**GPI Geospatial, Inc. (GPI)**

# *SURVEY AND MAP REPORT FOR THE SPECIFIC PURPOSE SURVEY FOR THE 2021 LiDAR ACQUISITION, CLASSIFICATION, and CREATION OF HYDRO-FLATTENED DIGITAL ELEVATION MODEL OF MIAMI-DADE COUNTY, FLORIDA*

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**LB#6748**

# *SURVEY AND MAP REPORT FOR*

# *THE SPECIFIC PURPOSE SURVEY FOR THE 2021 LiDAR ACQUISITION, CLASSIFICATION, and CREATION OF HYDRO-FLATTENED DIGITAL ELEVATION MODEL OF MIAMI-DADE COUNTY, FLORIDA*

Client: Miami-Dade County Information Technology Department
Client Project Number: E15-MDAD-01, Work Order 3
GPI Geospatial Project Number: 2020572.00
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Client contact: Mairim Avila
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## Introduction

GPI Geospatial, Inc. (GPI), LB 6748, has been contracted to provide Miami-Dade County Information Technology Department (ITD) a **Specific Purpose Survey** for the 2021 LiDAR Acquisition, Classification, and Creation of Hydro-flattened DEM of Miami-Dade County, Florida.

This Survey and Map Report meets the Standards of Practice as defined in Chapter 5J-17 of the FAC, according to Section 472 of the Florida Statutes.

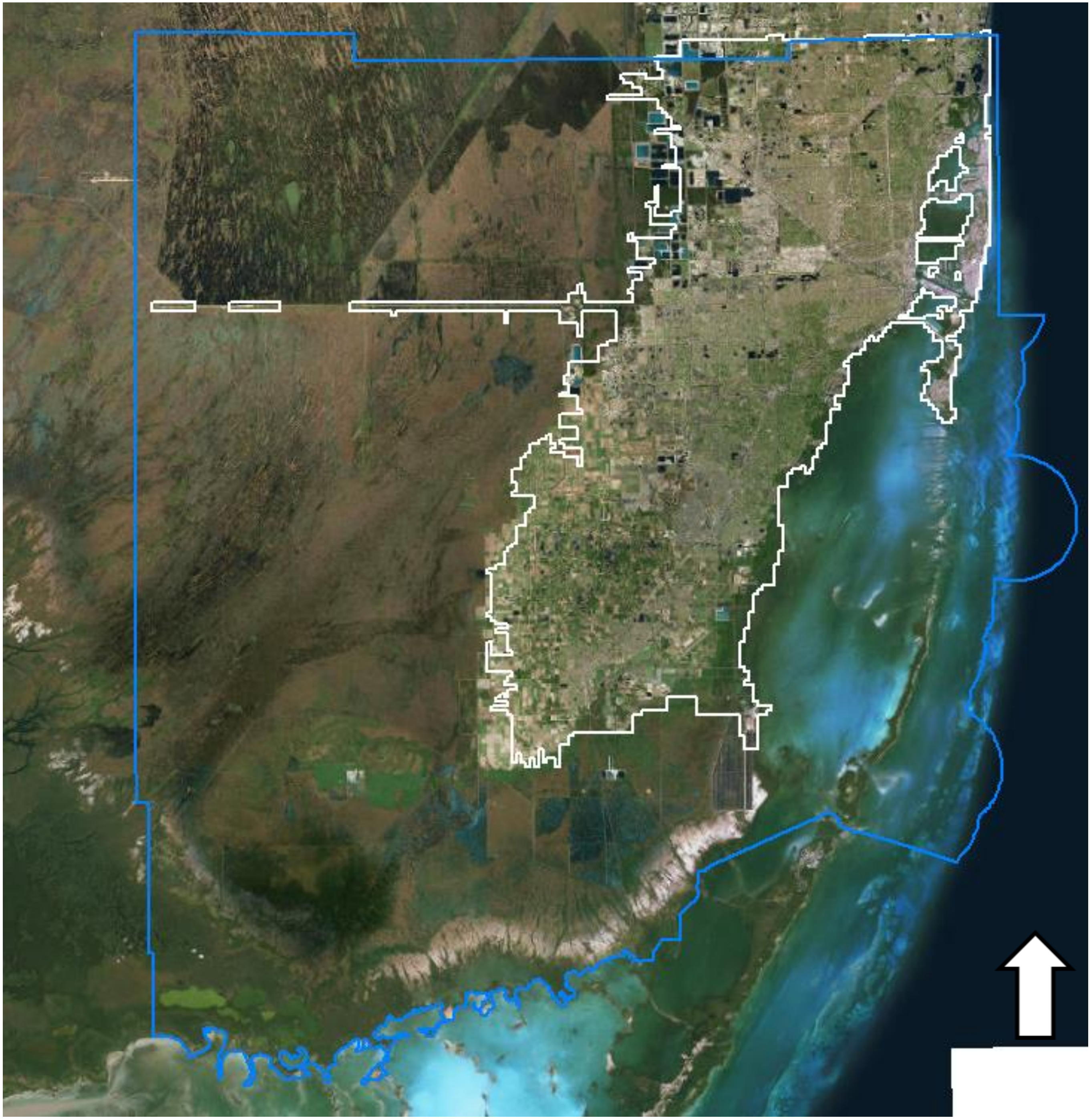
The purpose of this survey was to acquire the LiDAR data for the 615 square miles provided by the Information Technology Department. GPI Geospatial Inc. collected high-density aerial LiDAR performing manual classification of the point cloud, collected hydro-breaklines to create a project-wide hydro-flattened Digital Elevation Model (DEM).

The aerial LiDAR collected was developed to meet USGS Base Specifications v2.1 for accuracy and final deliverables.

GPI is the prime contract holder and was tasked with the initial data collection, calibration, contract management, final project QA & QC, and certifying the project deliverables meet the State of Florida standards of practice. GPI teamed with Woolpert Inc. to perform the LiDAR classification, breakline collection, DEM generation, and creation of the intensity.Tifs, geodatabase, and metadata.

## Project Limits and Location

Located in Miami-Dade County, Florida, the project limits cover 615 square miles of Miami-Dade County outlined in white below. The boundary follows the urban footprint of the county.



## General Notes

Additions or deletions to survey maps, or reports, by other than the signing party, or parties, are prohibited without the written consent of the signing party or parties.

The survey map and report or the copies thereof are not valid without the signature and the digital seal of a Florida licensed surveyor and mapper. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies. This report certifies the digital deliverables as shown in the **Deliverables** section of this report.

This report is not valid without the map called Specific Purpose Survey for the 2021 LiDAR Acquisition, Classification, and Creation of Hydro-flattened DEM of Miami-Dade County, Florida, for which files were delivered (See Deliverables section) on digital media on 10/15/2021. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.

All units are US Feet.

## Horizontal and Vertical Control

GPI set and measured thirty-nine (39) targets in 2018. These points were reused for the 2021 project. The horizontal coordinates and vertical elevation values are referenced to the latest NGS realization of the North American Datum of 1983 adjustment of 2011 (NAD83/2011). We utilized single baseline post-processed static solutions and held local NGS points as base for the control values. The occupation on the control points was 30-minute sessions. The map projection referenced is the Florida State Plane Coordinate System, East Zone, in units of the US Survey Feet. The vertical datum is referenced to North American Vertical Datum 1988 (NAVD 88). Data collection was established using RTK GPS using twelve (12) NGS monuments to check in for the control survey. See Appendix A for the datasheets. For the 2021 project, the index control points were reprocessed and adjusted to Geoid 2018.

> **Horizontal Datum:** Constrained to the Florida State Plane Coordinates System (SPCS), East Zone (0901) projection, referenced to the North American Datum of 1983, adjustment of 2011 (NAD83/2011).
>
> **Vertical Datum:** North American Vertical Datum of 1988 (NAVD88) Geoid 18.

For the airborne GPS processing, Florida Permanent Reference Network (FPRN) stations were utilized.

## Previously located Verification (Control) Points.

As part of the 2018 Collection, GPI had obtained XYZ coordinate information for several control points through Miami Dade County. These points were used in the control of the ITD Survey for 2021. These points were double occupied connected to FPRN BASES using 2012 Geoid. GPI LiDAR Technicians verified with the new point cloud and selected the points that have not been disturbed and could be used to control this year's ITD LiDAR Survey. These points were re-imported into Leica INFINITY and re-post processed using State Plane Coordinate System, North American Datum of 1983, Adjustment 2011, East Zone, using Geoid 18, with Ellipsoid GRS 1980. Orthometric heights were obtained in the North American Vertical Datum of 1988. Control Residuals from converting geoid 12b to Geoid 18, **see Appendix B**

## Non-Vegetated Vertical Accuracy (NVA) Check Point Collection

The NVA points were from the Miami-Dade County, Florida Ortho Photo Control project provided to GPI from Woolpert. For collection methods and additional information, **see Appendix C**.

## Vegetated Vertical Accuracy (VVA) Check Point Collection

GPI planned VVA checkpoints to be spatially disturbed to encompass the project AOI. Following the proposed VVA layout, GPI field crews visited the sites to obtain XYZ information for the proposed verification of VVA Points. GPI set a 60D Nail (no id. number) flat with the ground on each selected site. Using our Leica 14 GPS/RTK receiver, we double occupied each one of the VVA points. The survey procedure to locate the VVA point was to perform the first observation for up to 180 Epochs, with the Leica Receiver connected to a Florida Department of Transportation (FDOT) Permanent Reference Network (FPRN) Base. After the 180 epochs were collected, the GPS Receiver was disconnected and then connected again to a second (different) FPRN Base, and recorded by observing another 180 Epochs session.

GPS/RTK observations were imported into Leica Infinity and post-processed using State Plane Coordinate System, North American Datum of 1983, Adjustment 2011, East Zone, using Geoid 18, with Ellipsoid GRS 1980. Orthometric heights were obtained in the North American Vertical Datum of 1988.

