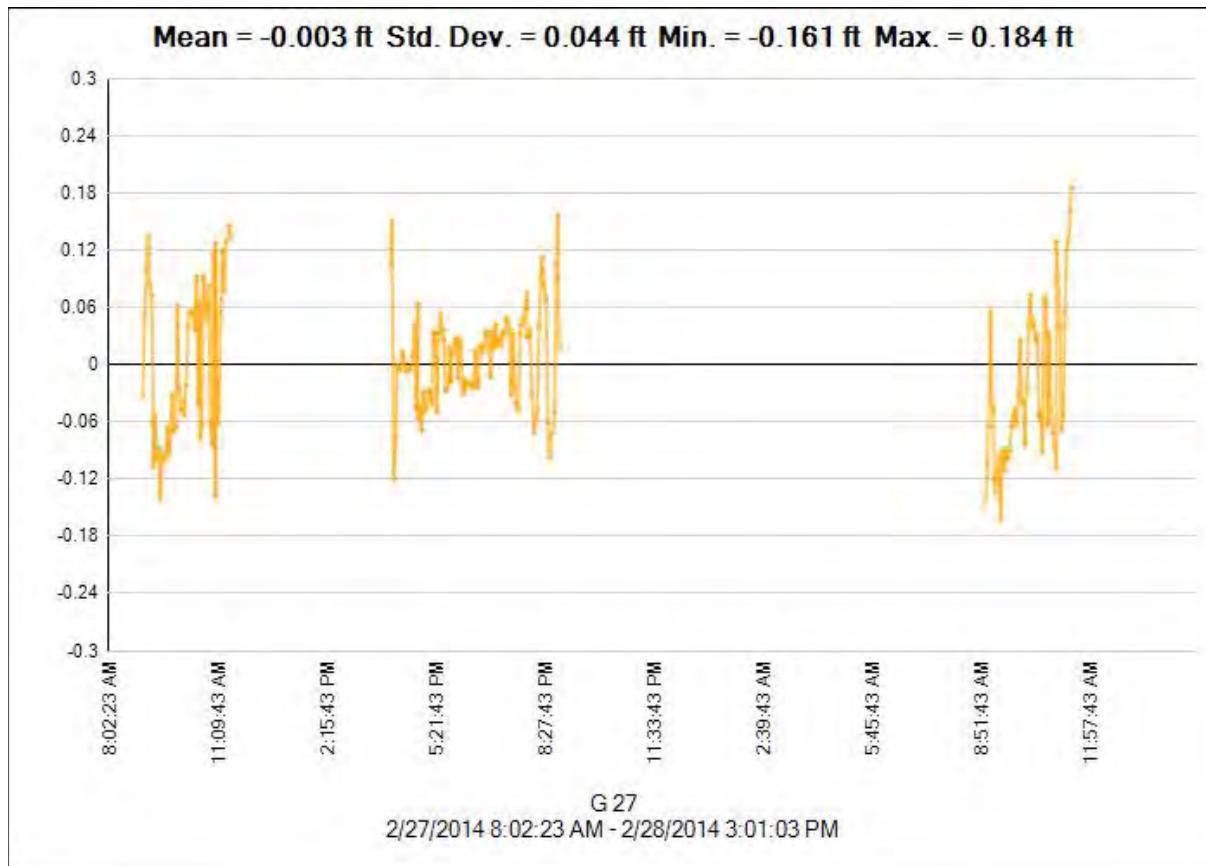


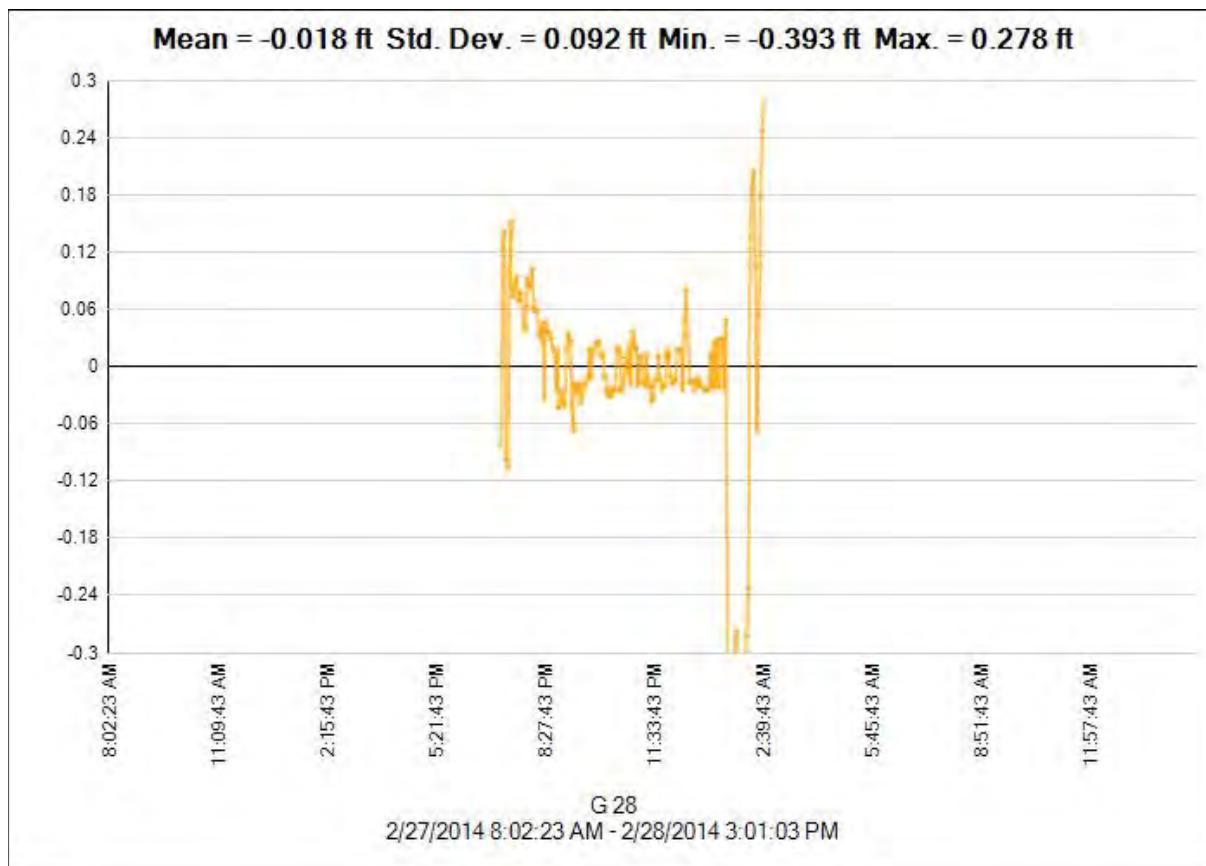


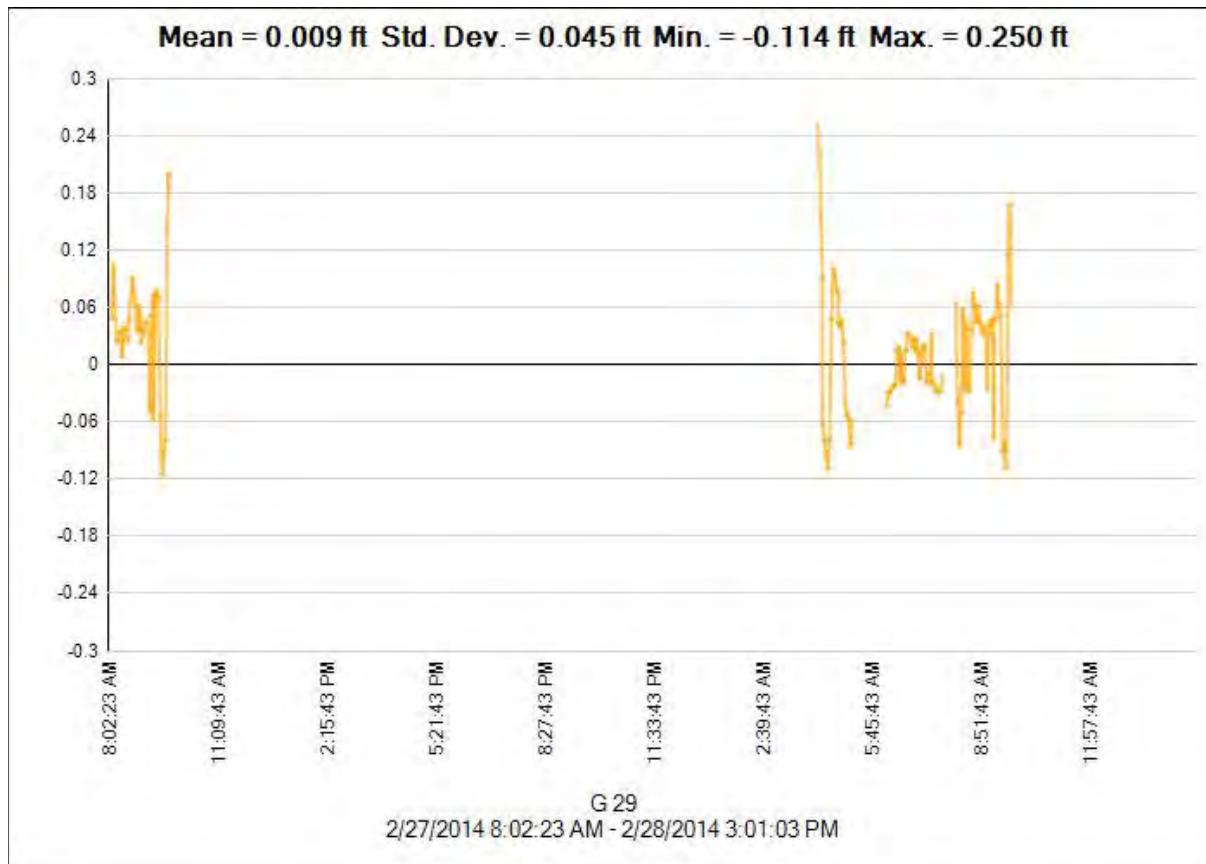


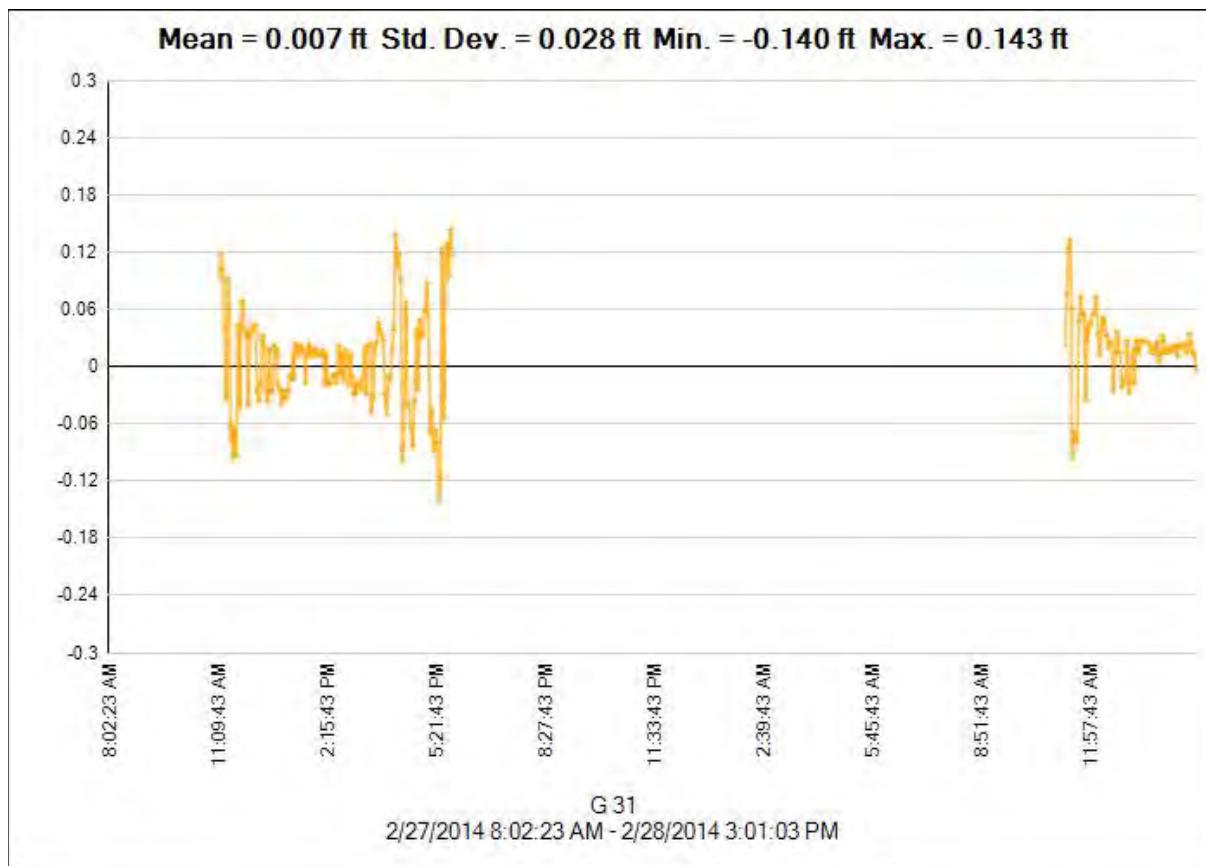


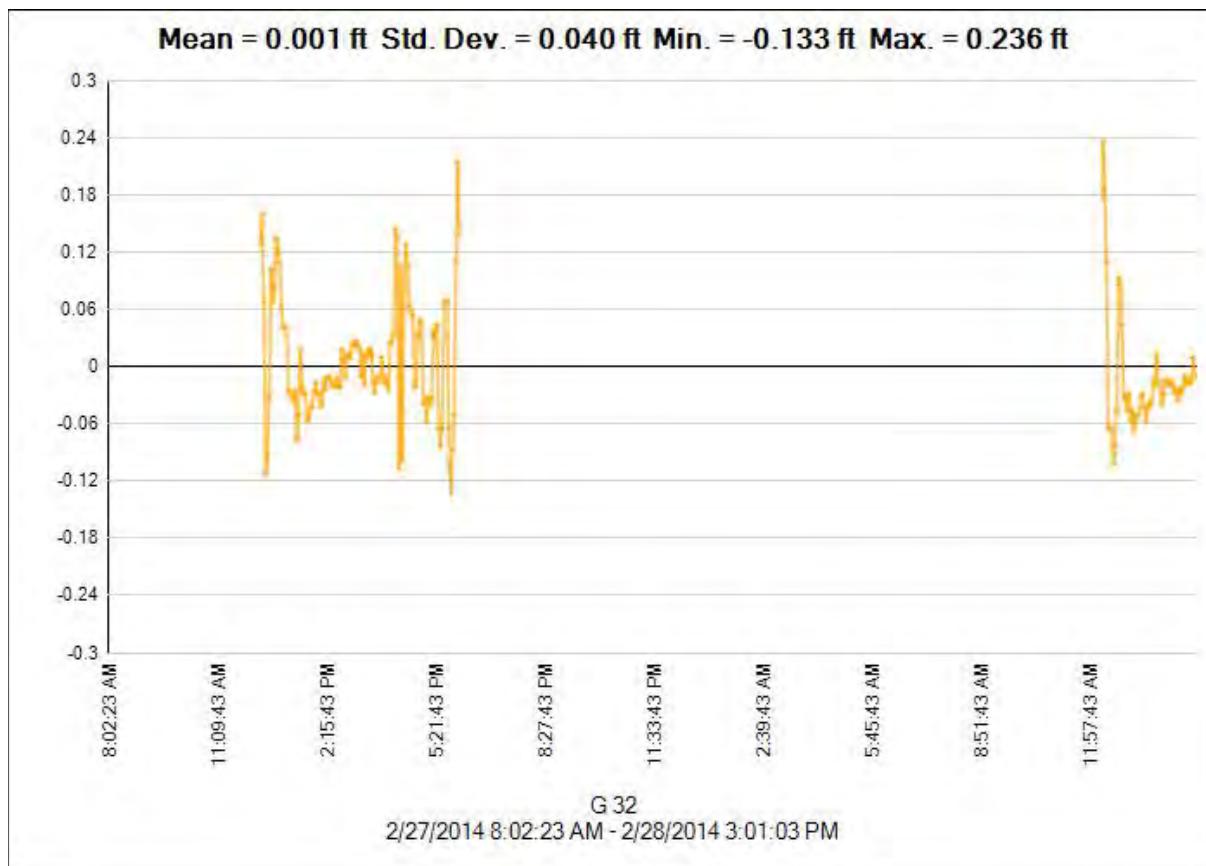














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





HOUN - LMCN (7:59:44 AM-2:59:44 PM) (S16)

Baseline observation: HOUN ---
LMCN
(B28)

Processed: 4/2/2014
10:00:21
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.005 ft

Vertical precision: 0.015 ft

RMS: 0.009 ft

Maximum PDOP: 15.443

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:10:59
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
2:59:44
PM
(Local:
UTC-6hr)

Processing duration: 1:06:48:45

Processing interval: Use all
data

Vector Components (Mark to Mark)

From:	HOUN
-------	------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	LMCN				
Grid		Local		Global	
Northing	275191.101 ft	Latitude	N29°15'17.90435"	Latitude	N29°15'17.90435"
Easting	3495143.513 ft	Longitude	W90°39'40.65193"	Longitude	W90°39'40.65193"
Elevation	31.574 ft	Height	-48.476 ft	Height	-48.476 ft

Vector					
ΔNorthing	-122538.231 ft	NS Fwd Azimuth	170°47'48"	ΔX	19109.715 ft
ΔEasting	20524.558 ft	Ellipsoid Dist.	124248.011 ft	ΔY	-60480.583 ft
ΔElevation	-13.776 ft	ΔHeight	-11.294 ft	ΔZ	-106838.088 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.001 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.002 ft
σ ΔEasting	0.002 ft	σ Ellipsoid Dist.	0.001 ft	σ ΔY	0.007 ft
σ ΔElevation	0.008 ft	σ ΔHeight	0.008 ft	σ ΔZ	0.004 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000003977		
Y	0.0000000434	0.0000044432	
Z	-0.0000000085	-0.0000023113	0.0000014294

Occupations

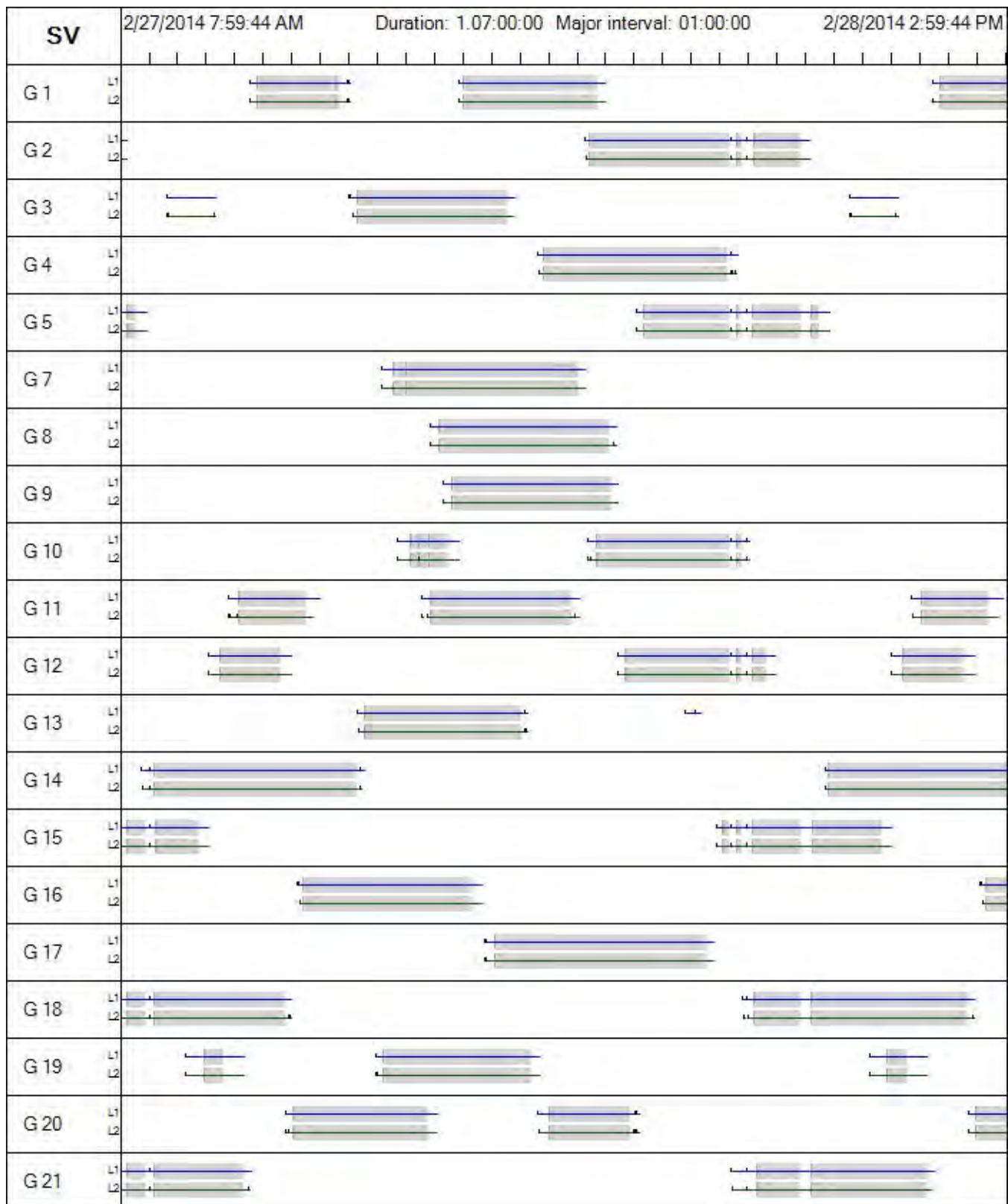
	From	To
Point ID:	HOUM	LMCN



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\lmcn0580_0.14o
Receiver type:	NetRS	NetRS
Receiver serial number:	4646125537	4508245724
Antenna type:	Zephyr Geodetic	Zephyr Geodetic
Antenna serial number:	-----	60104388
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Antenna Phase Center	Bottom of antenna mount