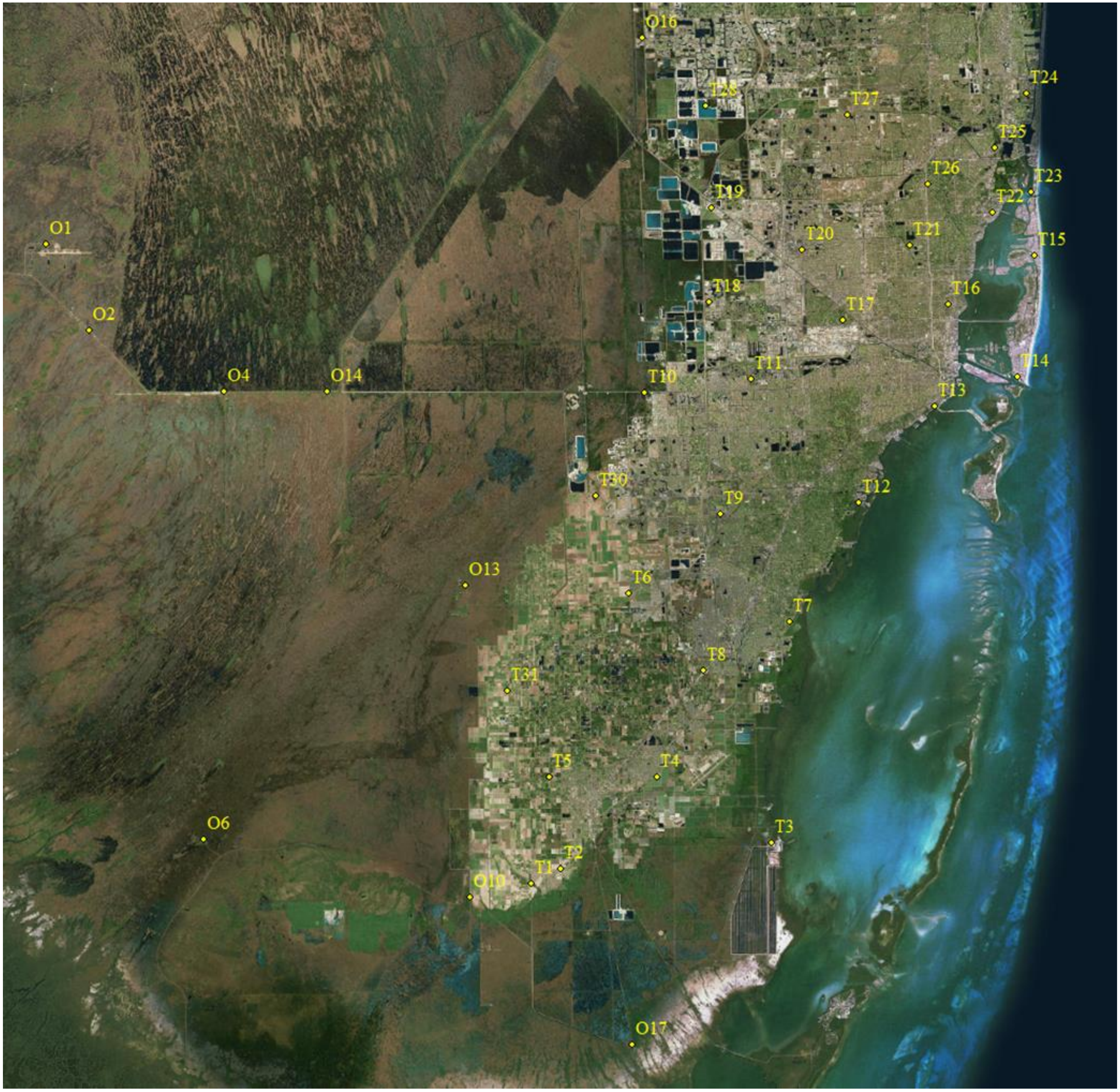
The two different recorded values for each VVA point were then compared to ensure that the difference between points was no greater than 0.07', and an average value was then obtained from the two measurements. In case that the difference between the two measurements was greater than 0.07', a third occupation was performed, the third point was then compared, and a new average was obtained, including the third measurement. After the averaging was completed, an ASCII file was generated and provided to GPI LiDAR technicians to compare with the calibrated point cloud. **See Appendix D** for the control sheets

# Final Control List

| Poiint Id | Northing | Easting | Orthometric Height | MONUMENT |
|---|---|---|---|---|
| O-1 | 557829.047 | 686577.634 | 10.162 | PK NAIL AND DISK SET IN CENTER OF PAINTED CROSS AERIAL TARGET |
| O-2 | 535090.900 | 697777.054 | 9.087 | PK NAIL AND DISK SET IN THE CENTER OF EXISTING PAINTED TARGET |
| O-4 | 519175.382 | 733037.983 | 12.874 | PK NAIL AND DISK SET ON NORTHWEST CORNER OF STOP BAR |
| O-6 | 402485.087 | 727606.961 | 3.375 | PK NAIL AND DISK SET ON NORTHERN MOST PAINT STRIPE IN MIDDLE PARKING SPOTS |
| O-10 | 387173.310 | 797204.150 | 7.814 | PK NAIL AND DISK SET ON CORNER OF GORE WESTBOUND SIDE OF ROAD |
| O-13 | 468771.846 | 795999.387 | 7.708 | PK NAIL AND DISK SET ON NORTHEAST CORNER OF PAINTED "S" IN PAINTED "NO SHOOTING" |
| O-14 | 519298.470 | 760087.325 | 13.187 | PK NAIL AND DISK SET ON CORNER OF GORE EASTBOUND SIDE OF ROAD |
| O-16 | 611516.067 | 842195.626 | 8.899 | PK NAIL AND DISK ON TIP OF TURN ARROW |
| O-17 | 348679.757 | 839483.072 | 12.328 | PK NAIL AND DISK ON TIP OF TURN ARROW |
| T-1 | 390772.231 | 813323.456 | 6.243 | PK NAIL AND DISK SET ON CORNER OF GORE WESTBOUND SIDE OF ROAD |
| T-2 | 394651.624 | 820927.233 | 4.817 | PK NAIL AND DISK SET IN CENTER OF EXISTING CROSS TARGET |
| T-3 | 401576.785 | 875784.058 | 4.657 | PK NAIL AND DISK SET ON TIP OF TURN ARROW |
| T-4 | 418498.519 | 845959.189 | 6.265 | PK NAIL AND DISK SET AT THE TIP OF TURN ARROW |
| T-5 | 418538.959 | 817882.450 | 8.836 | PK NAIL AND DISK SET ON SW CORNER OF STOP BAR |
| T-6 | 466530.313 | 838742.284 | 8.741 | PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR |
| T-7 | 459201.170 | 880705.063 | 11.955 | PK NAIL AND DISK SET ON TIP OF TURN ARROW |
| T-8 | 446484.270 | 858264.035 | 11.112 | PK NAIL AND DISK SET ON TIP OF CHEVRON |
| T-9 | 487246.312 | 862698.248 | 7.966 | PK NAIL AND DISK SET ON TIP OF TURN/STRAIGHT ARROW |
| T-10 | 519091.190 | 842914.727 | 8.127 | PK NAIL AND DISK SET ON TIP OF ARROW FACING WEST |
| T-11 | 522362.936 | 870724.236 | 4.920 | PK NAIL AND DISK SET ON CORNER OF CHEVRON |
| T-12 | 490235.660 | 898780.139 | 2.118 | PK NAIL AND DISK ON TIP OF CHEVRON |
| T-13 | 515383.418 | 918391.197 | 13.486 | PK NAIL AND DISK SET ON TIP OF CHEVRON |
| T-14 | 522972.264 | 940010.124 | 1.970 | PK NAIL AND DISK SET ON NORTHWEST CORNER OF CROSSWALK BAR |
| T-15 | 554659.378 | 944477.952 | 3.061 | PK NAIL AND DISK SET ON NORTHWEST CORNER OF STOP BAR |
| T-16 | 541888.820 | 922063.197 | 16.260 | PK NAIL AND DISK SET ON CORNER OF GORE NORTHBOUND LANE |
| T-17 | 537935.069 | 894470.545 | 4.890 | PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR |
| T-18 | 542593.097 | 859522.703 | 5.849 | PK NAIL AND DISK SET ON TIP OF RIGHT TURN ARROW |
| T-19 | 567265.069 | 860235.652 | 5.290 | PK NAIL AND DISK SET ON TIP OF RIGHT TURN ARROW |
| T-20 | 556311.962 | 883923.741 | 4.745 | PK NAIL AND DISK SET ON TIP OF CHEVRON |
| T-21 | 557394.266 | 911979.083 | 5.021 | PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR |
| T-22 | 566081.327 | 933514.533 | 3.110 | PK NAIL AND DISK SET ON CORNER OF GORE AND PARKING STRIPE |
| T-23 | 571432.821 | 943785.947 | 4.510 | PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR |
| T-24 | 597153.648 | 942574.841 | 4.732 | PK NAIL AND DISK SET ON TIP OF TURN ARROW |
| T-25 | 582897.200 | 934113.147 | 5.071 | PK NAIL AND DISK SET ON SOUTHEAST CORNER OF STOP BAR |
| T-26 | 573241.558 | 916670.528 | 13.446 | PK NAIL AND DISK SET ON SOUTHWEST CORNER OF STOP BAR |
| T-27 | 591468.840 | 895894.316 | 4.784 | PK NAIL AND DISK SET ON SOUTHWEST CORNER OF STOP BAR |
| T-28 | 593694.064 | 858652.741 | 4.762 | PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR |
| T-31 | 491995.639 | 830011.523 | 7.547 | PK NAIL AND DISK SET ON SOUTHWEST CORNER OF STOP BAR |
| T-30 | 441049.719 | 806916.626 | 6.182 | PK NAIL AND DISK SET ON TIP OF RIGHT TURN ARROW |

**Note:** Point T13 was recollected due to higher-than-expected results. New elevation value collected as 13.209

# Control Point Locations



**See Appendix E** for the control sheets.

# Accuracies

## Horizontal Accuracy

The data set was produced to meet ASPRS “Positional Accuracy Standards for Digital Geospatial Data” (2014) for a 2.2 feet RMSEx / RMSEy Horizontal Accuracy Class, which equates to Positional Horizontal Accuracy = +/- 3.8 feet at a 95% confidence level.

## Relative Accuracy: Interswath (Overlap) Consistency

Interswath or overlap consistency was assessed at multiple locations within overlap in non-vegetated areas containing only single returns and located in areas with slopes of less than 10 degrees. To the extent allowed by the data, test areas were chosen where the full width of the overlap was represented. These overlap areas include adjacent, overlapping parallel swaths within a project, cross-tie swaths and a sample of intersecting project swaths in both flight directions, and adjacent, overlapping lifts.

The interswath accuracy will be assessed in accordance with the USGS Base Specification v1.3 and will be calculated and reported in the metadata accordingly.  The Interswath (between swath) accuracy is required to meet ≤ 0.26-foot RMSDz.

The interswath consistency results were produced as polygon features in Esri shapefile format. **See Appendix F** for the interswath test results and the location of the interswath test locations.

## Relative Accuracy: Intraswath Precision

Intraswath precision (or smooth surface precision) was performed on hard surfaces with areas consisting of approximately 100 pixels (ex.: parking lots, large rooftops) and containing only single return LiDAR points. Sample areas were selected where the full width of the swath(s) (left, center, and right) was represented to the extent the data allowed.

The Intraswath (within swath) accuracy is required to meet ≤ 0.66-foot RMSDz.

The intraswath precision results were produced as polygon features in Esri shapefile format. **See Appendix G** for the intraswath test results and the location of the intraswath test locations.

## Classified LiDAR Point Cloud Testing

This project required Non-Vegetated Vertical Accuracy (NVA) and Vegetated Vertical Accuracy (VVA) to be tested on the classified LiDAR point cloud data. The dataset was required to meet a target NVA value of 19.6 cm at a 95% confidence level using an RMSEz target value of 10 cm x 1.9600 and a target VVA value of 30 cm at the 95th percentile. Testing was assessed and reported using guidelines developed by the National Digital Elevation Program (NDEP) and the American Society for Photogrammetry and Remote Sensing (ASPRS).

The NVA and VVA values were calculated using independent checkpoints that were not used in the calibration or post-processing of the LiDAR point cloud data. Checkpoints were distributed throughout the project area. NVA checkpoints were located in bare earth and urban (non-vegetated) land cover classes. VVA checkpoints were located in brush/tall grass/weeds (vegetated) land cover classes. These checkpoints were surveyed using GPS techniques.

Testing was performed using TINs created from the final calibrated and controlled swath data. For each NVA checkpoint, an elevation value was derived from the TIN at the point's x,y location. This value was compared to the checkpoint's surveyed elevation value.

### Digital Elevation Model Testing

This project required Non-Vegetated Accuracy (NVA) and Vegetated Vertical Accuracy (VVA) testing of the digital elevation model (DEM) dataset. The calculated NVA value was required to meet 19.6 cm at a 95% confidence level using an RMSEz target value of 10 cm x 1.9600. VVA was required to meet 0.30 cm at the 95th percentile error. Testing was assessed and reported using guidelines developed by the National Digital Elevation Program (NDEP) and the American Society for Photogrammetry and Remote Sensing (ASPRS).

Testing was performed using the bare earth DEM created as part of this task order. An elevation value was derived from the DEM at the point's x,y location for each checkpoint. This value was compared to the checkpoint's surveyed elevation value.

The NVA and VVA values were calculated using independent checkpoints that were not used in the calibration or post-processing of the LiDAR point cloud data. Checkpoints were distributed throughout the project area. NVA checkpoints were located in bare earth and urban (non-vegetated) land cover classes. VVA checkpoints were located in brush/tall grass/weeds (vegetated) land cover classes.

These checkpoints were surveyed using GPS techniques. **See Appendix H** for DEM and Point cloud testing results.

## Project Approach and Execution

Survey/Collection Date (s): 4/07/21, 4/08/21,4/09/21,4/16/21
Sensor: Riegl VQ-1560ii SN: S2224887
Platform: Fixed Wing Cessna 206
Collection Software: RiAcquire
Altitude: 4,200 feet
Number of Flight Lines: 82
Speed: 120 knots
FOV: 58.5 deg

Side Overlap: 30%
Point Density: 27 ppsm
Scan Rate:540 lps
PRR: 3600 kHz
Laser Power:100%

Survey/Collection Date (s): 6/10/21
Sensor: Riegl VQ-1560ii SN: S2224887
Platform: Fixed Wing Cessna 206
Collection Software: RiAcquire
Altitude: 2,500 feet
Number of Flight Lines: 13
Speed: 120 knots
FOV: 58.5 deg
Side Overlap: 30%
Point Density: 50.6 ppsm
Scan Rate:540 lps
PRR: 4000 kHz
Laser Power:100%

The whole project was collected at 4,200 feet, and the 2,500 feet mission data was the re-flight to fill in void areas. This height was used to recollect data under the cloud ceiling quickly. See **Appendix I** for Flight logs.

**See Appendix J** for the sensor calibration report.

## ABGPS Processing

The Global Positioning System (GPS) data were processed using Applanix POSPac Mapping Suite version 8.5 using the Smart Base method and single base methods. A fixed bias carrier phase solution was computed in forward and reverse directions. The LiDAR collection took place when Positional Dilution of Precision (PDOP) was at or below 3. Occasionally, the PDOP rose slightly above 3. This did not affect the data. The GPS trajectory was combined with the IMU data using the Applanix POSPac software. The resulting Smoothed Best Estimate of Trajectory (SBET) was exported and used in Riegl RiProcess software to compute the laser mass point positions in Northing, Easting, and Elevations coordinates. **See Appendix K** for POS Graphs.

## Post-processing/Adjustment

The raw laser data were merged with the SBET using Riegl RiProcess software. The data set was processed using RiProcess, RiAnalyze, and RiWorld software, where each flight line was processed to a point cloud. Riegl's Scan Data Adjustment tool adjusted the data to the flight line to ensure a proper relative calibration match between flight lines. Each flight was checked for project coverage, data gaps between overlapping flight lines, point density and exported in LAS 1.4

format. The entire project was collected without gaps. The LAS files were projected to the NAD_1983_2011_StatePlane_Florida_East_FIPS_0901_Feet and North American Vertical Datum of 1988 (NAVD88). Ellipsoidal heights were converted to orthometric heights using the current Geoid 18. **See Appendix L** for control reports.

## LiDAR Data Classification

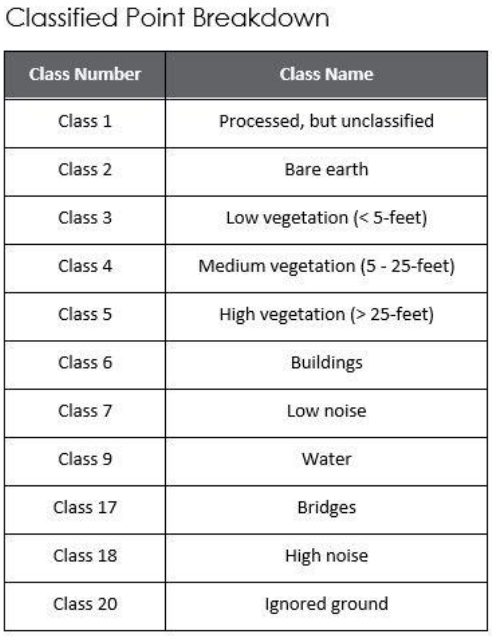
LAS data was initially classified as ground and non-ground points “first and only” as well as “last of many” LiDAR returns. Additional filters were created to meet the task order classification specifications. Statistical absolute accuracy was assessed via direct comparisons of classified ground points to ground RTK survey data. Based on the statistical analysis, the LiDAR data was adjusted to reduce the vertical bias compared to the survey ground control of higher accuracy.

The bare-earth (Class 2 - Ground) LiDAR points underwent a manual QA/QC step to verify the quality of the DEM as well as a peer-based QC review. This included a review of the DEM surface to remove artifacts and ensure topographic quality. After the bare-earth surface is finalized, it is used to generate all hydro-breaklines through a semi-automated process.

All ground (Class 2) LiDAR data inside the Lake Pond and Double Line Drain hydro flattening breaklines were then classified to water (Class 9) using TerraScan/LP360 macro functionality. A buffer of 0.7 meters was also used around each hydro-flattened feature to classify these ground (Class 2) points to Ignored Ground (Class 20). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the ground (Class 2) points were reclassified to the correct classification after completing the automated classification.

All overlap data was processed through automated functionality provided by TerraScan to classify the overlapping flight line data to approved classes by USGS. The overlapping data were classified using the standard LAS overlap bit. These classes were created through automated processes only and were not verified for classification accuracy. Due to software limitations within TerraScan, these classes were used to trip the withheld bit within various software packages. These processes were reviewed and accepted by USGS through numerous conference calls and pilot study areas.

All data were manually reviewed, and any remaining artifacts were removed using functionality provided by TerraScan and TerraModeler. Global Mapper was used as a final check of the bare earth dataset. GeoCue was then used to create the deliverable industry-standard LAS files. Woolpert proprietary software and LP360 were used to perform a final statistical analysis of the classes in the LAS files on a per tile level to verify final classification metrics and full LAS header information.