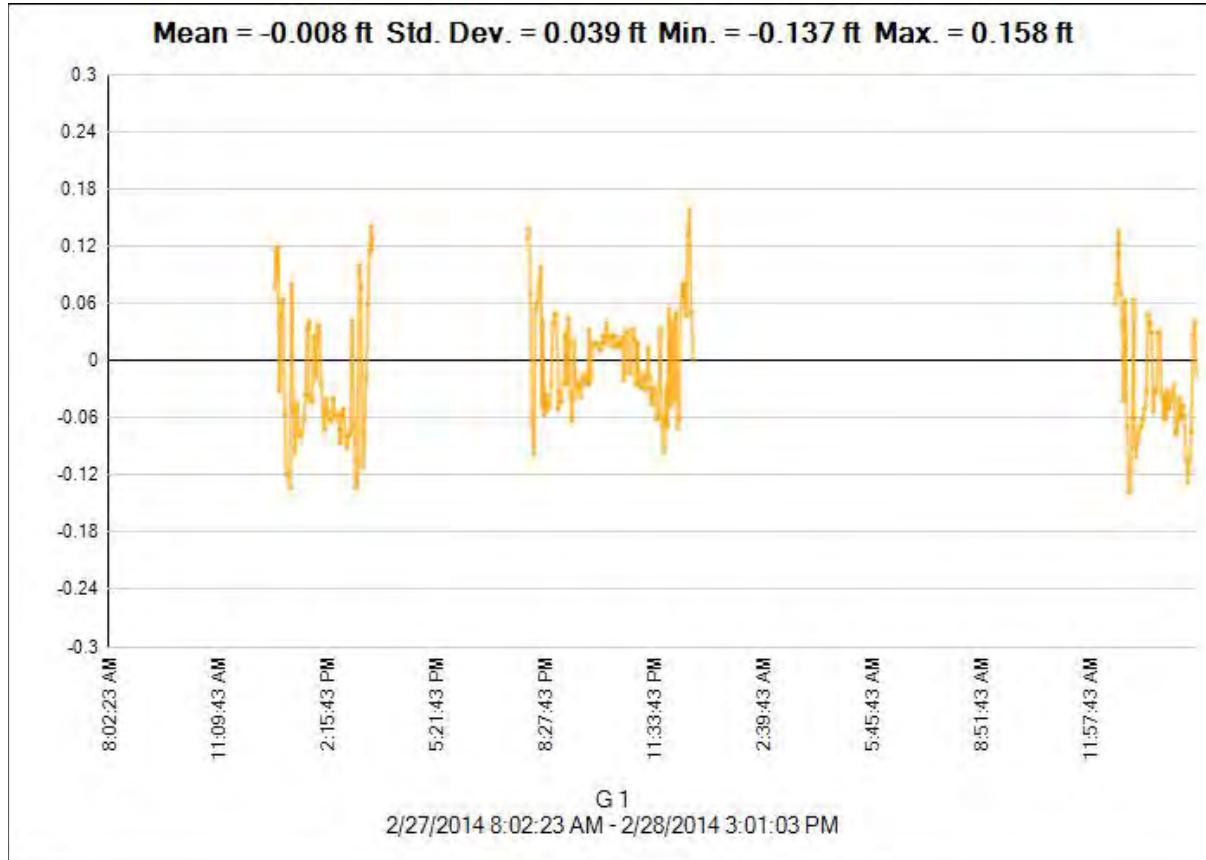
Tracking Summary

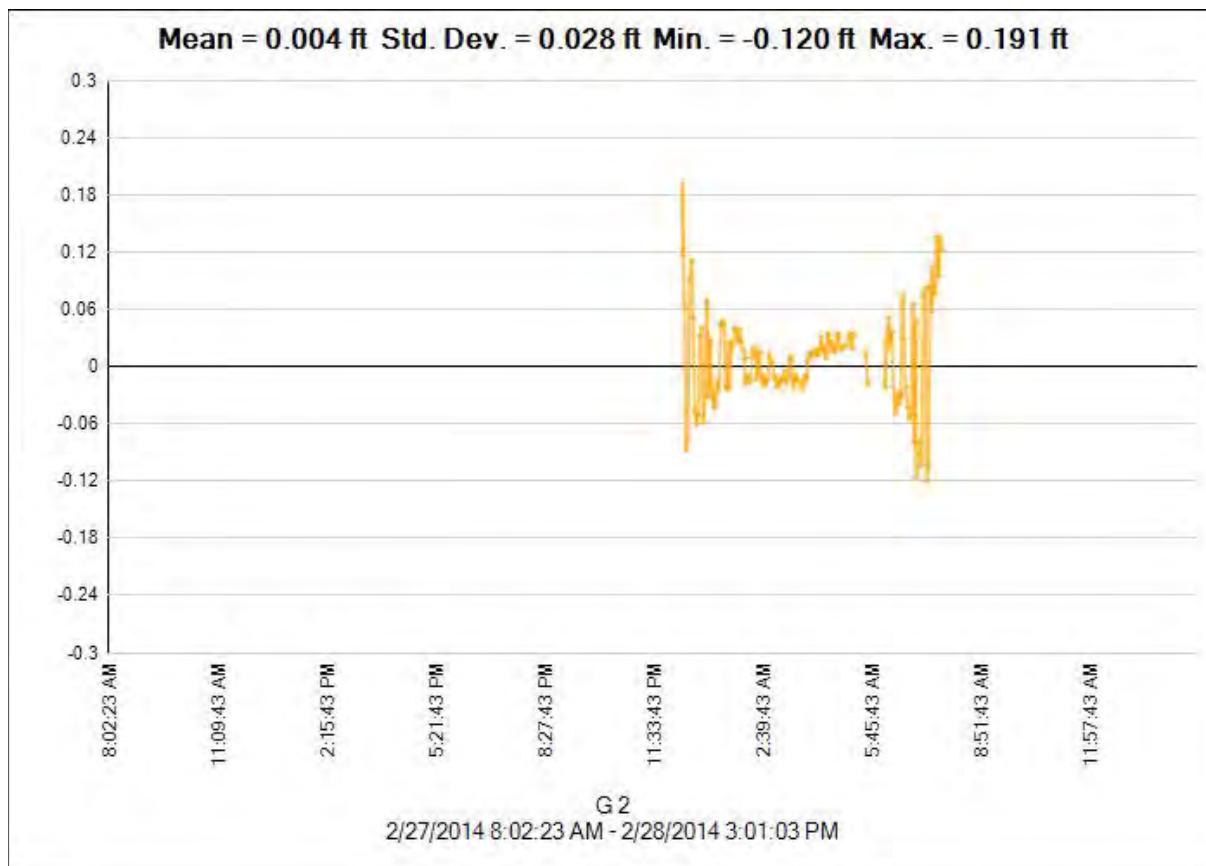


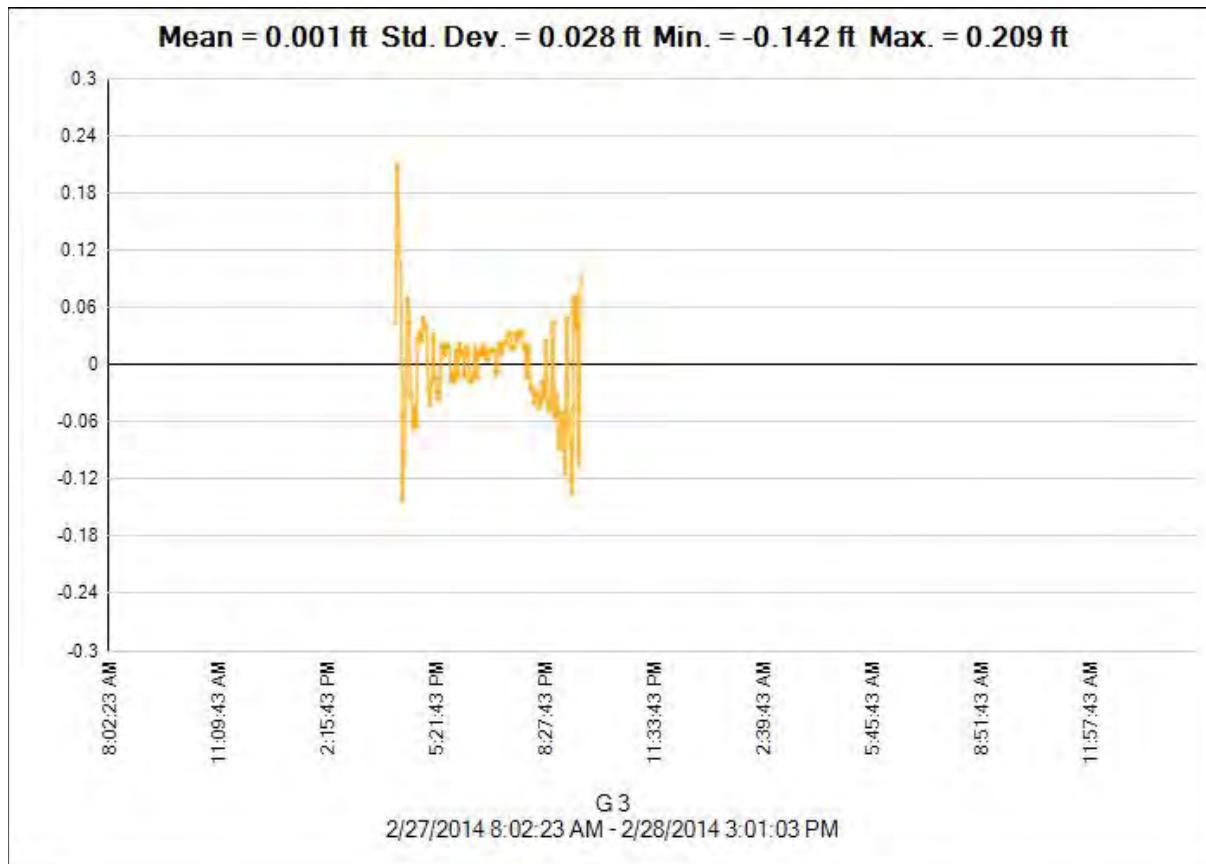


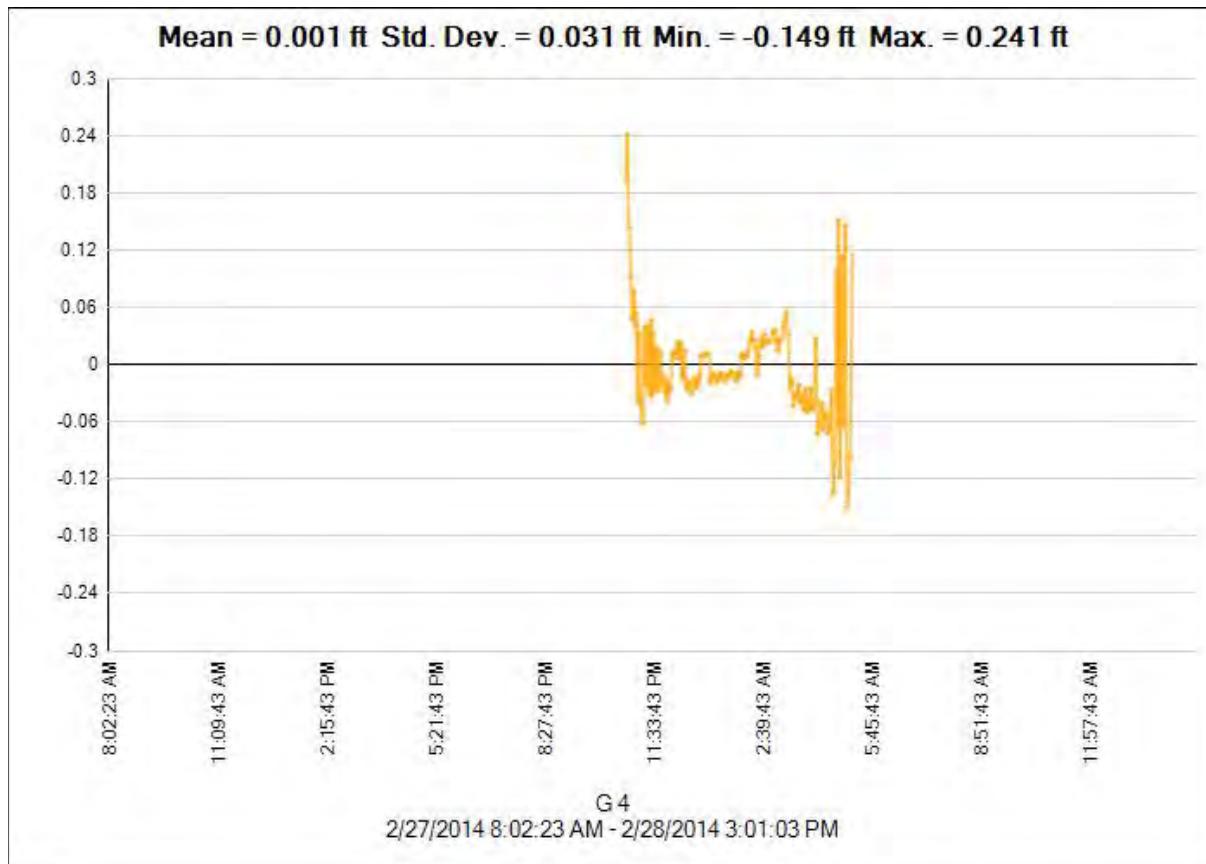


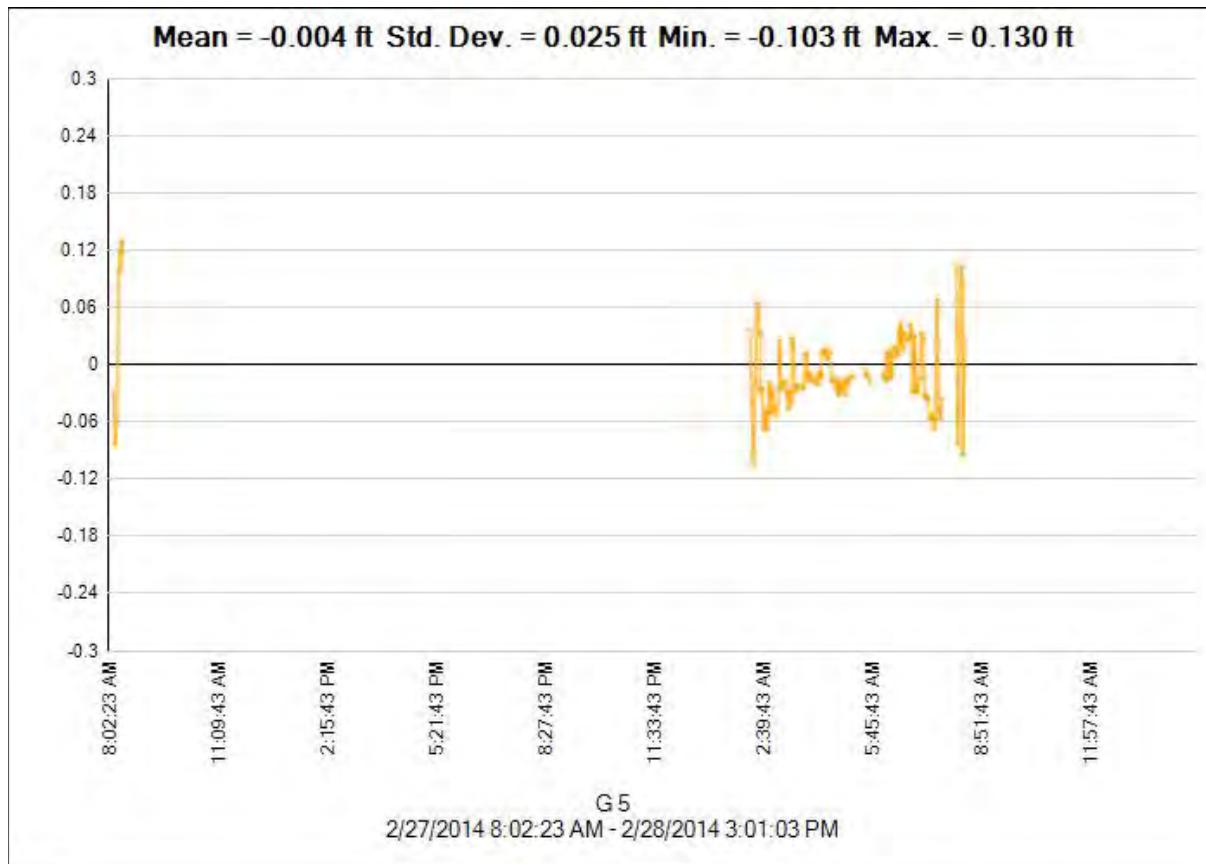
Residuals

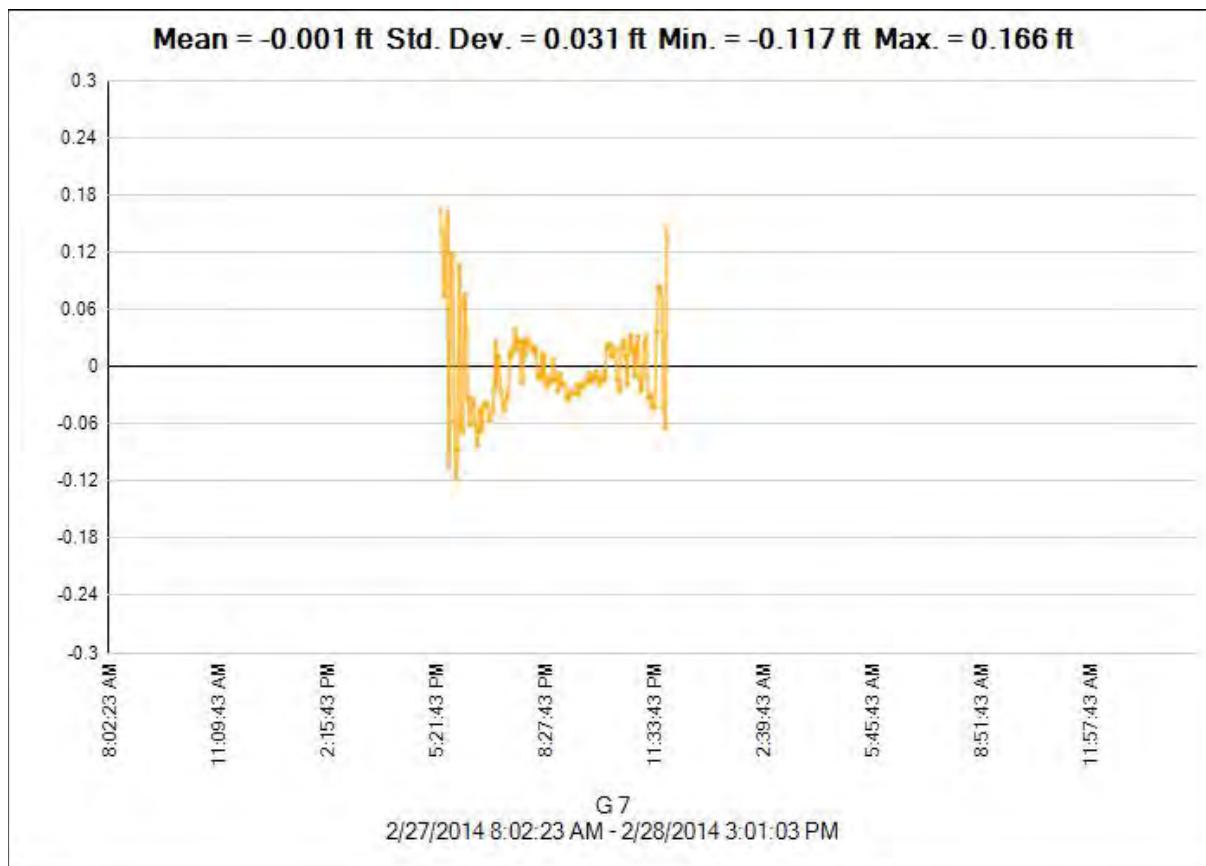


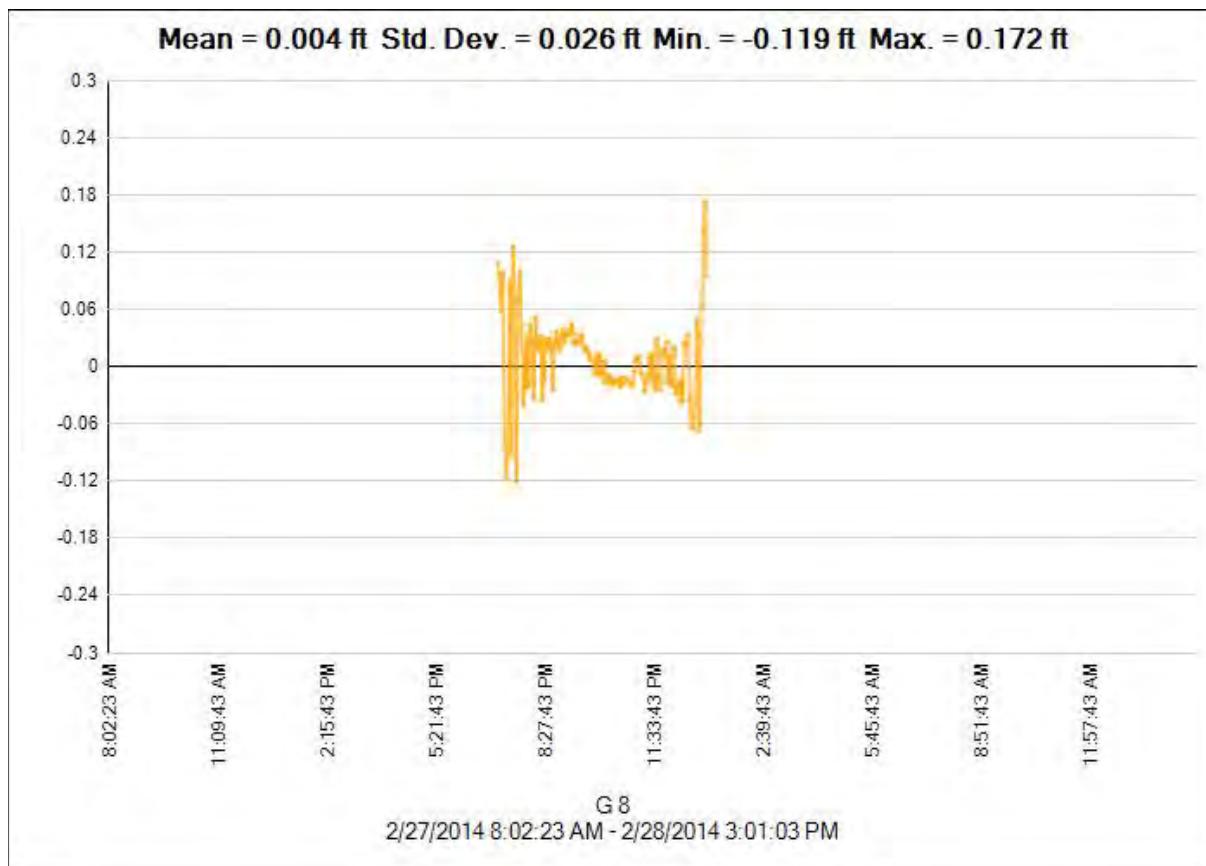


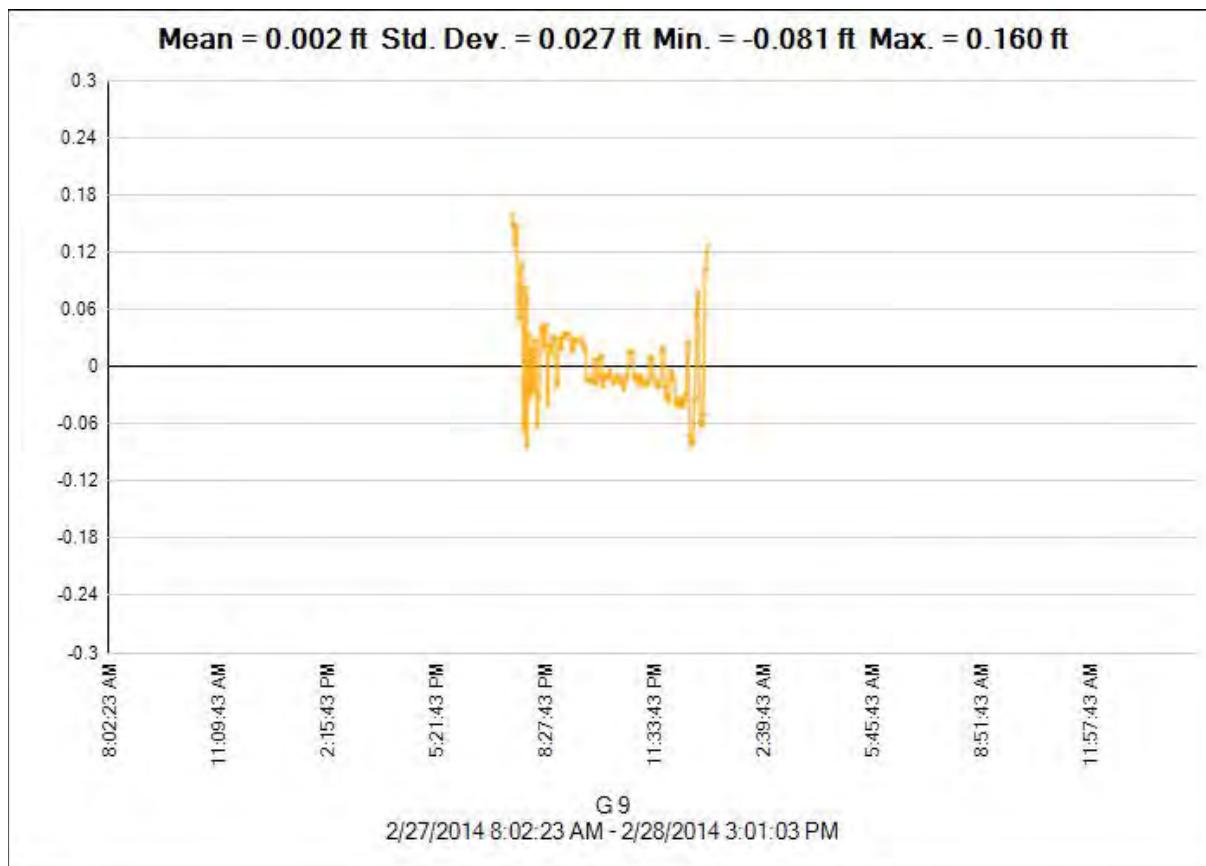


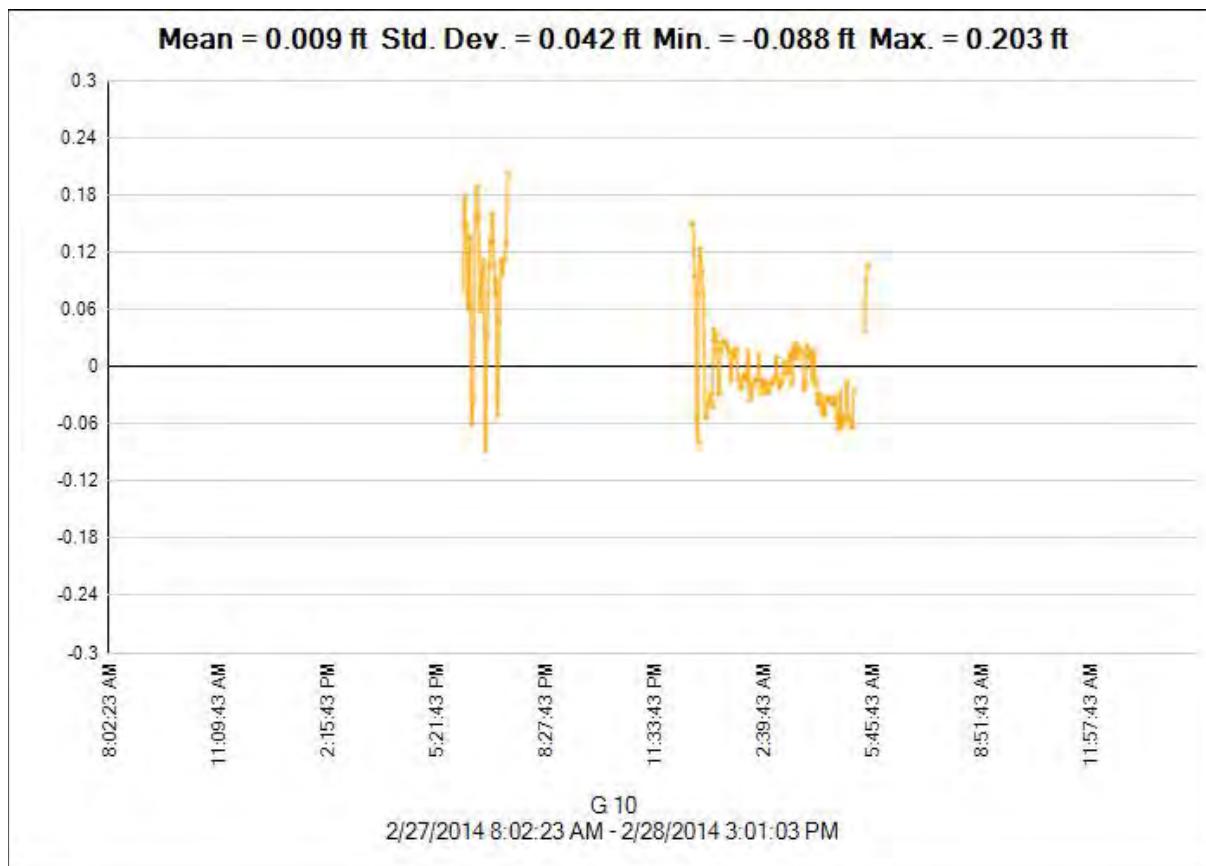


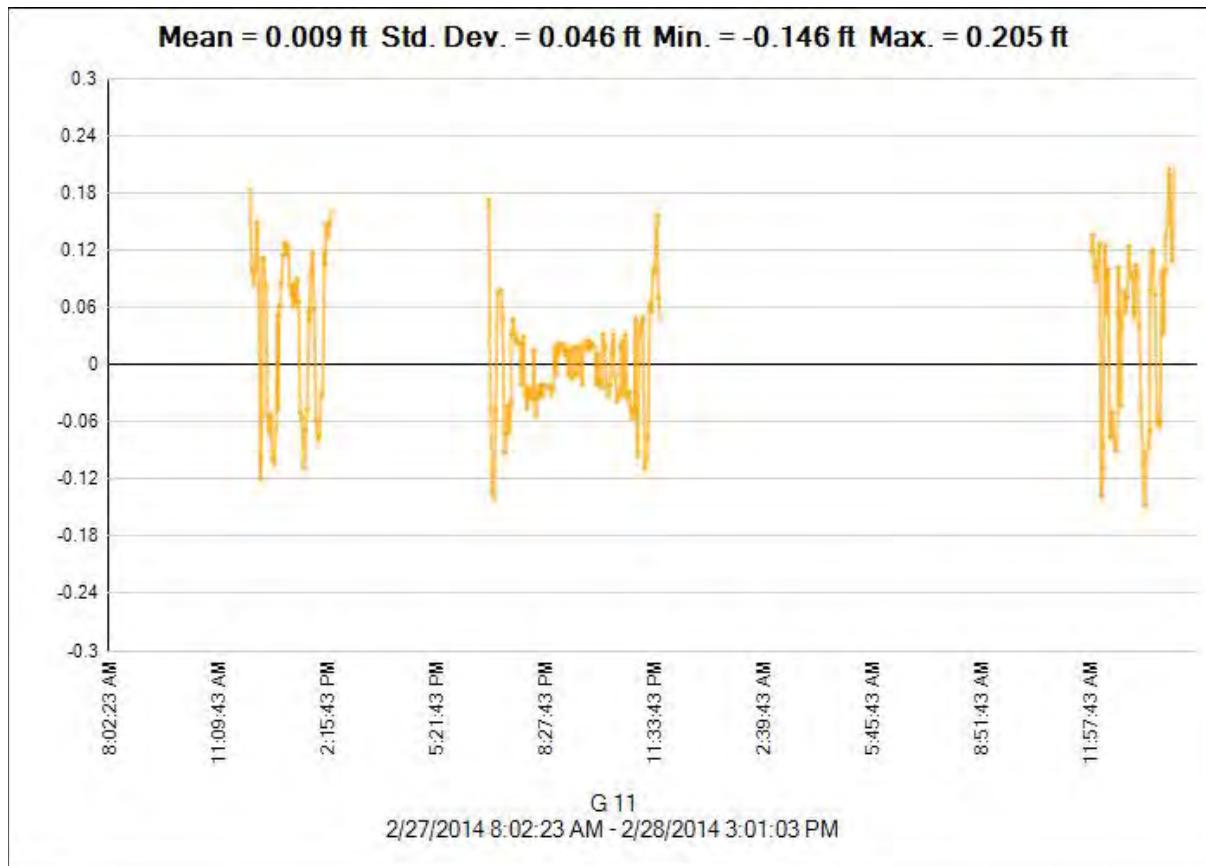


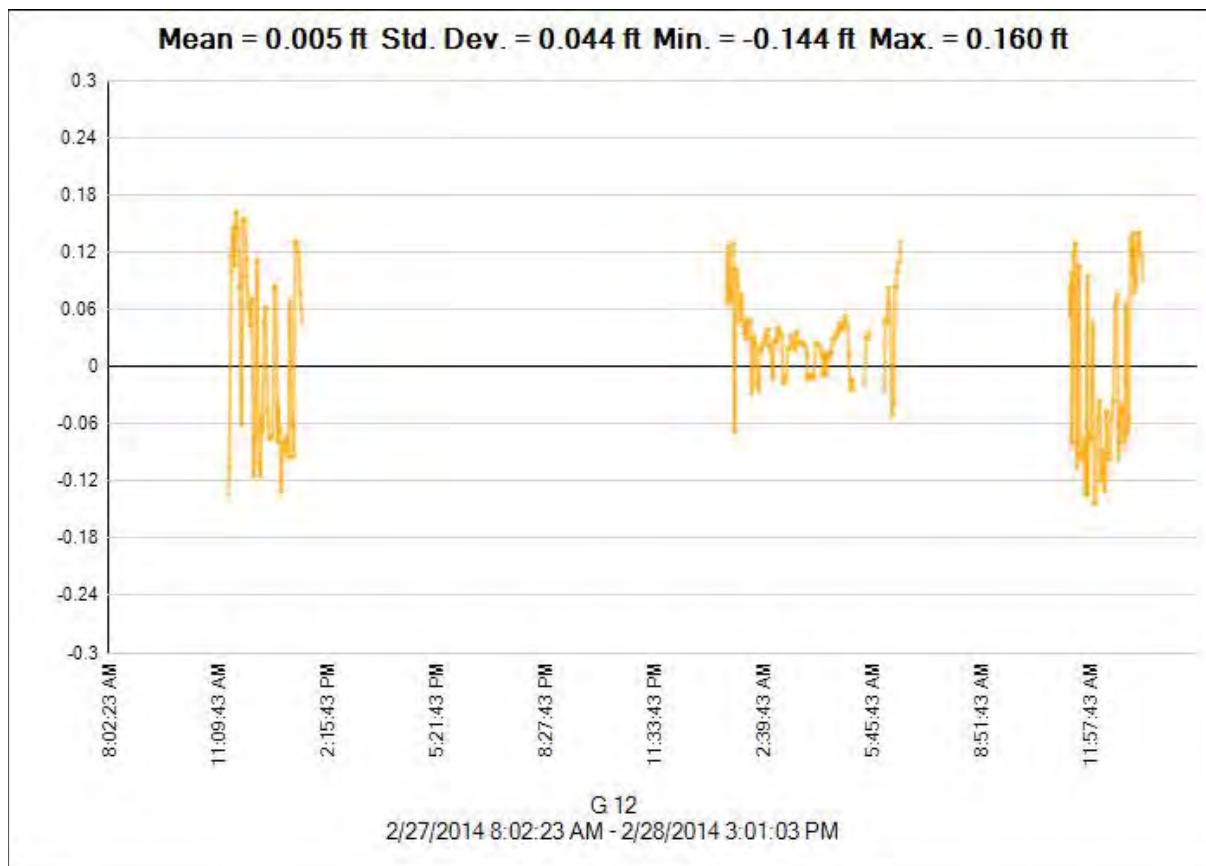


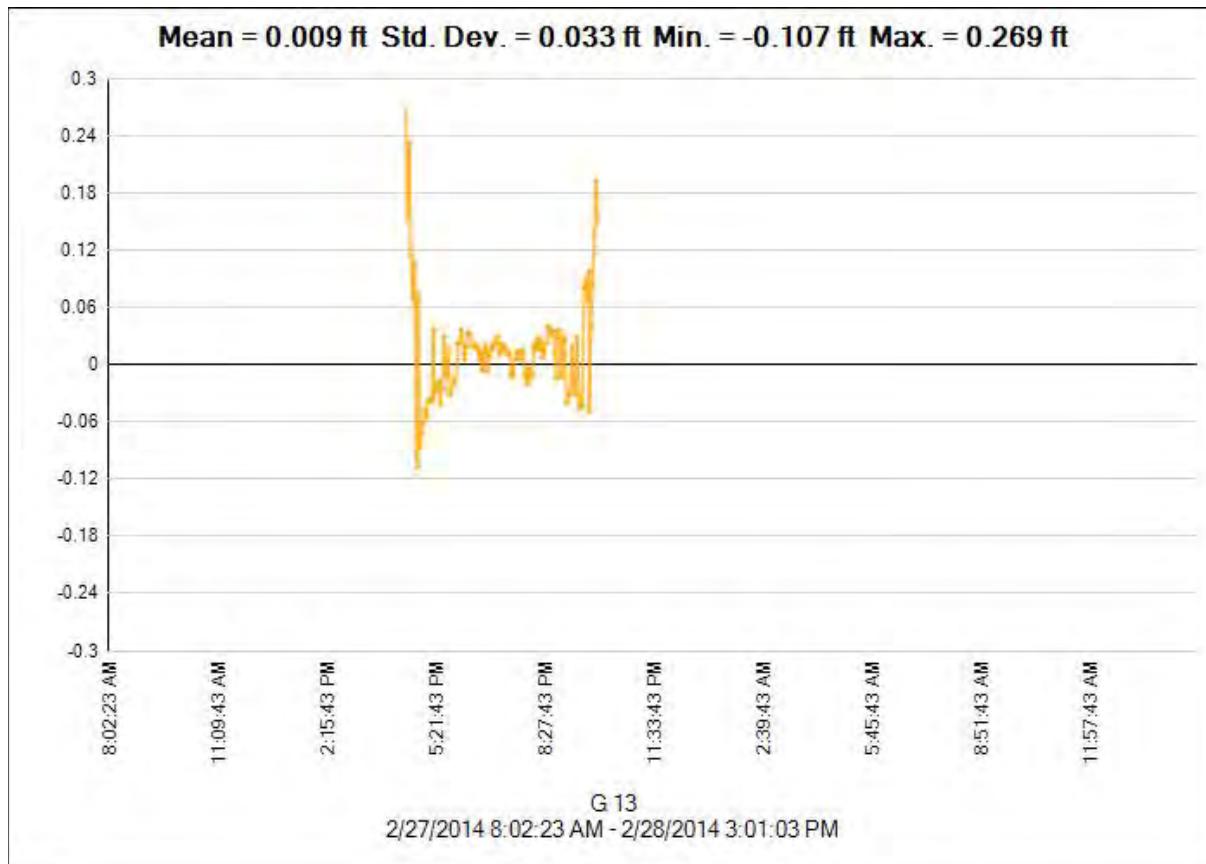


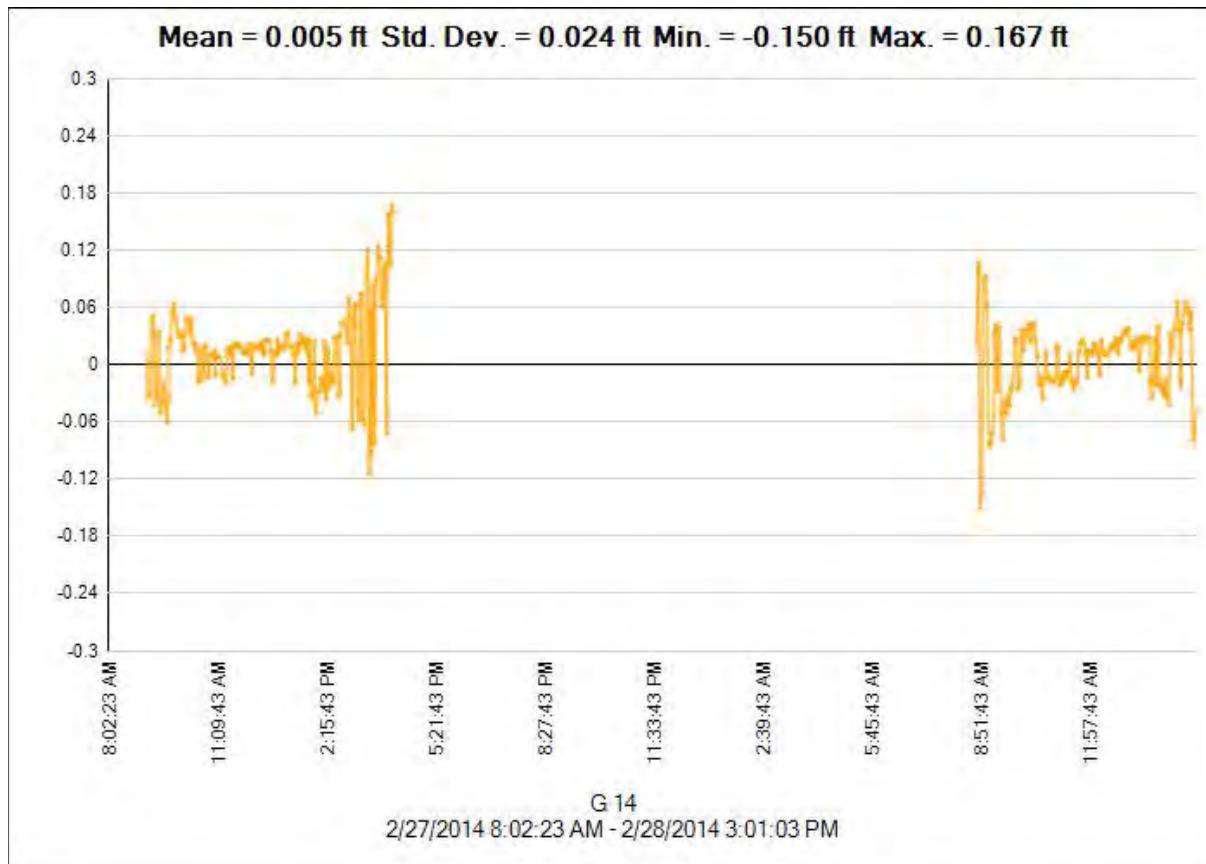


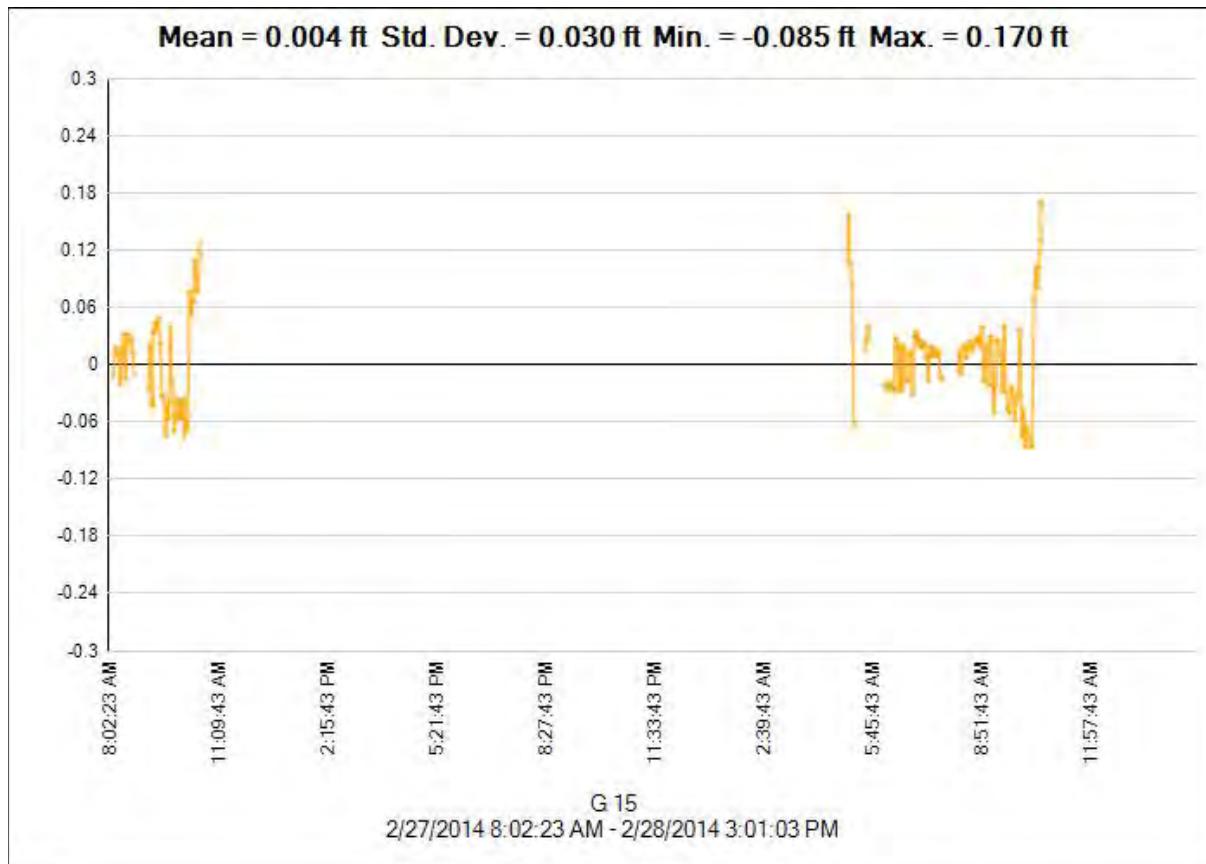


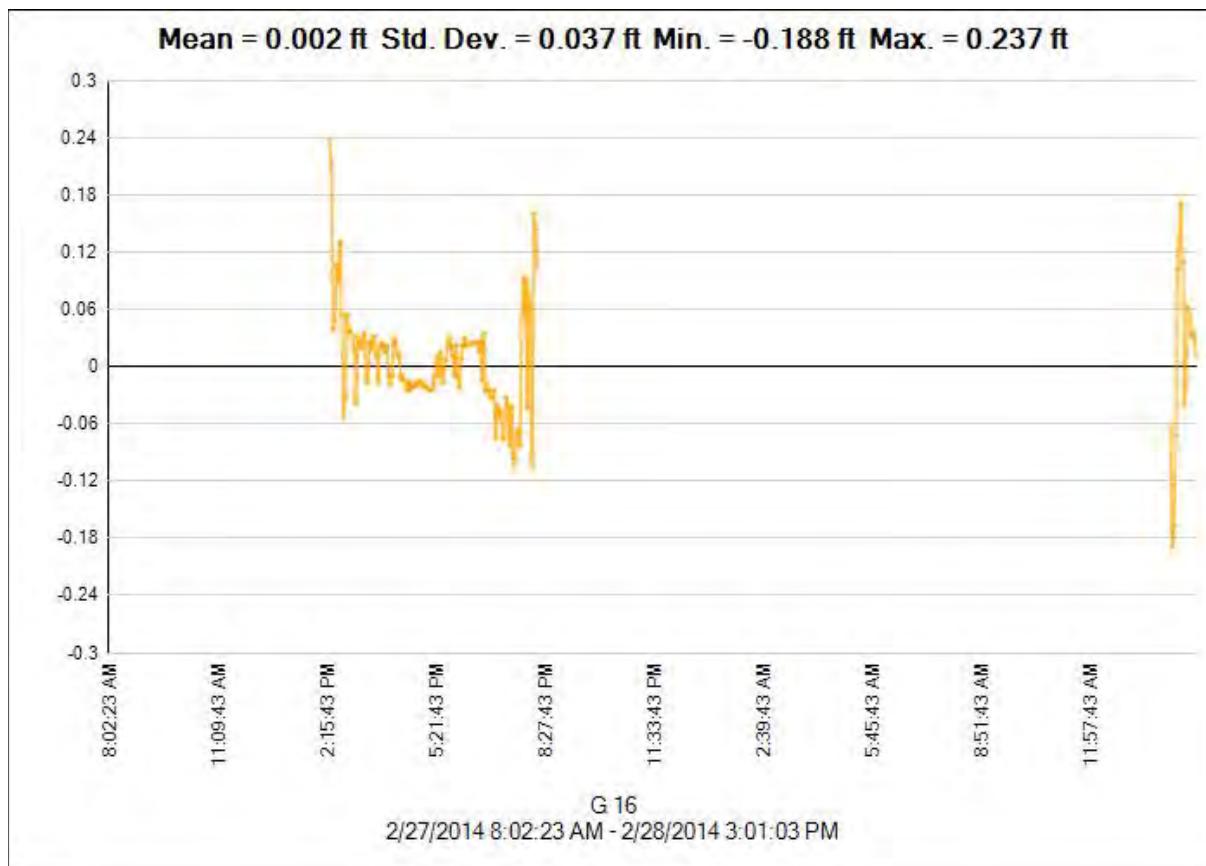


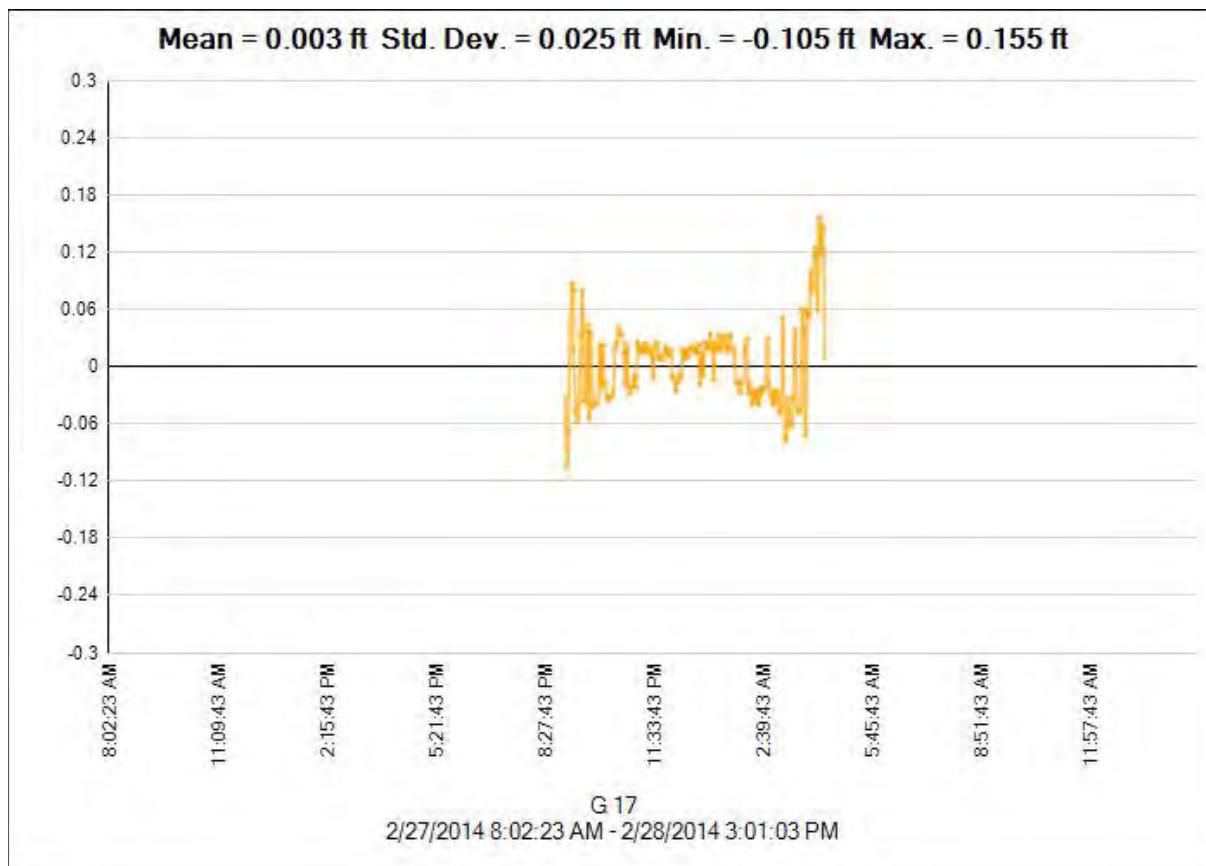


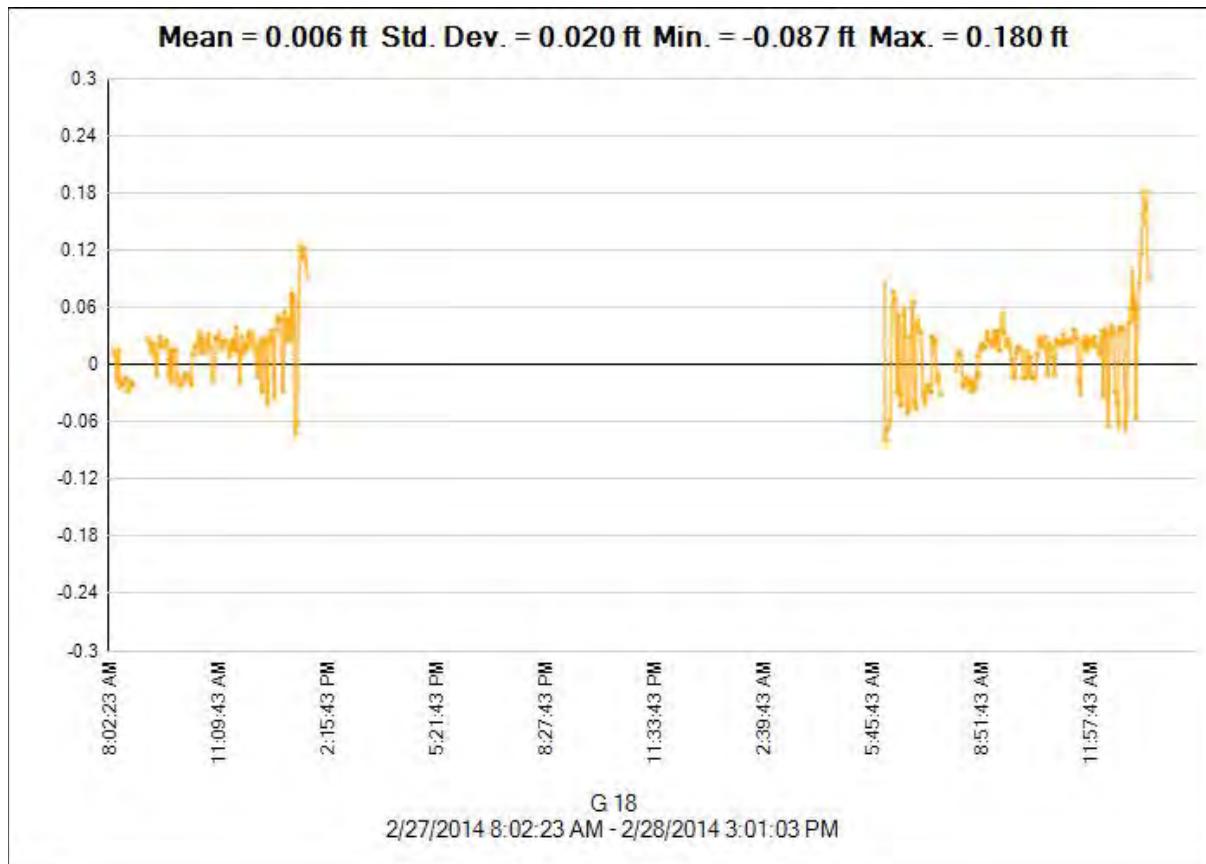


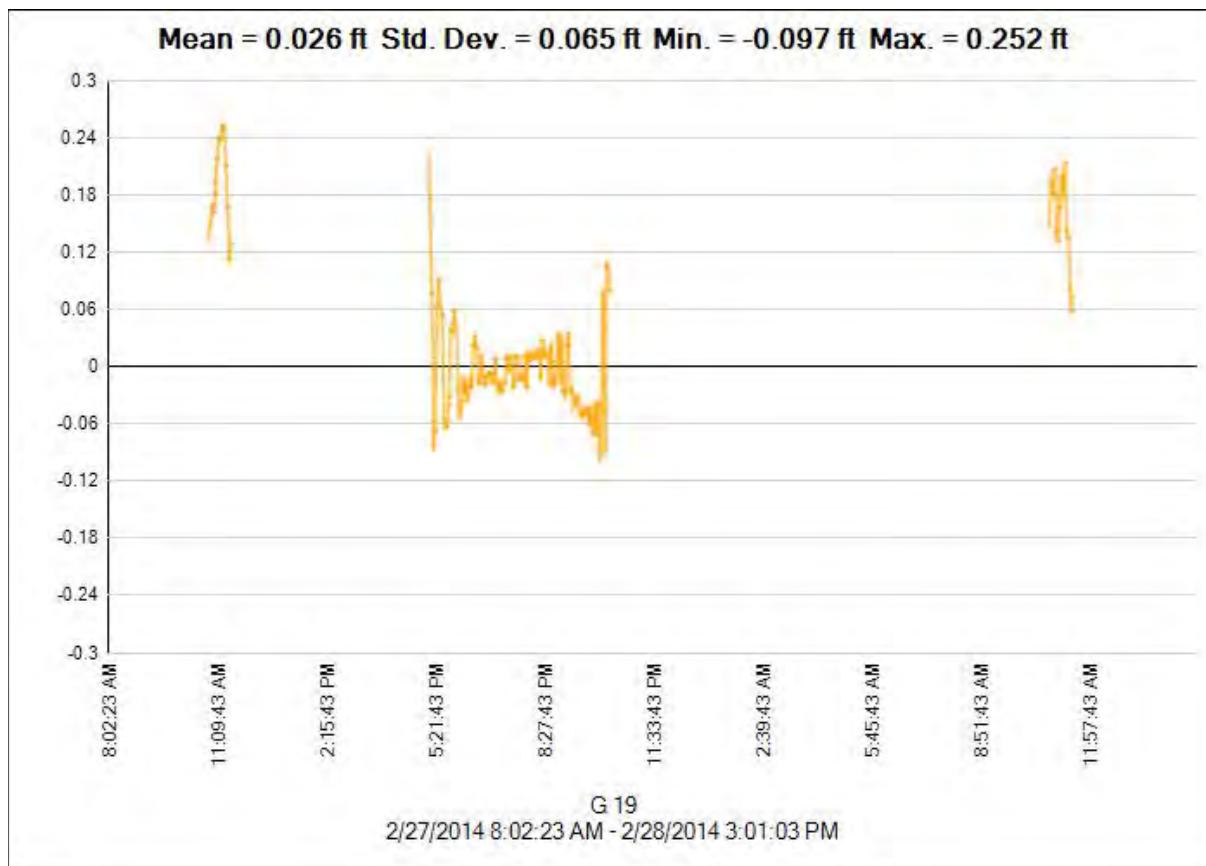


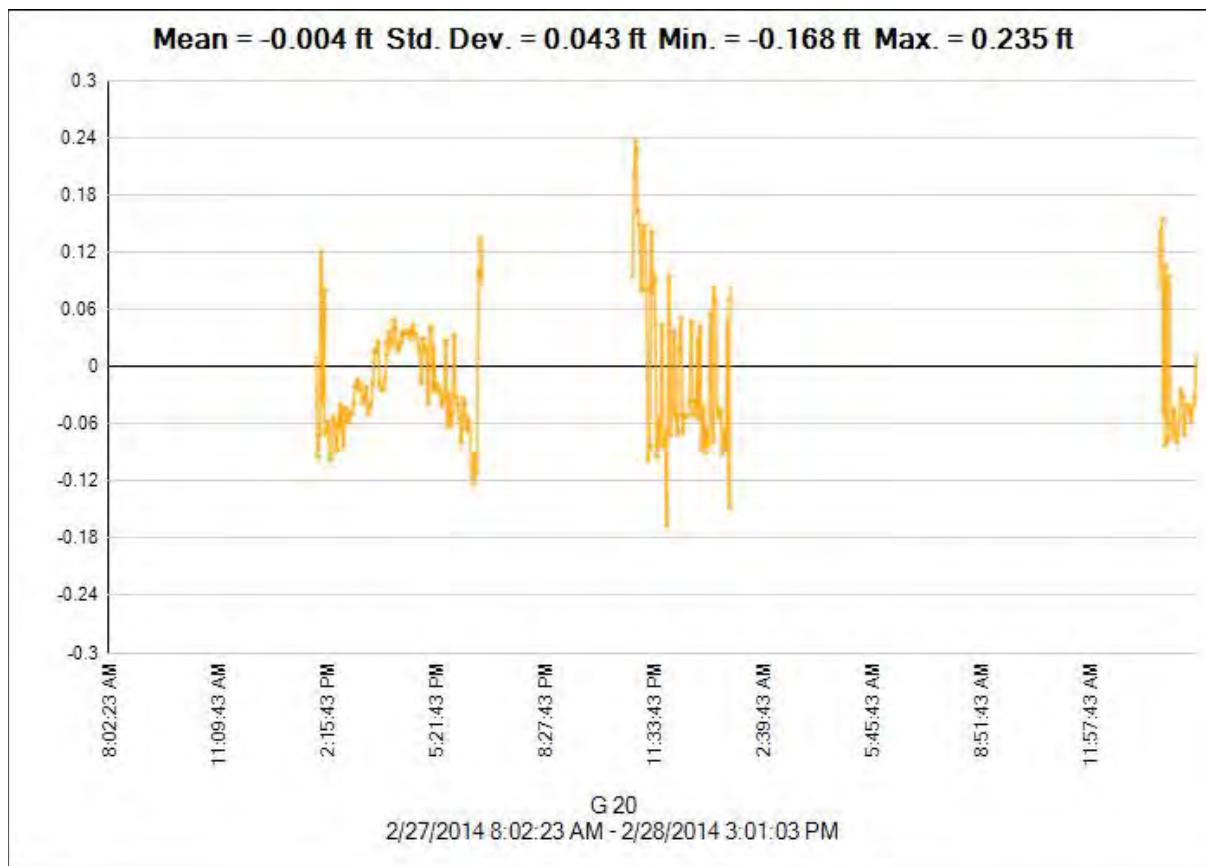


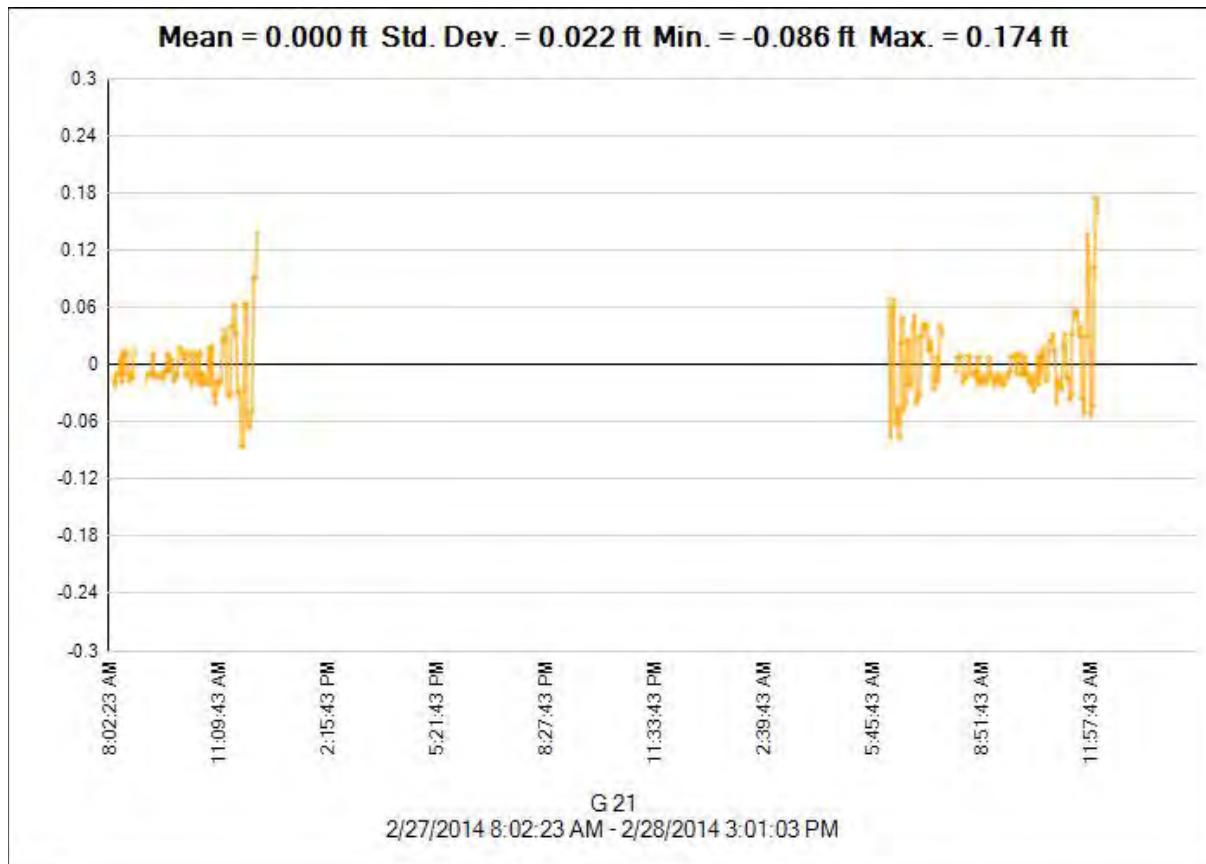


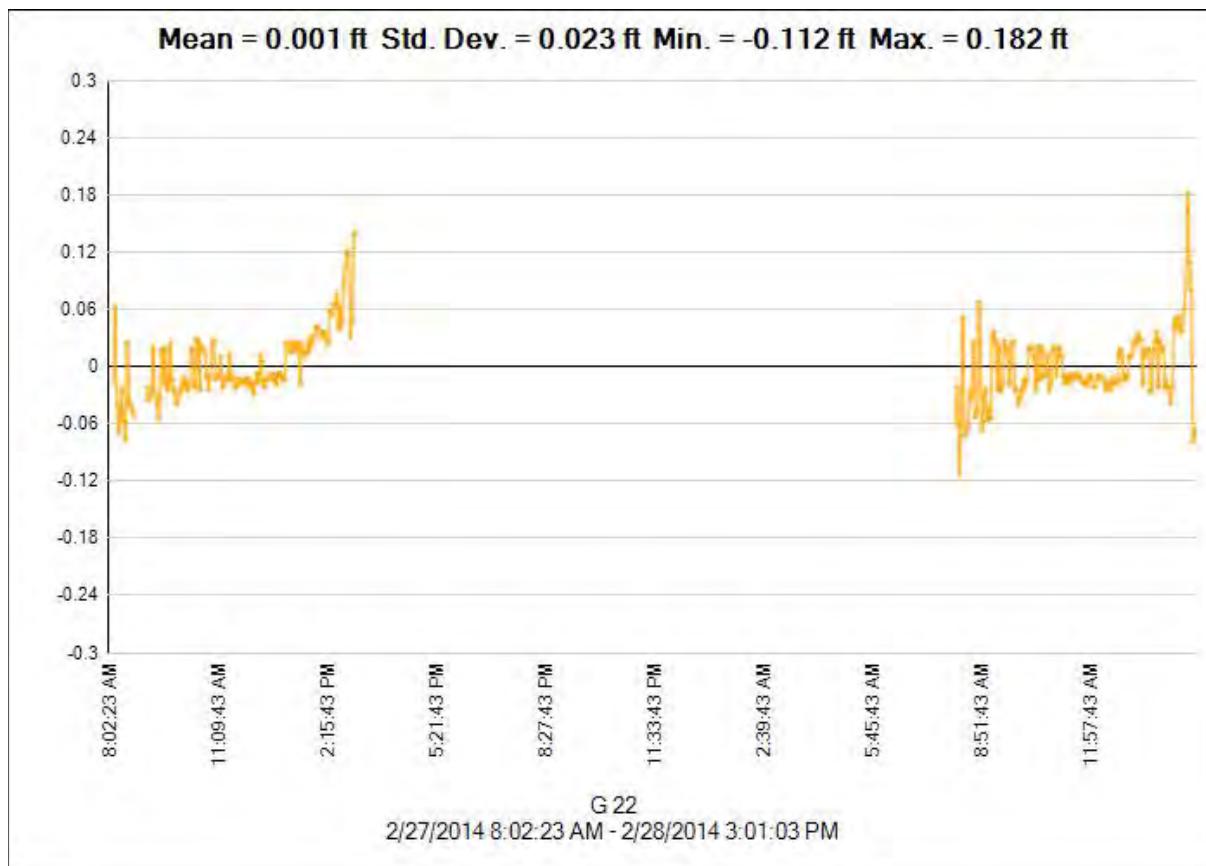


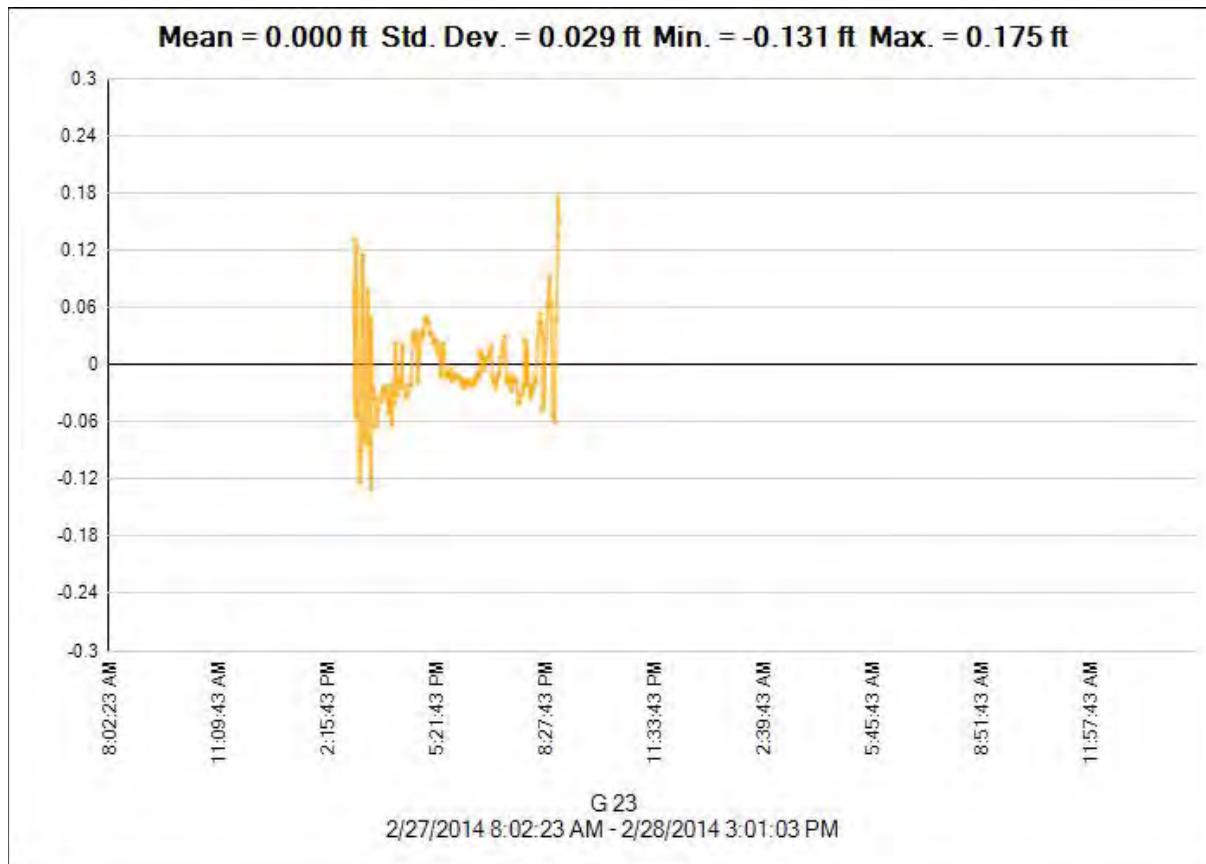


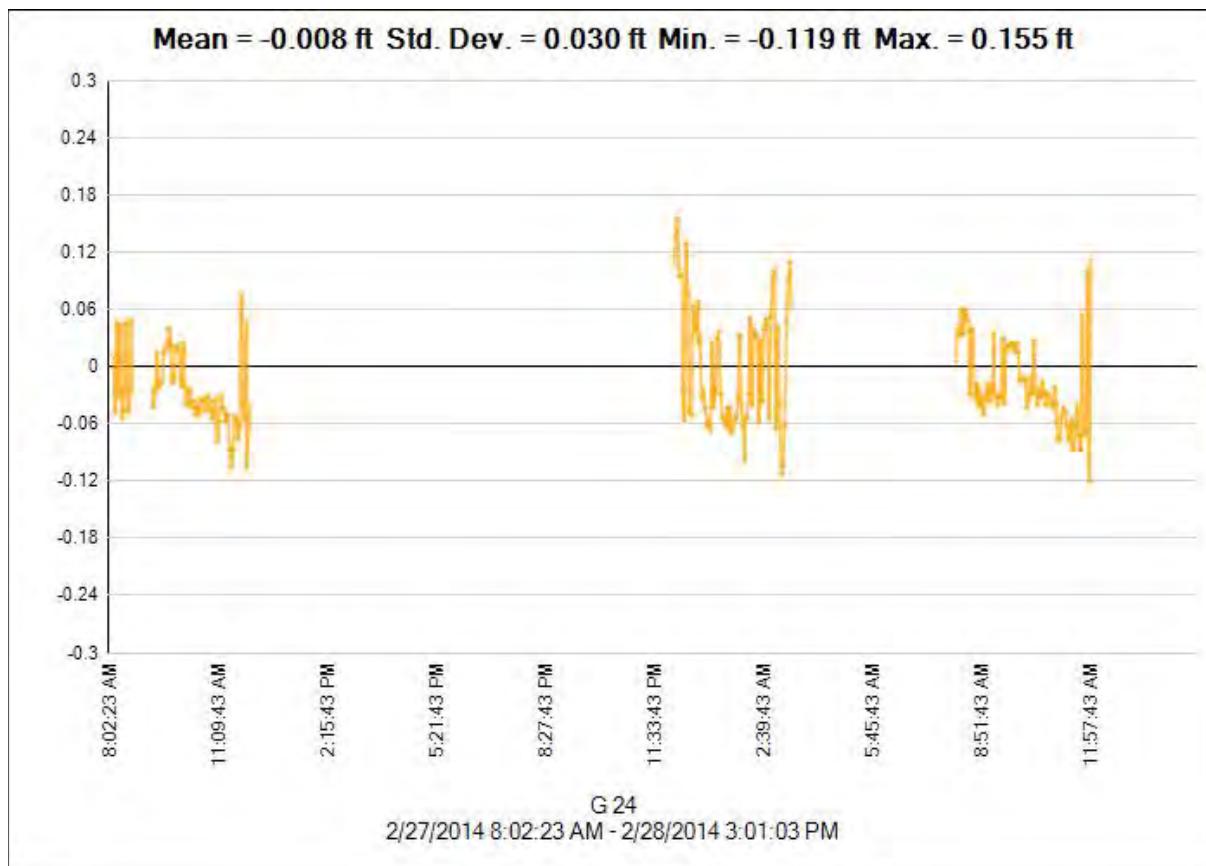


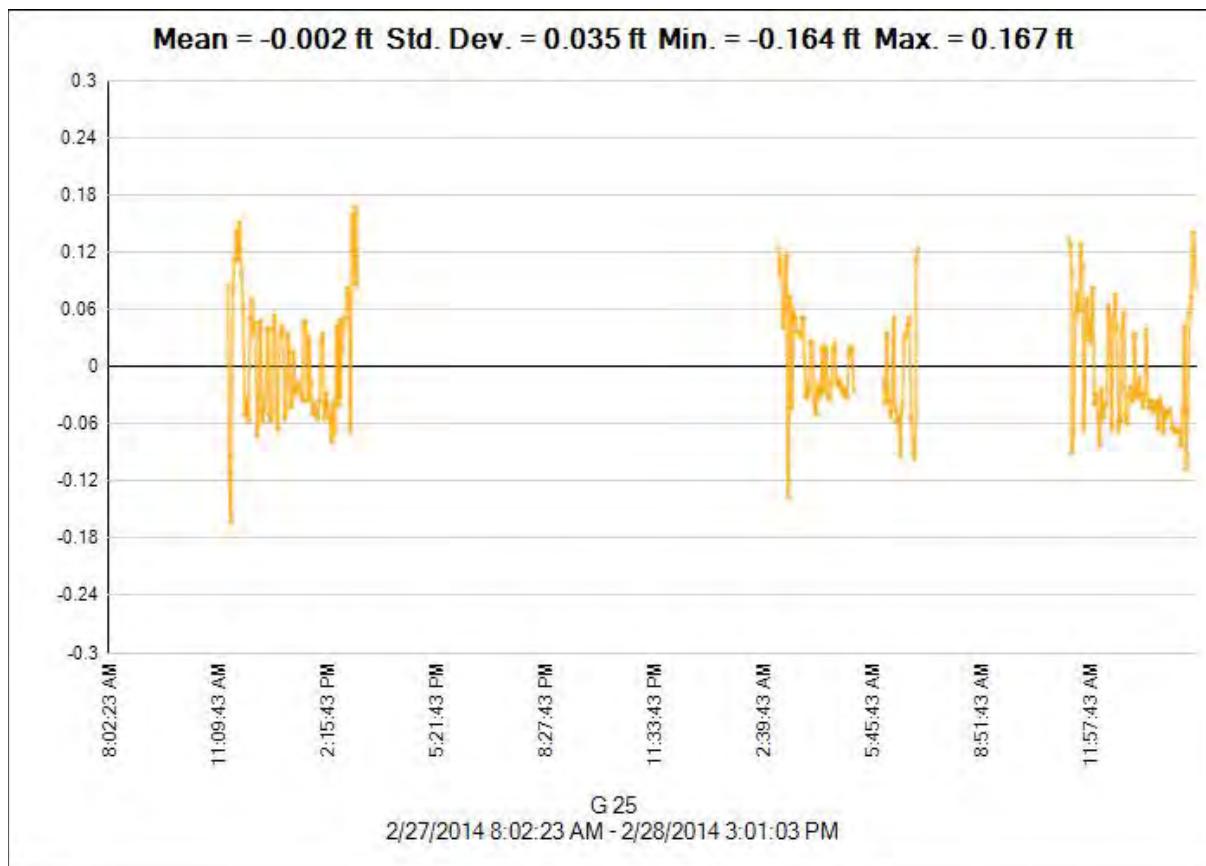


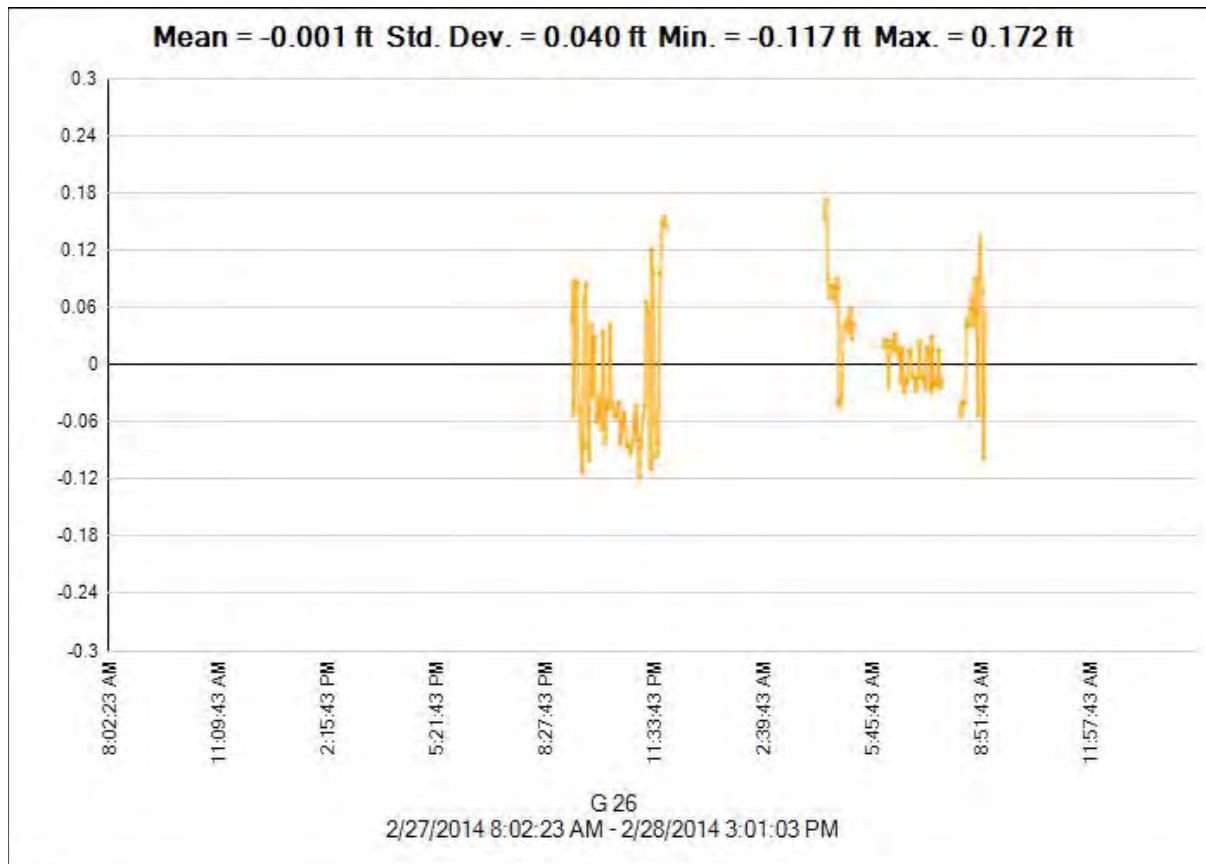


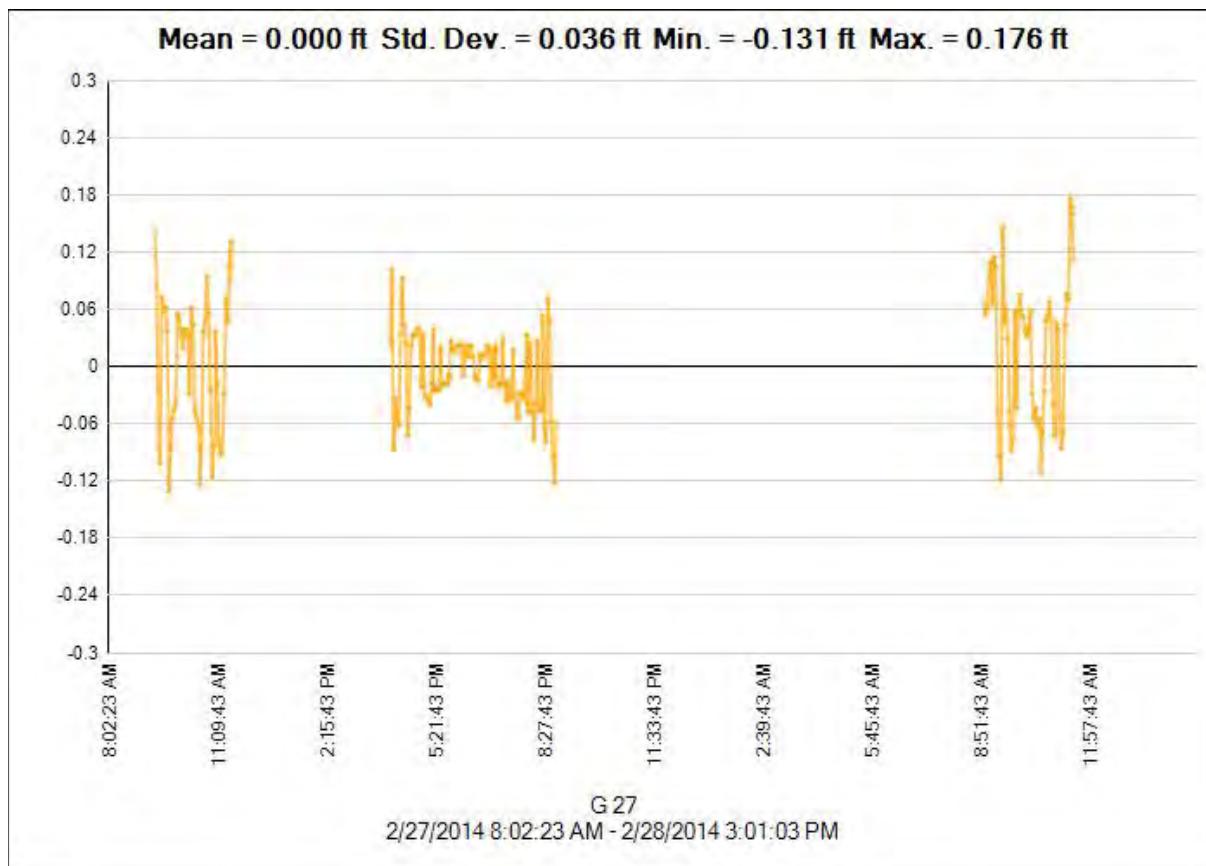


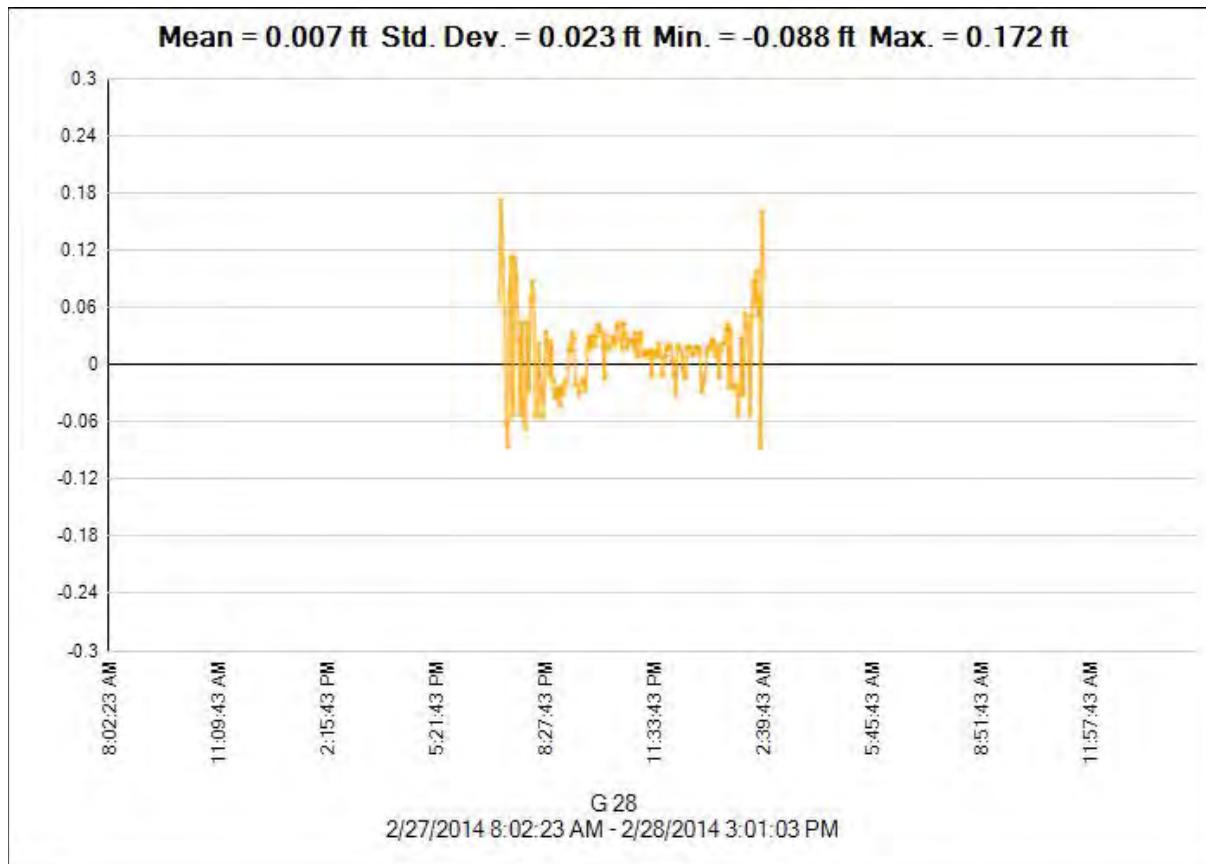


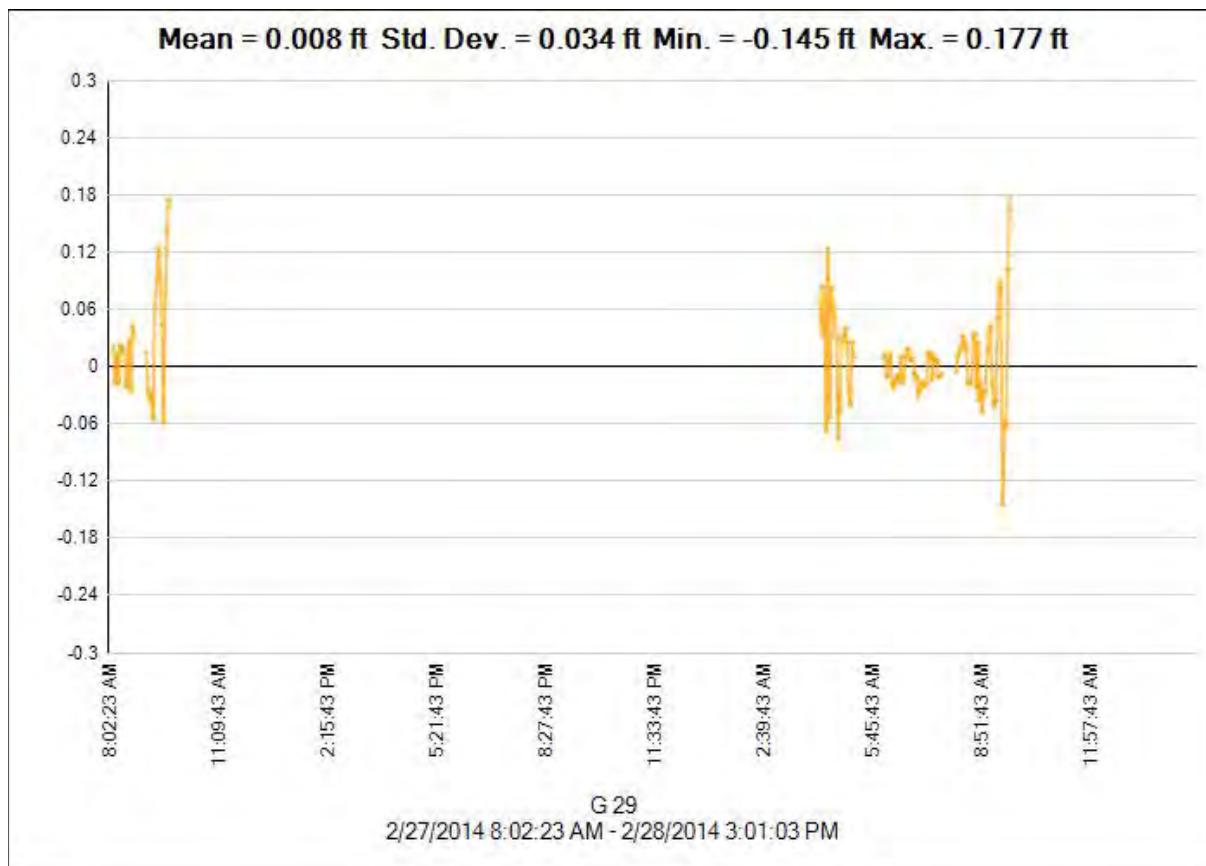


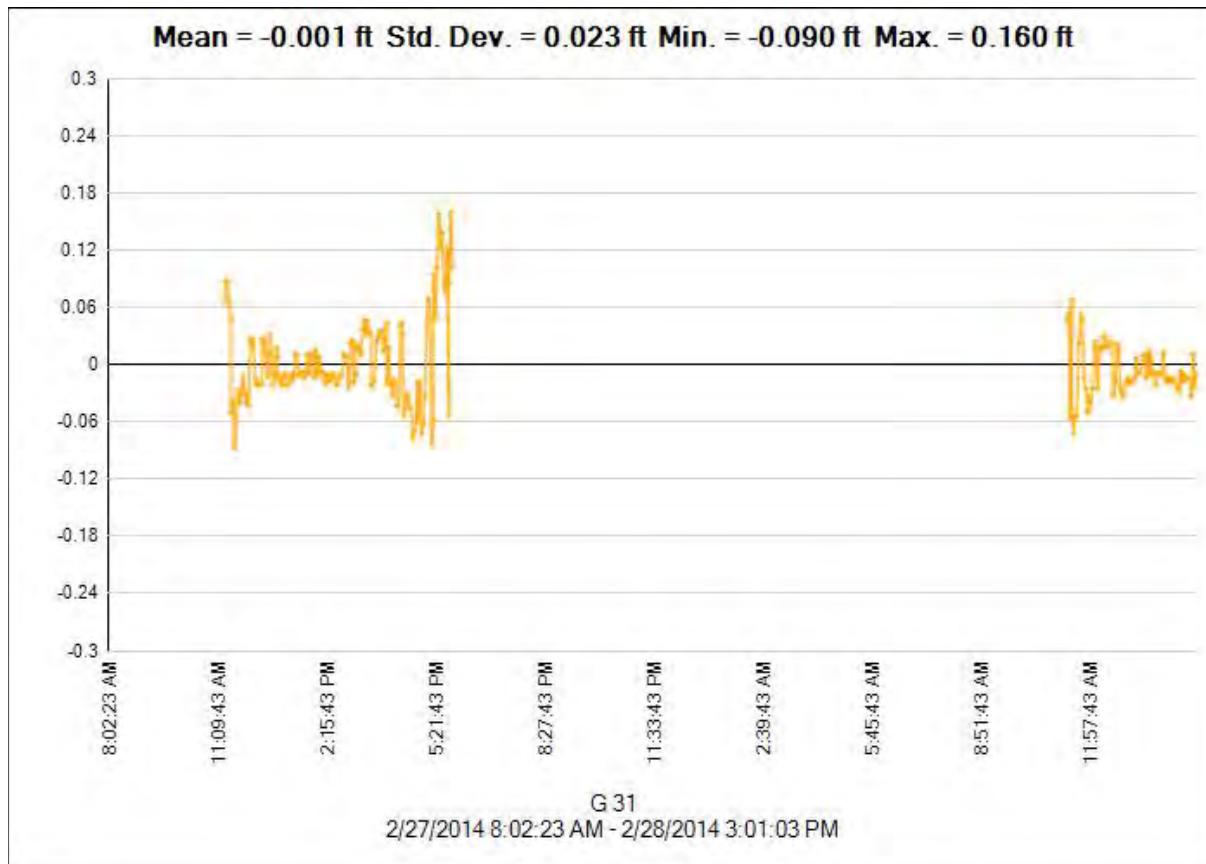


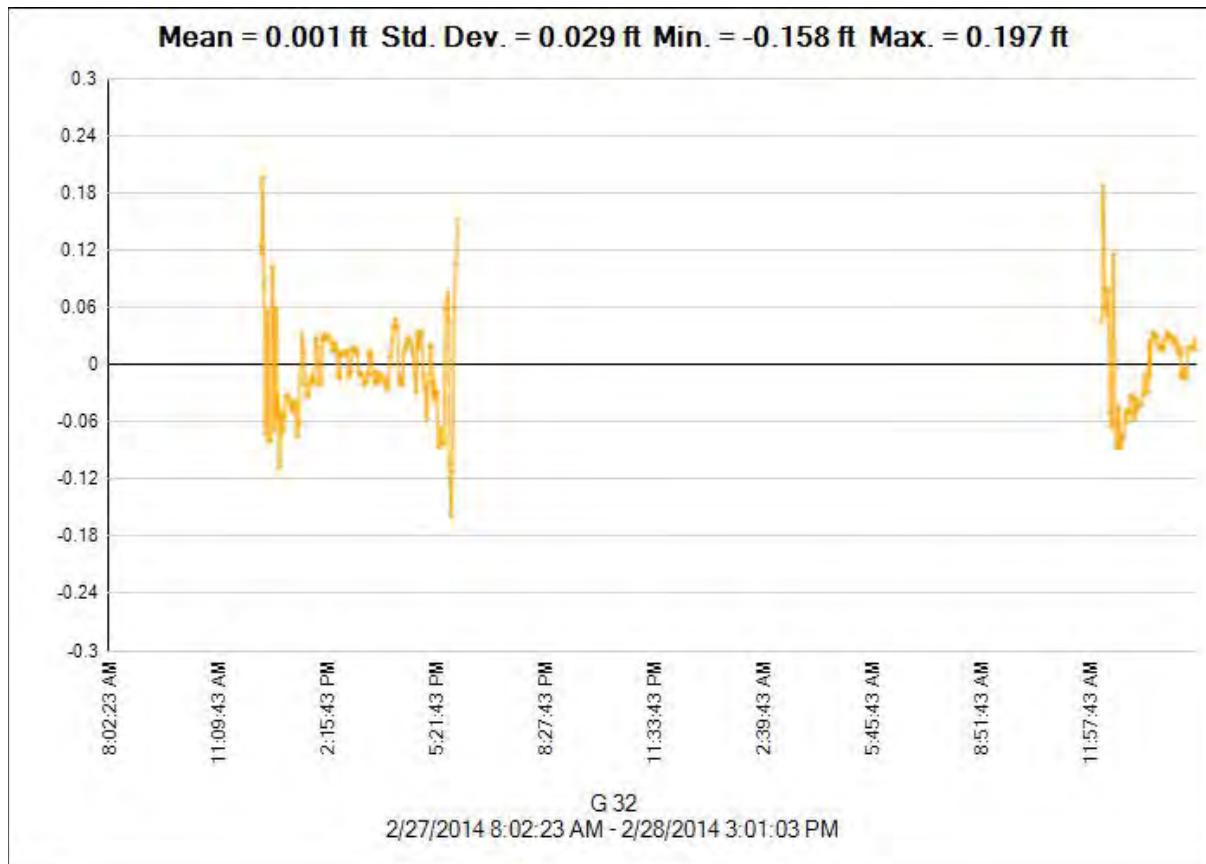














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





LMCN - TE14-SM-01 (8:19:09 AM-2:24:14 PM) (S18)

Baseline observation: LMCN ---
TE14-SM-
01 (B29)

Processed: 4/2/2014
10:00:47
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.010 ft

Vertical precision: 0.035 ft

RMS: 0.018 ft

Maximum PDOP: 3.639

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
8:21:14
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
2:24:14
PM
(Local:
UTC-6hr)

Processing duration: 06:03:00

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	LMCN
-------	------



Grid		Local		Global	
Northing	275191.093 ft	Latitude	N29°15'17.90427"	Latitude	N29°15'17.90427"
Easting	3495143.496 ft	Longitude	W90°39'40.65211"	Longitude	W90°39'40.65211"
Elevation	31.681 ft	Height	-48.369 ft	Height	-48.369 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.180 ft	Latitude	N29°02'49.70623"	Latitude	N29°02'49.70623"
Easting	3438609.465 ft	Longitude	W90°50'22.54590"	Longitude	W90°50'22.54590"
Elevation	1.139 ft	Height	-77.619 ft	Height	-77.619 ft

Vector					
ΔNorthing	-75867.913 ft	NS Fwd Azimuth	217°01'37"	ΔX	-57393.909 ft
ΔEasting	-56534.031 ft	Ellipsoid Dist.	94611.855 ft	ΔY	-36040.119 ft
ΔElevation	-30.541 ft	ΔHeight	-29.249 ft	ΔZ	-66018.055 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.004 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.004 ft
σ ΔEasting	0.004 ft	σ Ellipsoid Dist.	0.004 ft	σ ΔY	0.016 ft
σ ΔElevation	0.018 ft	σ ΔHeight	0.018 ft	σ ΔZ	0.009 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000015610		
Y	-0.0000007545	0.0000240112	
Z	0.0000004559	-0.0000115137	0.0000070476

Occupations

	From	To
Point ID:	LMCN	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\lmcn0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920590.T02
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	4508245724	5040K18292
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2
Antenna serial number:	60104388	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount



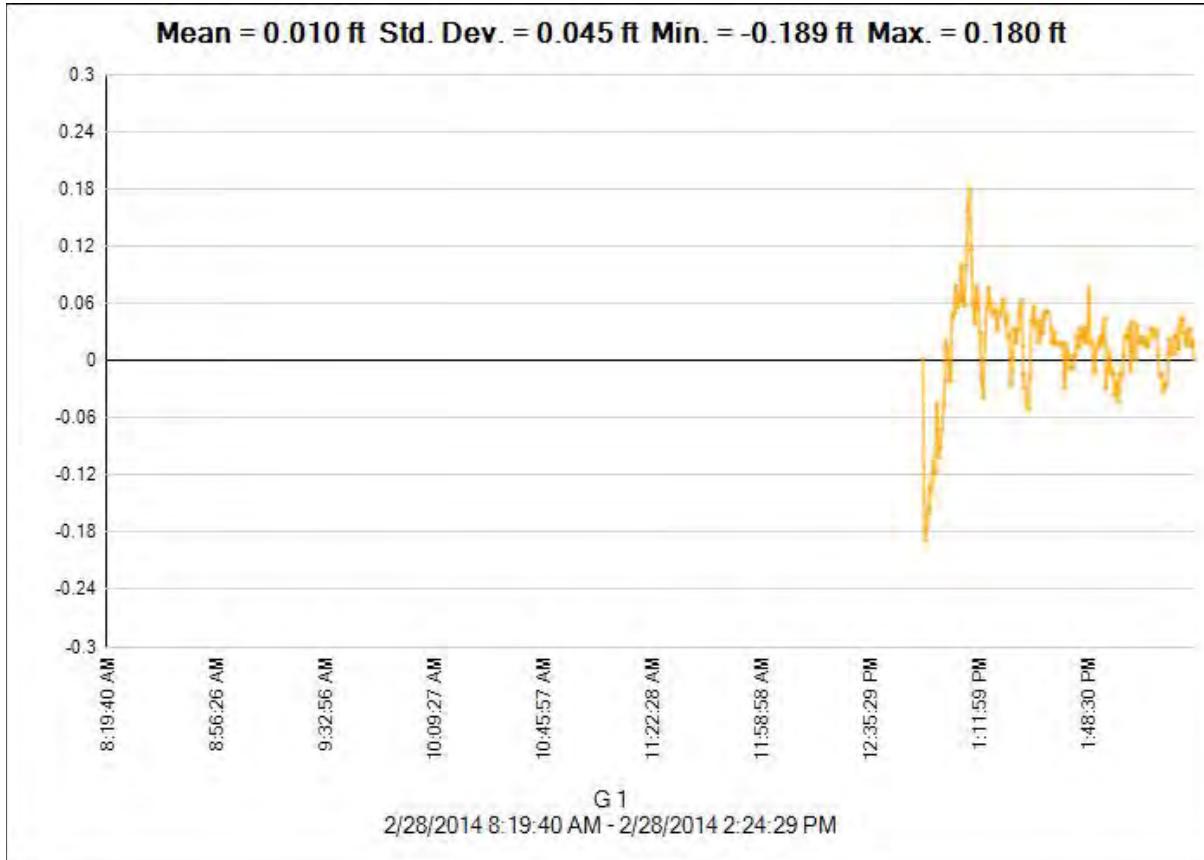
Tracking Summary

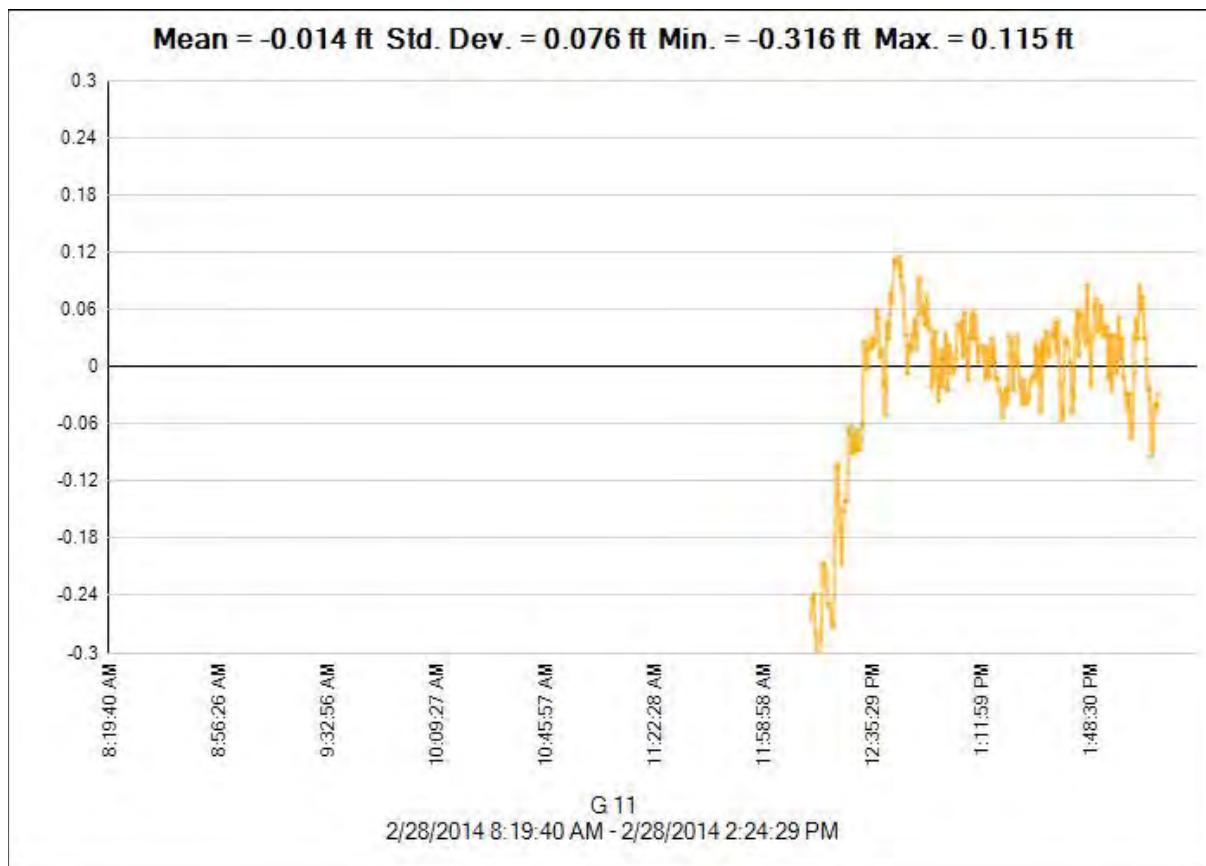


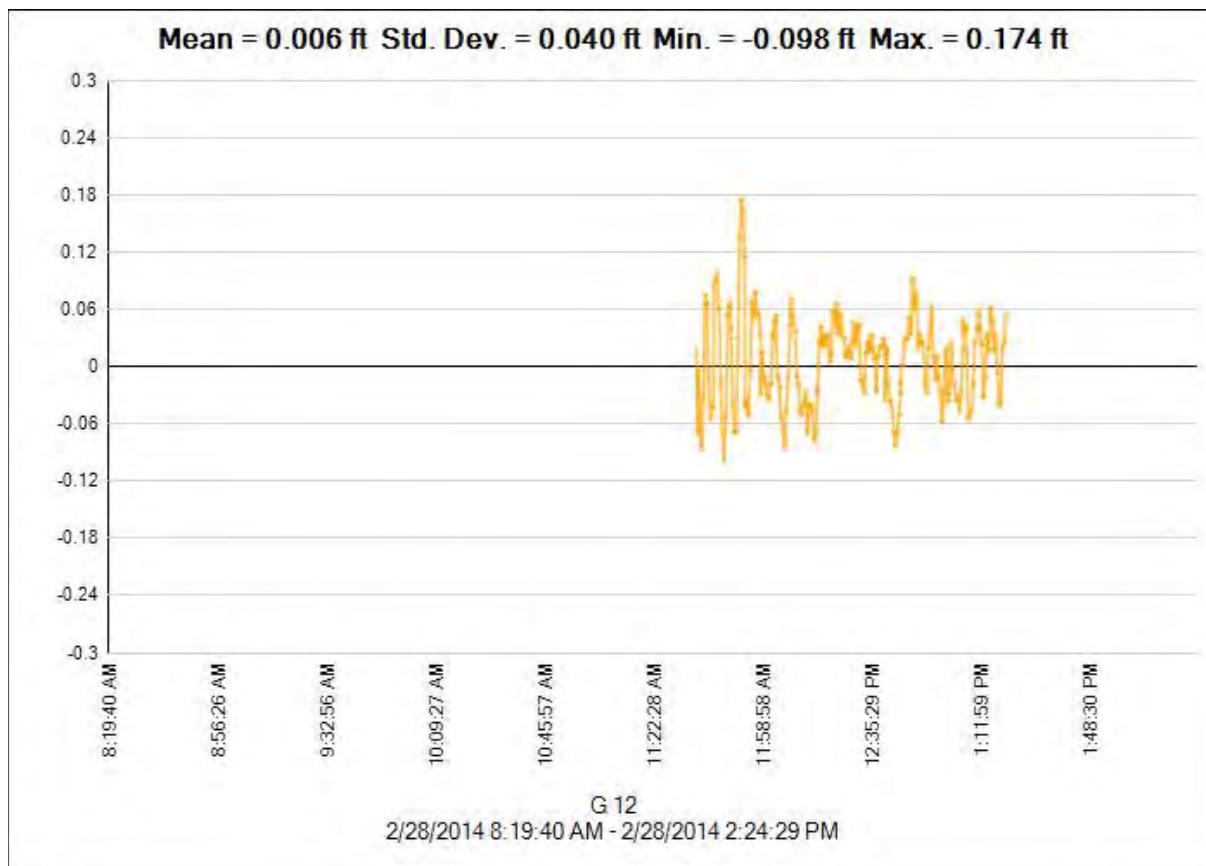
SV	2/28/2014 8:19:09 AM	Duration: 06:05:05	Major interval: 00:10:00	2/28/2014 2:24:14 PM
G 1	L1 L2			
G 11	L1 L2			
G 12	L1 L2			
G 14	L1 L2			
G 15	L1 L2			
G 16	L1 L2			
G 18	L1 L2			
G 20	L1 L2			
G 21	L1 L2			
G 22	L1 L2			
G 24	L1 L2			
G 25	L1 L2			
G 26	L1 L2			
G 27	L1 L2			
G 29	L1 L2			
G 31	L1 L2			
G 32	L1 L2			

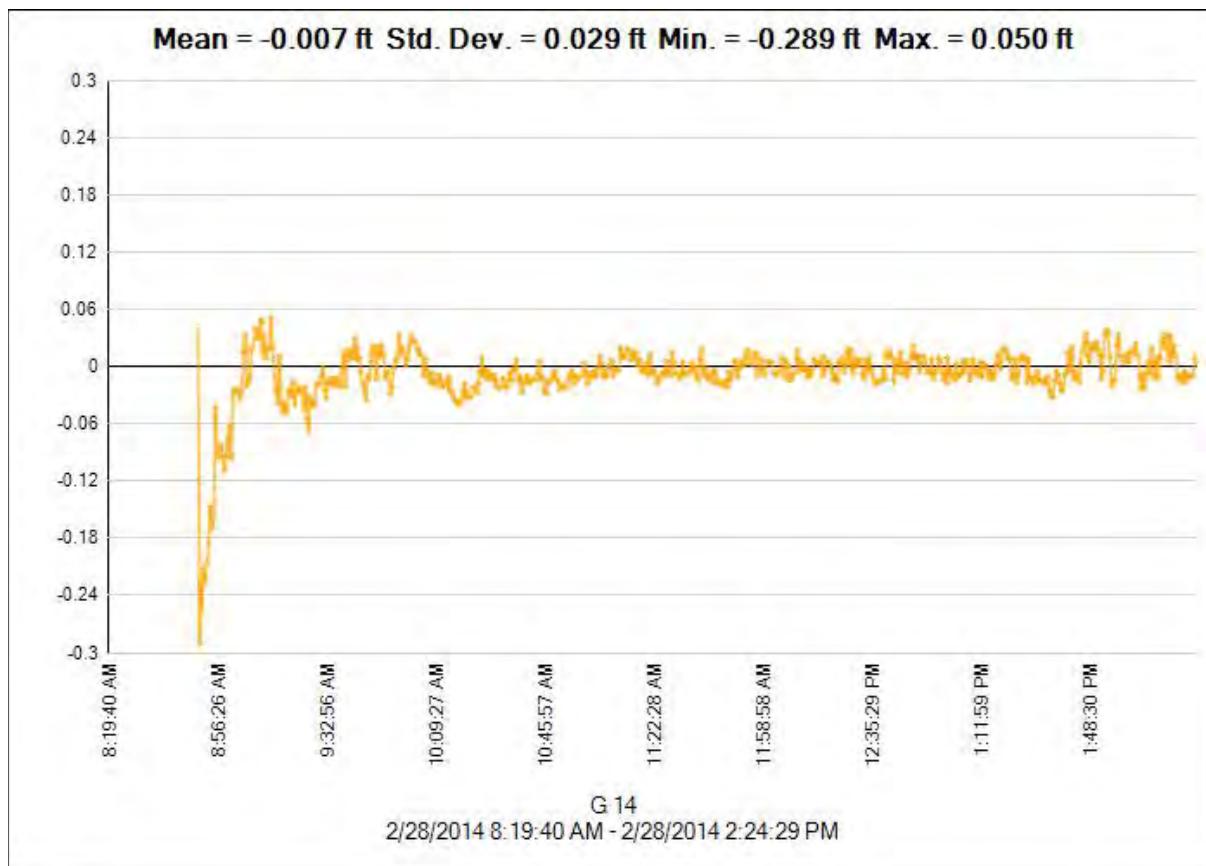


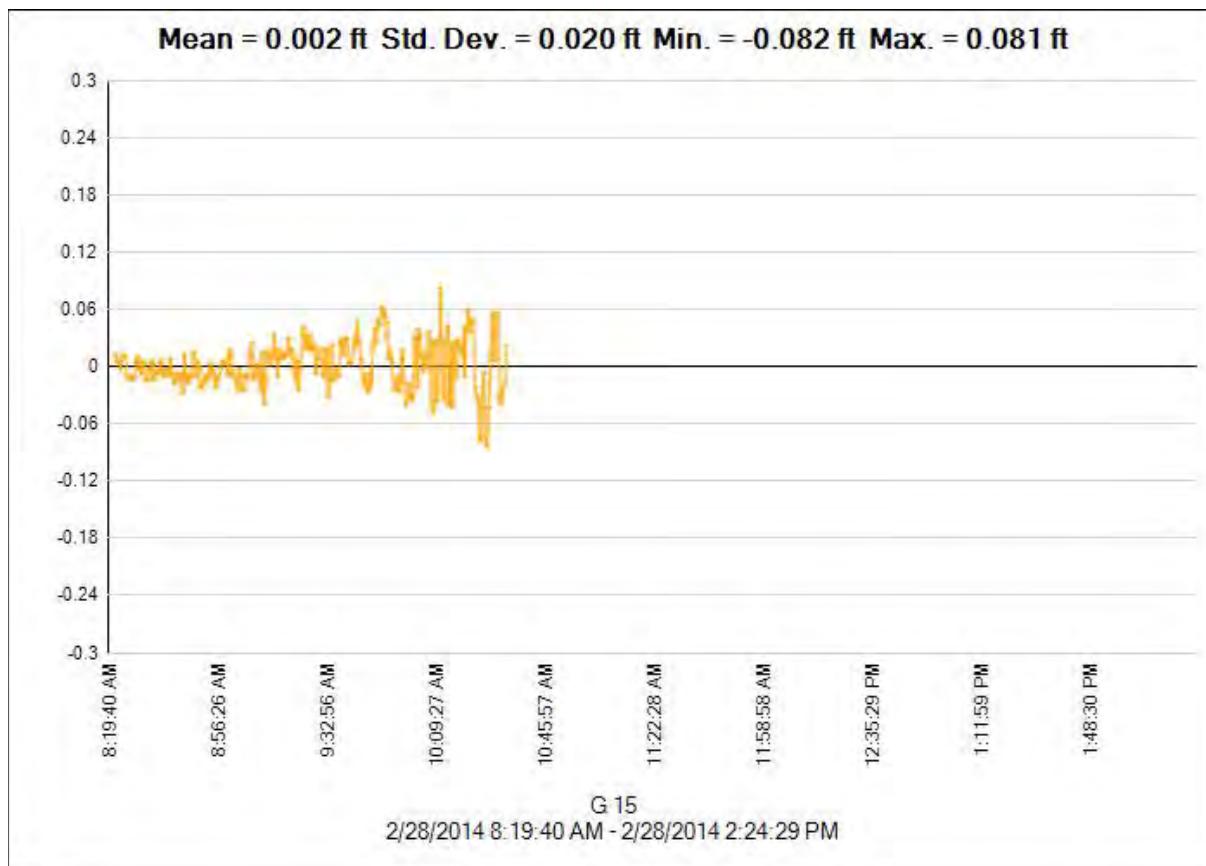
Residuals





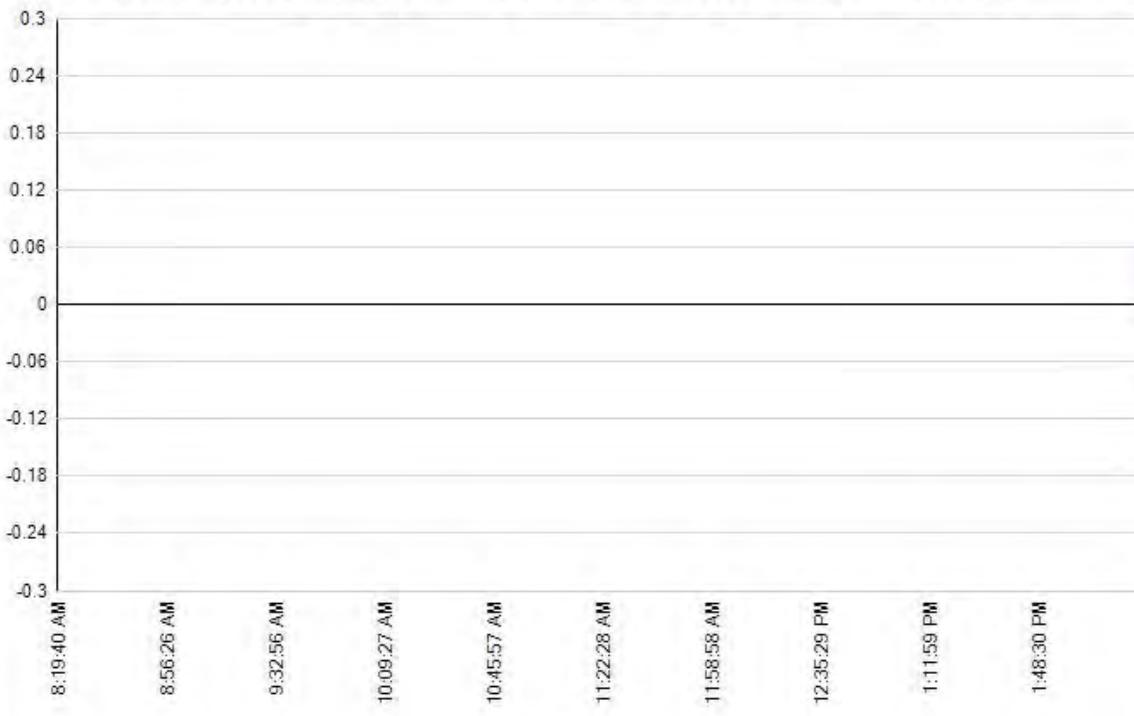


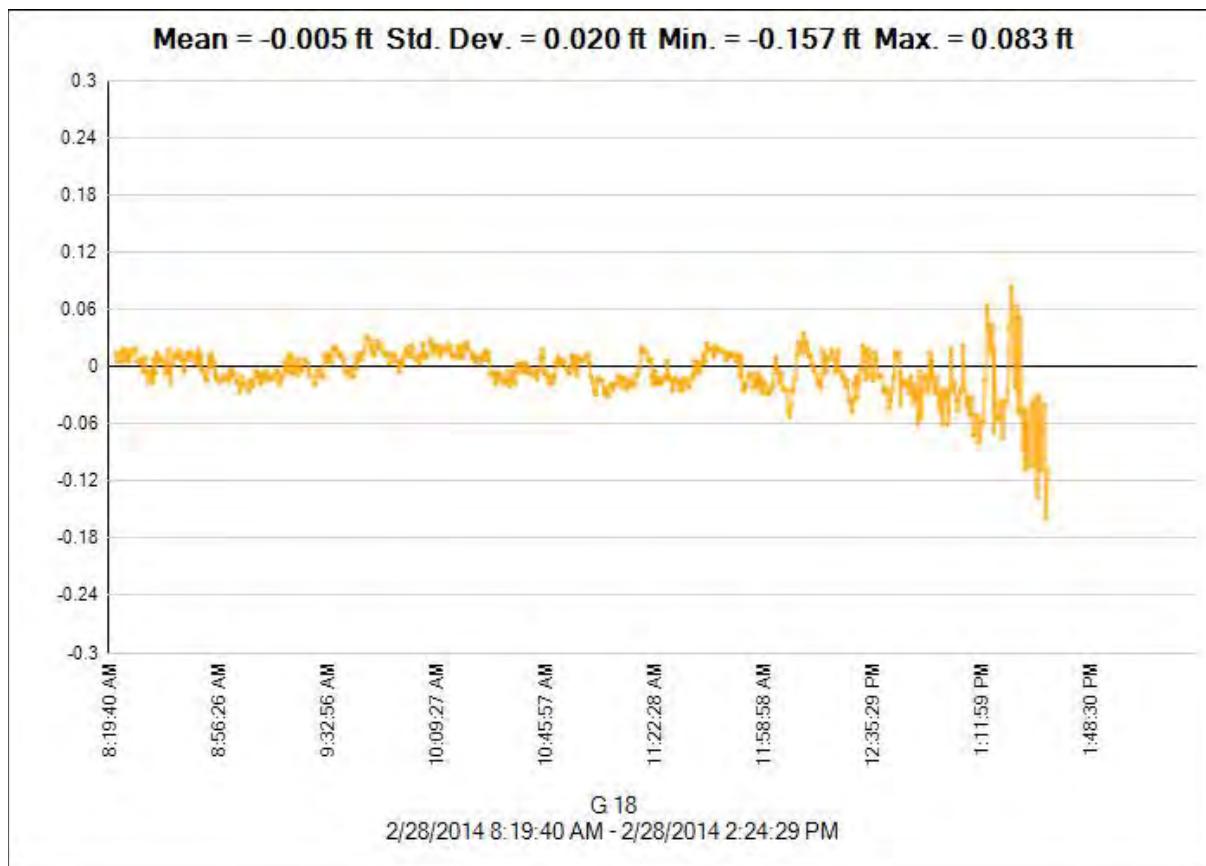


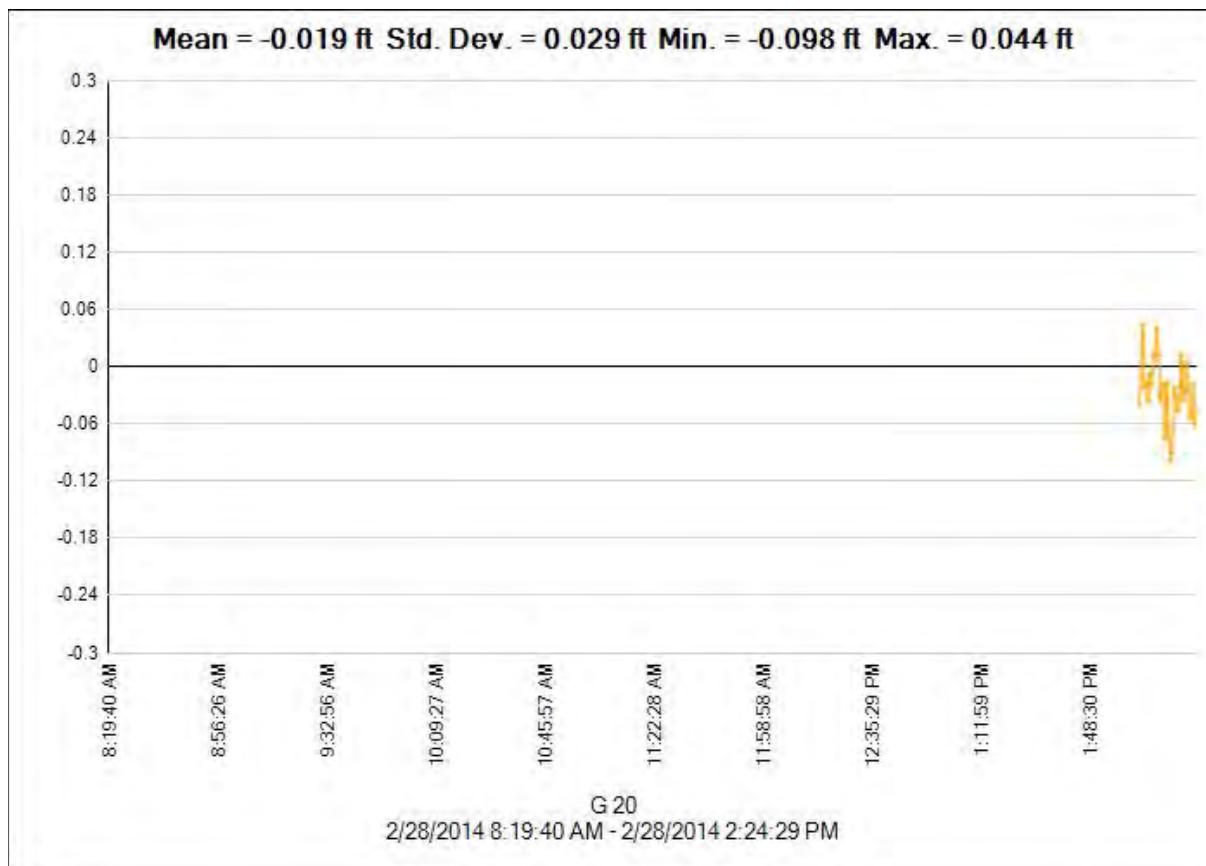


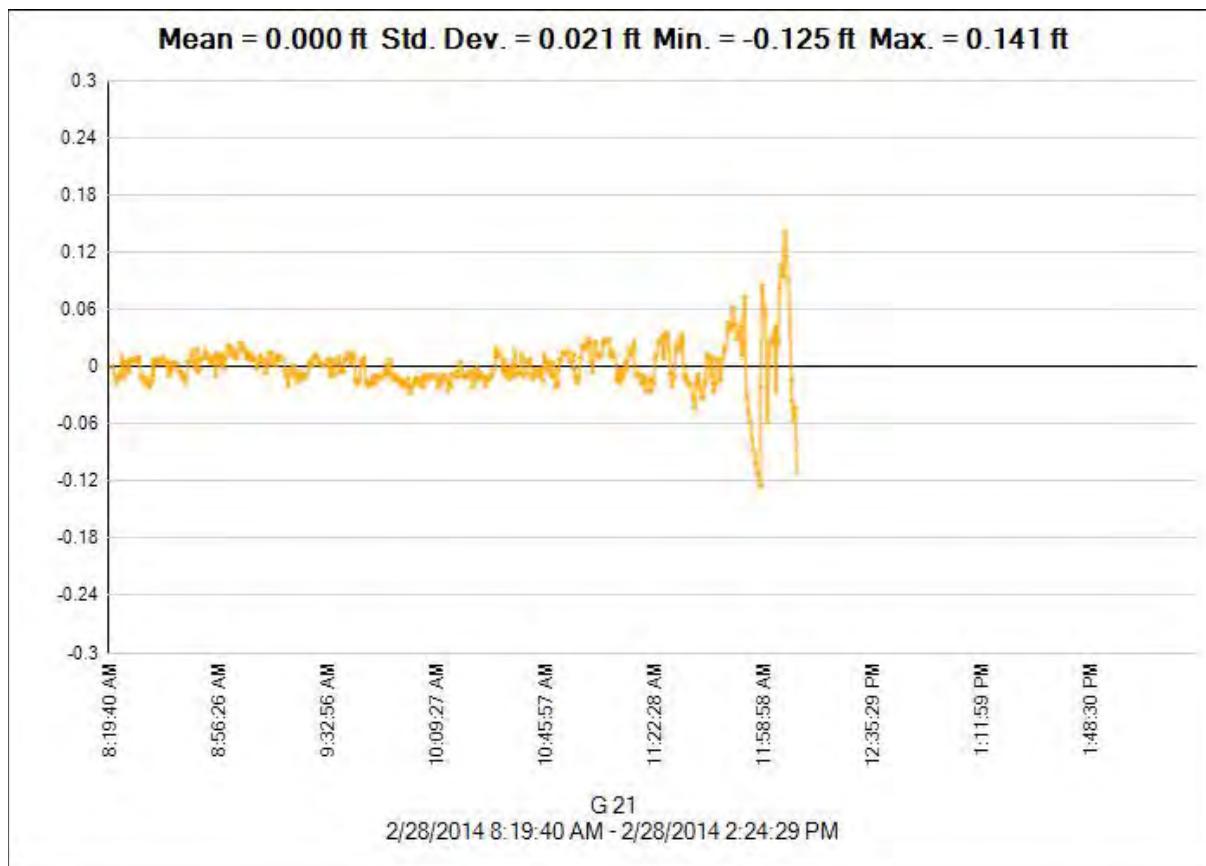


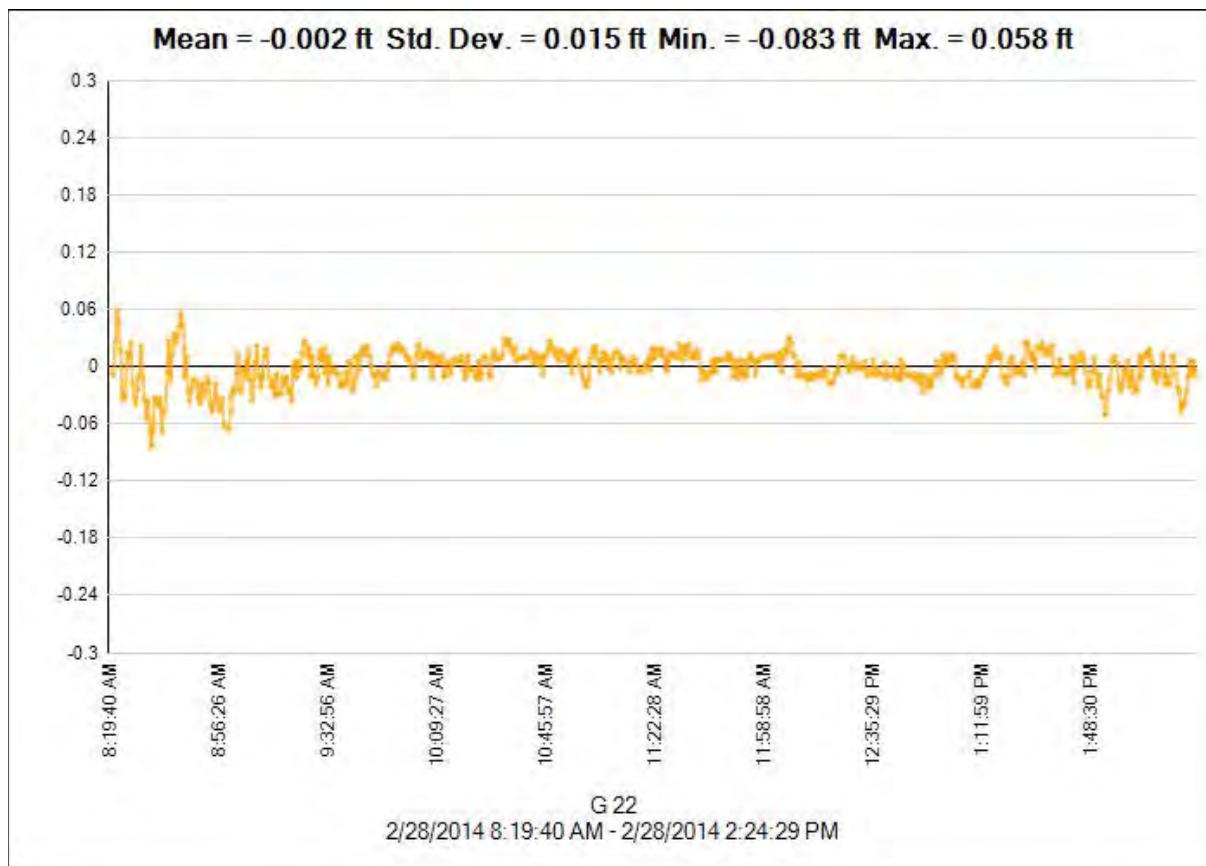
Mean = 0.036 ft Std. Dev. = 0.019 ft Min. = 0.017 ft Max. = 0.055 ft

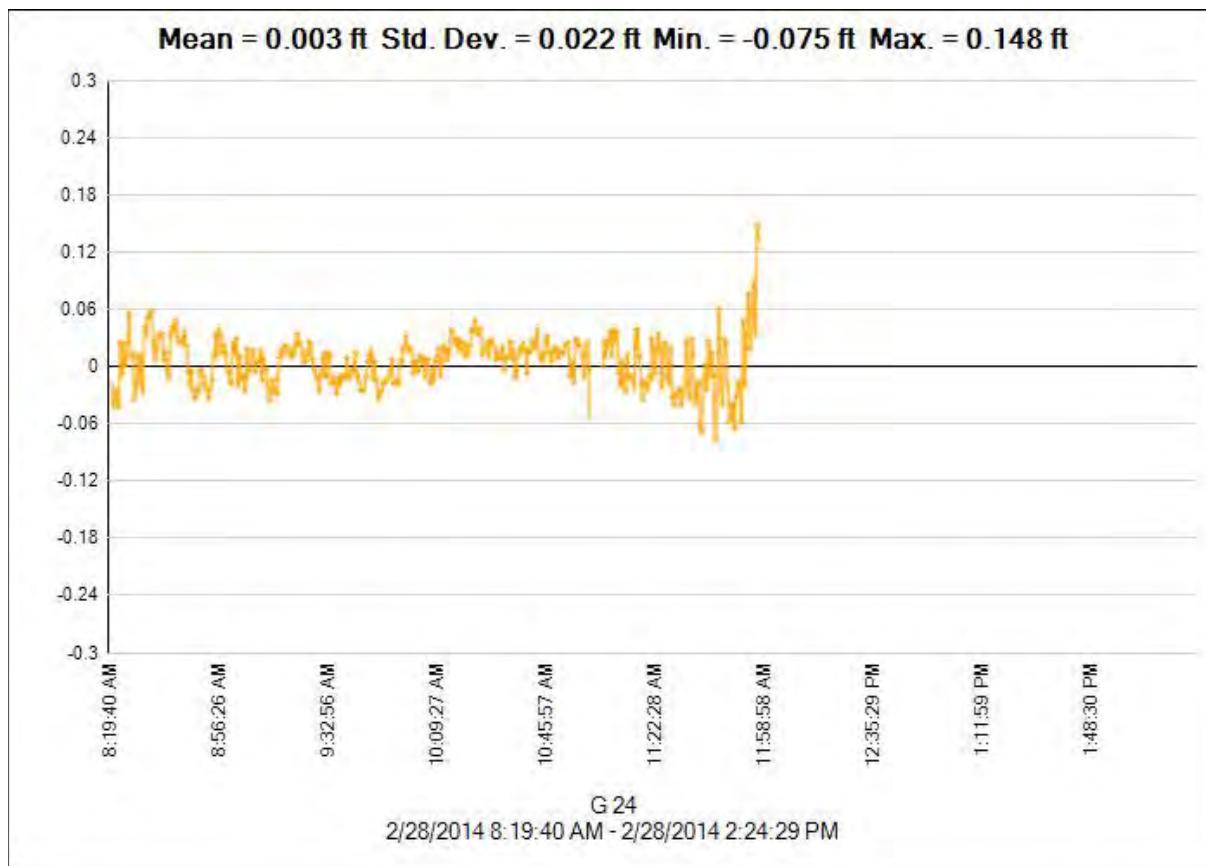


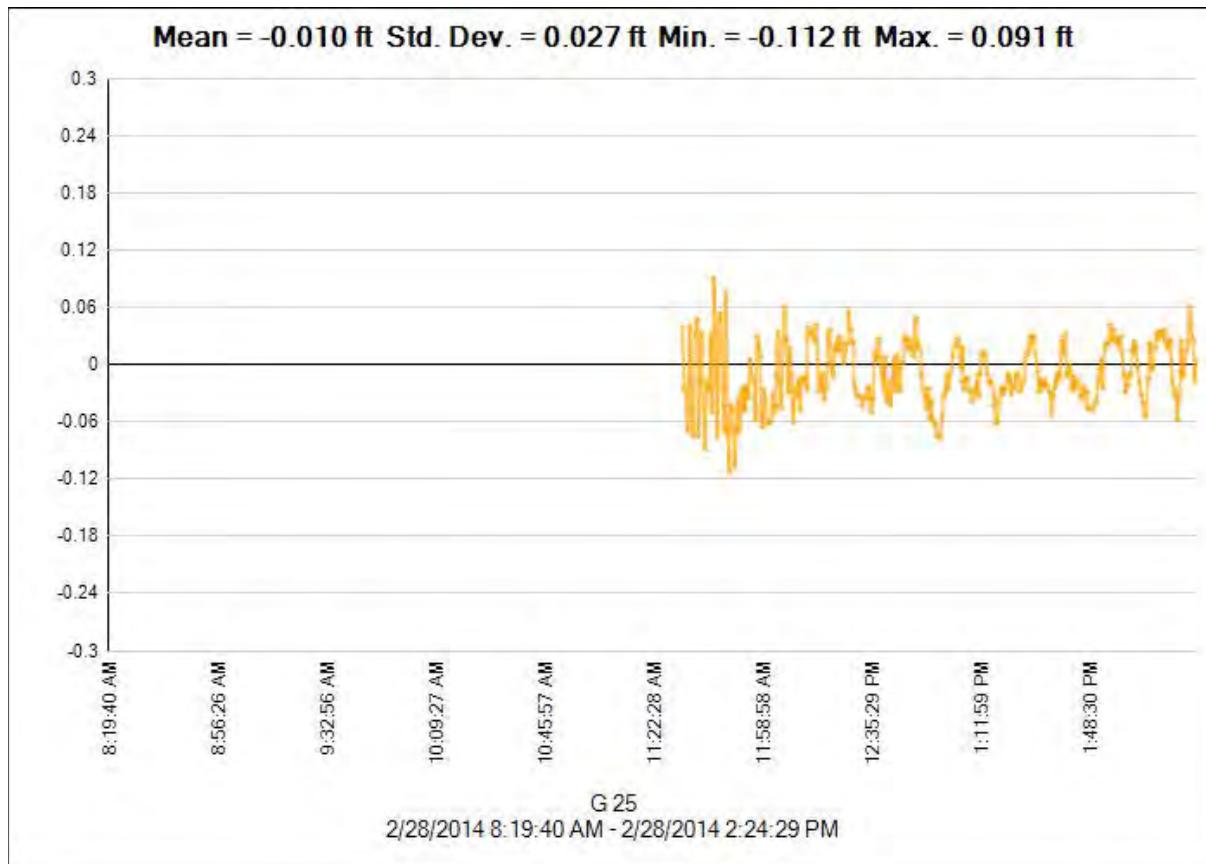


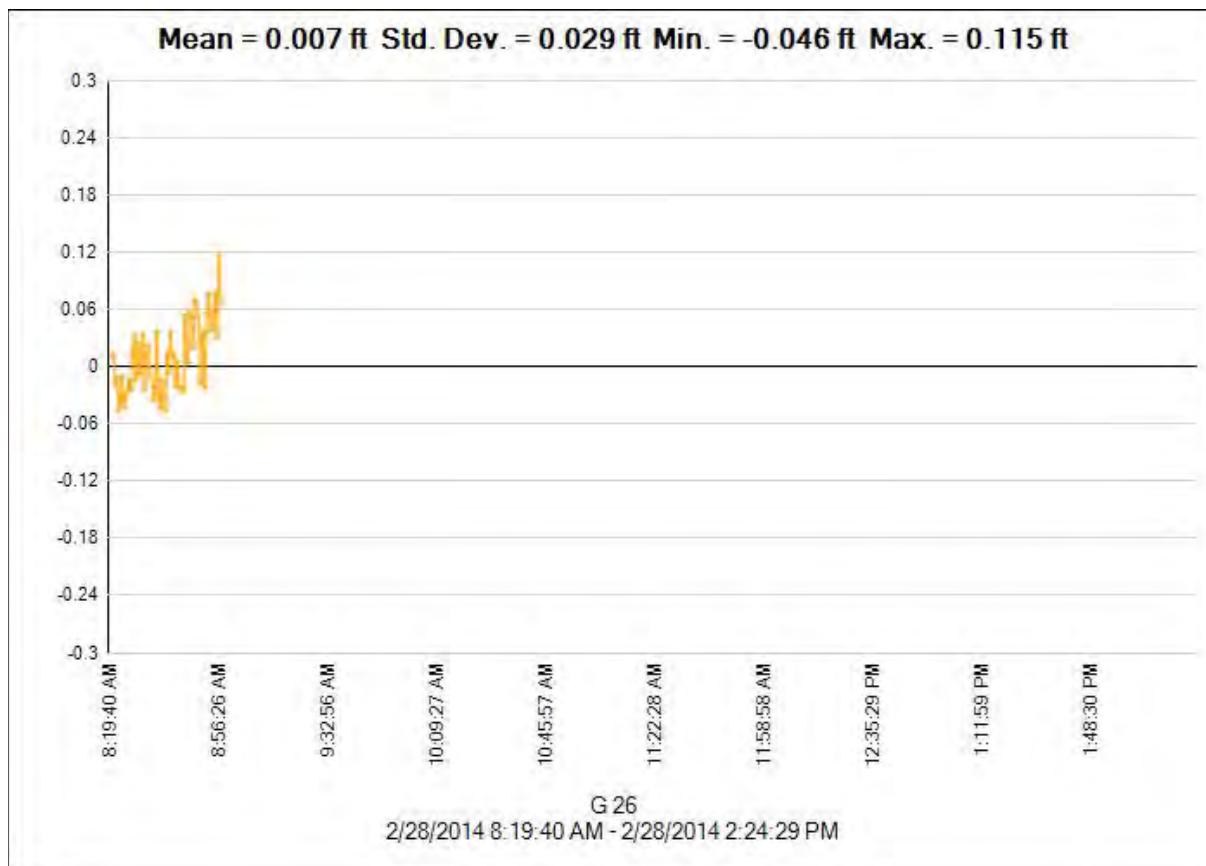


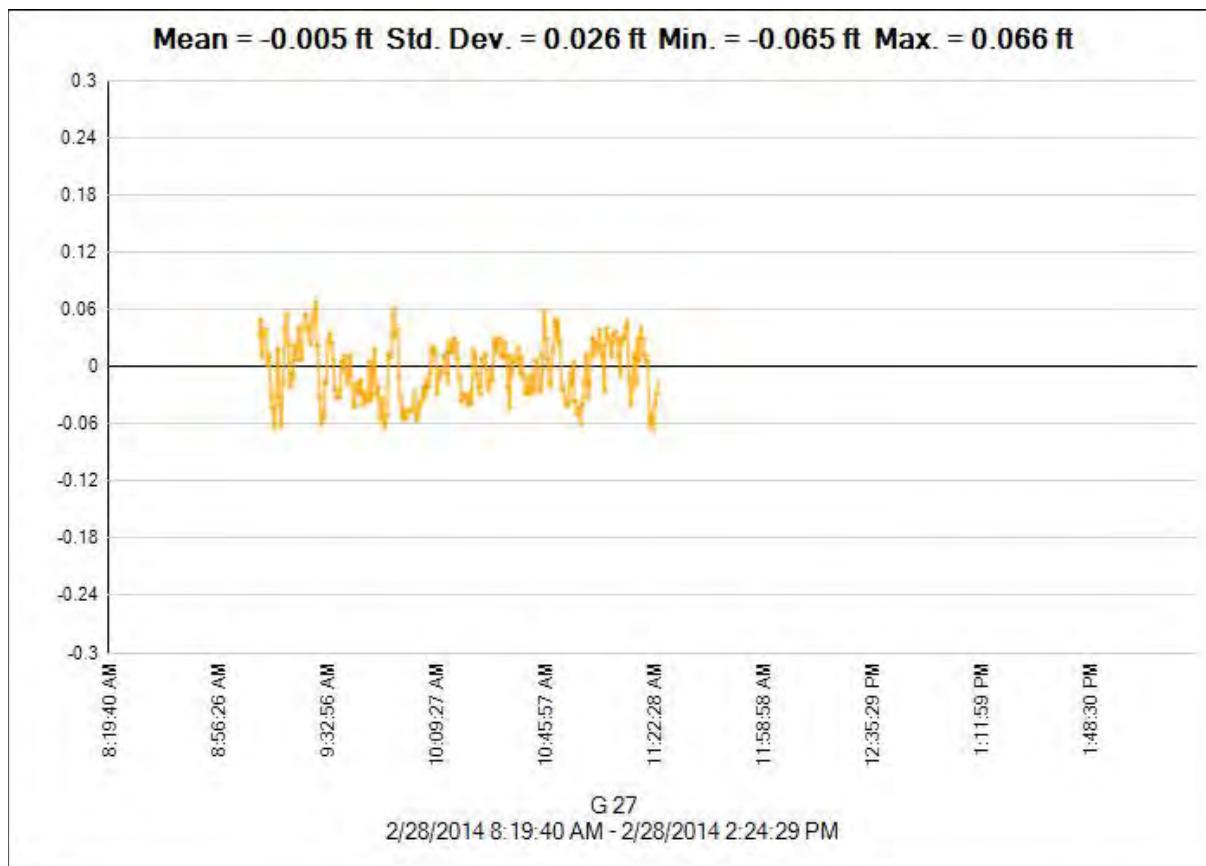


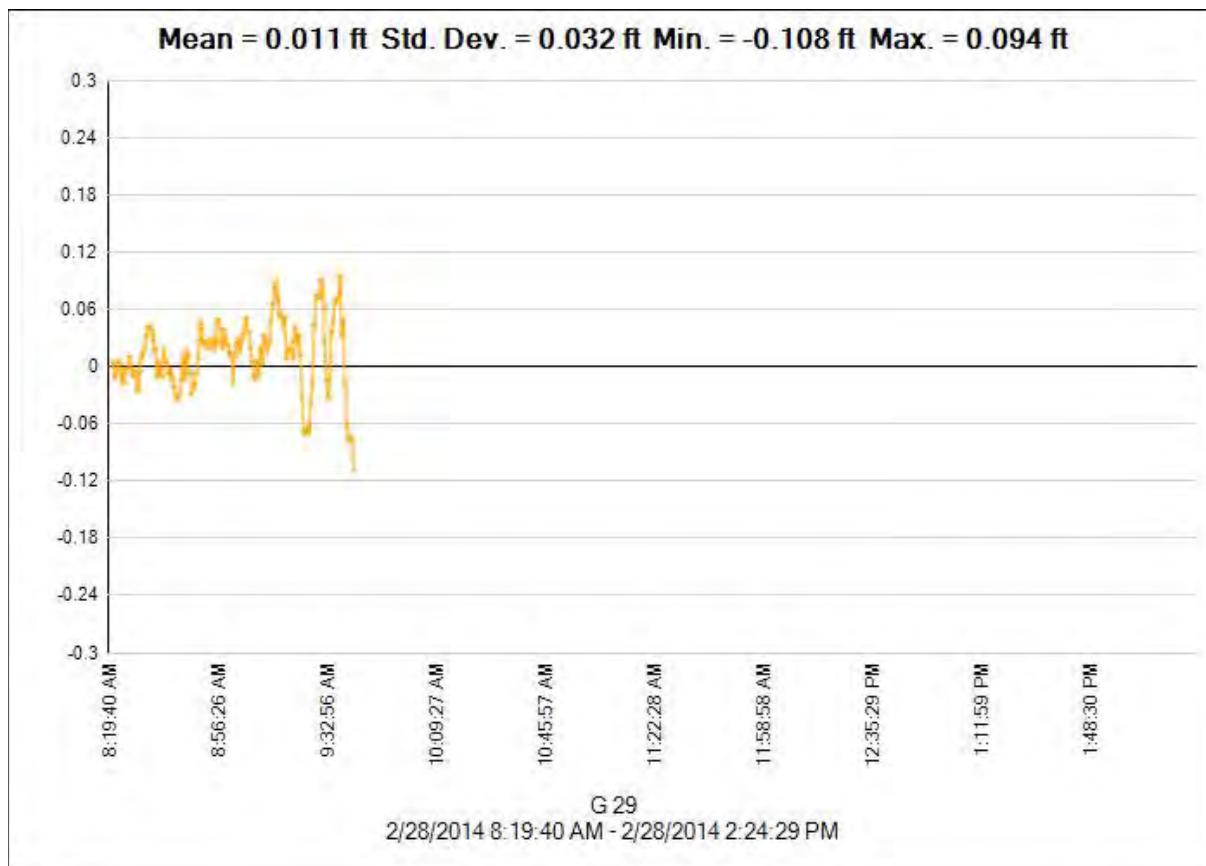


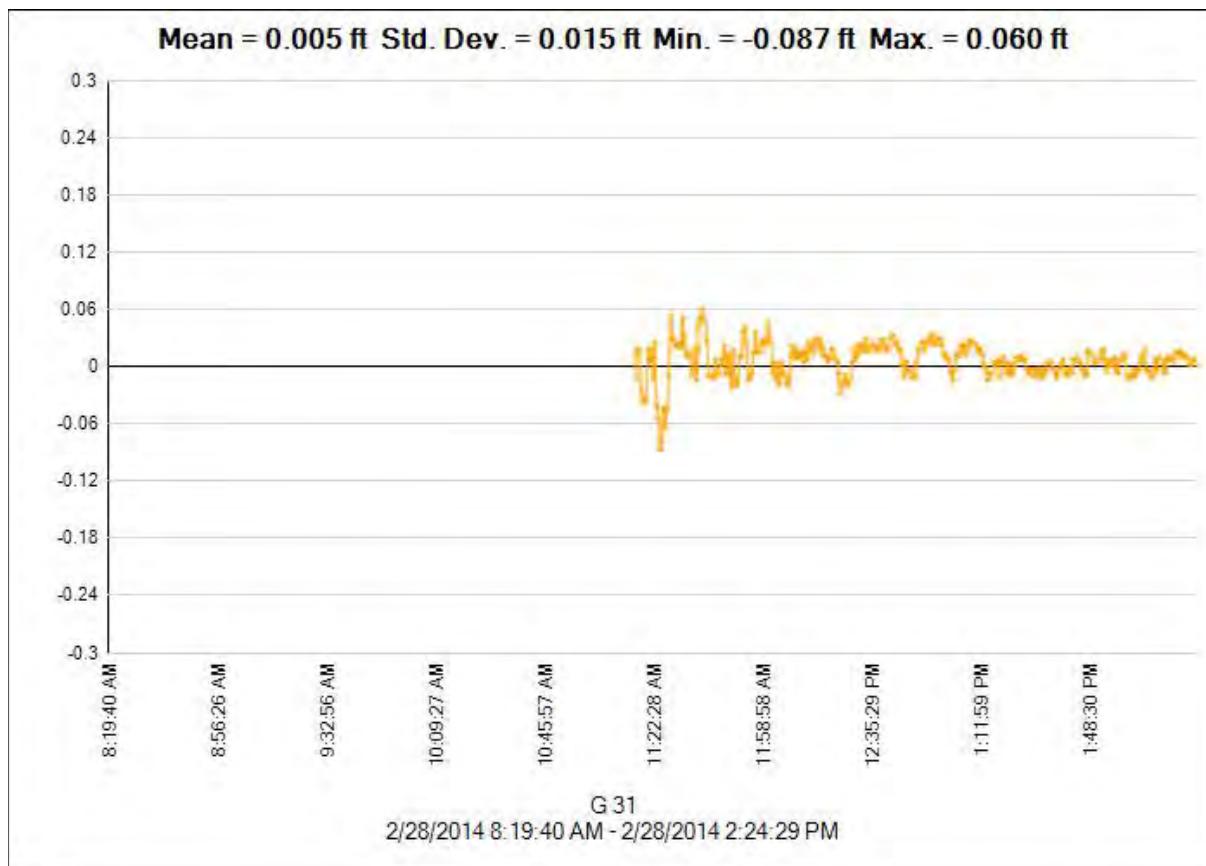


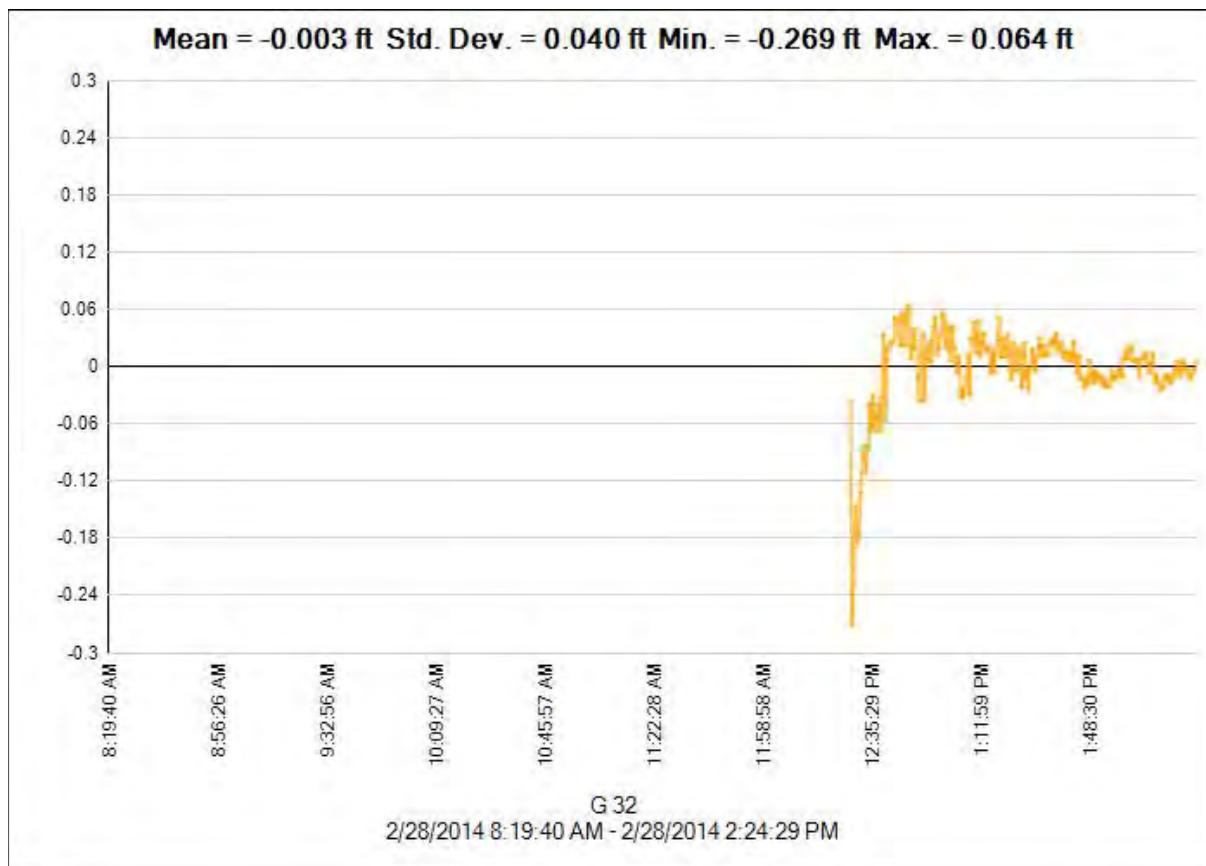














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





LMCN - TE14-SM-01 (8:44:37 AM-4:48:15 PM) (S17)

Baseline observation: LMCN ---
TE14-SM-
01 (B30)

Processed: 4/2/2014
10:00:38
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.013 ft

Vertical precision: 0.031 ft

RMS: 0.012 ft

Maximum PDOP: 2.999

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:47:44
AM
(Local:
UTC-6hr)

Processing stop time: 2/27/2014
4:48:14
PM
(Local:
UTC-6hr)

Processing duration: 08:00:30

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	LMCN
-------	------



Grid		Local		Global	
Northing	275191.093 ft	Latitude	N29°15'17.90427"	Latitude	N29°15'17.90427"
Easting	3495143.496 ft	Longitude	W90°39'40.65211"	Longitude	W90°39'40.65211"
Elevation	31.681 ft	Height	-48.369 ft	Height	-48.369 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.201 ft	Latitude	N29°02'49.70644"	Latitude	N29°02'49.70644"
Easting	3438609.462 ft	Longitude	W90°50'22.54594"	Longitude	W90°50'22.54594"
Elevation	1.155 ft	Height	-77.603 ft	Height	-77.603 ft

Vector					
ΔNorthing	-75867.891 ft	NS Fwd Azimuth	217°01'38"	ΔX	-57393.912 ft
ΔEasting	-56534.034 ft	Ellipsoid Dist.	94611.840 ft	ΔY	-36040.123 ft
ΔElevation	-30.525 ft	ΔHeight	-29.234 ft	ΔZ	-66018.029 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.003 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.005 ft
σ ΔEasting	0.005 ft	σ Ellipsoid Dist.	0.004 ft	σ ΔY	0.014 ft
σ ΔElevation	0.016 ft	σ ΔHeight	0.016 ft	σ ΔZ	0.008 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000024905		
Y	0.0000006465	0.0000176678	
Z	-0.0000001087	-0.0000090698	0.0000057248

Occupations

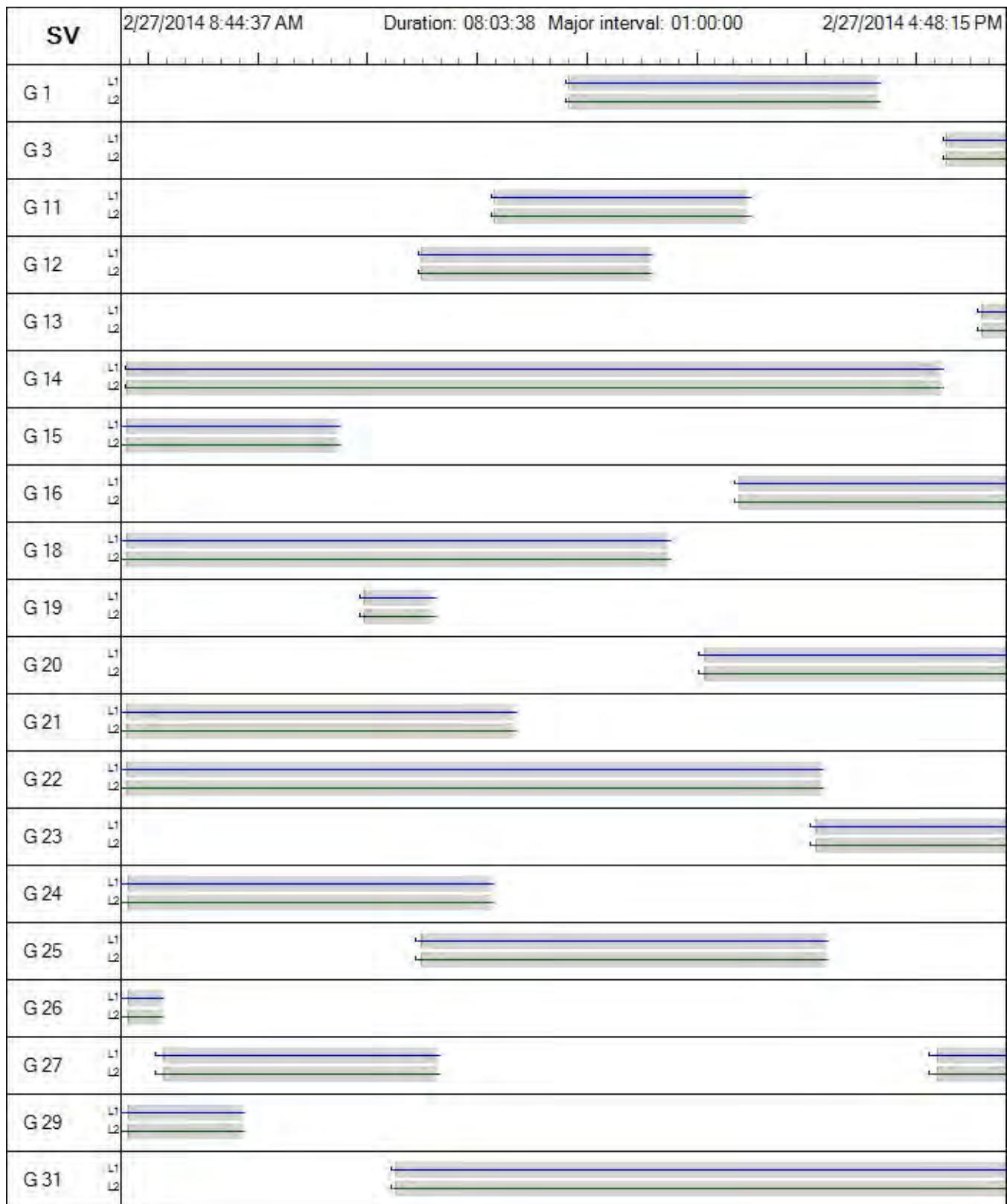
	From	To
Point ID:	LMCN	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\lmcn0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920580.T02
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	4508245724	5040K18292
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2
Antenna serial number:	60104388	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount