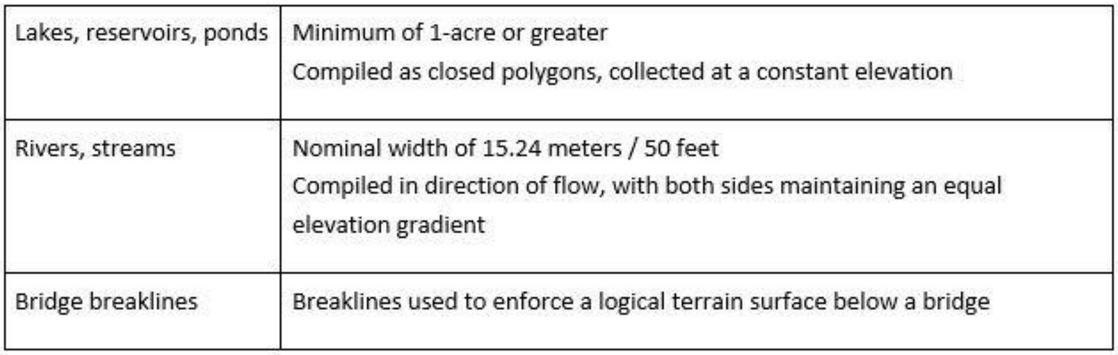


Classified Point Breakdown

| Class Number | Class Name |
|---|---|
| Class 1 | Processed, but unclassified |
| Class 2 | Bare earth |
| Class 3 | Low vegetation (< 5-feet) |
| Class 4 | Medium vegetation (5 - 25-feet) |
| Class 5 | High vegetation (> 25-feet) |
| Class 6 | Buildings |
| Class 7 | Low noise |
| Class 9 | Water |
| Class 17 | Bridges |
| Class 18 | High noise |
| Class 20 | Ignored ground |

## Hydro-Flattening

The LiDAR task order required compilation of breaklines defining the following types of water body features:



| | |
|---|---|
| Lakes, reservoirs, ponds | Minimum of 1-acre or greater<br>Compiled as closed polygons, collected at a constant elevation |
| Rivers, streams | Nominal width of 15.24 meters / 50 feet<br>Compiled in direction of flow, with both sides maintaining an equal elevation gradient |
| Bridge breaklines | Breaklines used to enforce a logical terrain surface below a bridge |

The following steps to hydrologically flatten the water bodies and for hydrologic gradient flattening of the double line streams within the existing LiDAR data:

1. The newly acquired LiDAR data was utilized to manually compile the hydrologic features in a 2D environment using the LiDAR intensity and bare earth surface. Open-Source imagery was used as a reference when necessary.
2. An integrated software approach was applied to combine the LiDAR data and 2D breaklines. This process “drapes” the 2D breaklines onto the 3D LiDAR surface model to assign an elevation. A monotonic process is performed to ensure the streams are consistently flowing in a gradient manner. A secondary step within the

program verifies an equally matching elevation of both stream edges. The breaklines that characterize the closed water bodies are draped onto the 3D LiDAR surface and assigned a constant elevation at or just below ground elevation.

3. All classified ground points from inside the hydrologic feature polygons were reclassified to water, class nine (9).
4. All classified ground points were reclassified from within a buffer along the hydrologic feature breaklines to buffered ground, class twenty (20). The buffer distance was approximately the task order designed nominal pulse spacing distance.
5. Breaklines used for bridge removal during the hydro-flattening were included with the hydrologic breakline geodatabase deliverable.
6. The LiDAR ground points and breaklines were used to generate a digital elevation model (DEM).
7. QA/QC for this task was performed by reviewing the hydrologically flattened DEM and hydrologic breakline features. Additionally, a combined approach utilizing commercial off-the-shelf software and proprietary methods was used to review the overall connectivity of the hydrologic breaklines.

TerraScan was used to add the hydrologic breakline vertices and export the lattice models. Breaklines defining the water bodies greater than 1-acre were provided as polygon features. Rivers and streams with a minimum width of 15.24 meters (50 feet) were provided polyline features. All lake and river breaklines compiled as part of the flattening process were provided in an Esri file geodatabase.

Breaklines used for DEM generation were provided as point features in Esri shapefile format.

## Digital Elevation Model (DEM)

TerraScan was used to add the hydrologic breakline vertices and export the lattice models. Class 2 (ground) LiDAR points in conjunction with the hydro breaklines and bridge breaklines were used to create 2-foot hydro-flattened bare-earth raster DEM files with a 5-foot mosaic grid file. Using automated scripting routines within ArcMap, a 32-bit floating-point raster GeoTIFF file was created for each tile. Files were clipped to the data extent. Each surface is reviewed using Global Mapper to check for any surface anomalies or incorrect elevations found within the surface.

## Intensity Imagery

LiDAR intensity data derived from the acquired LiDAR data were linearly rescaled from the 16-bit intensity and provided as 1-foot pixel, 8-bit, 256 gray-scale GeoTIFF files. Files were clipped to the data extent.

## Bridge and Overpass Polygon

Polygon Z file representing the location of all bridges and overpass areas resting on pillars. The file includes all bridge and overpass areas that were classified in the point cloud as class 17.

# Abbreviations

| | |
|---|---|
| ABGPS | Airborne Global Positioning System |
| AC | Acre |
| AGIS | Airports Geographic Information System |
| AGL | Above Ground Level |
| ASPRS | American Society of Photogrammetry and Remote Sensing |
| AT | Aerial Triangulation |
| BM | Benchmark |
| CADD | Computer Aided Design & Drafting |
| CD | Compact Disk |
| CMS | Certified Mapping Scientist |
| CP | Certified Photogrammetrist |
| CORS | Continuously Operating Reference Station |
| CSDGM | Content Standard for Digital Geospatial Metadata |
| CVA | Consolidated Vertical Accuracy |
| DEM | Digital Elevation Model |
| DFIRM | Digital Flood Insurance Rate Maps |
| DTM | Digital Terrain Model |
| DVD | Digital Versatile Disk / Digital Video Disk |
| DXF | Drawing Exchange Format |
| ECW | Enhanced Compression Wavelet |
| ESRI | Environmental Systems Research Institute |
| F.A.C. | Florida’s Administrative Code |
| FCDOP | Florida County Digital Orthoimagery Program |
| FDEM | Florida Department of Emergency Management |
| FDOT | Florida Department of Transportation |
| FEMA | Federal Emergency Management Agency |
| FGDC | Federal Geographic Data Committee |
| FIRM | Flood Insurance Rate Maps |
| FIPS | Federal Information Processing Standards |
| FPRN | Florida Permanent Reference Network |
| FS | Florida Statutes |
| FVA | Fundamental Vertical Accuracy |
| FY | Fiscal Year |
| GIS | Geographic Information system |
| GISP | Geographic Information System Professional |
| GNSS | Global Navigation Satellite System |
| GSD | Ground Sample Distance |
| GPS | Global Positioning System |
| HARN | High Accuracy Reference Network |

| | |
|---|---|
| HD | Hard Drive |
| HPGN | High Precision Geodetic Network |
| ID | Identification |
| IMU | Inertial Measurement Unit |
| INFO | Information |
| ITD | Information Technology Department |
| LB | Licensed Business |
| LS | Licensed Surveyor |
| LiDAR | Light Detection and Ranging |
| MDAD | Miami-Dade Aviation Department |
| MSL | Mean Sea Level |
| NAD | North American Datum |
| NAVD88 | North American Vertical Datum of 1988 |
| NDEP | National Digital Elevation Program |
| NDVI | Normalized Difference Vegetation Index |
| NGS | National Geodetic Survey |
| NGVD | National Geodetic Vertical Datum |
| NMAS | National Map Accuracy Standards |
| No. | Number |
| NSRS | National Spatial Reference system |
| NSSDA | National Standard for Spatial Data Accuracy |
| NTS | Not to Scale |
| OPUS | Online Positioning User Service |
| PDOP | Positional Dilution of Precision |
| PH.D. | Doctor of Philosophy |
| PLS | Professional Land Surveyor |
| PPSM | Point Per Square Meter |
| PRM | Permanent Reference Monument |
| PRR | Pulse Rate Repetition |
| PSM | Professional Surveyor and Mapper |
| QA | Quality Assurance |
| QC | Quality Control |
| RMSE | Root Mean Square Error |
| RMSEz | Vertical Root Mean Square Error |
| RMSEr | Horizontal Root Mean Square Error |
| RTK | Real Time Kinematic |
| SF | Square Feet |
| SFWMD | South Florida Water Management District |
| SHA | Secured Hash Standard |
| SPCS | State Plane Coordinate System |
| SWFWMD | Southwest Florida Water Management District |
| SVA | Supplemental Vertical Accuracy |

| | |
|---|---|
| USFT | United States Survey Feet |
| USGS | United States Geological Survey |
| UTC | Coordinated Universal Time |
| UTM | Universal Transverse Mercator |
| XML | Extensible Markup Language |

## Equipment and Personnel

Esri ArcMap v10.7, Esri ArcCatolog V10.7, Geocue, LP360 v2019.1.30.4, LASTools 2021, TerraScan V20, Global Mapper V20.0, RiProcess 1.8.6, RiWorld 6.0, SDC Import 3.0, Applanix MMS POS Pac 8.5, RiAcquire, google earth, Riegle VQ-1560ii, Cessna 206.

GPI Team: Sandino Santos, Anthony Bausola, Gregor Adams, Titus Beachy, Kurt Griffel, Sonja Ellefson, CP Jon Popelars, Tyler Stentz, CMS, Matt Laluzerne, PSM and Iarelis Hall, PSM.

Woolpert Team: Michael Zoltek, Chris McPartland, Ryan Bowe, Mike Meiser.

## Variances from the Scope, Issues, or Problems

After performing a coverage check of the project, few areas were flagged for clouds and coverage voids due to larger building footprints. These areas were re-flown at a lower flight altitude and numbered in the 6000 series flight line number to note that they were not a part of the original flight plan. In these areas, the 6000 series lines fully replaced the originally collected data.

Control point T13 was recollected due to higher-than-expected results. The new elevation value collected was 13.209'.

## Quality Assurance/Quality Control

The project's progress was closely monitored throughout the entire period of work. The overall project was divided into three phases: Phase 1 Collection and calibration, phase 2 classification breakline collection along with delivering a pilot project for review, and phase 3, hydro flattened DEMs in 2ft and 5ft tiles, a mosaic, intensity images, and final geodatabase file with the metadata.

In the first phase, the LiDAR data was checked for deviations, data separation, pitch, completeness, and other items that could compromise the quality of the data during the collection and processing phases. The data were indexed to project control. Once the data were calibrated and indexed to project control, the LAS point cloud was manually classified by technicians and then QC'ed by analysts. 3D breaklines were collected from the LiDAR to enforce and flatten DEMs. The final DEMS were reviewed for spikes in hydro features, voids, artifacts, and misclassified data.

Final QC of the point cloud data GPI ran statistics looking for rouge classes outside the project scope, checking the LAS is 1.4 format, the WKT header is correct, and for proper project GPS time.

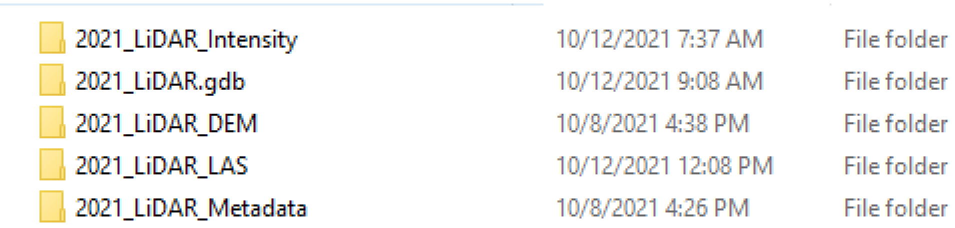
The final delivery drive was reviewed for naming consistency,  total file numbers, and individual files opened in the correct software.

## Revisions

GPI received a shapefile from ITD named Lidar2021_QCAReas.zip on 1/7/2022. GPI addressed comments from ITD that included classification errors, adjusting waterbody elevations, digitizing a stream, and updating some parts of the final .gdb file. DEMs were remade for the corresponding tiles as part of the fixes, and the overall mosaic 5ft DEM was reproduced to incorporate the fixes. GPI updated the final .gdb file to include the new breaklines; additional breaklines in the bridge feature class were adjusted and added. The Lidar_Swath feature class was updated to include standard local time for the start and stop of the flight lines and the Collection_2021 was added to visualize the collection dates.

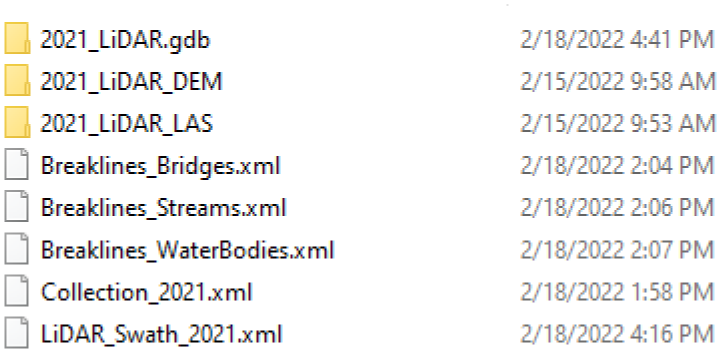
## Deliverables

The project deliverables were delivered on a WD Element 4TB external hard drive SN:WX41D893RJCL with GPI sticker 500005. Below are the deliverable folders that include 1ft intensity .tifs, ESRI geodatabase, bare earth DEMs in 2ft, and 5ft cell size tiled and 5ft mosaic, LAS 1.4 fully classified and 1 set of tiled mass points in LAS 1.4, and metadata in .xml format.



| | | |
|---|---|---|
| 2021_LiDAR_Intensity | 10/12/2021 7:37 AM | File folder |
| 2021_LiDAR.gdb | 10/12/2021 9:08 AM | File folder |
| 2021_LiDAR_DEM | 10/8/2021 4:38 PM | File folder |
| 2021_LiDAR_LAS | 10/12/2021 12:08 PM | File folder |
| 2021_LiDAR_Metadata | 10/8/2021 4:26 PM | File folder |

The deliverables that had items to address were re-delivered via the GPI FTP site on 2/18/2022.



| | |
|---|---|
| 2021_LiDAR.gdb | 2/18/2022 4:41 PM |
| 2021_LiDAR_DEM | 2/15/2022 9:58 AM |
| 2021_LiDAR_LAS | 2/15/2022 9:53 AM |
| Breaklines_Bridges.xml | 2/18/2022 2:04 PM |
| Breaklines_Streams.xml | 2/18/2022 2:06 PM |
| Breaklines_WaterBodies.xml | 2/18/2022 2:07 PM |
| Collection_2021.xml | 2/18/2022 1:58 PM |
| LiDAR_Swath_2021.xml | 2/18/2022 4:16 PM |

# Certifications

(1) This Survey and Map Report and accompanying Survey meets all applicable requirements of the Standards of Practice - Professional Matters in Surveying and Mapping as contained in Chapter 5J-17 of FAC, according to section 472 of the Florida Statutes.
(2) This report is not valid without the digital signature and seal of the Florida Surveyor and Mapper in responsible charge. This report certifies the digital deliverables, as shown in the **Deliverables** section of this report. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.
(3) The seal appearing on this document was authorized by Matthew R. LaLuzerne, PSM LS6766 on 2/22/2022 unless accompanied by an electronic signature as described in this section.
(4) Additions or deletions to this data by anyone other than the signing party are prohibited without the signing party's written consent.
(5) This report, or the project deliverables, is not full and complete without the other.
(6) Quality Control was conducted on this project and found to meet specifications.

Prepared for Miami-Dade County Information Technology Department
Surveyor and Mapper in Responsible Charge:

This item has been digitally signed and sealed by:
**Matthew R. LaLuzerne**
**Florida Professional Surveyor and Mapper**
**License Number LS6766**

Matthew R LaLuzerne
Digitally signed by Matthew R LaLuzerne
DN: CN=Matthew R LaLuzerne,
OU=A01410D0000016DF34F979D00006AA2,
O=GPI GEOSPATIAL INC., C=US
Date: 2022.02.22 14:09:28-05'00'

MATTHEW R. LALUZERNE
6766

For the Firm of:
**GPI Geospatial, Inc., LB 6748**
3051 E. Livingston Street Suite 300,
Orlando, Florida 32803

# Appendix A

# FPRN Datasheet

| | |
|---|---|
| Site Name: | District 6 |
| Site Code: | FLD6 |
| RTCM Code: | 0602 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702046 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16247007 |
| Satellite Systems: | G/R/E/-/- |

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| - M | 9.854 M | 9.850 M |

## NAD 83 (2011) epoch 2010.000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°46'49.67364" N |
| E Longitude | 279°37'24.65114" E |
| W Longitude | 80°22'35.34886" W |
| Ellipsoid Height | -15.100 M |

| Cartesian Coordinates* |
|---|
| X = 960733.552 M |
| Y = -5666055.255 M |
| Z = 2757175.001 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160442.792 M |
| E: 262537.481 M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851520.031 M |
| E: 562516.144 M |

## ITRF 2014 epoch 2019.837

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.69285" N |
| E Longitude | 279° 37' 24.63186" E |
| W Longitude | 80° 22' 35.36814" W |
| | |
| Ellipsoid Height | -16.723 M |

| Cartesian Coordinates* |
|---|
| X = 960732.735 M |
| Y = -5666053.651 M |
| Z = 2757174.827 M |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851520.620 M |
| E: 562515.604 M |

* Positions and Coordinates were calculated using OPUS Projects software published by National Geodetic Survey (NGS).
** FPRN18 Orthometric Heights were calculated using Infinity software published by Leica Geosystems.

# NAD 83 (2011) epoch 2010.000

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.67336" N |
| W Longitude | 80° 22' 35.34834" W |
| Ellipsoid Height | -15.107 M |
| | |
| **Cartesian Coordinates*** | |
| X = 960733.566 M | |
| Y = -5666055.250 M | |
| Z = 2757174.990 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160442.783 M |
| E: 262537.496 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851520.023 M |
| E: 562516.158 M |

# ITRF 2014 epoch 2019.078

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.69278" N |
| E Longitude | 279° 37' 24.63214" E |
| W Longitude | 80° 22' 35.36786" W |
| | |
| Ellipsoid Height | -16.718 M |
| | |
| **Cartesian Coordinates*** | |
| X = 960732.744 M | |
| Y = -5666053.655 M | |
| Z = 2757174.828 M | |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851520.618 M |
| E: 562515.612 M |

# NAD 83 (2011) epoch 2010.000

After 8/16/2018

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.67350" N |
| W. Longitude | 80° 22' 35.34867" W |
| Ellipsoid Height | -15.104 M |
| | |
| **Cartesian Coordinates*** | |
| X = 960733.557 M | |
| Y = -5666055.253 M | |
| Z = 2757174.996 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160442.788 M |
| E: 262537.487 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851520.027 M |
| E: 562516.149 M |

## NAD 83 (2011) epoch 2010.000

After 8/25/2015

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.67350" N |
| W. Longitude | 80° 22' 35.34867" W |
| Ellipsoid Height | -15.104 M |
| | |
| **Cartesian Coordinates*** | |
| X = 960733.557 M | |
| Y = -5666055.253 M | |
| Z = 2757174.996 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160442.788 M |
| E: 262537.487 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851520.027 M |
| E: 562516.149 M |

## NAD 83 (2011) epoch 2010.000

After 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.67325" N |
| W. Longitude | 80° 22' 35.34835" W |
| Ellipsoid Height | -15.104 M |
| | |
| **Cartesian Coordinates*** | |
| X = 960733.566 M | |
| Y = -5666055.255 M | |
| Z = 2757174.989 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160442.780 M |
| E: 262537.496 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851520.019 M |
| E: 562516.158 M |

## NAD 83 (CORS96)

Prior to 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.67349" N |
| W. Longitude | 80° 22' 35.34936" W |
| Ellipsoid Height | -15.098 M |
| | |
| **Cartesian Coordinates*** | |
| X = 960733.539 M | |
| Y = -5666055.261 M | |
| Z = 2757174.998 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160442.787 M |
| E: 262537.468 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851520.027 M |
| E: 562516.130 M |

# FPRN Datasheet

| | |
|---|---|
| Site Name: | Miami Beach |
| Site Code: | FLMB |
| RTCM Code: | 0601 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702024 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268030 |
| Satellite Systems: | G/R/E/-/- |

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| - M | 10.198 M | 10.235 M |