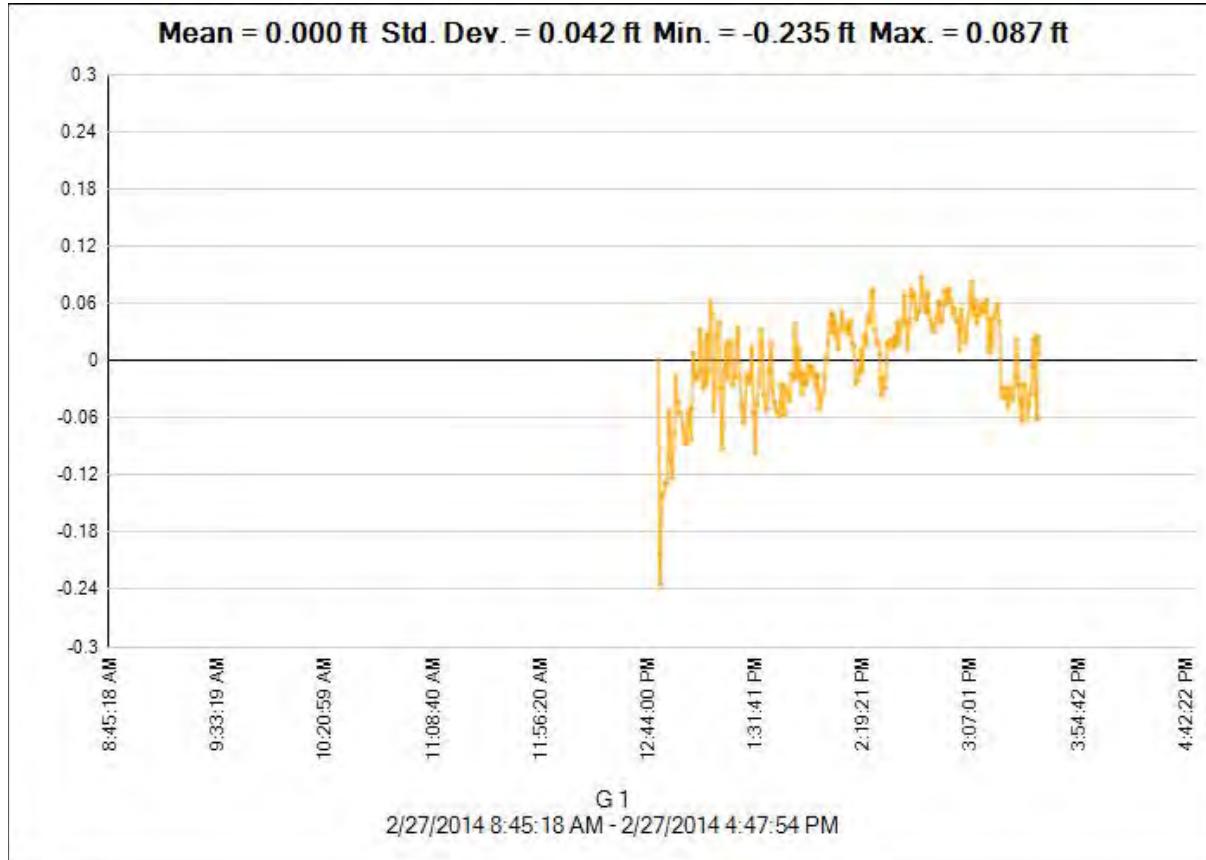
Tracking Summary

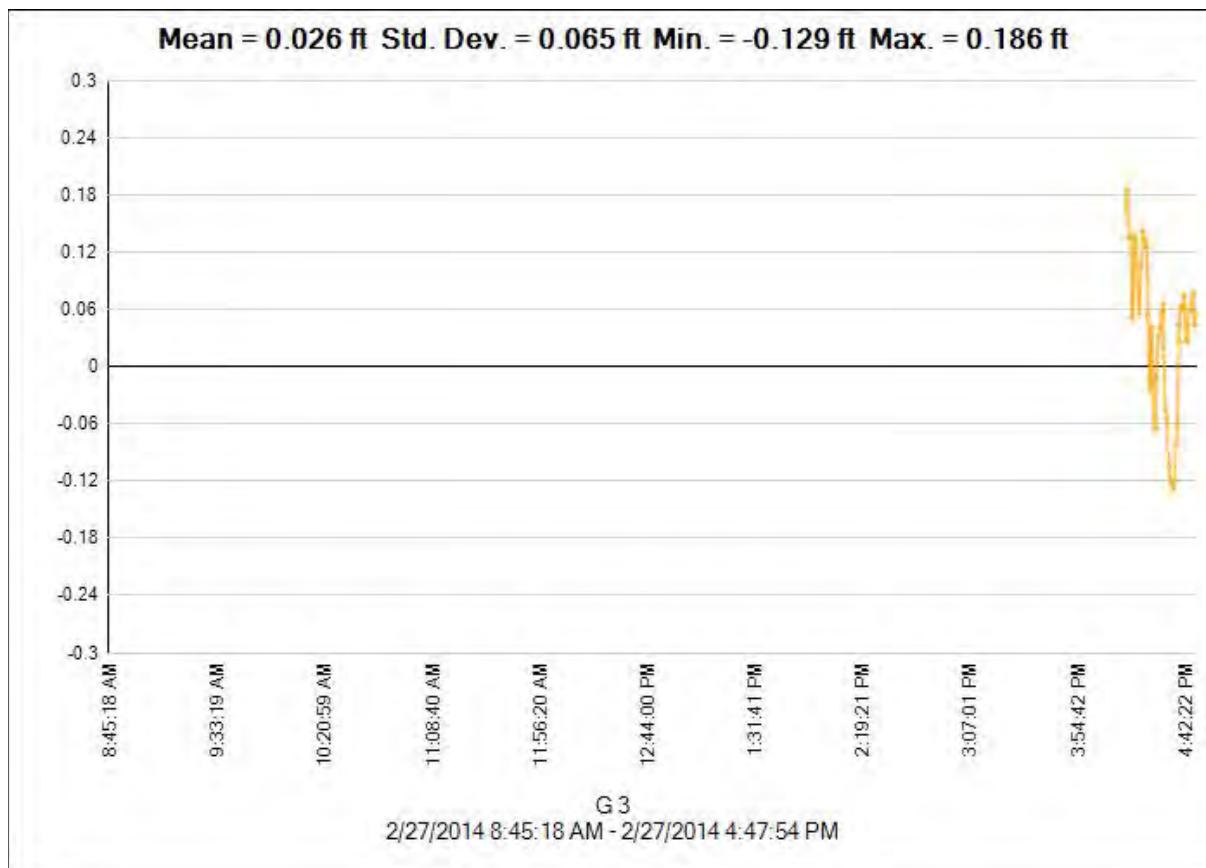


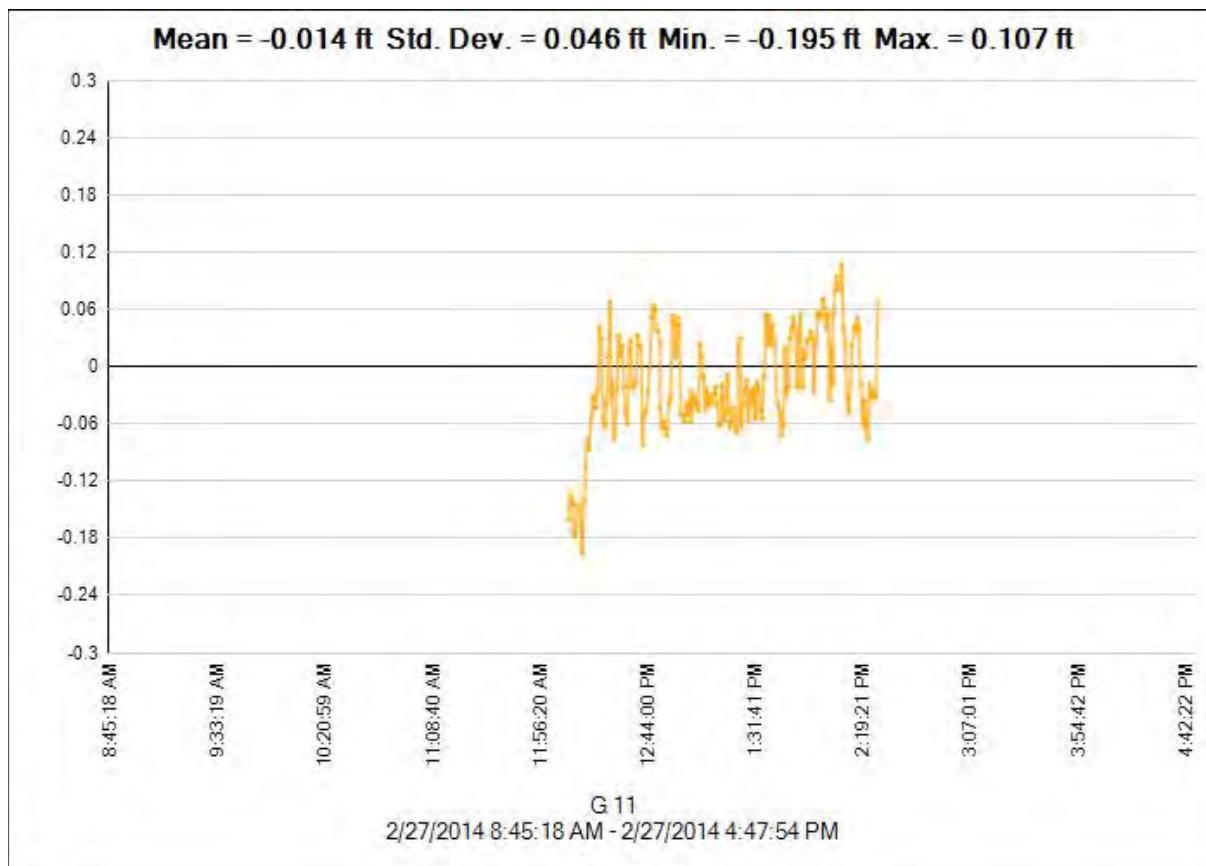


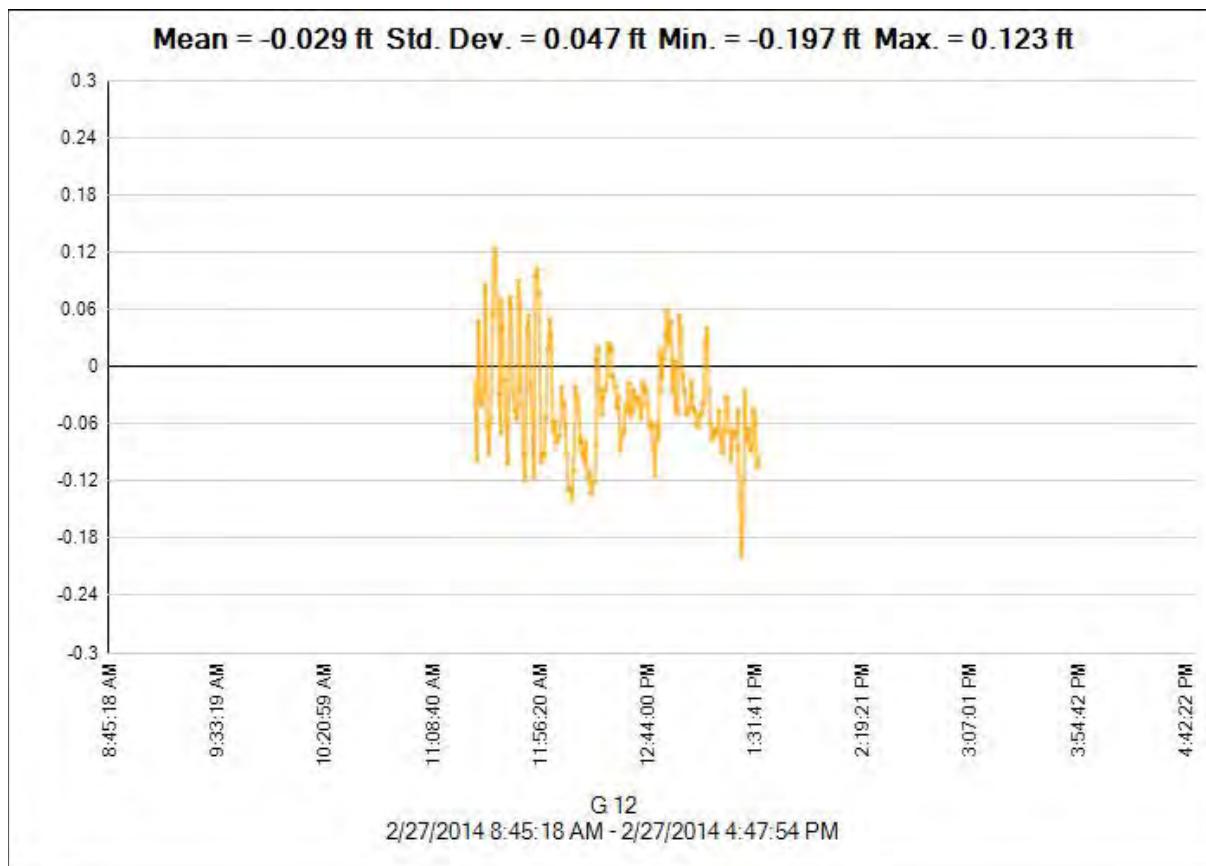


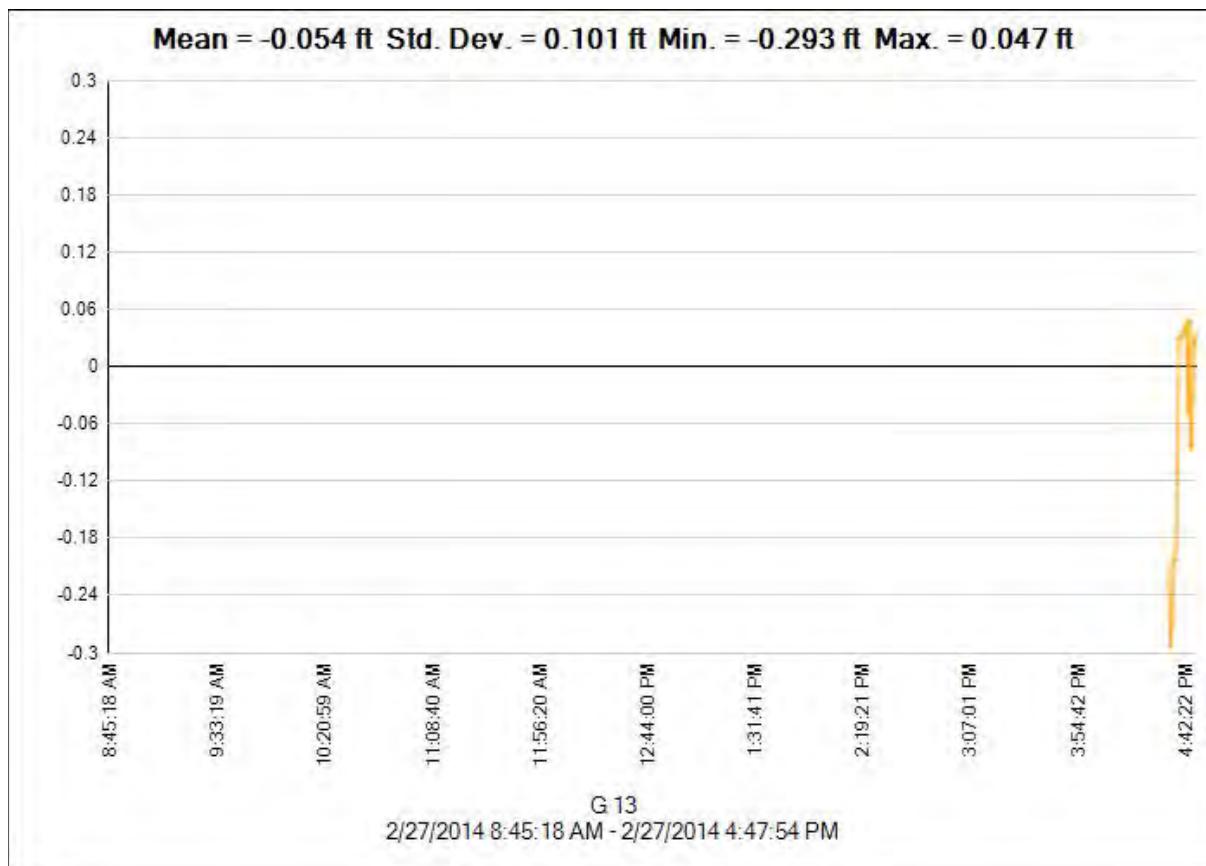
Residuals

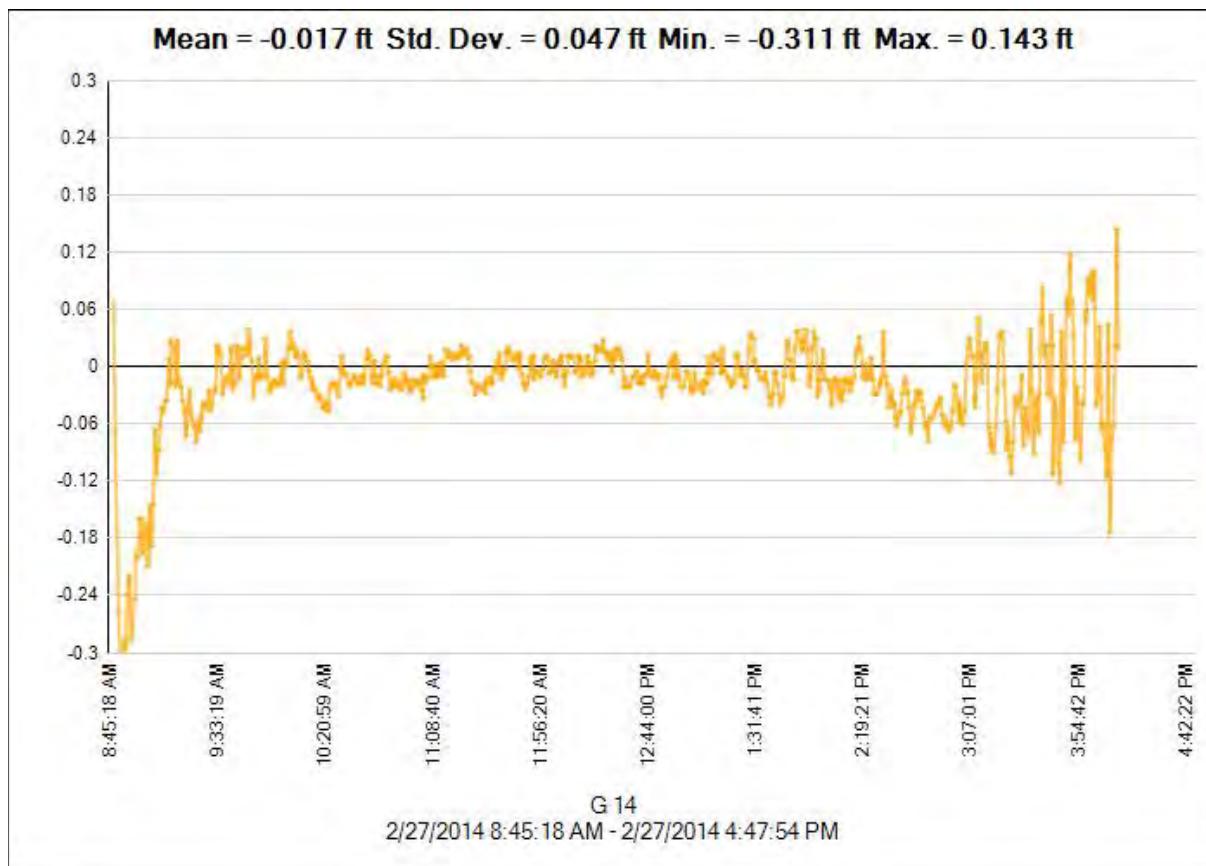


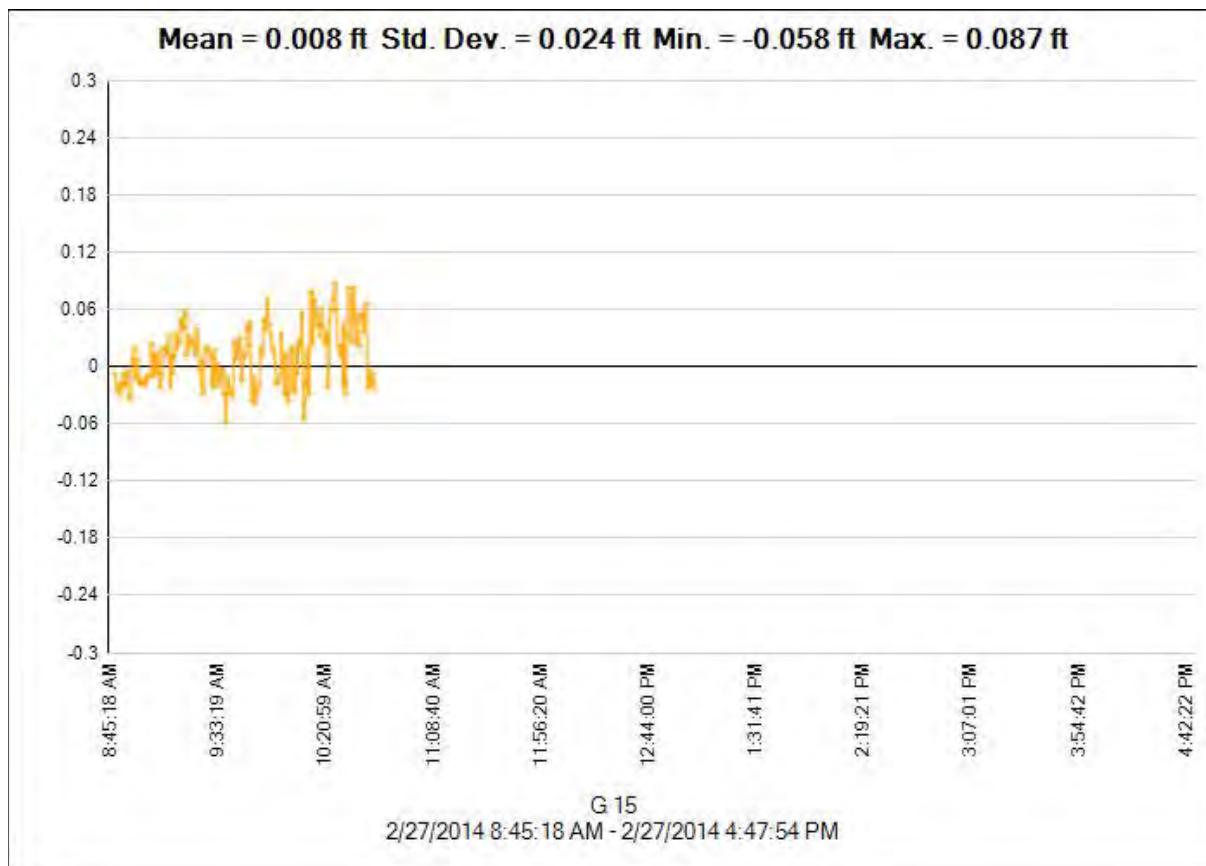


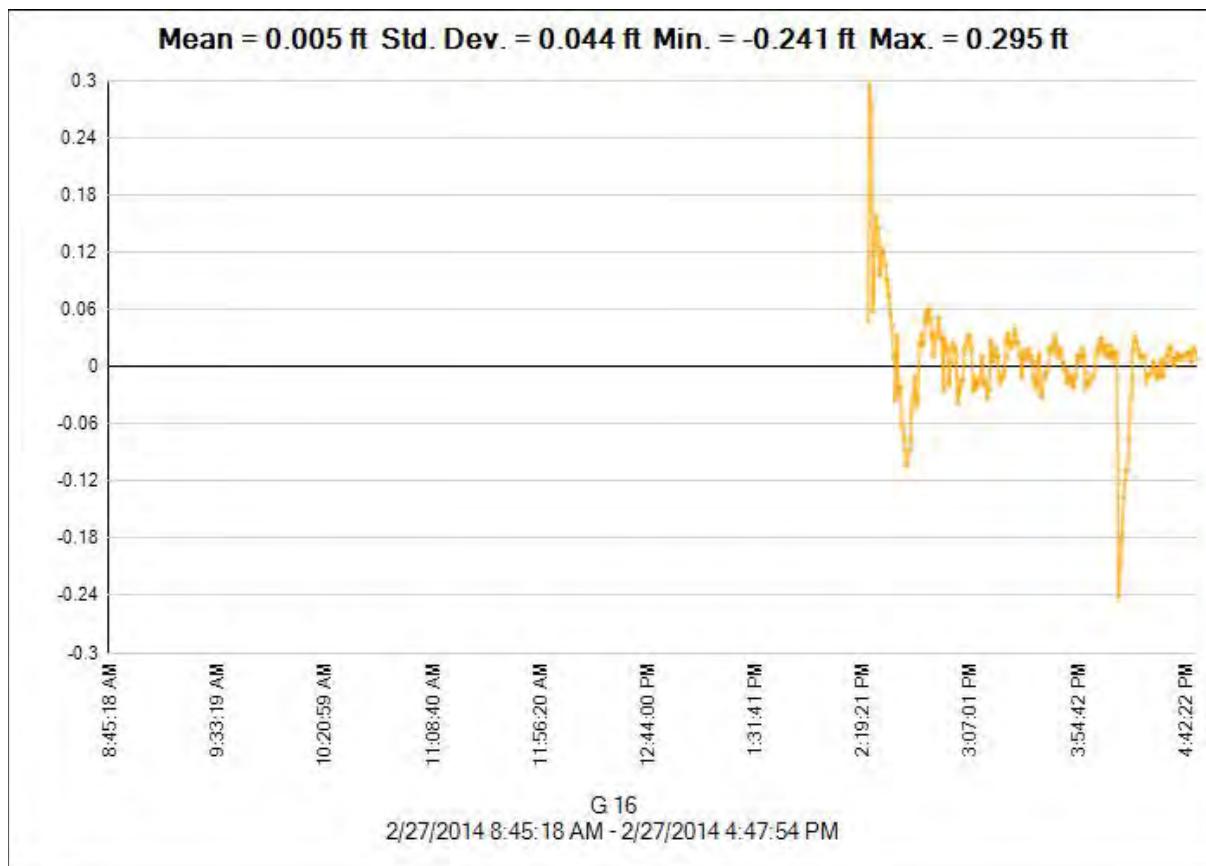


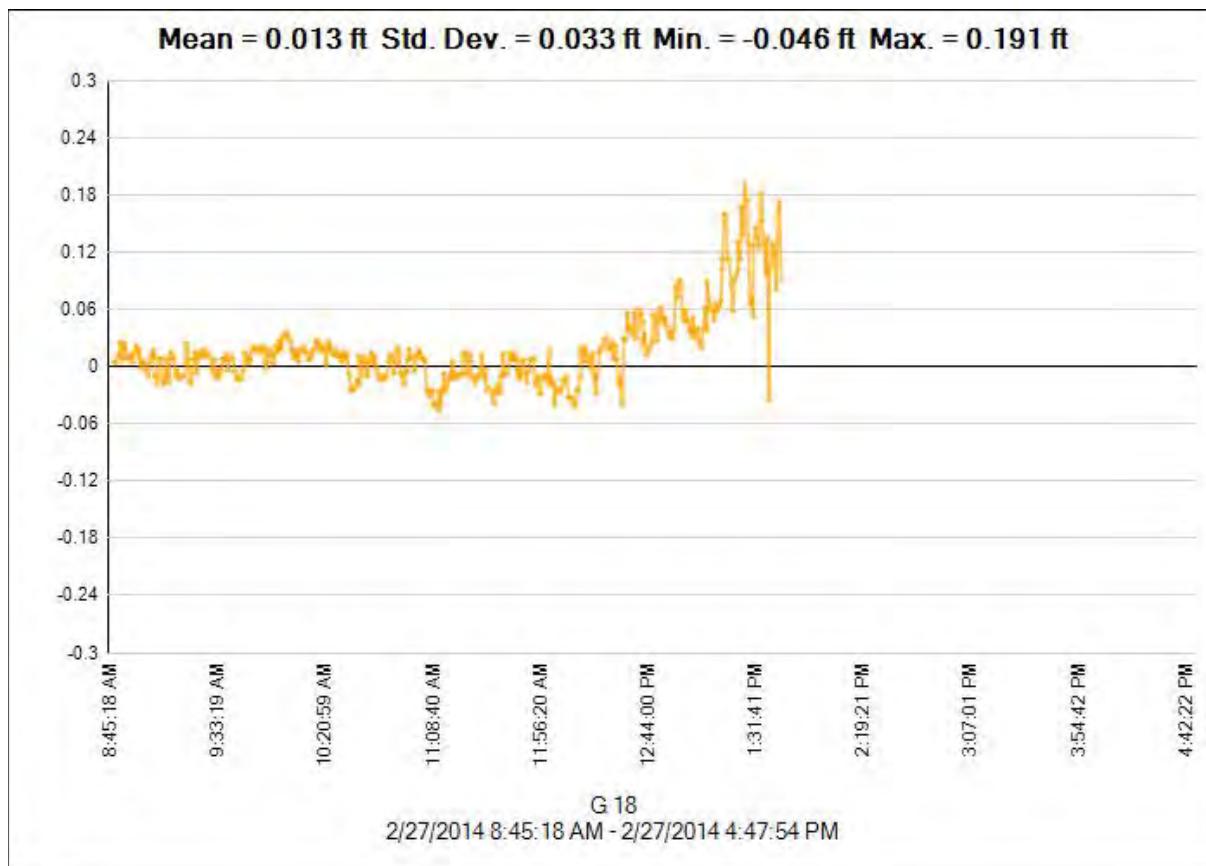


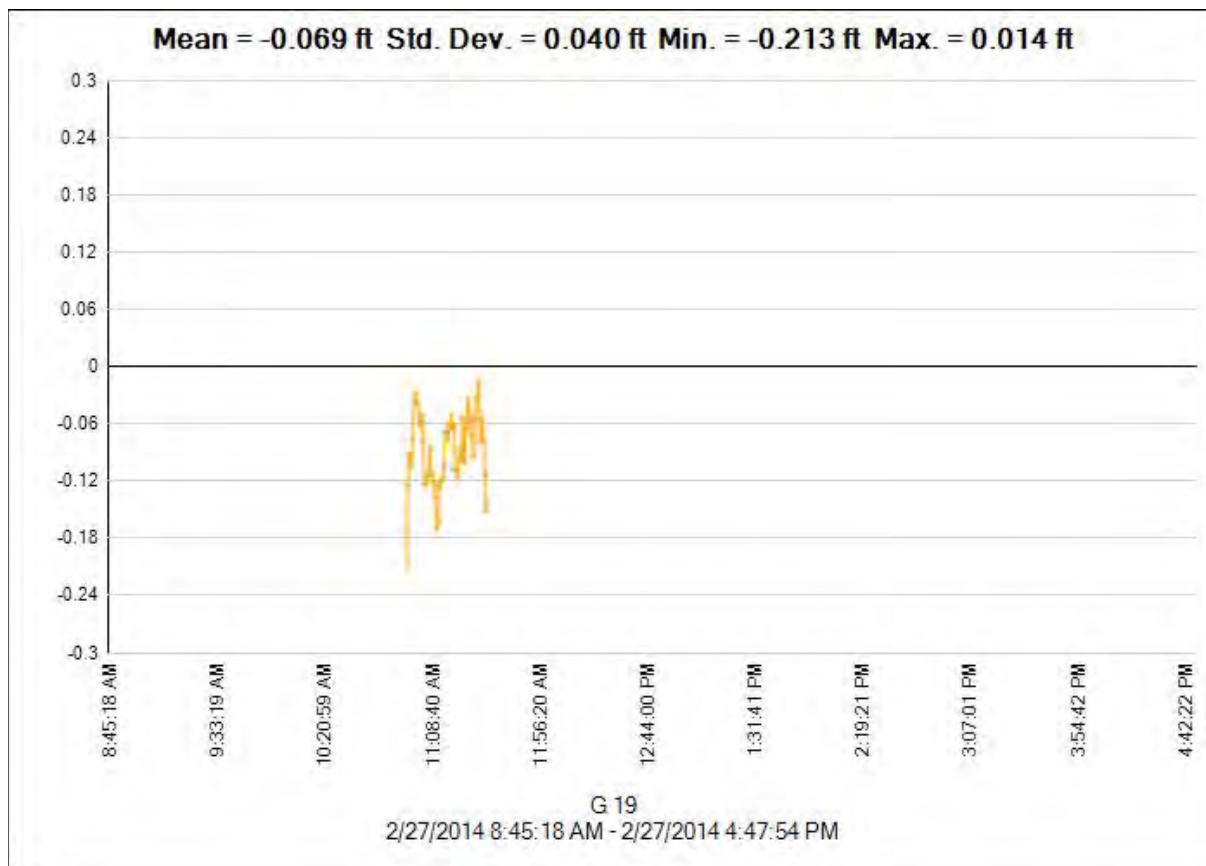


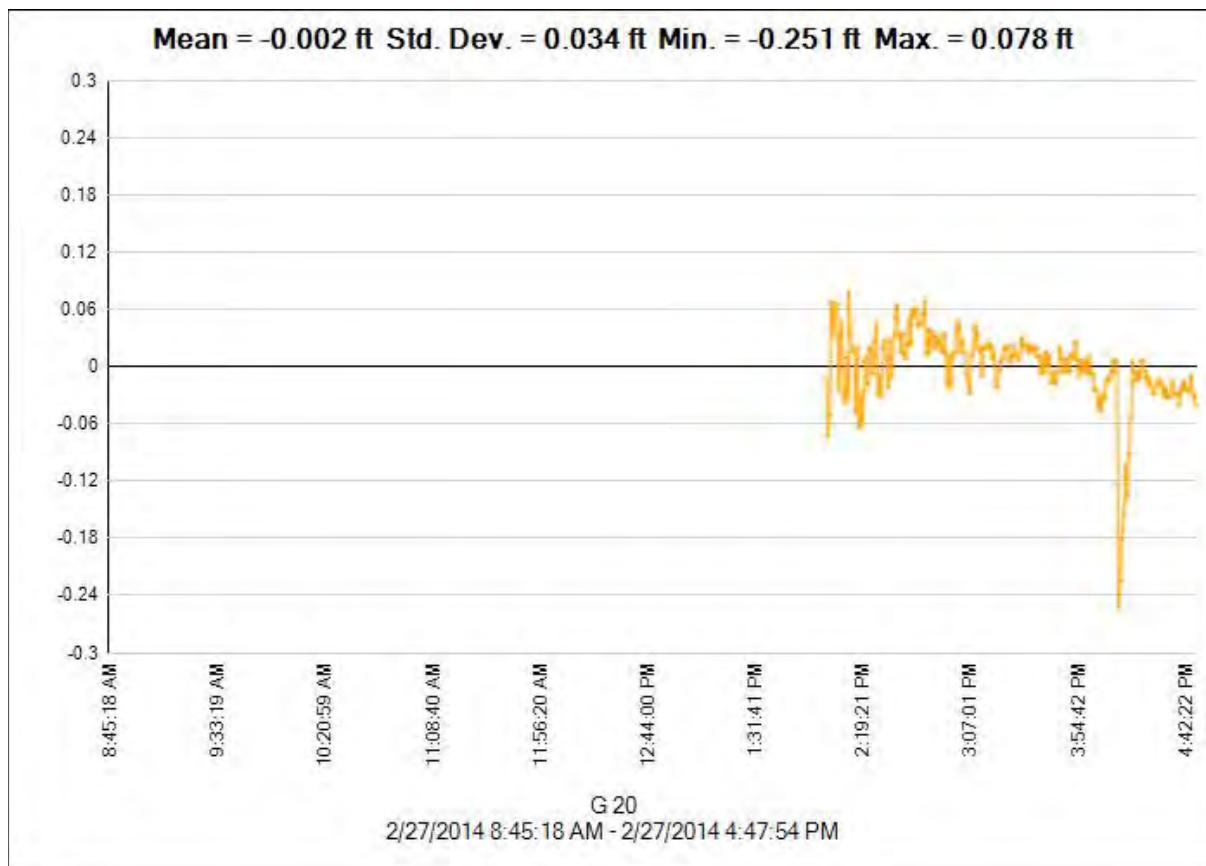


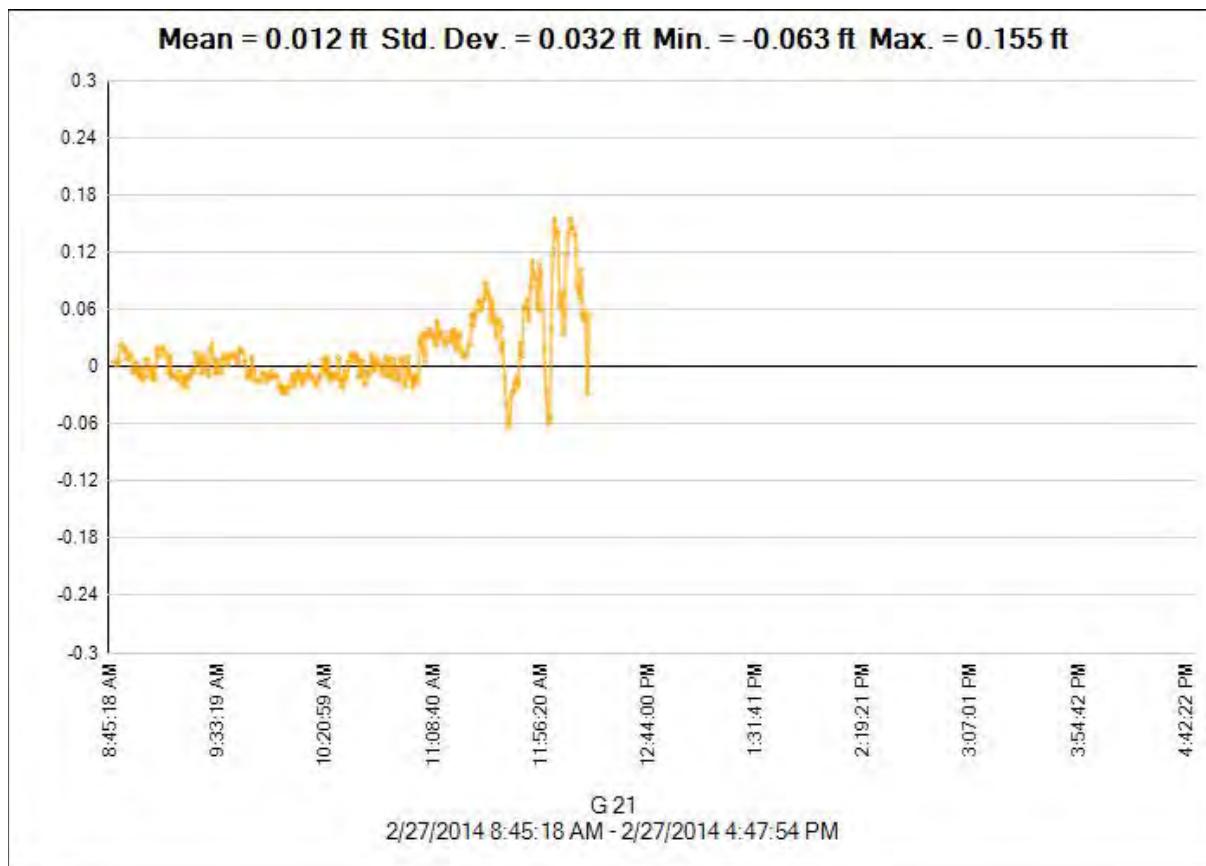


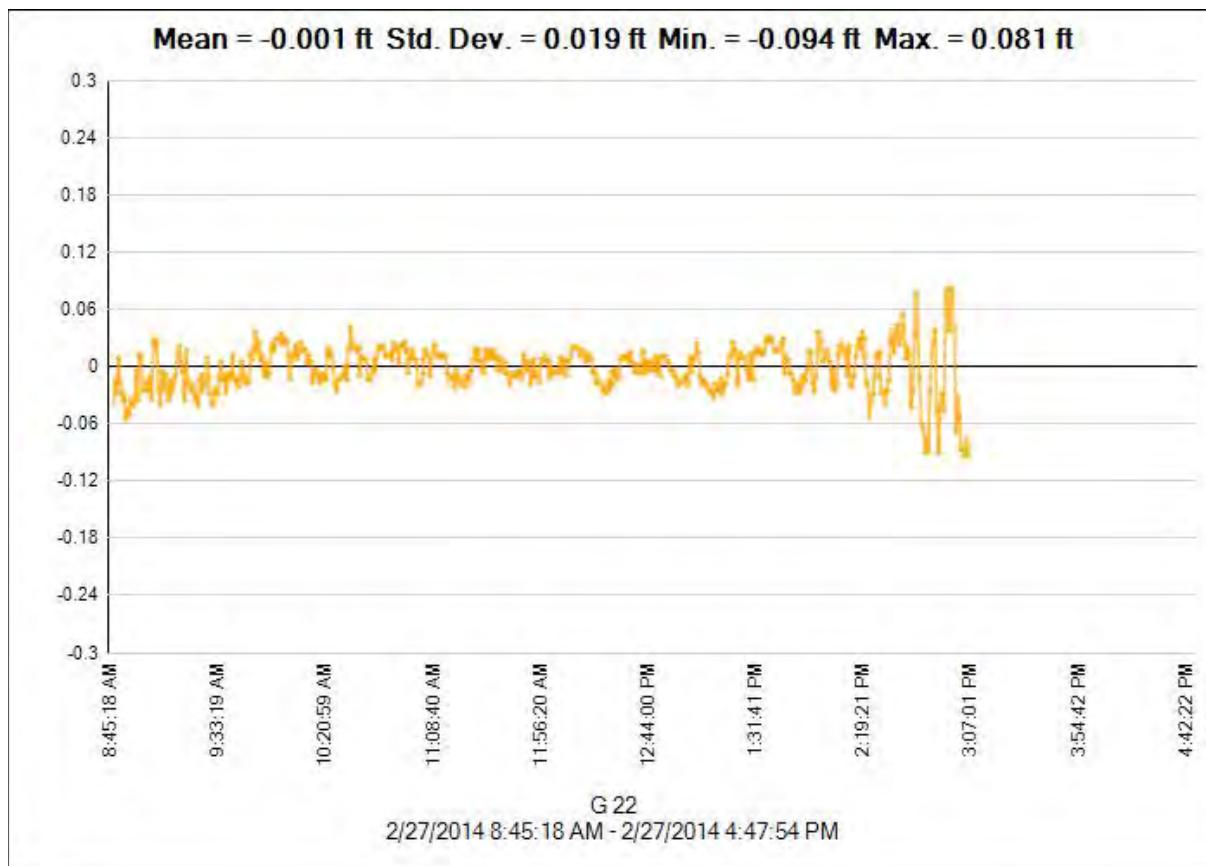


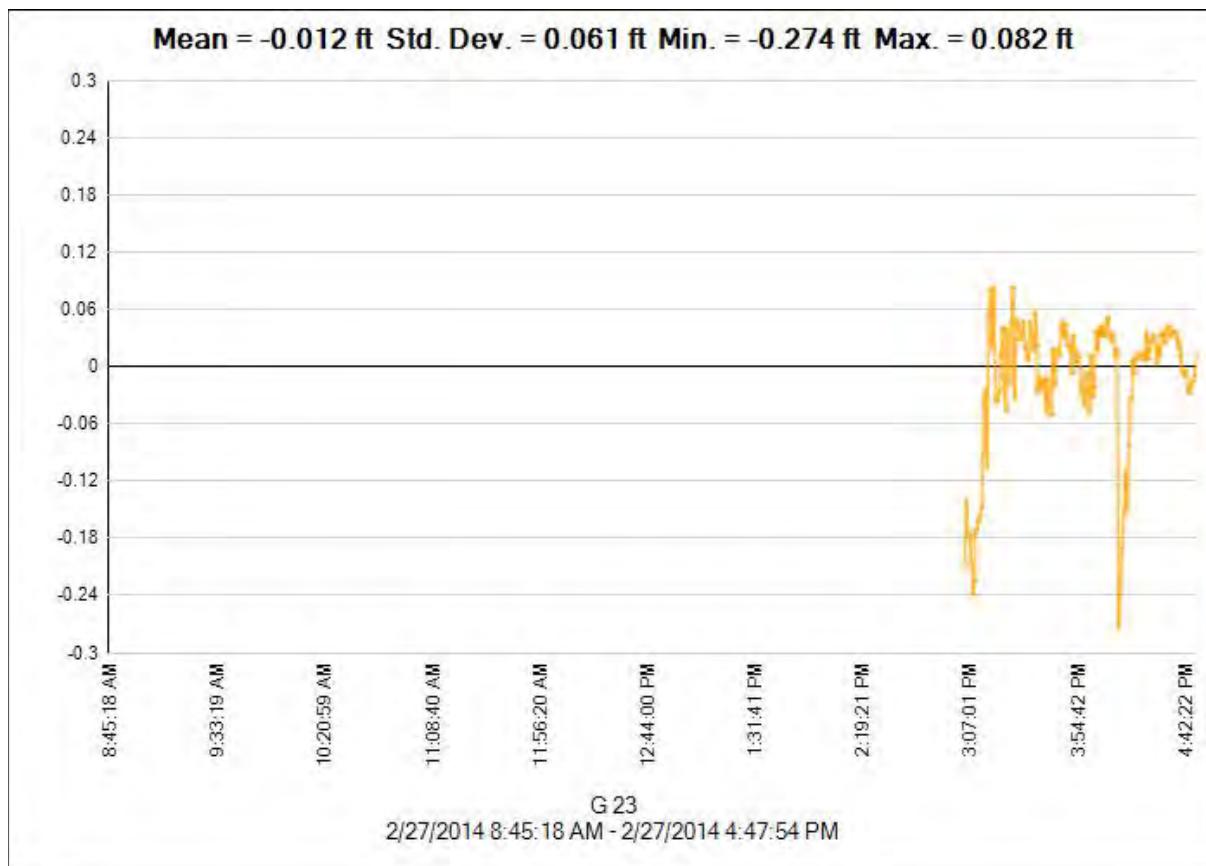


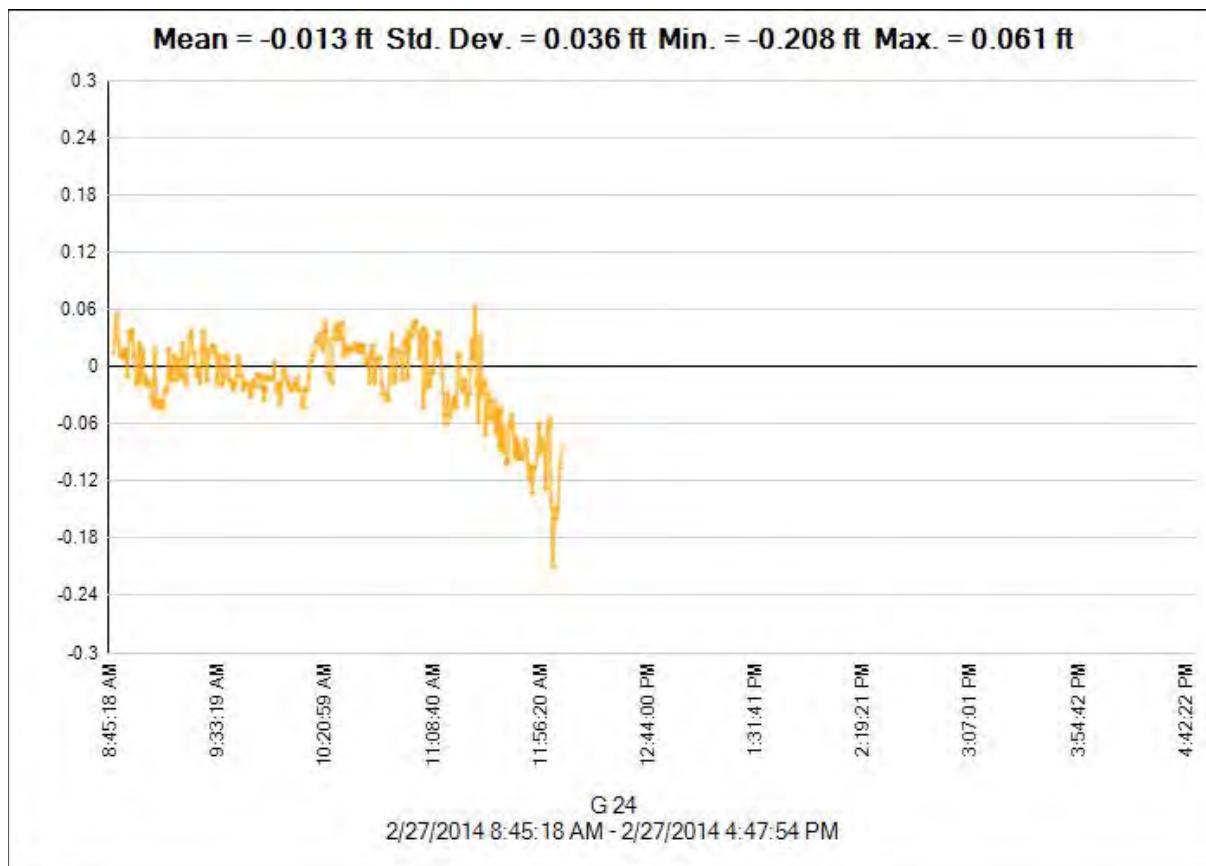


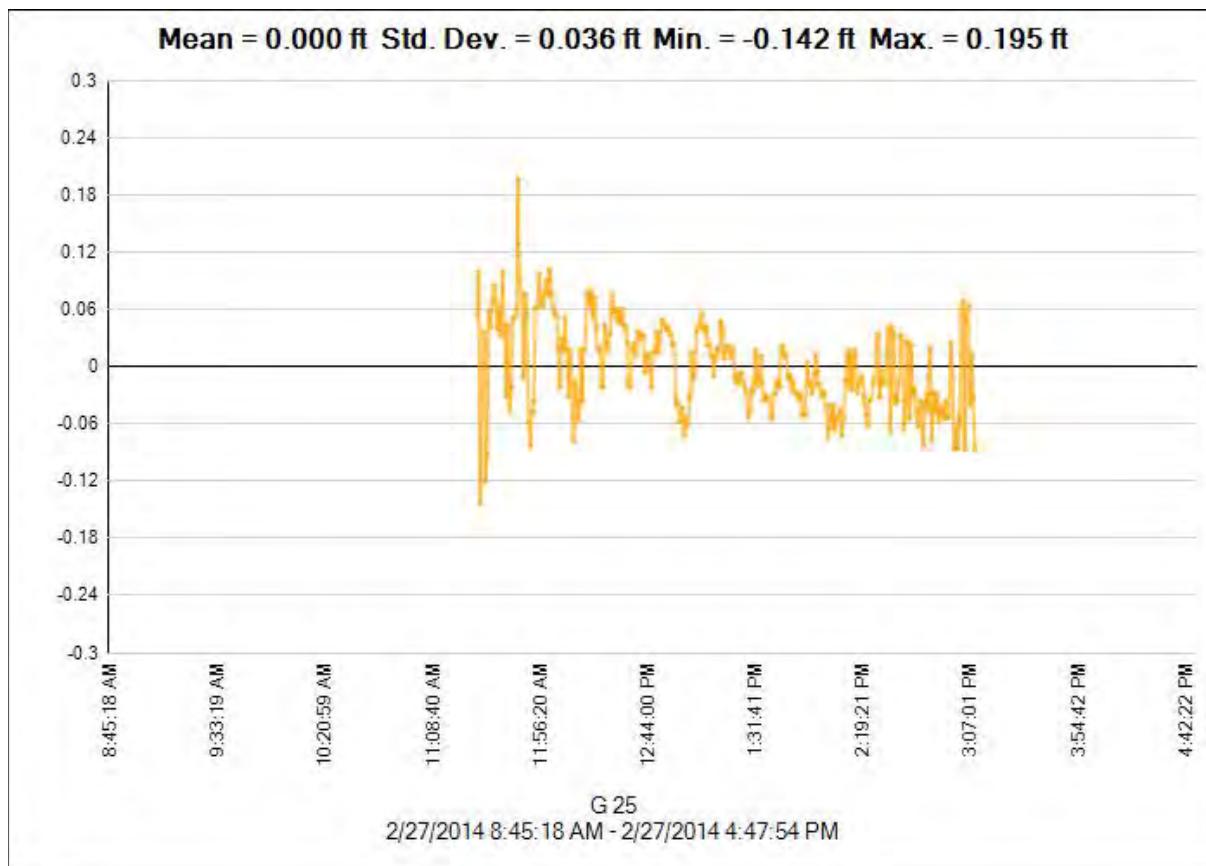


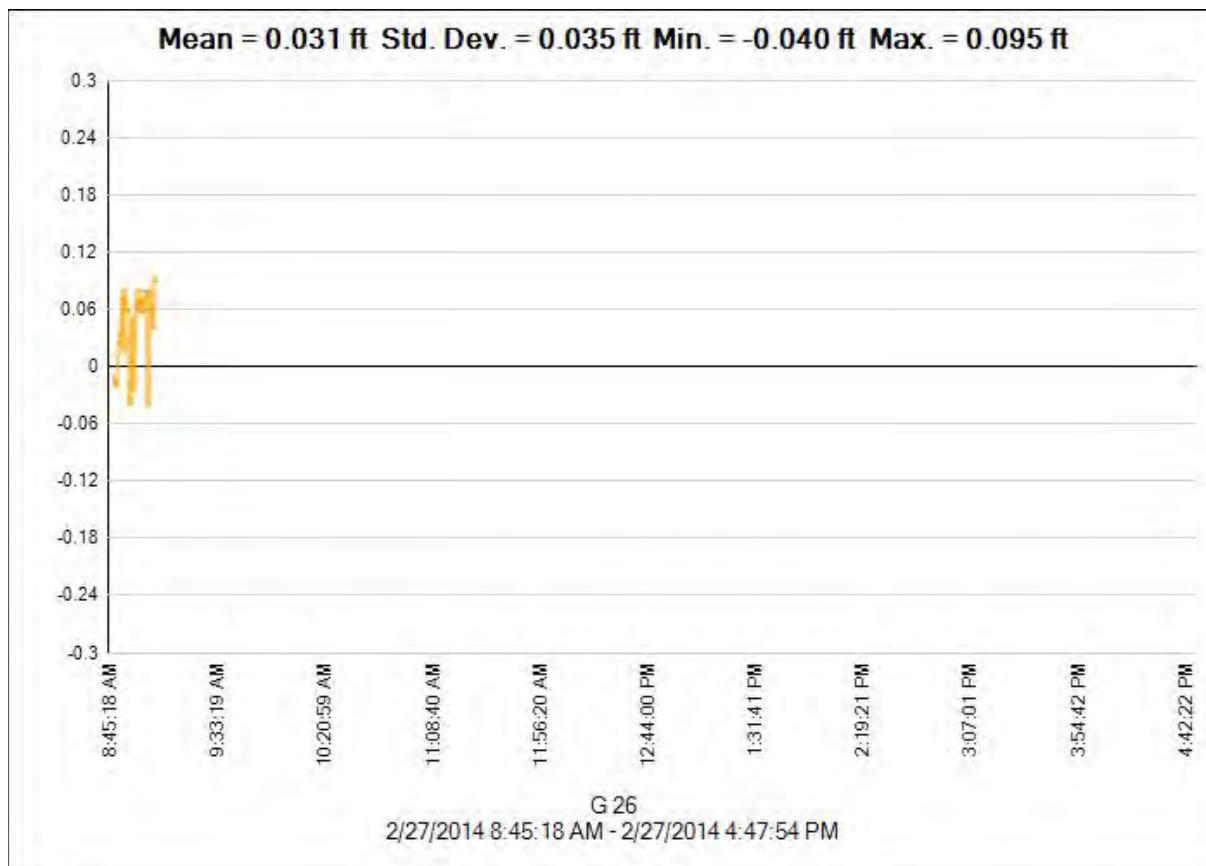


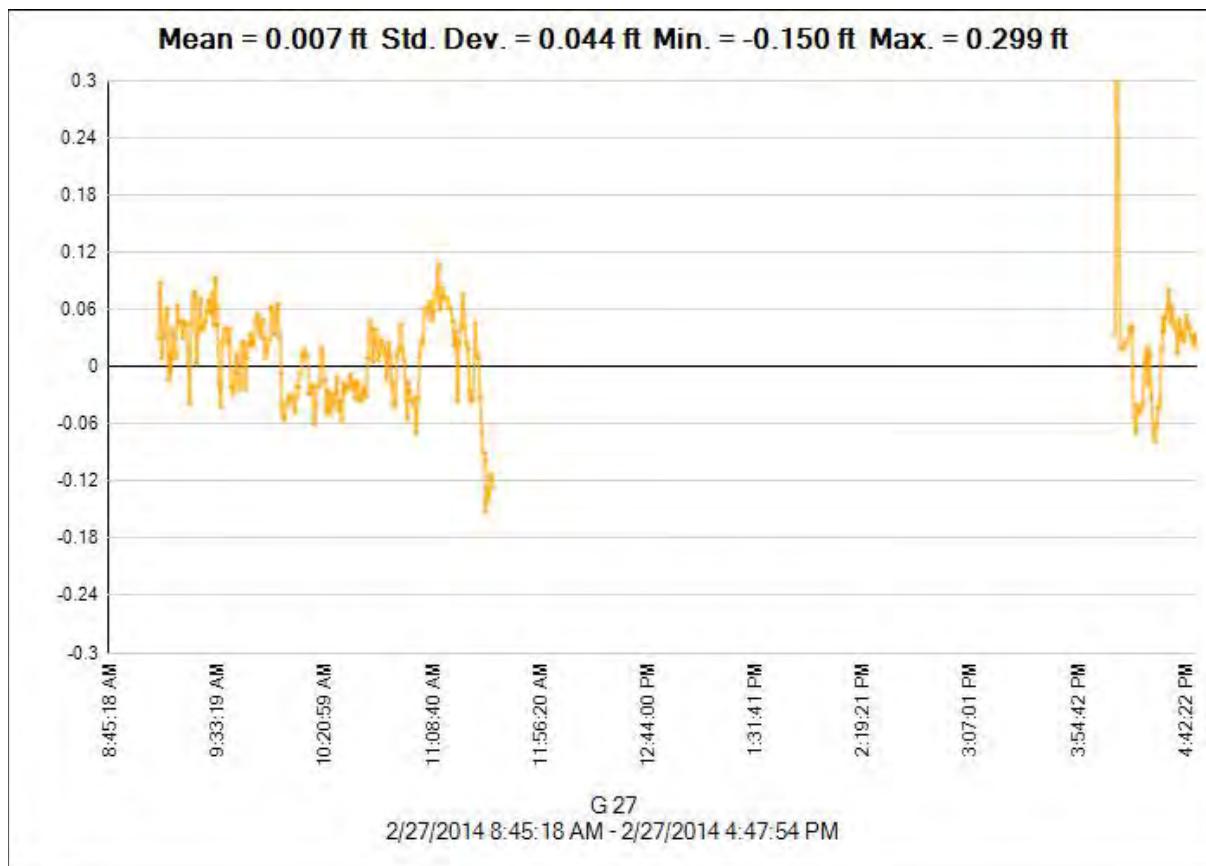


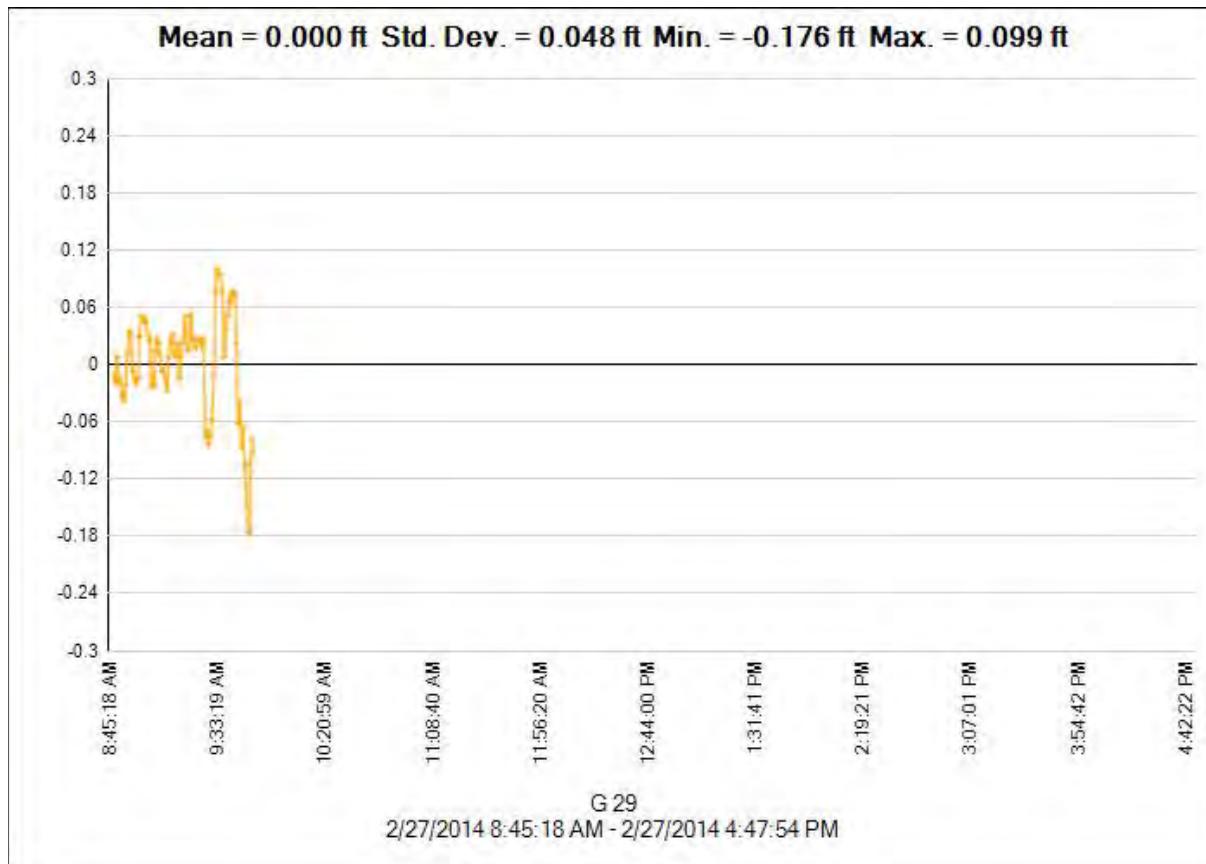


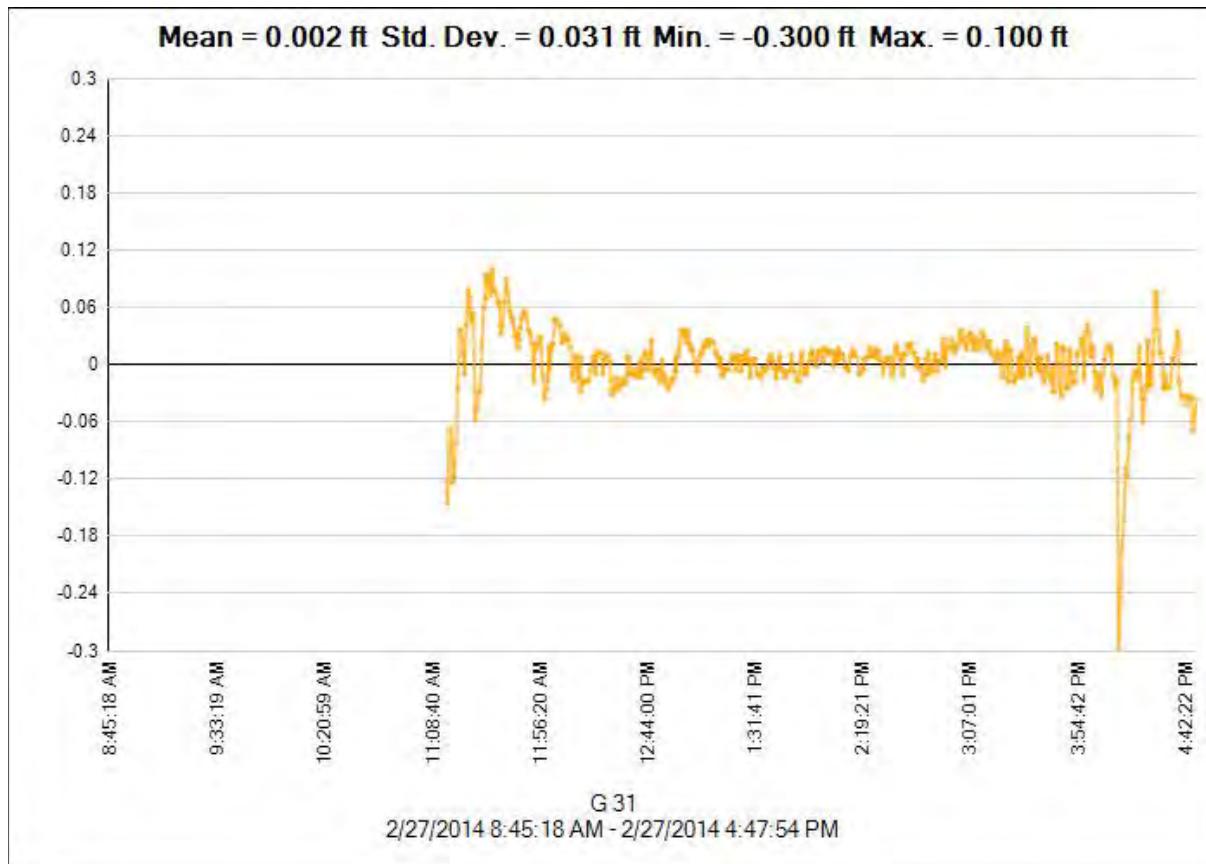


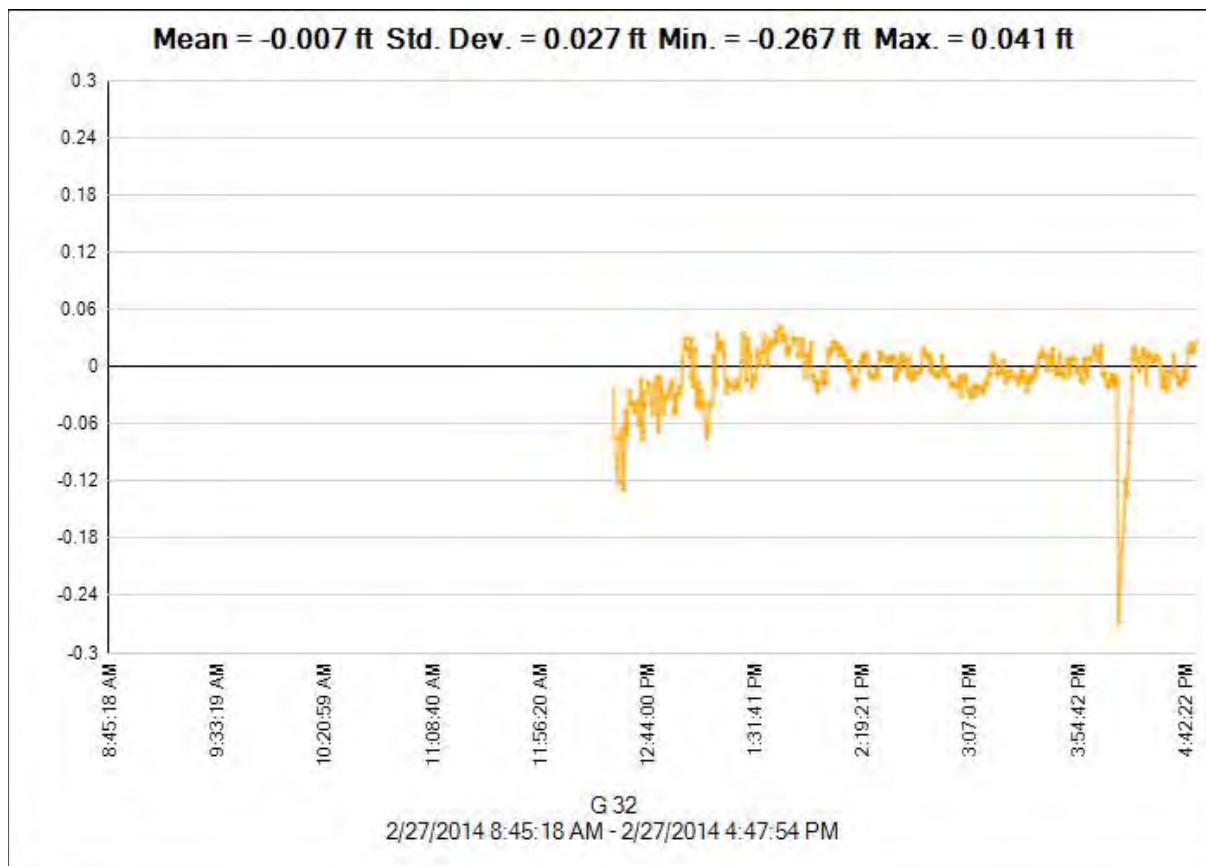














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





LMCN - 290307 (10:30:38 AM-11:58:24 AM) (S23)

Baseline observation: LMCN ---
290307
(B35)

Processed: 4/2/2014
10:00:25
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.018 ft

Vertical precision: 0.103 ft

RMS: 0.012 ft

Maximum PDOP: 2.895

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
10:31:59
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
11:58:14
AM
(Local:
UTC-6hr)

Processing duration: 01:26:15

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	LMCN
-------	------



Grid		Local		Global	
Northing	275191.093 ft	Latitude	N29°15'17.90427"	Latitude	N29°15'17.90427"
Easting	3495143.496 ft	Longitude	W90°39'40.65211"	Longitude	W90°39'40.65211"
Elevation	31.681 ft	Height	-48.369 ft	Height	-48.369 ft

To:	290307				
Grid		Local		Global	
Northing	202494.947 ft	Latitude	N29°03'20.68076"	Latitude	N29°03'20.68075"
Easting	3448248.063 ft	Longitude	W90°48'33.79872"	Longitude	W90°48'33.79872"
Elevation	7.702 ft	Height	-71.089 ft	Height	-71.089 ft

Vector					
ΔNorthing	-72696.146 ft	NS Fwd Azimuth	213°09'39"	ΔX	-47721.173 ft
ΔEasting	-46895.433 ft	Ellipsoid Dist.	86506.639 ft	ΔY	-34665.578 ft
ΔElevation	-23.979 ft	ΔHeight	-22.720 ft	ΔZ	-63279.799 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.007 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.007 ft
σ ΔEasting	0.007 ft	σ Ellipsoid Dist.	0.006 ft	σ ΔY	0.047 ft
σ ΔElevation	0.053 ft	σ ΔHeight	0.053 ft	σ ΔZ	0.024 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000040898		
Y	-0.0000064034	0.0002084275	
Z	0.0000027942	-0.0001010547	0.0000538088

Occupations

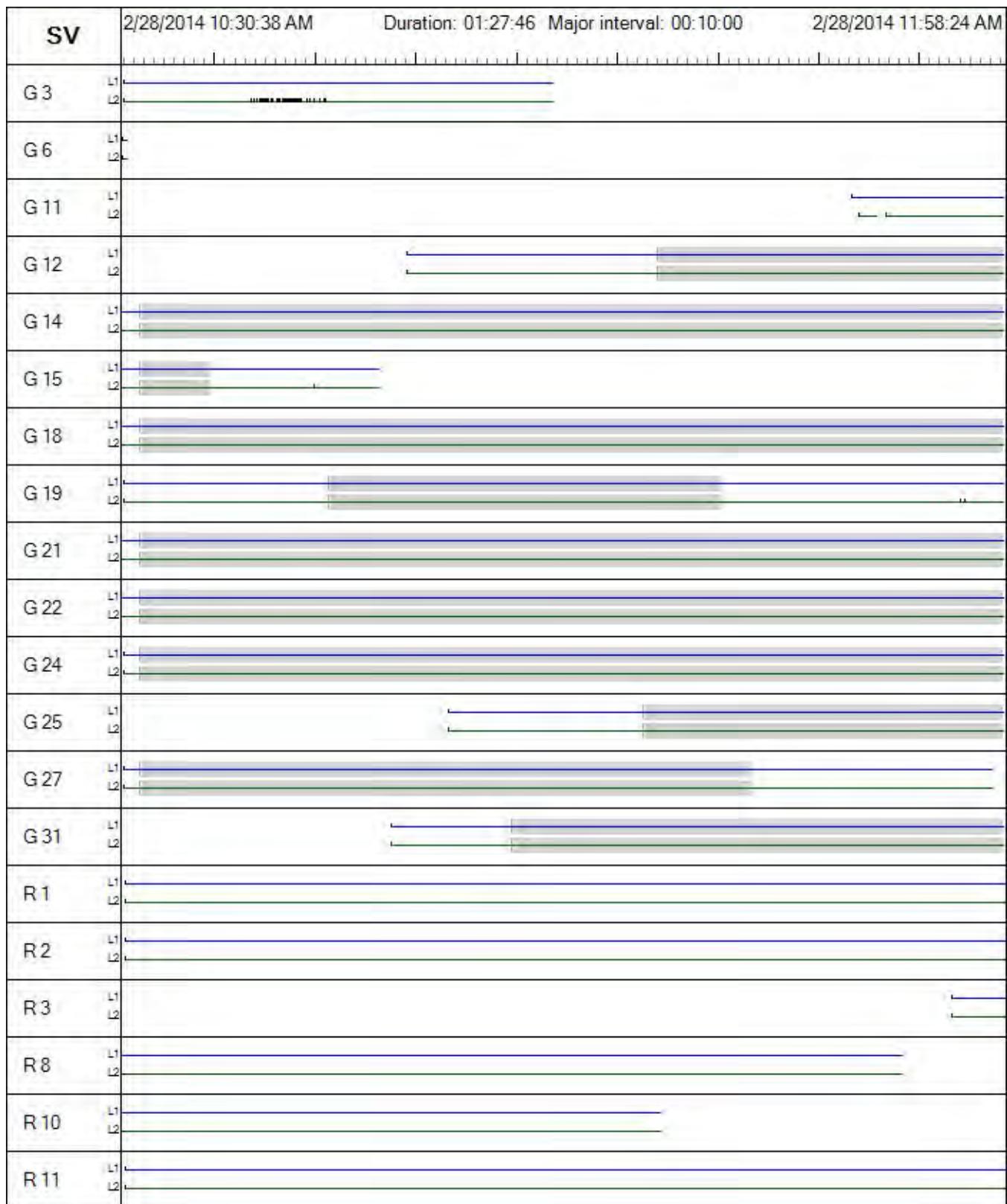
	From	To
Point ID:	LMCN	290307



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\lmcn0580_0.140	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\290307059A0.140
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	4508245724	
Antenna type:	Zephyr Geodetic	X91R
Antenna serial number:	60104388	-----
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Bottom of antenna mount	Antenna Phase Center



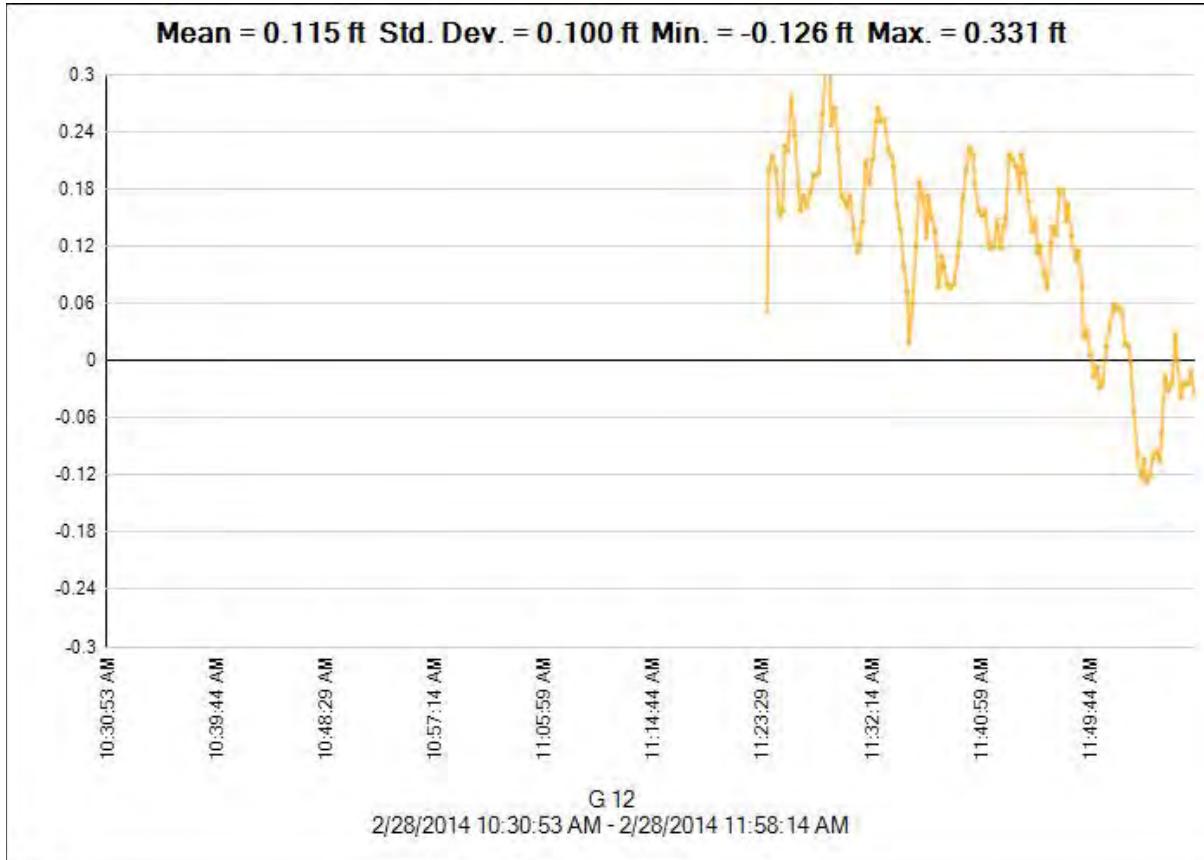
Tracking Summary

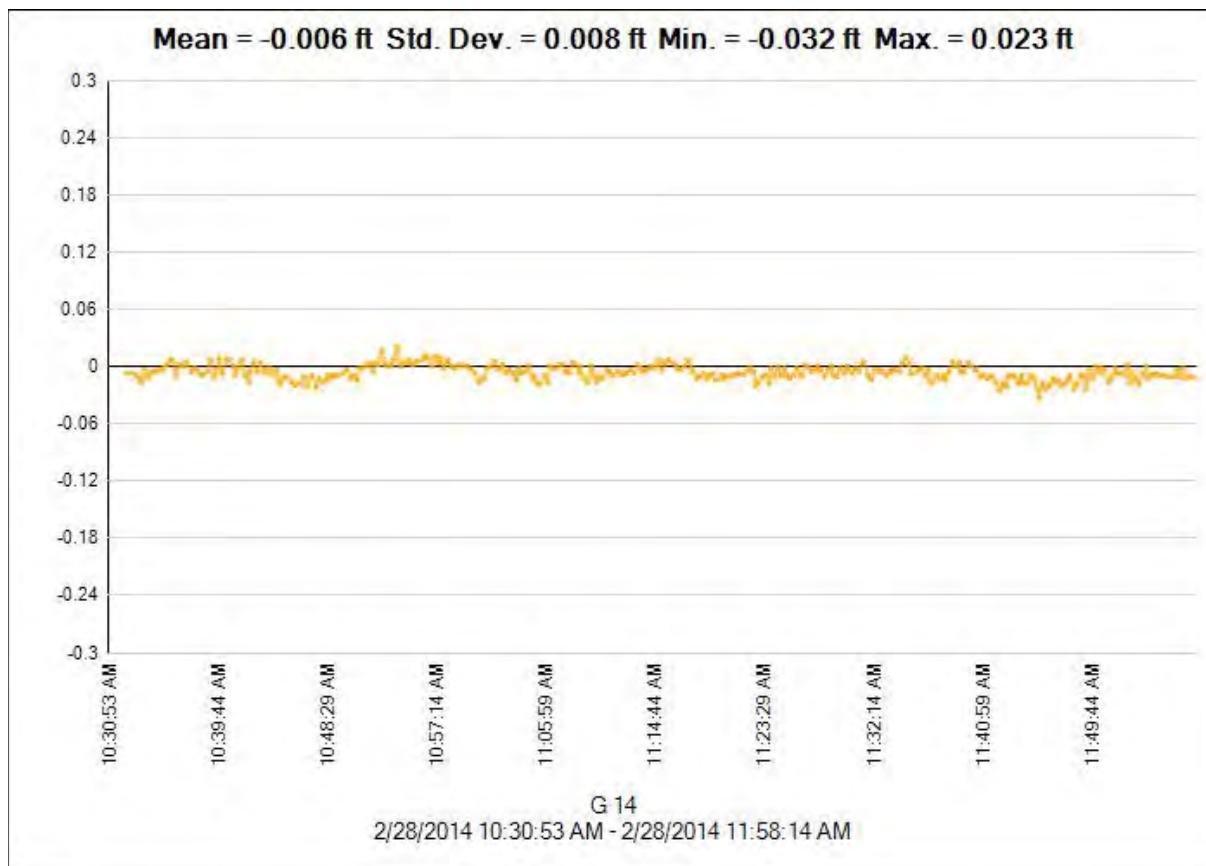


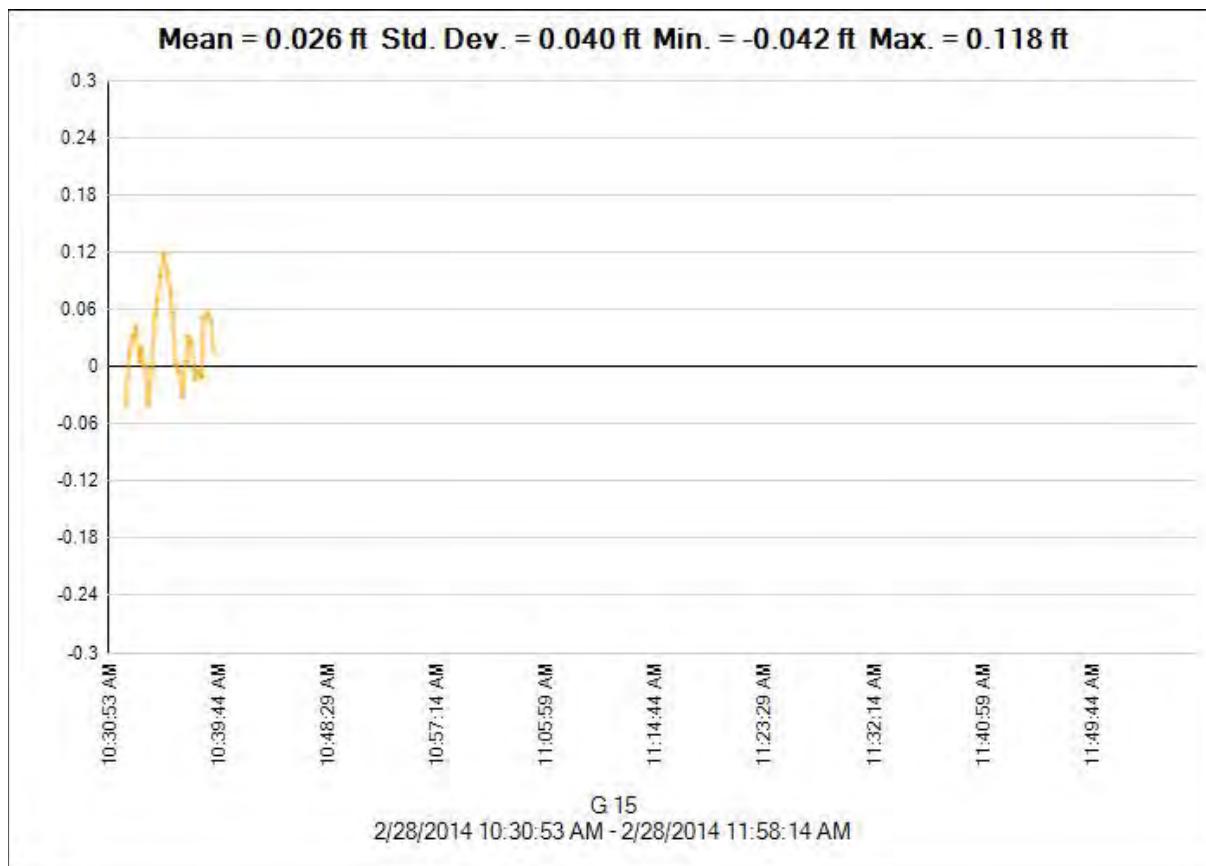


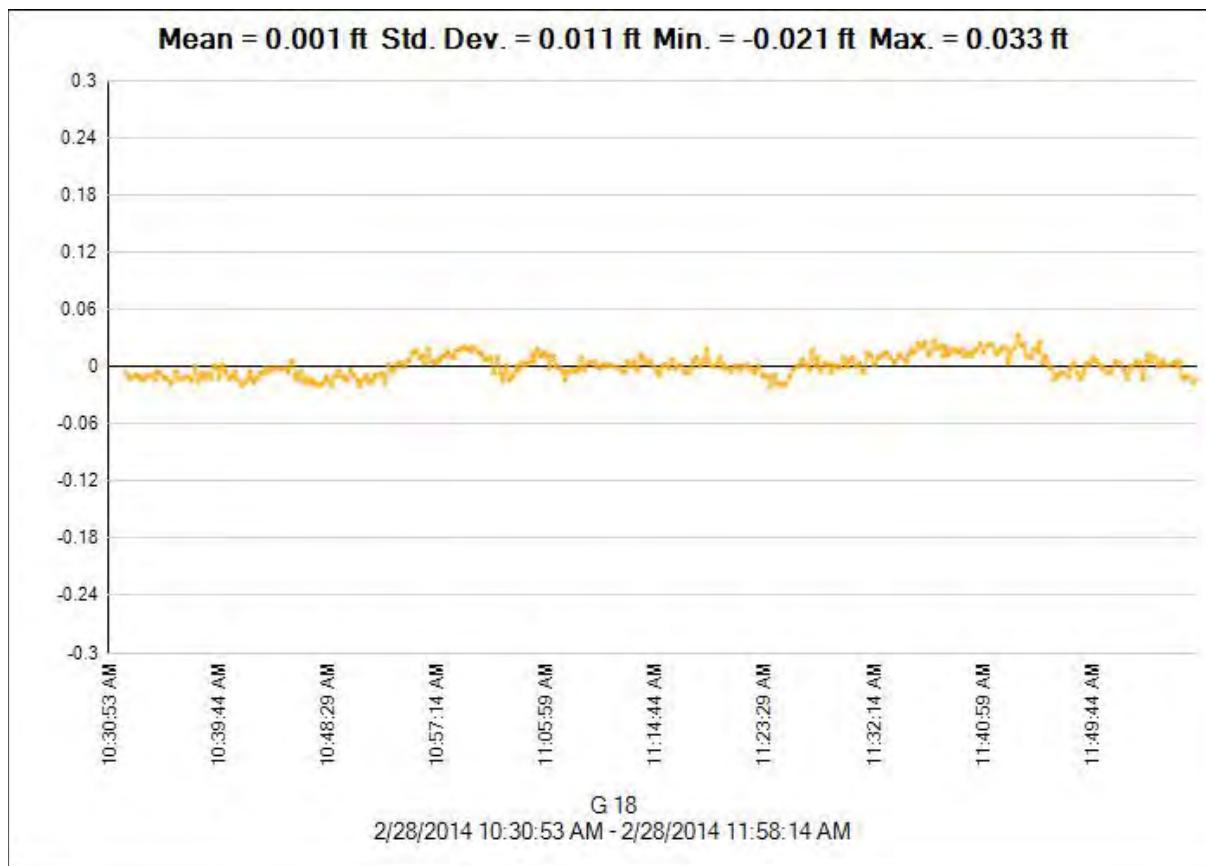


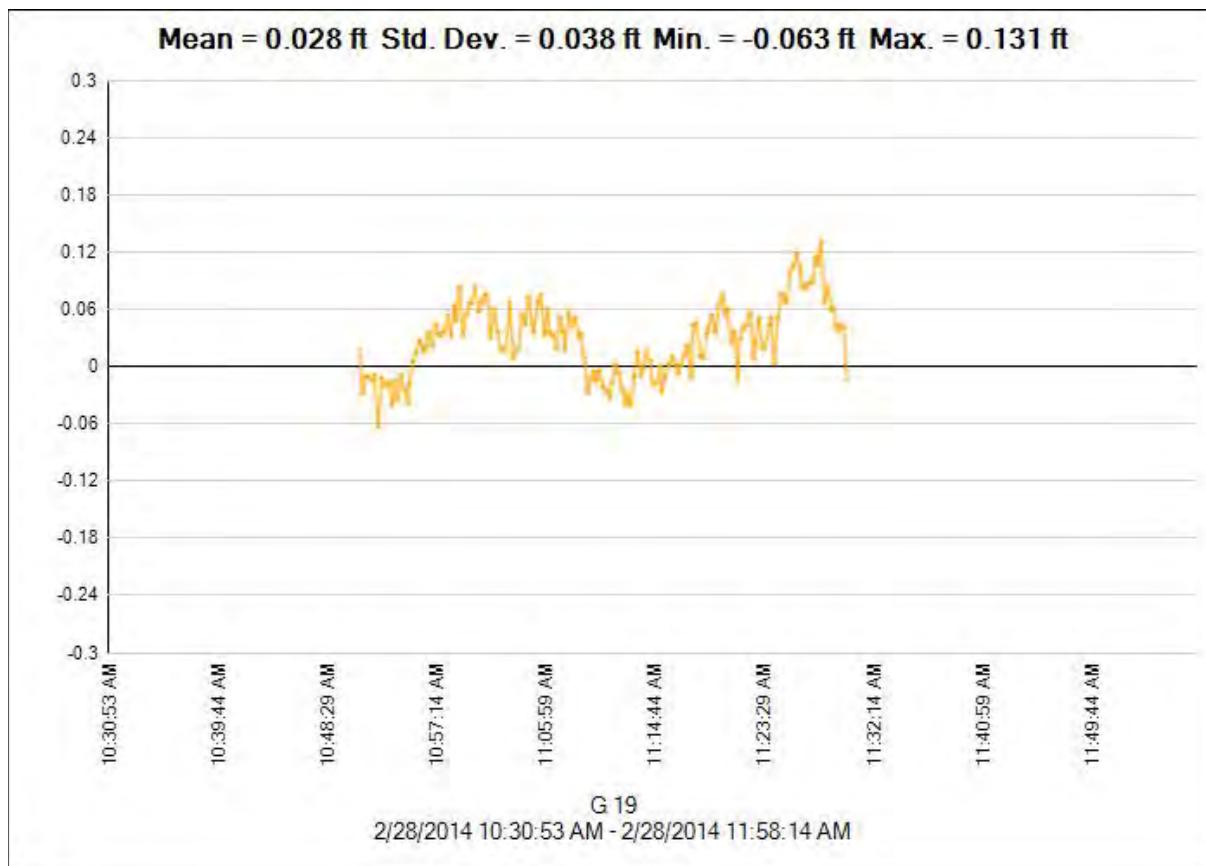
Residuals

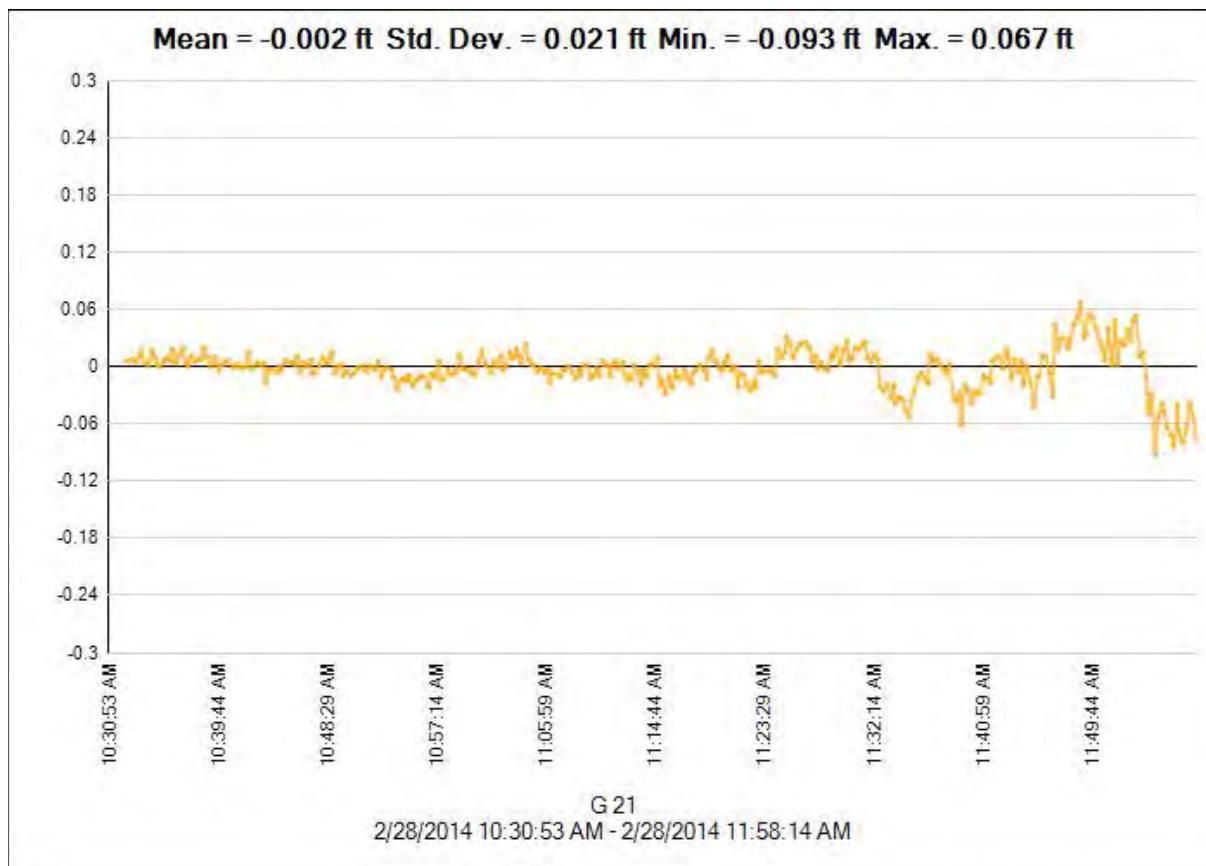


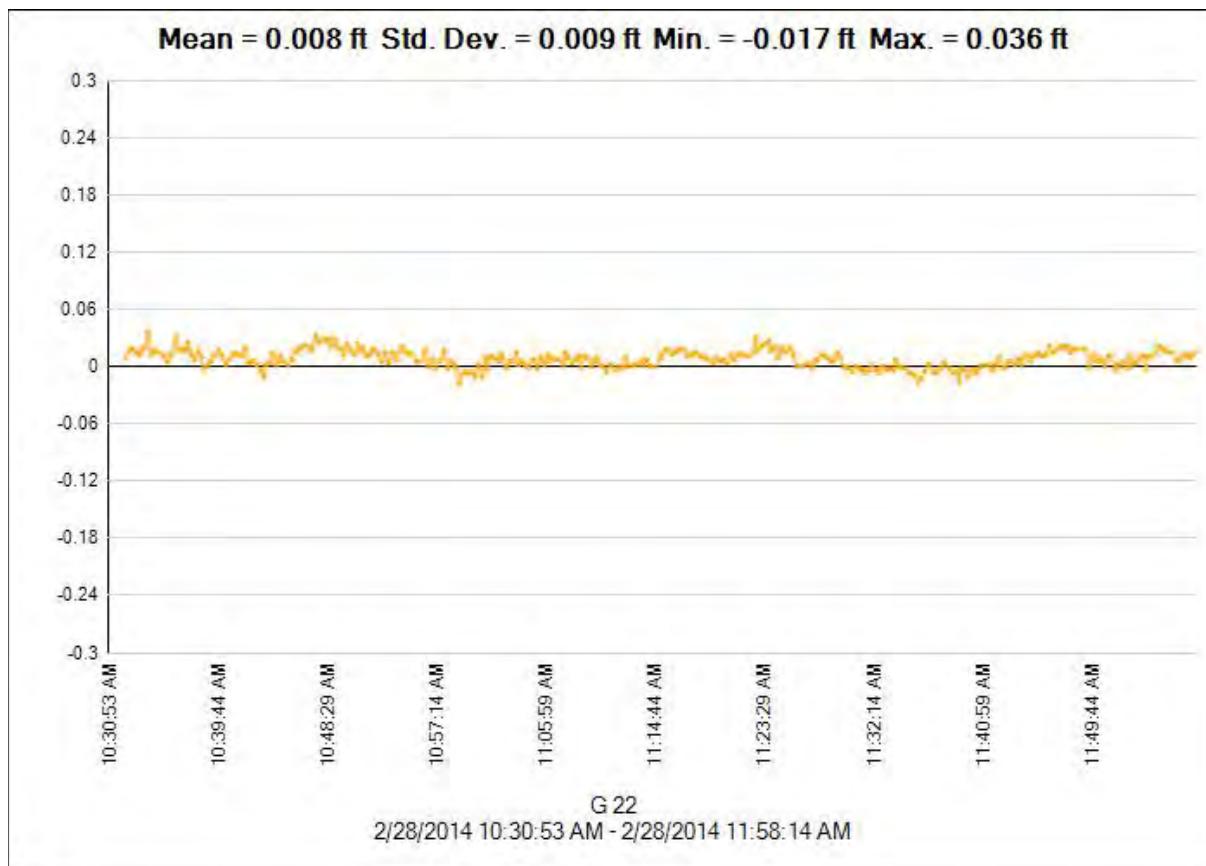


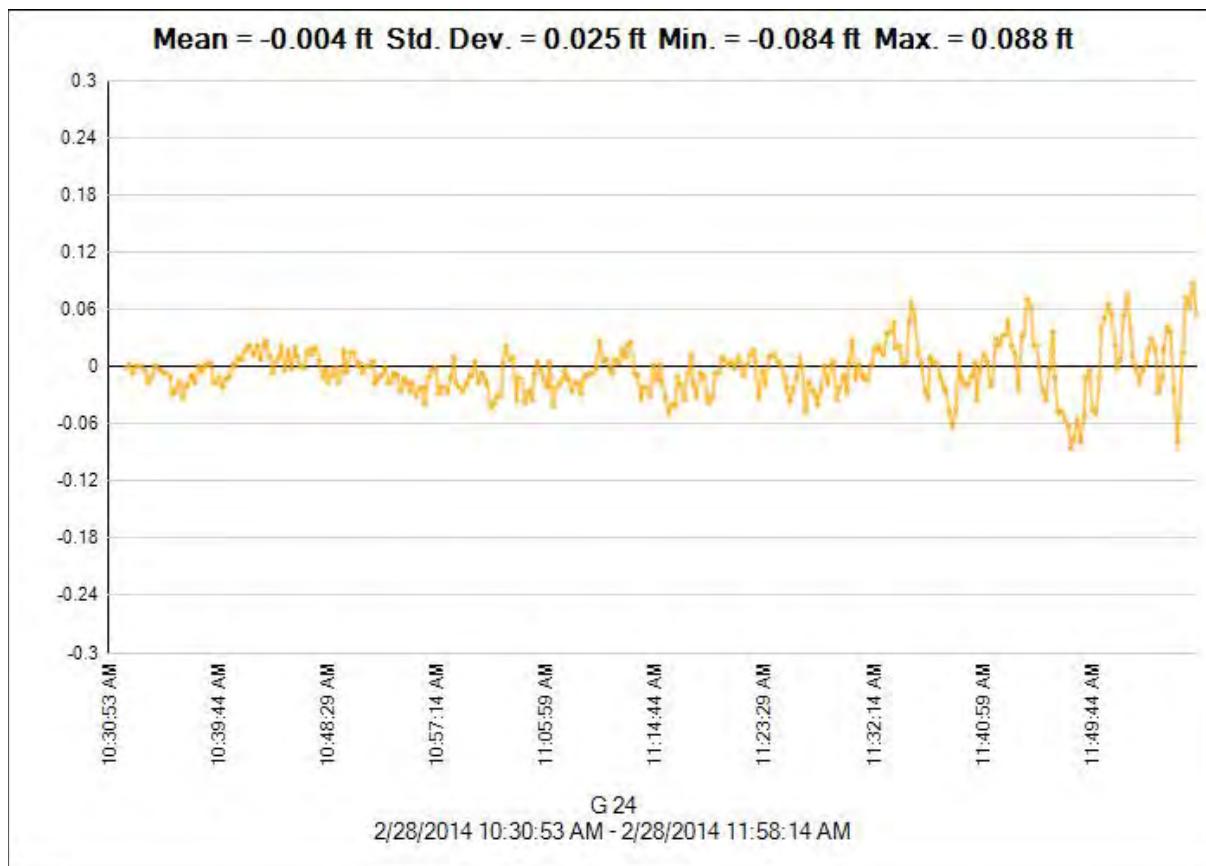


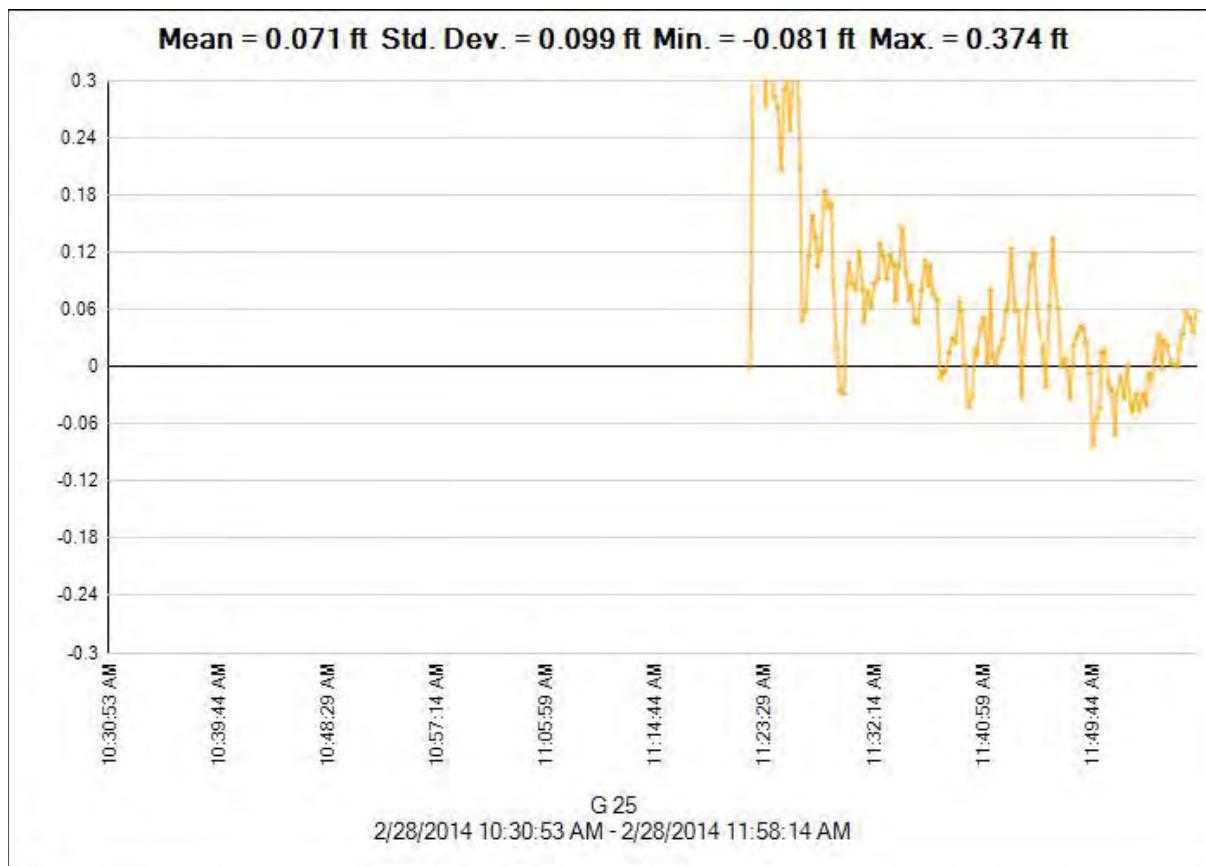


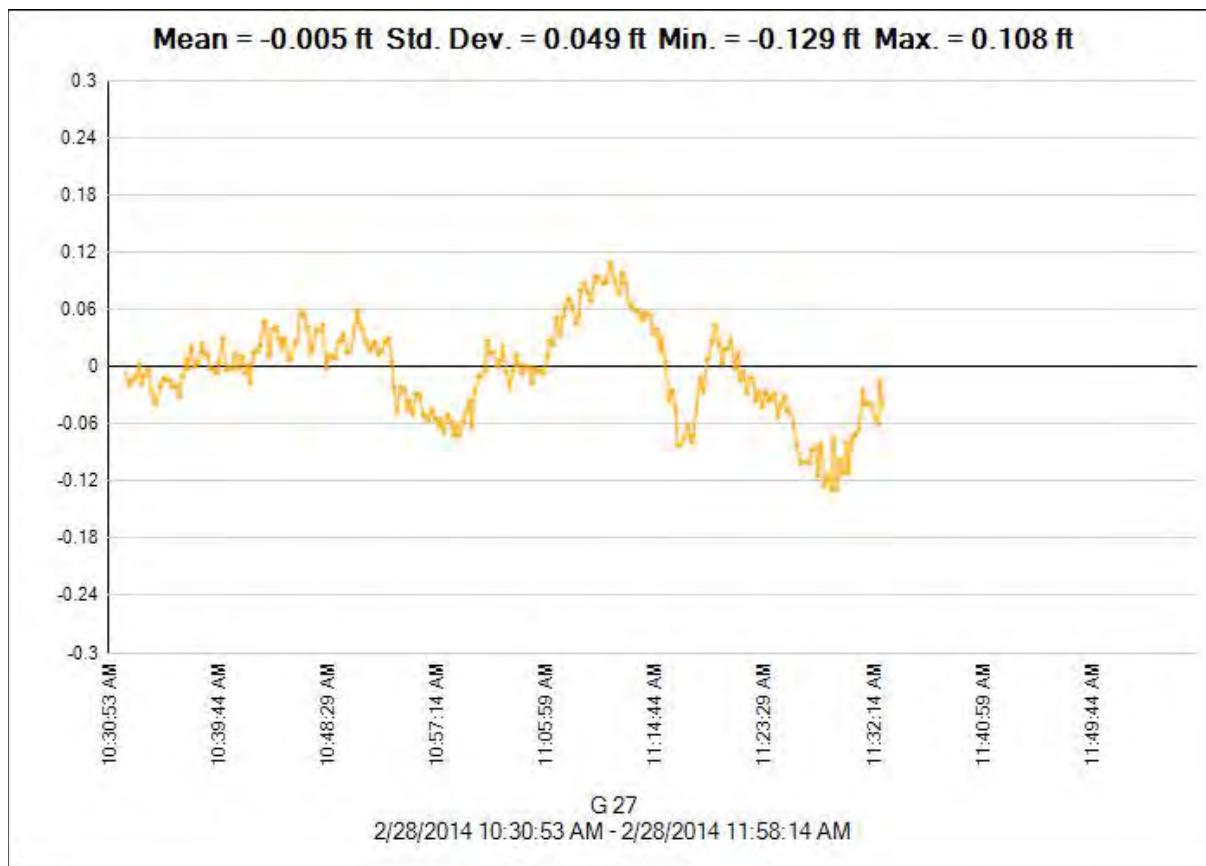


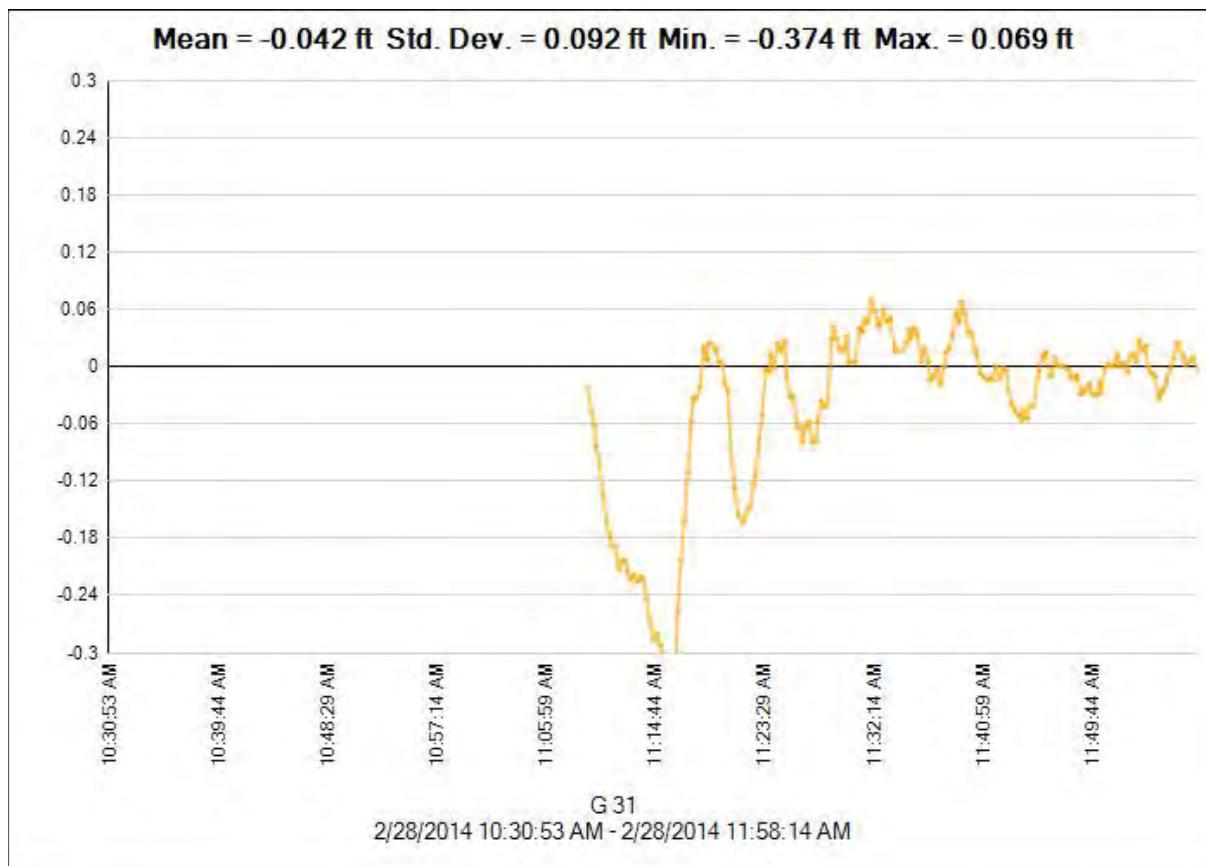














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





GRIS - 290307 (10:30:38 AM-11:58:24 AM) (S24)

Baseline observation: GRIS ---
290307
(B36)

Processed: 4/2/2014
10:00:35
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.042 ft

Vertical precision: 0.153 ft

RMS: 0.073 ft

Maximum PDOP: 2.361

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
10:31:29
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
11:58:14
AM
(Local:
UTC-6hr)

Processing duration: 01:26:45

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	GRIS
-------	------



Grid		Local		Global	
Northing	281033.474 ft	Latitude	N29°15'55.88300"	Latitude	N29°15'55.88300"
Easting	3719590.183 ft	Longitude	W89°57'26.26226"	Longitude	W89°57'26.26226"
Elevation	27.375 ft	Height	-51.286 ft	Height	-51.286 ft

To:	290307				
Grid		Local		Global	
Northing	202494.933 ft	Latitude	N29°03'20.68062"	Latitude	N29°03'20.68061"
Easting	3448248.084 ft	Longitude	W90°48'33.79848"	Longitude	W90°48'33.79848"
Elevation	7.649 ft	Height	-71.142 ft	Height	-71.143 ft