## NAD 83 (2011) epoch 2010.000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°46'57.83802" N |
| E Longitude | 279°51'45.83189" E |
| W Longitude | 80°08'14.16811" W |
| Ellipsoid Height | -15.511 M |

| Cartesian Coordinates* |
|---|
| X = 984362.801  M |
| Y = -5661886.676  M |
| Z = 2757401.059  M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160829.399 M |
| E: 286529.885 M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851906.506 M |
| E: 586500.362 M |

## ITRF 2014 epoch 2019.837

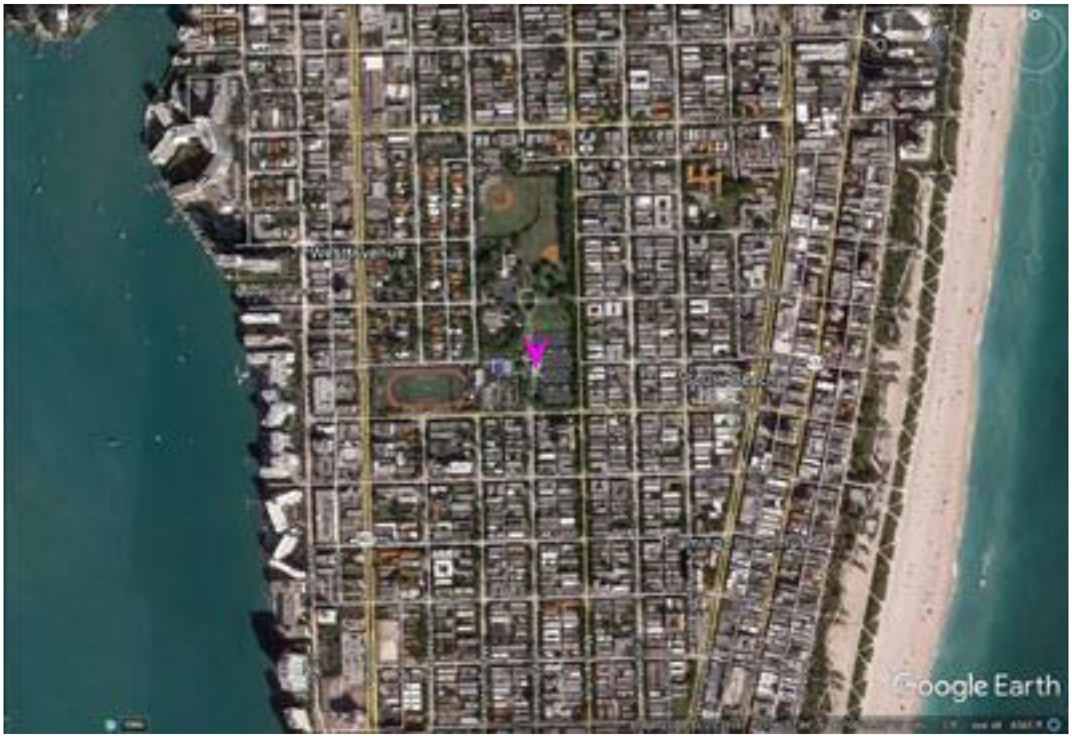
After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.85732" N |
| E Longitude | 279° 51' 45.81290" E |
| W Longitude | 80° 08' 14.18710" W |
| | |
| Ellipsoid Height | -17.136 M |

| Cartesian Coordinates* |
|---|
| X = 984361.985 M |
| Y = -5661885.071 M |
| Z = 2757400.887 M |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851907.096 M |
| E: 586499.829 M |



* Positions and Coordinates were calculated using OPUS Projects software published by National Geodetic Survey (NGS).
** FPRN18 Orthometric Heights were calculated using Infinity software published by Leica Geosystems.

## NAD 83 (2011) epoch 2010.000

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.83776" N |
| W Longitude | 80° 08' 14.16748" W |
| Ellipsoid Height | -15.510 M |
| | |
| **Cartesian Coordinates*** | |
| X = 984362.819 M | |
| Y = -5661886.677 M | |
| Z = 2757401.052 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160829.391 M |
| E: 286529.903 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851906.498 M |
| E: 586500.379 M |

## ITRF 2014 epoch 2019.078

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.85727" N |
| E Longitude | 279° 51' 45.81325" E |
| W Longitude | 80° 08' 14.18675" W |
| | |
| Ellipsoid Height | -17.123 M |
| | |
| **Cartesian Coordinates*** | |
| X = 984361.996 M | |
| Y = -5661885.081 M | |
| Z = 2757400.891 M | |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851907.095 M |
| E: 586499.839 M |

## NAD 83 (2011) epoch 2010.000

After 8/16/2018

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.83786" N |
| W. Longitude | 80° 08' 14.16764" W |
| Ellipsoid Height | -15.518 M |
| | |
| **Cartesian Coordinates*** | |
| X = 984362.813 M | |
| Y = -5661886.669 M | |
| Z = 2757401.052 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160829.394 M |
| E: 286529.898 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2851906.501 M |
| E: 586500.375 M |

# NAD 83 (2011) epoch 2010.000

After 8/25/2015

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.83786" N |
| W. Longitude | 80° 08' 14.16764" W |
| Ellipsoid Height | -15.518 M |

| Cartesian Coordinates* |
|---|
| X = 984362.813 M |
| Y = -5661886.669 M |
| Z = 2757401.052 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160829.394 M |
| E: 286529.898 M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851906.501 M |
| E: 586500.375 M |

# NAD 83 (2011) epoch 2010.000

After 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.83764" N |
| W. Longitude | 80° 08' 14.16768" W |
| Ellipsoid Height | -15.518 M |

| Cartesian Coordinates* |
|---|
| X = 984362.813 M |
| Y = -5661886.673 M |
| Z = 2757401.045 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160829.387 M |
| E: 286529.897 M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851906.495 M |
| E: 586500.374 M |

# NAD 83 (CORS96)

Prior to 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.83782" N |
| W. Longitude | 80° 08' 14.16834" W |
| Ellipsoid Height | -15.504 M |

| Cartesian Coordinates* |
|---|
| X = 984362.796 M |
| Y = -5661886.686 M |
| Z = 2757401.056 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 160829.393 M |
| E: 286529.879 M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2851906.500 M |
| E: 586500.355 M |

# FPRN Datasheet

| | |
|---|---|
| Site Name: | North Dade |
| Site Code: | FLND |
| RTCM Code: | 0606 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1701995 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268036 |
| Satellite Systems: | G/R/E/-/- |

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| - M | 8.146 M | 8.139 M |

## NAD 83 (2011) epoch 2010.000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°57'56.76791" N |
| E Longitude | 279°49'57.77677" E |
| W Longitude | 80°10'02.22323" W |
| Ellipsoid Height | -17.382 M |

| Cartesian Coordinates* |
|---|
| X = 979885.116 M |
| Y = -5653680.729 M |
| Z = 2775645.262 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 181088.013 M |
| E: 283390.664 M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2872158.208 M |
| E: 583362.212 M |

## ITRF 2014 epoch 2019.837

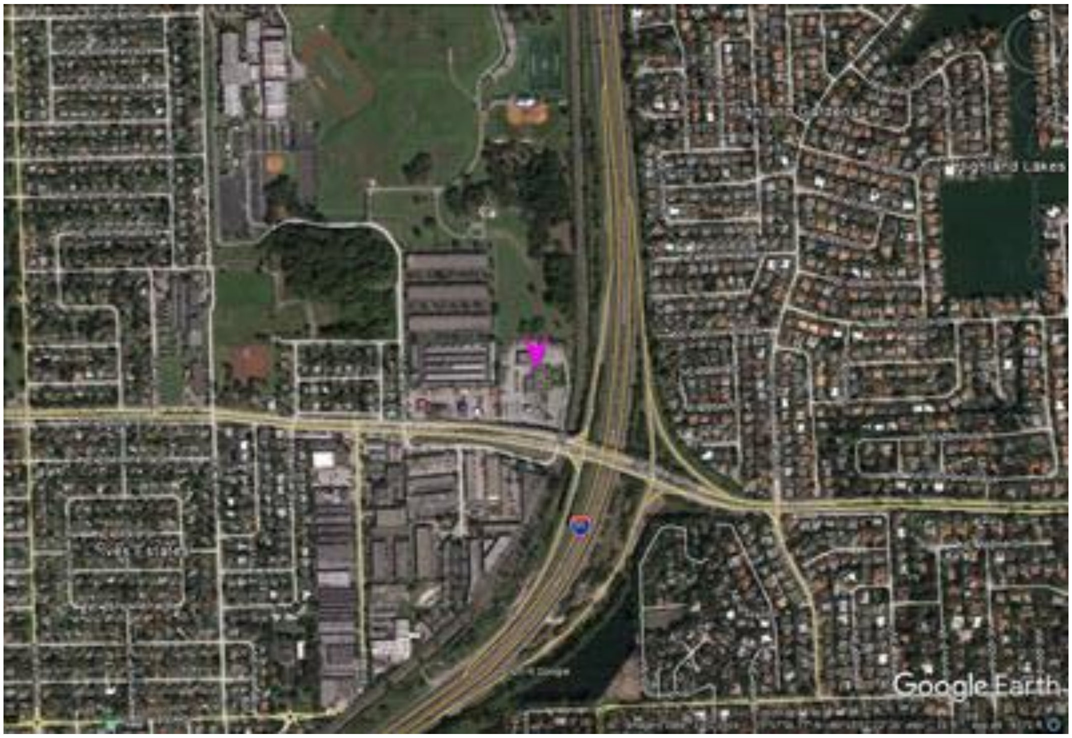
After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.78737" N |
| E Longitude | 279° 49' 57.75765" E |
| W Longitude | 80° 10' 02.24235" W |
| | |
| Ellipsoid Height | -18.997 M |

| Cartesian Coordinates* |
|---|
| X = 979884.299 M |
| Y = -5653679.130 M |
| Z = 2775645.093 M |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2872158.804 M |
| E: 583361.676 M |



* Positions and Coordinates were calculated using OPUS Projects software published by National Geodetic Survey (NGS).
** FPRN18 Orthometric Heights were calculated using Infinity software published by Leica Geosystems.