Vector					
ΔNorthing	-78538.542 ft	NS Fwd Azimuth	254°32'24"	ΔX	-272214.415 ft
ΔEasting	-271342.099 ft	Ellipsoid Dist.	282470.519 ft	ΔY	-35331.324 ft
ΔElevation	-19.726 ft	ΔHeight	-19.856 ft	ΔZ	-66625.274 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.014 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.017 ft
σ ΔEasting	0.017 ft	σ Ellipsoid Dist.	0.017 ft	σ ΔY	0.070 ft
σ ΔElevation	0.078 ft	σ ΔHeight	0.078 ft	σ ΔZ	0.037 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000275145		
Y	-0.0000320535	0.0004581836	
Z	0.0000168320	-0.0002196975	0.0001263481

Occupations

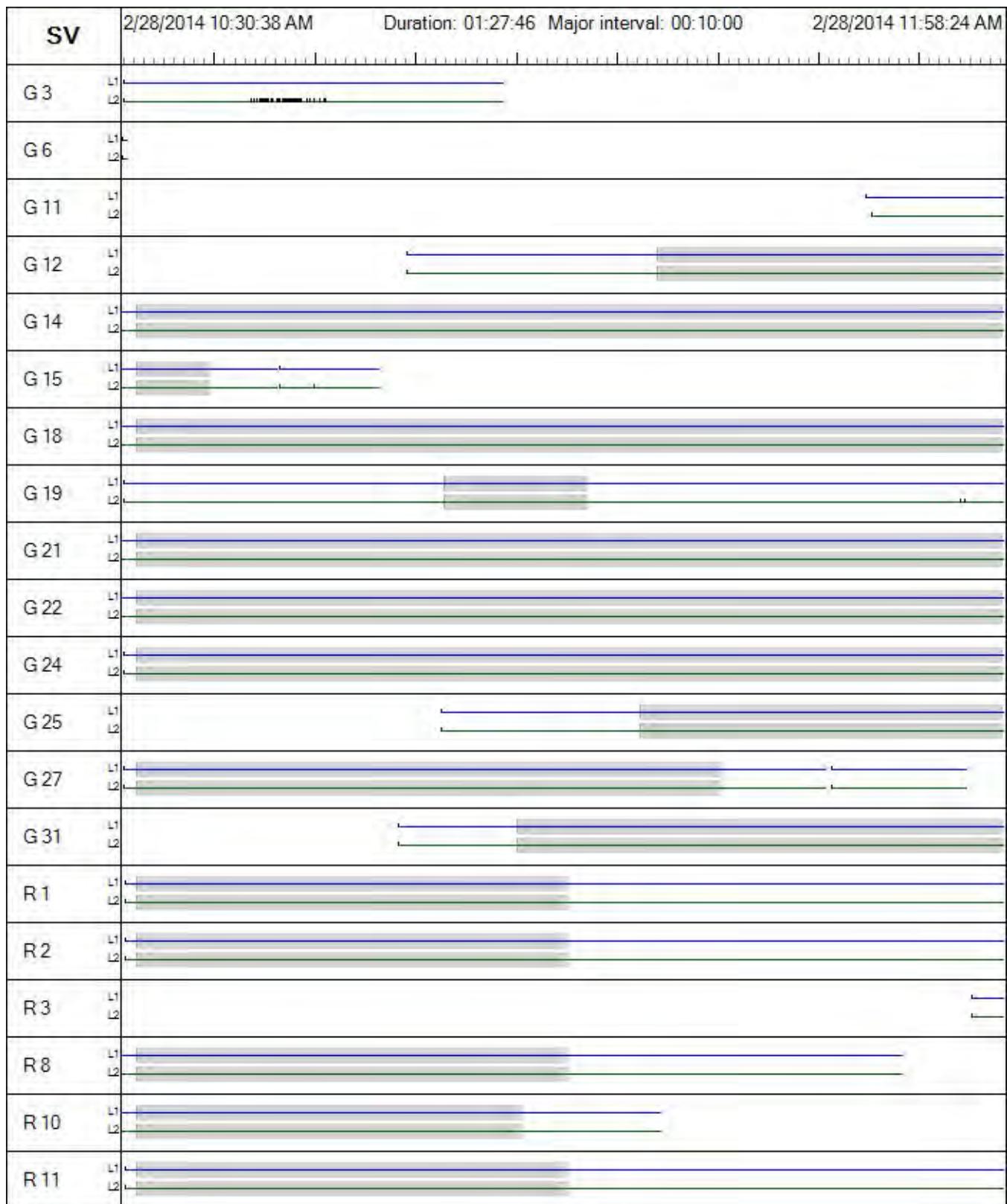
	From	To
Point ID:	GRIS	290307



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\290307059A0.14O
Receiver type:	NetR9	R7 GNSS
Receiver serial number:	5201K41142	
Antenna type:	Zephyr Geodetic 2 RoHS	X91R
Antenna serial number:	5000117437	-----
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Bottom of antenna mount	Antenna Phase Center



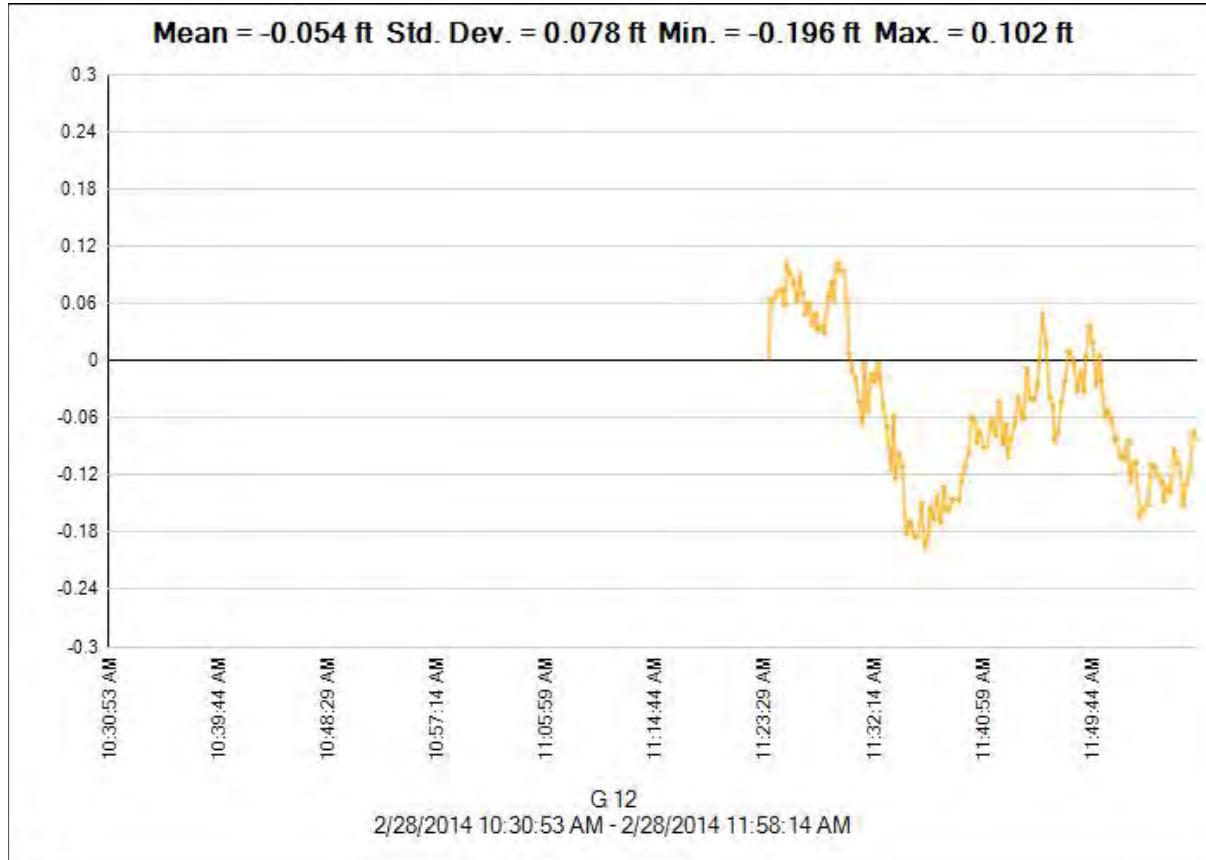
Tracking Summary

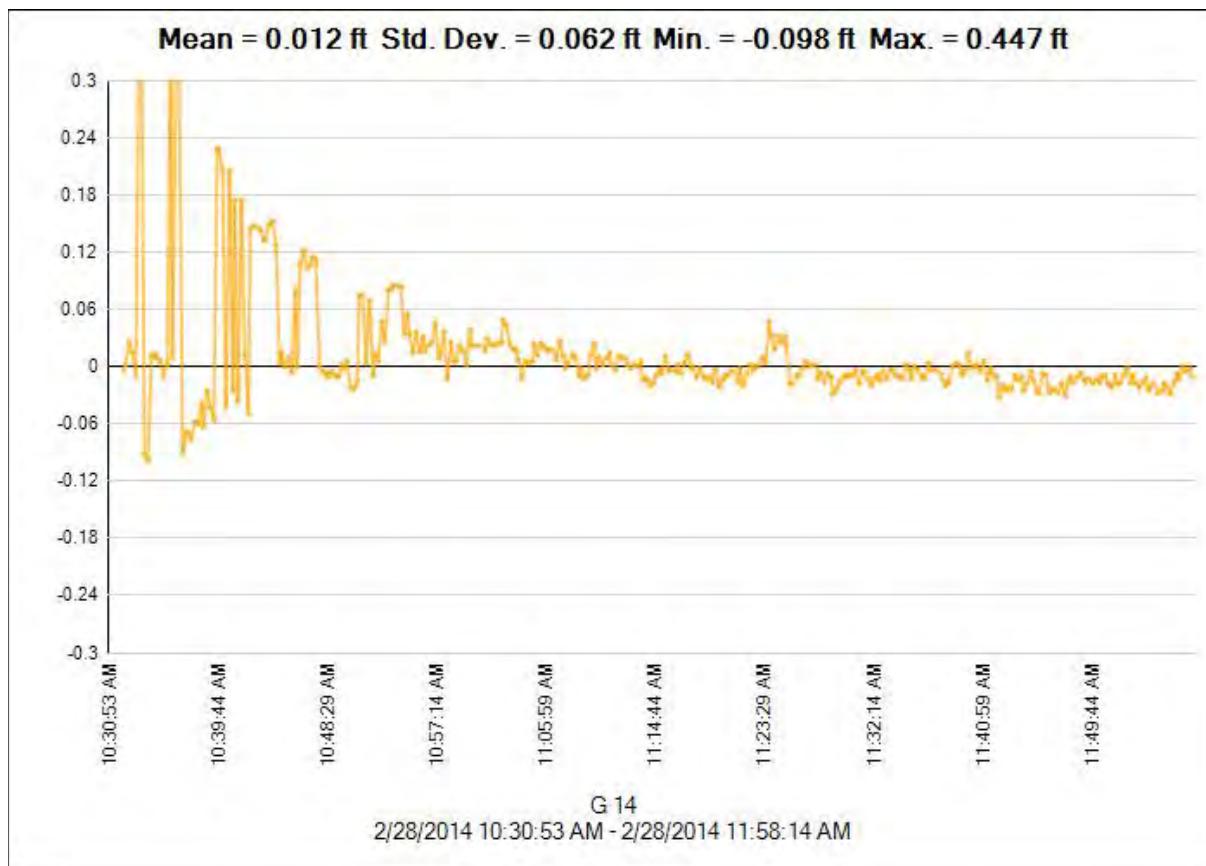


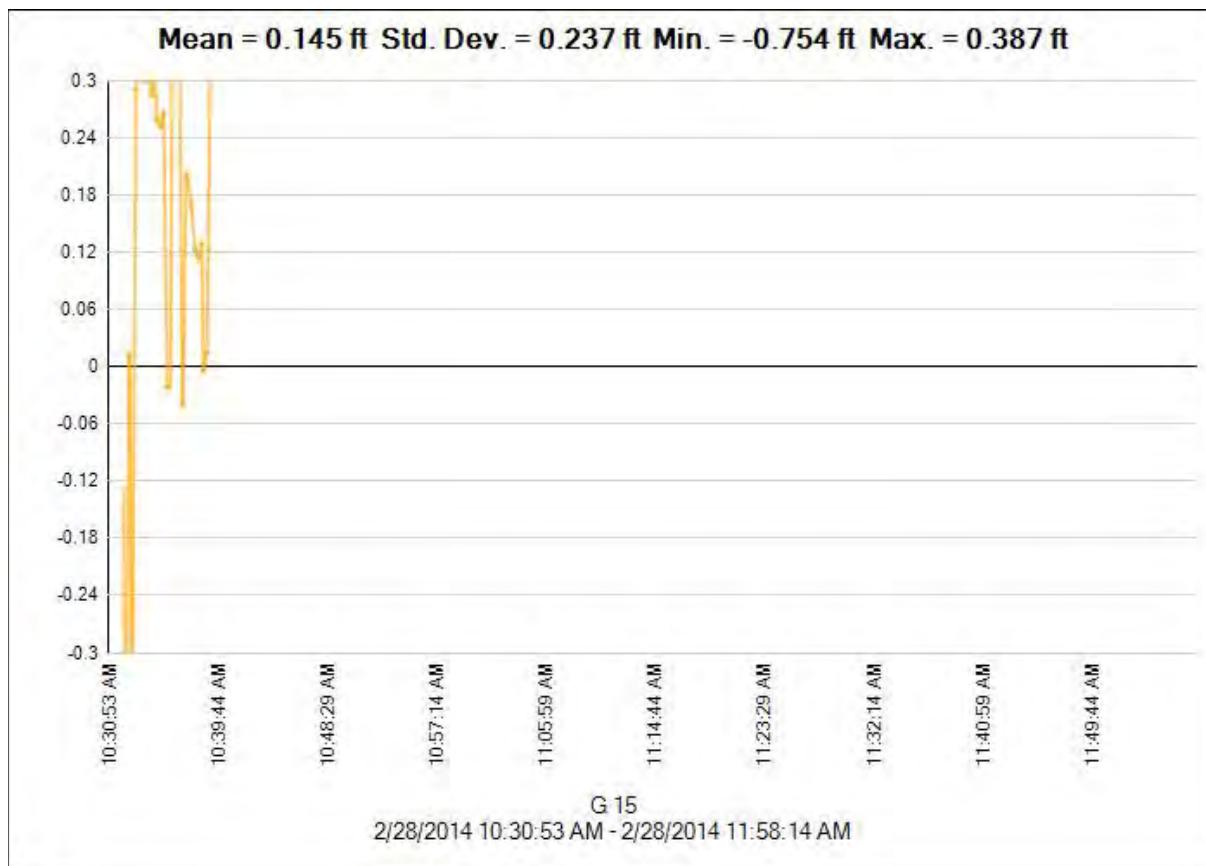


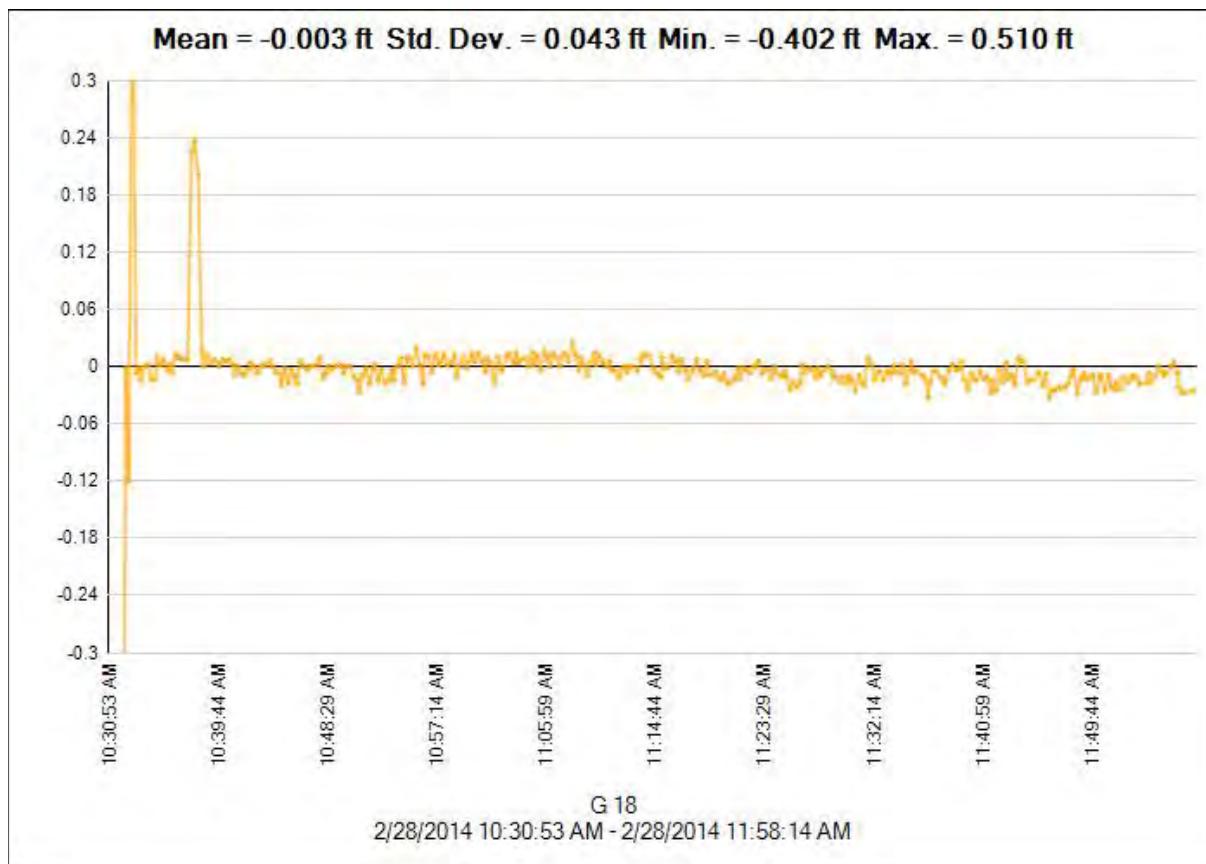


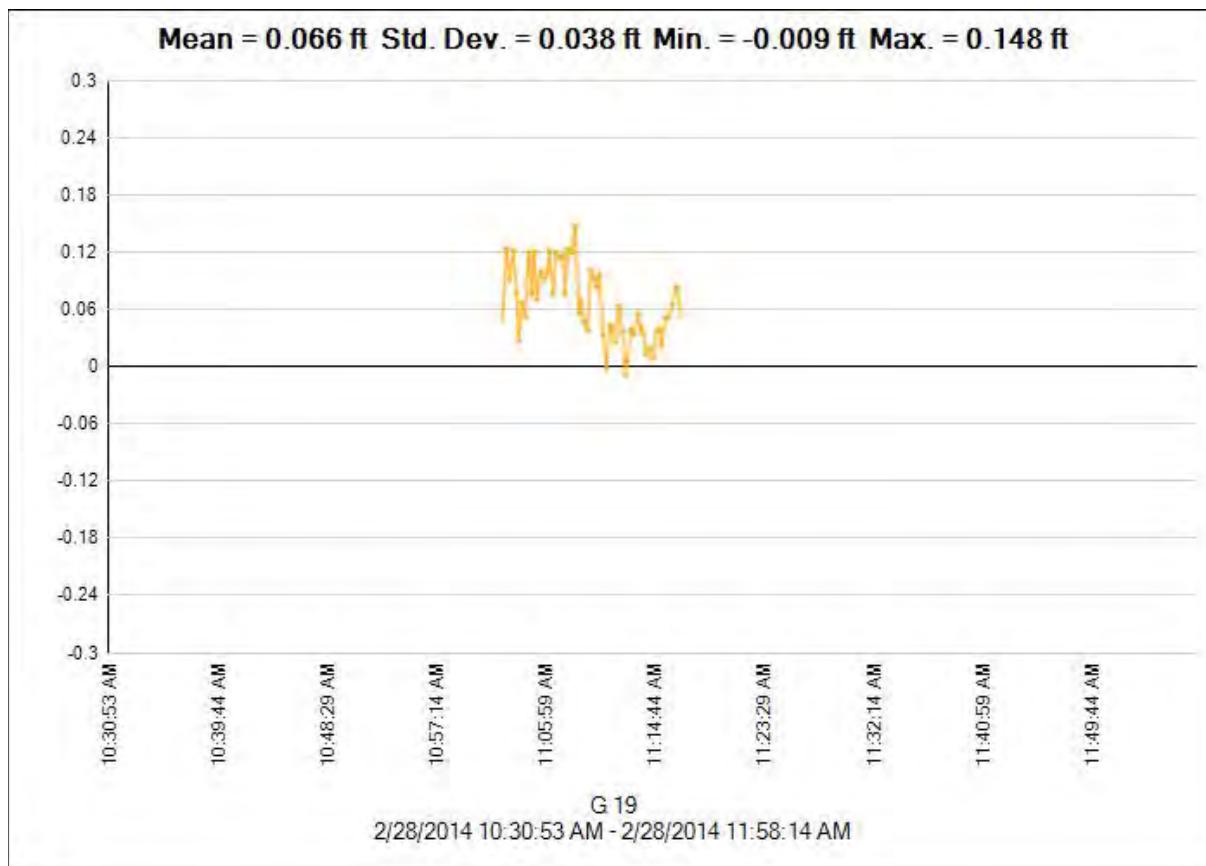
Residuals

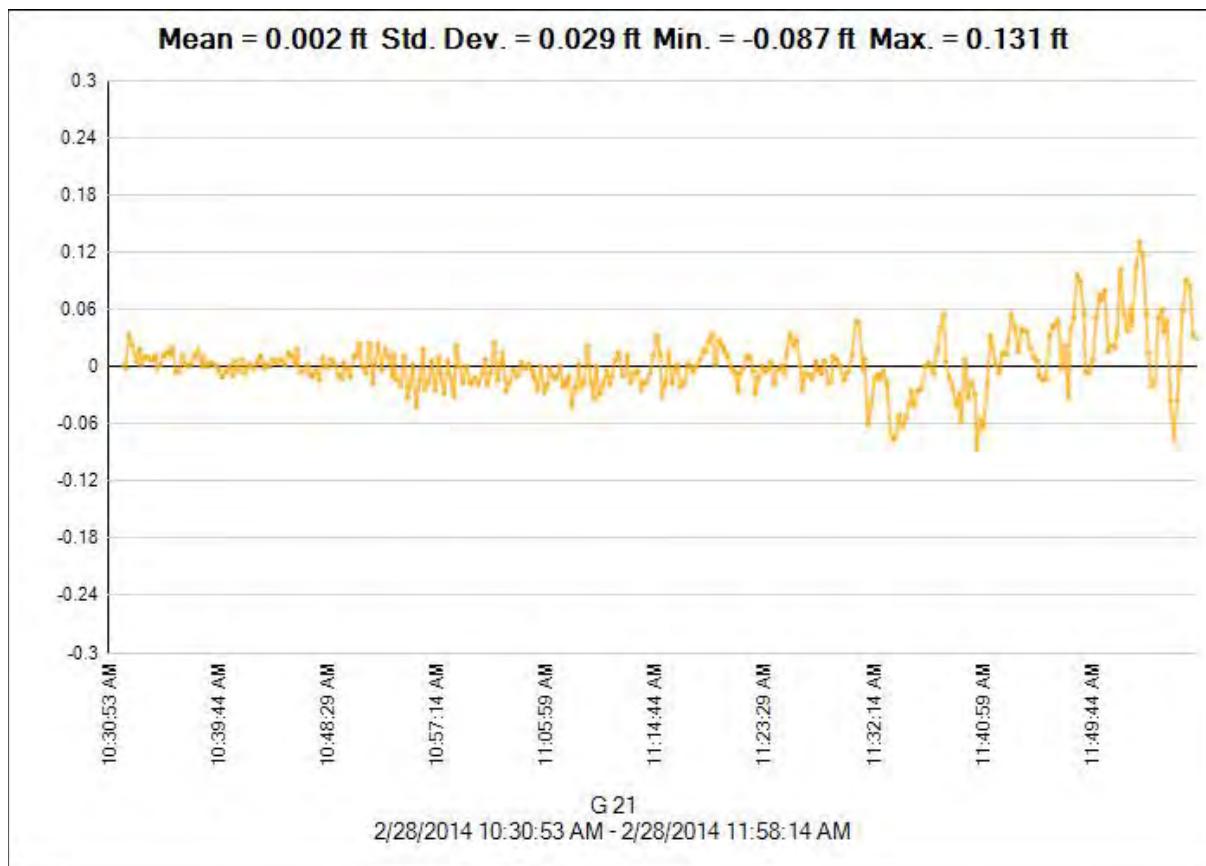


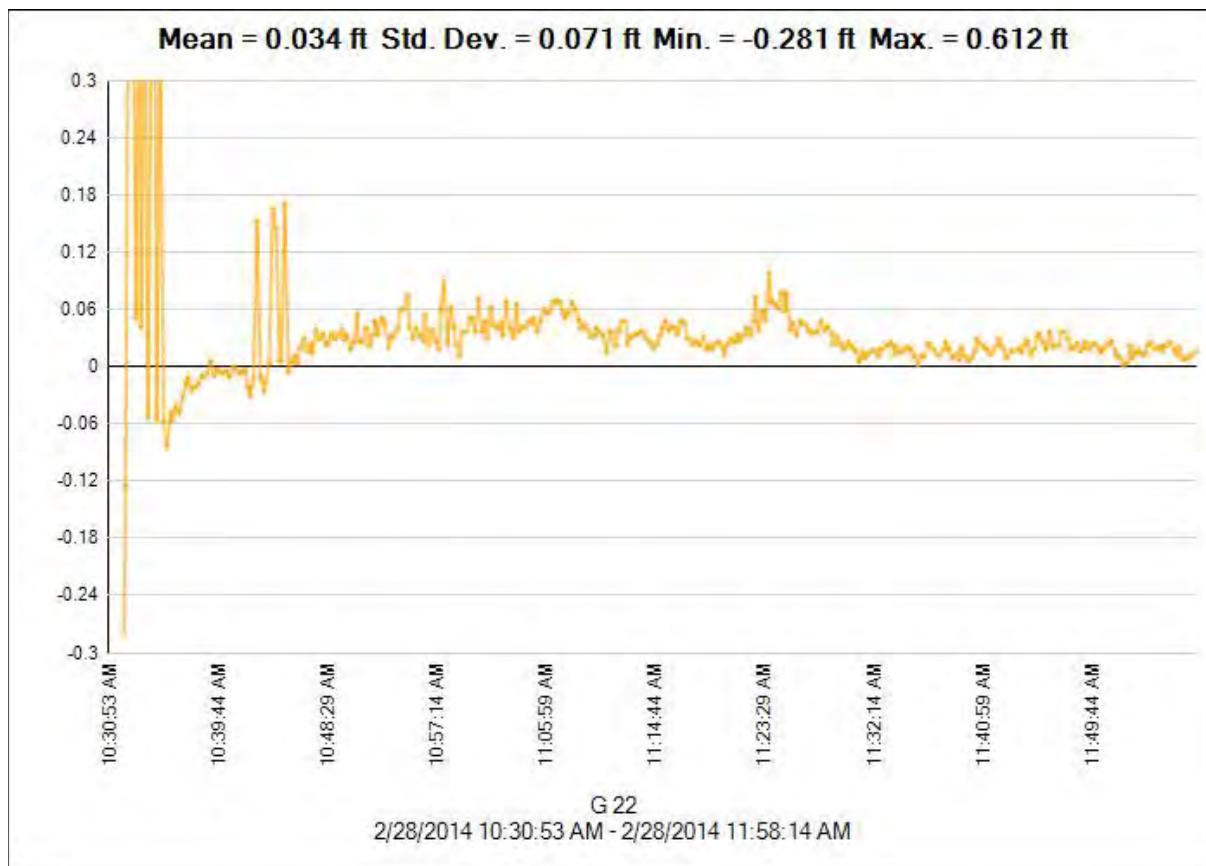


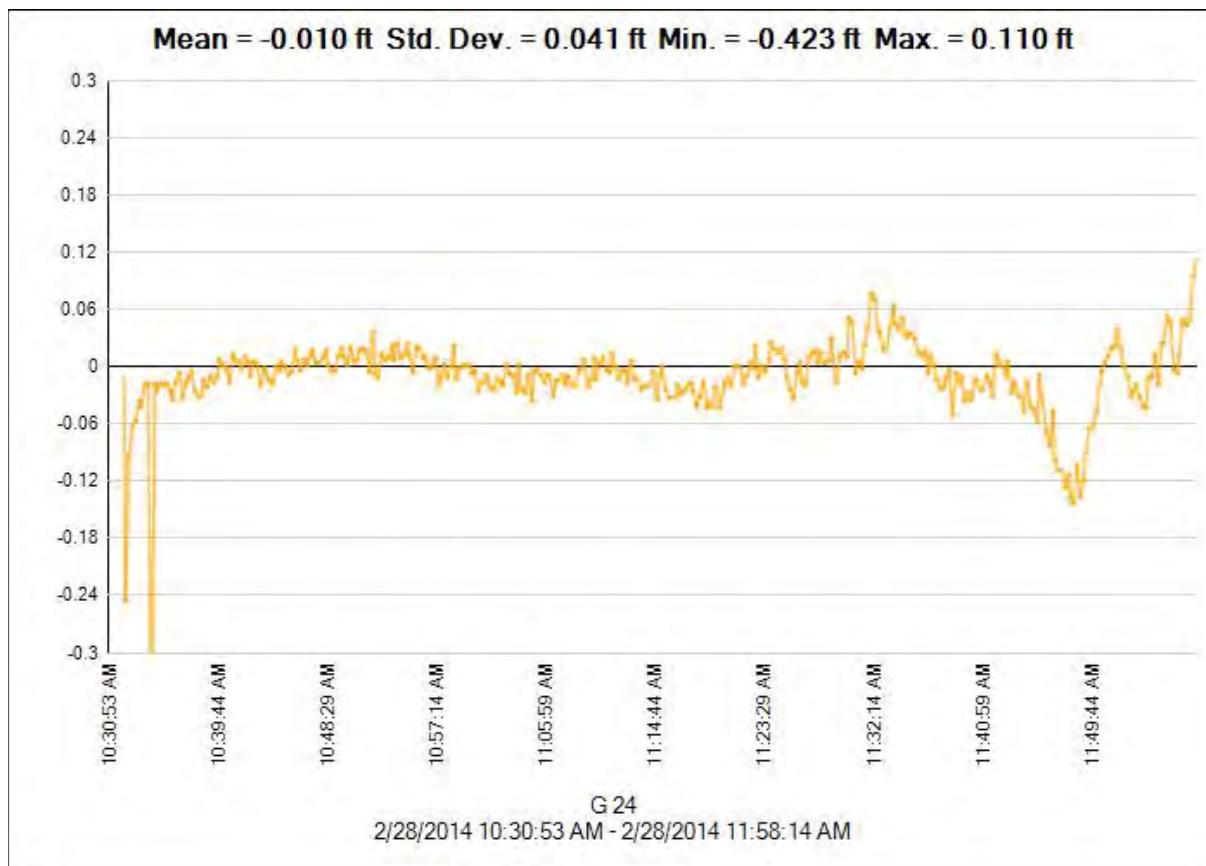


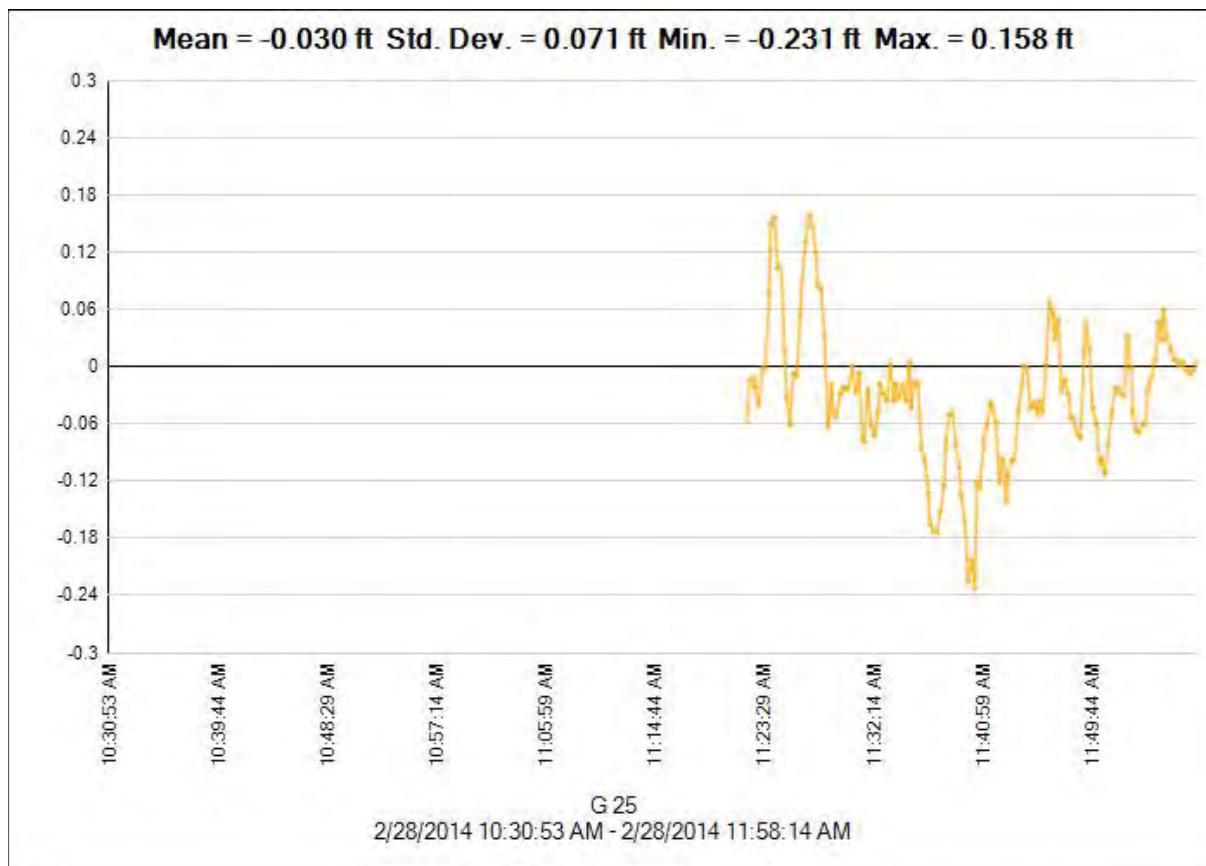


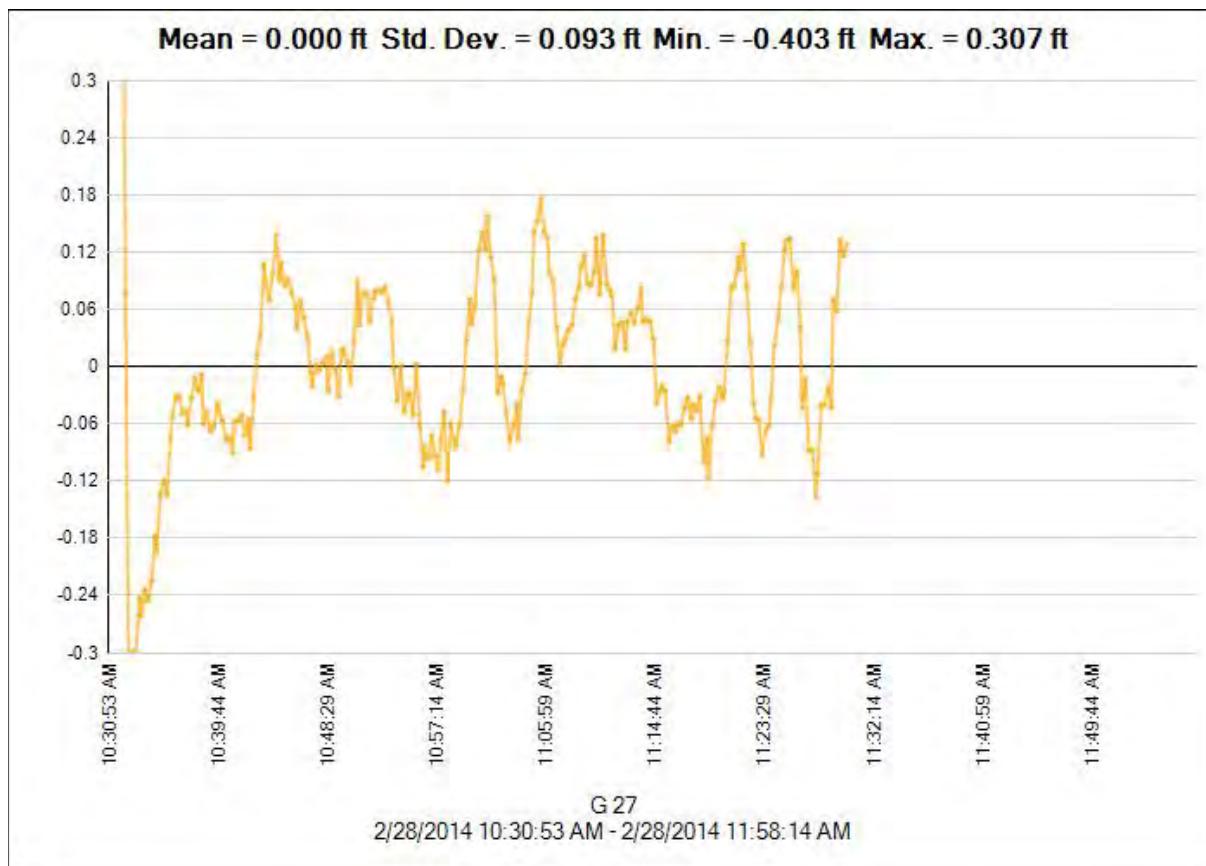


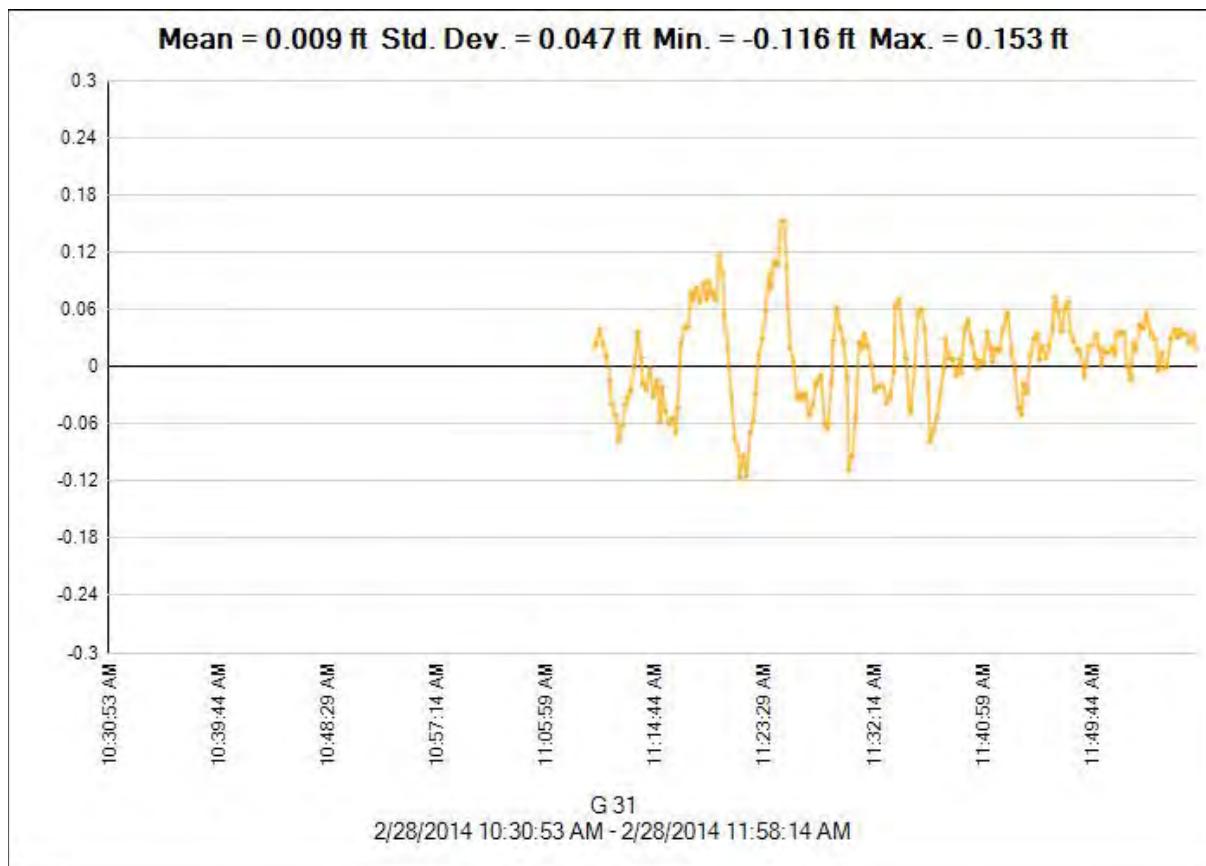


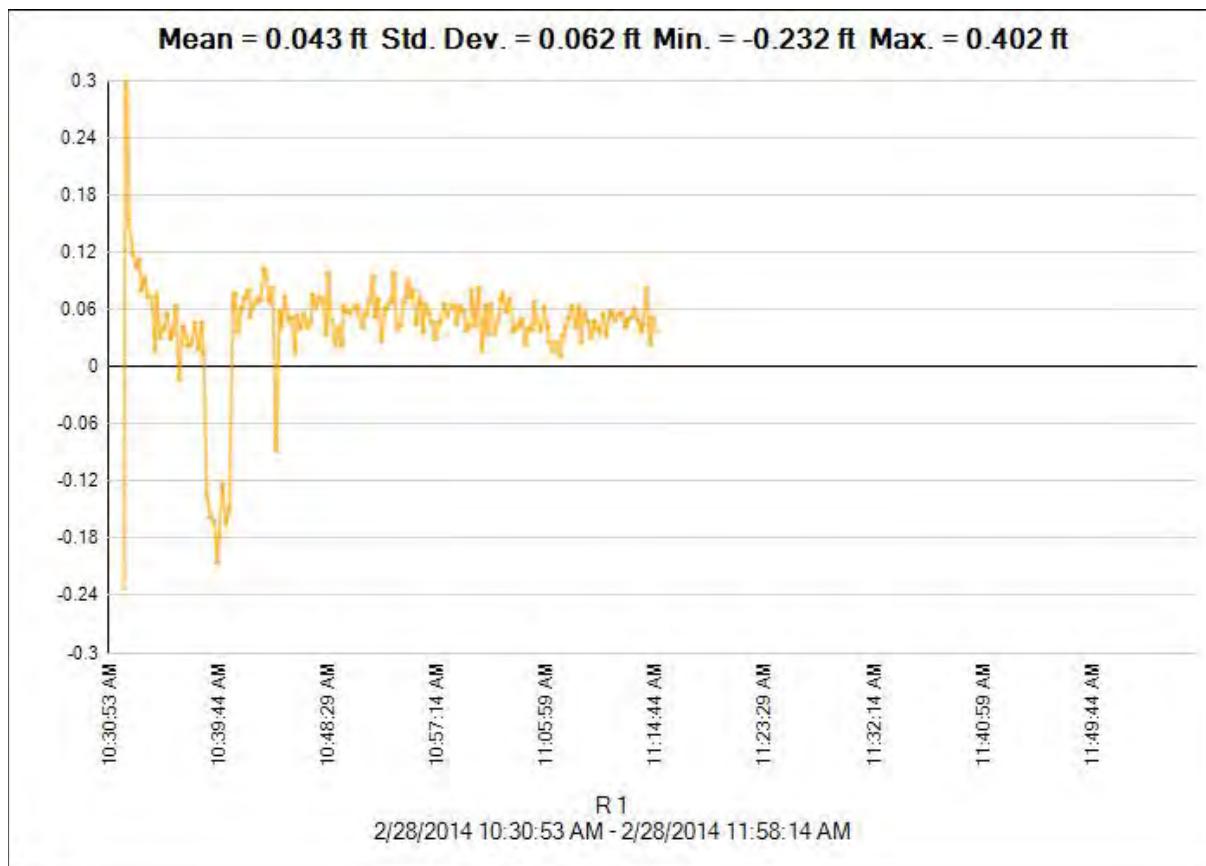


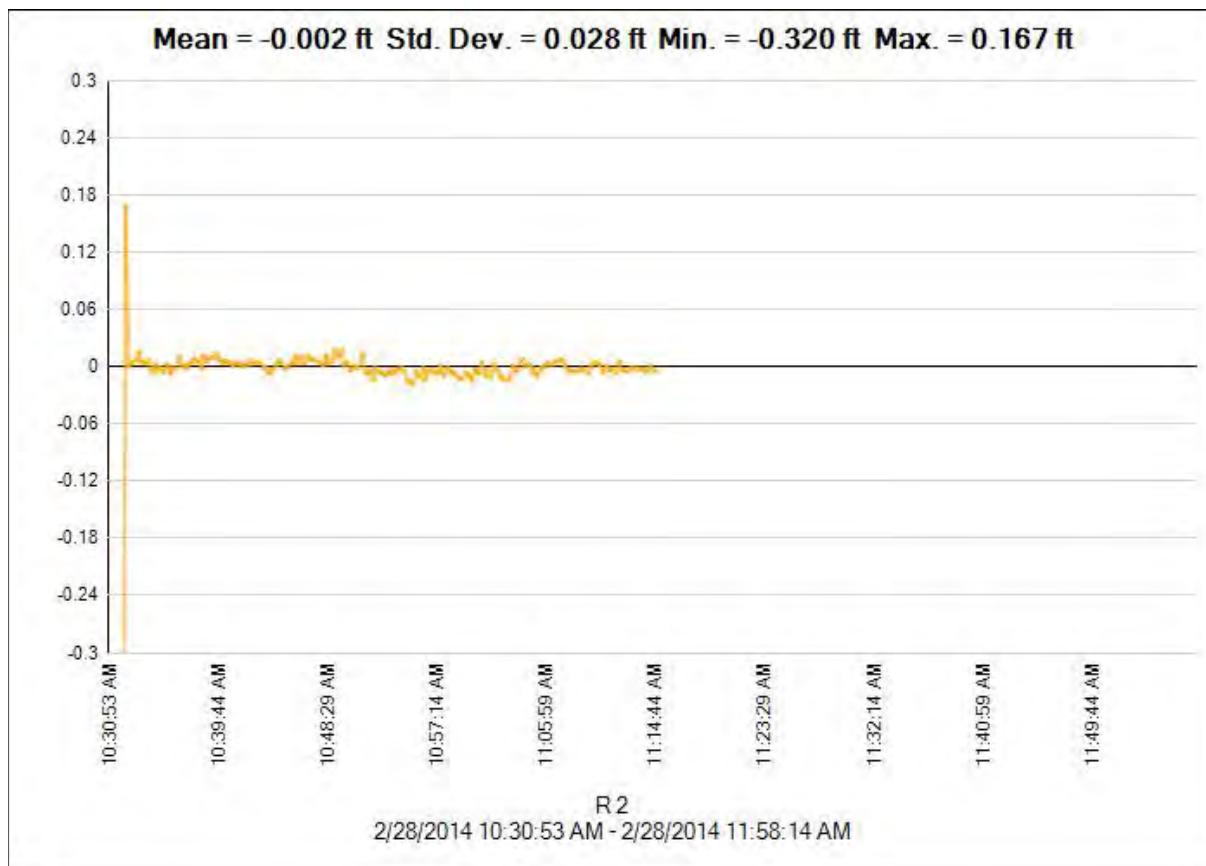


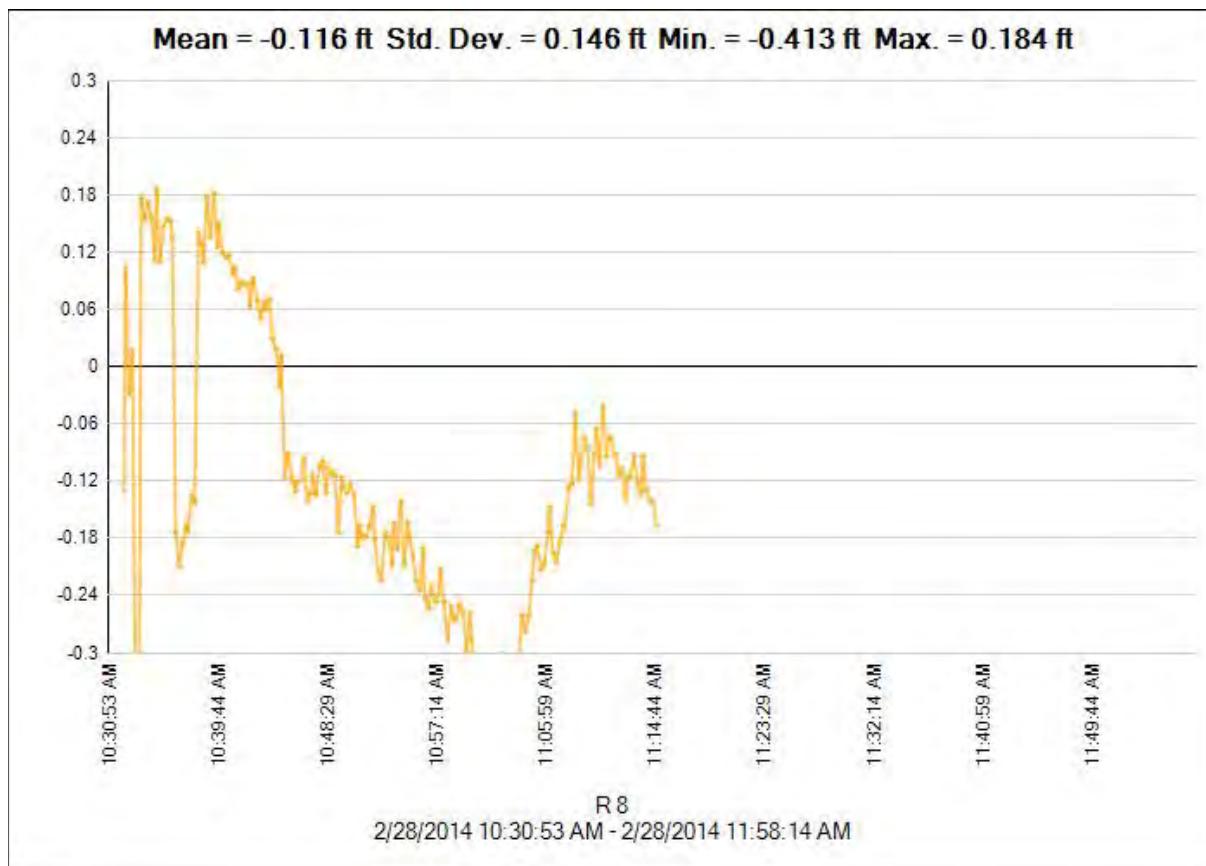


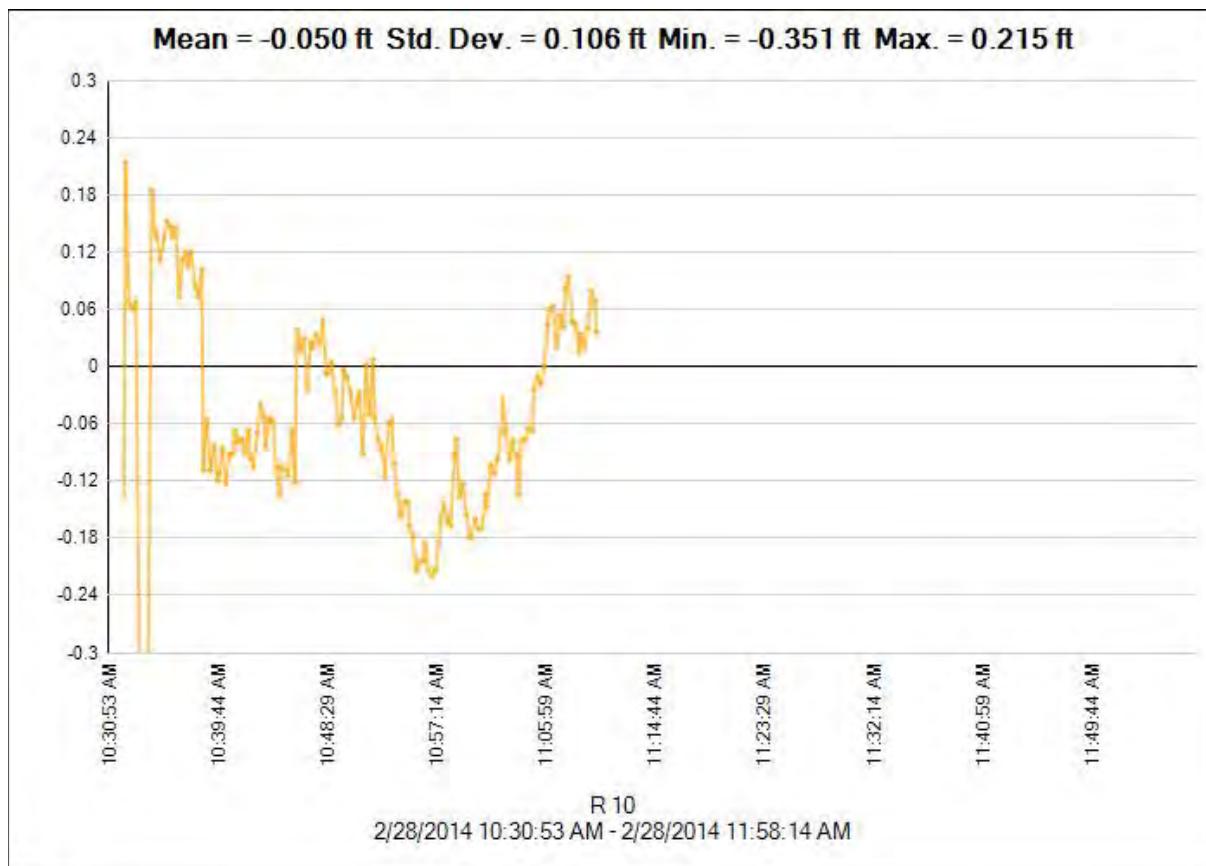


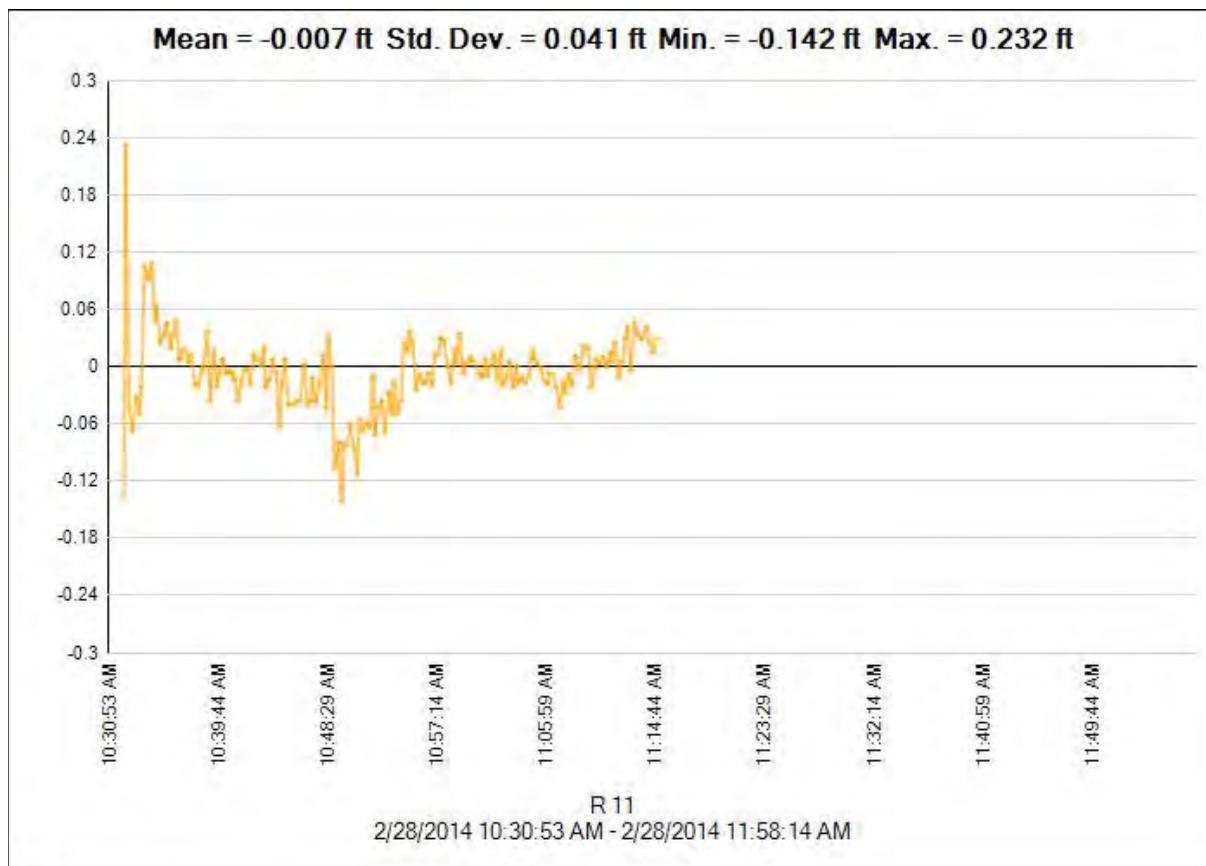


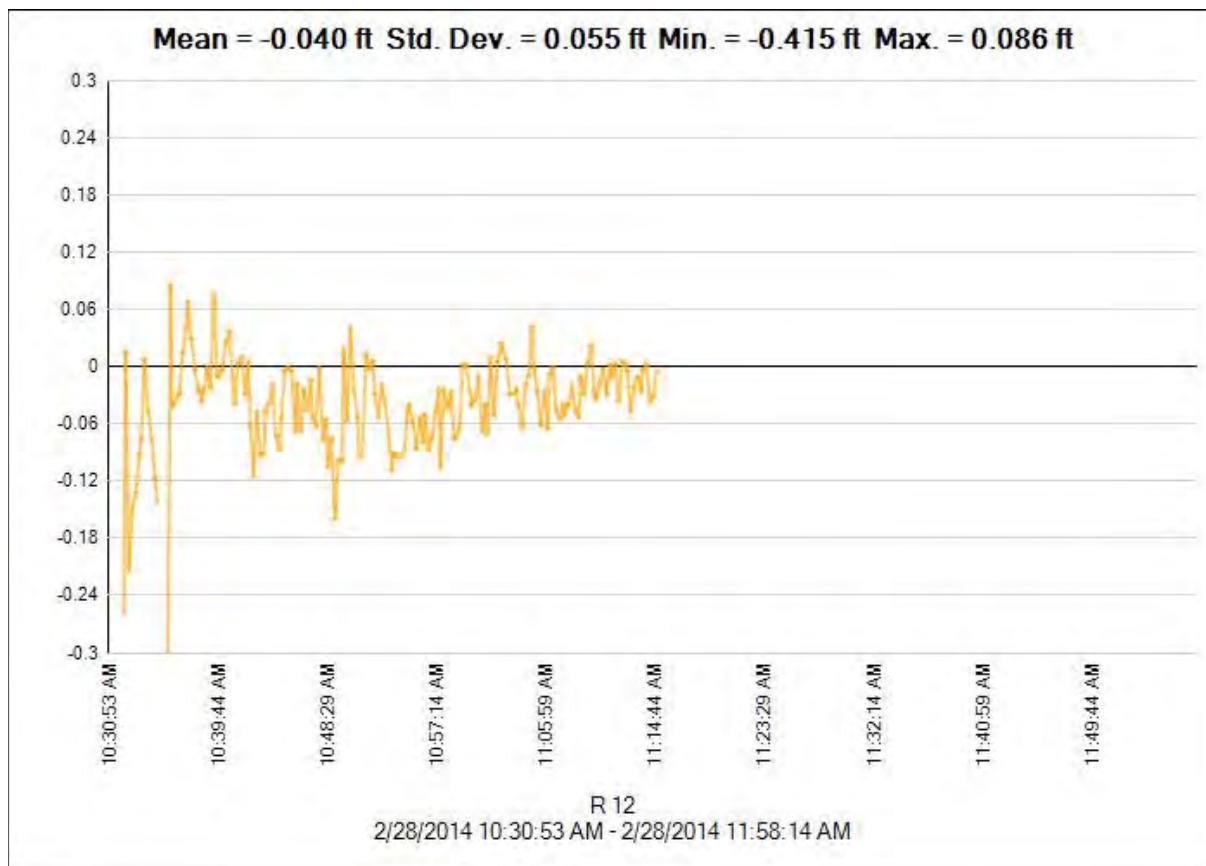


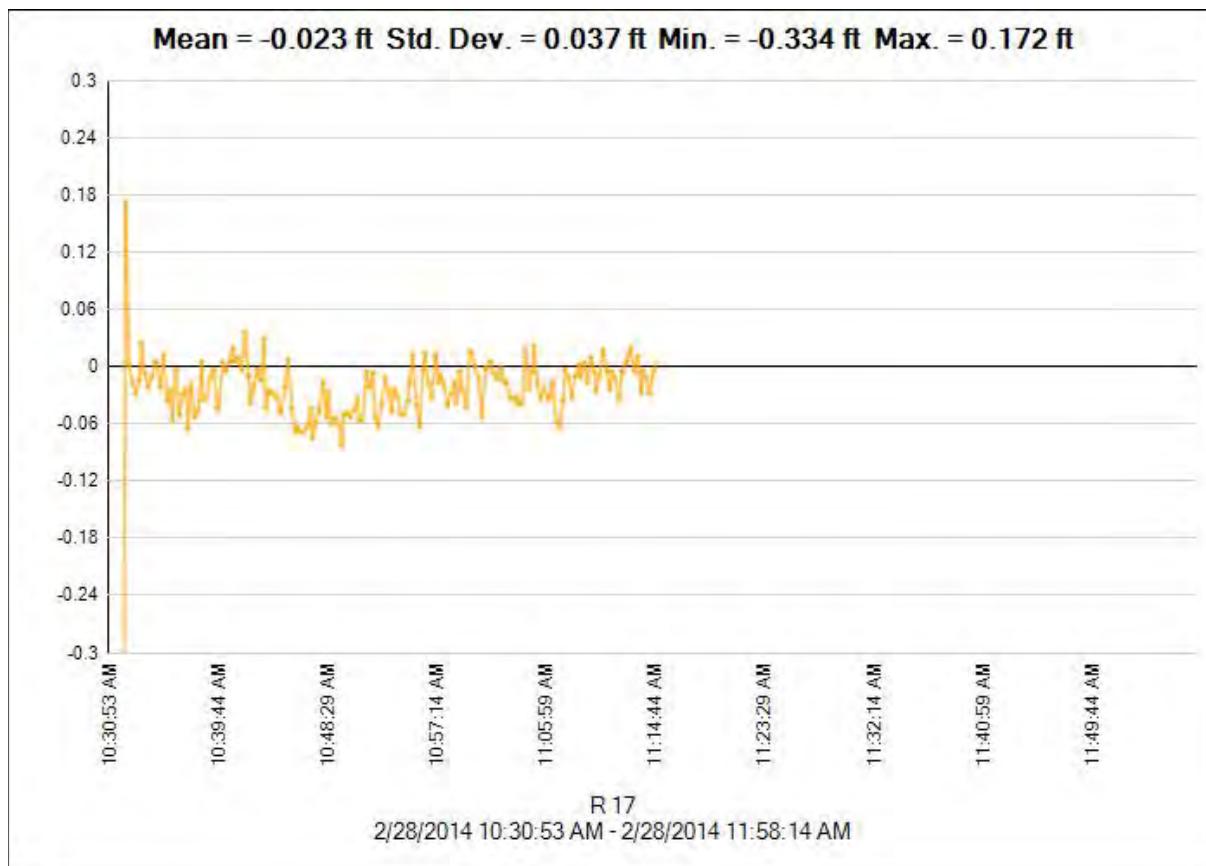


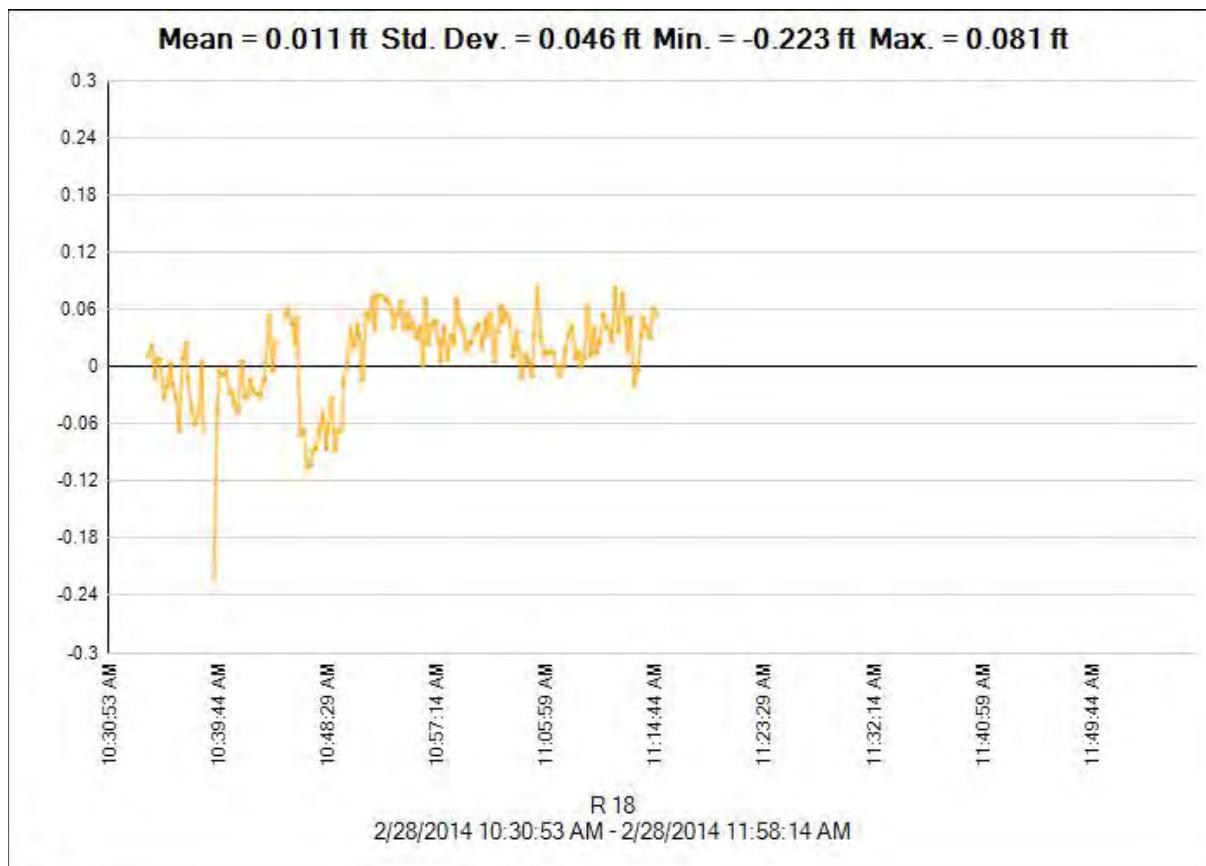


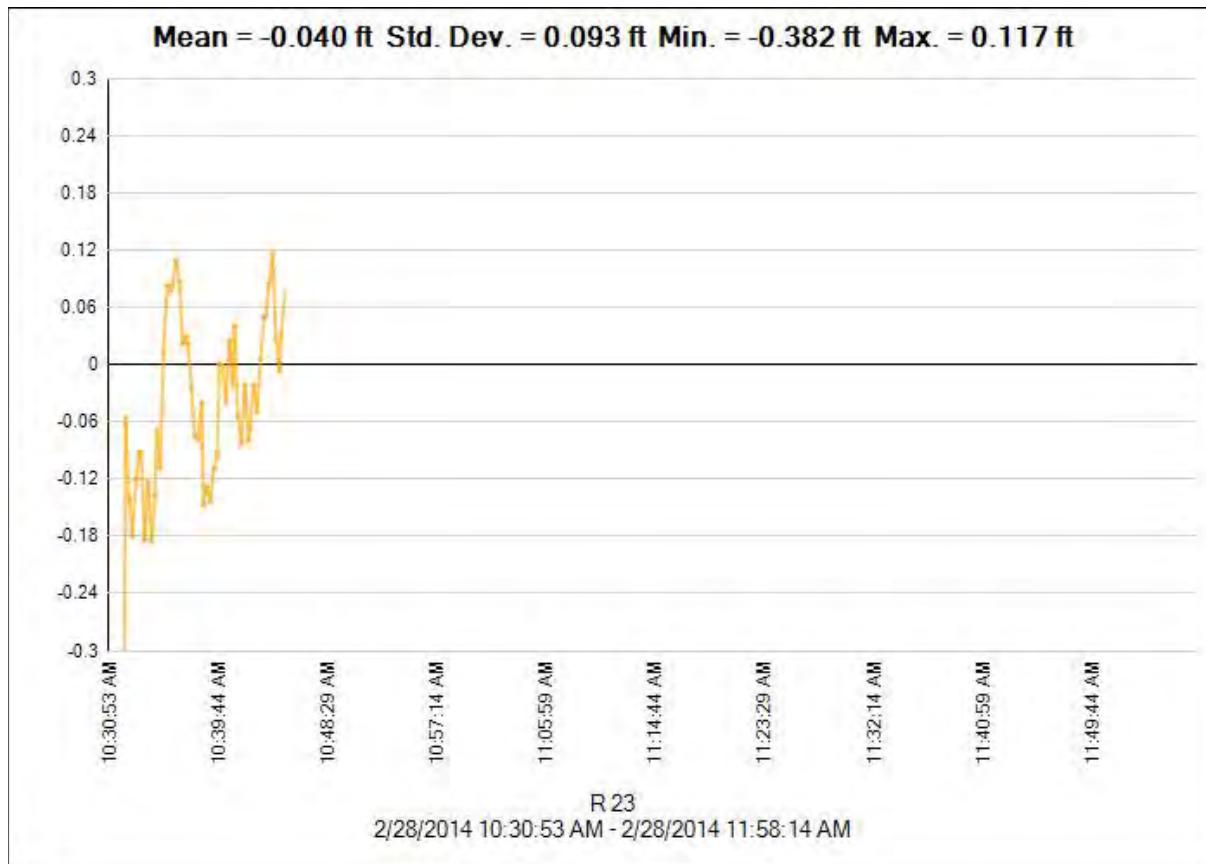


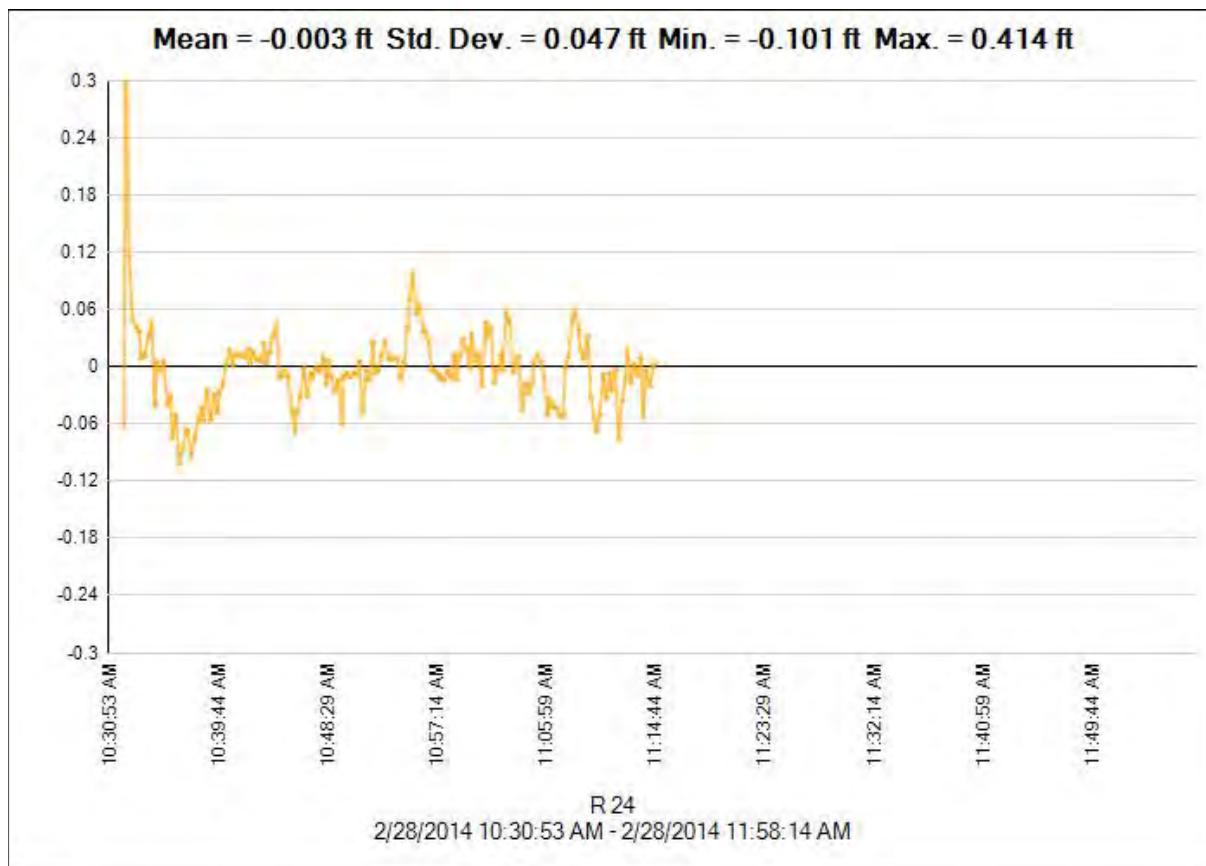














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





HOU M - 290307 (10:30:38 AM-11:58:24 AM) (S25)

Baseline observation: HOU M ---
290307
(B37)

Processed: 4/2/2014
10:00:00
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.034 ft

Vertical precision: 0.116 ft

RMS: 0.098 ft

Maximum PDOP: 2.881

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
10:31:14
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
11:58:14
AM
(Local:
UTC-6hr)

Processing duration: 01:27:00

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	HOU M
-------	-------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	290307				
Grid		Local		Global	
Northing	202494.938 ft	Latitude	N29°03'20.68067"	Latitude	N29°03'20.68067"
Easting	3448248.061 ft	Longitude	W90°48'33.79874"	Longitude	W90°48'33.79874"
Elevation	7.549 ft	Height	-71.242 ft	Height	-71.242 ft

Vector					
ΔNorthing	-195234.395 ft	NS Fwd Azimuth	187°59'49"	ΔX	-28611.475 ft
ΔEasting	-26370.893 ft	Ellipsoid Dist.	197007.615 ft	ΔY	-95146.128 ft
ΔElevation	-37.801 ft	ΔHeight	-34.060 ft	ΔZ	-170117.924 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.014 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.010 ft
σ ΔEasting	0.010 ft	σ Ellipsoid Dist.	0.014 ft	σ ΔY	0.055 ft
σ ΔElevation	0.059 ft	σ ΔHeight	0.059 ft	σ ΔZ	0.026 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000098331		
Y	-0.0000057286	0.0002831715	
Z	0.0000037751	-0.0001149604	0.0000636522

Occupations

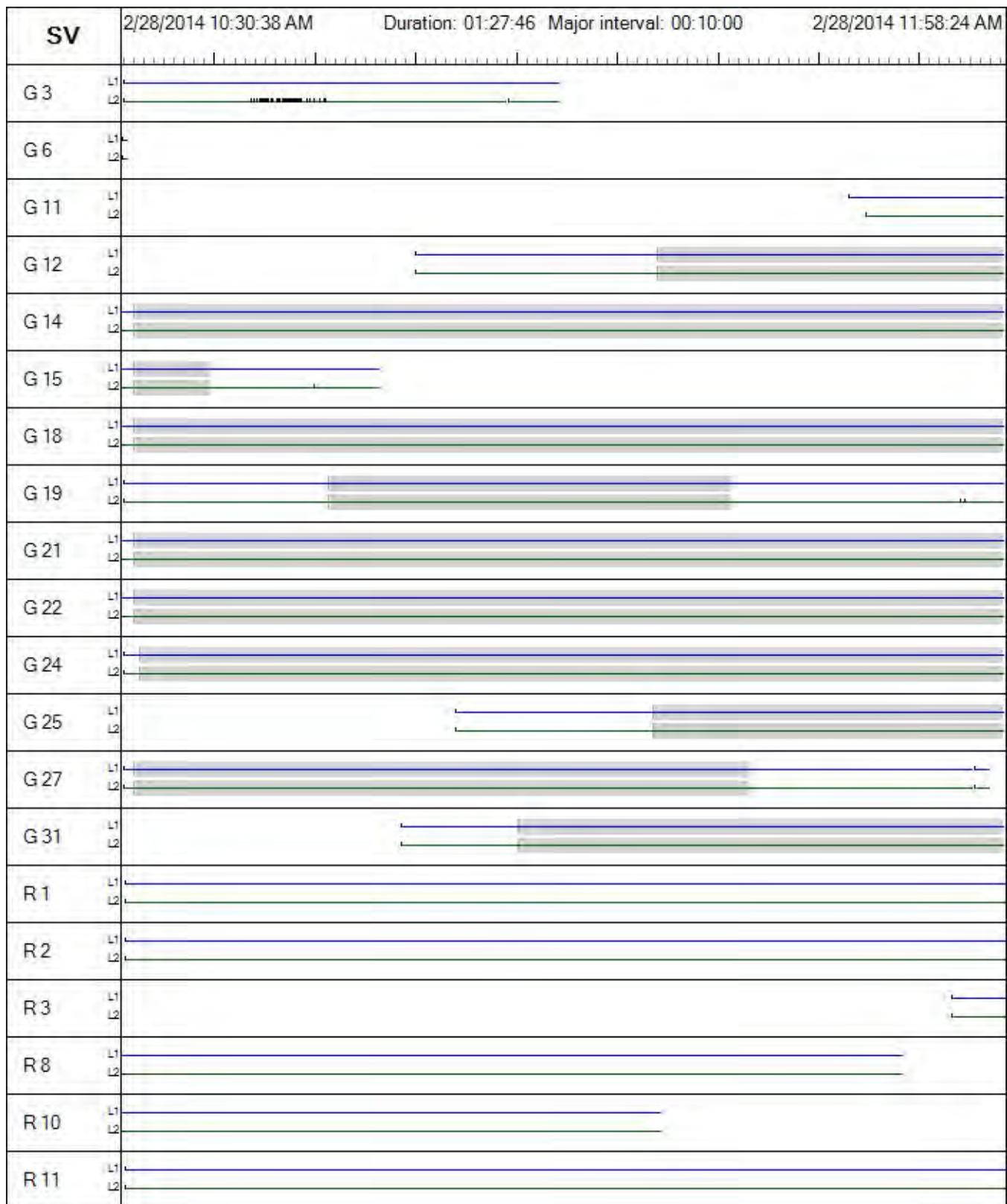
	From	To
Point ID:	HOUM	290307



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\290307059A0.14O
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	4646125537	
Antenna type:	Zephyr Geodetic	X91R
Antenna serial number:	-----	-----
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Antenna Phase Center	Antenna Phase Center



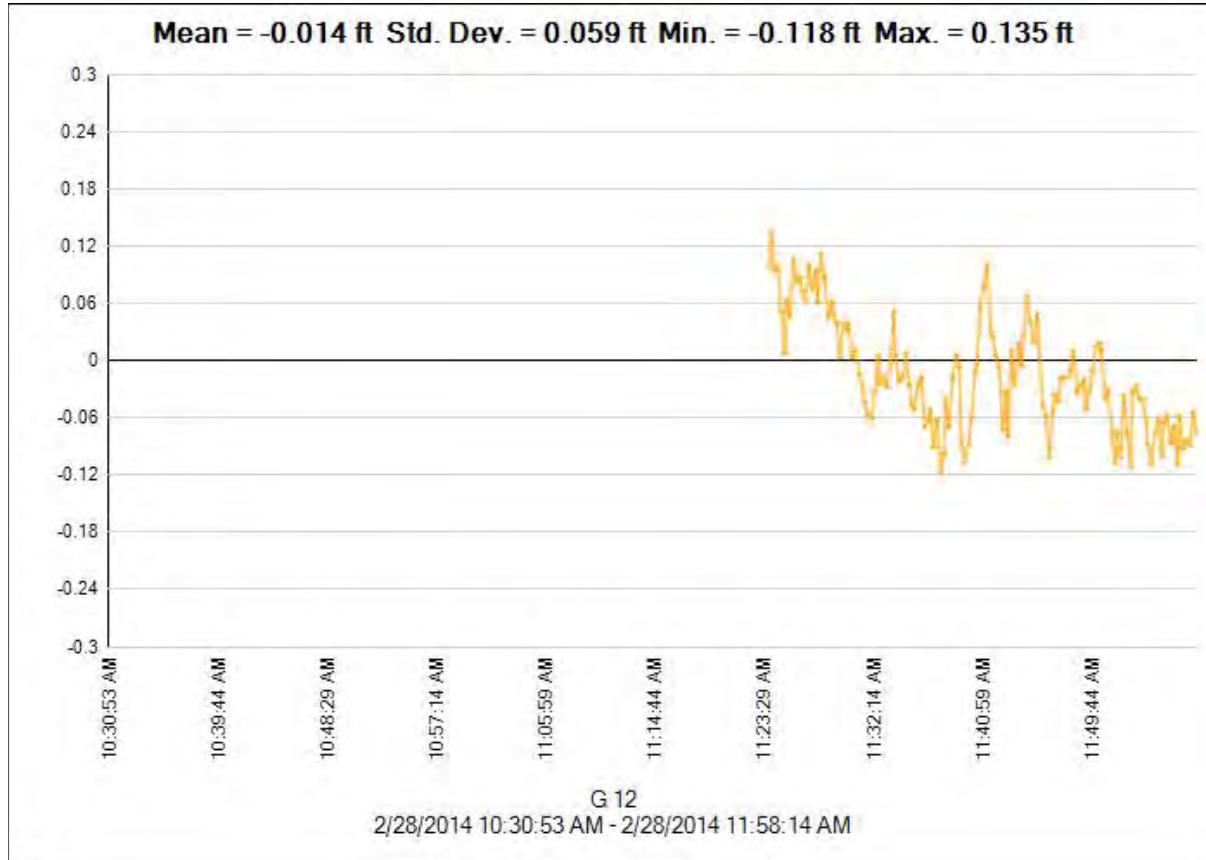
Tracking Summary

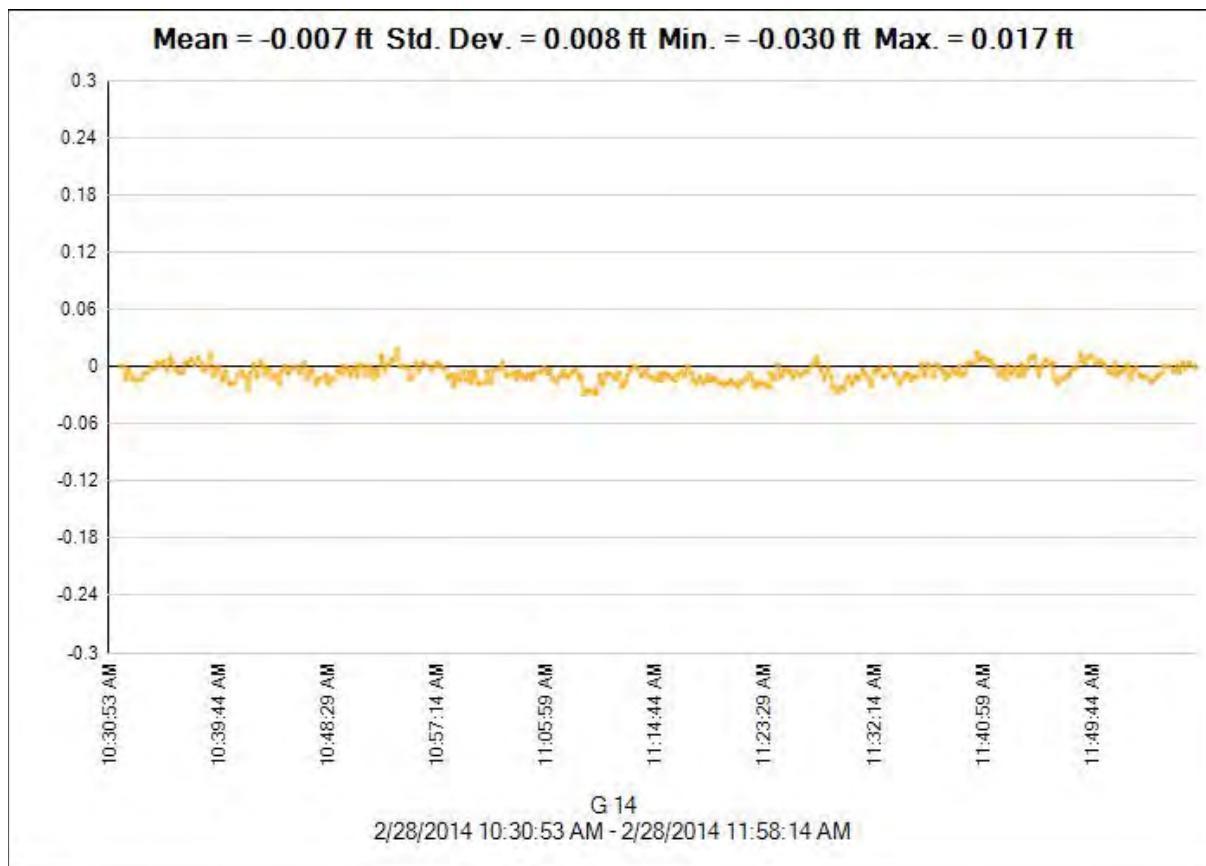


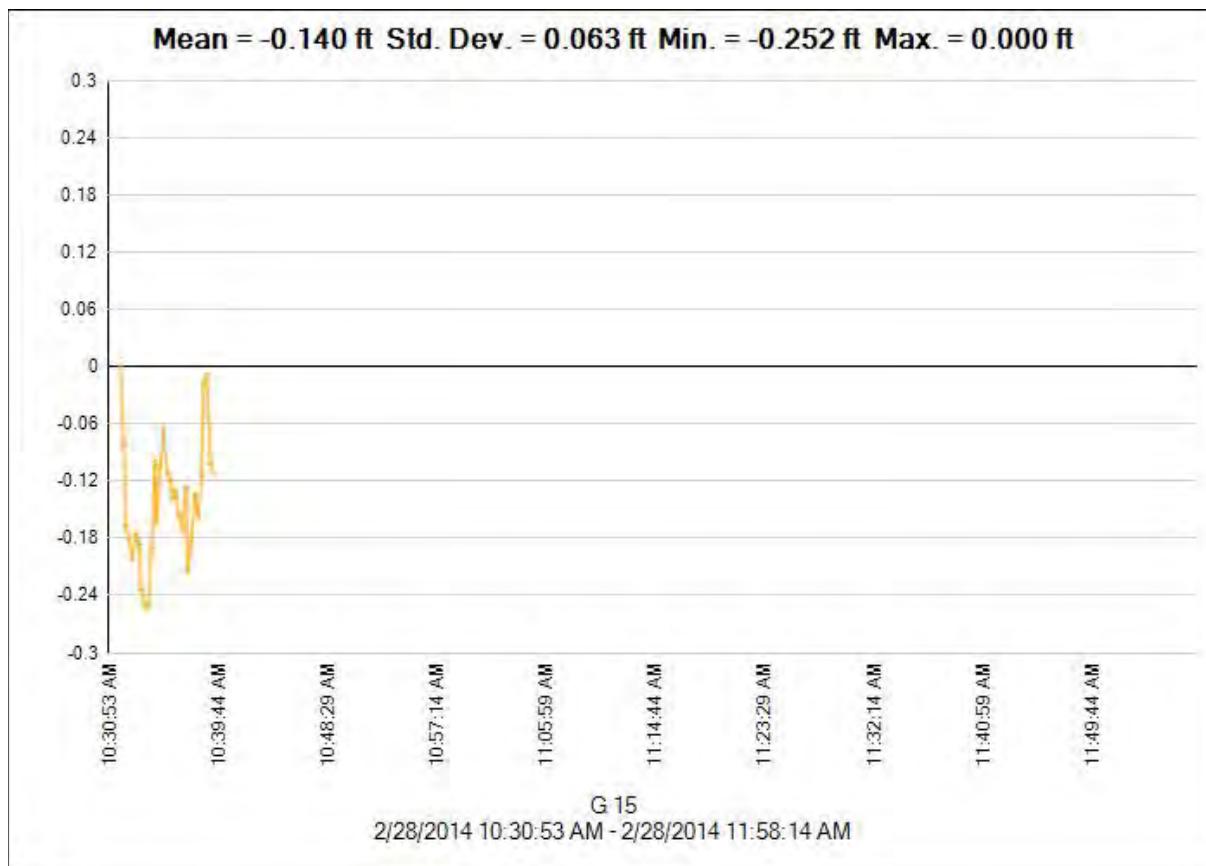


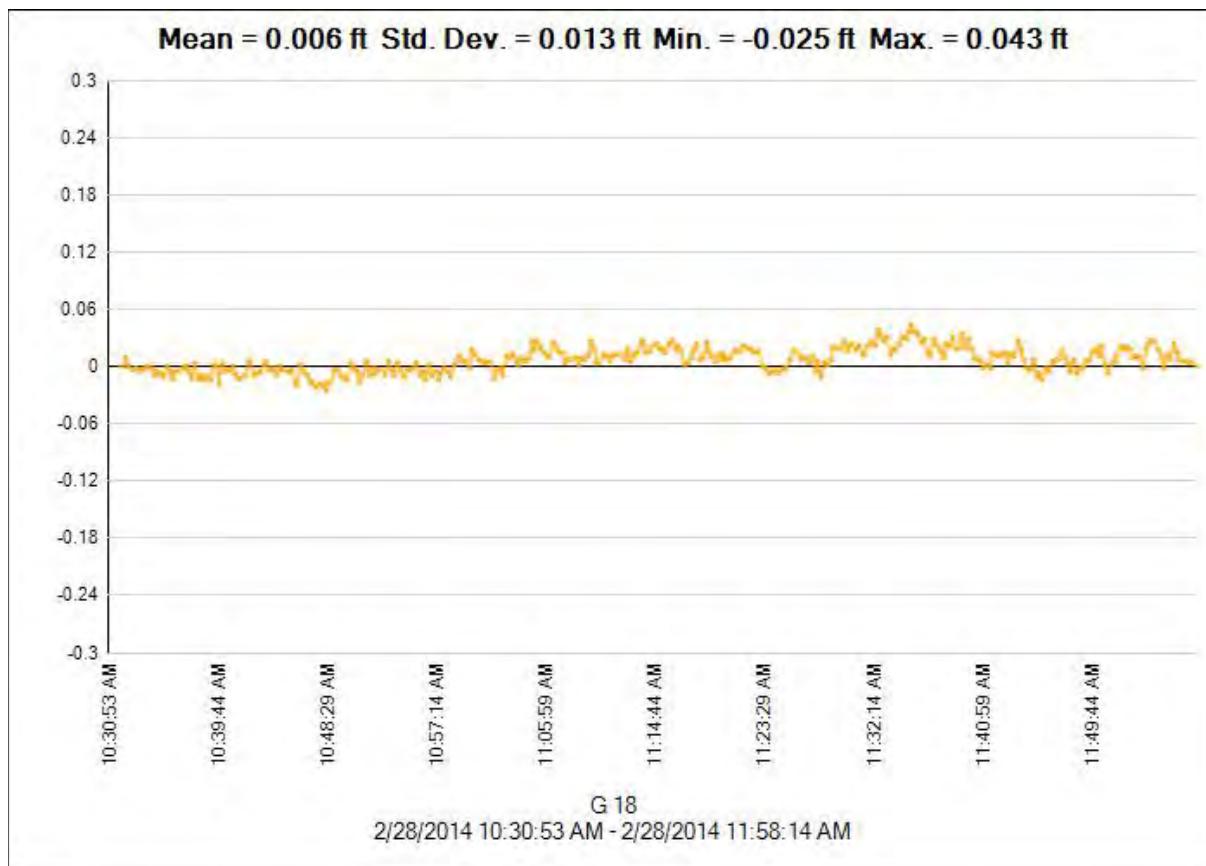


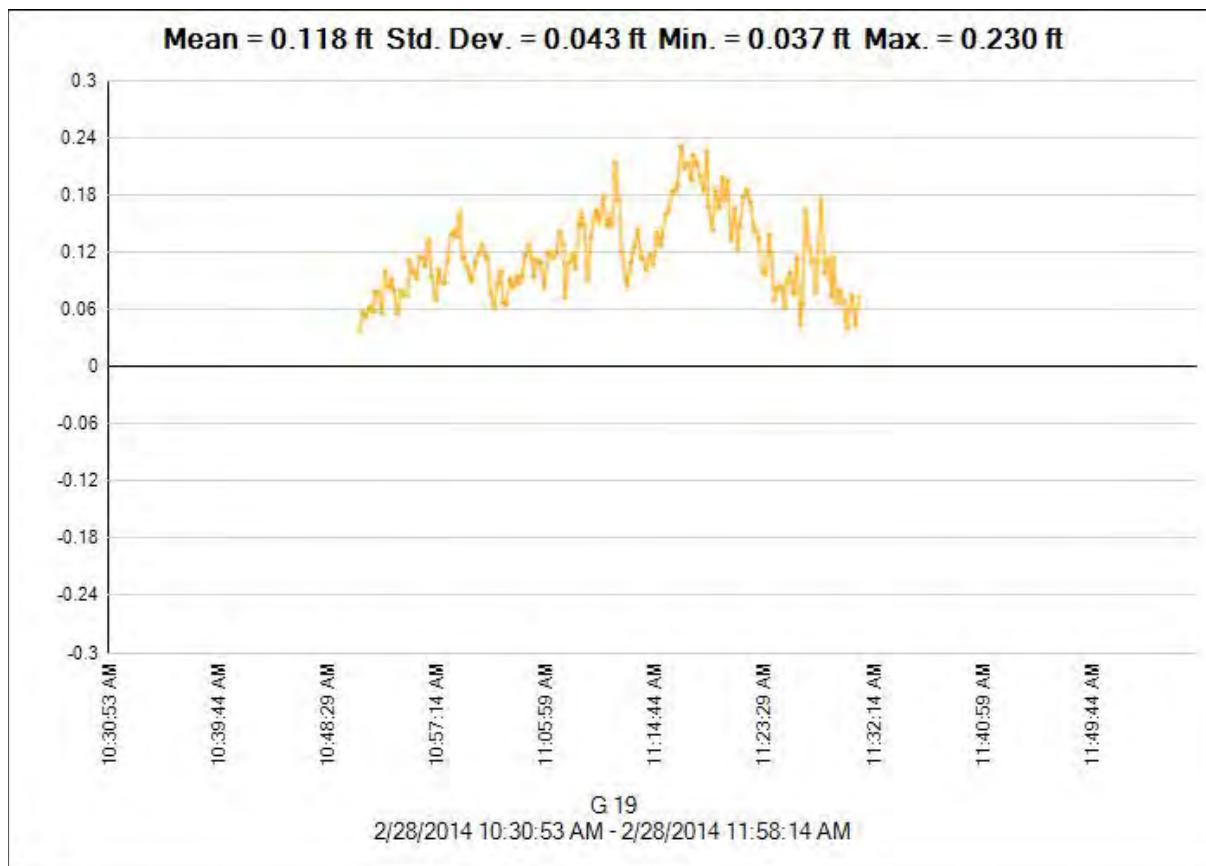
Residuals

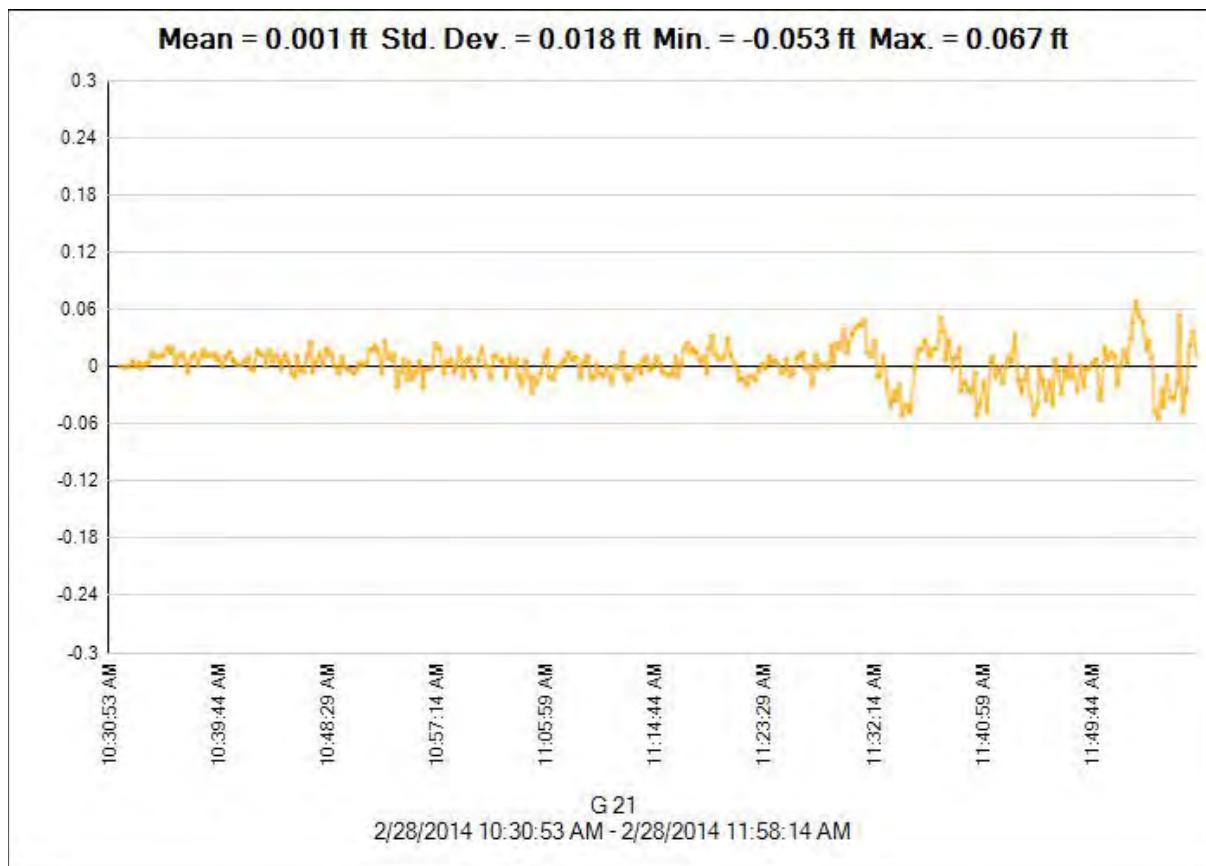


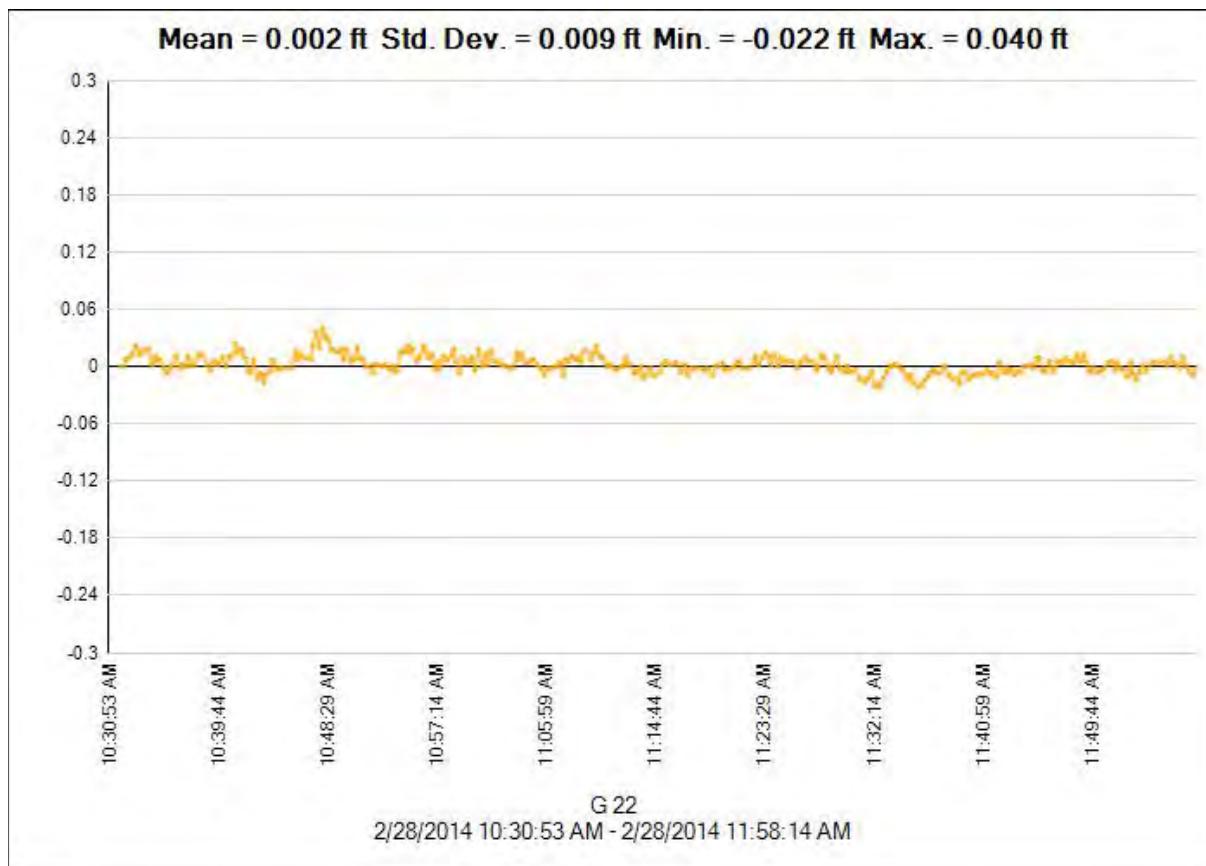


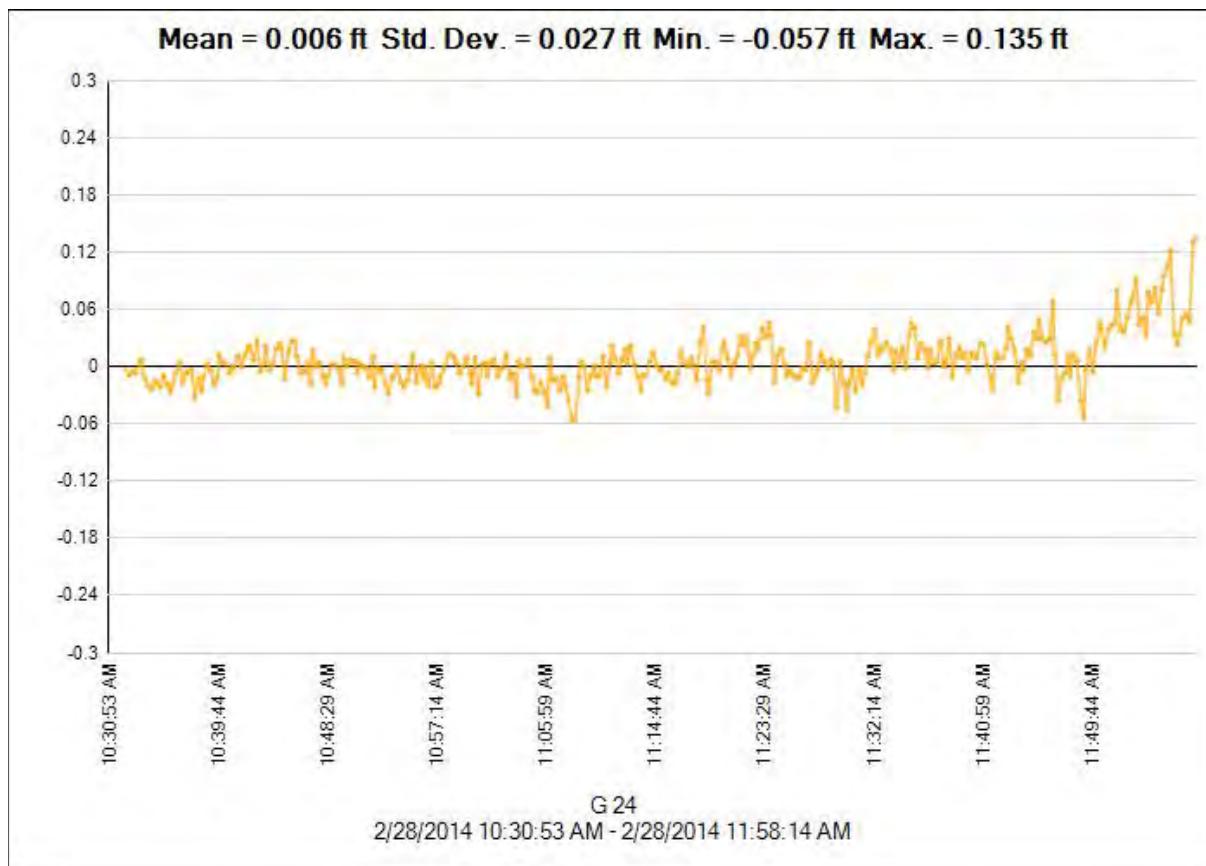


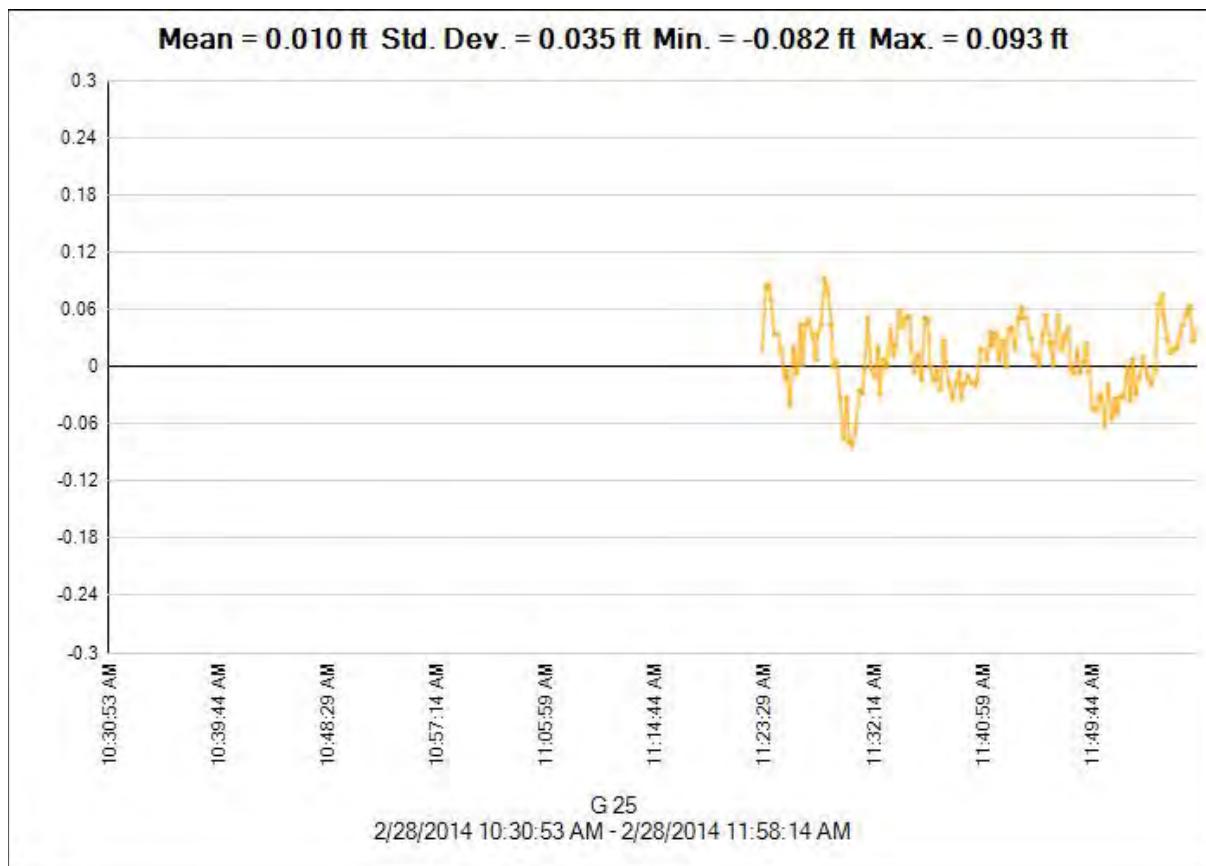


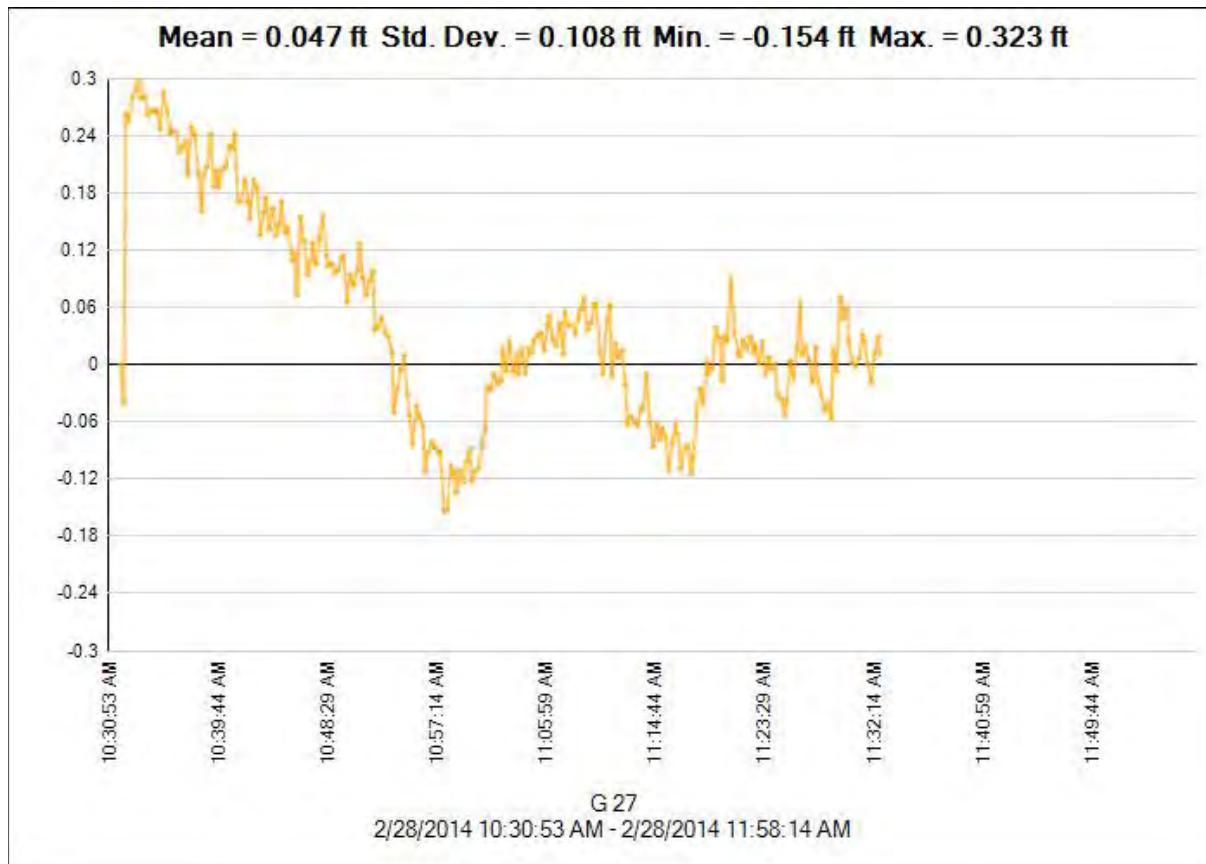


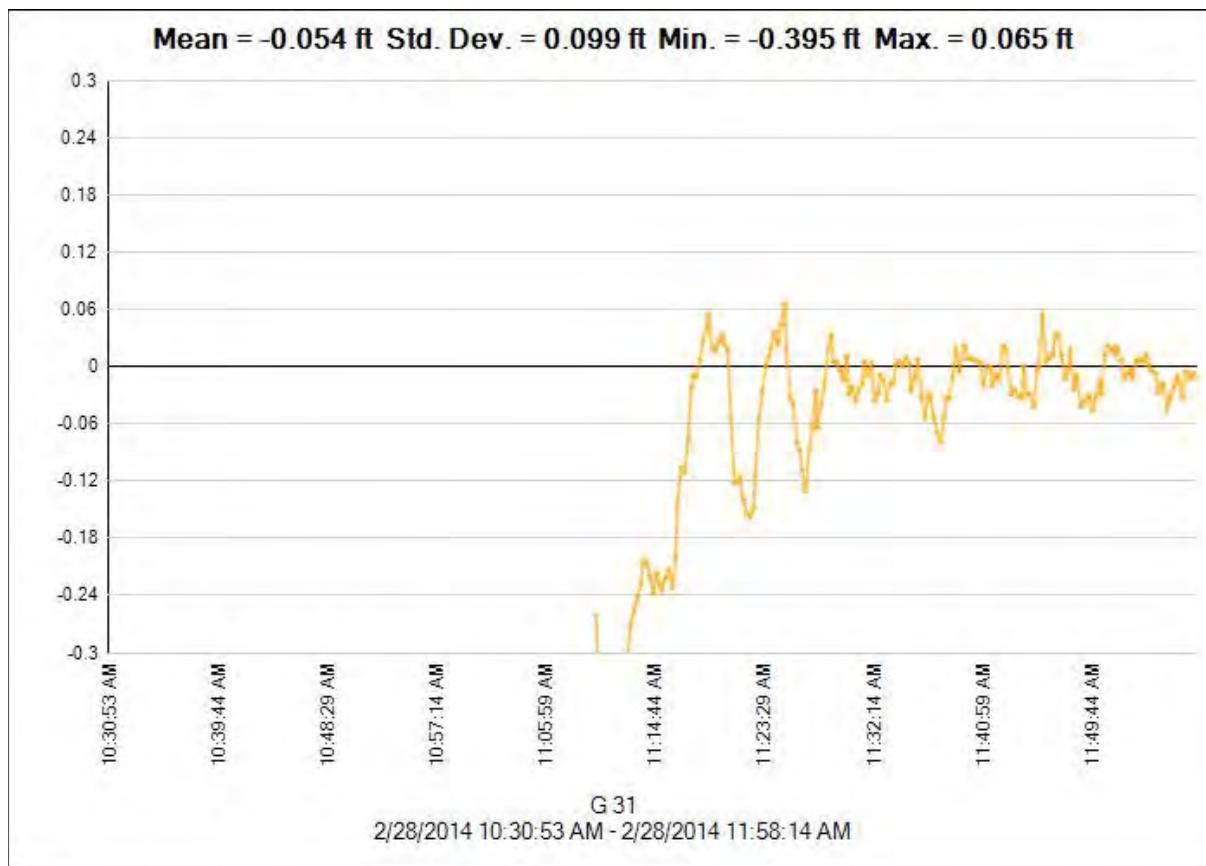














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





TE14-SM-01 - 290307 (10:30:38 AM-11:58:24 AM) (S26)

Baseline observation: TE14-SM-
01 ---
290307
(B38)

Processed: 4/2/2014
10:00:20
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.013 ft

Vertical precision: 0.076 ft

RMS: 0.017 ft

Maximum PDOP: 3.140

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
10:31:09
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
11:58:24
AM
(Local:
UTC-6hr)

Processing duration: 01:27:15

Processing interval: 5 seconds

Vector Components (Mark to Mark)

From:	TE14-SM-01
-------	------------



Grid		Local		Global	
Northing	199323.183 ft	Latitude	N29°02'49.70626"	Latitude	N29°02'49.70626"
Easting	3438609.465 ft	Longitude	W90°50'22.54591"	Longitude	W90°50'22.54591"
Elevation	1.034 ft	Height	-77.724 ft	Height	-77.724 ft

To:	290307				
Grid		Local		Global	
Northing	202494.953 ft	Latitude	N29°03'20.68082"	Latitude	N29°03'20.68081"
Easting	3448248.064 ft	Longitude	W90°48'33.79871"	Longitude	W90°48'33.79871"
Elevation	7.514 ft	Height	-71.277 ft	Height	-71.278 ft

Vector					
ΔNorthing	3171.769 ft	NS Fwd Azimuth	72°01'56"	ΔX	9672.738 ft
ΔEasting	9638.599 ft	Ellipsoid Dist.	10146.426 ft	ΔY	1374.615 ft
ΔElevation	6.480 ft	ΔHeight	6.447 ft	ΔZ	2738.219 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.005 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.005 ft
σ ΔEasting	0.005 ft	σ Ellipsoid Dist.	0.005 ft	σ ΔY	0.035 ft
σ ΔElevation	0.039 ft	σ ΔHeight	0.039 ft	σ ΔZ	0.018 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000021474		
Y	-0.0000023099	0.0001141446	
Z	0.0000009194	-0.0000545750	0.0000285522

Occupations

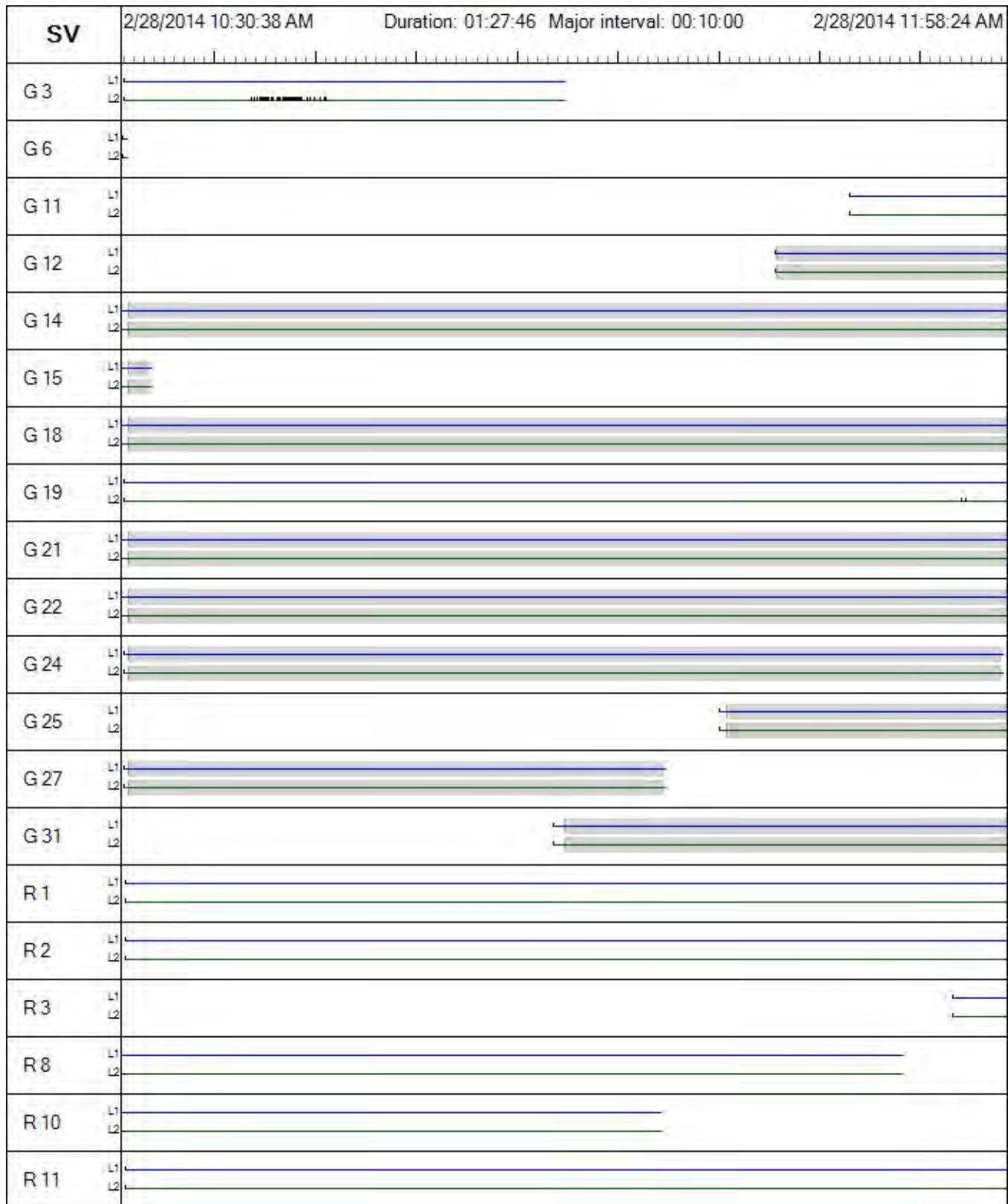
	From	To
Point ID:	TE14-SM-01	290307



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920590.T02	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\290307059A0.14O
Receiver type:	R7 GNSS	R7 GNSS
Receiver serial number:	5040K18292	
Antenna type:	Zephyr Geodetic 2	X91R
Antenna serial number:	-----	-----
Antenna height (measured):	6.562 ft	0.000 ft
Antenna method:	Bottom of antenna mount	Antenna Phase Center



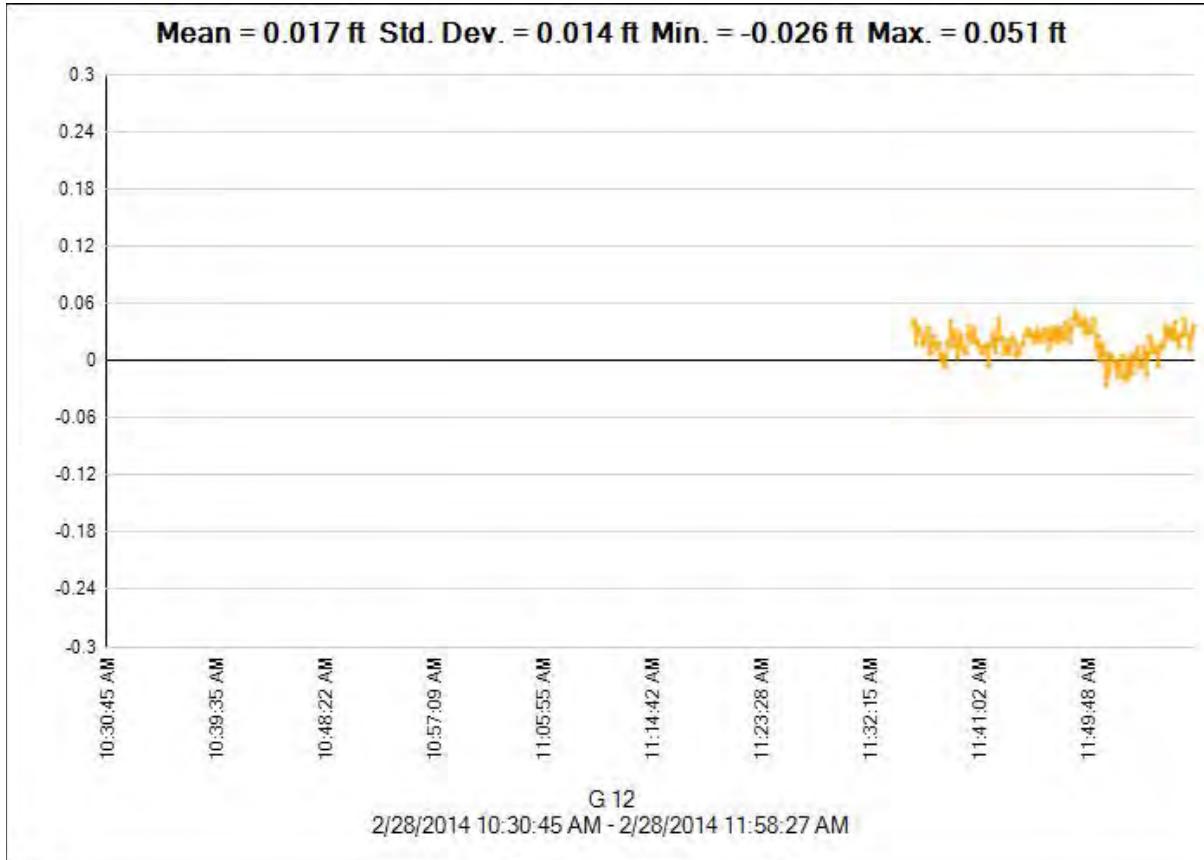
Tracking Summary

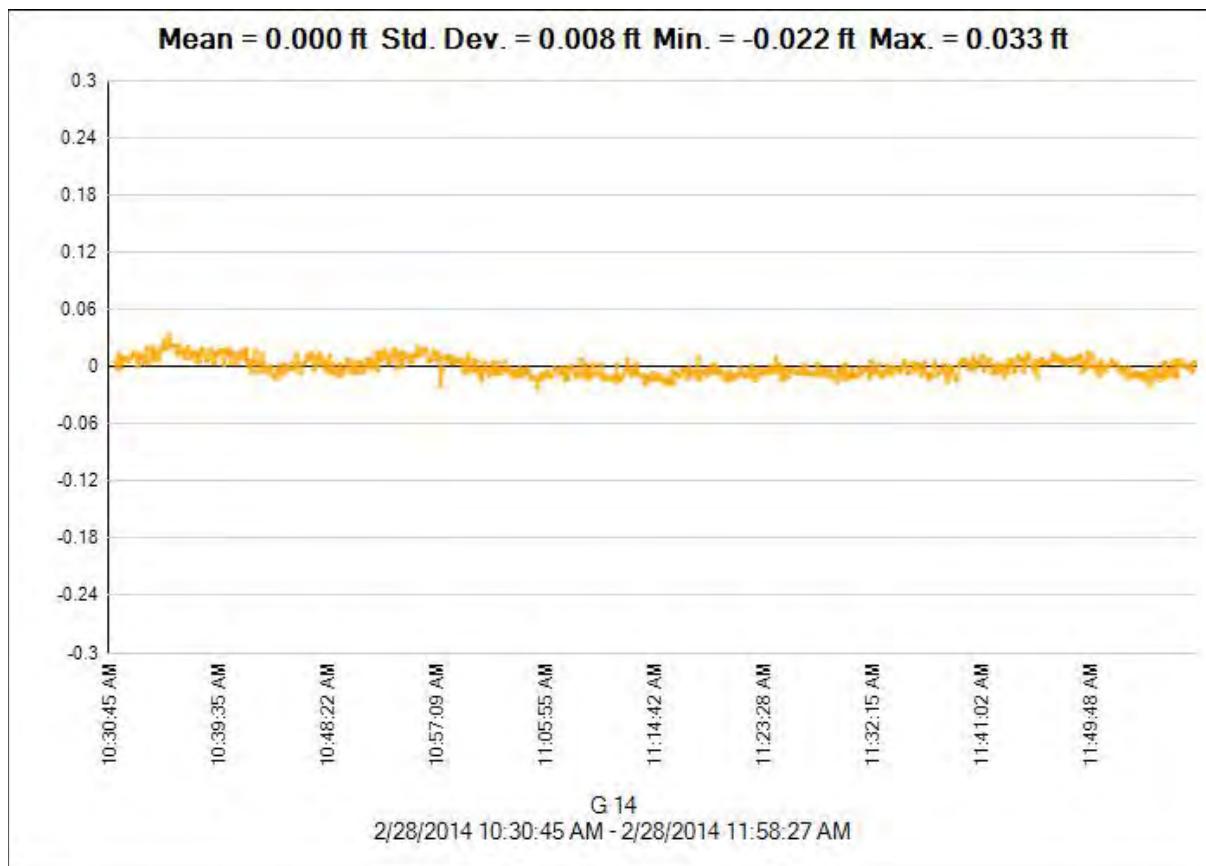


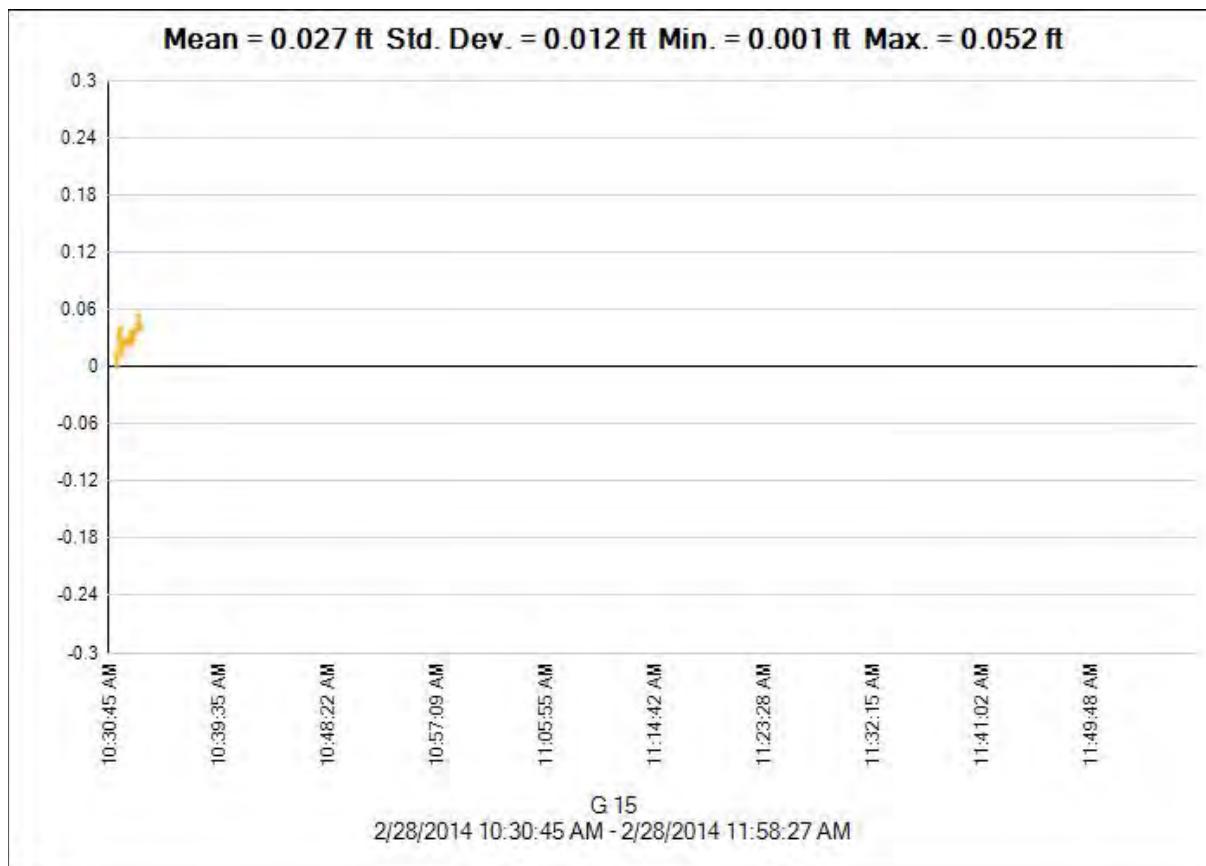


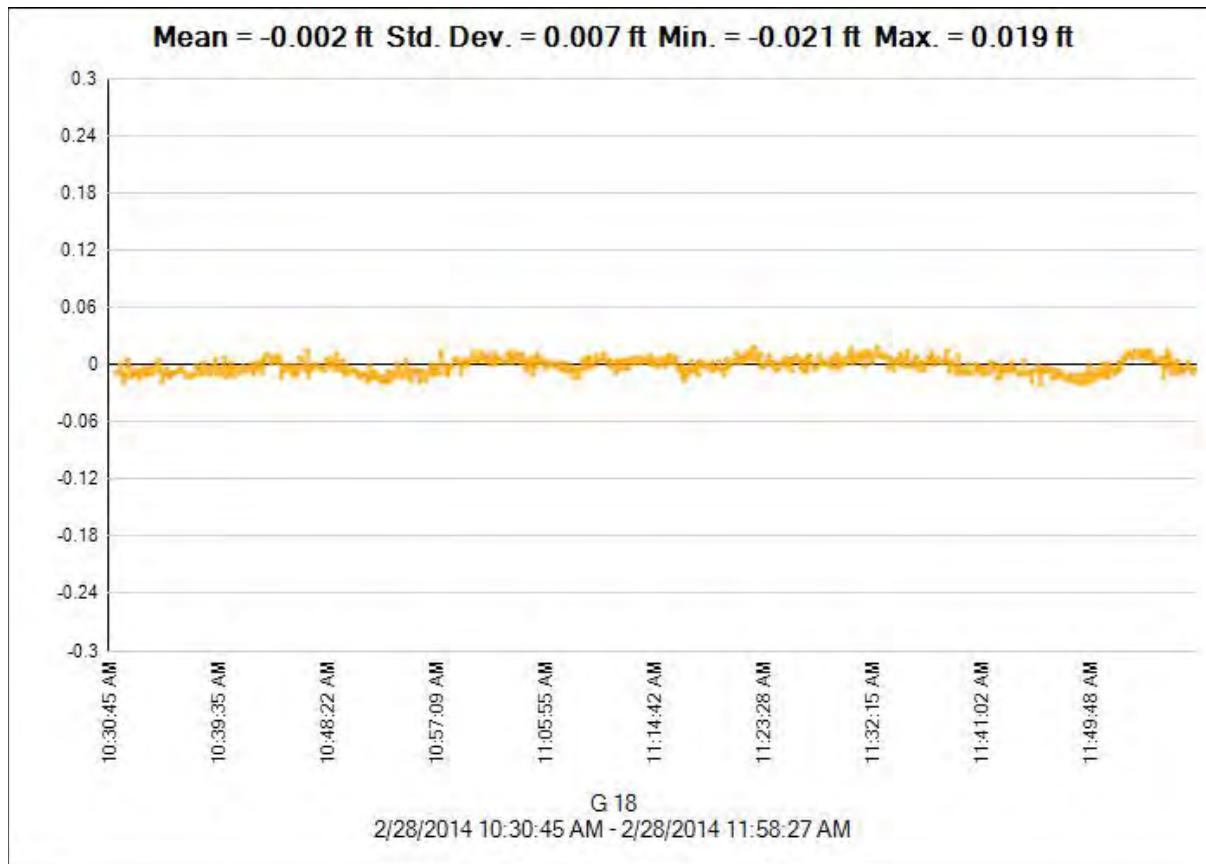


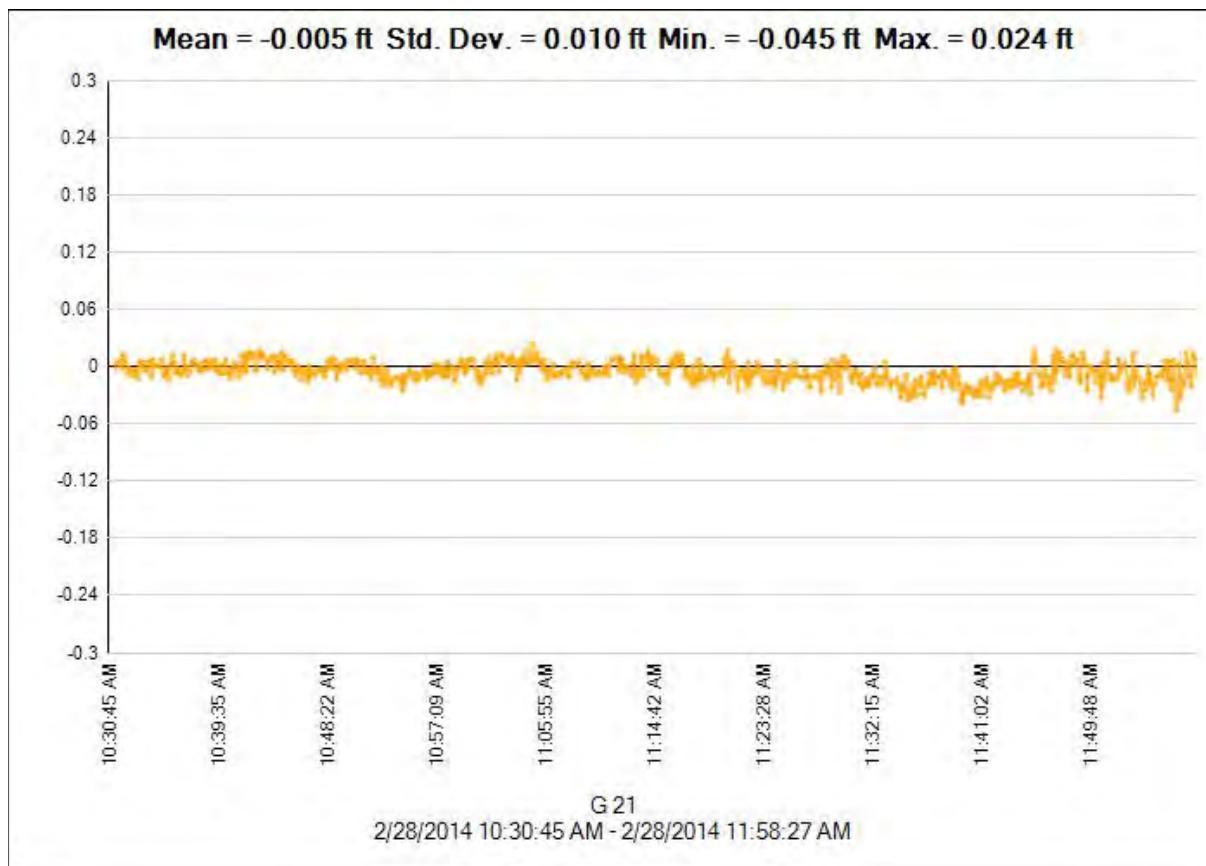
Residuals

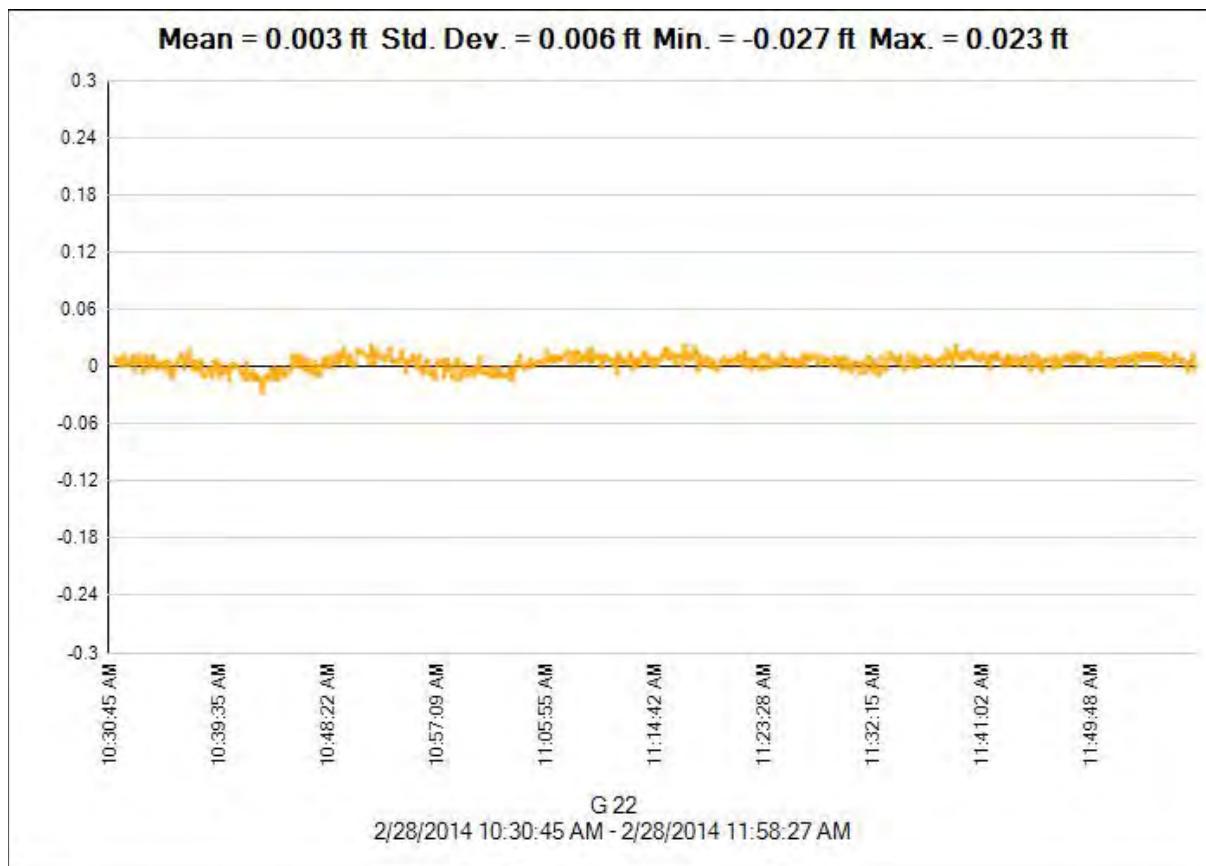


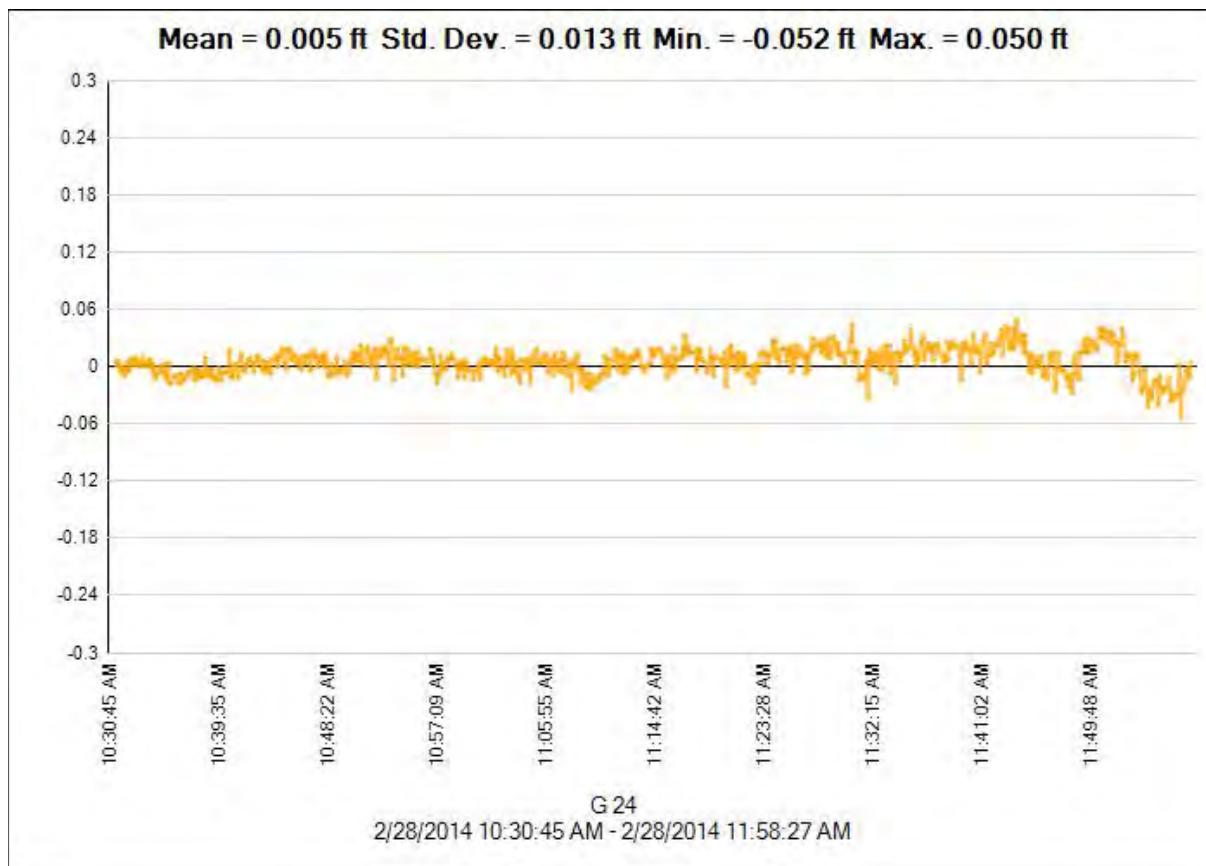


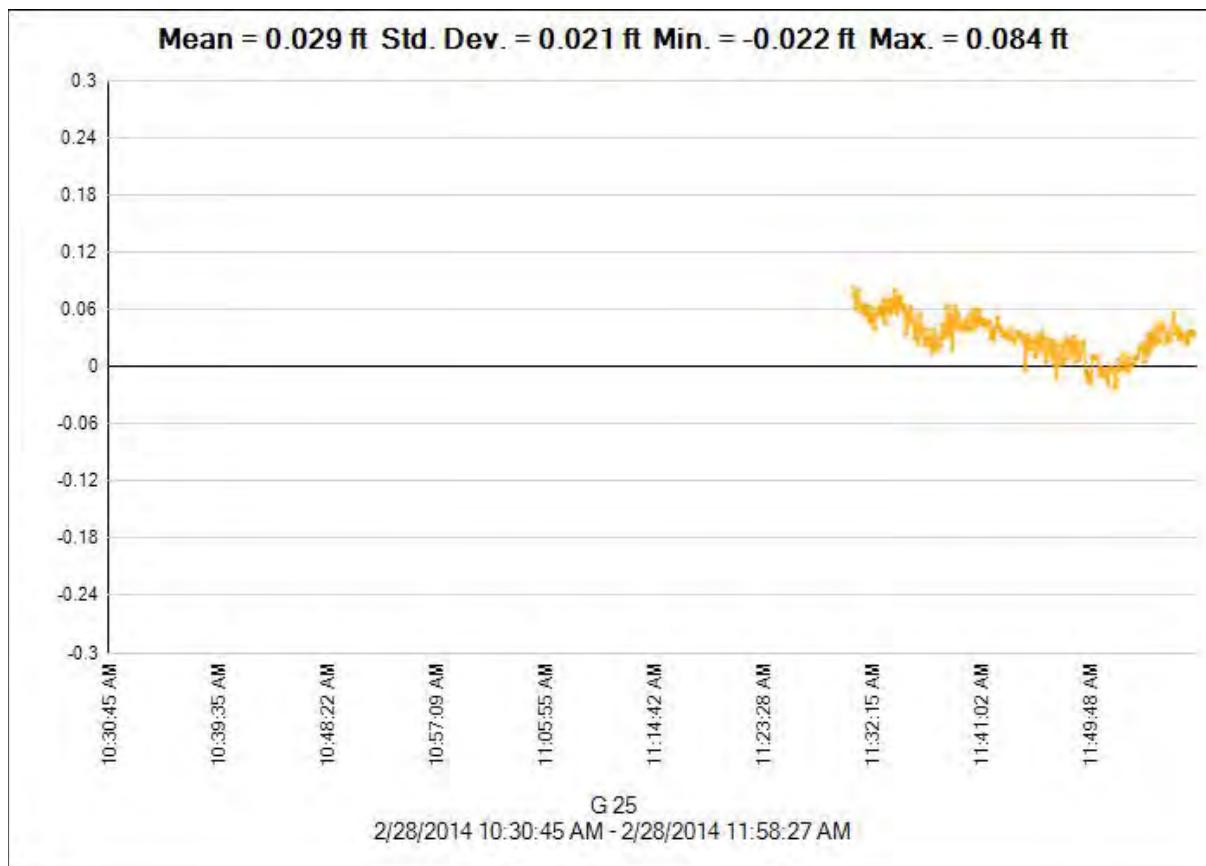


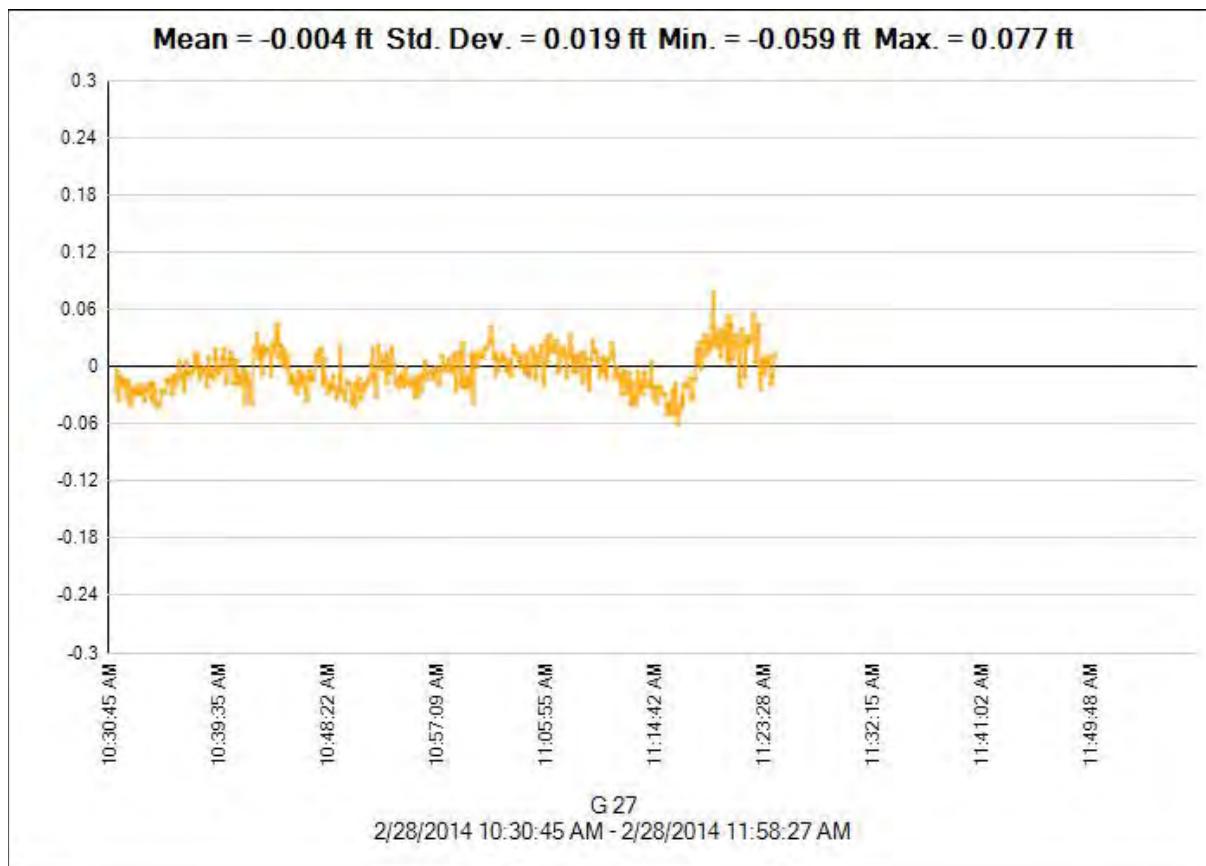


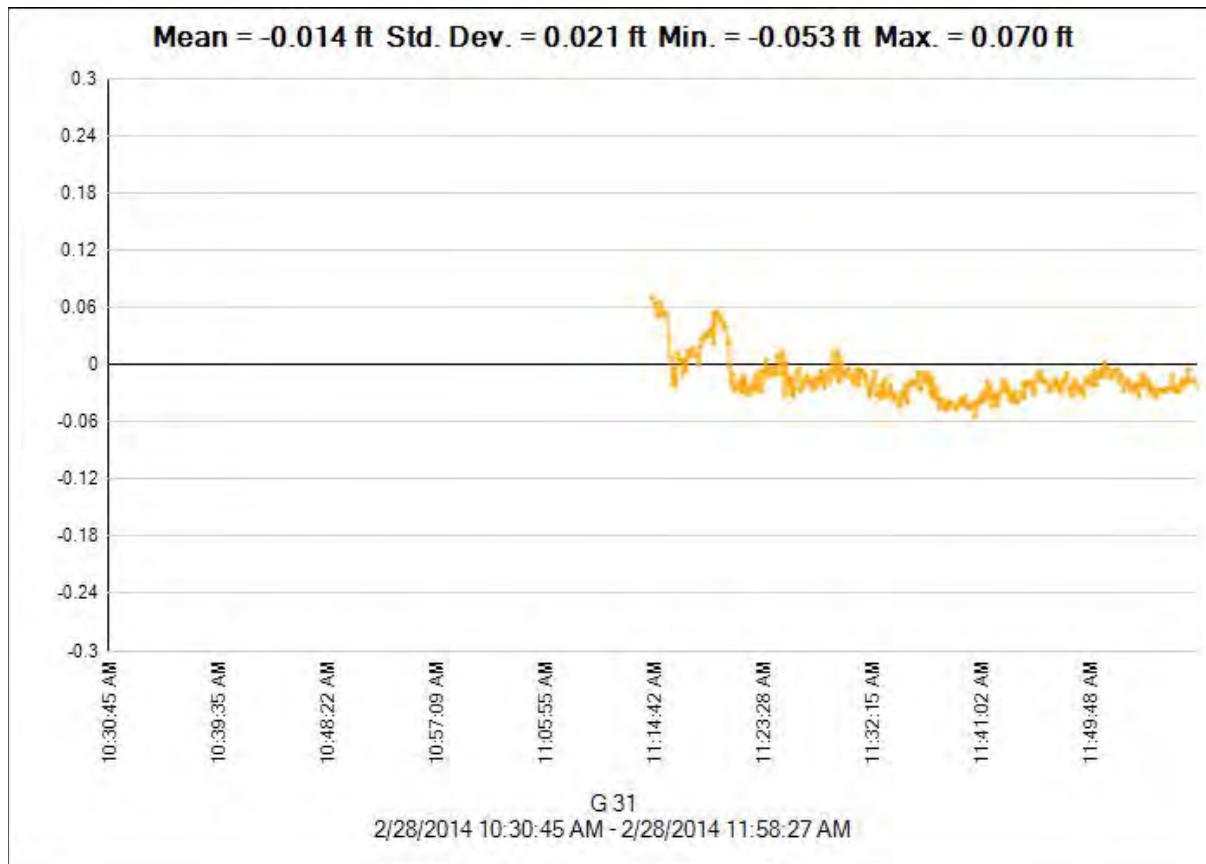














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





GRIS - FWTR (12:59:44 AM-10:59:43 AM) (S32)

Baseline observation: GRIS ---
FWTR
(B44)

Processed: 4/2/2014
10:00:47
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.078 ft

Vertical precision: 0.104 ft

RMS: 0.130 ft

Maximum PDOP: 4.192

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
1:01:44
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
10:59:29
AM
(Local:
UTC-6hr)

Processing duration: 09:57:45

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	GRIS
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Grid		Local		Global	
Northing	281033.474 ft	Latitude	N29°15'55.88300"	Latitude	N29°15'55.88300"
Easting	3719590.183 ft	Longitude	W89°57'26.26226"	Longitude	W89°57'26.26226"
Elevation	27.375 ft	Height	-51.286 ft	Height	-51.286 ft

To:	FWTR				
Grid		Local		Global	
Northing	384088.360 ft	Latitude	N29°33'09.21302"	Latitude	N29°33'09.21301"
Easting	2971987.425 ft	Longitude	W92°18'16.93987"	Longitude	W92°18'16.93987"
Elevation	27.010 ft	Height	-56.351 ft	Height	-56.351 ft

Vector					
ΔNorthing	103054.886 ft	NS Fwd Azimuth	278°31'31"	ΔX	-746234.874 ft
ΔEasting	-747602.757 ft	Ellipsoid Dist.	754687.996 ft	ΔY	65991.862 ft
ΔElevation	-0.365 ft	ΔHeight	-5.065 ft	ΔZ	90928.468 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.015 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.032 ft
σ ΔEasting	0.032 ft	σ Ellipsoid Dist.	0.032 ft	σ ΔY	0.047 ft
σ ΔElevation	0.053 ft	σ ΔHeight	0.053 ft	σ ΔZ	0.029 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000929960		
Y	-0.0000195494	0.0002045516	
Z	-0.0000010500	-0.0001000905	0.0000769982

Occupations

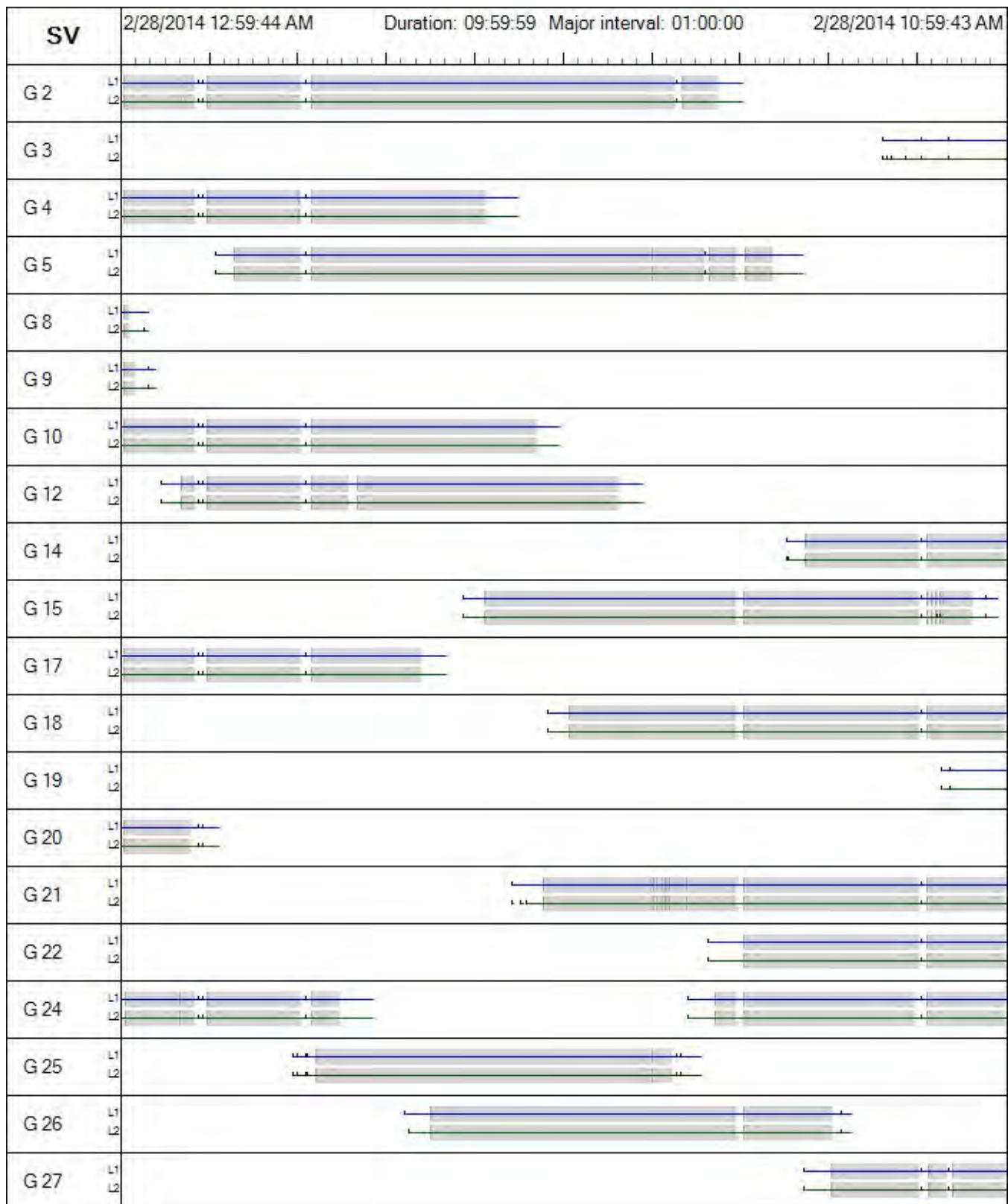
	From	To
Point ID:	GRIS	FWTR



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\FWTR059E.14o
Receiver type:	NetR9	NetRS
Receiver serial number:	5201K41142	Unknown
Antenna type:	Zephyr Geodetic 2 RoHS	Zephyr Geodetic
Antenna serial number:	5000117437	12697374
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount



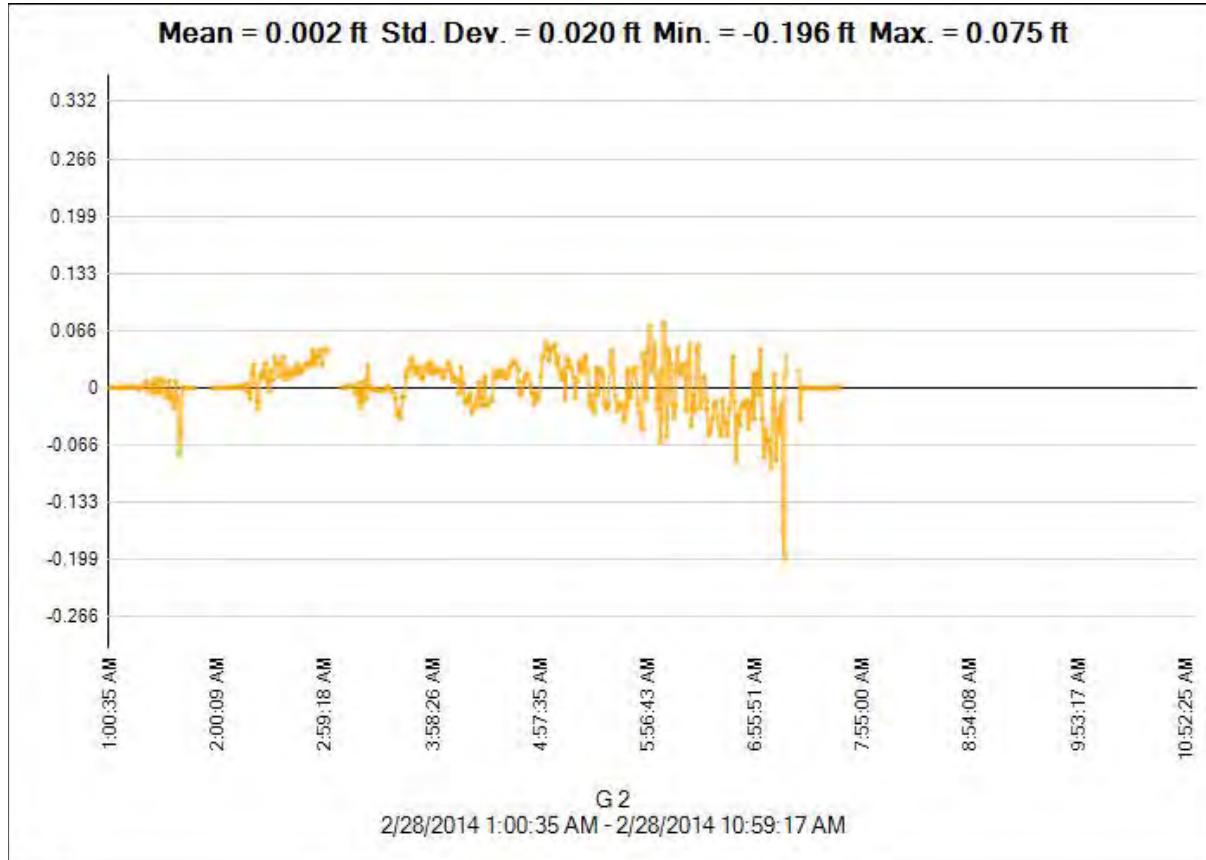
Tracking Summary

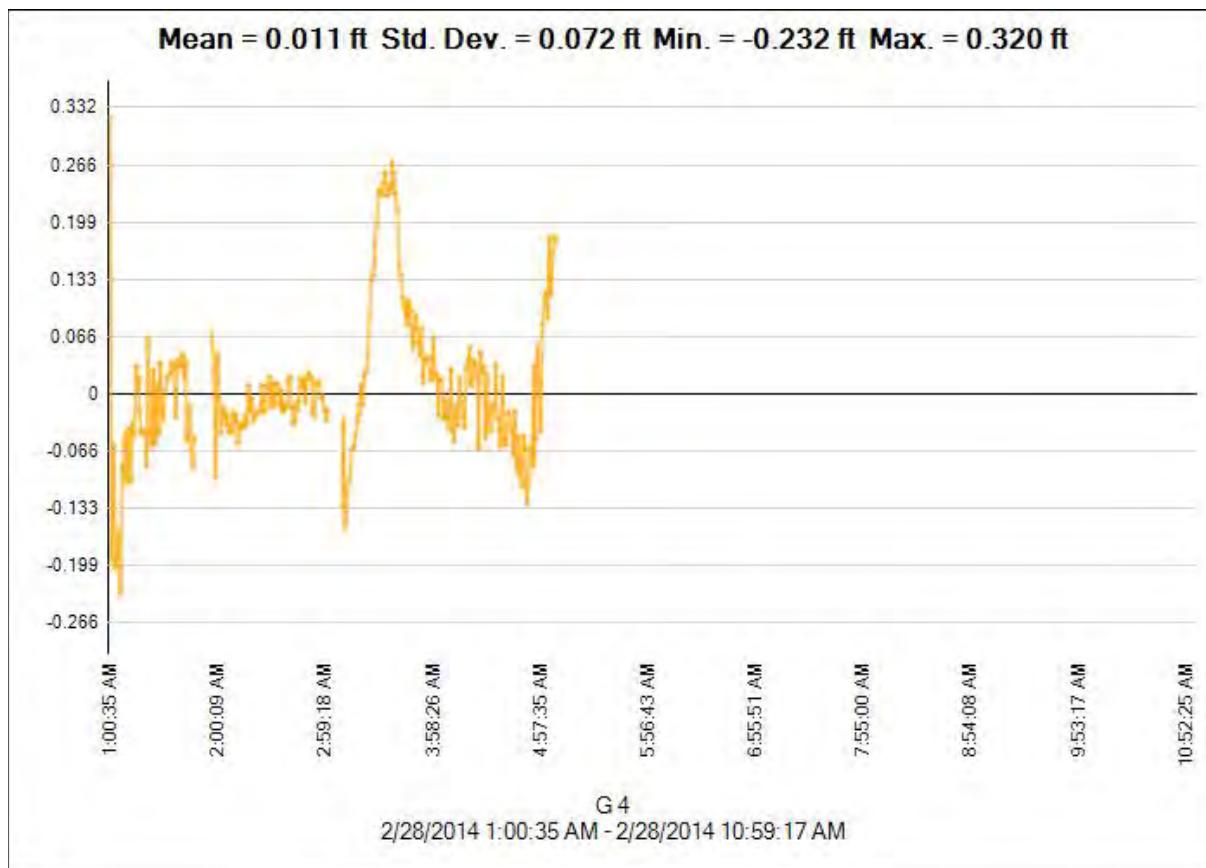


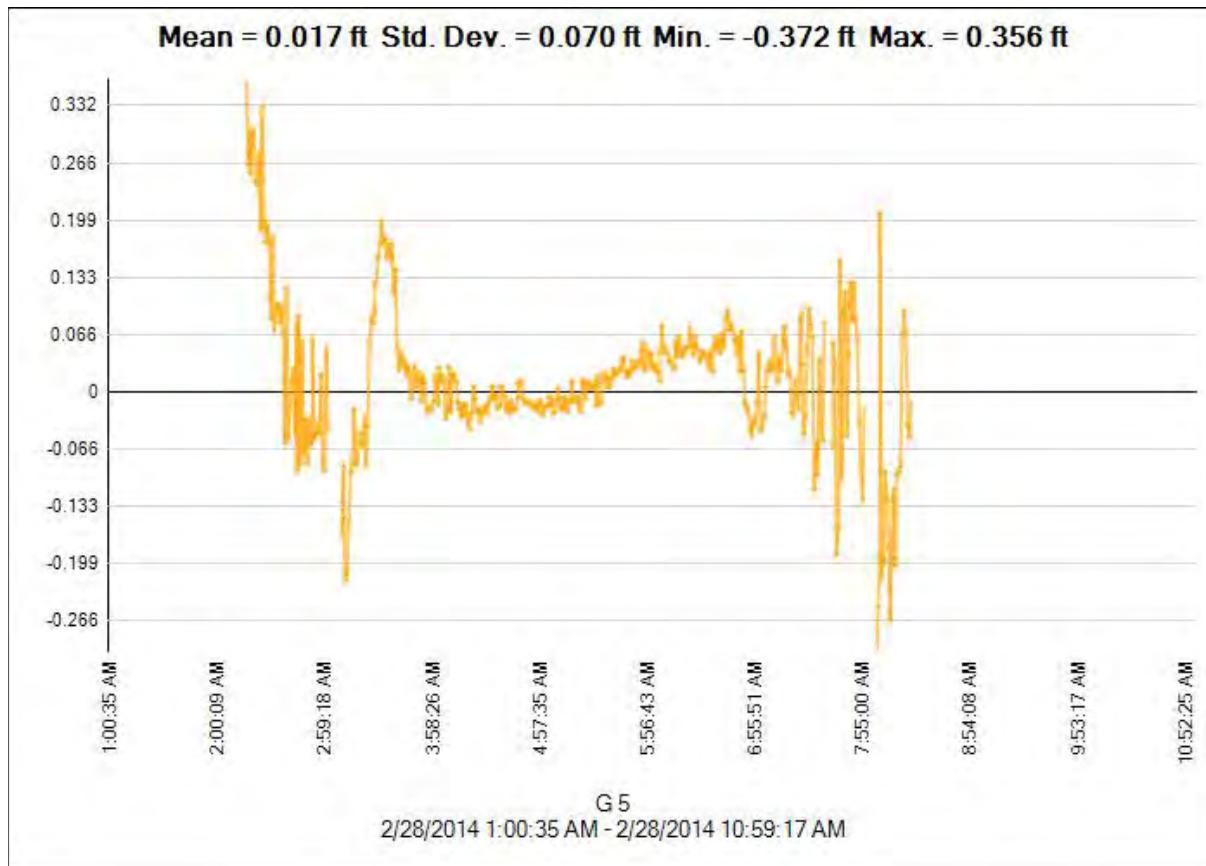


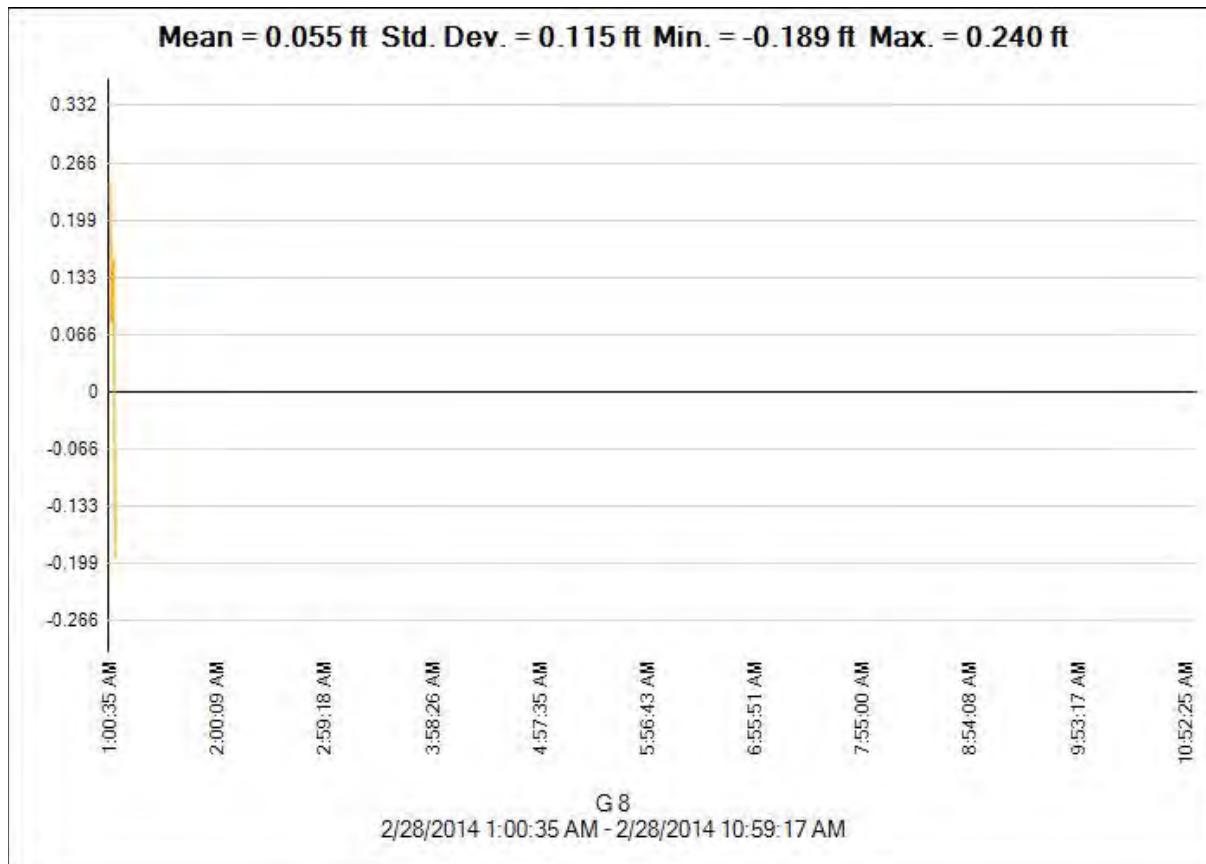


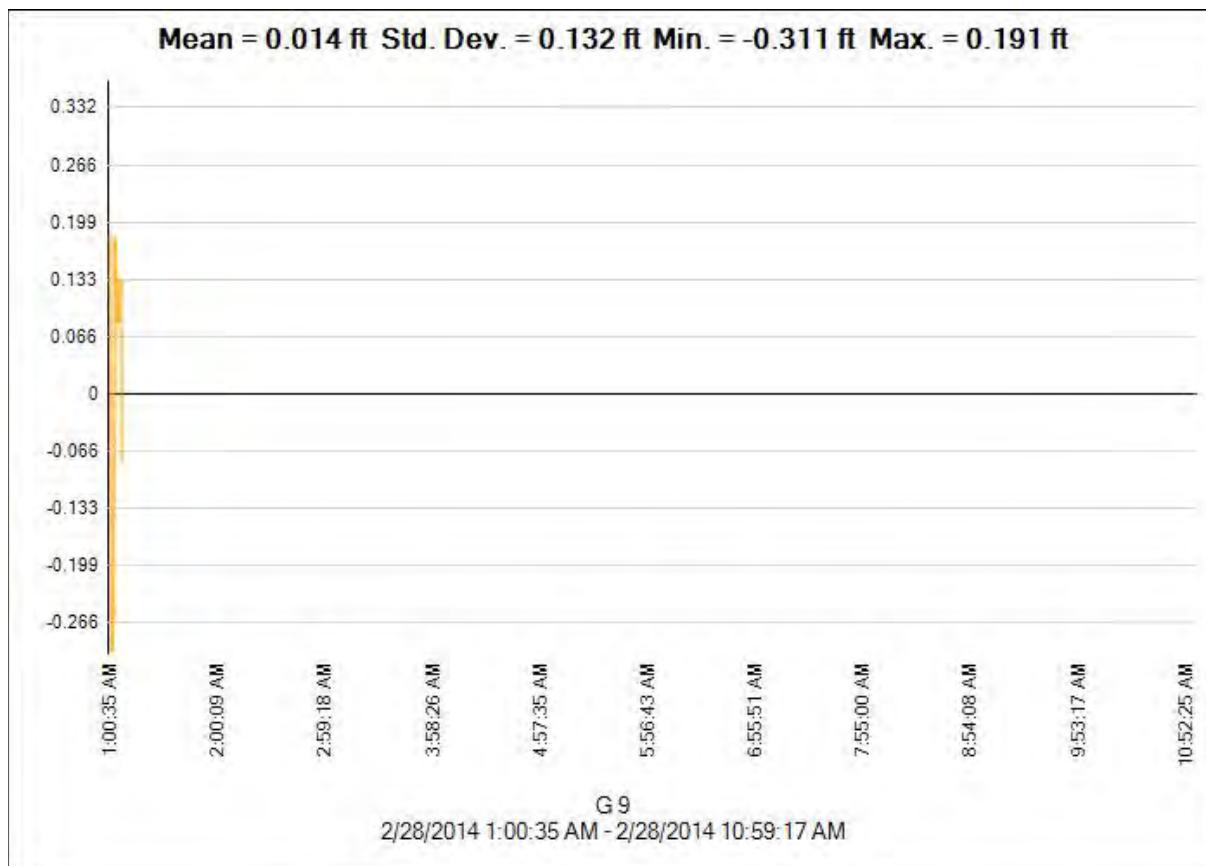
Residuals

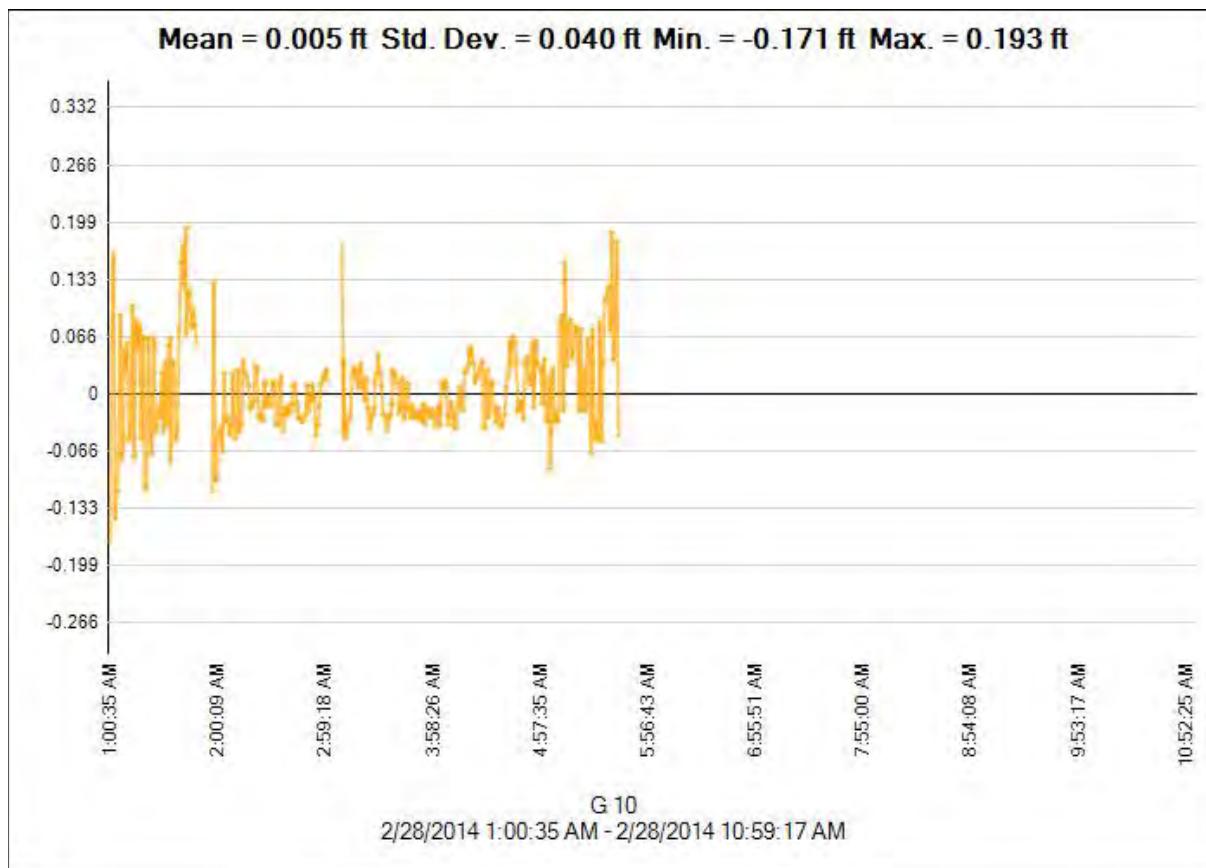


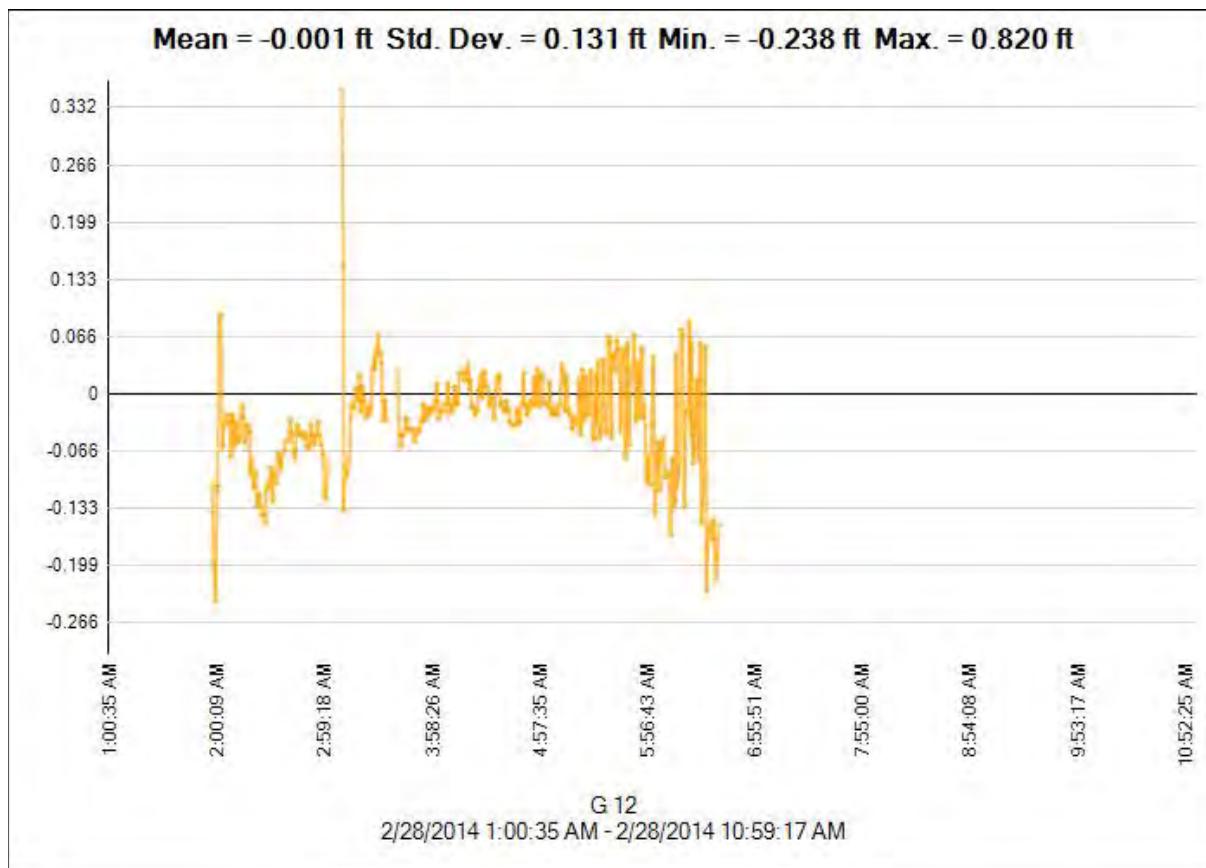


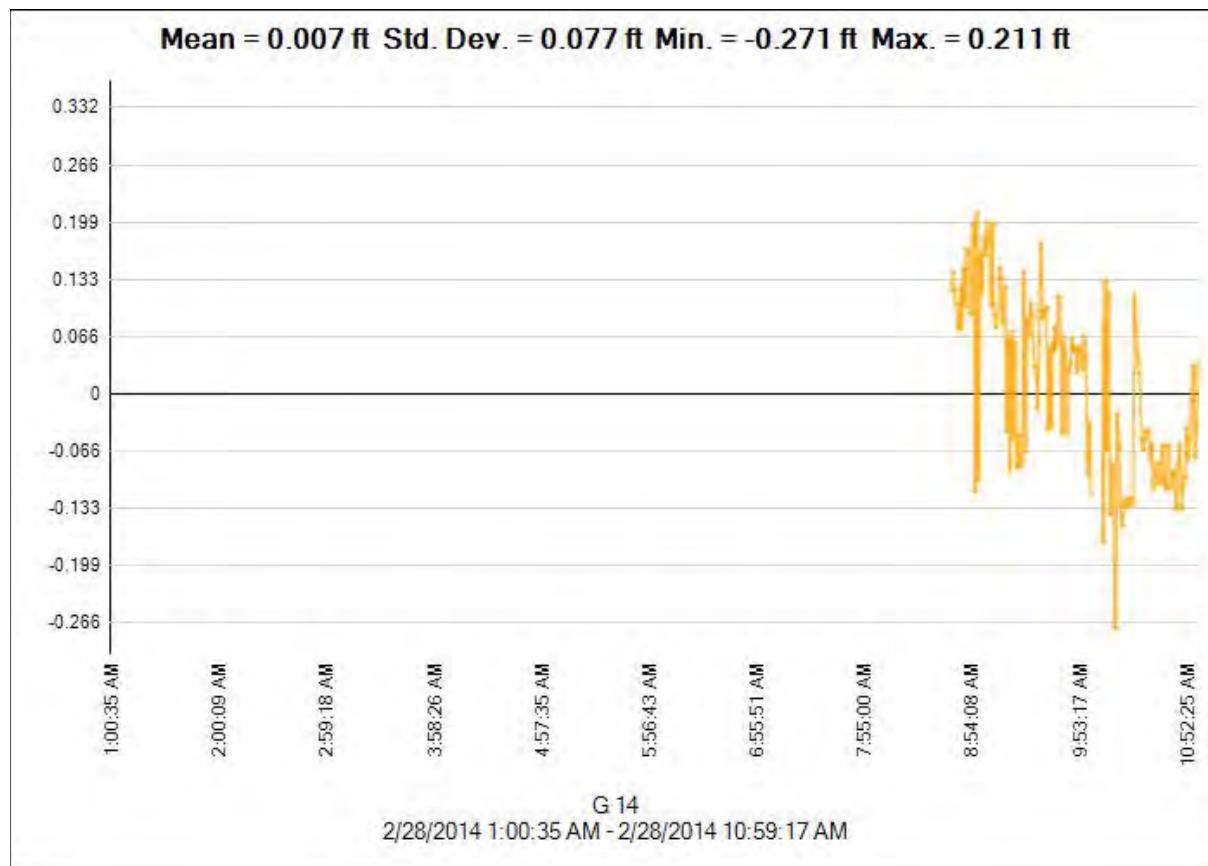


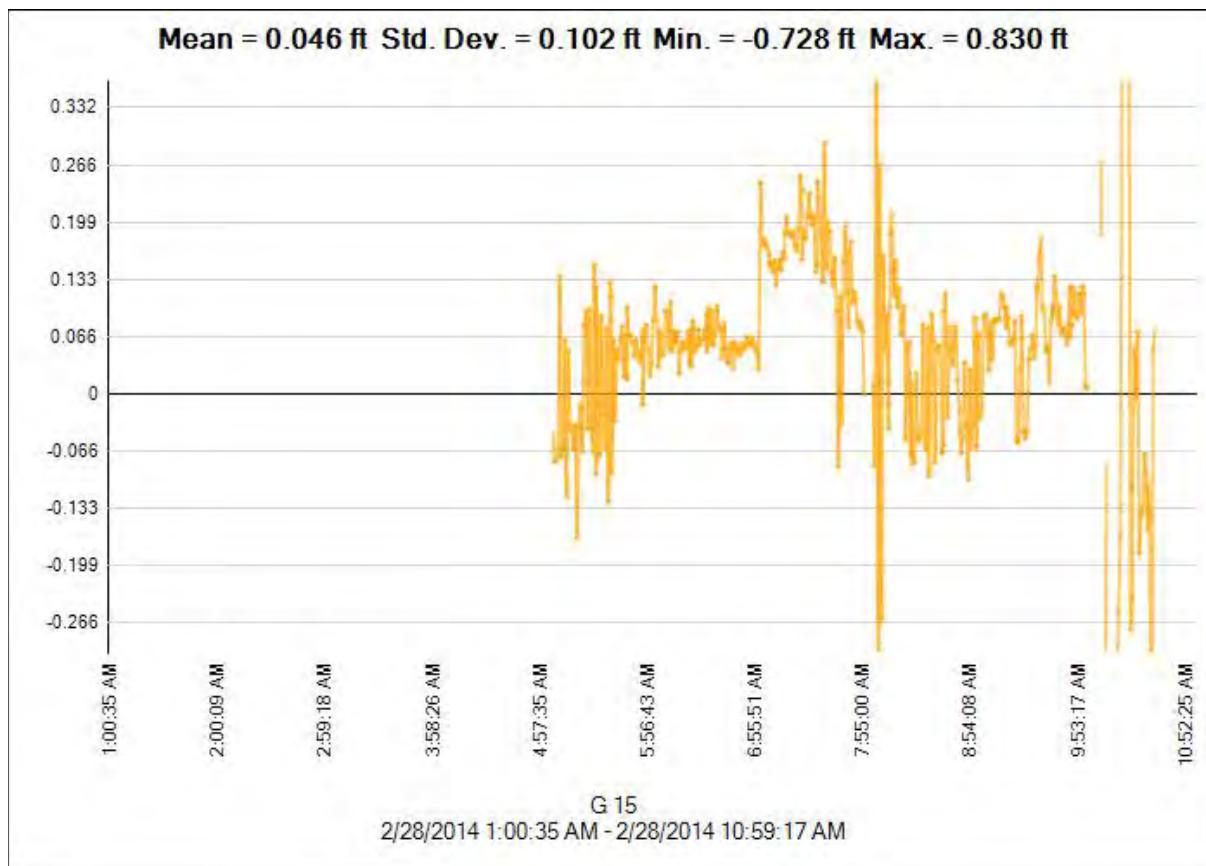


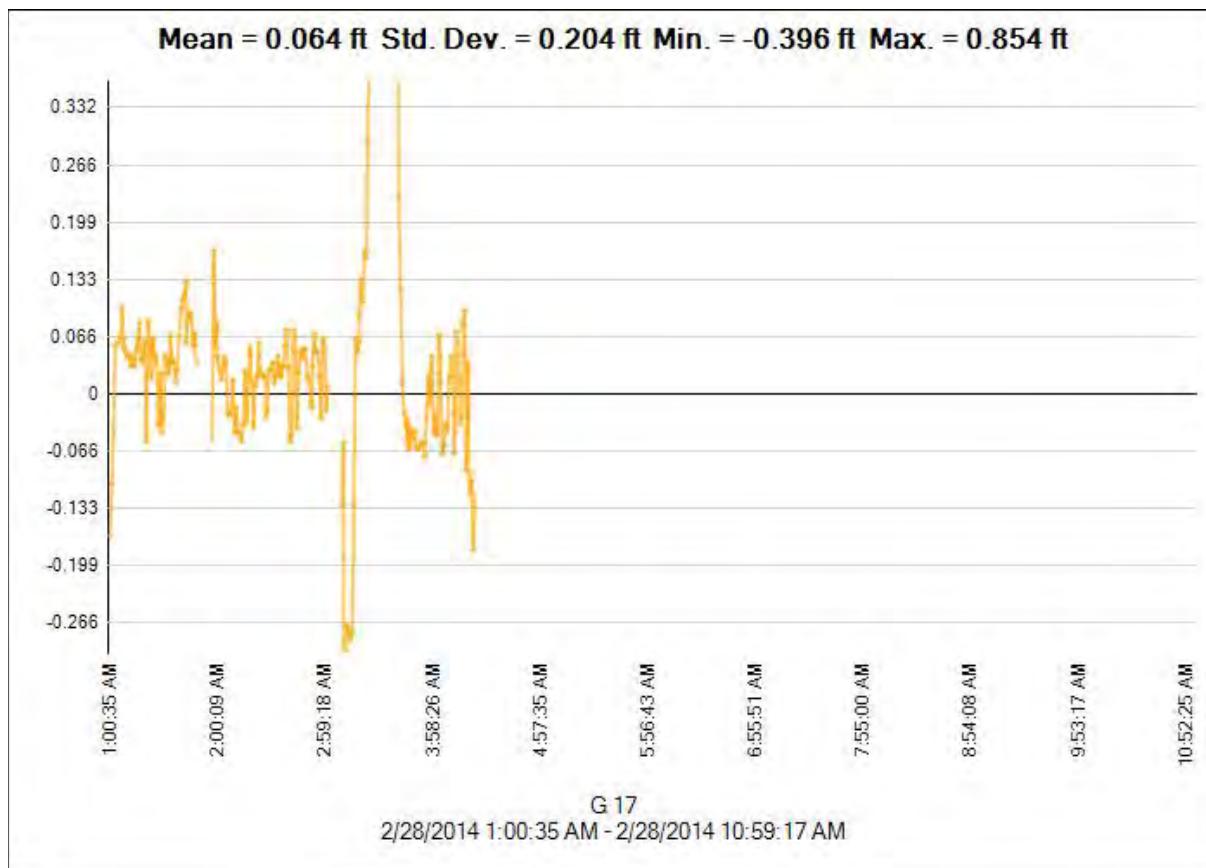


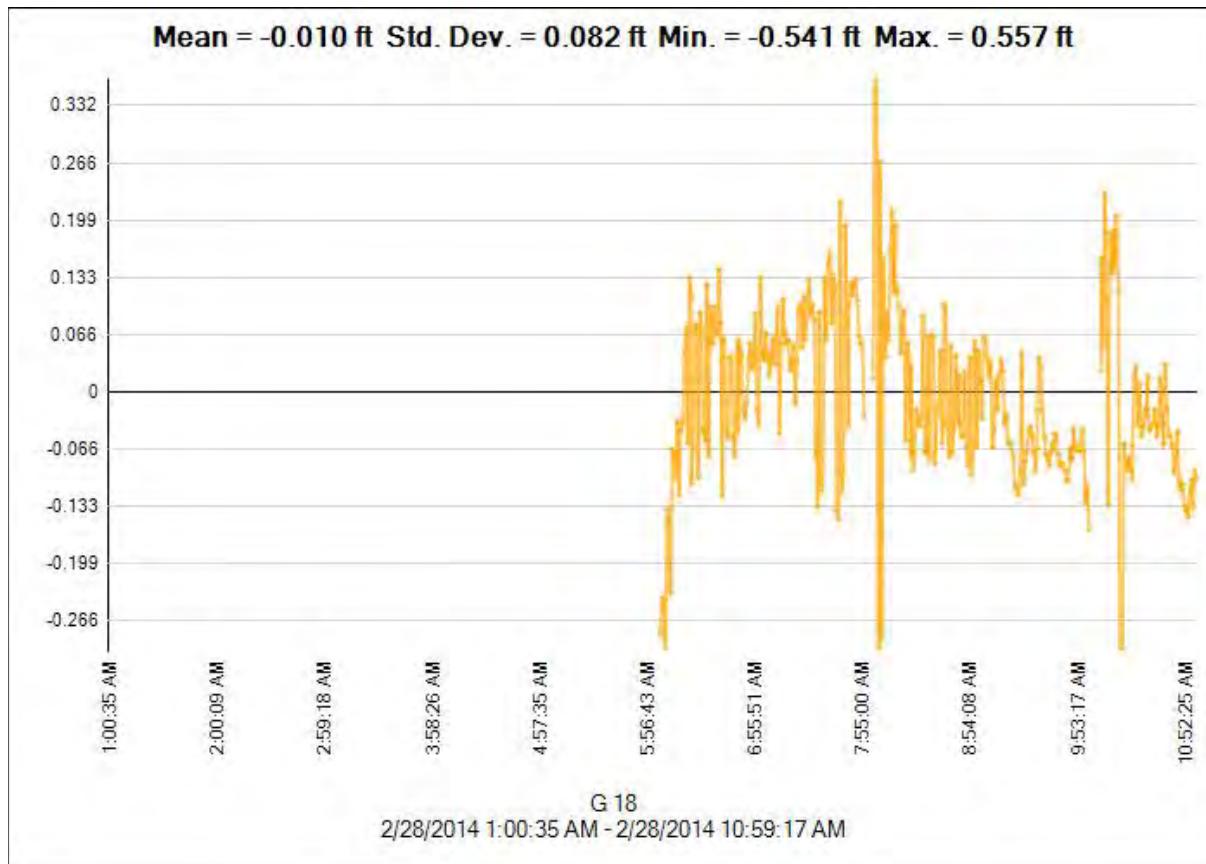


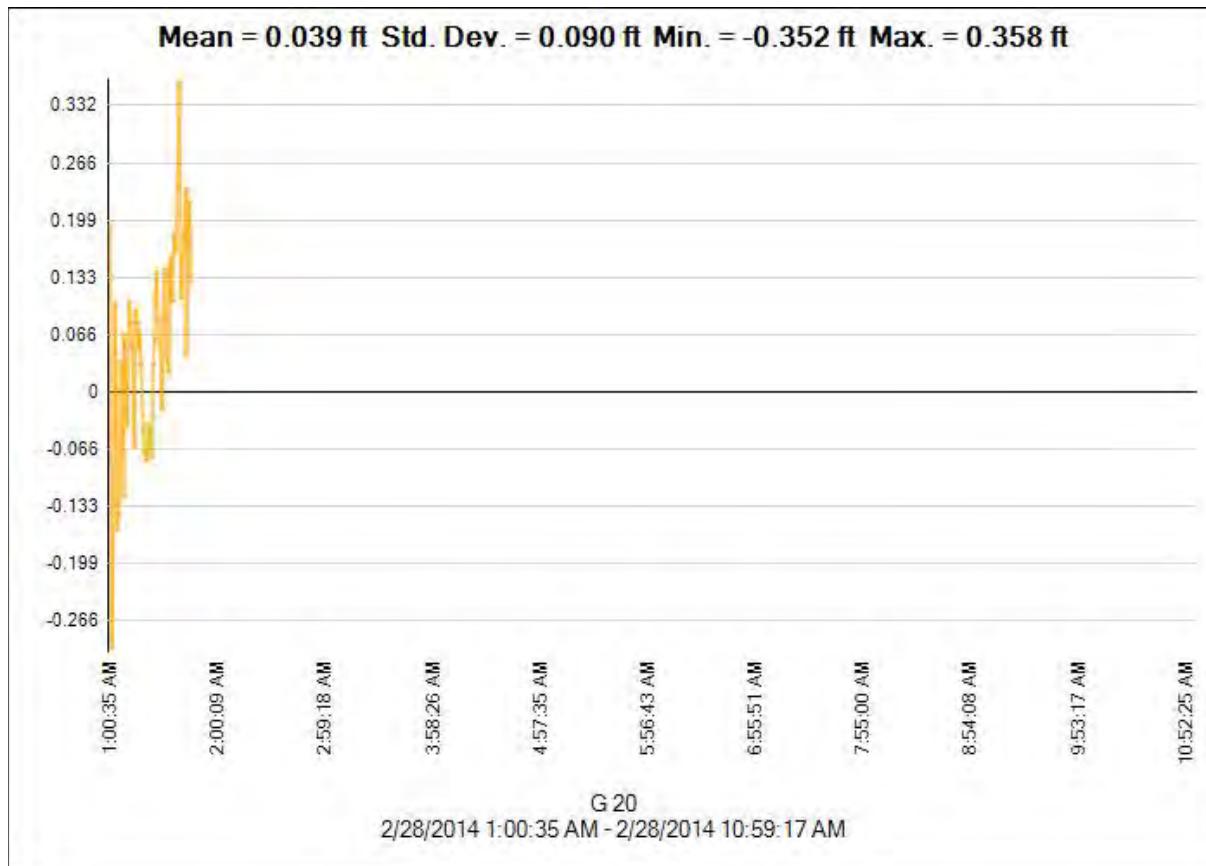


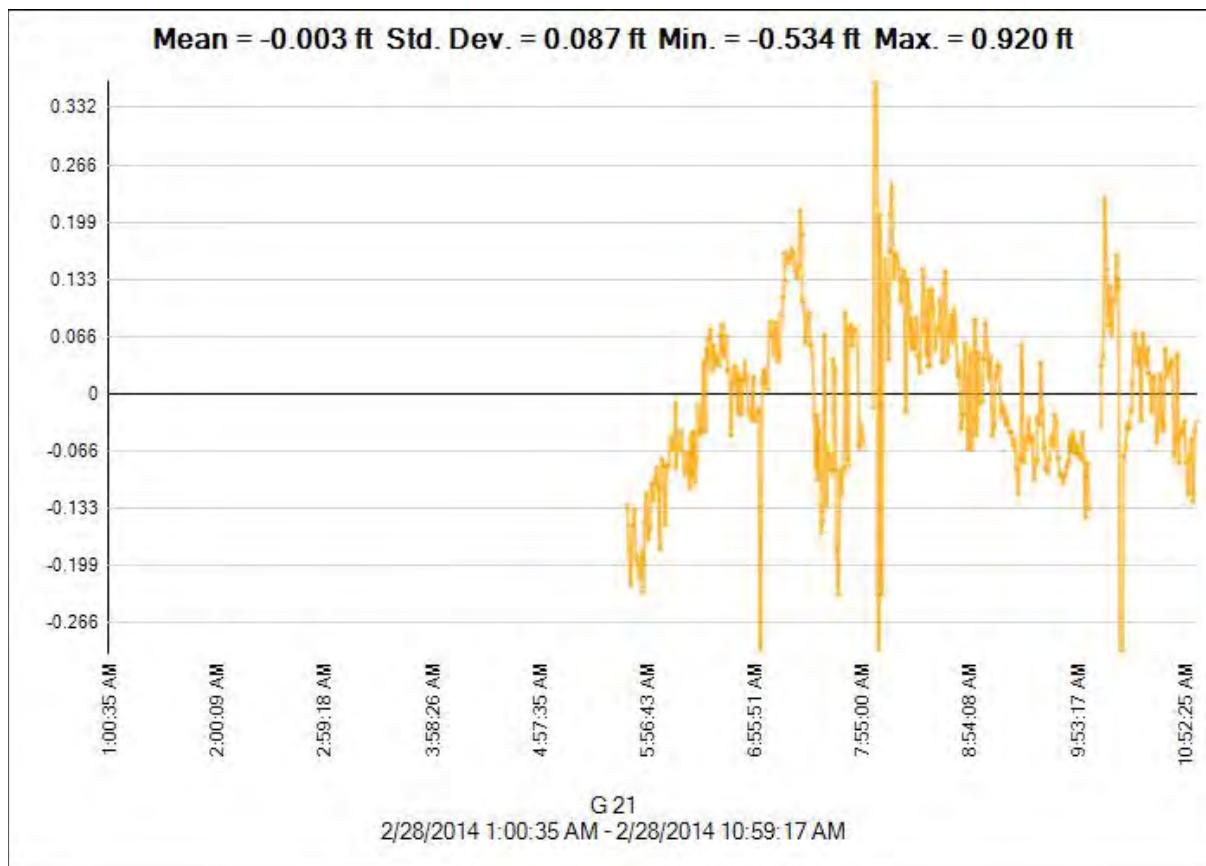


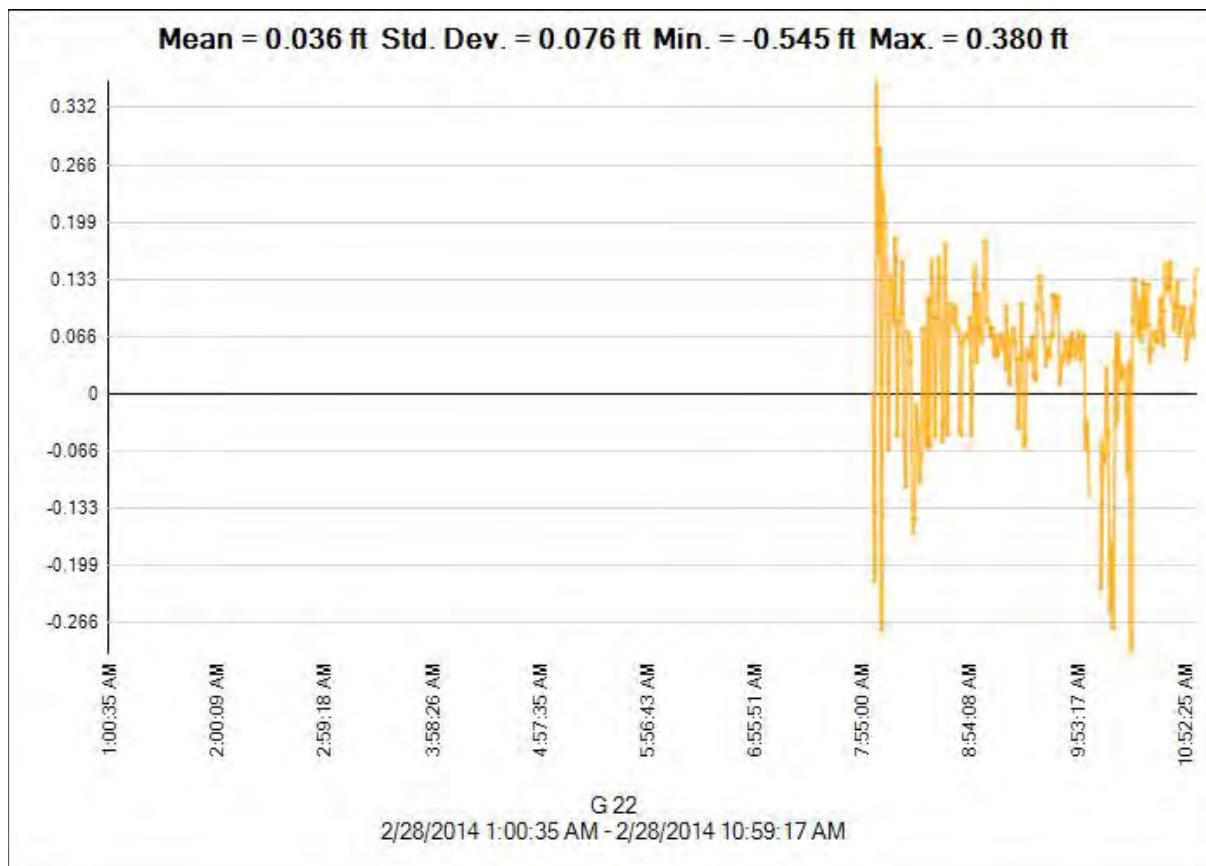


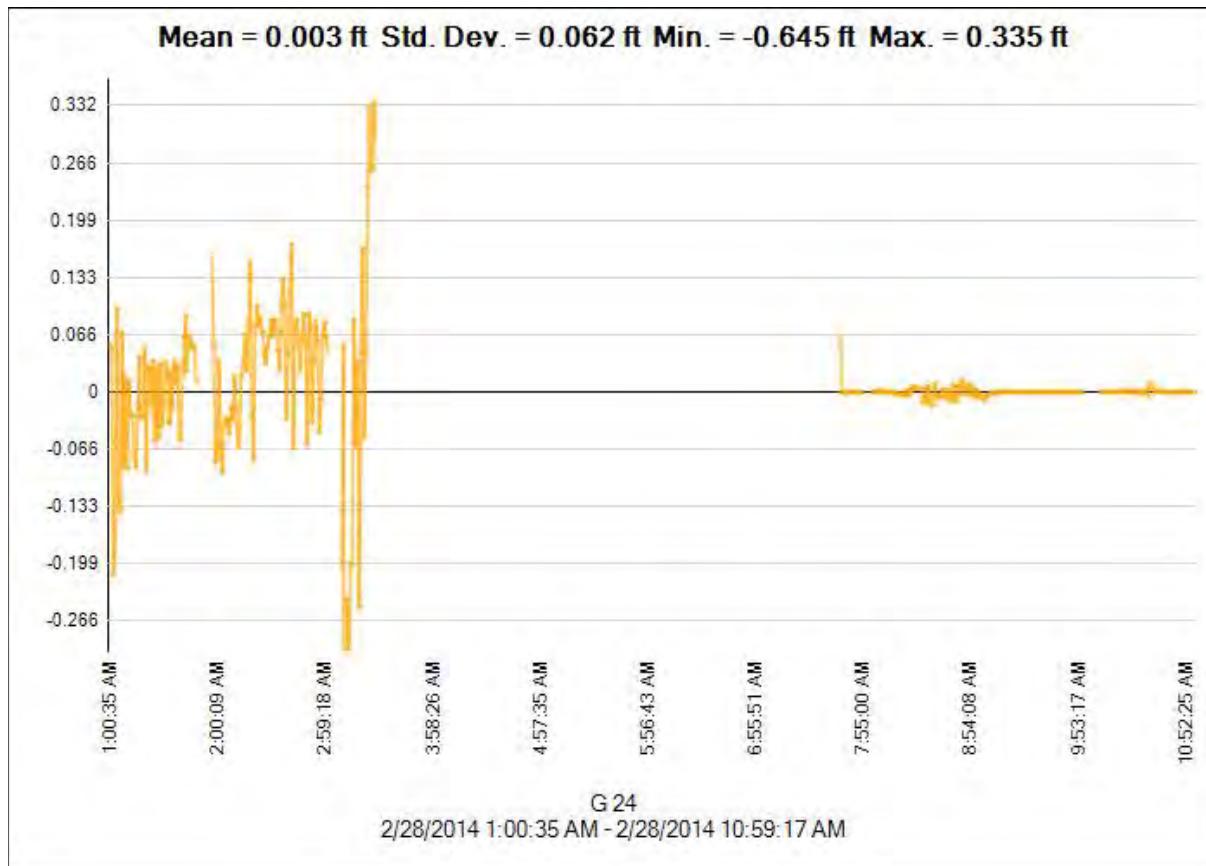


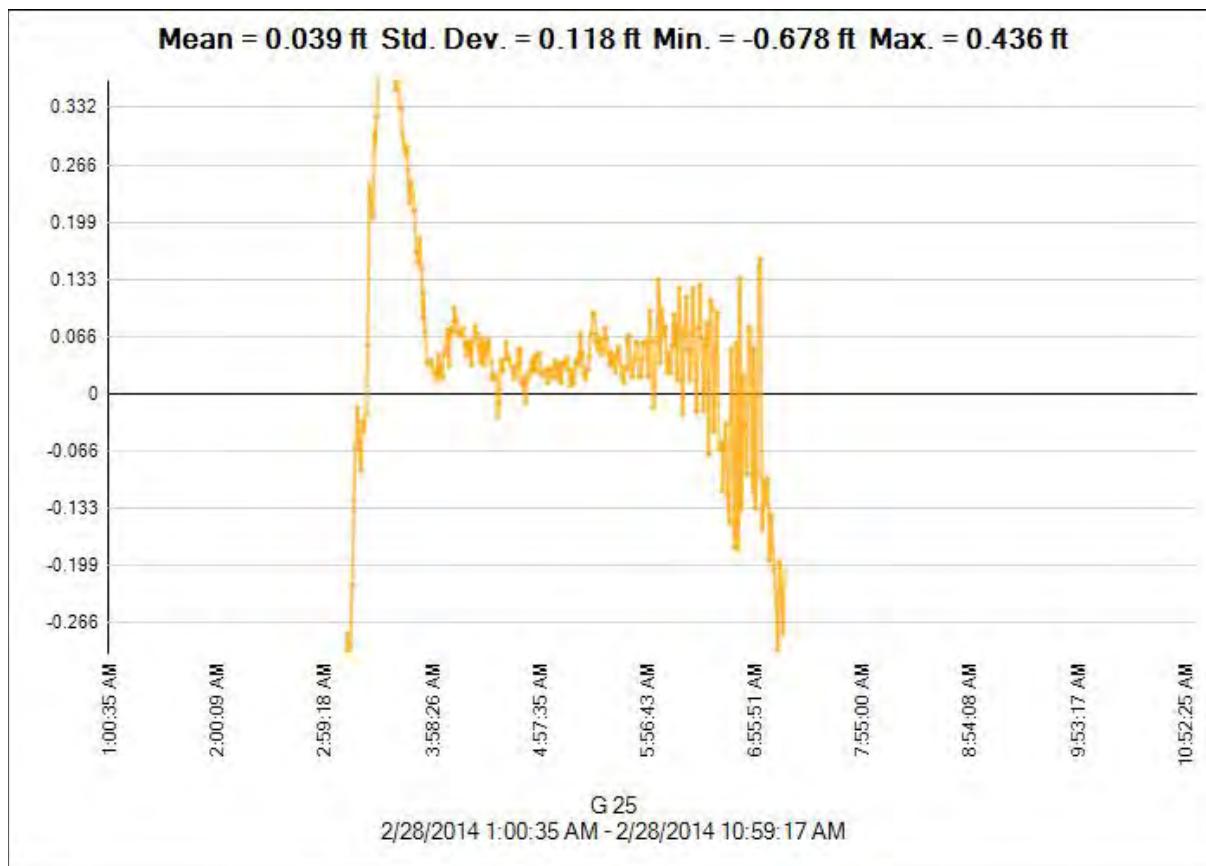


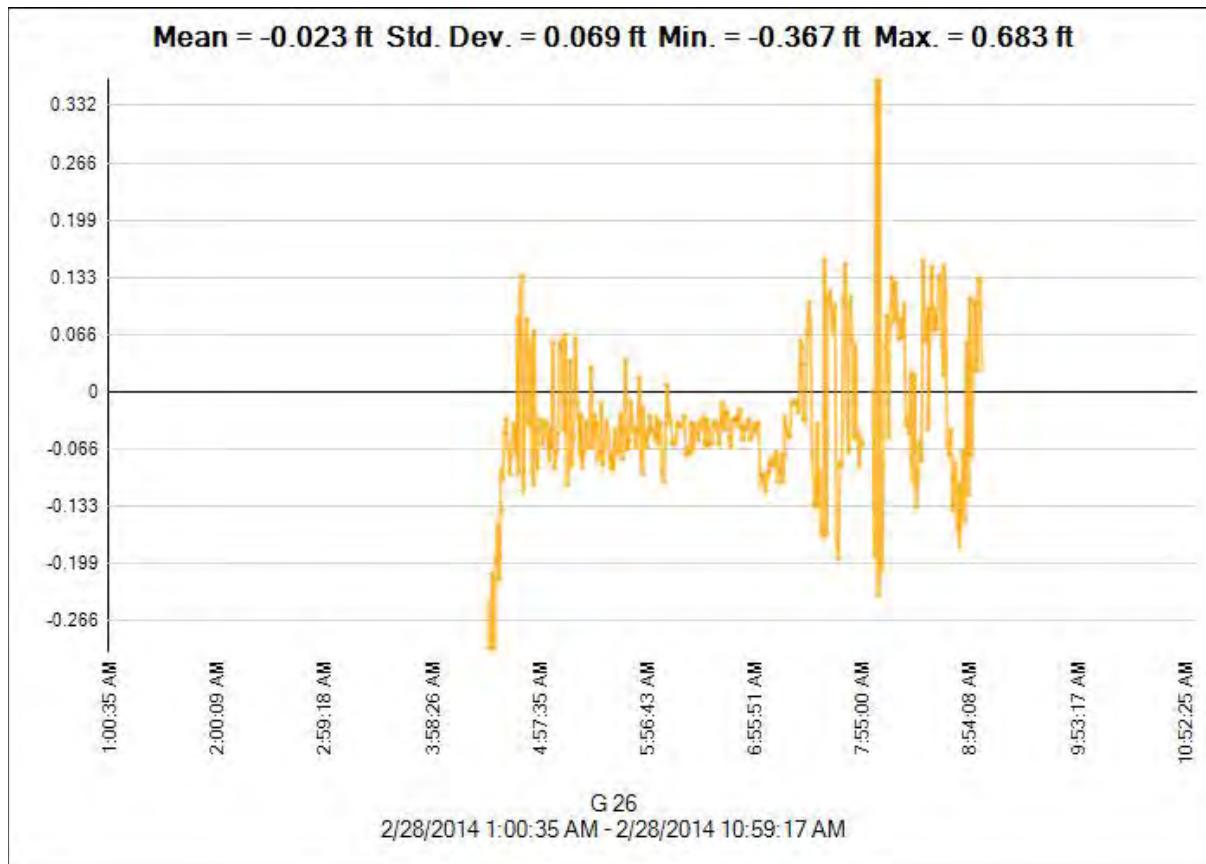


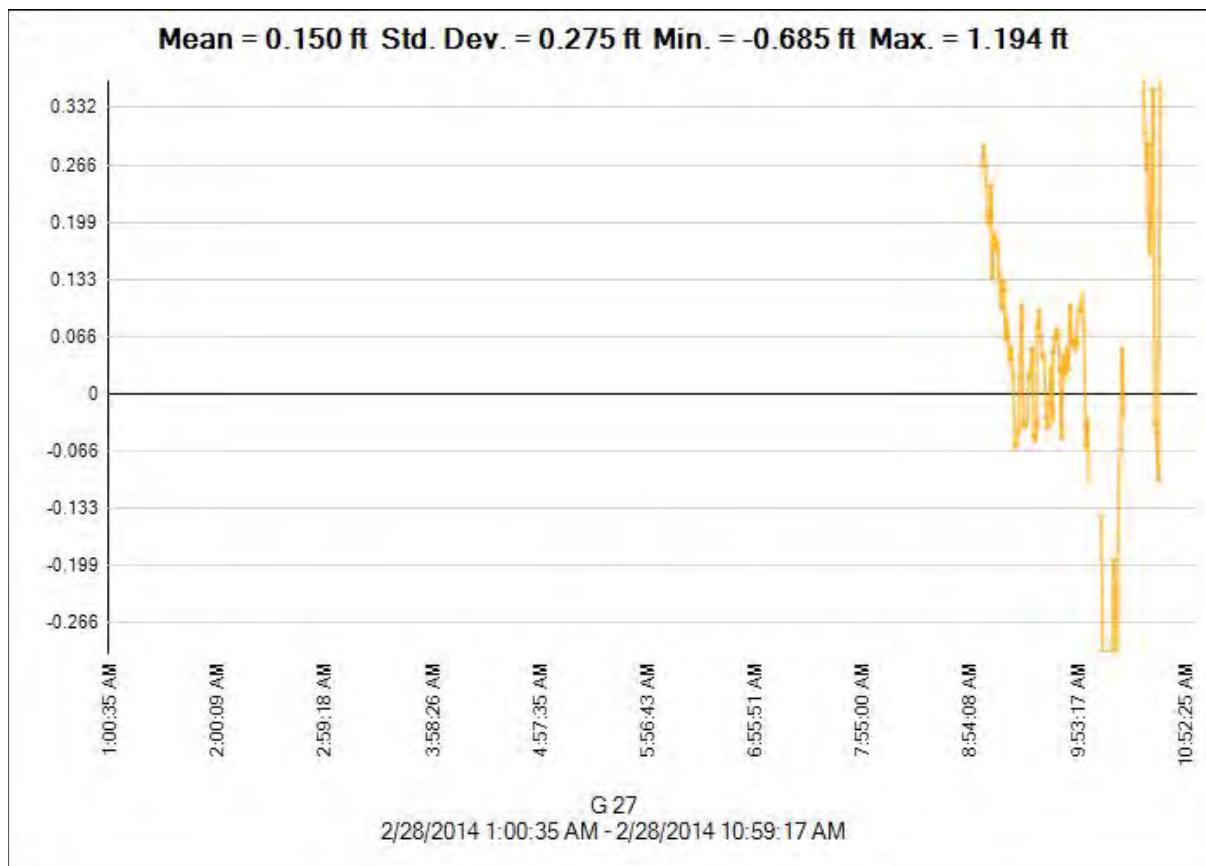


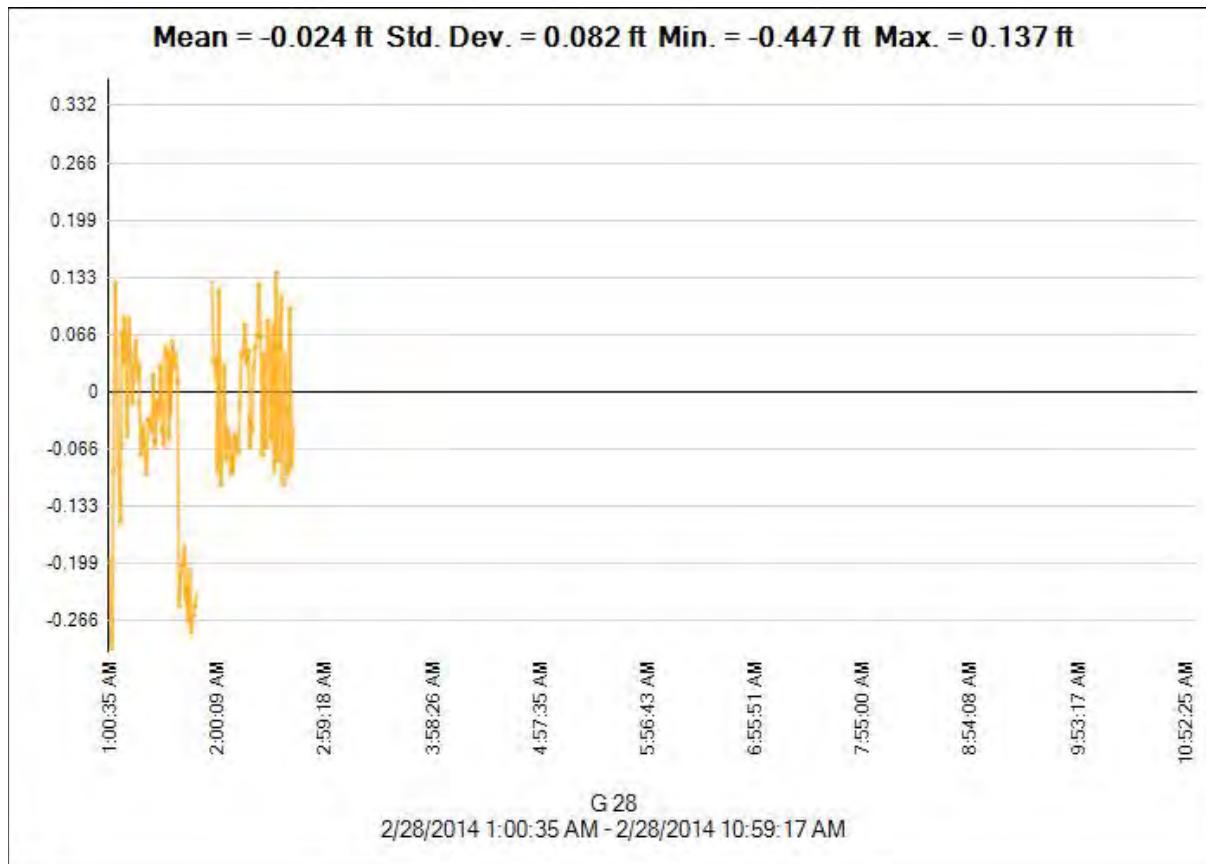


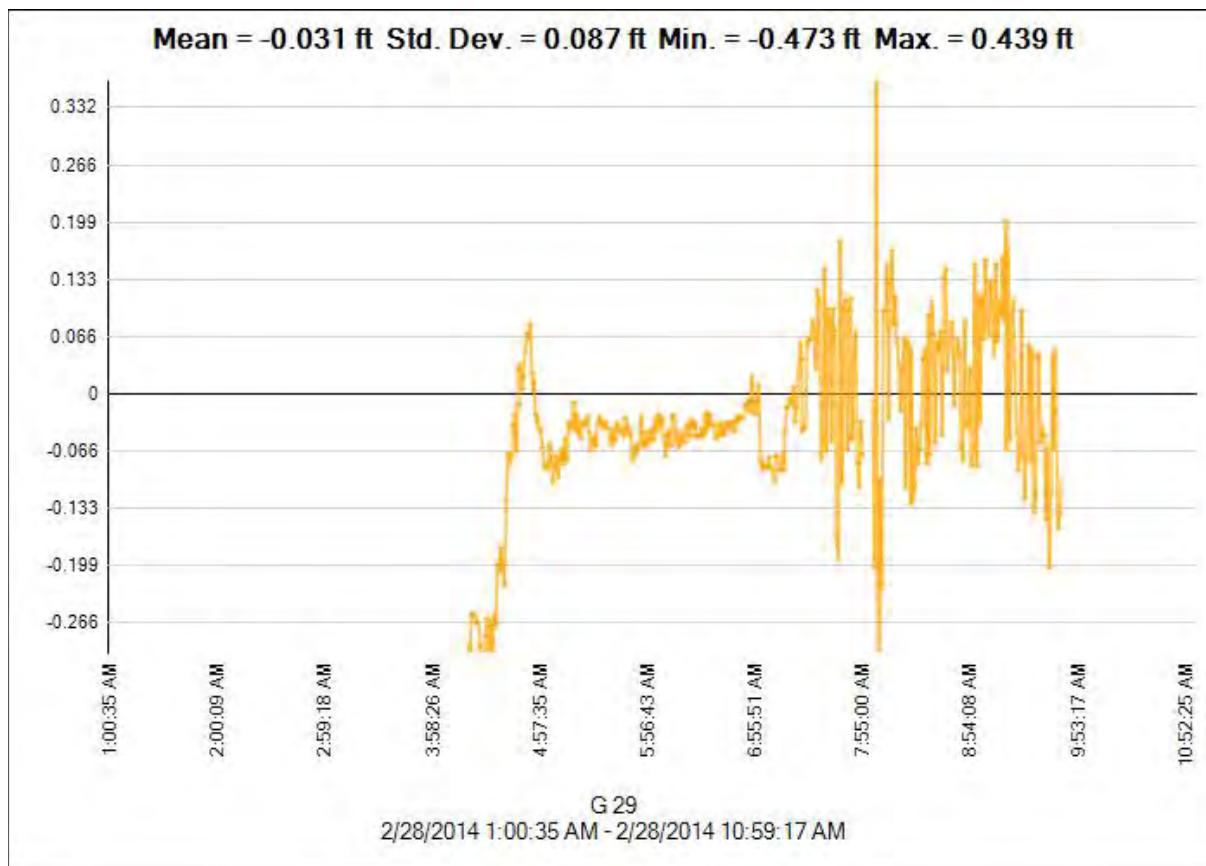














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





HOUN - FWTR (12:59:44 AM-10:59:43 AM) (S33)

Baseline observation: HOUN ---
FWTR
(B45)

Processed: 4/2/2014
10:00:10
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.031 ft

Vertical precision: 0.086 ft

RMS: 0.050 ft

Maximum PDOP: 3.297

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
1:02:29
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
10:59:29
AM
(Local:
UTC-6hr)

Processing duration: 09:57:00

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	HOUN
-------	------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	FWTR				
Grid		Local		Global	
Northing	384088.364 ft	Latitude	N29°33'09.21307"	Latitude	N29°33'09.21306"
Easting	2971987.472 ft	Longitude	W92°18'16.93934"	Longitude	W92°18'16.93934"
Elevation	27.009 ft	Height	-56.352 ft	Height	-56.352 ft

Vector					
ΔNorthing	-13640.968 ft	NS Fwd Azimuth	268°44'43"	ΔX	-502631.866 ft
ΔEasting	-502631.482 ft	Ellipsoid Dist.	502840.015 ft	ΔY	6176.969 ft
ΔElevation	-18.341 ft	ΔHeight	-19.170 ft	ΔZ	-12564.136 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.010 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.013 ft
σ ΔEasting	0.013 ft	σ Ellipsoid Dist.	0.013 ft	σ ΔY	0.038 ft
σ ΔElevation	0.044 ft	σ ΔHeight	0.044 ft	σ ΔZ	0.024 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000152165		
Y	0.0000020514	0.0001373730	
Z	-0.0000022702	-0.0000730910	0.0000515942

Occupations

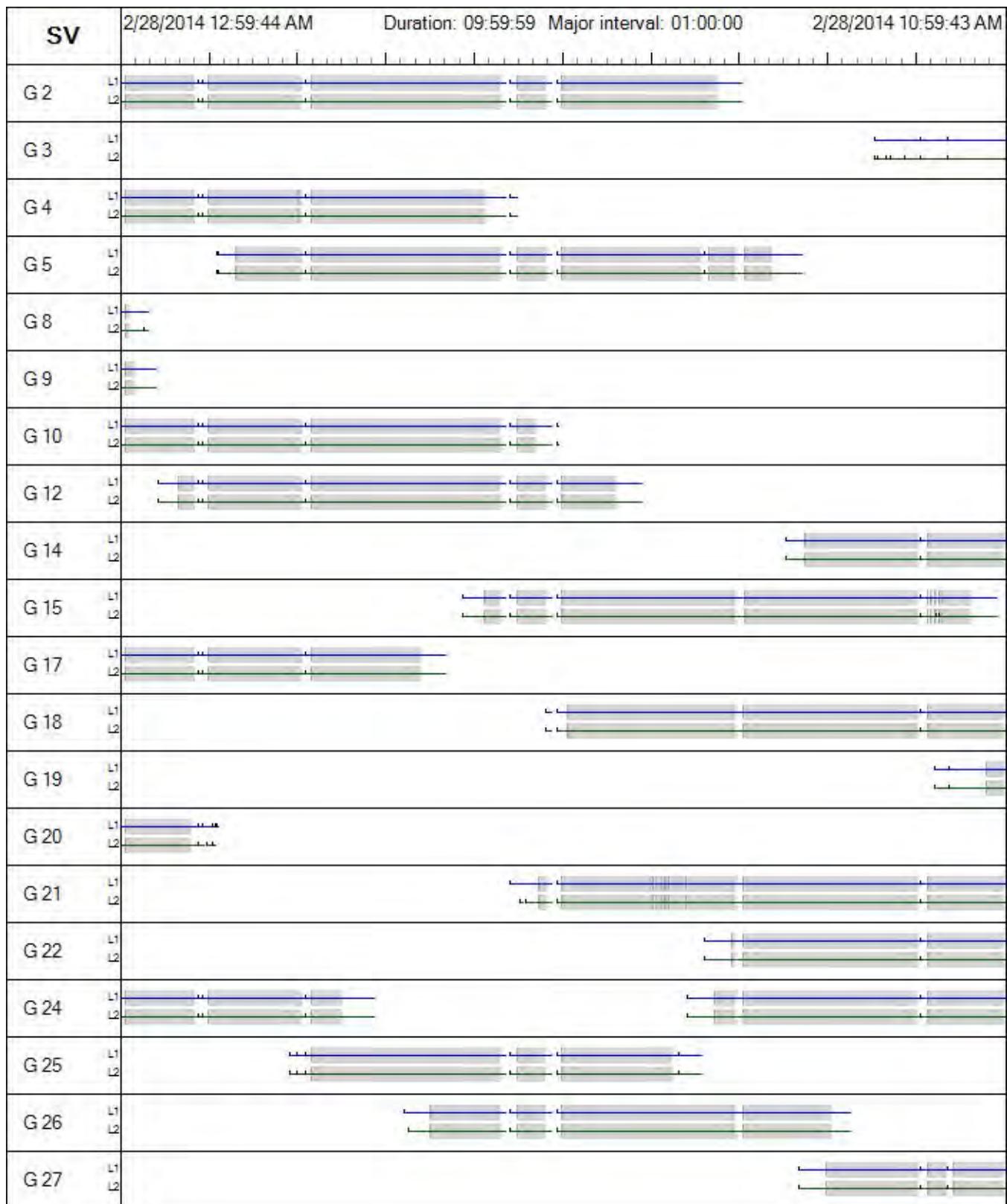
	From	To
Point ID:	HOUM	FWTR



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\FWTR059E.14o
Receiver type:	NetRS	NetRS
Receiver serial number:	4646125537	Unknown
Antenna type:	Zephyr Geodetic	Zephyr Geodetic
Antenna serial number:	-----	12697374
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Antenna Phase Center	Bottom of antenna mount



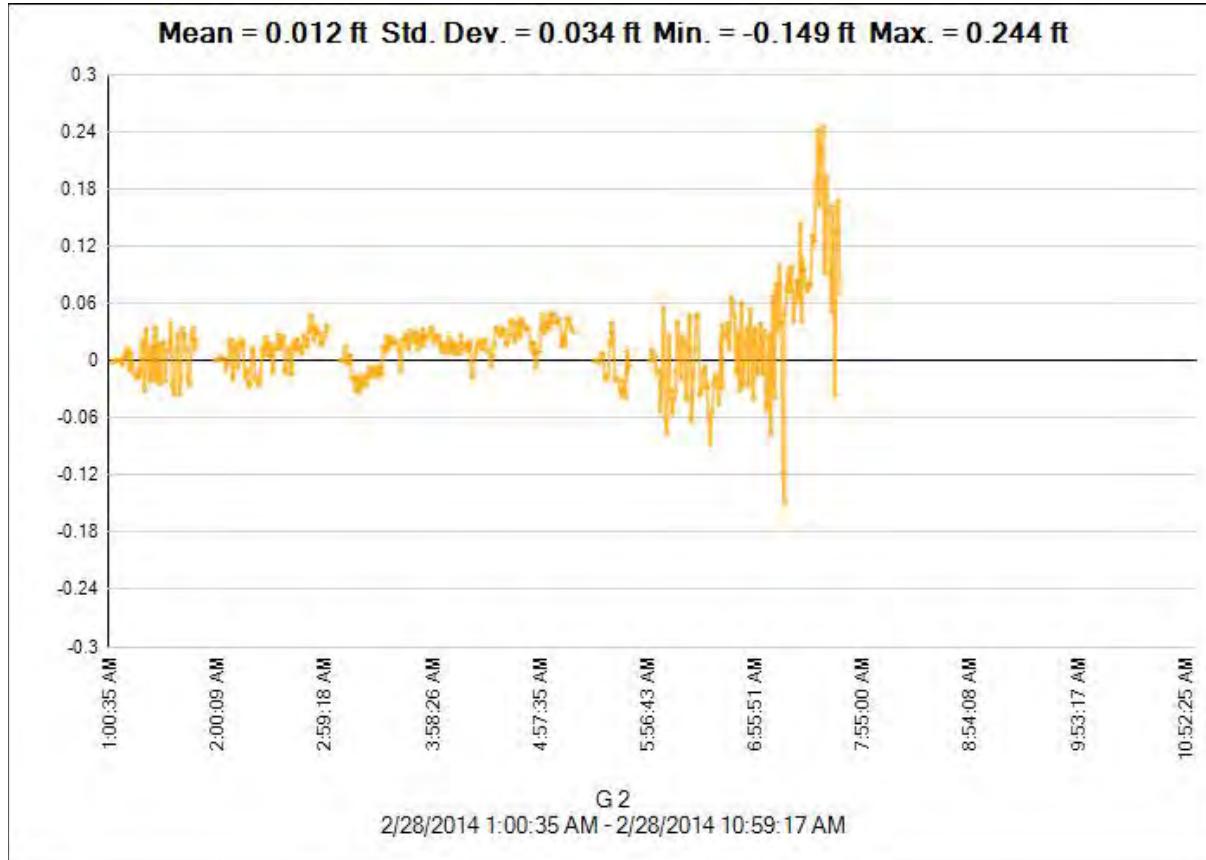
Tracking Summary

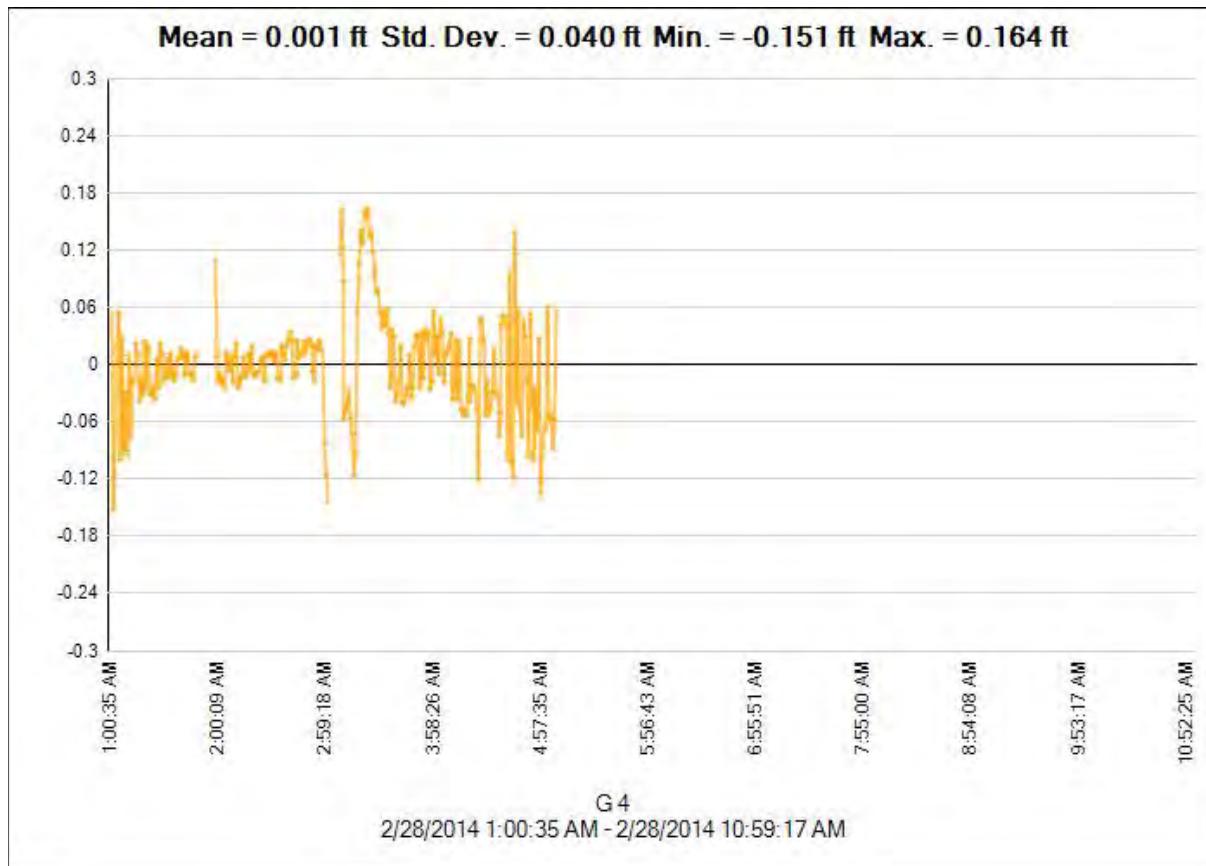


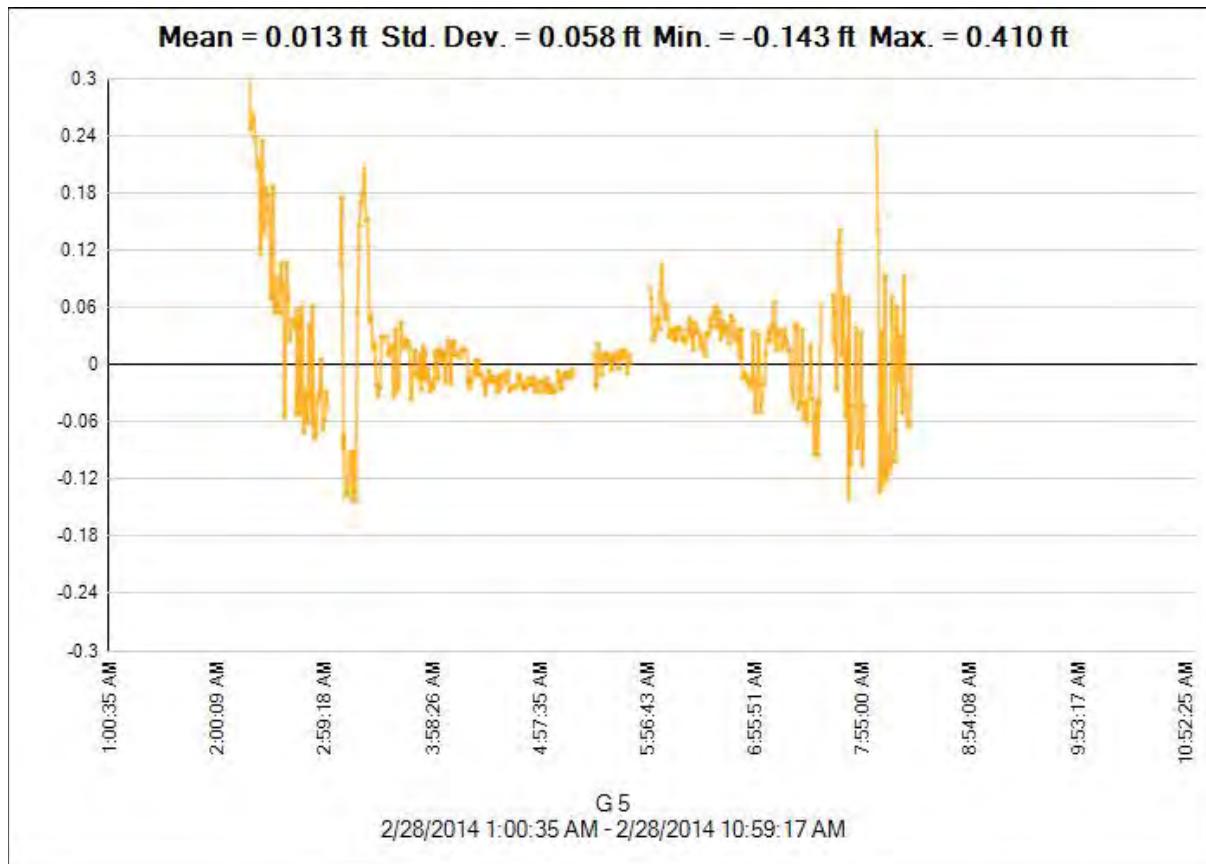


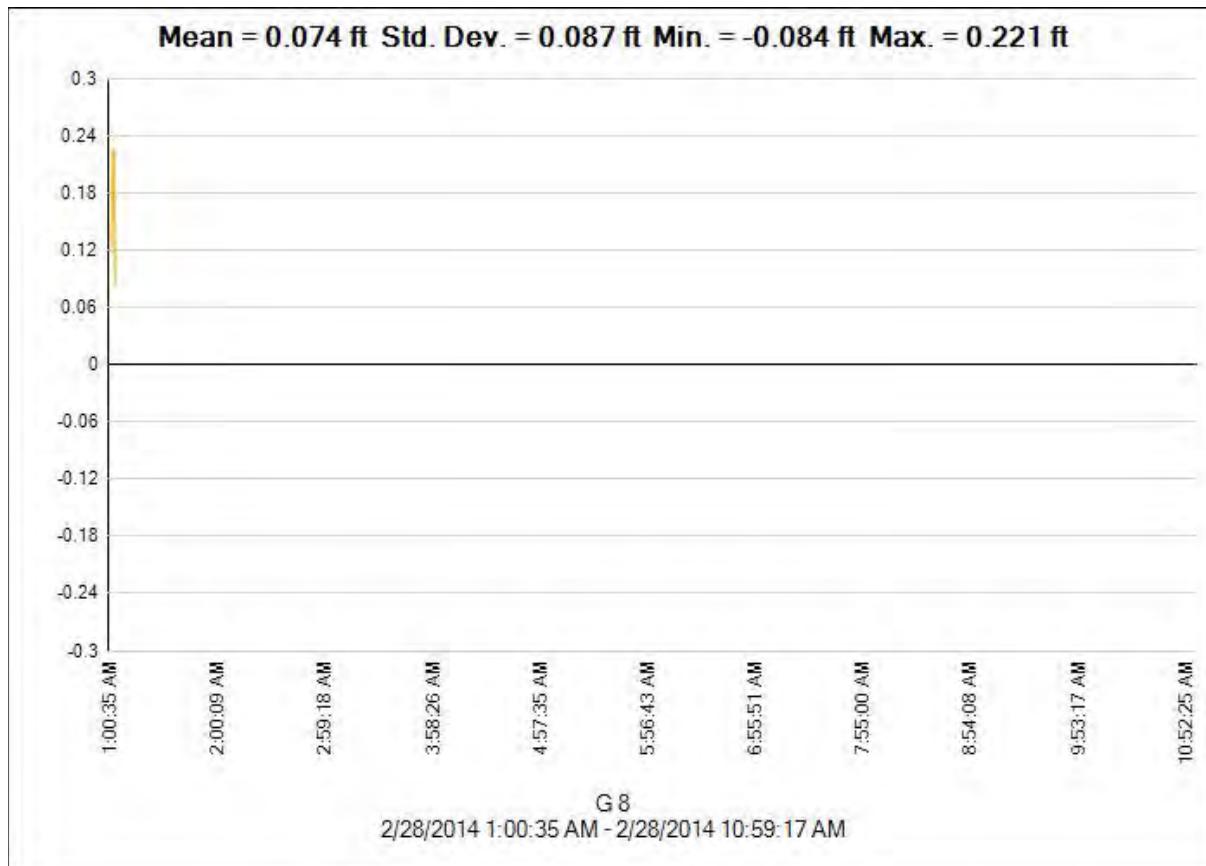


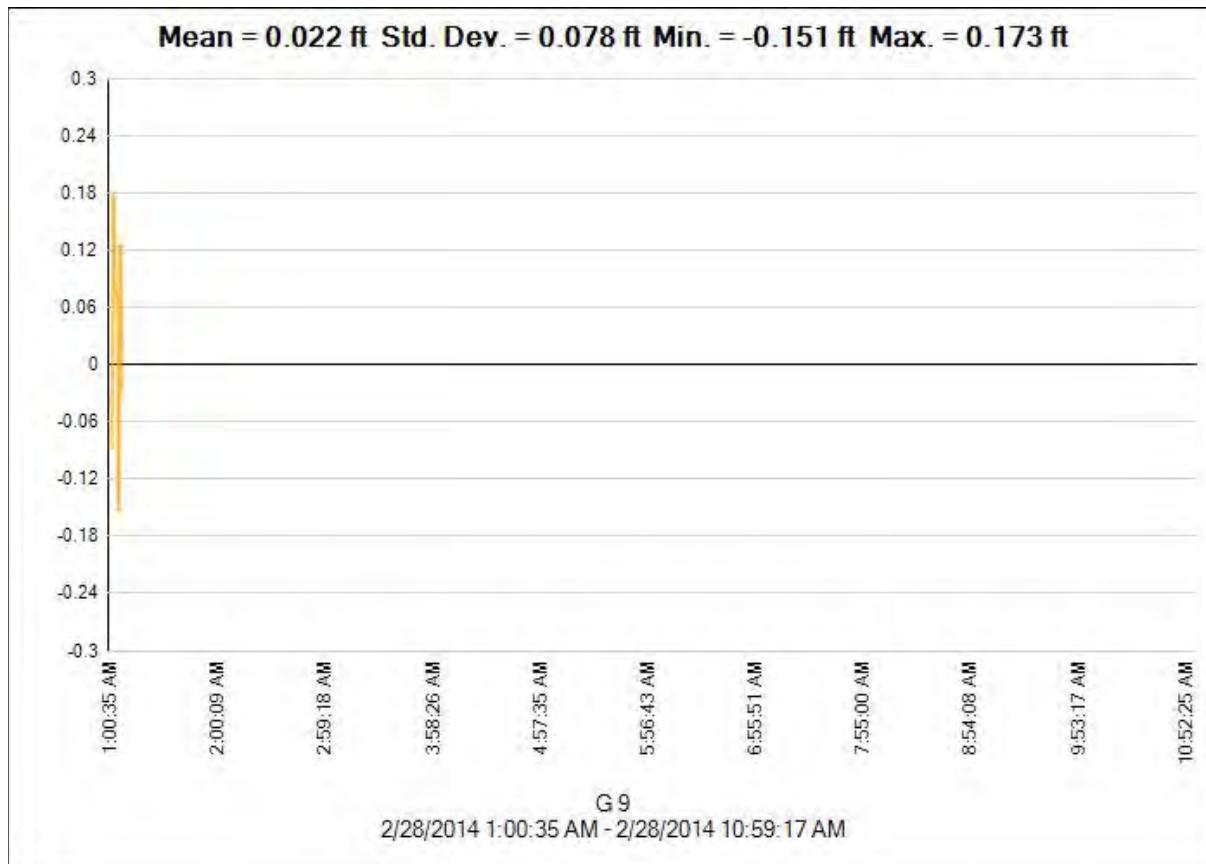
Residuals

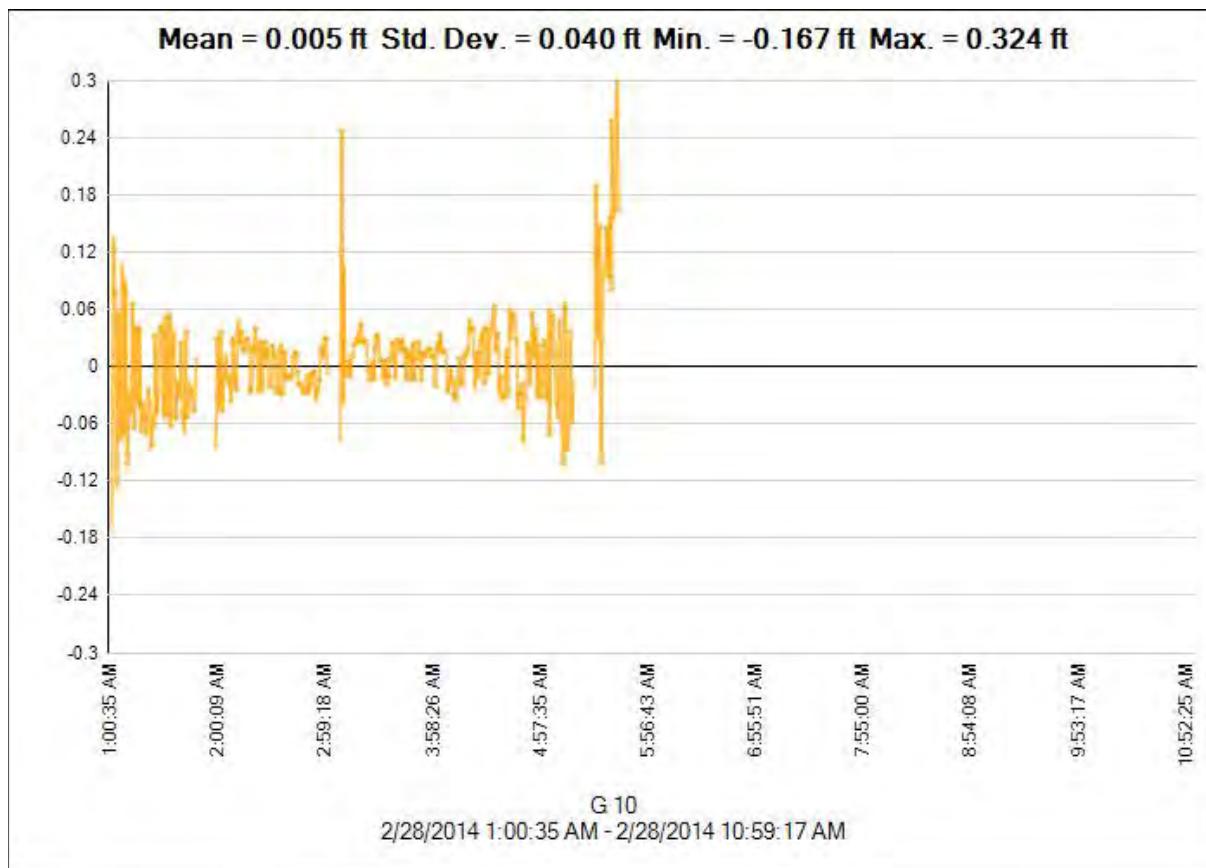


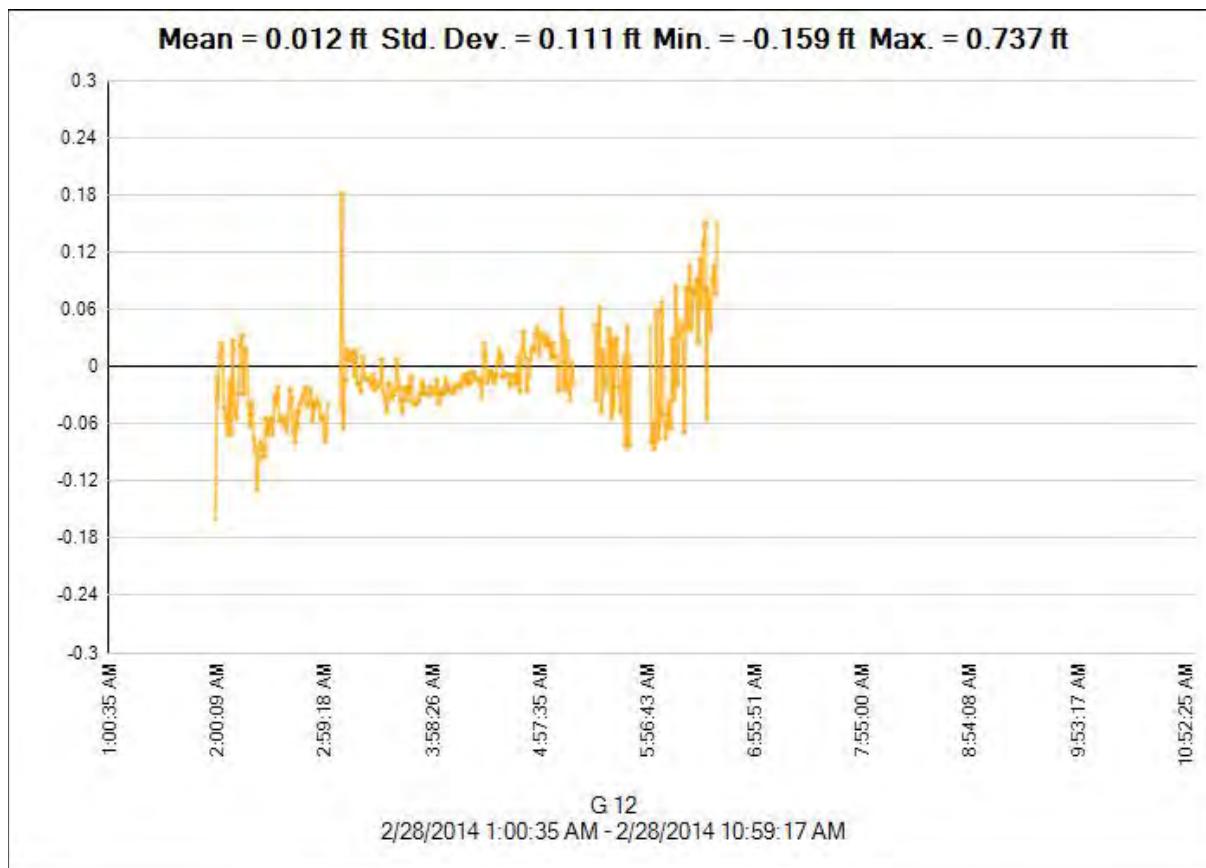


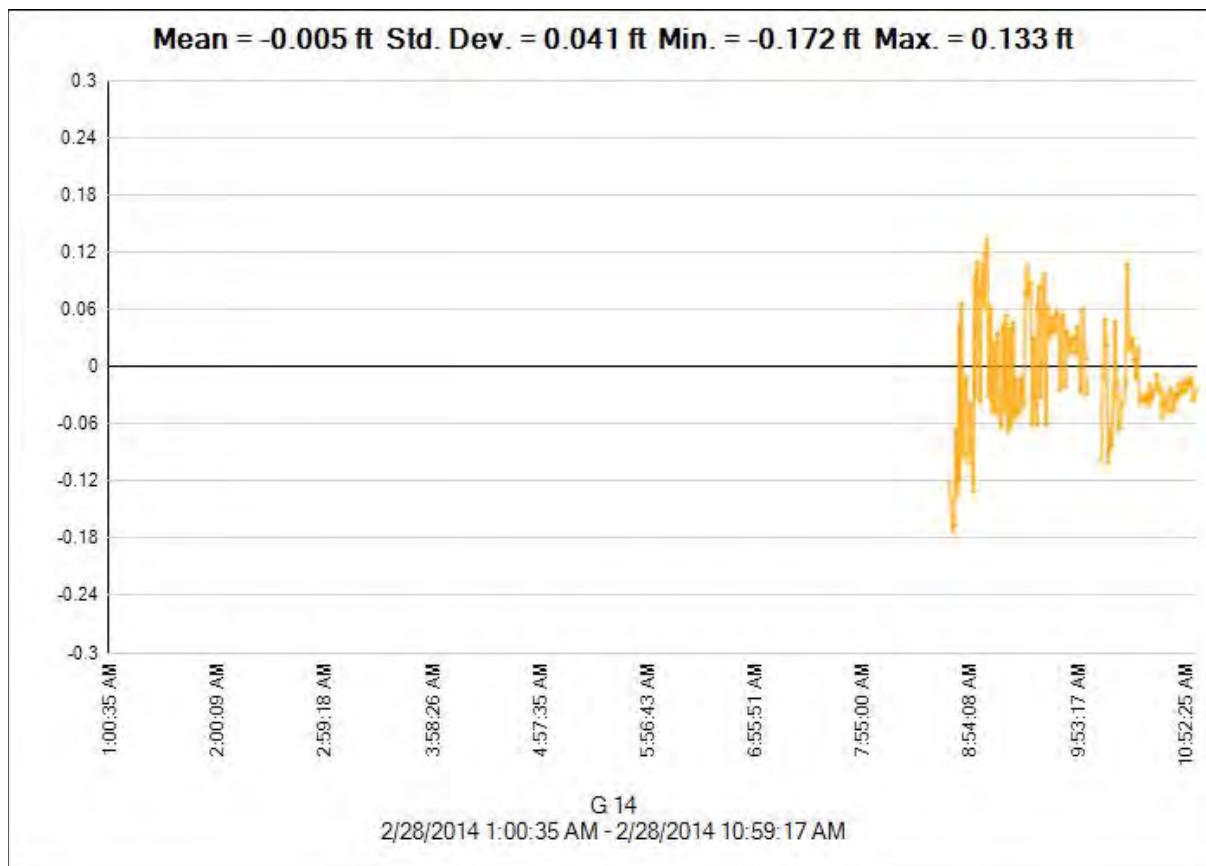


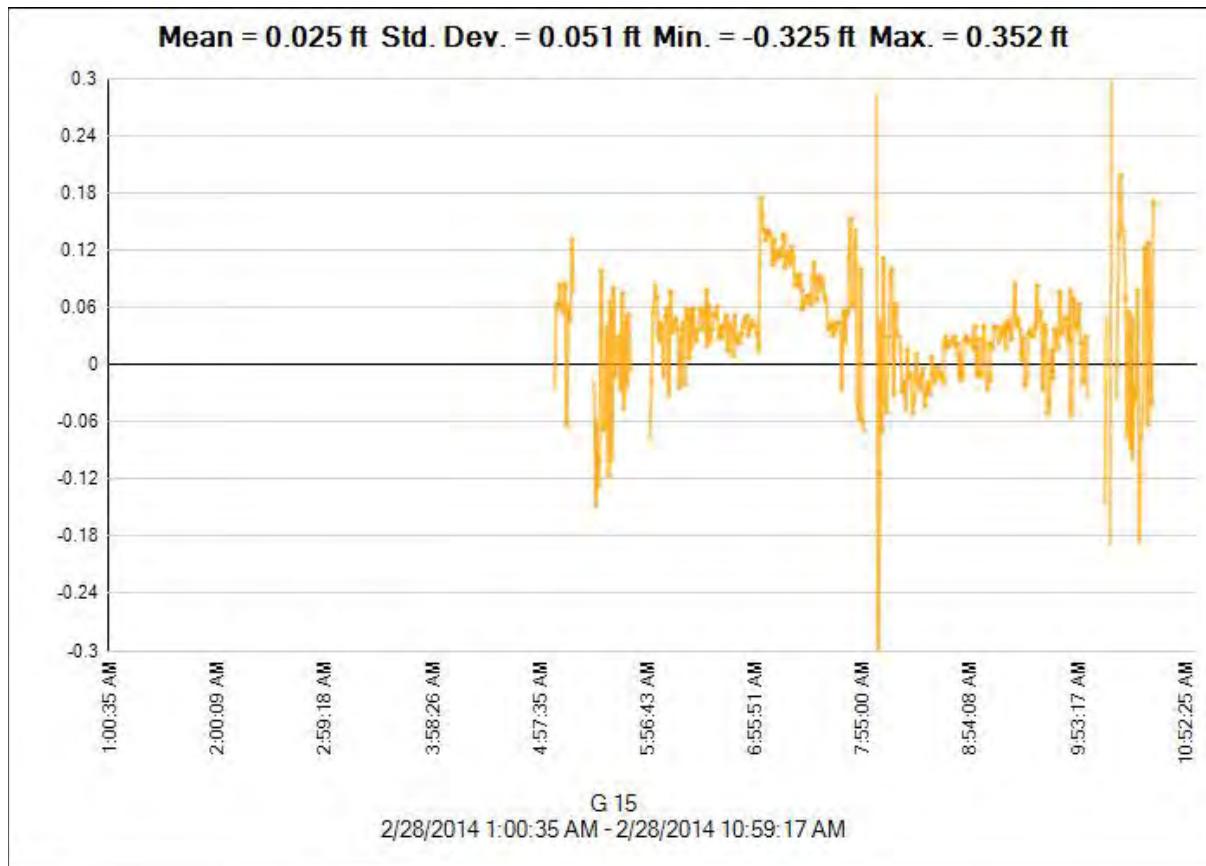


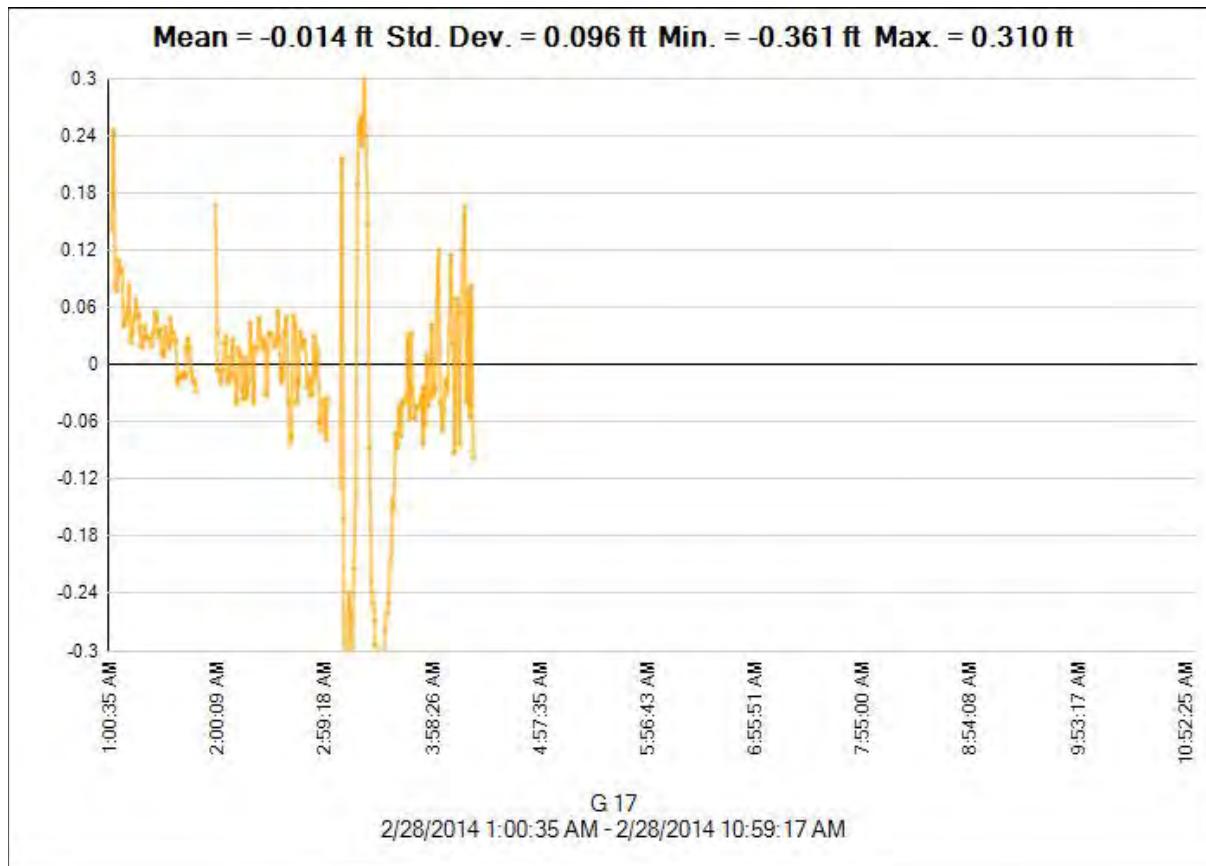


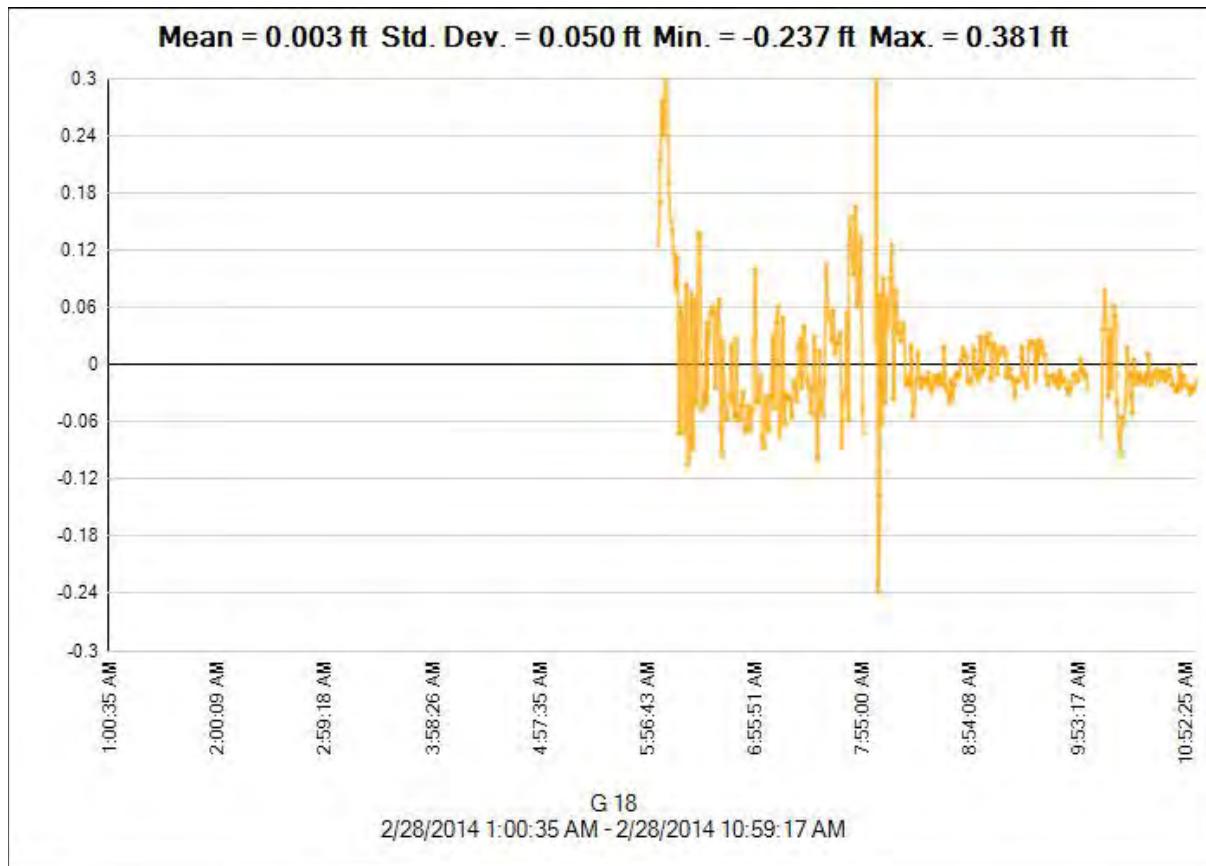


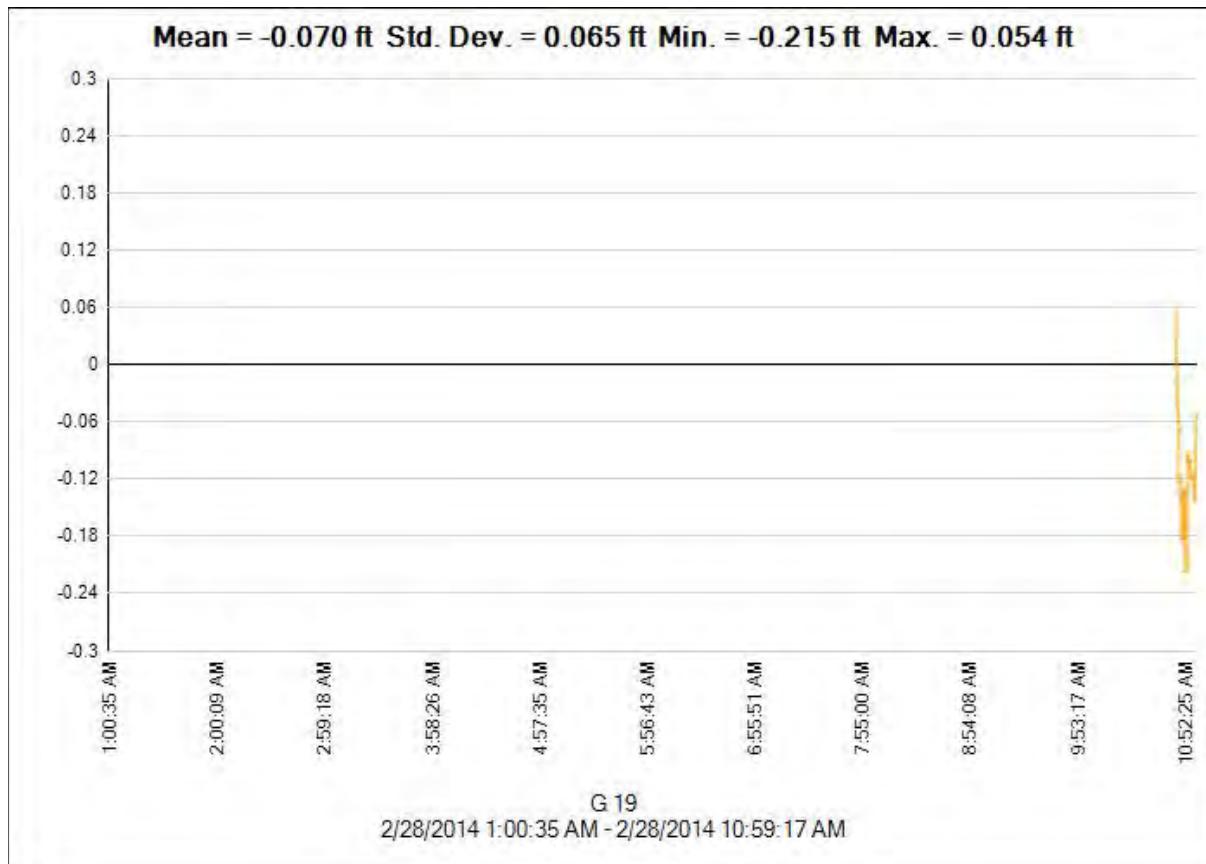


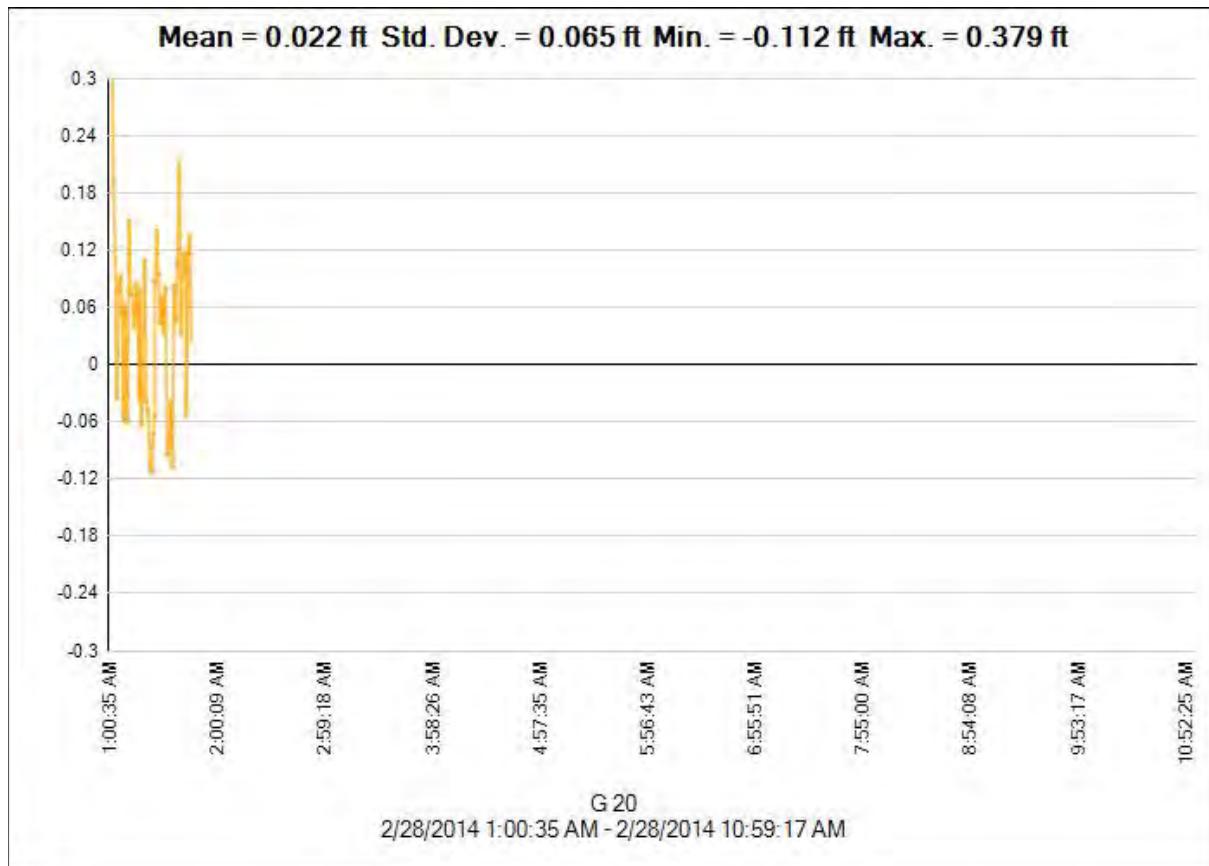


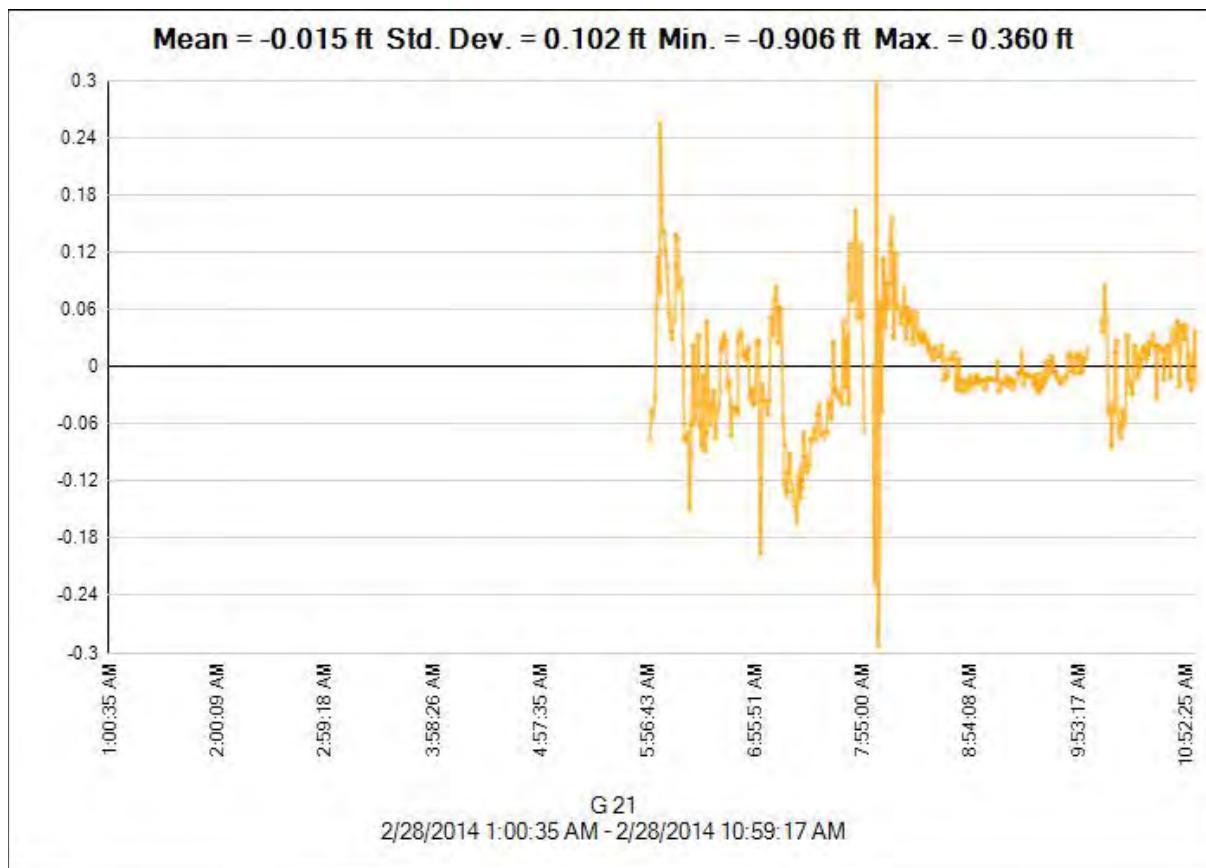


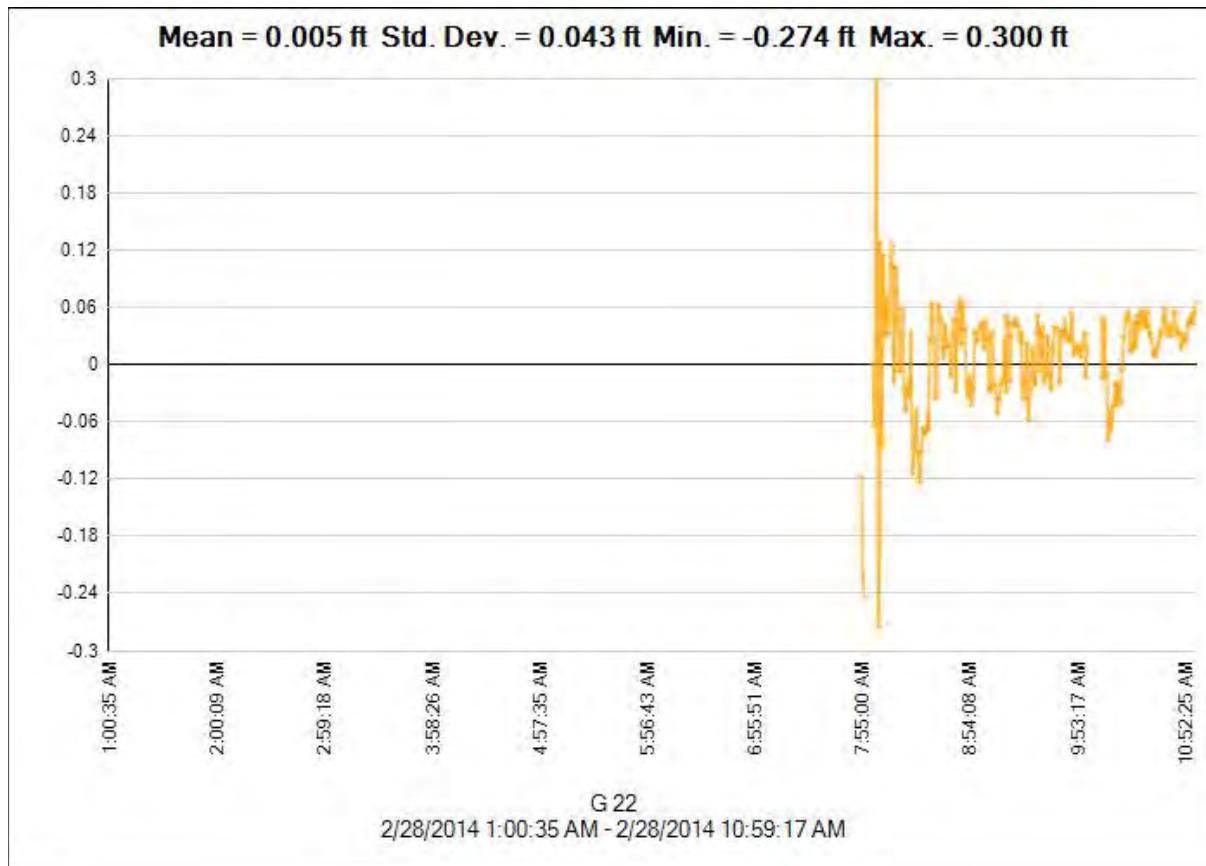


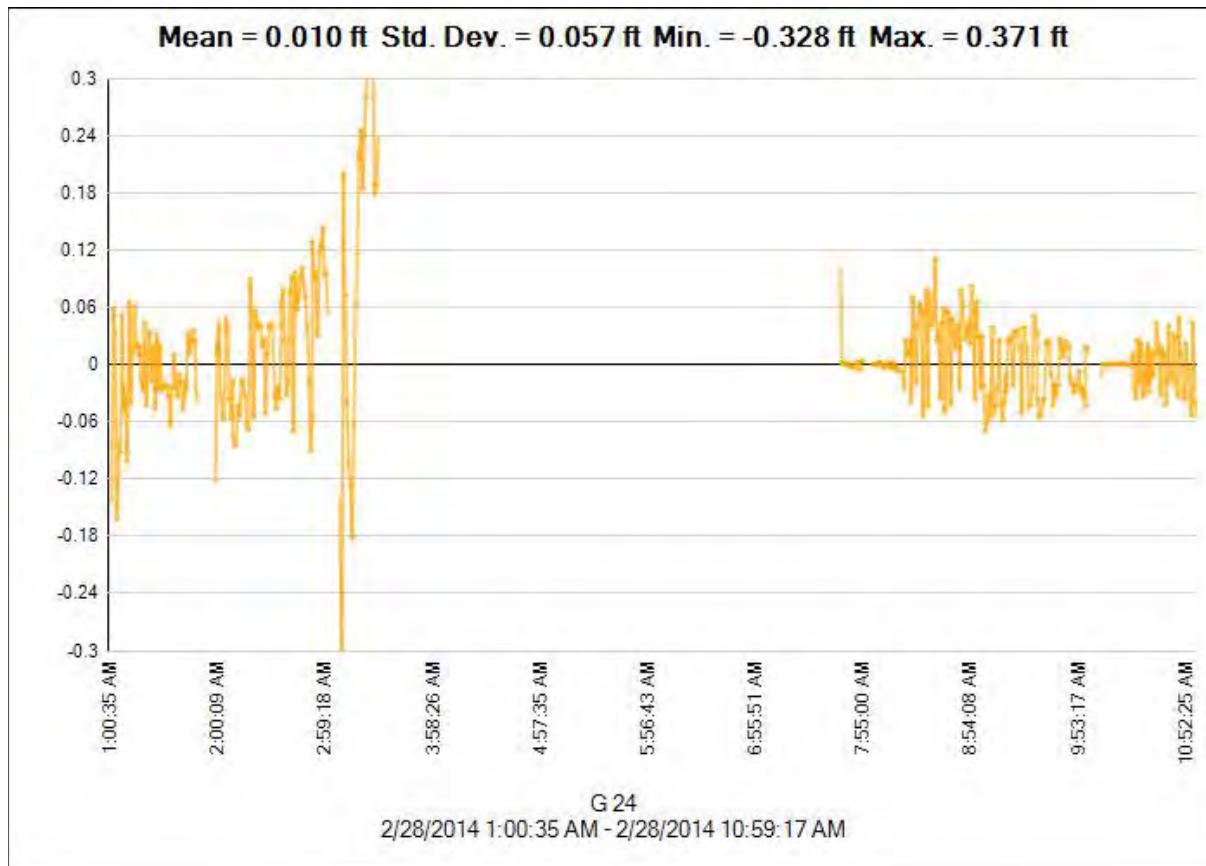


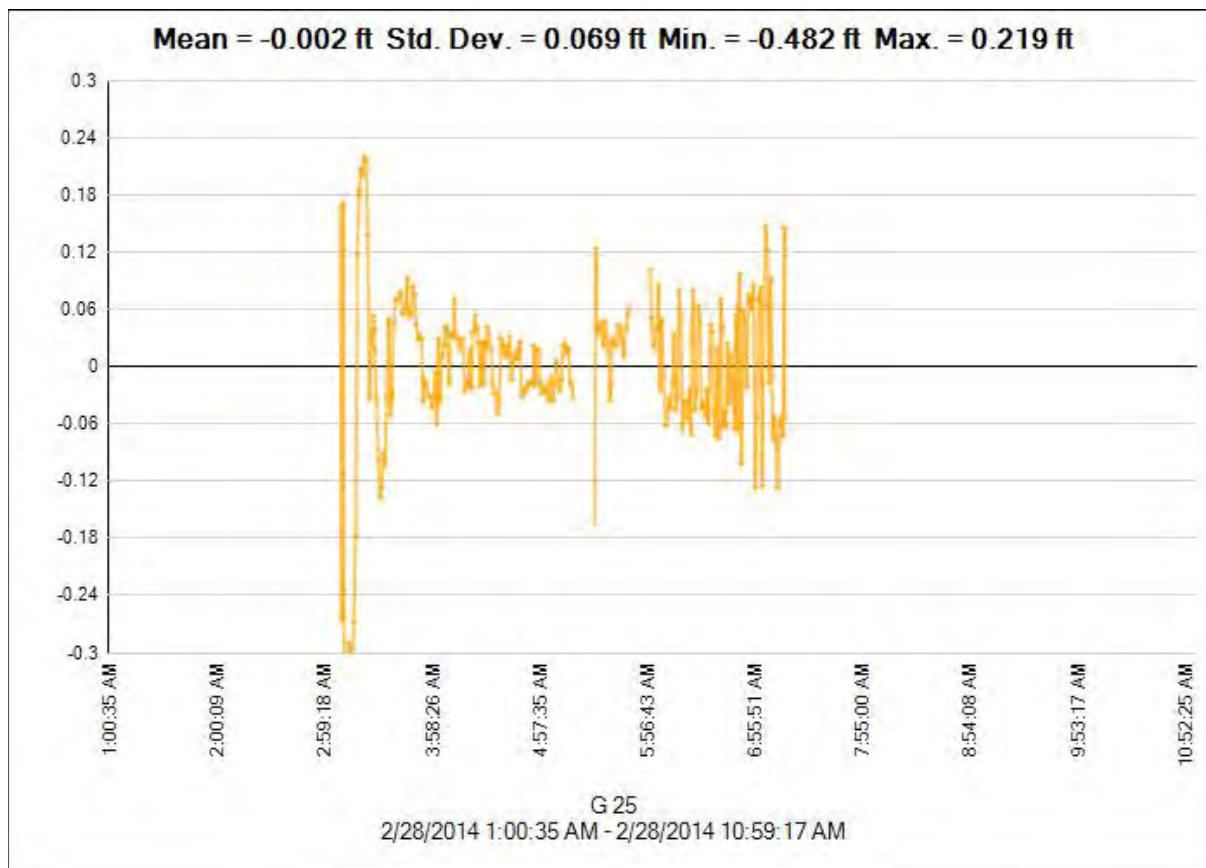


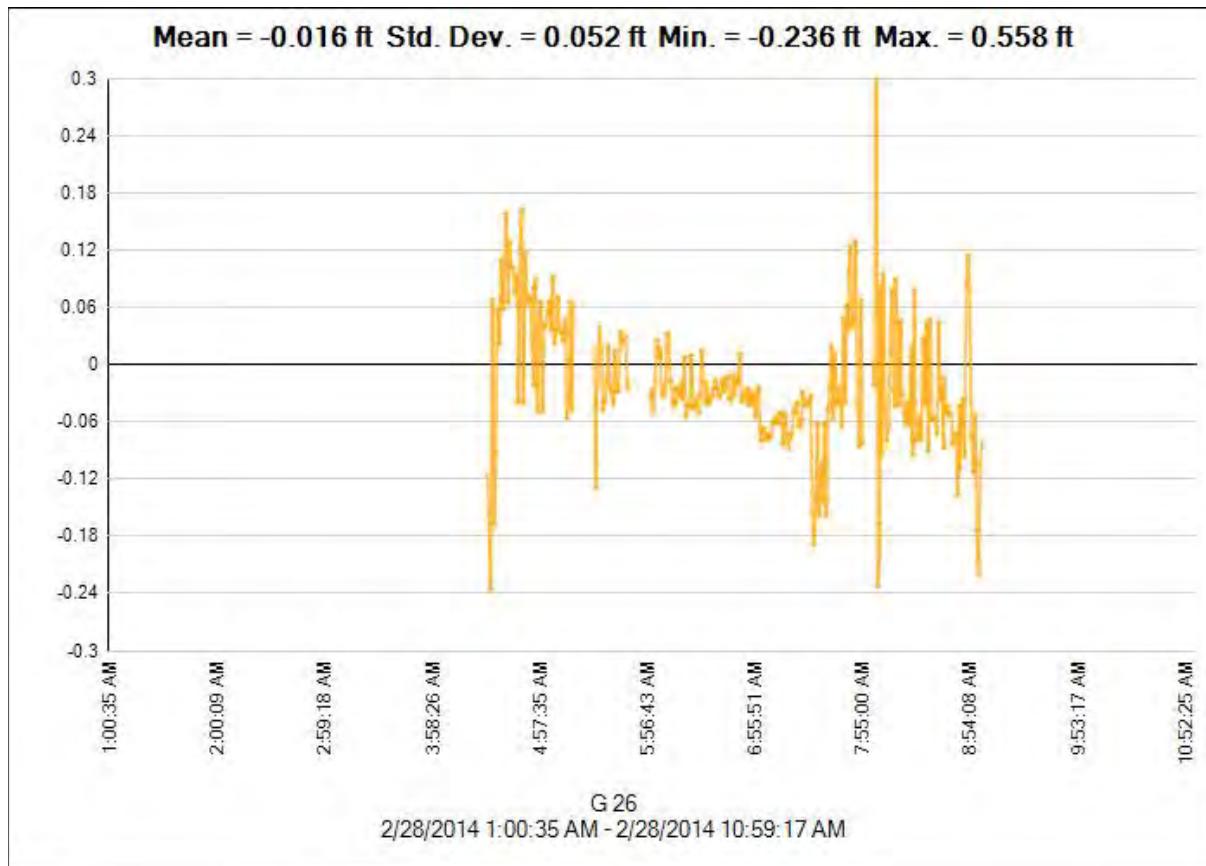


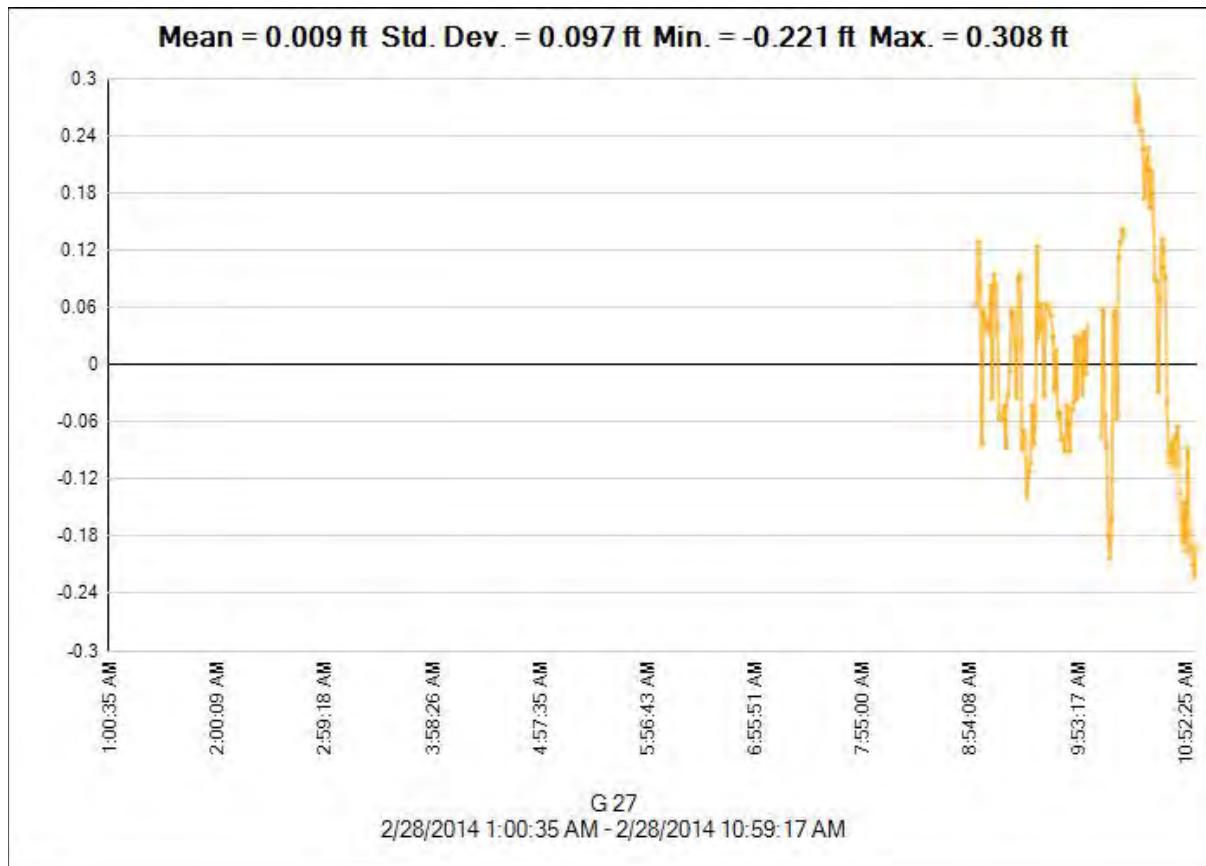


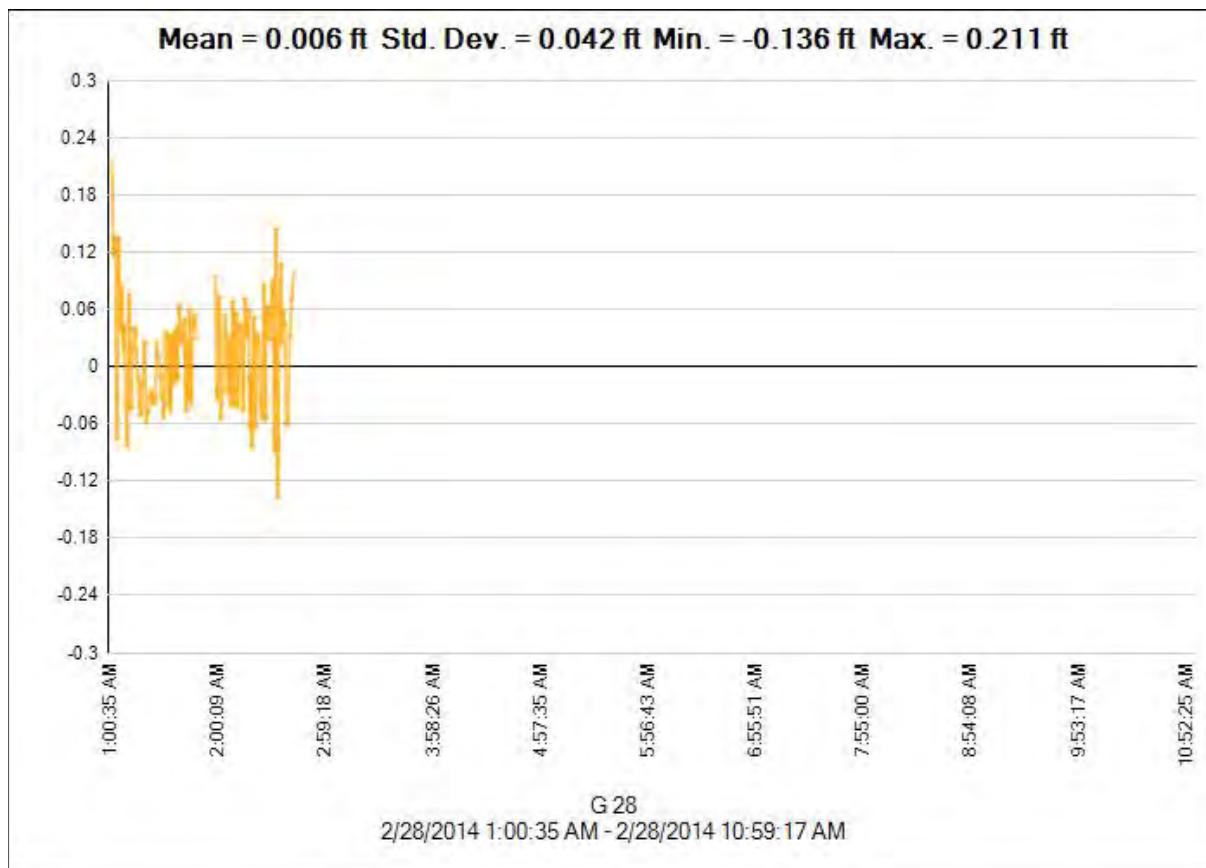


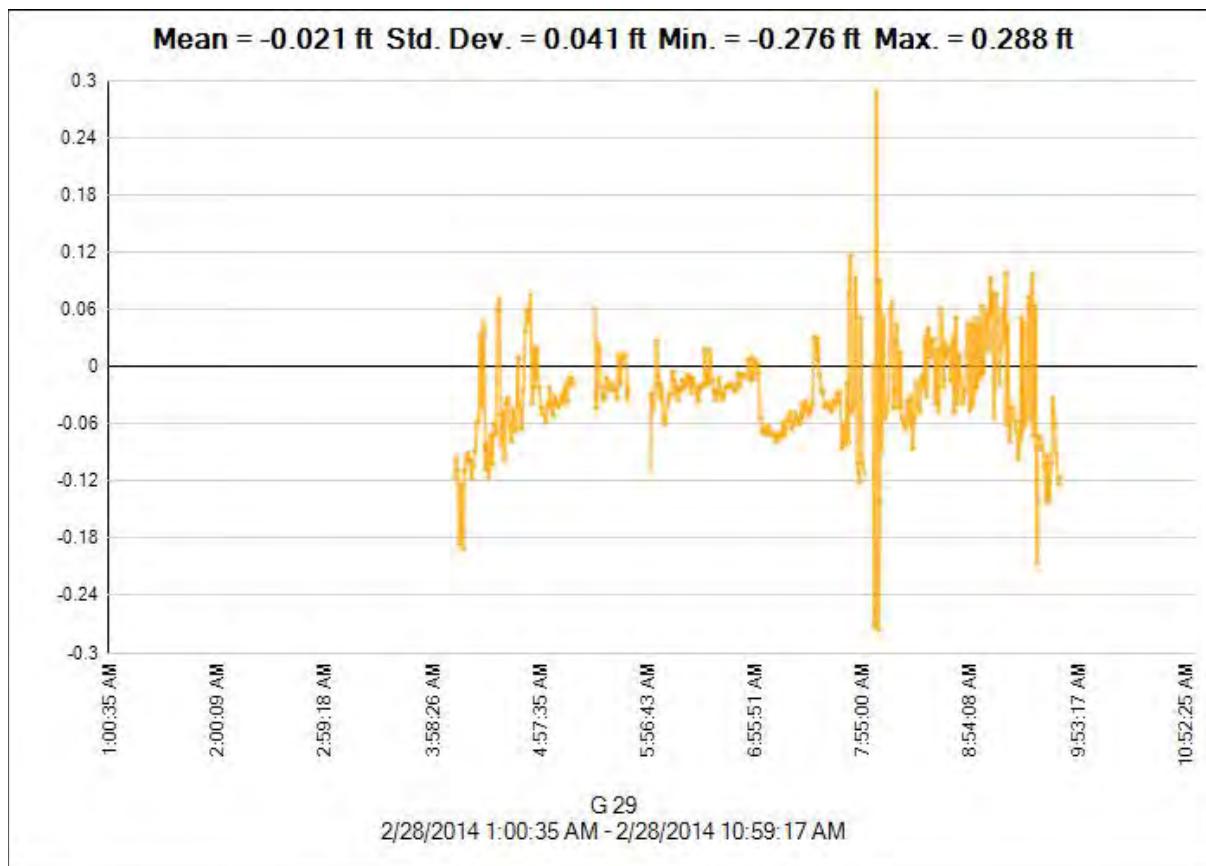














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





FWTR - TE14-SM-01 (8:19:09 AM-10:59:43 AM) (S34)