## NAD 83 (2011) epoch 2010.000

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.76763" N |
| W Longitude | 80° 10' 02.22262" W |
| Ellipsoid Height | -17.378 M |
| | |
| **Cartesian Coordinates*** | |
| X = 979885.134 M | |
| Y = -5653680.733 M | |
| Z = 2775645.256 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 181088.005 M |
| E: 283390.681 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2872158.200 M |
| E: 583362.229 M |

## ITRF 2014 epoch 2019.078

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.78728" N |
| E Longitude | 279° 49' 57.758" E |
| W Longitude | 80° 10' 02.24200" W |
| | |
| Ellipsoid Height | -18.987 M |
| | |
| **Cartesian Coordinates*** | |
| X = 979884.311 M | |
| Y = -5653679.139 M | |
| Z = 2775645.095 M | |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2872158.801 M |
| E: 583361.686 M |

## NAD 83 (2011) epoch 2010.000

After 8/16/2018

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.76786" N |
| W. Longitude | 80° 10' 02.22280" W |
| Ellipsoid Height | -17.368 M |
| | |
| **Cartesian Coordinates*** | |
| X = 979885.130 M | |
| Y = -5653680.740 M | |
| Z = 2775645.267 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 181088.012 M |
| E: 283390.676 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2872158.207 M |
| E: 583362.224 M |

## NAD 83 (2011) epoch 2010.000

After 8/25/2015

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.76786" N |
| W. Longitude | 80° 10' 02.22280" W |
| Ellipsoid Height | -17.368 M |
| | |
| Cartesian Coordinates* | |
| X = 979885.130 M | |
| Y = -5653680.740 M | |
| Z = 2775645.267 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 181088.012 M |
| E: 283390.676 M |
| |
| UTM Coordinates* |
| Zone: 17 |
| N: 2872158.207 M |
| E: 583362.224 M |

## NAD 83 (2011) epoch 2010.000

After 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.76772" N |
| W. Longitude | 80° 10' 02.22301" W |
| Ellipsoid Height | -17.368 M |
| | |
| Cartesian Coordinates* | |
| X = 979885.125 M | |
| Y = -5653680.743 M | |
| Z = 2775645.263 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 181088.007 M |
| E: 283390.671 M |
| |
| UTM Coordinates* |
| Zone: 17 |
| N: 2872158.203 M |
| E: 583362.218 M |

## NAD 83 (CORS96)

Prior to 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | - N |
| W. Longitude | - W |
| Ellipsoid Height | 0.000 M |
| | |
| Cartesian Coordinates* | |
| X = 0.000 M | |
| Y = 0.000 M | |
| Z = 0.000 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 0.000 M |
| E: 0.000 M |
| |
| UTM Coordinates* |
| Zone: 17 |
| N: 0.000 M |
| E: 0.000 M |

# FPRN Datasheet

| | |
|---|---|
| Site Name: | Richmond Heights |
| Site Code: | RMND |
| RTCM Code: | 0608 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702057 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268032 |
| Satellite Systems: | G/R/E/-/- |

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| - M | 11.121 M | 11.123 M |

## NAD 83 (2011) epoch 2010.000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°36'49.58944" N |
| E Longitude | 279°36'57.85931" E |
| W Longitude | 80°23'02.14069" W |
| Ellipsoid Height | -13.983 M |
| | |

| Cartesian Coordinates* |
|---|
| X = 961335.328 M |
| Y = -5674075.783 M |
| Z = 2740535.400 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 141973.209 M |
| E: 261877.125 M |
| |
| |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2833056.750 M |
| E: 561856.013 M |

## ITRF 2014 epoch 2019.837

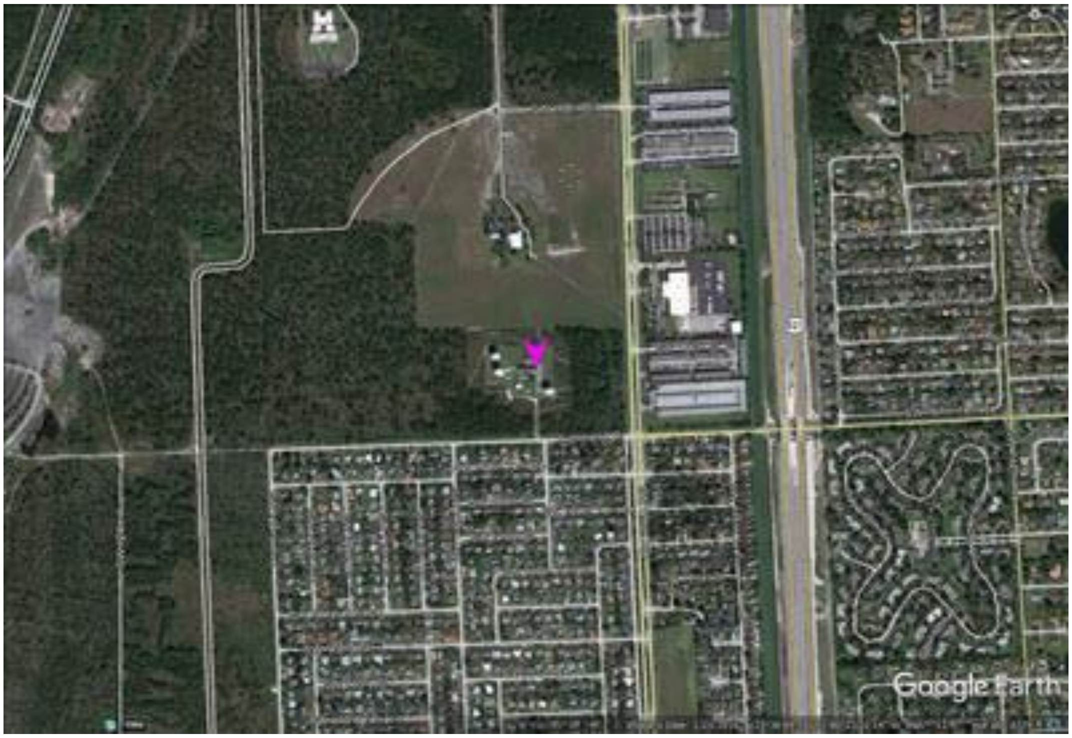
After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.60849" N |
| E Longitude | 279° 36' 57.84016" E |
| W Longitude | 80° 23' 02.15984" W |
| | |
| Ellipsoid Height | -15.608 M |

| Cartesian Coordinates* |
|---|
| X = 961334.514 M |
| Y = -5674074.178 M |
| Z = 2740535.227 M |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2833057.334 M |
| E: 561855.476 M |



* Positions and Coordinates were calculated using OPUS Projects software published by National Geodetic Survey (NGS).
** FPRN18 Orthometric Heights were calculated using Infinity software published by Leica Geosystems.

# NAD 83 (2011) epoch 2010.000

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.58918" N |
| W Longitude | 80° 23' 02.14002" W |
| Ellipsoid Height | -13.990 M |
| | |

| Cartesian Coordinates* |
|---|
| X = 961335.346 M |
| Y = -5674075.777 M |
| Z = 2740535.390 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 141973.201 M |
| E: 261877.144 M |
| |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2833056.742 M |
| E: 561856.032 M |

# ITRF 2014 epoch 2019.078

After 9/6/2019

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.60845" N |
| E Longitude | 279° 36' 57.84053" E |
| W Longitude | 80° 23' 02.15947" W |
| | |
| Ellipsoid Height | -15.606 M |

| Cartesian Coordinates* |
|---|
| X = 961334.525 M |
| Y = -5674074.179 M |
| Z = 2740535.226 M |

| State Plane Coordinates* |
|---|
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |
| Zone: - |
| N: - M |
| E: - M |
| |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2833057.332 M |
| E: 561855.486 M |

# NAD 83 (2011) epoch 2010.000

After 8/16/2018

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.58918" N |
| W. Longitude | 80° 23' 02.14083" W |
| Ellipsoid Height | -13.976 M |
| | |

| Cartesian Coordinates* |
|---|
| X = 961335.326 M |
| Y = -5674075.794 M |
| Z = 2740535.396 M |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 141973.201 M |
| E: 261877.121 M |
| |

| UTM Coordinates* |
|---|
| Zone: 17 |
| N: 2833056.742 M |
| E: 561856.009 M |

## NAD 83 (2011) epoch 2010.000

After 8/25/2015

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.58918" N |
| W. Longitude | 80° 23' 02.14083" W |
| Ellipsoid Height | -13.976 M |
| | |
| **Cartesian Coordinates*** | |
| X = 961335.326 M | |
| Y = -5674075.794 M | |
| Z = 2740535.396 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 141973.201 M |
| E: 261877.121 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2833056.742 M |
| E: 561856.009 M |

## NAD 83 (2011) epoch 2010.000

After 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.58918" N |
| W. Longitude | 80° 23' 02.14083" W |
| Ellipsoid Height | -13.976 M |
| | |
| **Cartesian Coordinates*** | |
| X = 961335.326 M | |
| Y = -5674075.794 M | |
| Z = 2740535.396 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 141973.201 M |
| E: 261877.121 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2833056.742 M |
| E: 561856.009 M |

## NAD 83 (CORS96)

Prior to 8/2/2014

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.58922" N |
| W. Longitude | 80° 23' 02.14116" W |
| Ellipsoid Height | -14.001 M |
| | |
| **Cartesian Coordinates*** | |
| X = 961335.313 M | |
| Y = -5674075.772 M | |
| Z = 2740535.386 M | |

| State Plane Coordinates* |
|---|
| Zone: FL E |
| N: 141973.202 M |
| E: 261877.112 M |
| |
| **UTM Coordinates*** |
| Zone: 17 |
| N: 2833056.743 M |
| E: 561856.000 M |