Baseline observation: FWTR ---
TE14-SM-
01 (B46)

Processed: 4/2/2014
10:00:27
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.061 ft

Vertical precision: 0.164 ft

RMS: 0.090 ft

Maximum PDOP: 3.197

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/28/2014
8:19:09
AM
(Local:
UTC-6hr)

Processing stop time: 2/28/2014
10:59:39
AM
(Local:
UTC-6hr)

Processing duration: 02:40:30

Processing interval: 5 seconds

Vector Components (Mark to Mark)

From:	FWTR		
	Grid	Local	Global



Northing	384088.365 ft	Latitude	N29°33'09.21307"	Latitude	N29°33'09.21307"
Easting	2971987.468 ft	Longitude	W92°18'16.93939"	Longitude	W92°18'16.93939"
Elevation	26.959 ft	Height	-56.402 ft	Height	-56.402 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.188 ft	Latitude	N29°02'49.70631"	Latitude	N29°02'49.70631"
Easting	3438609.427 ft	Longitude	W90°50'22.54633"	Longitude	W90°50'22.54633"
Elevation	0.972 ft	Height	-77.786 ft	Height	-77.786 ft

Vector					
ΔNorthing	-184765.177 ft	NS Fwd Azimuth	111°07'22"	ΔX	464347.622 ft
ΔEasting	466621.960 ft	Ellipsoid Dist.	501869.244 ft	ΔY	-102697.662 ft
ΔElevation	-25.987 ft	ΔHeight	-21.384 ft	ΔZ	-160292.013 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.018 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.025 ft
σ ΔEasting	0.025 ft	σ Ellipsoid Dist.	0.025 ft	σ ΔY	0.075 ft
σ ΔElevation	0.084 ft	σ ΔHeight	0.084 ft	σ ΔZ	0.041 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000581717		
Y	0.0000115260	0.0005237647	
Z	-0.0000109377	-0.0002533559	0.0001594140

Occupations

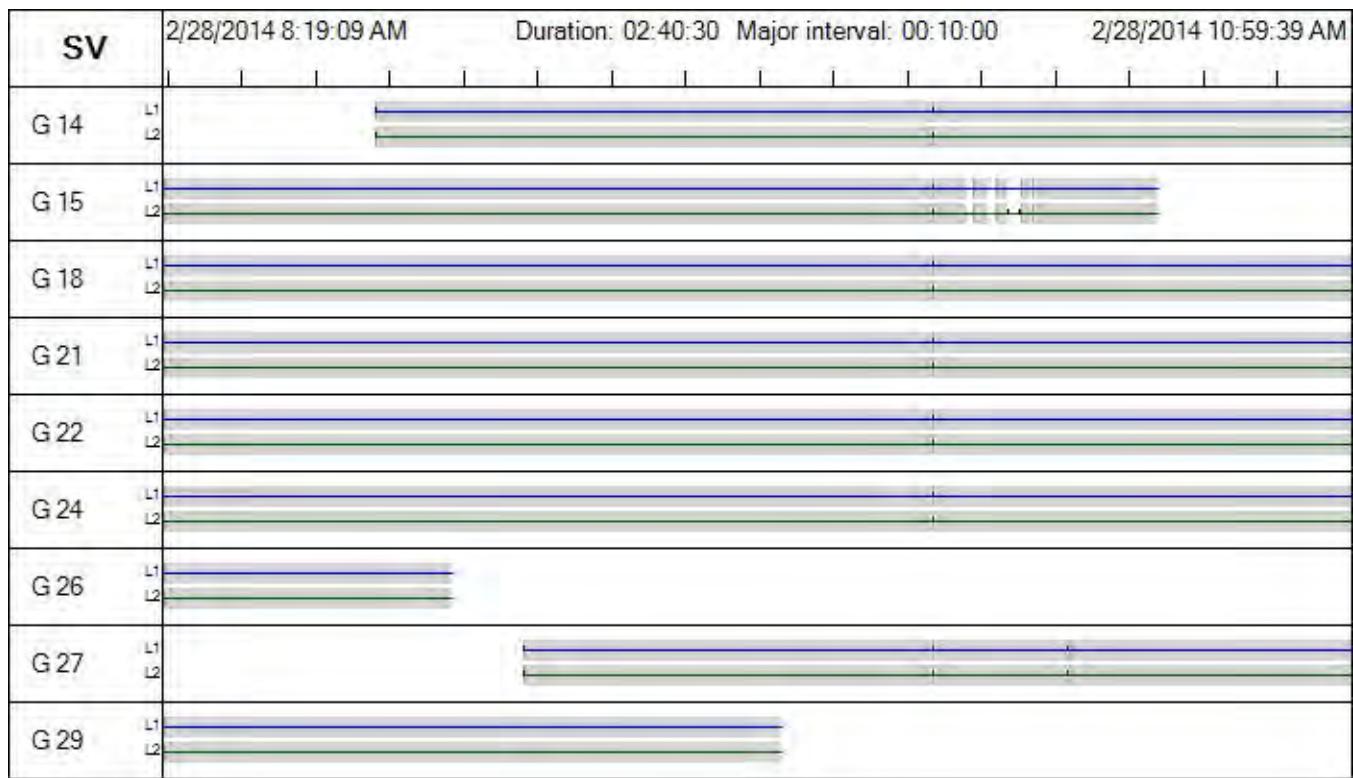
	From	To
Point ID:	FWTR	TE14-SM-01
Data file:	P:\2014\2143976 - Whiskey Island Back	P:\2014\2143976 - Whiskey Island Back



	Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\FWTR059E.14o	Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920590.T02
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	Unknown	5040K18292
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2
Antenna serial number:	12697374	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount

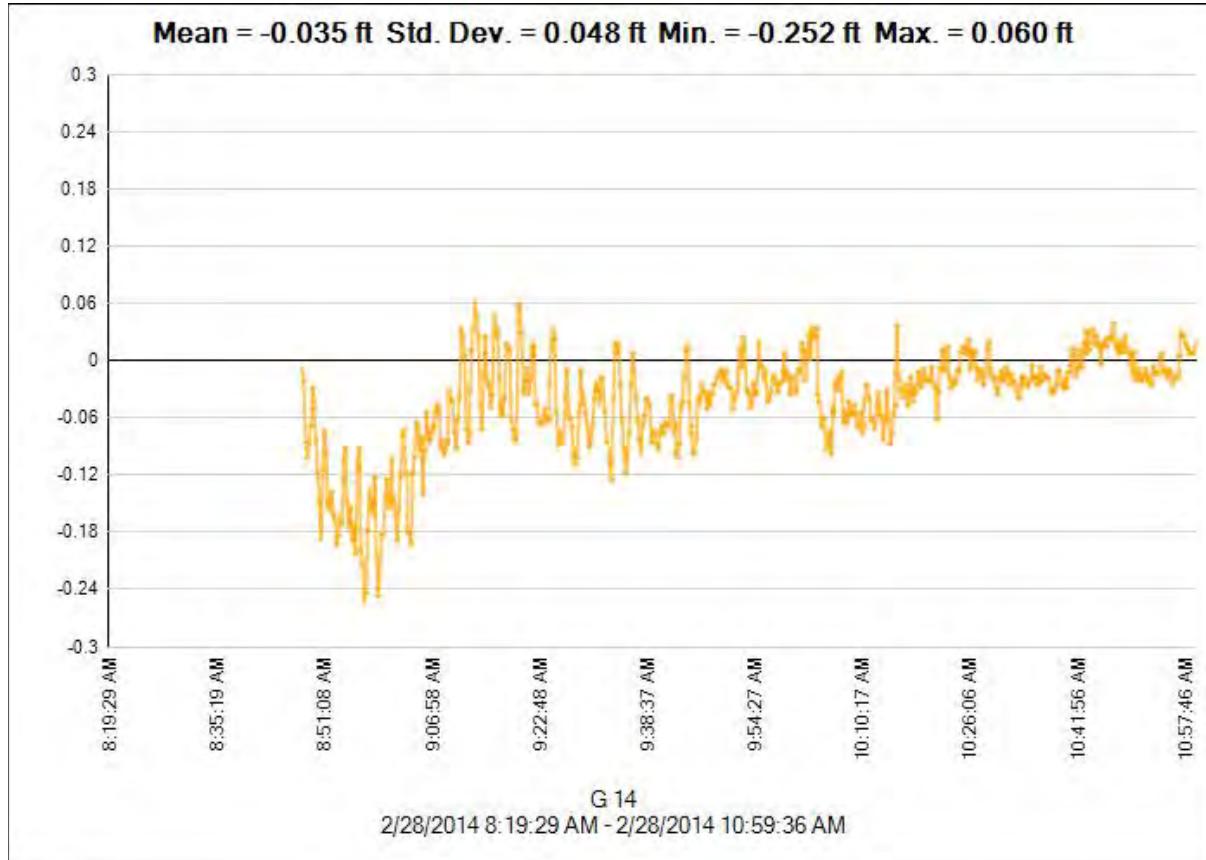


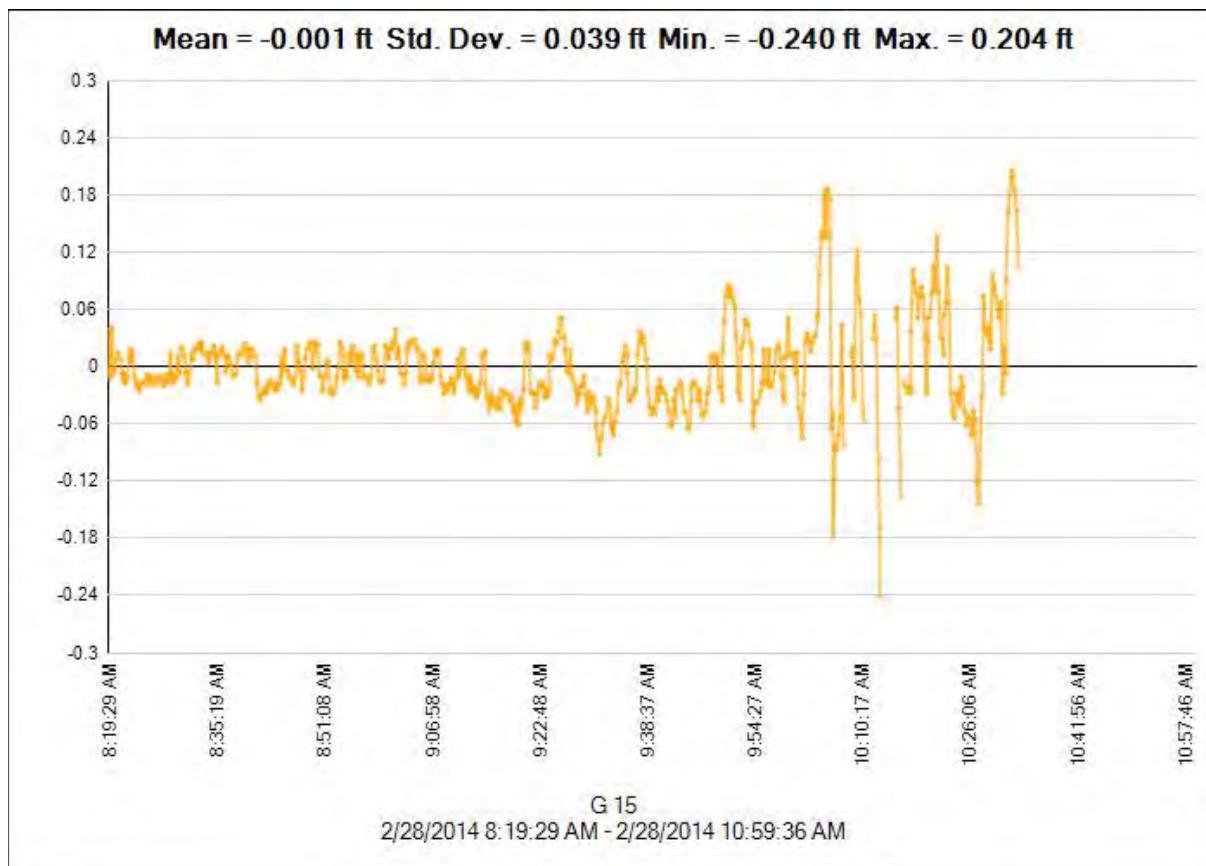
Tracking Summary

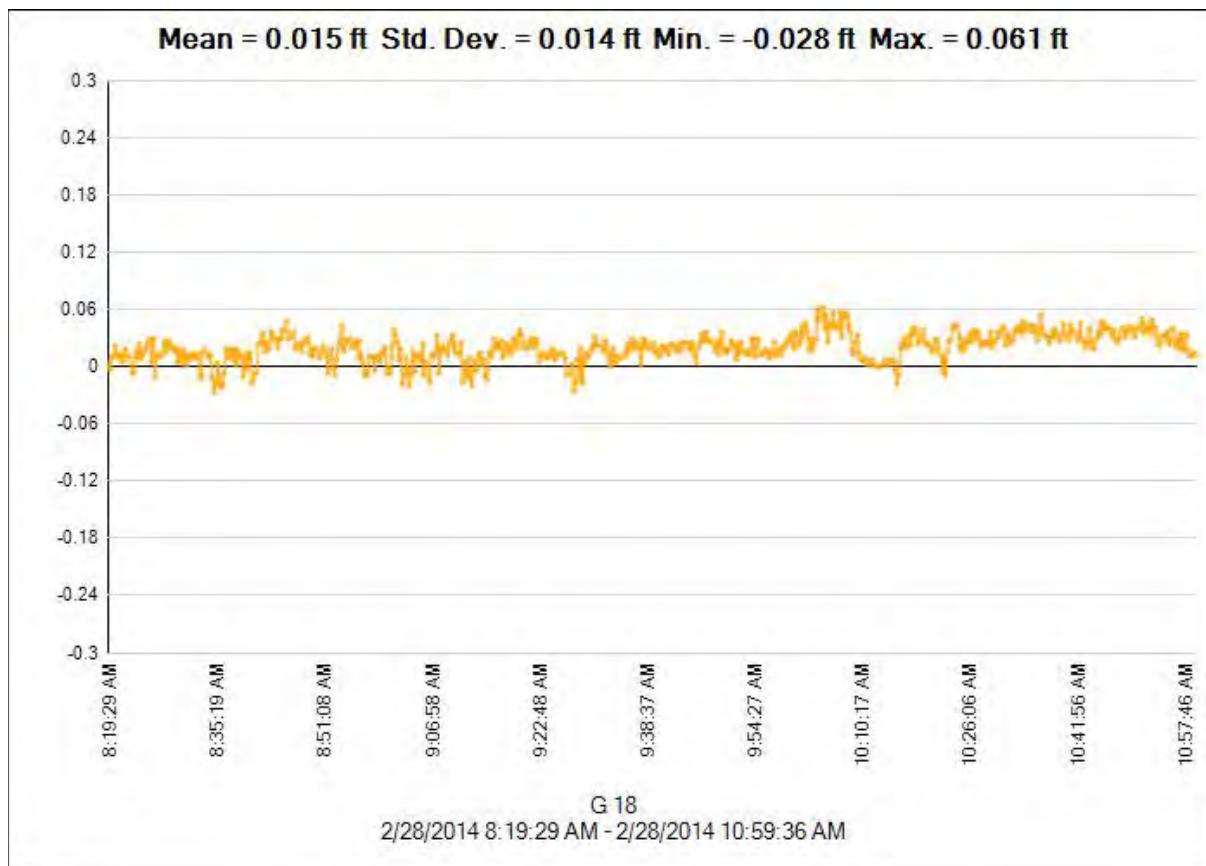


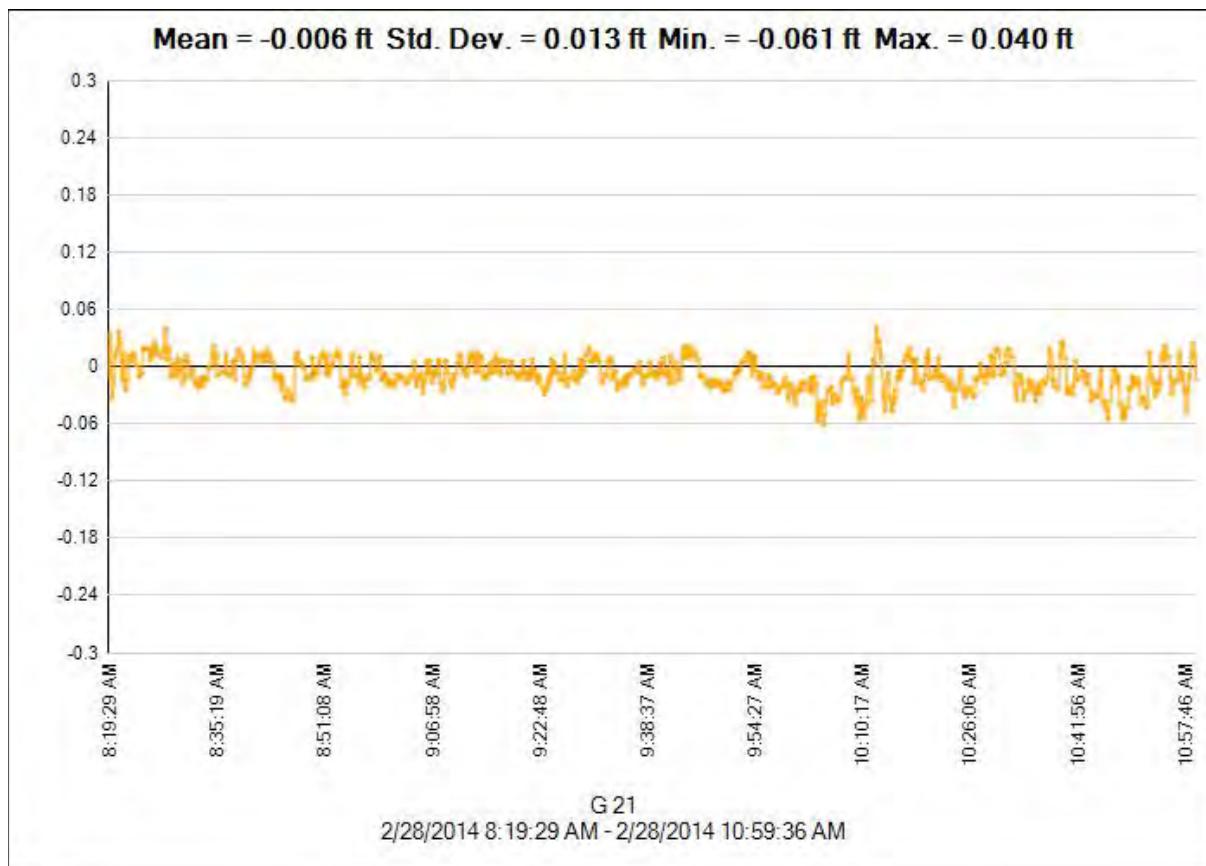


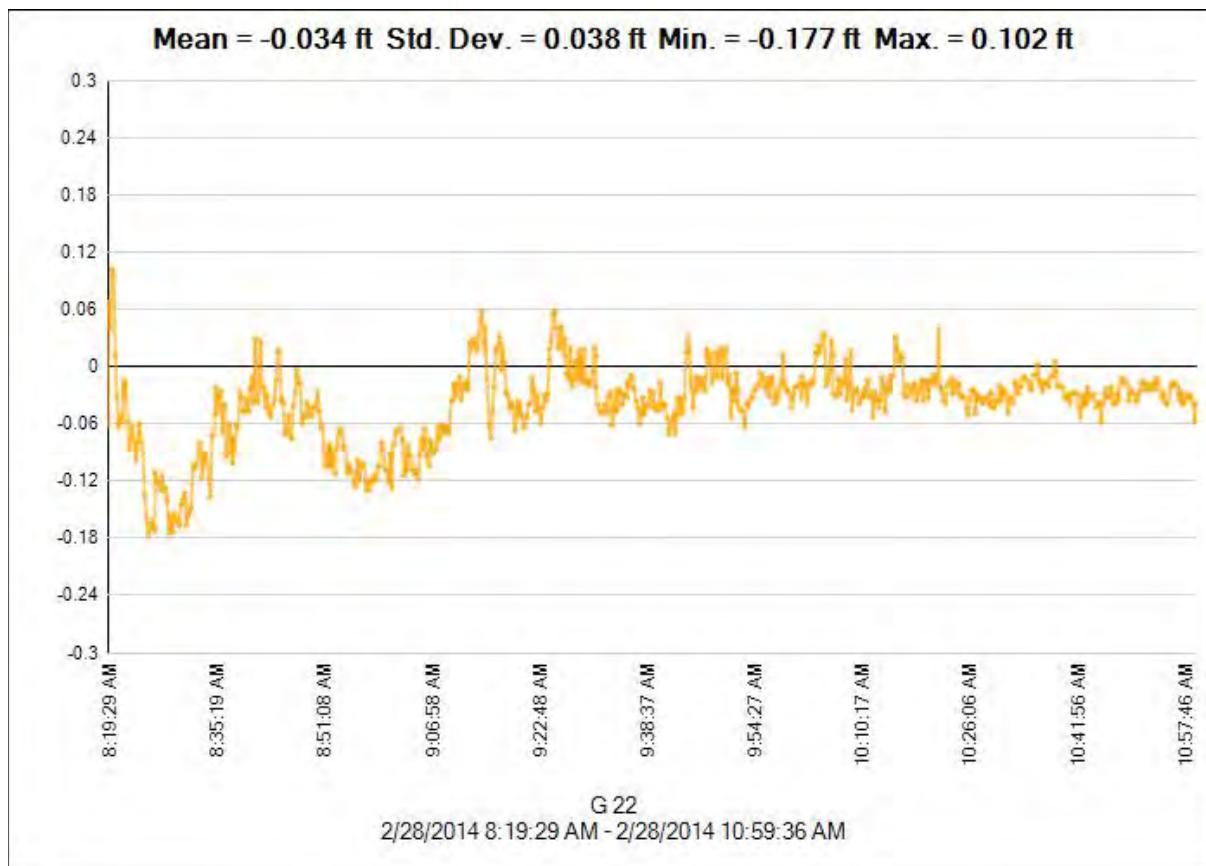
Residuals

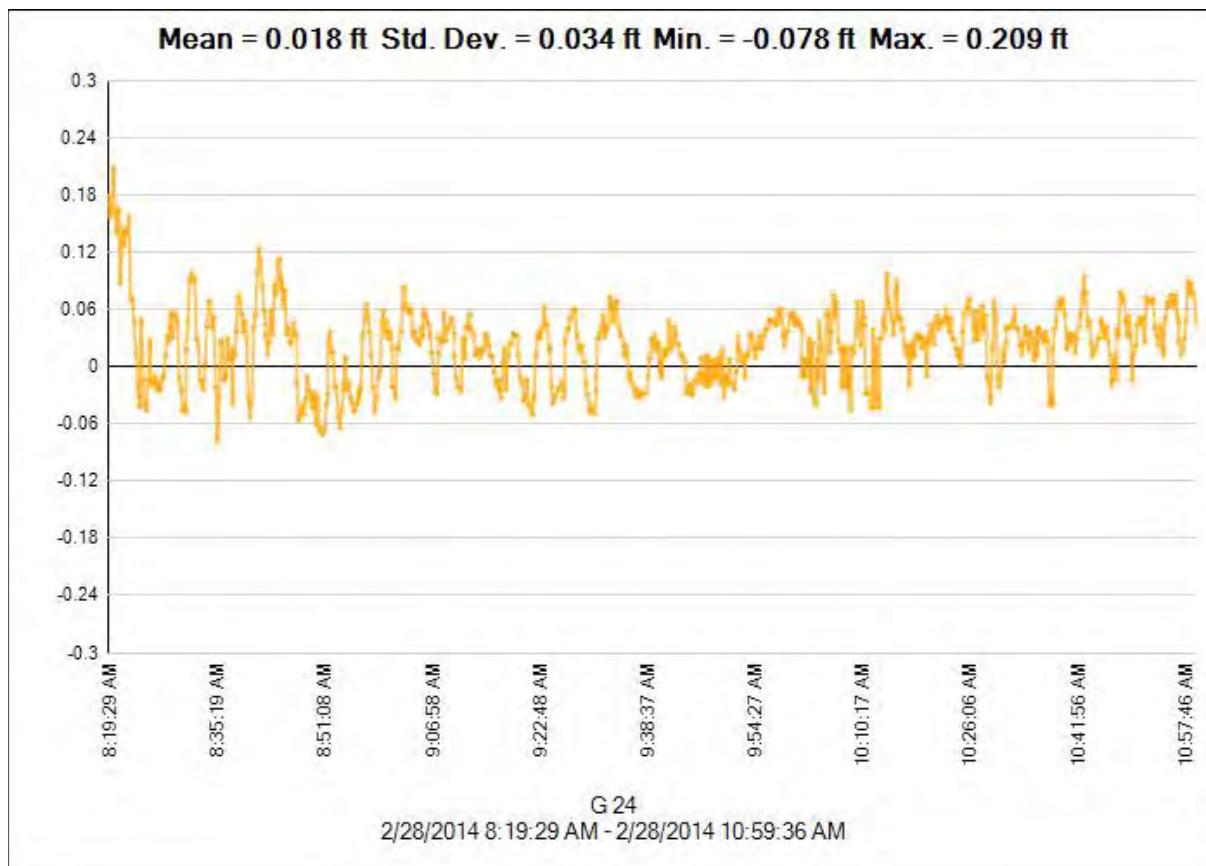


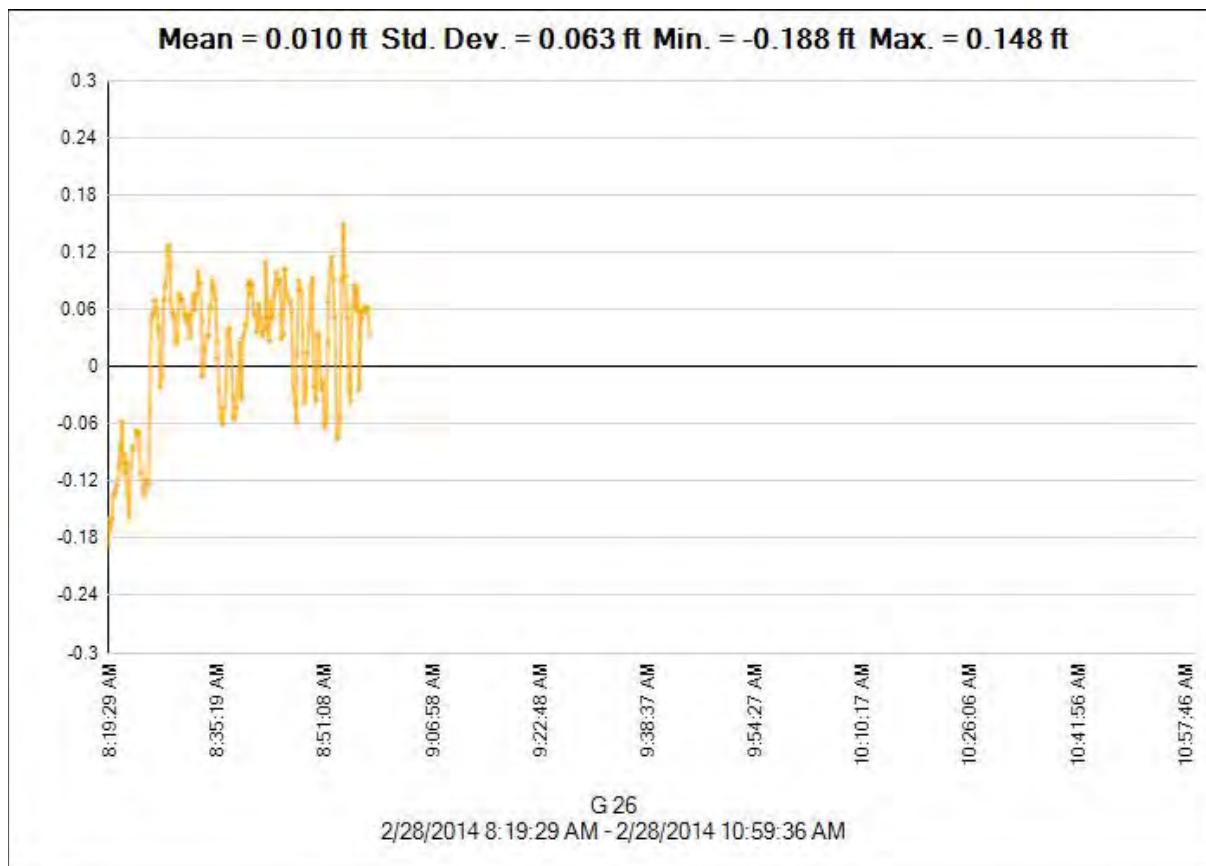


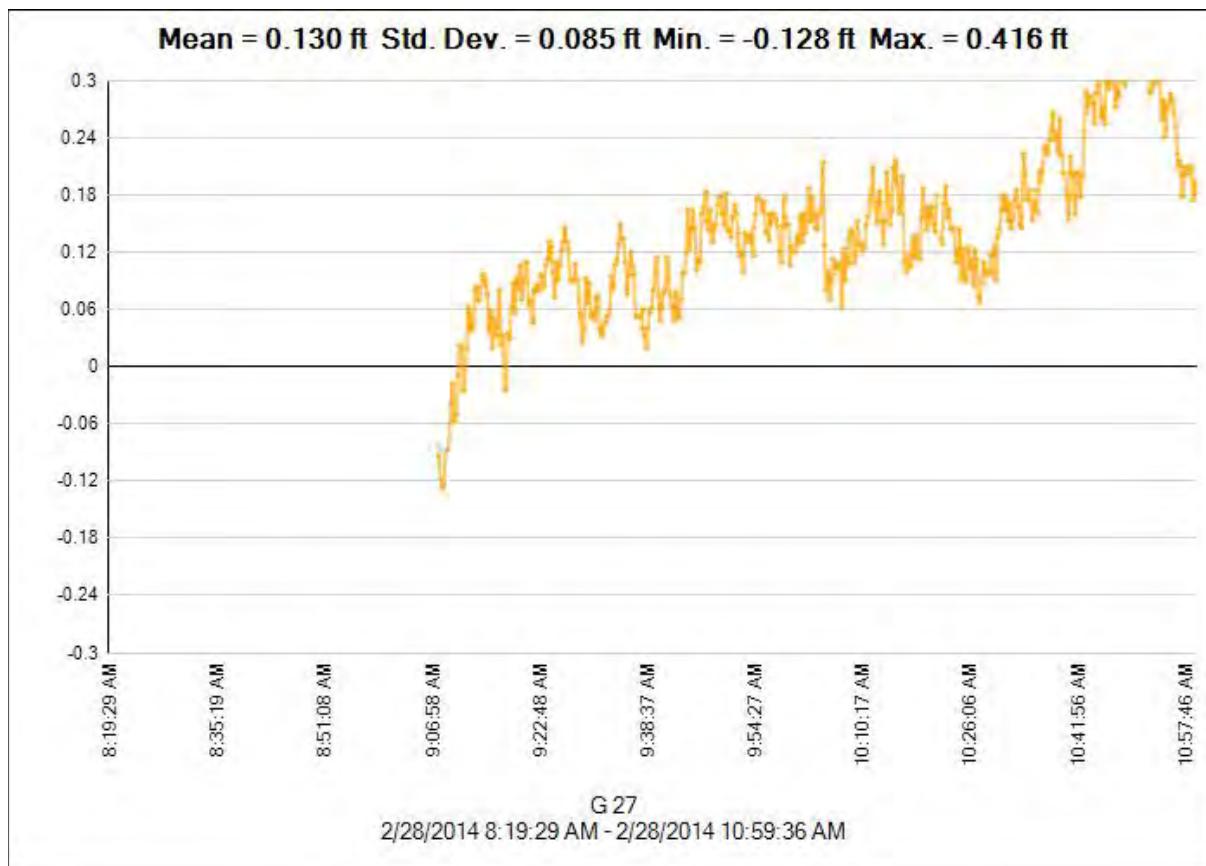


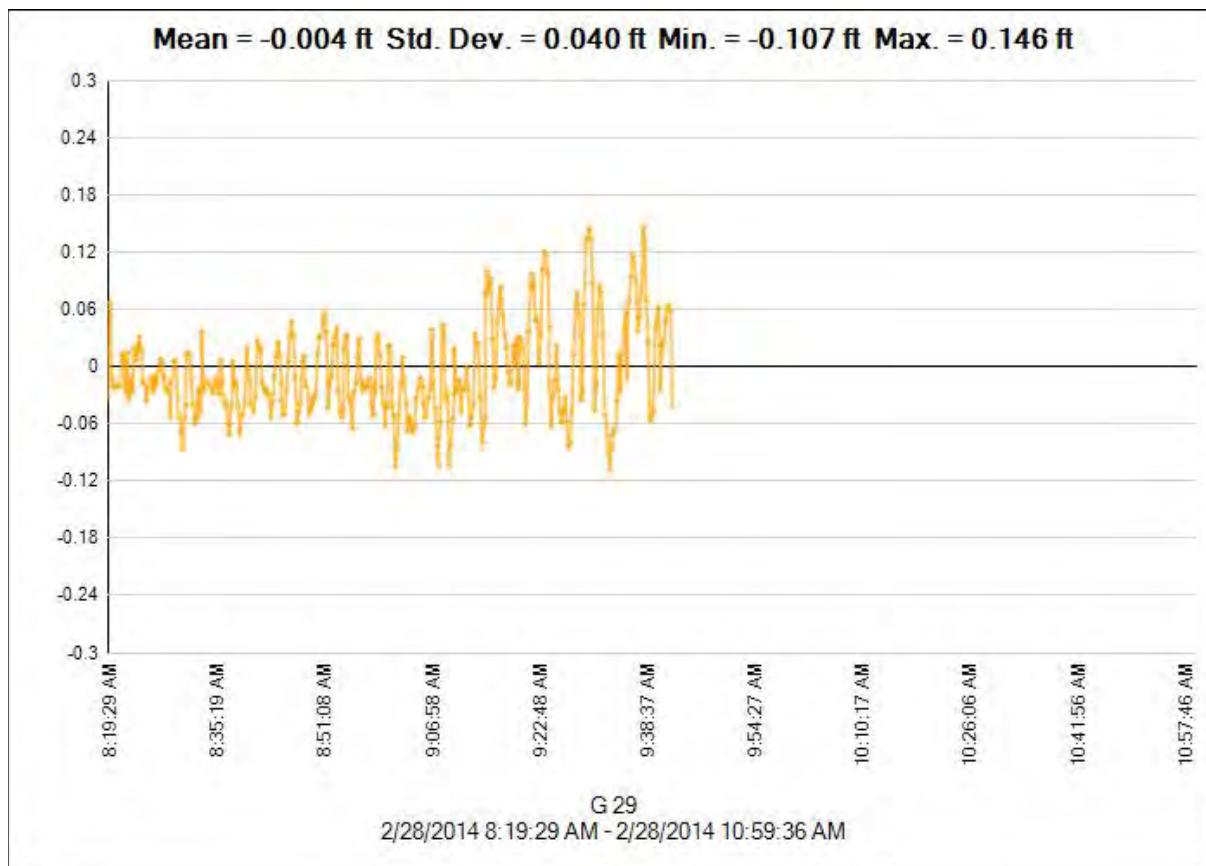














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





GRIS - FWTR (7:59:44 AM-10:59:29 AM) (S36)

Baseline observation: GRIS ---
FWTR
(B48)

Processed: 4/2/2014
10:00:52
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.061 ft

Vertical precision: 0.088 ft

RMS: 0.116 ft

Maximum PDOP: 2.533

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:00:14
AM
(Local:
UTC-6hr)

Processing stop time: 2/27/2014
10:59:29
AM
(Local:
UTC-6hr)

Processing duration: 02:59:15

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	GRIS
-------	------



Grid		Local		Global	
Northing	281033.474 ft	Latitude	N29°15'55.88300"	Latitude	N29°15'55.88300"
Easting	3719590.183 ft	Longitude	W89°57'26.26226"	Longitude	W89°57'26.26226"
Elevation	27.375 ft	Height	-51.286 ft	Height	-51.286 ft

To:	FWTR				
Grid		Local		Global	
Northing	384088.351 ft	Latitude	N29°33'09.21294"	Latitude	N29°33'09.21293"
Easting	2971987.488 ft	Longitude	W92°18'16.93916"	Longitude	W92°18'16.93916"
Elevation	27.044 ft	Height	-56.317 ft	Height	-56.317 ft

Vector					
ΔNorthing	103054.877 ft	NS Fwd Azimuth	278°31'31"	ΔX	-746234.813 ft
ΔEasting	-747602.695 ft	Ellipsoid Dist.	754687.933 ft	ΔY	65991.826 ft
ΔElevation	-0.331 ft	ΔHeight	-5.031 ft	ΔZ	90928.477 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.018 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.025 ft
σ ΔEasting	0.025 ft	σ Ellipsoid Dist.	0.025 ft	σ ΔY	0.039 ft
σ ΔElevation	0.045 ft	σ ΔHeight	0.045 ft	σ ΔZ	0.028 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000568330		
Y	0.0000017872	0.0001445720	
Z	0.0000011423	-0.0000709052	0.0000740694

Occupations

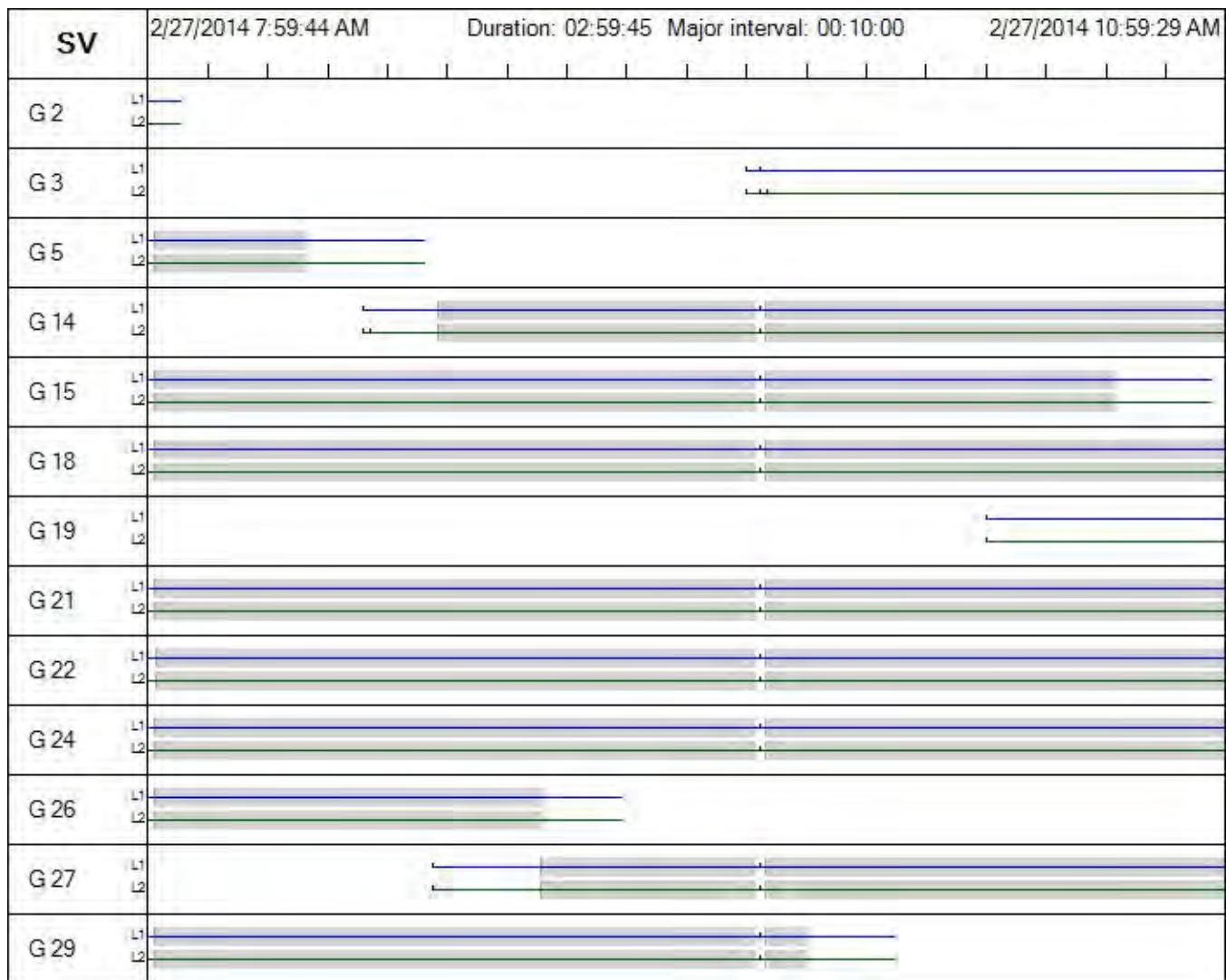
	From	To
Point ID:	GRIS	FWTR



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\gris0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\FWTR058E.14o
Receiver type:	NetR9	NetRS
Receiver serial number:	5201K41142	Unknown
Antenna type:	Zephyr Geodetic 2 RoHS	Zephyr Geodetic
Antenna serial number:	5000117437	12697374
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount

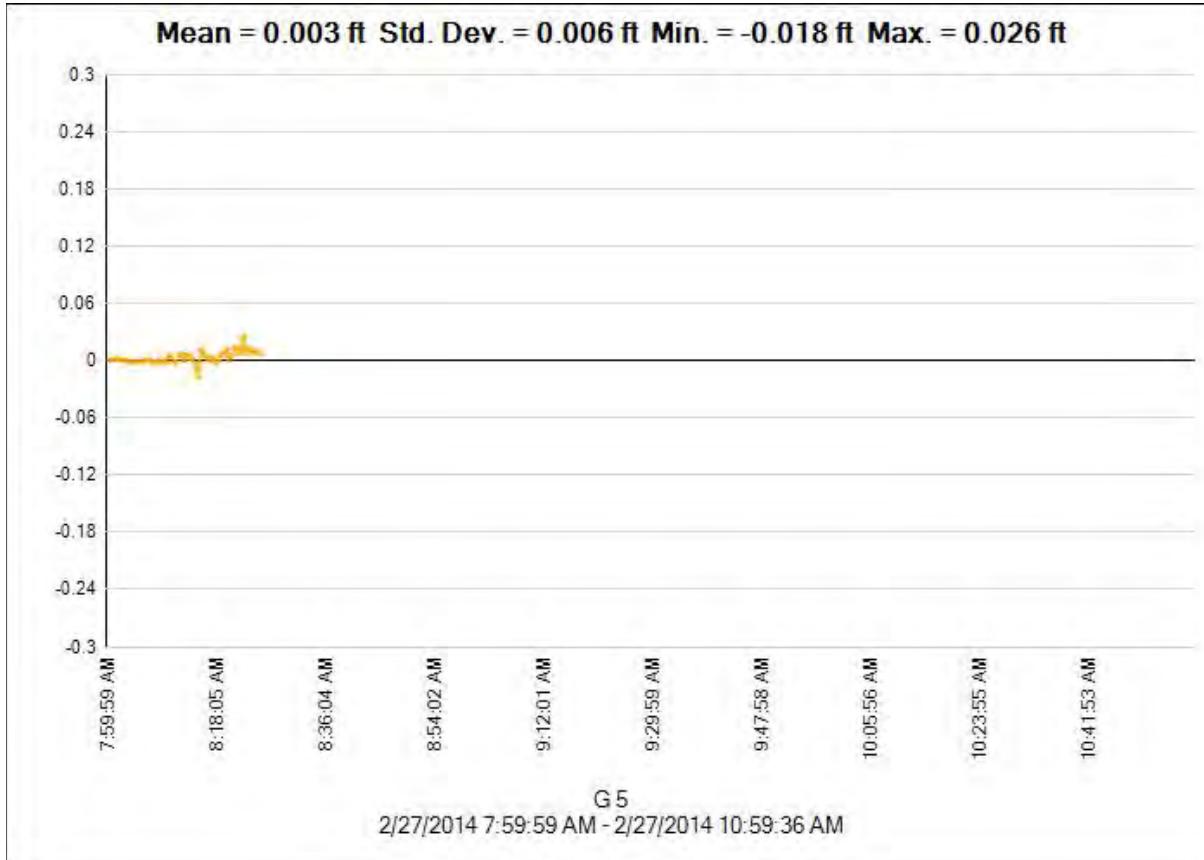


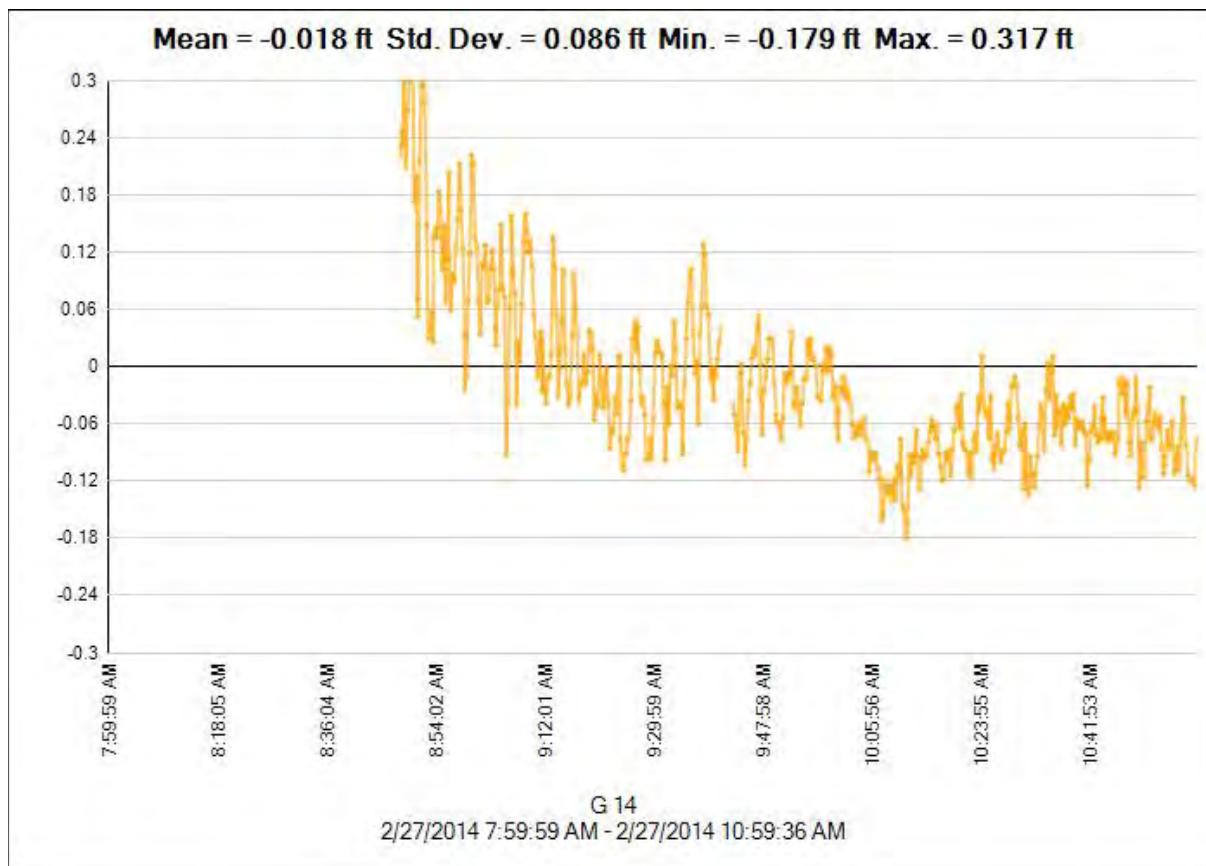
Tracking Summary

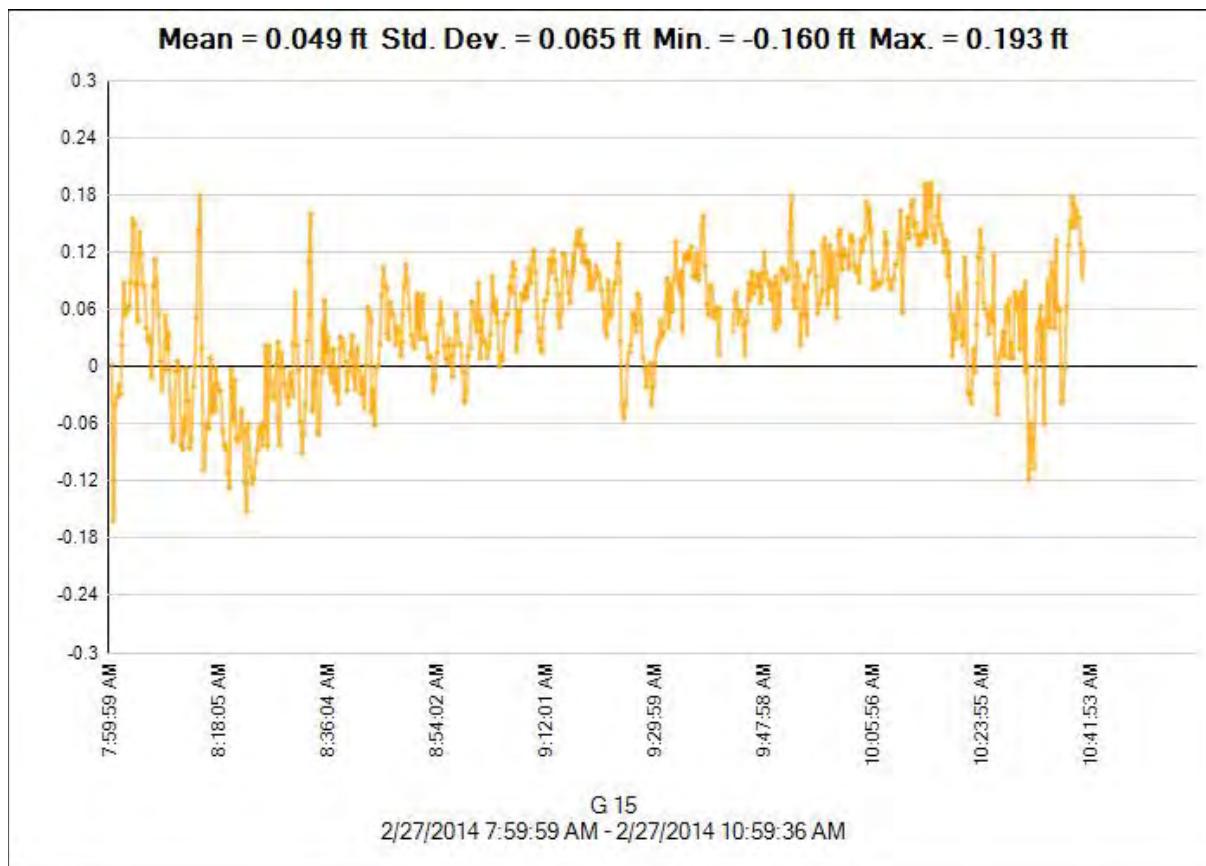


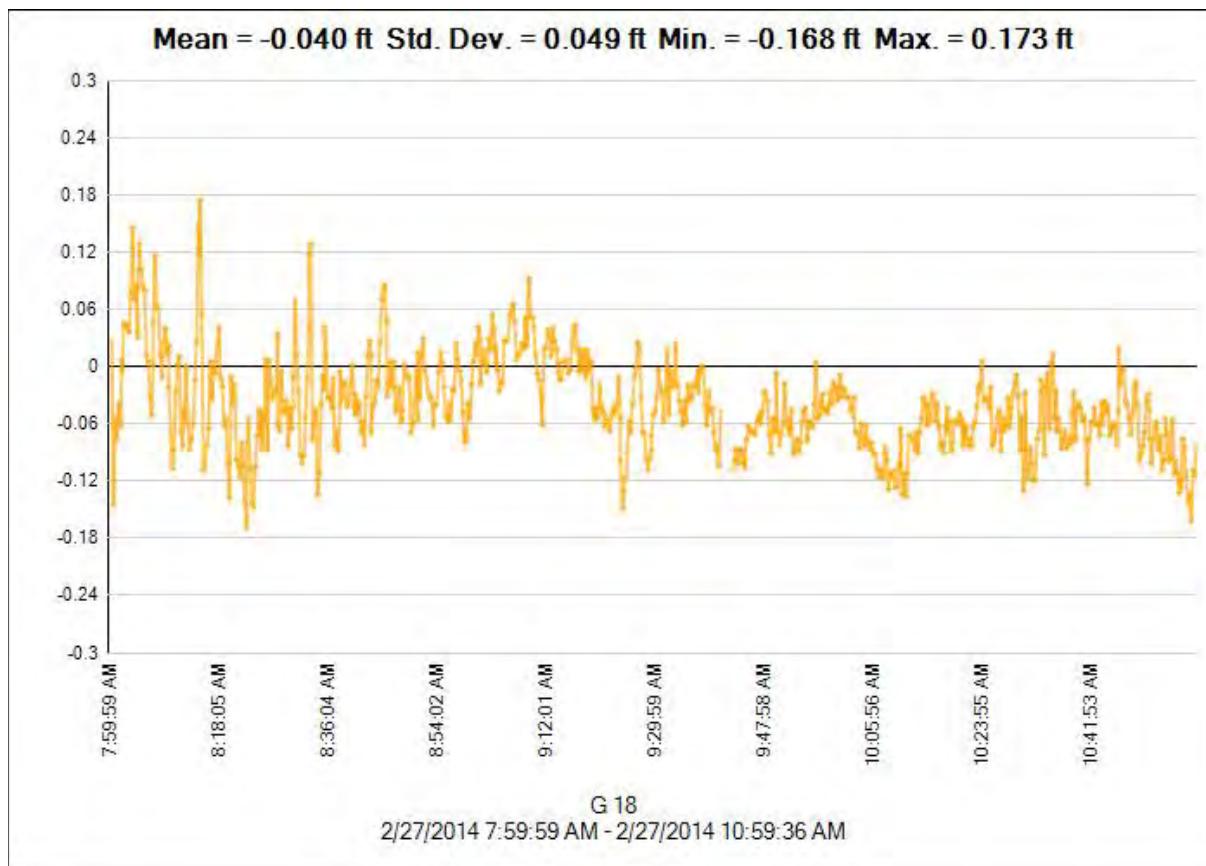


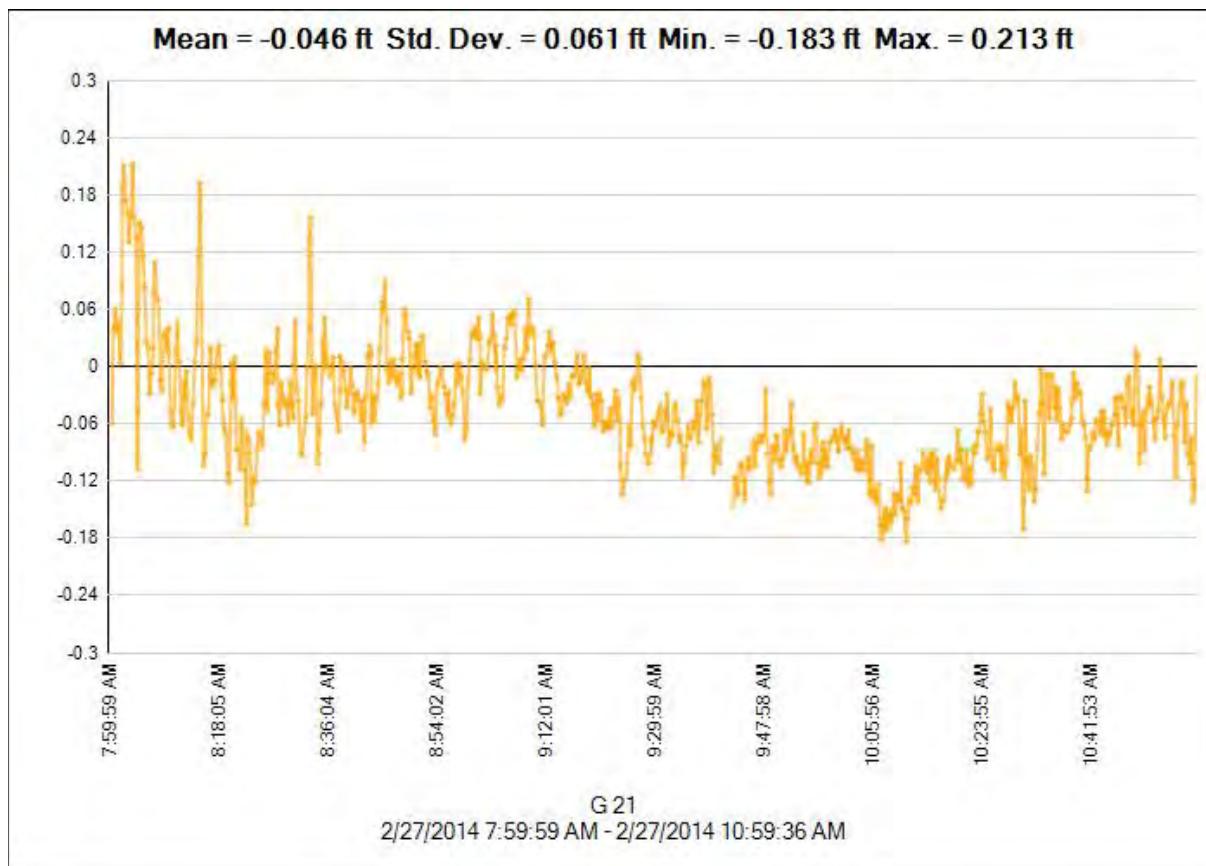
Residuals

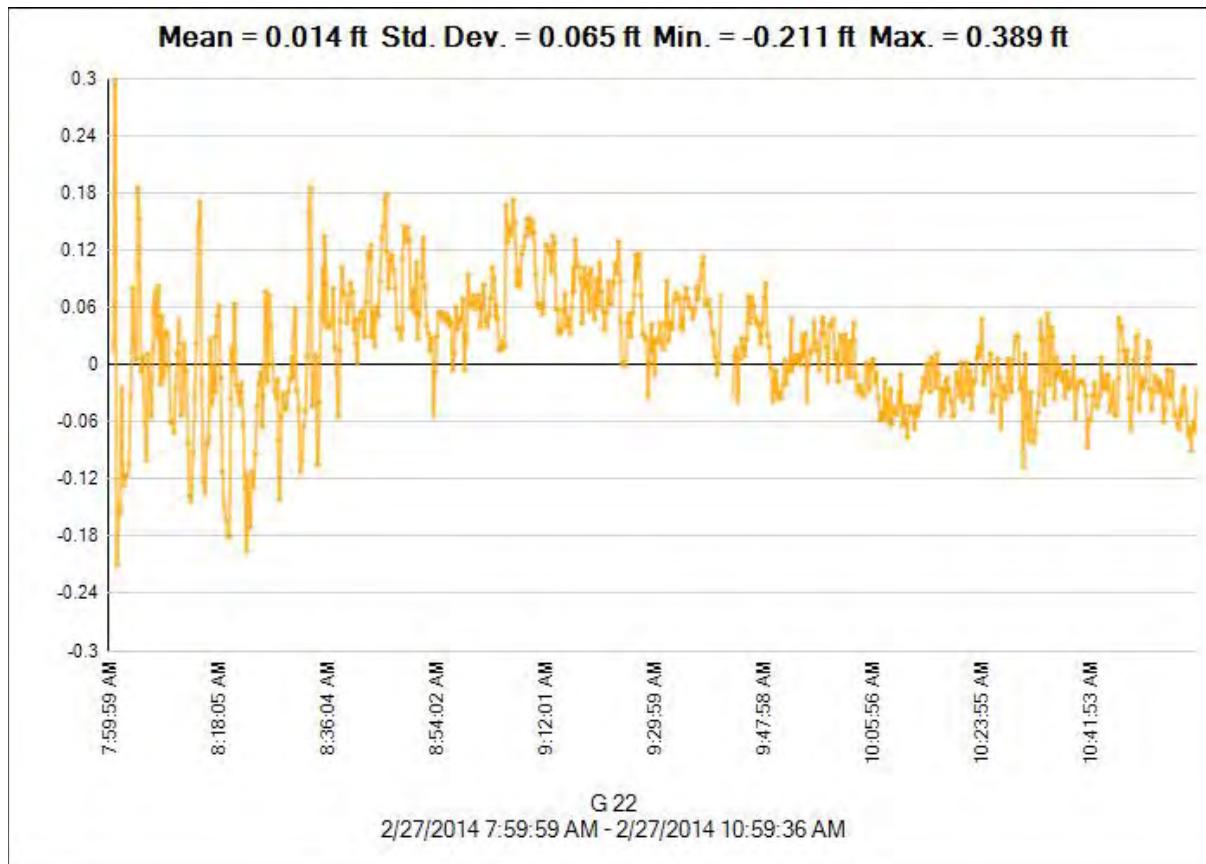


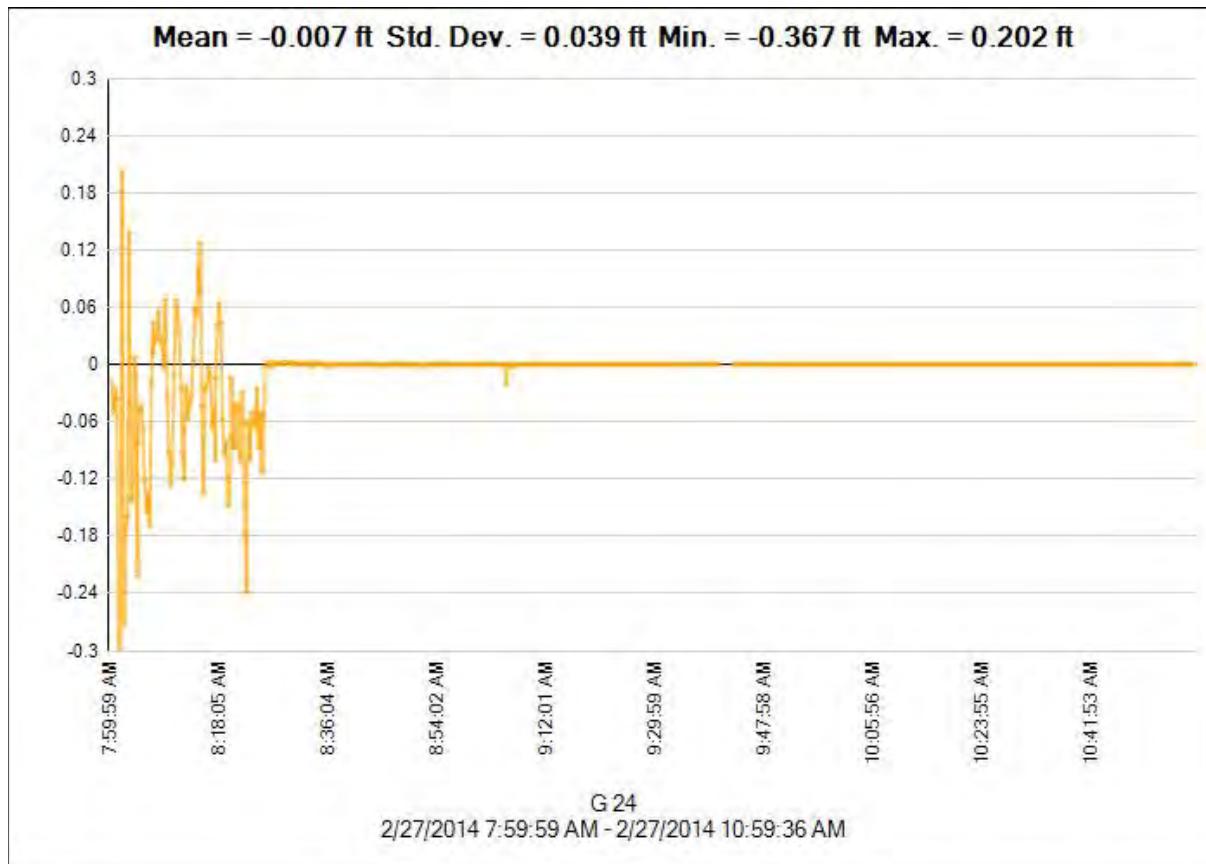


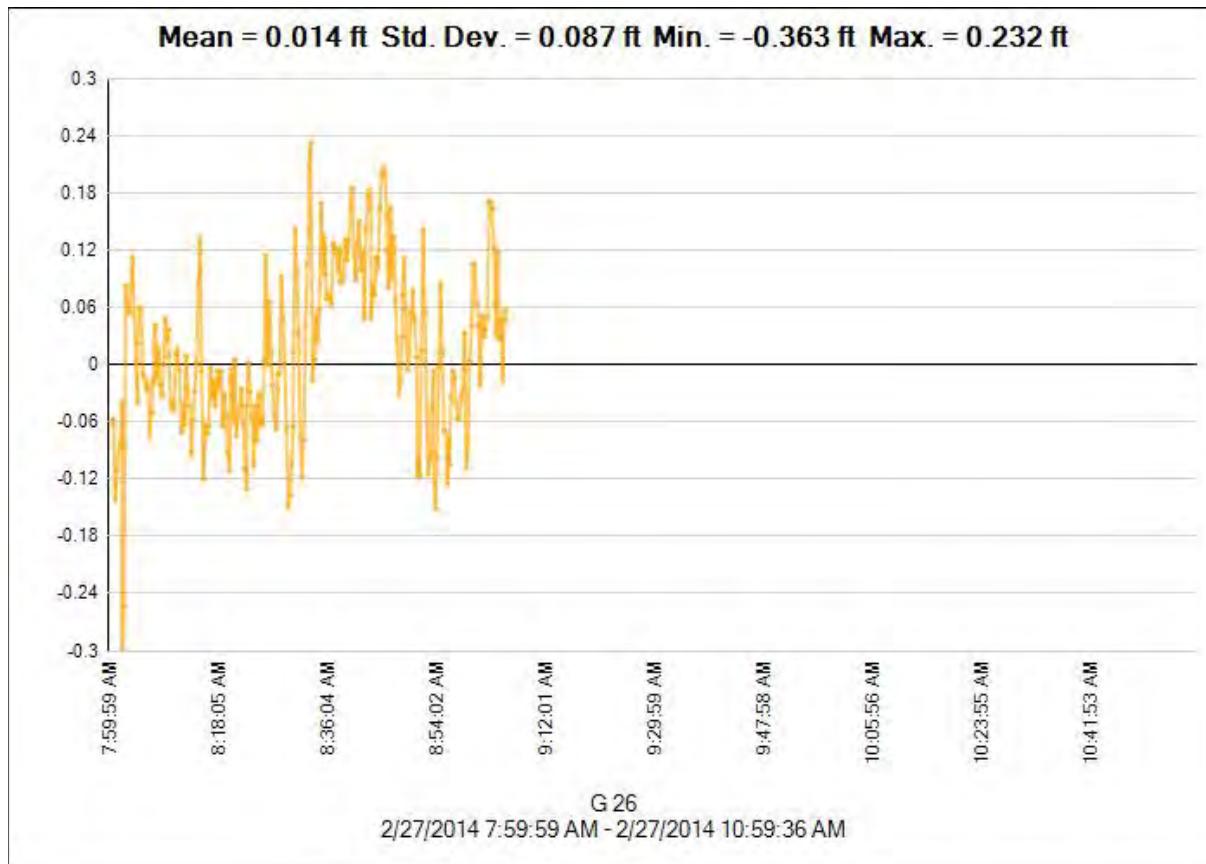


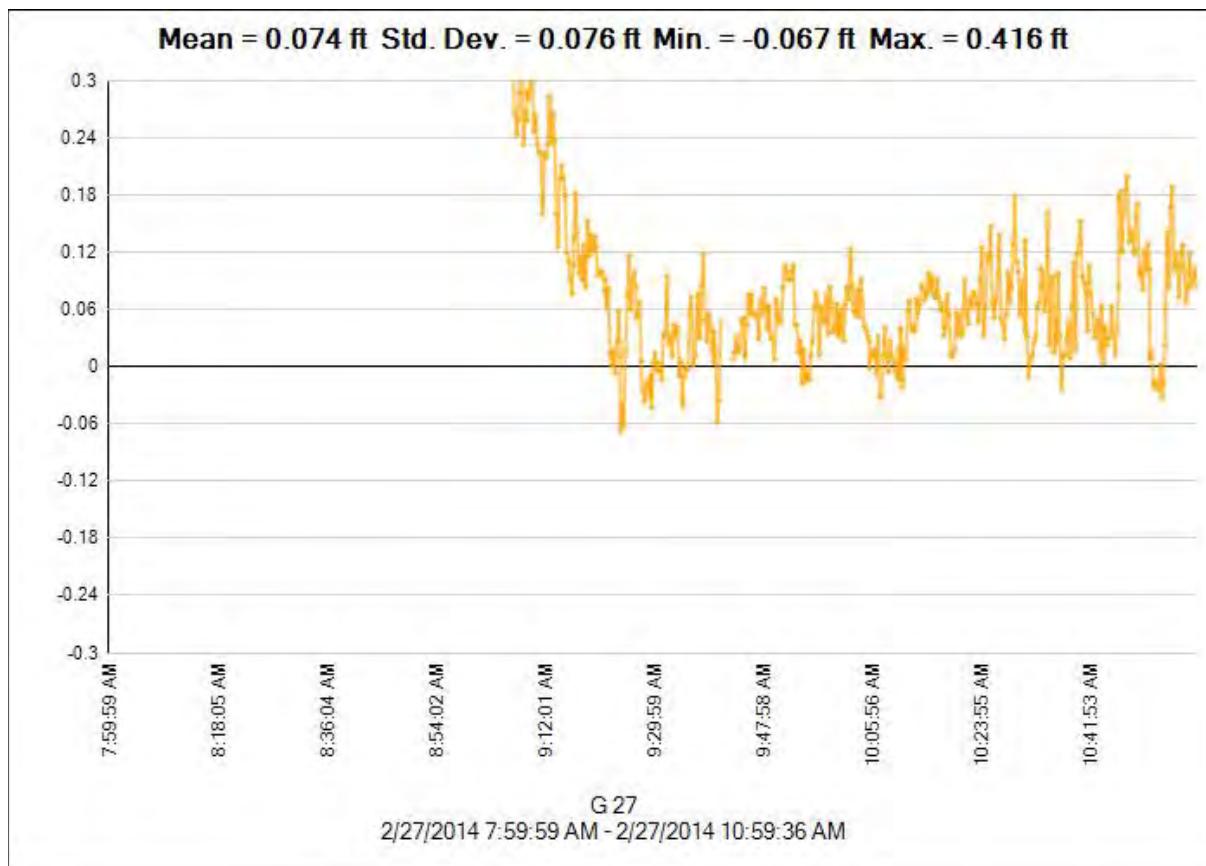


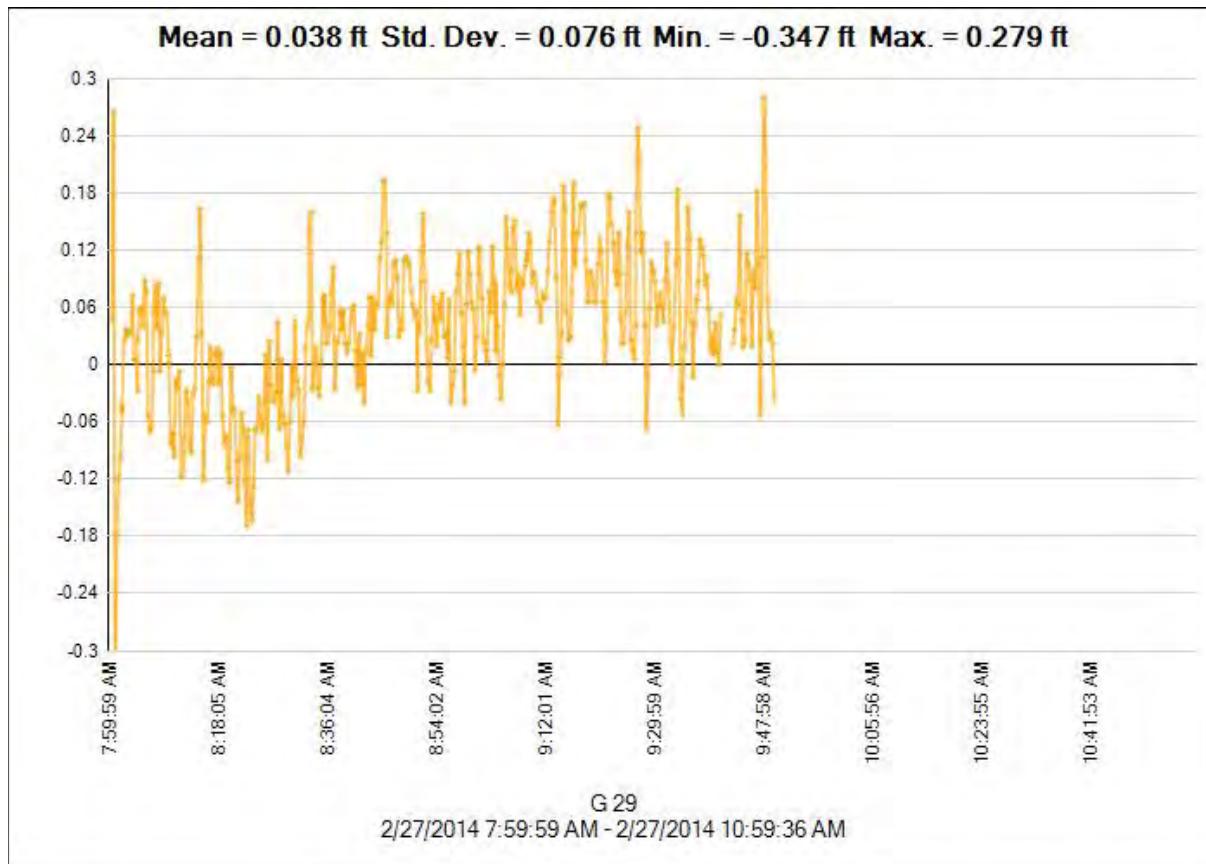














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





HOUN - FWTR (7:59:44 AM-10:59:29 AM) (S37)

Baseline observation: HOUN ---
FWTR
(B49)

Processed: 4/2/2014
10:00:14
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.038 ft

Vertical precision: 0.057 ft

RMS: 0.083 ft

Maximum PDOP: 2.884

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:00:29
AM
(Local:
UTC-6hr)

Processing stop time: 2/27/2014
10:59:29
AM
(Local:
UTC-6hr)

Processing duration: 02:59:00

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	HOUN
-------	------



Grid		Local		Global	
Northing	397729.333 ft	Latitude	N29°35'32.10964"	Latitude	N29°35'32.10964"
Easting	3474618.955 ft	Longitude	W90°43'24.98847"	Longitude	W90°43'24.98847"
Elevation	45.350 ft	Height	-37.182 ft	Height	-37.182 ft

To:	FWTR				
Grid		Local		Global	
Northing	384088.360 ft	Latitude	N29°33'09.21303"	Latitude	N29°33'09.21302"
Easting	2971987.494 ft	Longitude	W92°18'16.93910"	Longitude	W92°18'16.93910"
Elevation	27.006 ft	Height	-56.354 ft	Height	-56.355 ft

Vector					
ΔNorthing	-13640.972 ft	NS Fwd Azimuth	268°44'43"	ΔX	-502631.845 ft
ΔEasting	-502631.461 ft	Ellipsoid Dist.	502839.994 ft	ΔY	6176.969 ft
ΔElevation	-18.344 ft	ΔHeight	-19.173 ft	ΔZ	-12564.140 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.013 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.016 ft
σ ΔEasting	0.016 ft	σ Ellipsoid Dist.	0.016 ft	σ ΔY	0.025 ft
σ ΔElevation	0.029 ft	σ ΔHeight	0.029 ft	σ ΔZ	0.019 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000227117		
Y	0.0000012150	0.0000583741	
Z	-0.0000007710	-0.0000297220	0.0000344404

Occupations

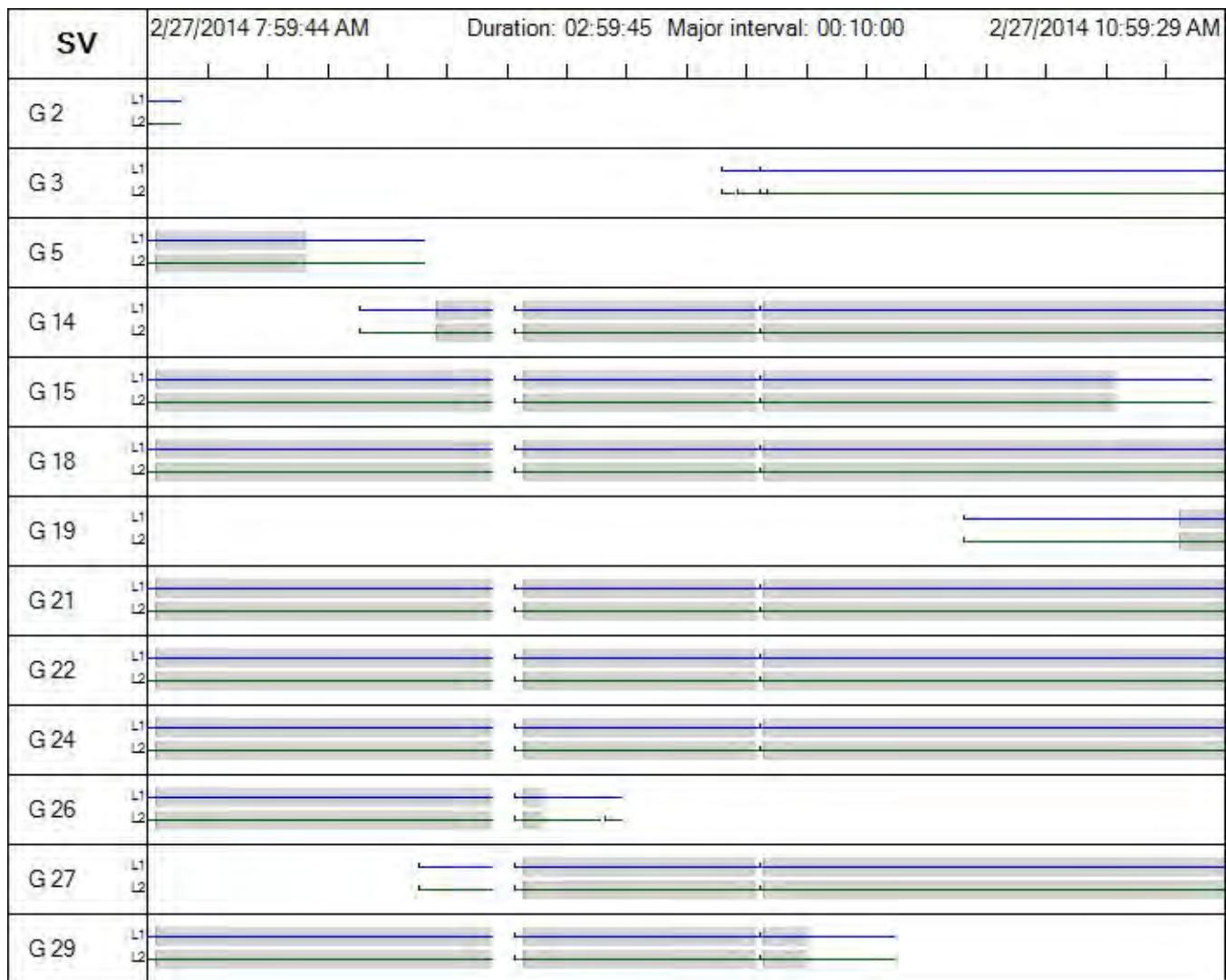
	From	To
Point ID:	HOUM	FWTR



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\houm0580_0.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\FWTR058E.14o
Receiver type:	NetRS	NetRS
Receiver serial number:	4646125537	Unknown
Antenna type:	Zephyr Geodetic	Zephyr Geodetic
Antenna serial number:	-----	12697374
Antenna height (measured):	0.000 ft	0.000 ft
Antenna method:	Antenna Phase Center	Bottom of antenna mount

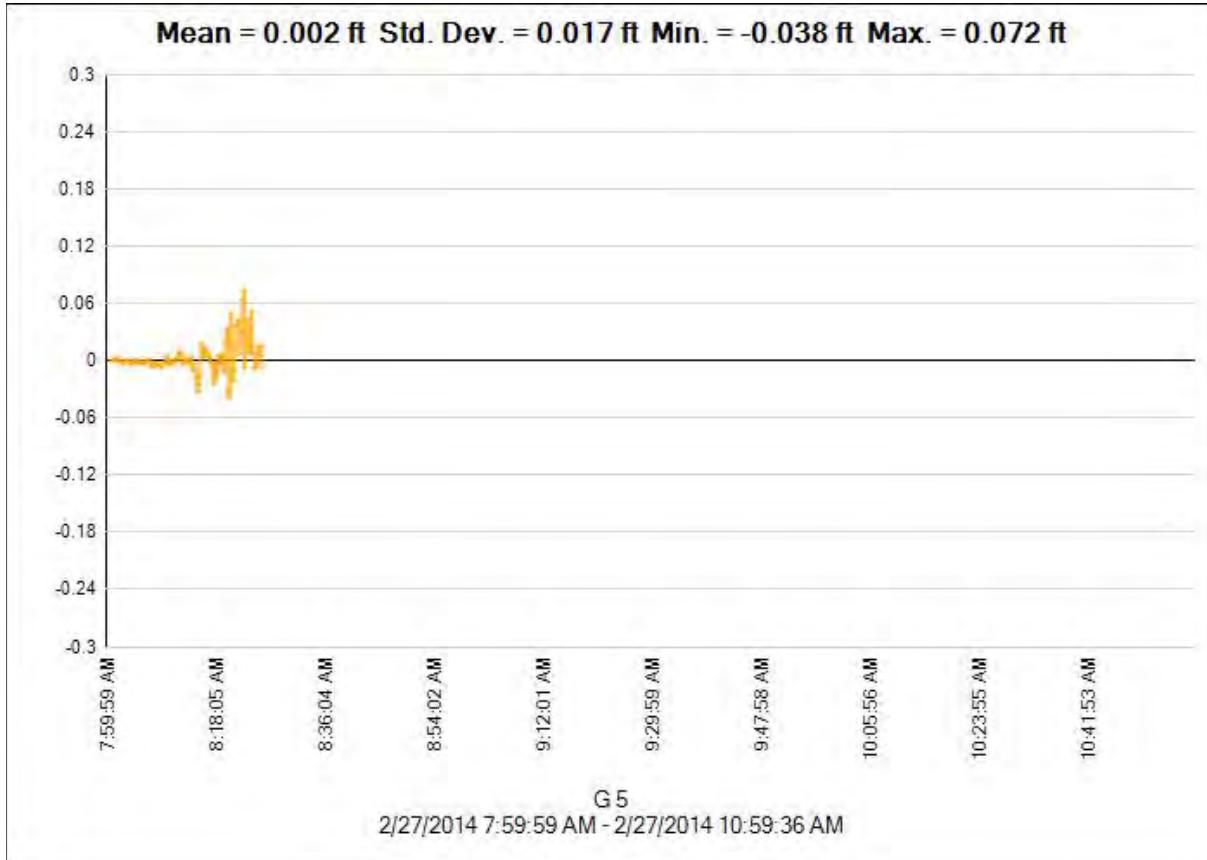


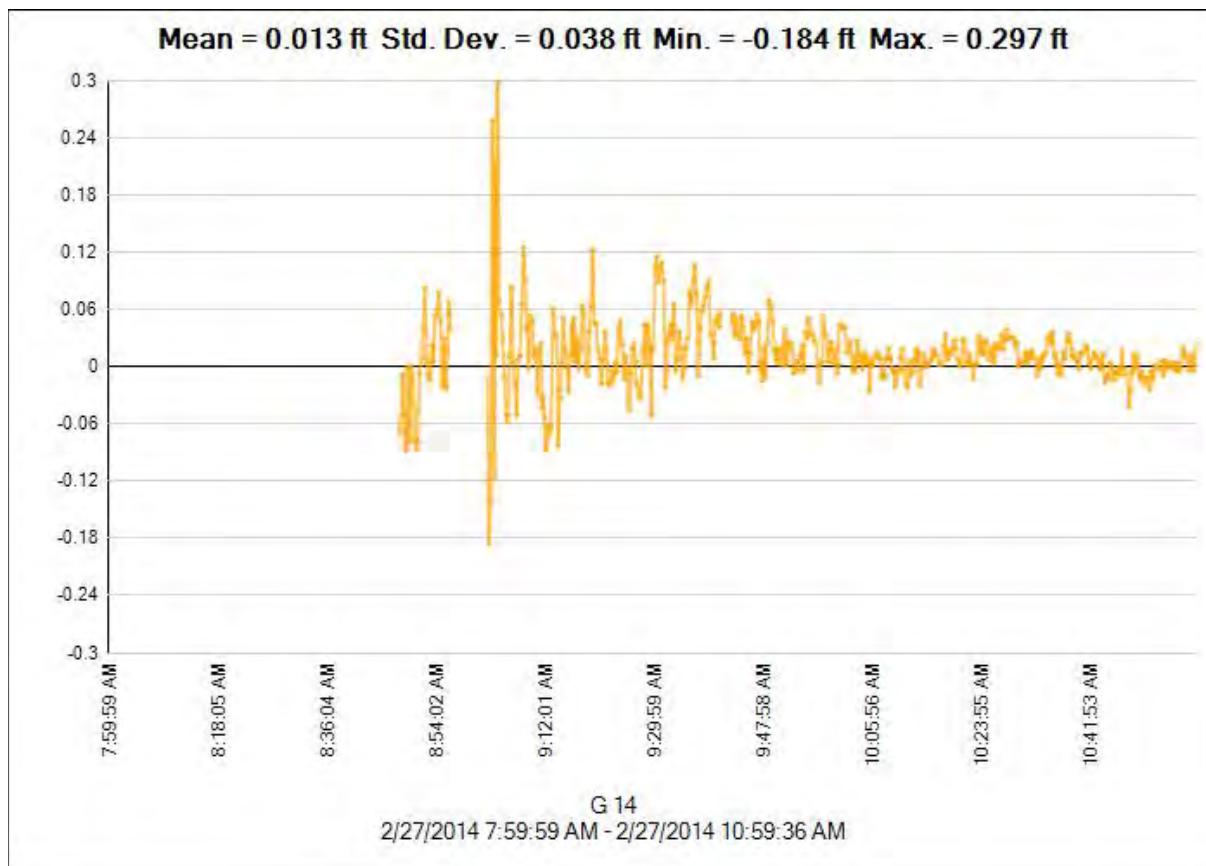
Tracking Summary

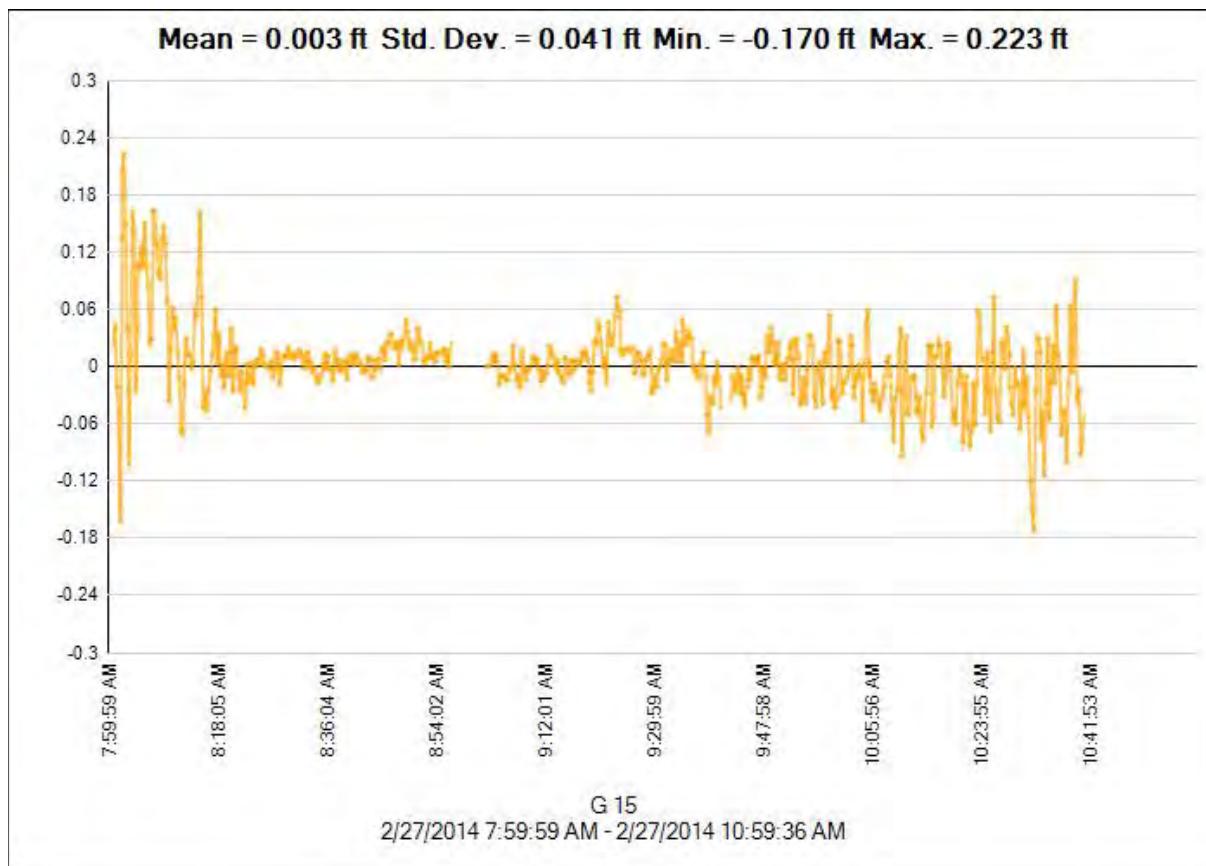


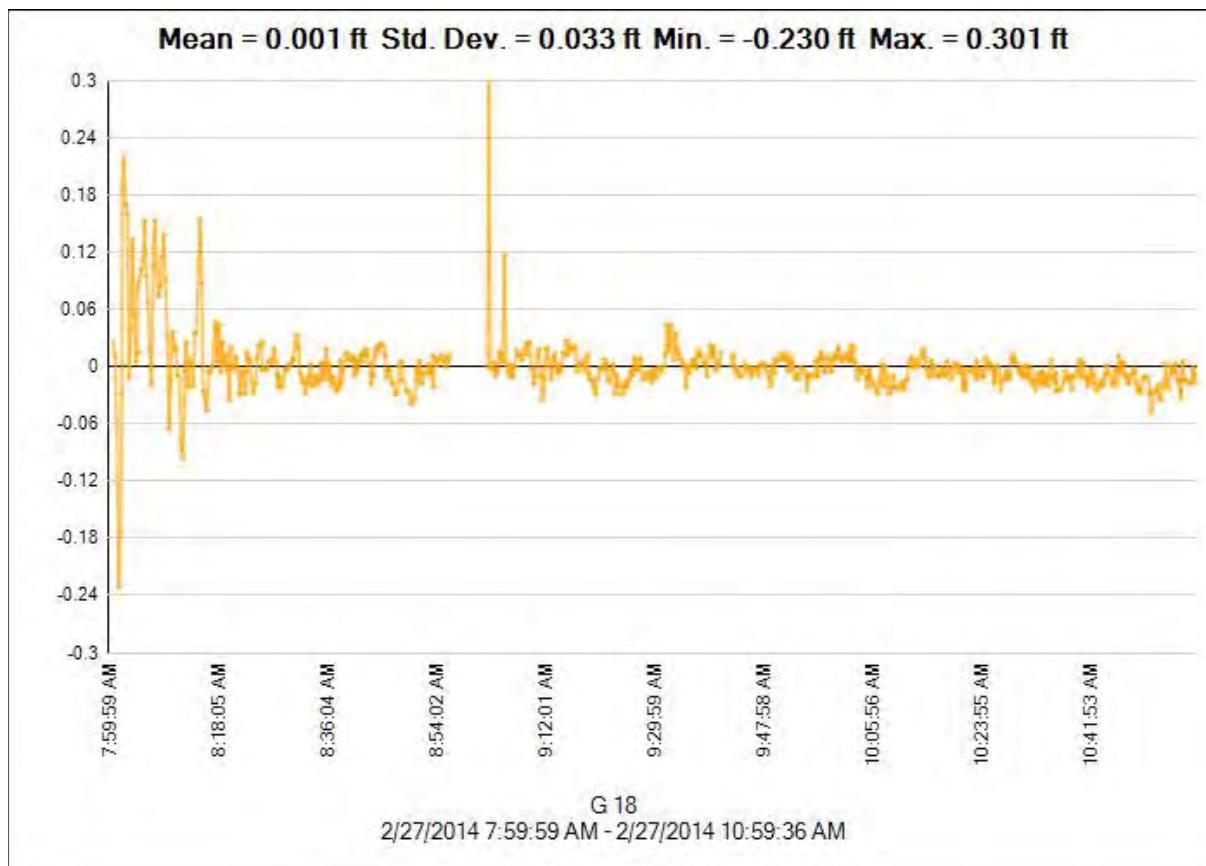


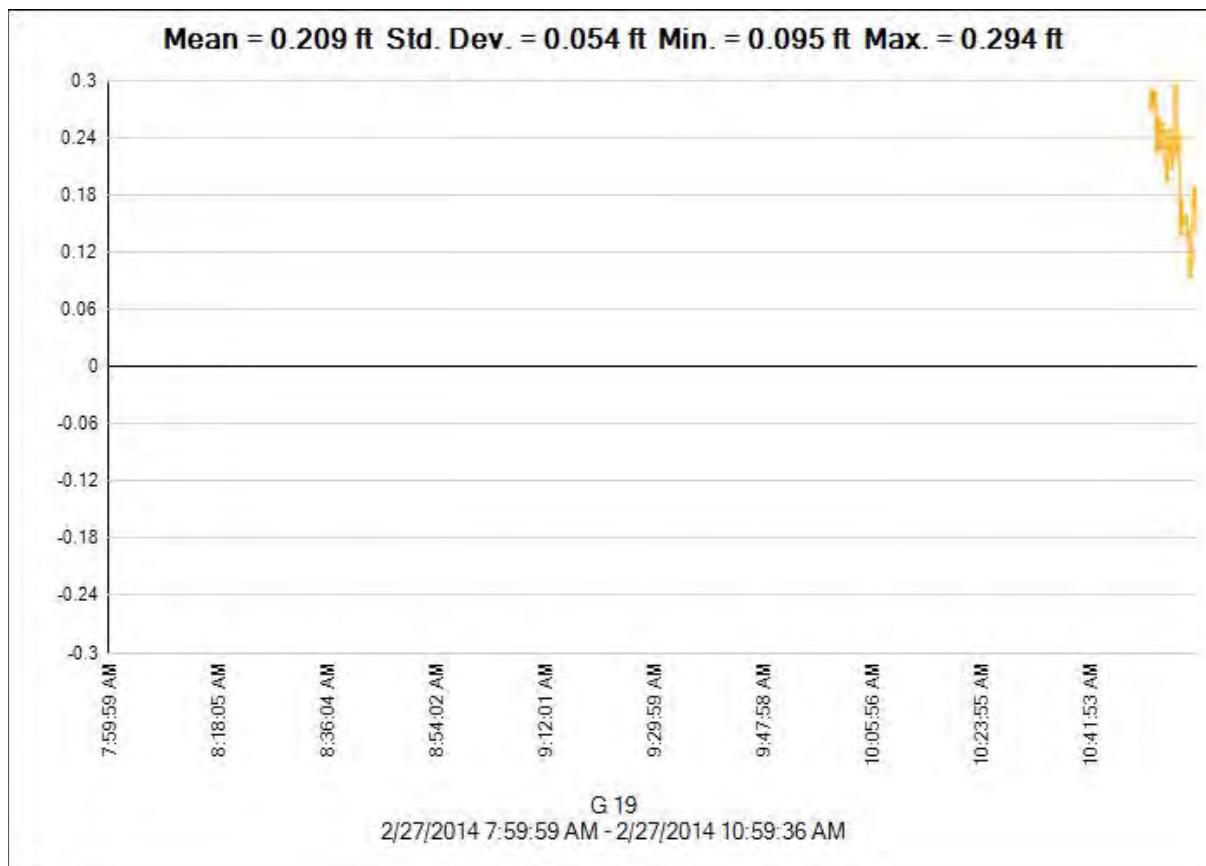
Residuals

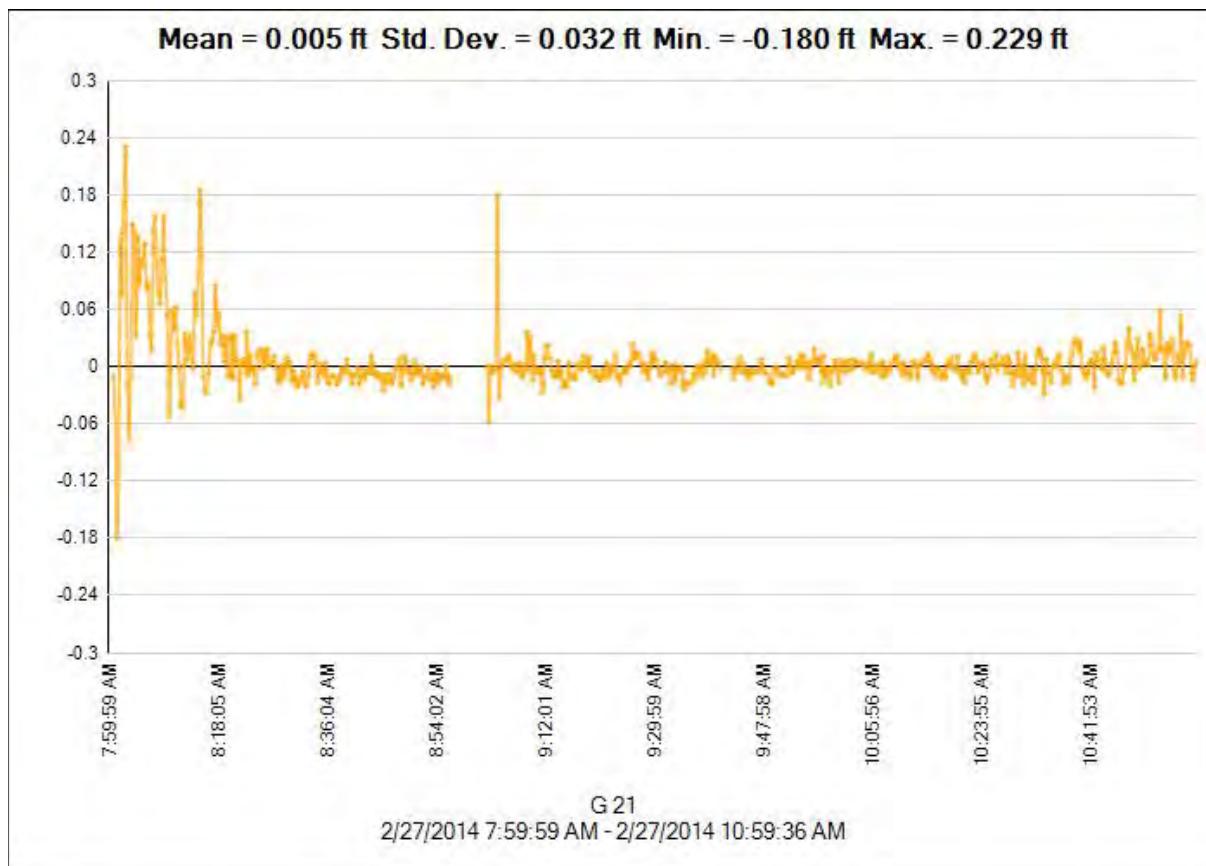


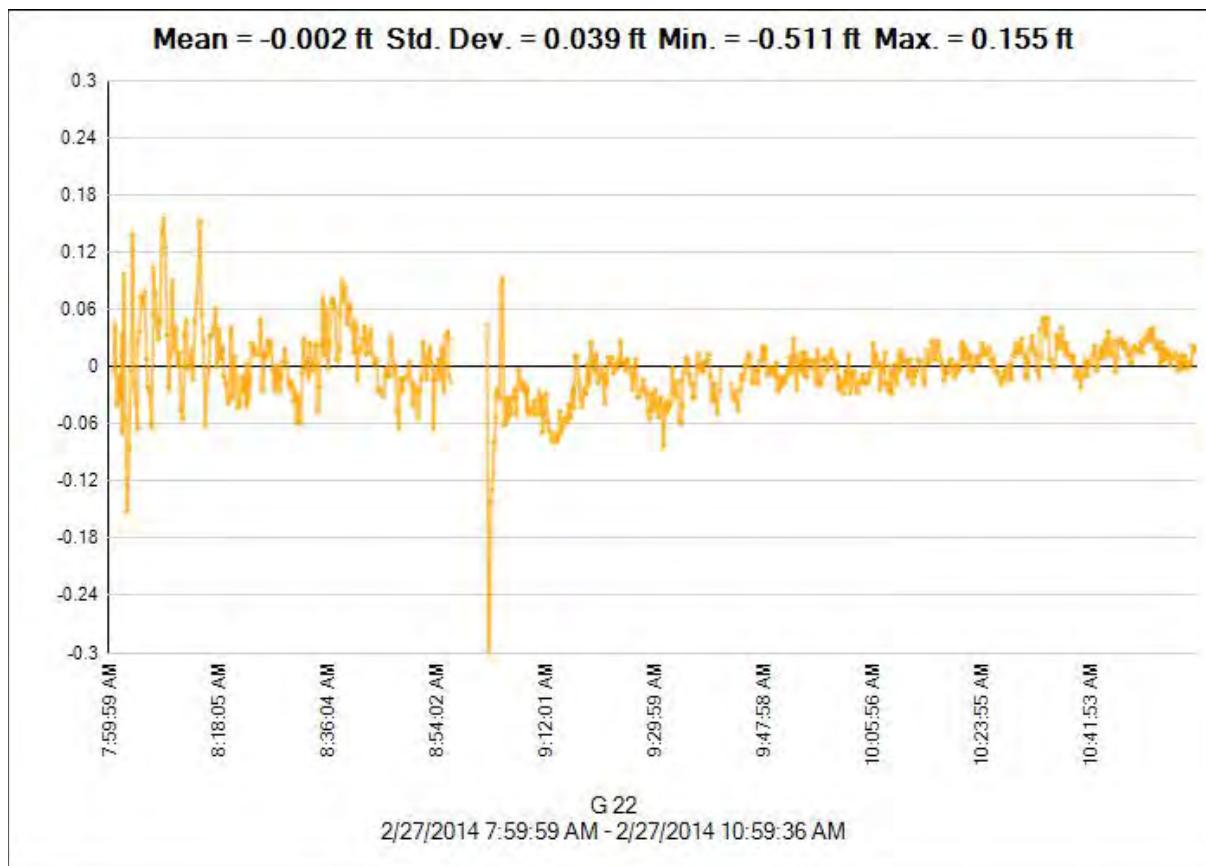


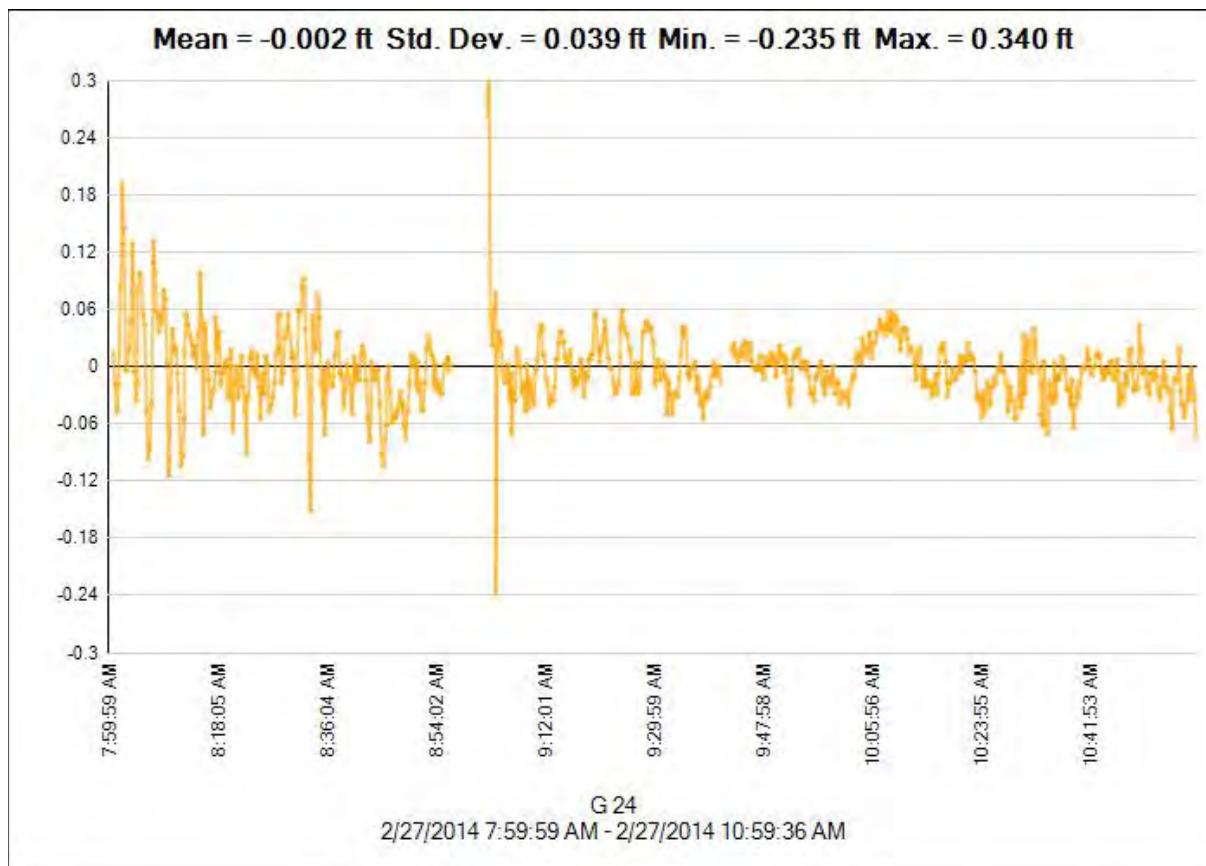


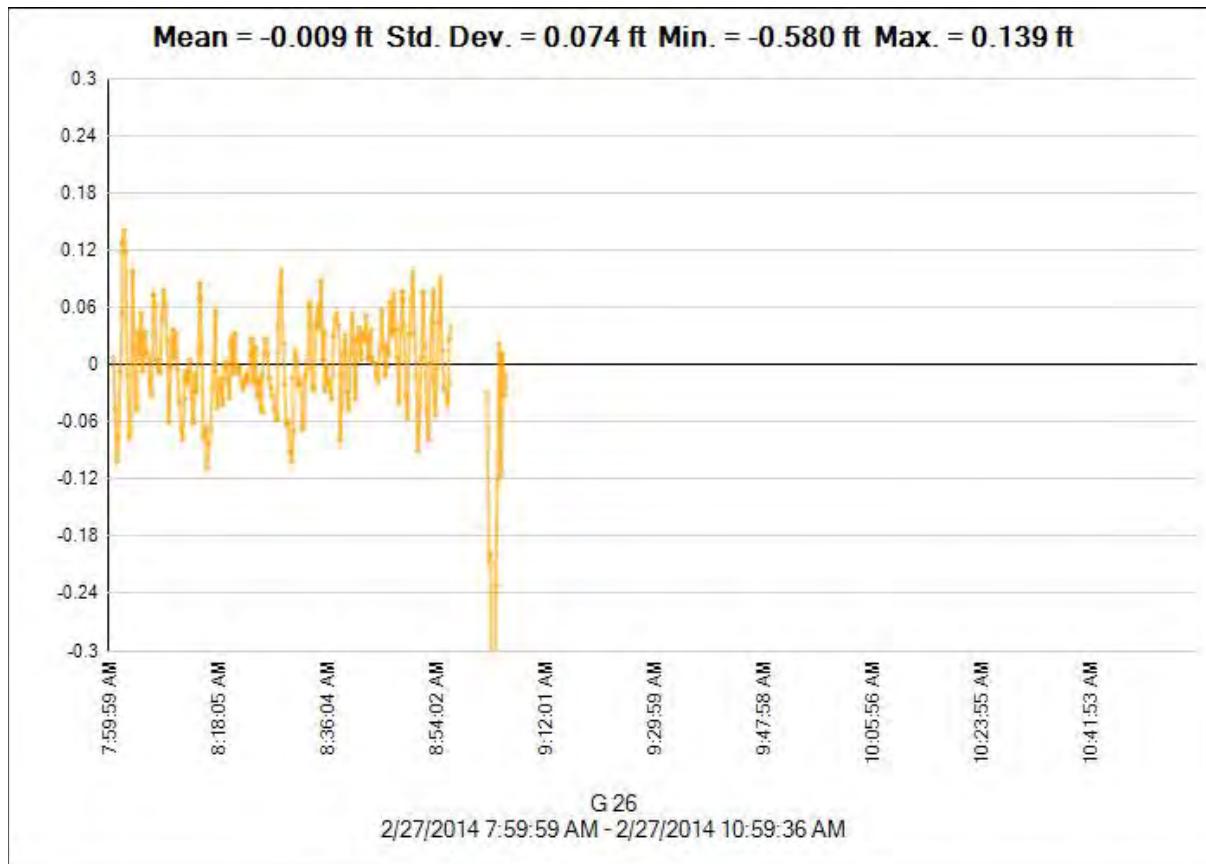


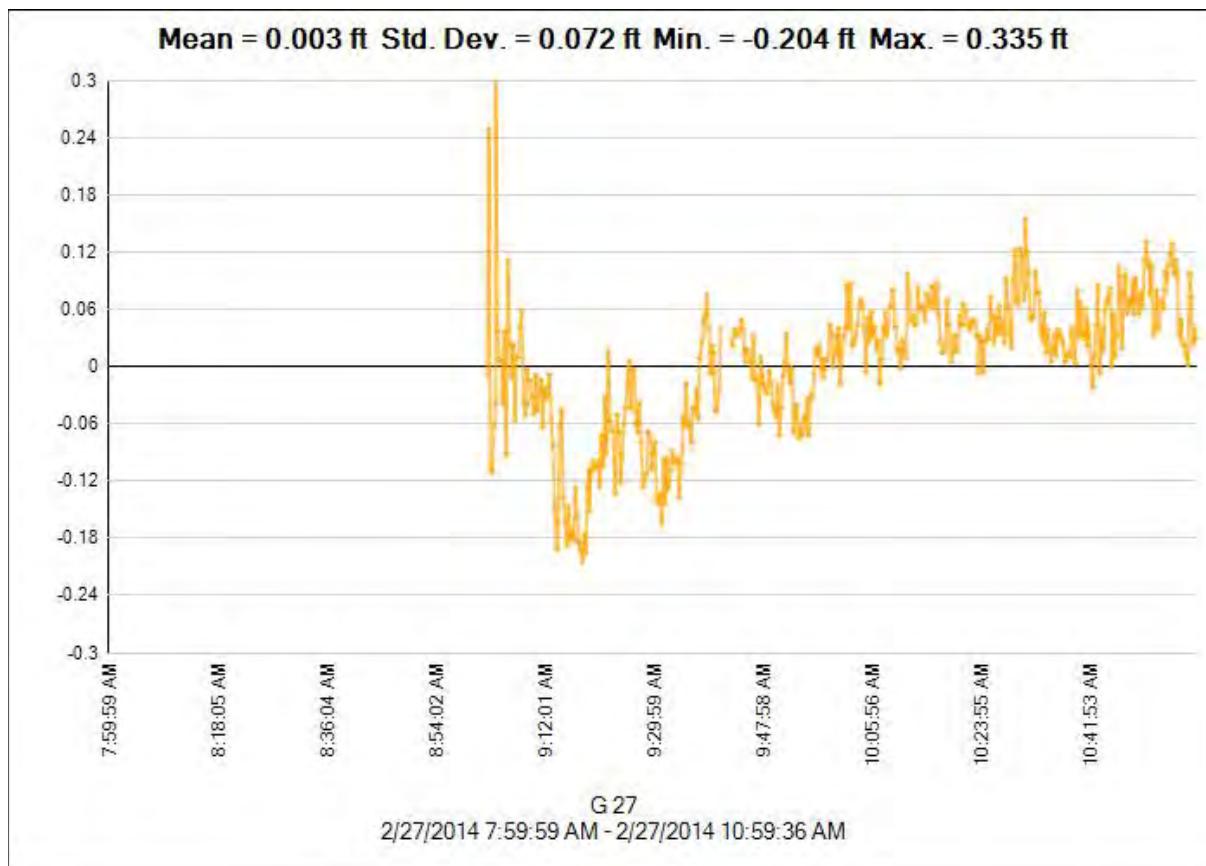


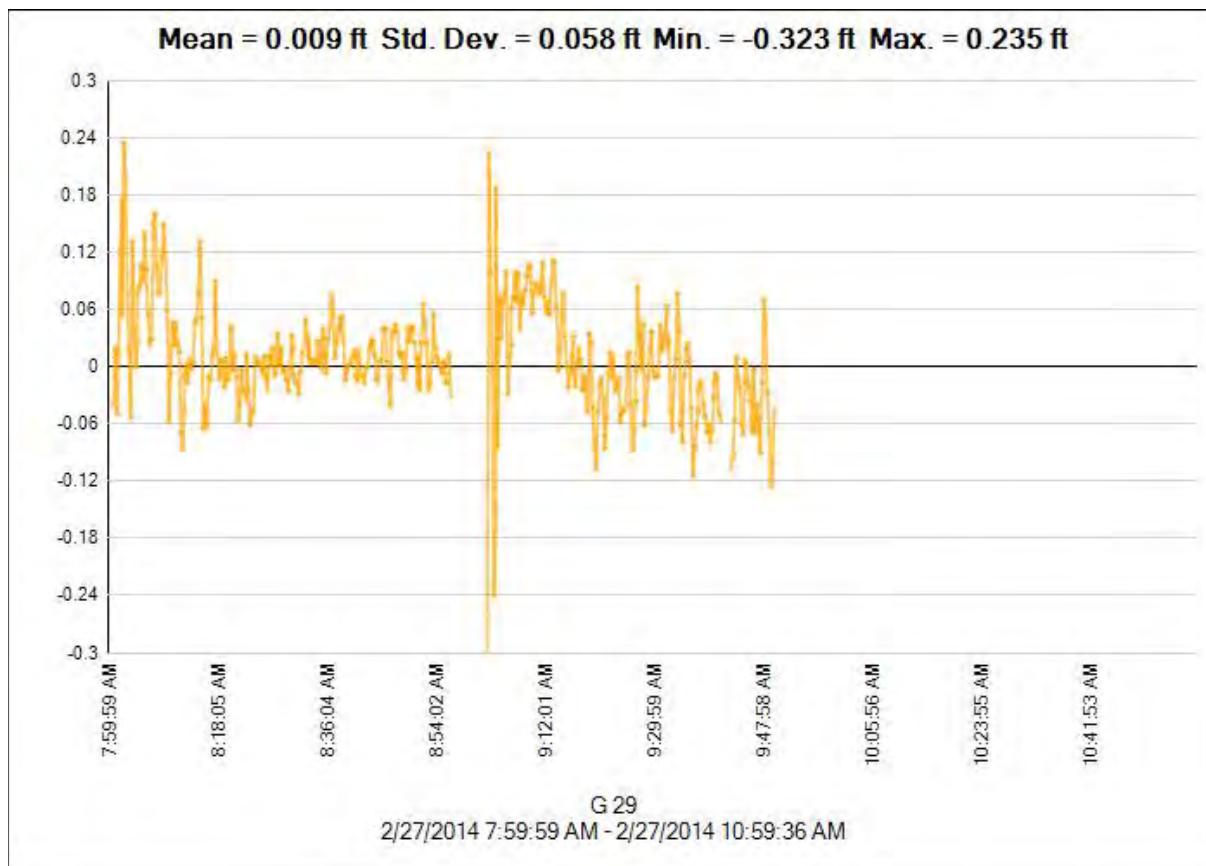














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm





FWTR - TE14-SM-01 (8:44:37 AM-10:59:29 AM) (S38)

Baseline observation: FWTR ---
TE14-SM-
01 (B50)

Processed: 4/2/2014
10:00:35
AM

Solution type: Fixed

Frequency used: Dual
Frequency
(L1, L2)

Horizontal precision: 0.052 ft

Vertical precision: 0.119 ft

RMS: 0.157 ft

Maximum PDOP: 2.648

Ephemeris used: Broadcast

Antenna model: NGS
Absolute

Processing start time: 2/27/2014
8:45:14
AM
(Local:
UTC-6hr)

Processing stop time: 2/27/2014
10:59:29
AM
(Local:
UTC-6hr)

Processing duration: 02:14:15

Processing interval: 15
seconds

Vector Components (Mark to Mark)

From:	FWTR
-------	------



Grid		Local		Global	
Northing	384088.365 ft	Latitude	N29°33'09.21307"	Latitude	N29°33'09.21307"
Easting	2971987.468 ft	Longitude	W92°18'16.93939"	Longitude	W92°18'16.93939"
Elevation	26.959 ft	Height	-56.402 ft	Height	-56.402 ft

To:	TE14-SM-01				
Grid		Local		Global	
Northing	199323.185 ft	Latitude	N29°02'49.70628"	Latitude	N29°02'49.70628"
Easting	3438609.426 ft	Longitude	W90°50'22.54635"	Longitude	W90°50'22.54635"
Elevation	0.977 ft	Height	-77.781 ft	Height	-77.781 ft

Vector					
ΔNorthing	-184765.180 ft	NS Fwd Azimuth	111°07'22"	ΔX	464347.621 ft
ΔEasting	466621.958 ft	Ellipsoid Dist.	501869.244 ft	ΔY	-102697.668 ft
ΔElevation	-25.982 ft	ΔHeight	-21.379 ft	ΔZ	-160292.014 ft

Standard Errors

Vector errors:					
σ ΔNorthing	0.014 ft	σ NS fwd Azimuth	0°00'00"	σ ΔX	0.021 ft
σ ΔEasting	0.021 ft	σ Ellipsoid Dist.	0.021 ft	σ ΔY	0.054 ft
σ ΔElevation	0.060 ft	σ ΔHeight	0.060 ft	σ ΔZ	0.030 ft

Aposteriori Covariance Matrix (US survey foot²)

	X	Y	Z
X	0.0000410432		
Y	0.0000024372	0.0002751694	
Z	-0.0000041470	-0.0001297807	0.0000843986

Occupations

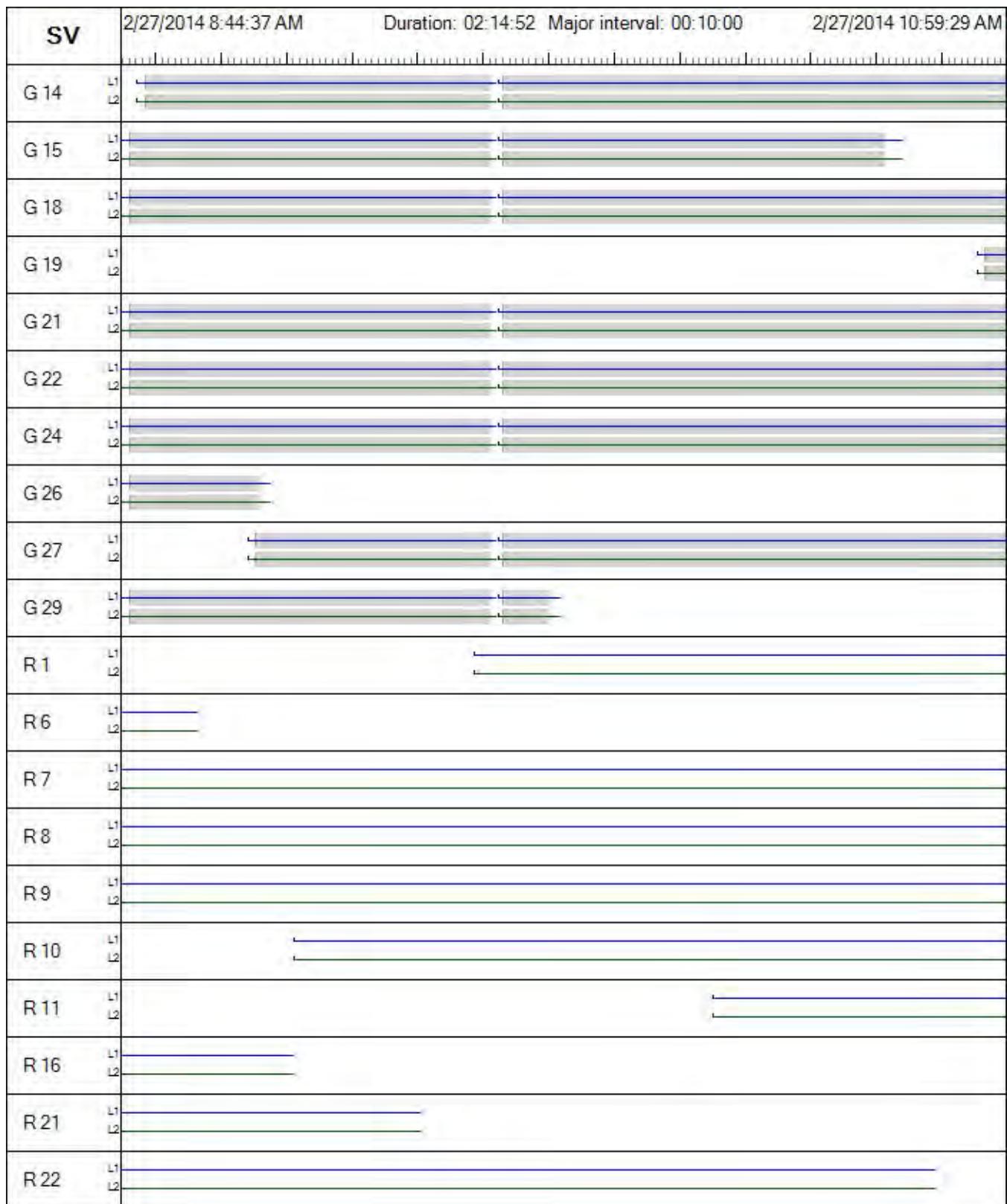
	From	To
Point ID:	FWTR	TE14-SM-01



Data file:	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\FWTR058E.14o	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier\82920580.T02
Receiver type:	NetRS	R7 GNSS
Receiver serial number:	Unknown	5040K18292
Antenna type:	Zephyr Geodetic	Zephyr Geodetic 2
Antenna serial number:	12697374	-----
Antenna height (measured):	0.000 ft	6.562 ft
Antenna method:	Bottom of antenna mount	Bottom of antenna mount



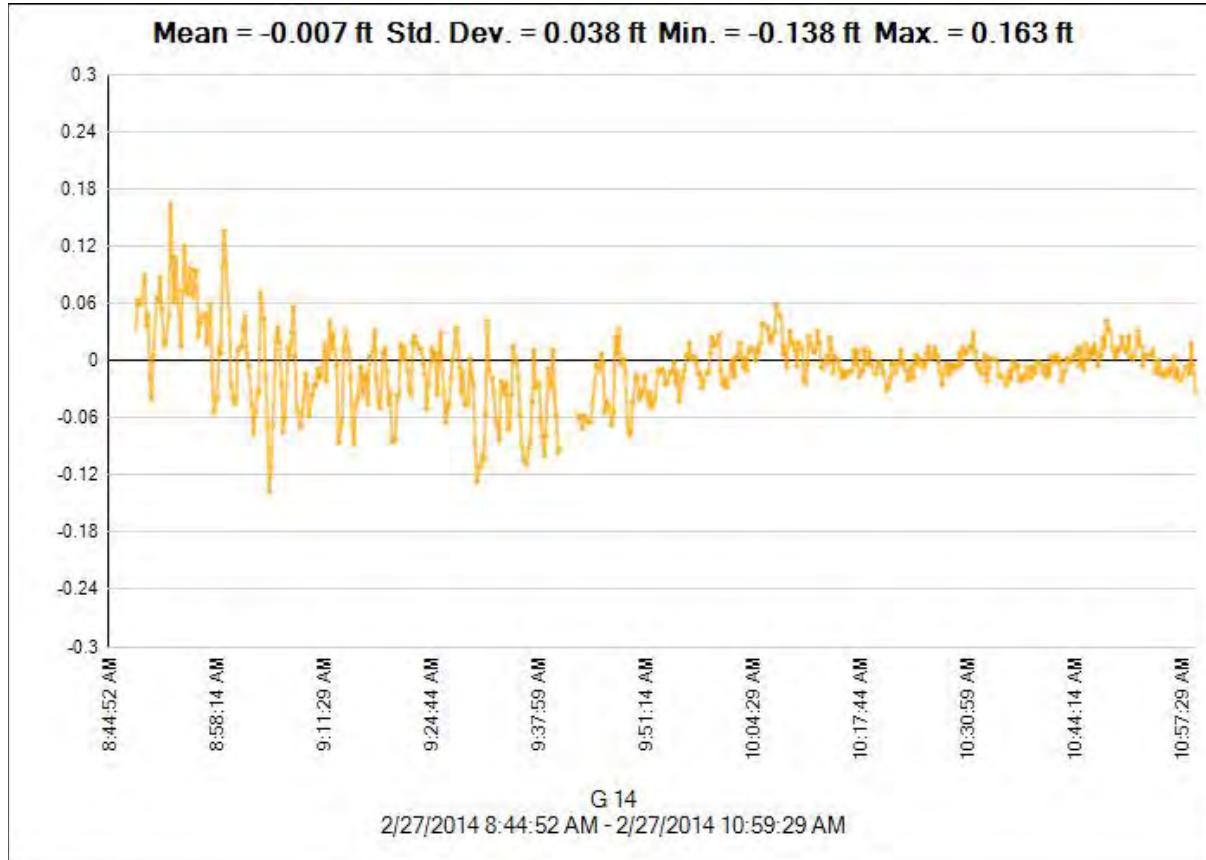
Tracking Summary

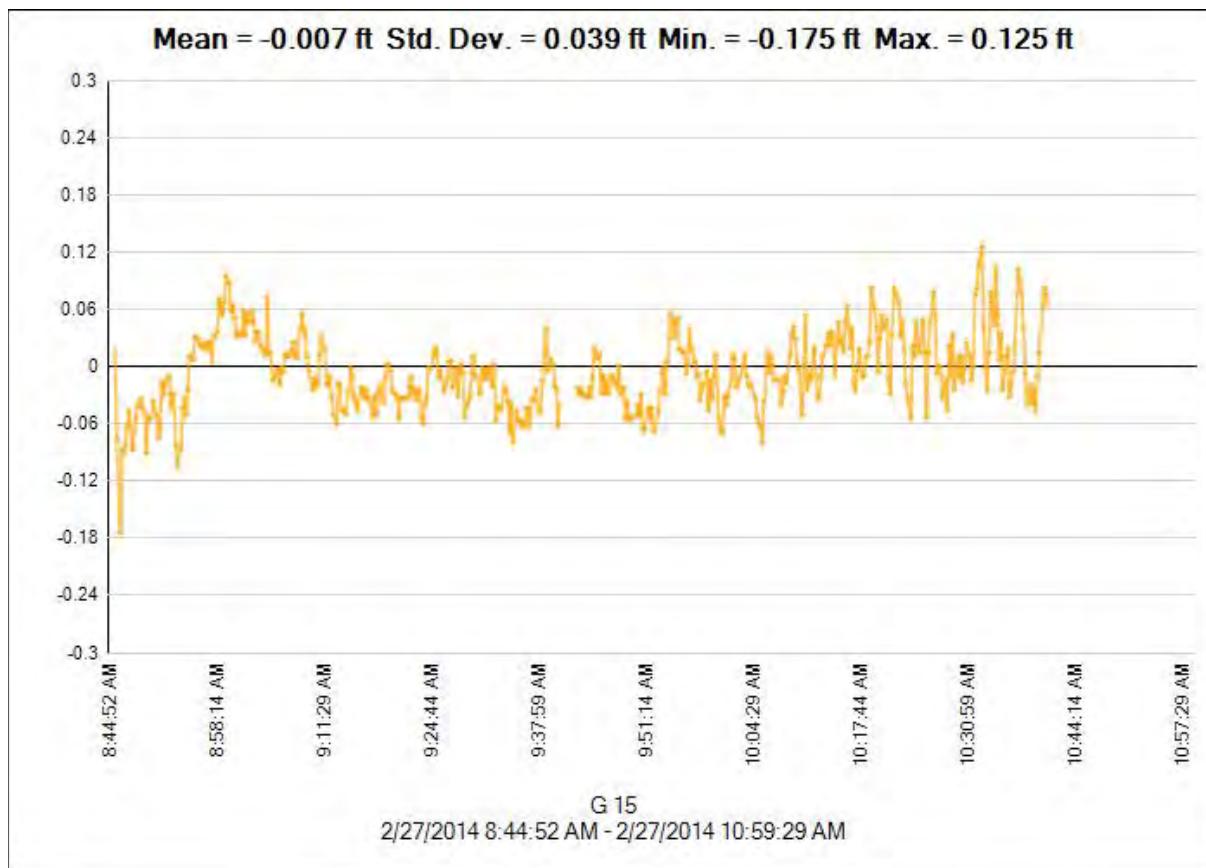


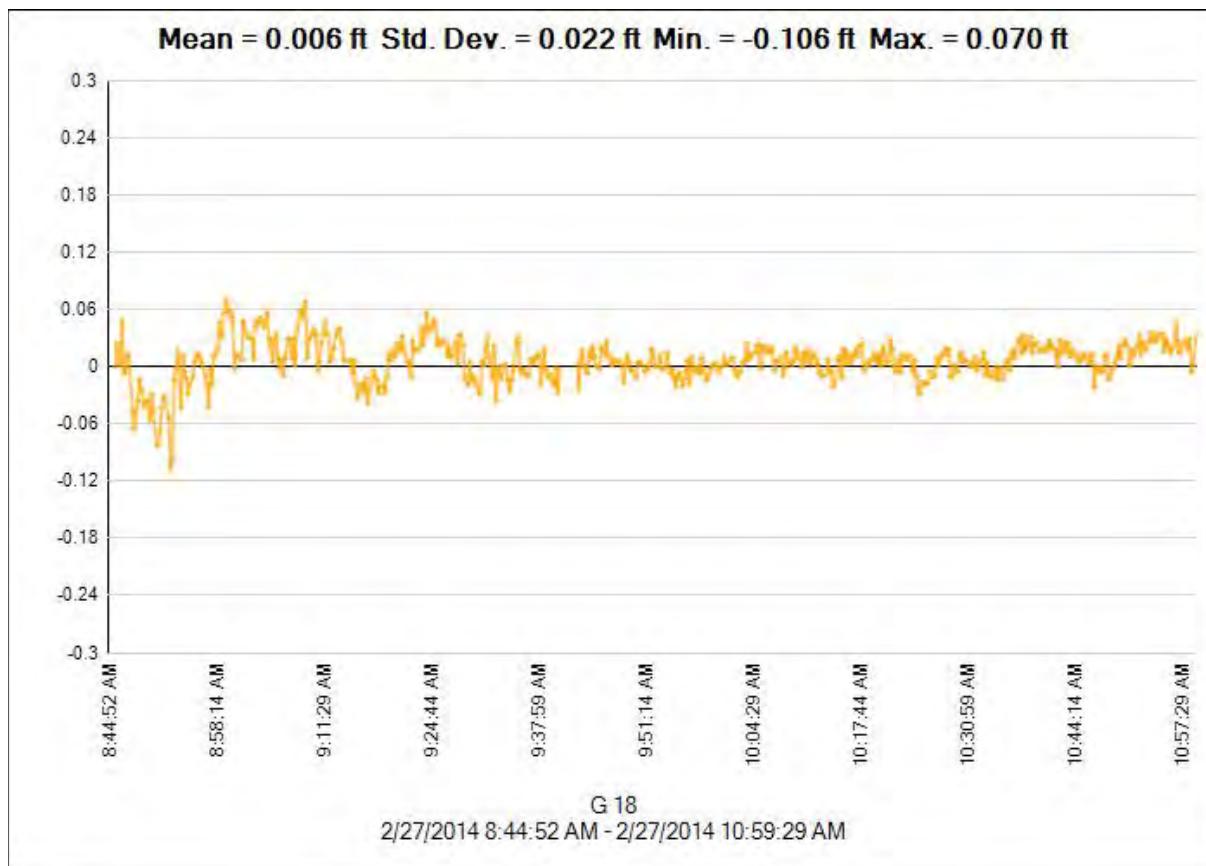


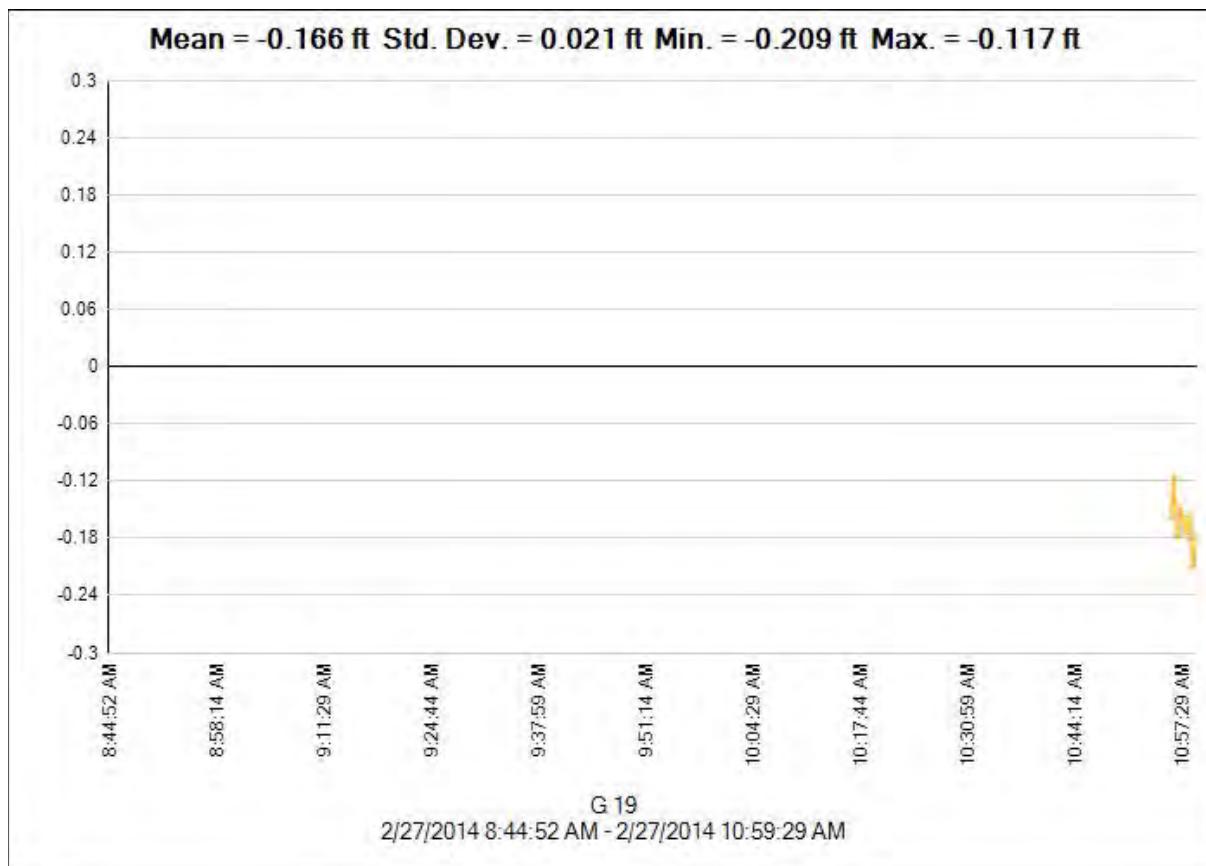


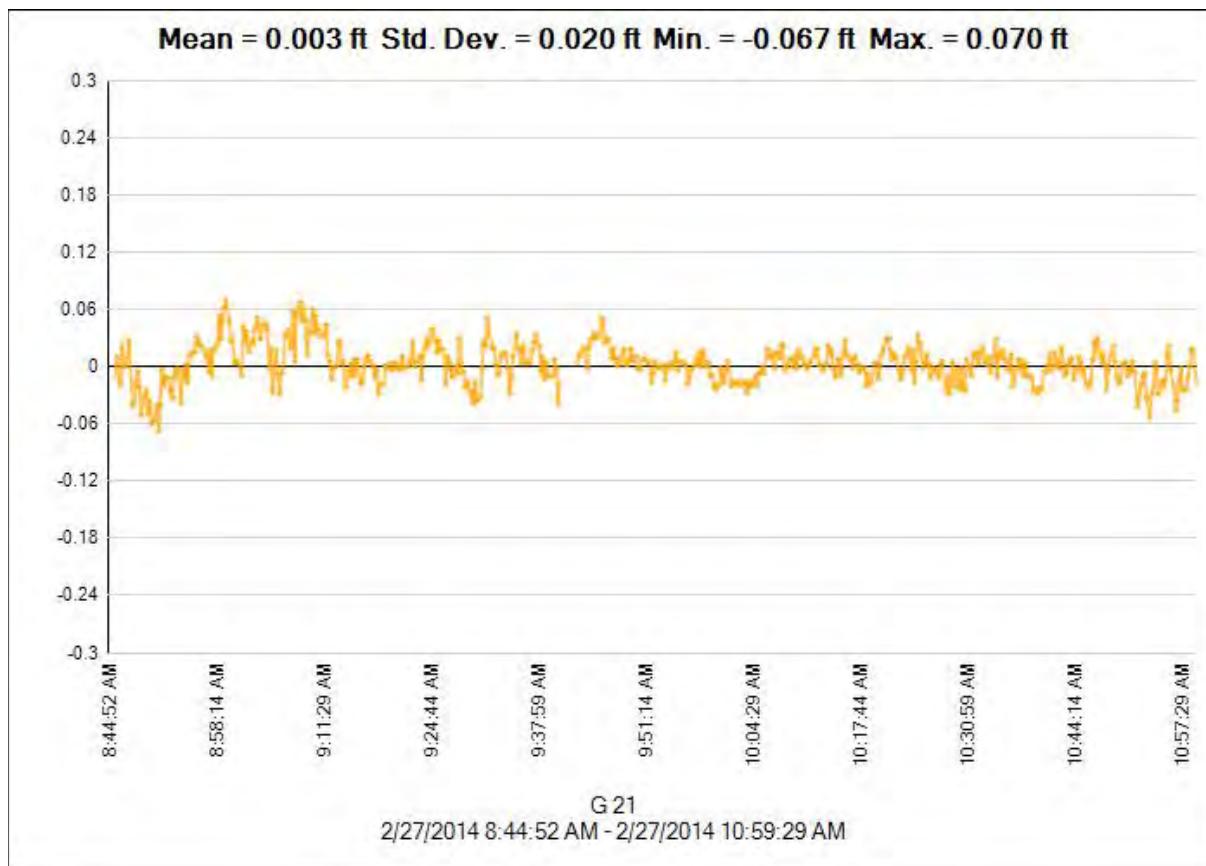
Residuals

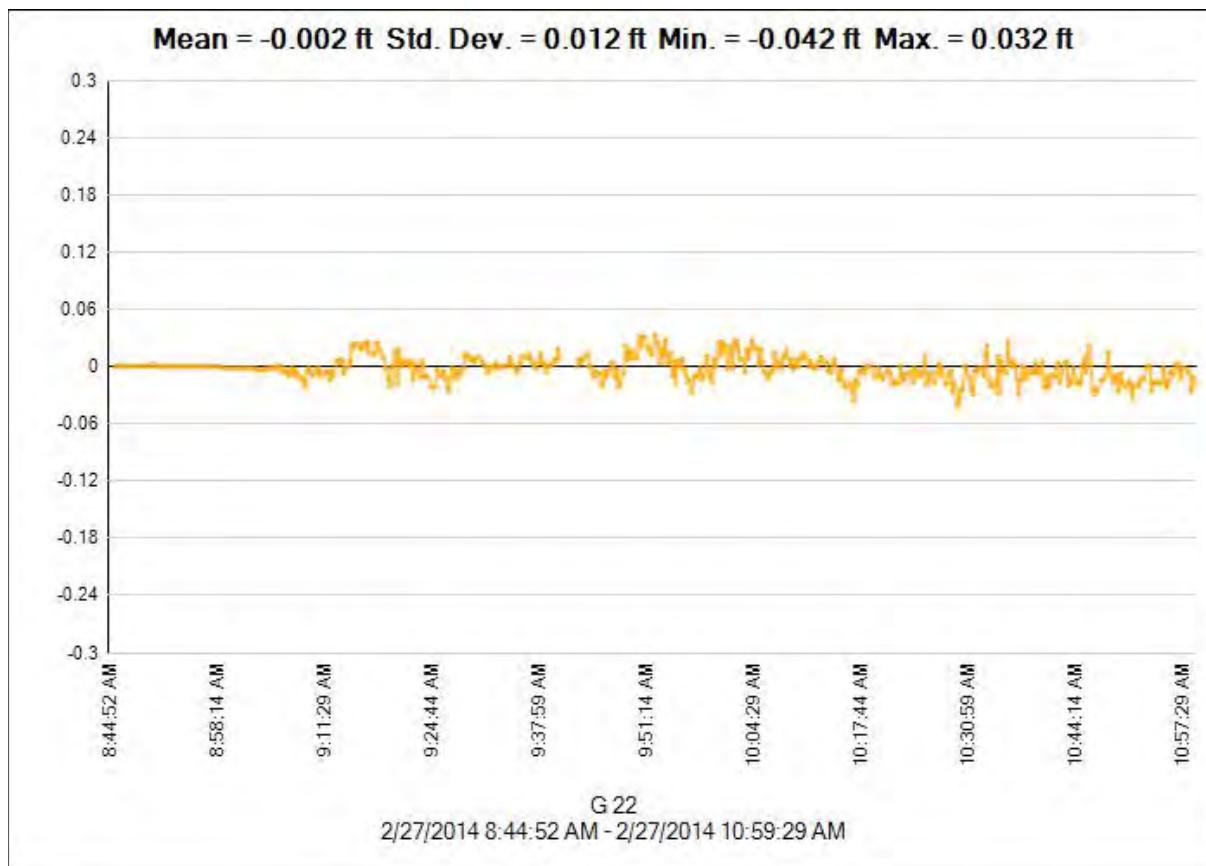


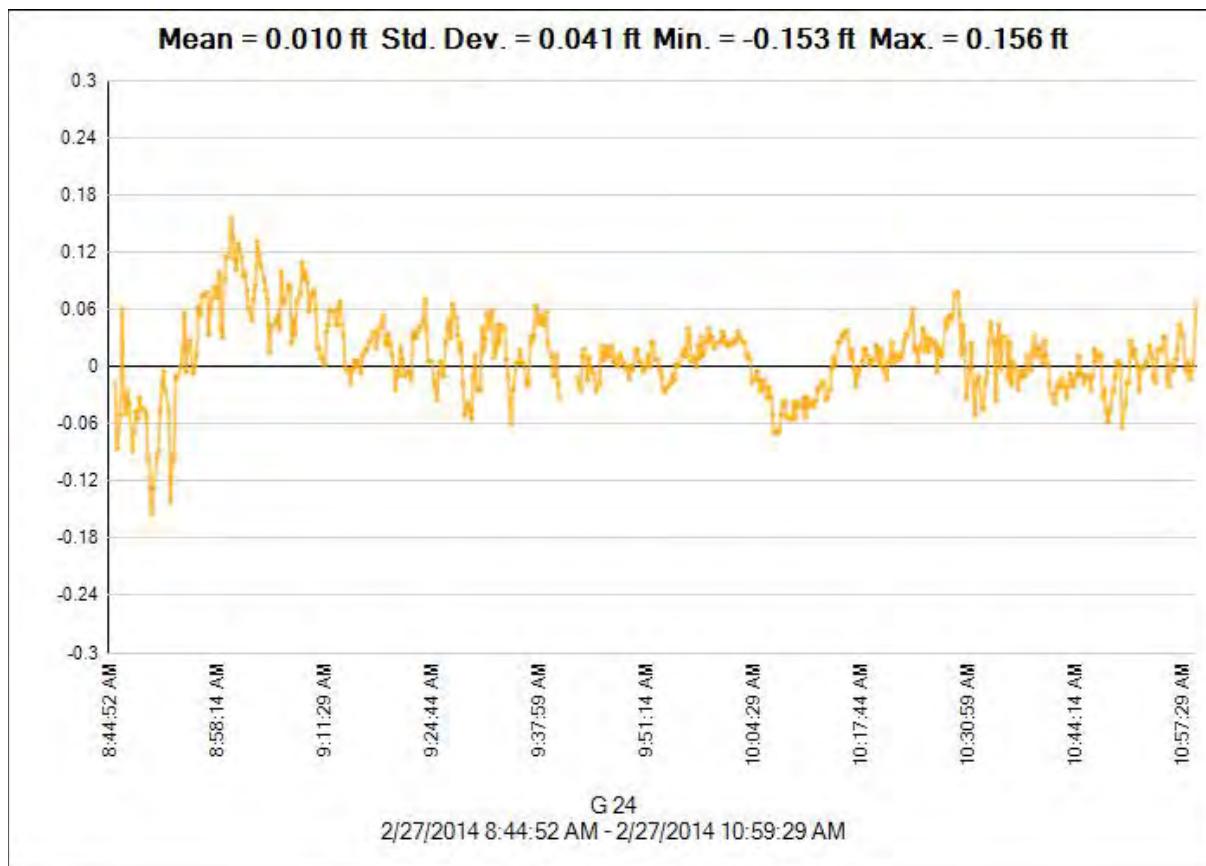


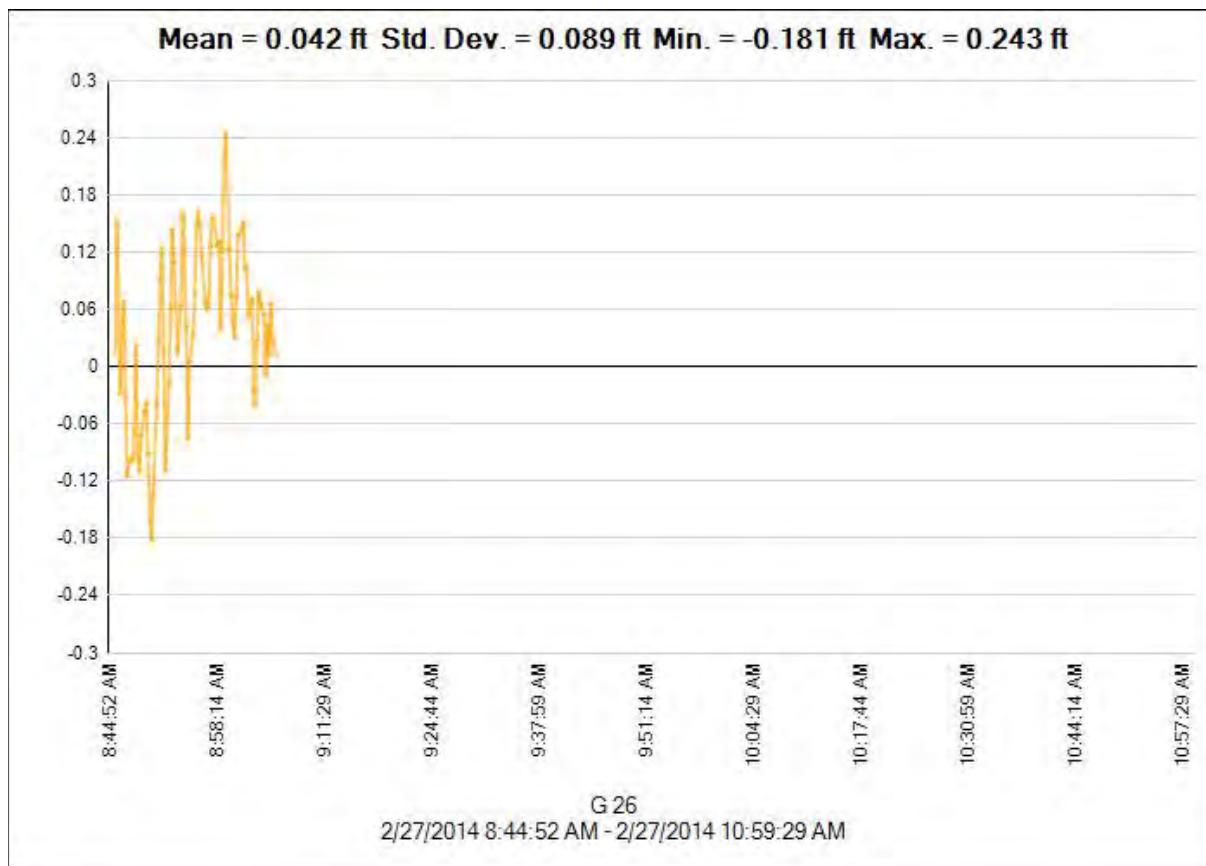


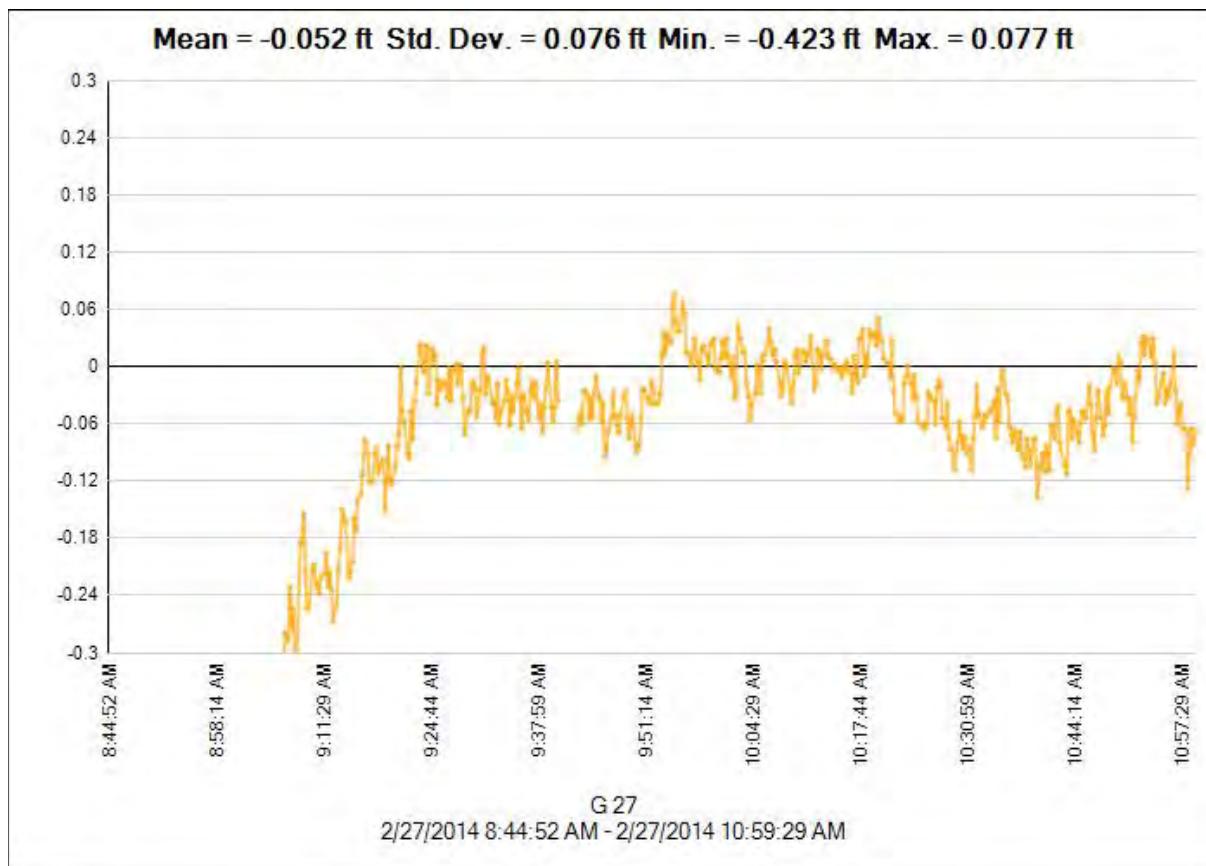


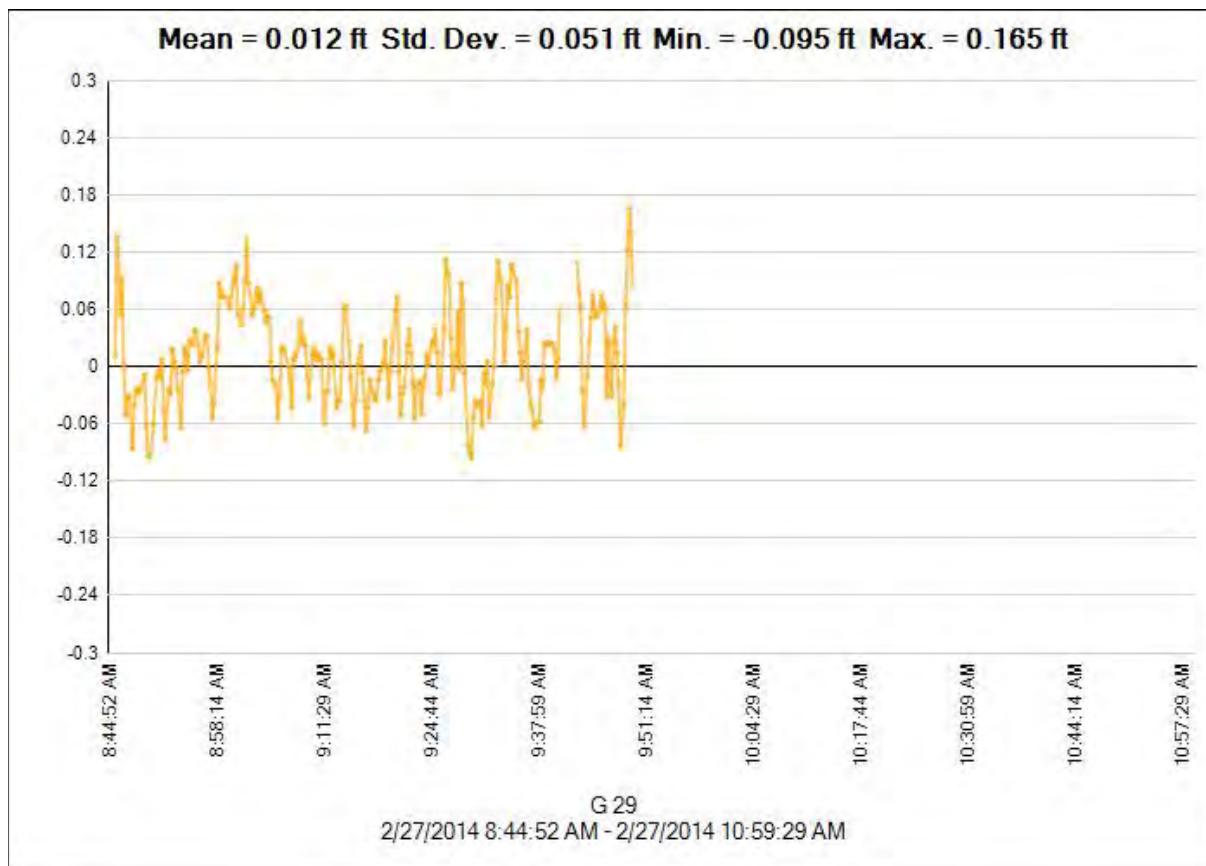














Processing style

Elevation mask: 10.0 deg
Auto start processing: Yes
Start automatic ID numbering: AUTO0001
Continuous vectors: No
Generate residuals: Yes
Antenna model: Automatic
Ephemeris type: Automatic
Frequency: Multiple Frequencies
Processing Interval: Use all data
Force float: No

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm

4/2/2014 10:12:32 AM	P:\2014\2143976 - Whiskey Island Back Barrier - CPRA\SurvDC-HDS\TBC\2143976.00C-Whiskey Island Barrier.vce	Trimble Business Center
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Appendix F

Field Notes

J.3. Typical GPS Log Sheet for Fixed Height Tripods

USE THIS FORM IS USING FIXED HEIGHT TRIPODS GPS LOG SHEET

Job No.	2143976.00C		Operator	Toby Lee	
Client	CPRA		Job Description	GPS & LiDAR	
Location	Whiskey Island Back Barrier Marsh				
SESSION INFO					
Station No.	4 Characters	Julian Date	3 Characters	Session No.	
<input type="text" value="1"/>		<input type="text" value="058"/>		<input type="text" value="1"/>	
Long Name	TE14-SM-01				
Monument Description	NGS style float sleeve				
Receiver Type	RT GNSS		Receiver Serial No.	5040K18292	
Antenna Type	Zephyr w/ground plane		Ant. Serial No.	1Z1Z118495	
Antenna Height Measurement is TRUE VERTICAL to Bottom of Antenna Mount if Using Fixed Height Tripod					
Reading 1	NA	Meters	Fixed Hgt 2 Meter Tripod	2.000	Meters
Reading 2	NA	Meters	Check Reading	6.562	Feet/Tenths
Reading 3	NA	Meters	Note: Record all readings on log sheet prior to entering in receiver		
Start Time	8:44 am		Stop Time	4:26 pm	
				Session Time 1	
Time Pdop Satellites in View					
8:44		Start Time			
4:26		Stop Time			
Time Note any Power Failures, Weather Conditions, etc.					
	Top of Rod seemed loose and could be moved from side-to-side 0.10'				

USE BACK OF THIS SHEET TO MAKE STATION SKETCH, REFERENCE TIES & DESCRIPTION

J.3. Typical GPS Log Sheet for Fixed Height Tripods

USE THIS FORM IS USING FIXED HEIGHT TRIPODS GPS LOG SHEET

Job No.	2143976.00C	Operator	Toby Lee																								
Client	CPRA	Job Description	GPS & LiDAR																								
Location	Whiskey Island Back marsh																										
SESSION INFO																											
Station No.	4 Characters <input type="text" value="1"/>	Julian Date	3 Characters <input type="text" value="059"/>																								
Session No.	1 Character <input type="text" value="1"/>																										
Long Name	TE14-SM-01																										
Monument Description	NGS Style Slip Stake																										
Receiver Type	R7 GASS	Receiver Serial No.	50140K18292																								
Antenna Type	Zephry w/ ground plane	Ant. Serial No.	1Z1Z118495																								
Antenna Height Measurement is <u>TRUE VERTICAL</u> to Bottom of Antenna Mount if Using Fixed Height Tripod																											
Reading 1	<input type="text" value="NA"/>	Meters	Fixed Hgt 2 Meter Tripod <input type="text" value="2.000"/> Meters																								
Reading 2	<input type="text" value="NA"/>	Meters	Check Reading <input type="text" value="6.562"/> Feet/Tenths																								
Reading 3	<input type="text" value="NA"/>	Meters	Note: Record all readings on log sheet prior to entering in receiver																								
Start Time	8:20am	Stop Time	Session Time 1																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Time</th> <th>Pdop</th> <th>Satellites in View</th> </tr> </thead> <tbody> <tr> <td>8:20</td> <td></td> <td>Start</td> </tr> <tr> <td>2:30</td> <td></td> <td>Stop</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Time	Pdop	Satellites in View	8:20		Start	2:30		Stop															
Time	Pdop	Satellites in View																									
8:20		Start																									
2:30		Stop																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Time</th> <th colspan="2">Note any Power Failures, Weather Conditions, etc.</th> </tr> </thead> <tbody> <tr> <td></td> <td colspan="2">Top of Rod Seemed loose and could be moved from side-to-side 0.10'</td> </tr> <tr> <td></td> <td colspan="2"></td> </tr> </tbody> </table>				Time	Note any Power Failures, Weather Conditions, etc.			Top of Rod Seemed loose and could be moved from side-to-side 0.10'																			
Time	Note any Power Failures, Weather Conditions, etc.																										
	Top of Rod Seemed loose and could be moved from side-to-side 0.10'																										

USE BACK OF THIS SHEET TO MAKE STATION SKETCH, REFERENCE TIES & DESCRIPTION

22

Time Log

- 7:00 Left Launch
 8:00 Navigated to North Slip
 8:30 " to S.S.2c Near TE14-sm-a
 8:45 Start GPS Base
 9:30 Start Setting Aerial Targets & Tie
 In Plate
 5:00 Leave Site
 6:00 Back @ Launch

7038

22

Toby L.

Jeremy P.

2-27-14

Cloudy

7:00am Cool & Windy

1-2' seas

60°

11:00pm Sunny & Calm

0' seas

Z143974.00C

Whiskey Island

Back Barrier Marsh Creation

Settle Plates & LIDAR

Survey

CPRA

File # 022714 IR

7038

23

RTK Rover / Hz
TE14-SM-01 / Zm

1

Point # Descr

100 CHK TB8SR-SM-01

$$HA = 0.03^\circ \quad \text{Elev Error} = -1.33'$$

$$VA = 0.083$$

101 CHK TB8TC-SM-01

$$HA = 0.021 \quad \text{Elev Error} = -1.41'$$

$$VA = 0.037$$

102 NG

103 Top Plate S Cap

104 " "

105 " "

106 " "

107 " "

108 " "

109 " "

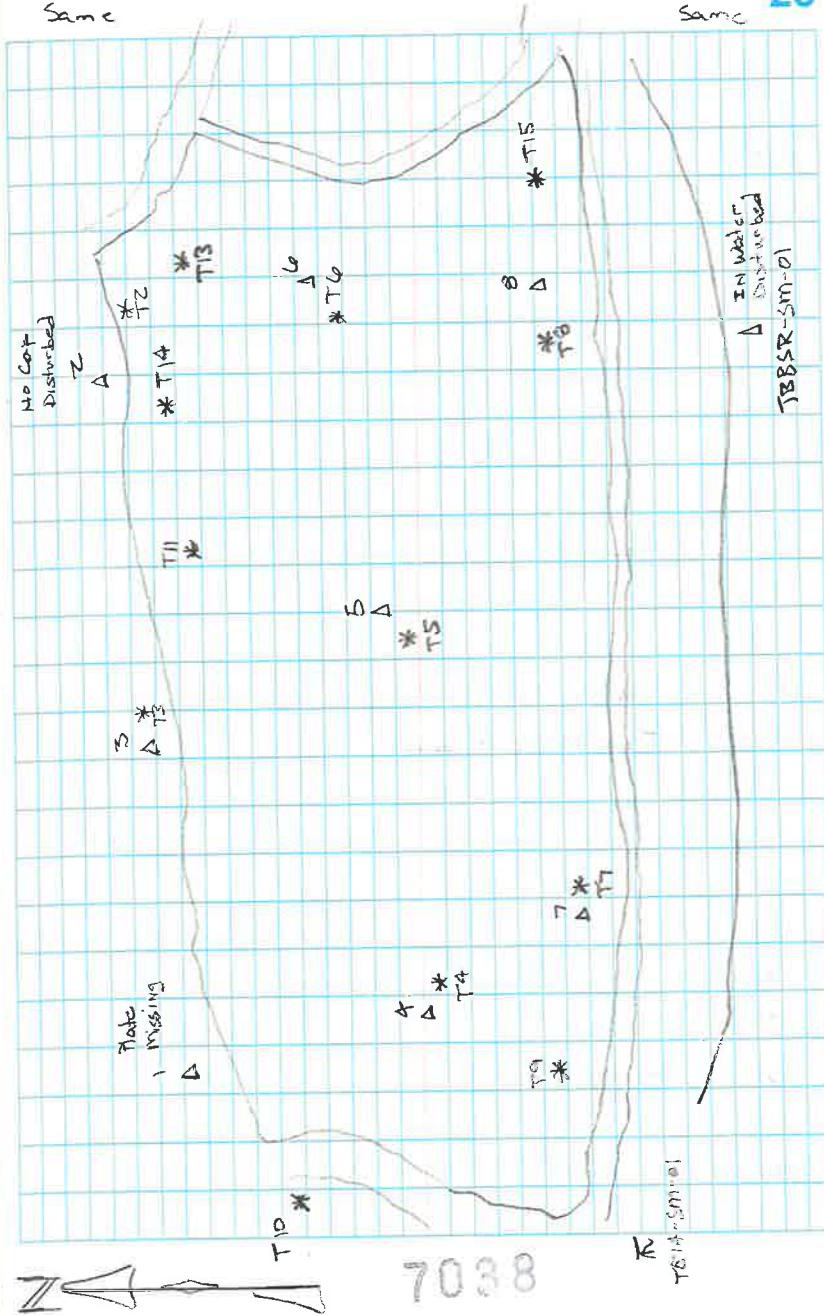
110 Target S

111 " "

112 " "

7038

Same



23

Same

7038

TS14-SM-01

24

Point # Descr

115 NG

116 Top Plat & Cap

117

118

119

120

121

122

123 Target 7

124

125

130 NG

131 Top Plate & Cap

132

133

134

135

136

137

138 Target 4

139

140

Same

24

Point # Descr

175 Target 9

176

177

7038

7038

Time Log

7:00 Left Launch
 8:00 Navigated to North slip
 8:30 To S. side near TE-14-SM-01
 8:45 Started Base
 9:30 Started setting Aerial Targets & tie in plates
 5:00 Leave site
 6:00 Back @ Launch

7065

Jeremy R.

Troy G.

68

2-27-14

cloudy

7:00 a.m. cool & windy
1-2' seas

2143976.00C

Whiskey Island

Back Barrier marsh creation

Settlement plates & Lidar
Survey

CPRA

File # 022714JR-A

7065

25

Time Log

7:00 Left Launch
7:55 On-Site
8:20 Start BOSC
2:30 End Base
3:30 Back @ Launch
7:00 Back @ Laf. Office/Demob

7038

Toby L

Joe F.

Jeremy P.

Jeremy R

2-28-14

7:00am Cool &
Cloudy
1'-2' waves

2143976.00C

Whiskey Island

Back Barrier Marsh Creation

GPS Base Log

For LiDAR

CPRA

7038

26

TR @ 1/4t.
Tel4-sm-01/2m

Start Time @ 8:20
End Time @ 2:30

1

LIDAR Survey Began

@ 10:15

LIDAR Survey Ended

@ 11:30

7038

Same

26

Same

7038

π @ / Ht

TE14-Sm-01/2m

RTK Rover / Ht

2m

<u>Point #</u>	<u>Description</u>
100 - 101	CP - CHK
200 - 201	T-12
202	NG
203 - 209	Plate 8
210 - 211	Target 8
212 - 213	Target 15
214 - 220	Plate 6
221	NG
222 - 223	Target 6
224 - 225	Target 13
226 - 227	Target 2
228 - 229	Target 10
230 - 231	Target 11
232 - 233	Target 3
234 - 240	Plate 3
241	Plate 2
242	NG
243 - 244	Target 14
245	NG

105

Same

Δ IN H_2O Disturbed
TBBSR-Sm-01

TE14-Sm-01

Same

No cap
DISTURBEDPLATE
MISSING

A

7065



Appendix G

Photographs



Photo 001 - TBBSR-SM-01



Photo 002 - TBBSR-SM-01



Photo 003 - TBBSR-SM-01

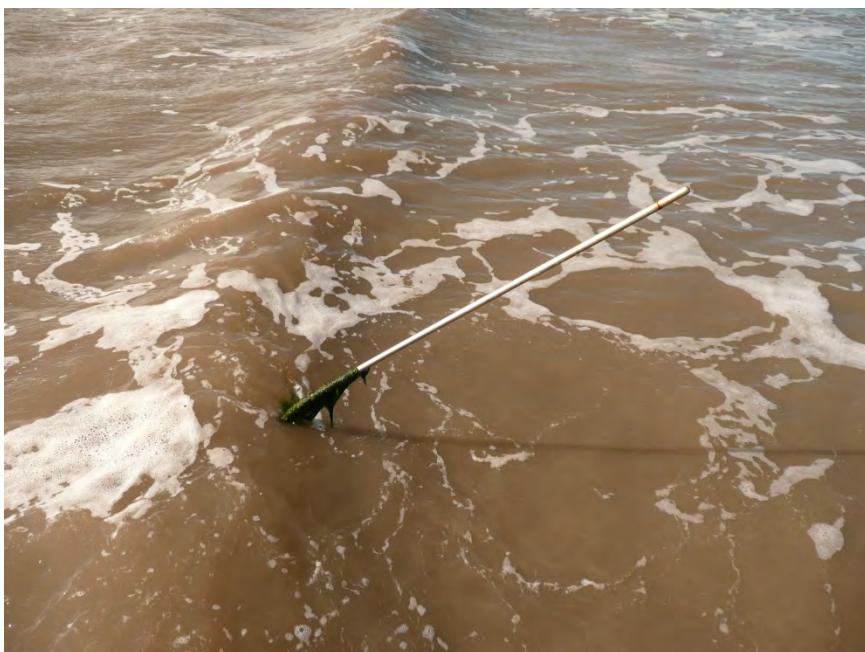


Photo 004 - TBBSR-SM-01



Photo 005 - TBBSR-SM-01



Photo 006 - TBBSR-SM-01



Photo 007 - TBBSR-SM-01



Photo 008 - TBBSR-SM-01



Photo 009 - PLATE02



Photo 010 - PLATE02



Photo 011 - PLATE02



Photo 012 - PLATE02



Photo 013 - PLATE02

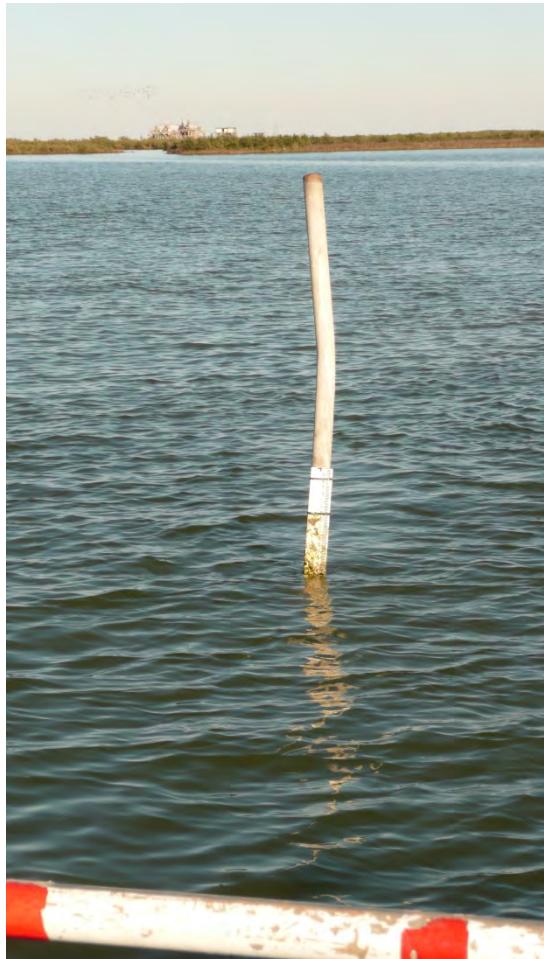


Photo 014 - PLATE02



Photo 015 - PLATE03

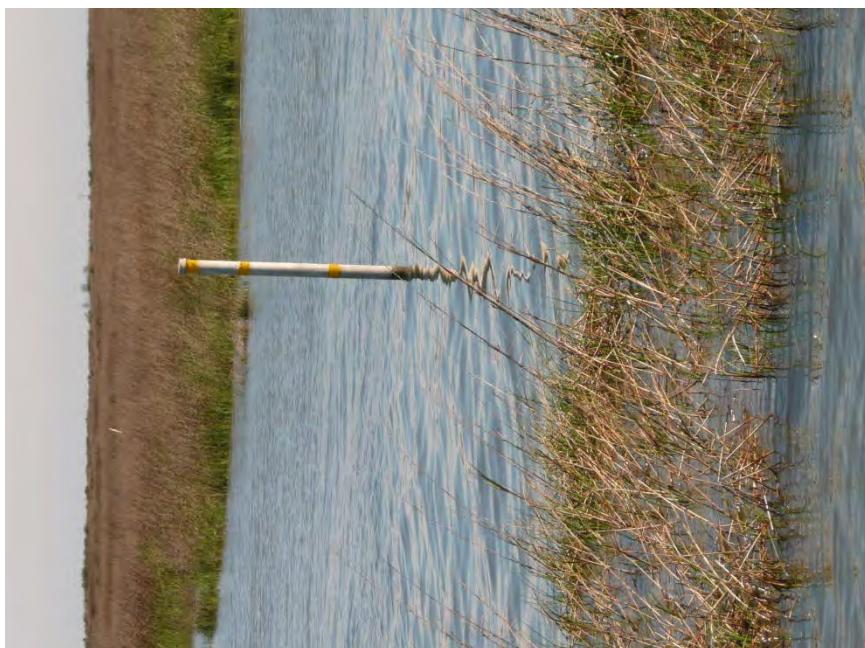


Photo 016 - PLATE03



Photo 017 - PLATE03



Photo 018 - PLATE03



Photo 019 - PLATE05



Photo 020 - PLATE05



Photo 021 - PLATE05



Photo 022 - PLATE05



Photo 023 - PLATE06



Photo 024 - PLATE07



Photo 025 - PLATE07

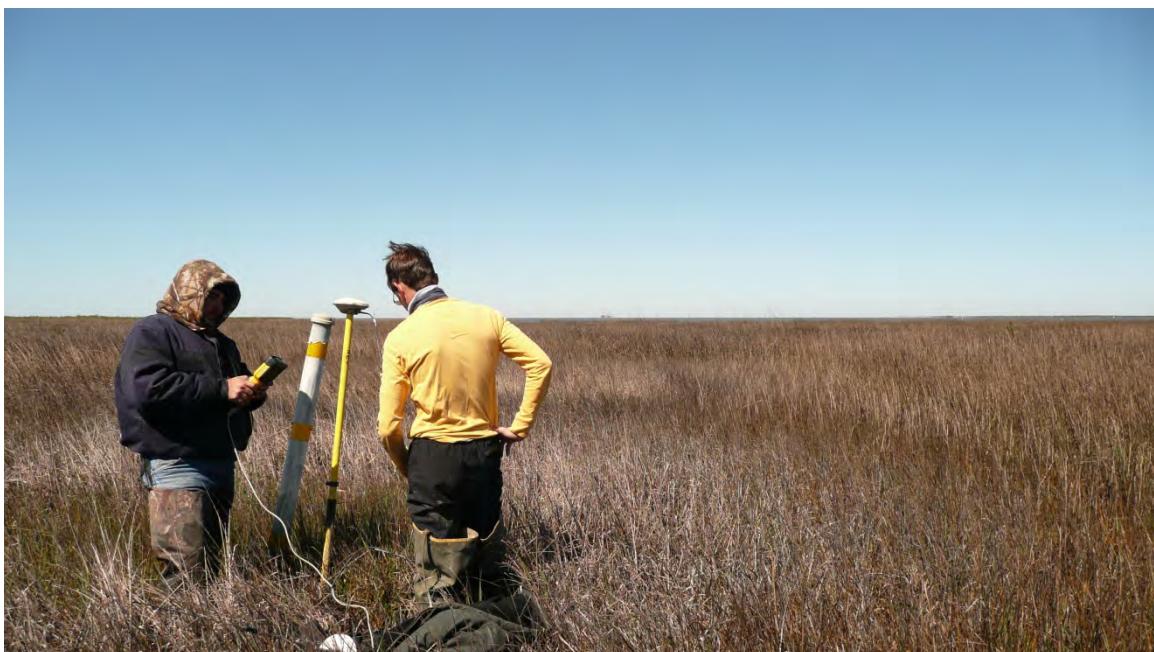


Photo 026 - PLATE07



Photo 027 - PLATE07



Photo 028 - PLATE08

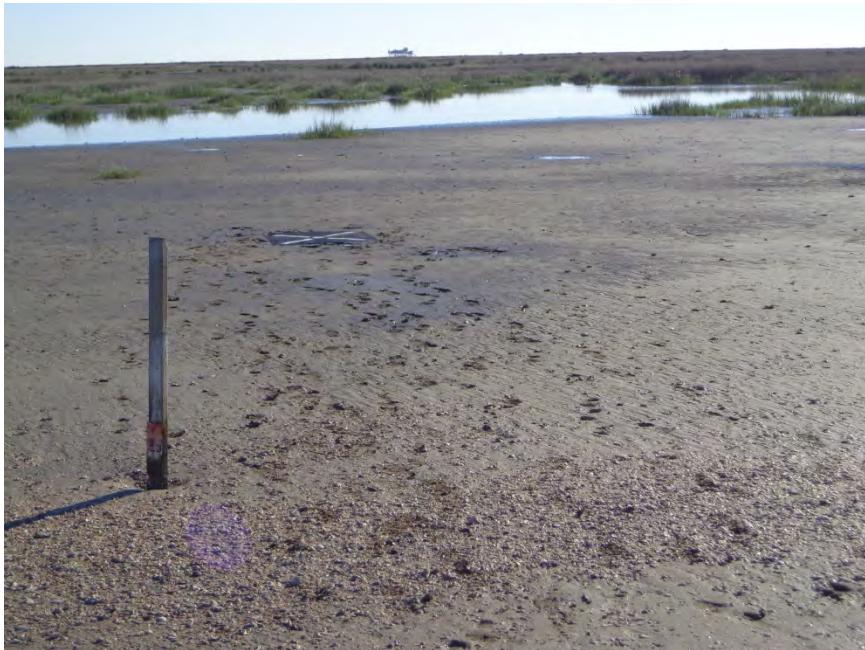


Photo 029 - TARGET02



Photo 030 - TARGET02



Photo 031 - TARGET02



Photo 032 - TARGET03



Photo 033 - TARGET03



Photo 034 - TARGET04



Photo 035 - TARGET04



Photo 036 - TARGET05



Photo 037 - TARGET05



Photo 038 - TARGET06

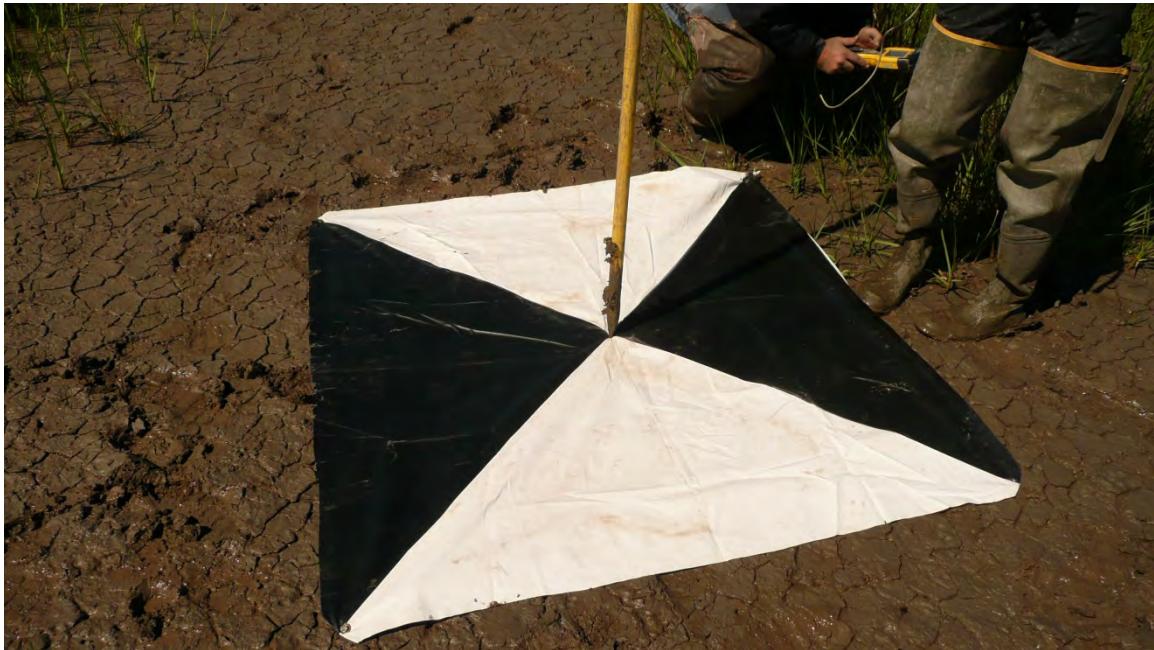


Photo 039 - TARGET07

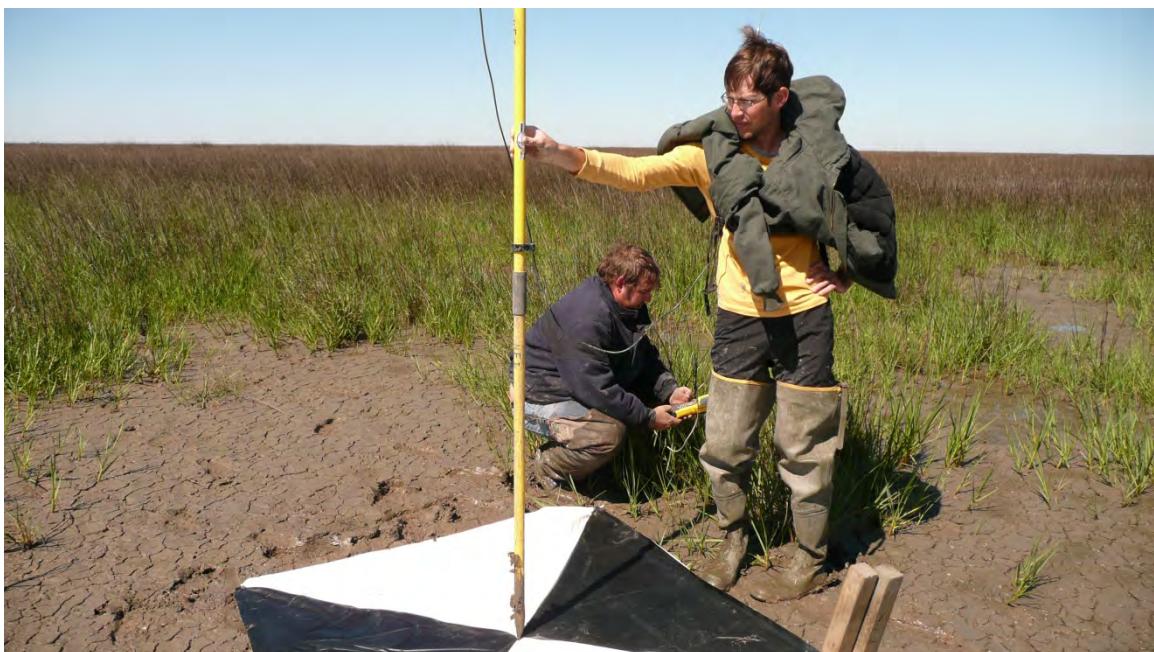


Photo 040 - TARGET07



Photo 041 - TARGET08



Photo 042 - TARGET12



Photo 043 - TARGET13



Photo 044 - TARGET15



Photo 047 - BASE_TE14-SM-01



Photo 048 - BASE_TE14-SM-01



Photo 045 - BASE_TE14-SM-01



Photo 046 - BASE_TE14-SM-01



Appendix H

Project Timeline and Series of Events



PROJECT TIMELINE AND SERIES OF EVENTS

DATES	EVENT
2/3/2014 - 2/16/2014	Project Setup, Project Work Plan Development and Preparations
2/17/2014	Fenstermaker/CPRA Strategic Kick-Off Meeting
2/18/2014 - 2/24/2014	Project Planning and Field Survey Preparations
2/20/2014	GPS Network Plan is finalized via email with Mr. Melvin Guidry of CPRA.
2/24/2014	Fenstermaker Project Team performs reconnaissance site visit of project site.
2/24/2014-2/25/2014	Finalize field survey details in preparation for field survey.
2/26/2014	Conditional Permit is received permitting access to Whiskey Island Back Barrier Marsh for performance of survey.
2/26/2014	Fenstermaker field team mobilizes to launch site in preparation for next-day start of field survey.
2/27/2014	Fenstermaker field team sets aerial scan targets and ties in settlement plates.
2/28/2014	Fenstermaker field team logs static sessions on GPS monument.
2/28/2014	Fenstermaker's subconsultant, Fagerman Technologies, performs aerial LiDAR data acquisition of project site.
3/3/2014 - 4/9/2014	Process data and prepare methodology report.
3/17/2014	Download CORS station data and GPS static network processing.
4/10/2014	Finalize DRAFT Survey Report and deliverables.
4/11/2014	DRAFT Report is sent to CPRA via mail.
6/4/2014	Comments received from CPRA via email.
6/23/2014	FINAL Report is sent to CPRA via mail.



Appendix I

Project Plans

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
01	TITLE SHEET AND LAYOUT MAP
02	EXISTING SURFACE ELEVATIONS

**COASTAL PROTECTION
AND
RESTORATION AUTHORITY**

PLANS OF MICRO-TOPOGRAPHIC SURVEY

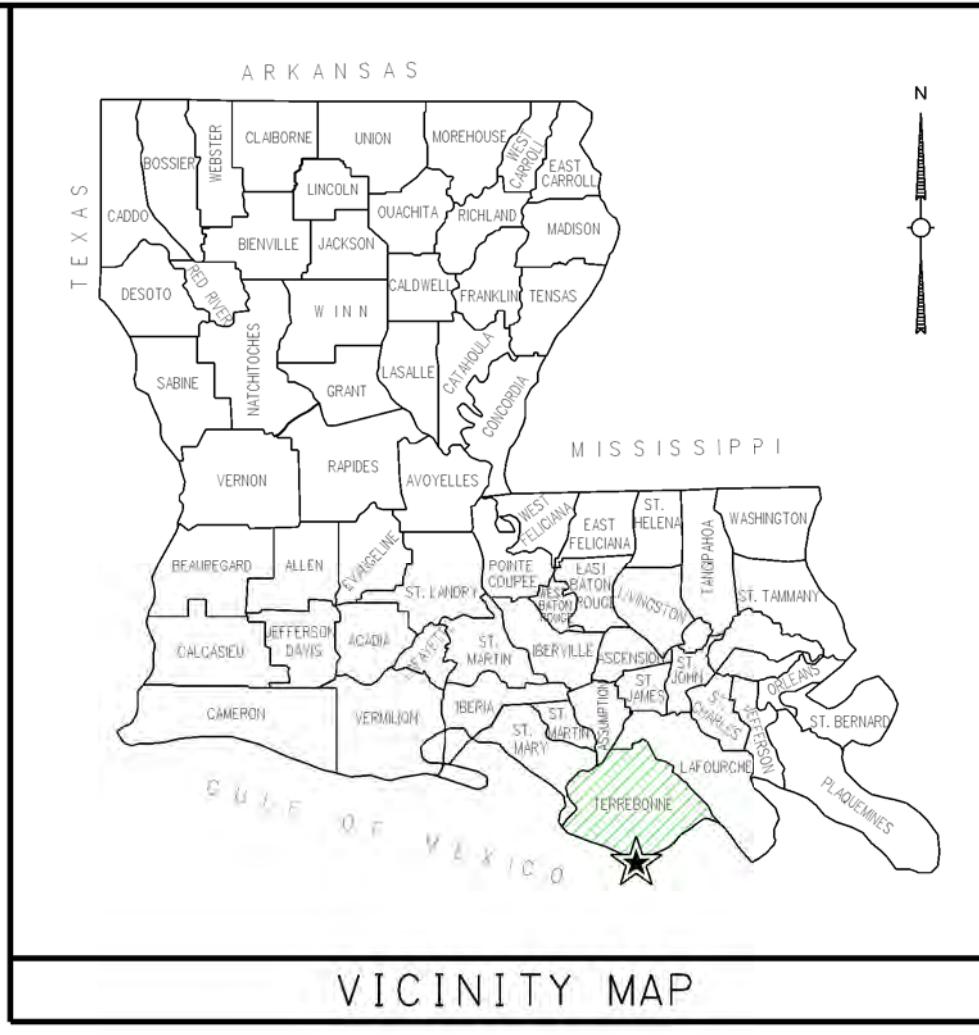
CPRA CONTRACT No. 2503-12-17

**WHISKEY ISLAND BACK BARRIER
MARSH CREATION (TE-50) PROJECT**

**TERREBONNE PARISH,
LOUISIANA**



COORDINATE SYSTEM GROUP: US STATE PLANE 1983
ZONE: LOUISIANA SOUTH (1702)
DATUM TRANSFORMATION: NAD 1983 (CONUS)
GEOID MODEL: GEOID 12A (CONUS)



SHEET NUMBER		01	
DESIGNED	SJB	CHECKED	TL
PARISH	TERREBONNE PARISH, LOUISIANA		
DETAILED	SJB	CHECKED	TL
CONTRACT NUMBER	2503-12-17		
DATE	03/18/2014		
SHEET	01 of 02		
BY			
REVISION DESCRIPTION			
NO.			
DATE			
BY			

Coastal Protection and
Restoration Authority

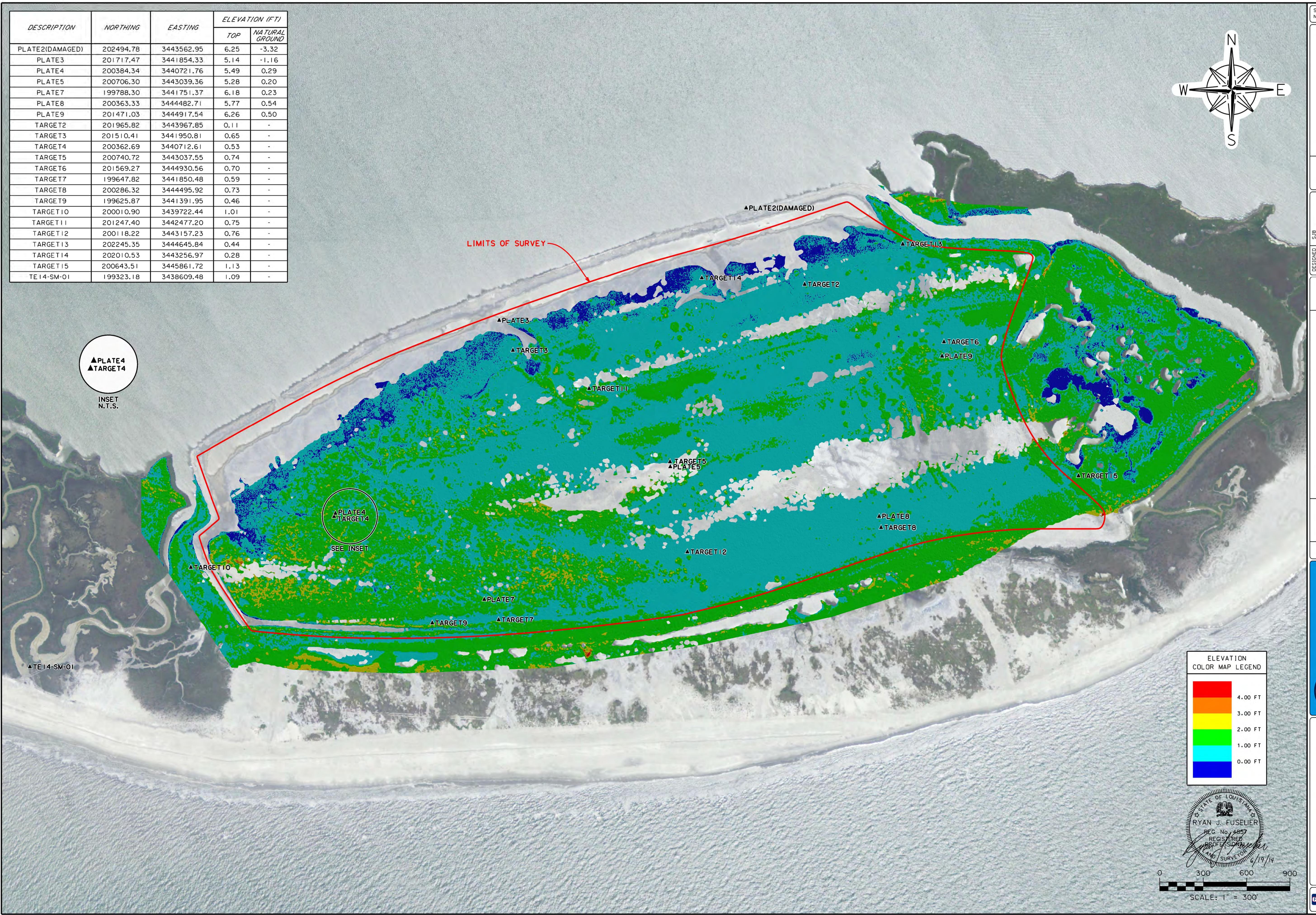
CPRA

STATE OF LOUISIANA
RYAN J. FUSELIER
REG. NO. 1857
REGISTERED PROFESSIONAL LAND SURVEYOR
FENSTERMAKER

Whiskey Island Back Barrier
Marsh Creation (TE-50)

TITLE SHEET

6/19/14



SHEET NUMBER	02
DESIGNED BY	
SUB CHECKED BY	
DETAILED BY	
SUB CHECKED BY	
DATE	03/18/2014
CONTRACT NUMBER	2503-12-17
BY	
REVISION DESCRIPTION	
NO.	
DATE	

DESIGNED BY	SUB CHECKED BY	DETAILED BY	SUB CHECKED BY



WHISKEY ISLAND BACK BARRIER MARSH CREATION (TE-50)	EXISTING SURFACE ELEVATIONS
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