# Appendix B

## LiDAR Index Control Conversion Residuals

| geoid12b | | | | | geoid18 | | | | | residual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| point id | northing | easthing | orthometric height | | point id | northing | easthing | orthometric height | | northing | easthing | orthometric height |
| O-1 | 557829.047 | 686577.634 | 10.161 | | O-1 | 557829.047 | 686577.634 | 10.162 | | 0.00 | 0.000 | -0.001 |
| O-2 | 535090.900 | 697777.054 | 9.079 | | O-2 | 535090.900 | 697777.054 | 9.087 | | 0.00 | 0.000 | -0.008 |
| O-4 | 519175.382 | 733037.983 | 12.872 | | O-4 | 519175.382 | 733037.983 | 12.874 | | 0.00 | 0.000 | -0.002 |
| O-6 | 402485.087 | 727606.961 | 3.364 | | O-6 | 402485.087 | 727606.961 | 3.375 | | 0.00 | 0.000 | -0.011 |
| O-10 | 387173.310 | 797204.150 | 7.826 | | O-10 | 387173.310 | 797204.150 | 7.814 | | 0.00 | 0.000 | 0.012 |
| O-13 | 468771.846 | 795999.387 | 7.716 | | O-13 | 468771.846 | 795999.387 | 7.708 | | 0.00 | 0.000 | 0.008 |
| O-14 | 519298.470 | 760087.325 | 13.187 | | O-14 | 519298.470 | 760087.325 | 13.187 | | 0.00 | 0.000 | 0.000 |
| O-16 | 611516.067 | 842195.626 | 8.887 | | O-16 | 611516.067 | 842195.626 | 8.899 | | 0.00 | 0.000 | -0.012 |
| O-17 | 348679.757 | 839483.072 | 12.323 | | O-17 | 348679.757 | 839483.072 | 12.328 | | 0.00 | 0.000 | -0.005 |
| T-1 | 390772.231 | 813323.456 | 6.243 | | T-1 | 390772.231 | 813323.456 | 6.243 | | 0.00 | 0.000 | 0.000 |
| T-2 | 394651.624 | 820927.233 | 4.816 | | T-2 | 394651.624 | 820927.233 | 4.817 | | 0.00 | 0.000 | -0.001 |
| T-3 | 401576.785 | 875784.058 | 4.702 | | T-3 | 401576.785 | 875784.058 | 4.657 | | 0.00 | 0.000 | 0.045 |
| T-4 | 418498.519 | 845959.189 | 6.281 | | T-4 | 418498.519 | 845959.189 | 6.265 | | 0.00 | 0.000 | 0.016 |
| T-5 | 418538.959 | 817882.450 | 8.834 | | T-5 | 418538.959 | 817882.450 | 8.836 | | 0.00 | 0.000 | -0.002 |
| T-6 | 466530.313 | 838742.284 | 8.752 | | T-6 | 466530.313 | 838742.284 | 8.741 | | 0.00 | 0.000 | 0.011 |
| T-7 | 459201.170 | 880705.063 | 12.013 | | T-7 | 459201.170 | 880705.063 | 11.955 | | 0.00 | 0.000 | 0.058 |
| T-8 | 446484.270 | 858264.035 | 11.139 | | T-8 | 446484.270 | 858264.035 | 11.112 | | 0.00 | 0.000 | 0.027 |
| T-9 | 487246.312 | 862698.248 | 7.978 | | T-9 | 487246.312 | 862698.248 | 7.966 | | 0.00 | 0.000 | 0.012 |
| T-10 | 519091.190 | 842914.727 | 8.121 | | T-10 | 519091.190 | 842914.727 | 8.127 | | 0.00 | 0.000 | -0.006 |
| T-11 | 522362.936 | 870724.236 | 4.905 | | T-11 | 522362.936 | 870724.236 | 4.920 | | 0.00 | 0.000 | -0.015 |
| T-12 | 490235.660 | 898780.139 | 2.134 | | T-12 | 490235.660 | 898780.139 | 2.118 | | 0.00 | 0.000 | 0.016 |
| T-13 | 515383.418 | 918391.197 | 13.466 | | T-13 | 515383.418 | 918391.197 | 13.486 | | 0.00 | 0.000 | -0.020 |
| T-14 | 522972.264 | 940010.124 | 1.963 | | T-14 | 522972.264 | 940010.124 | 1.970 | | 0.00 | 0.000 | -0.007 |
| T-15 | 554659.378 | 944477.952 | 3.072 | | T-15 | 554659.378 | 944477.952 | 3.061 | | 0.00 | 0.000 | 0.011 |
| T-16 | 541888.820 | 922063.197 | 16.245 | | T-16 | 541888.820 | 922063.197 | 16.260 | | 0.00 | 0.000 | -0.015 |
| T-17 | 537935.069 | 894470.545 | 4.861 | | T-17 | 537935.069 | 894470.545 | 4.890 | | 0.00 | 0.000 | -0.029 |
| T-18 | 542593.097 | 859522.703 | 5.829 | | T-18 | 542593.097 | 859522.703 | 5.849 | | 0.00 | 0.000 | -0.020 |
| T-19 | 567265.069 | 860235.652 | 5.257 | | T-19 | 567265.069 | 860235.652 | 5.290 | | 0.00 | 0.000 | -0.033 |
| T-20 | 556311.962 | 883923.741 | 4.700 | | T-20 | 556311.962 | 883923.741 | 4.745 | | 0.00 | 0.000 | -0.045 |
| T-21 | 557394.266 | 911979.083 | 4.992 | | T-21 | 557394.266 | 911979.083 | 5.021 | | 0.00 | 0.000 | -0.029 |
| T-22 | 566081.327 | 933514.533 | 3.098 | | T-22 | 566081.327 | 933514.533 | 3.110 | | 0.00 | 0.000 | -0.012 |
| T-23 | 571432.821 | 943785.947 | 4.503 | | T-23 | 571432.821 | 943785.947 | 4.510 | | 0.00 | 0.000 | -0.007 |
| T-24 | 597153.648 | 942574.841 | 4.717 | | T-24 | 597153.648 | 942574.841 | 4.732 | | 0.00 | 0.000 | -0.015 |
| T-25 | 582897.200 | 934113.147 | 5.052 | | T-25 | 582897.200 | 934113.147 | 5.071 | | 0.00 | 0.000 | -0.019 |
| T-26 | 573241.558 | 916670.528 | 13.415 | | T-26 | 573241.558 | 916670.528 | 13.446 | | 0.00 | 0.000 | -0.031 |
| T-27 | 591468.840 | 895894.316 | 4.755 | | T-27 | 591468.840 | 895894.316 | 4.784 | | 0.00 | 0.000 | -0.029 |
| T-28 | 593694.064 | 858652.741 | 4.742 | | T-28 | 593694.064 | 858652.741 | 4.762 | | 0.00 | 0.000 | -0.020 |
| T-31 | 491995.639 | 830011.523 | 7.555 | | T-31 | 491995.639 | 830011.523 | 7.547 | | 0.00 | 0.000 | 0.008 |
| T-30 | 441049.719 | 806916.626 | 6.185 | | T-30 | 441049.719 | 806916.626 | 6.182 | | 0.00 | 0.000 | 0.003 |

# Appendix C

# SURVEYORS REPORT
# MIAMI-DADE COUNTY, FLORIDA
# ORTHO PHOTO CONTROL
# 1/4/2021

| | | | |
|---|---|---|---|
| FPID | N/A | T.W.O. | 1 |
| FDOR CONTRACT# | P0146 | RFQ# | 17/18-18 |
| PREPARED FOR: | WOOLPERT, INC. | | |
| PREPARED BY: | WOOLPERT, INC.<br>6100 BLUE LAGOON DRIVE, SUITE 440<br>MIAMI, FL 33126<br>(305) 351-2942 | | |
| SURVEYOR IN RESPONSIBLE CHARGE | Jose Sanfiel P.S.M. 5636<br>Jose.Sanfiel@woolpert.com | | |

---

## TABLE OF CONTENTS

# PROJECT INFORMATION

Abbreviations Used

| | |
|---|---|
| FDOR | Florida Department of Revenue |
| FPID | Financial Project ID |
| FPRN | Florida Permanent Reference Network |
| GCP | Ground Control Point |
| GNSS | Global Navigation Satellite System |
| NAD | North American Datum |
| NAVD | North American Vertical Datum |
| OPUS | Online Positioning User Service |
| RMSEh | Root Mean Square Error in horizontal direction. |
| RMSEz | Root Mean Square Error in vertical direction. |
| RTK | Real Time Kinematic |
| T.W.O. | Task Work Order |
| VRS | Virtual Reference System |
| X | Easting Coordinate |
| Y | Northing Coordinate |
| Z | Vertical Coordinate (Elevation) |

## Purpose & Objective

The objective of this contract is to provide X, Y & Z values for 93 photo identifiable control points and vertical check points to support orthophotography.

## Field Work Completed By & When

The field work was performed from December 9, 2019 through January 6, 2020 by field technicians Jorge Alfageme, Suswyn Mills, Yonnier Nordelo, and Delcio Romero.

## Equipment & Software

Trimble R8 GNSS/SPS88x and Trimble R10 receivers with 2.0-meter fixed height tripods were used to observe each photo identifiable point. Trimble Business Center version 5.00 was used to process the data.

## Methodology

93 Ground Control Points (GCPs) were collected as control to support the processing of collected lidar data. For these points, Woolpert collected Real Time Kinematic (RTK) data while logged into the Florida DOT's FPRN Network. GCPs within 14 kilometers from the nearest functional FPRN station used single baseline settings. Points further than 14 kilometers from the nearest functional FPRN station were collected in "Multibase Mode" to utilize the full benefit of the atmospheric modeling of the Virtual Reference Station (VRS). Dual observations for each GCP were made at different times and different satellite constellations for 10 epochs per occupation which met the horizontal limit of 0.04 feet RMSEh and the vertical limit of 0.05 feet RMSEz. The mean value of the multiple observations was held as the control value for each point. In some cases, the FPRN and/or VRS networks were not available so Woolpert used 25-minute static observations and post processed using OPUS or Trimble CenterPoint RTX Post-Processing Service. *Note: Any points falling outside of this tolerance are denoted with an "*" in the coordinate listing pages of this report.*

## Data Source for Project Control

Florida Permanent Reference Network (F.P.R.N) http://www.fdot.gov/geospatial/fprn.shtm

## Horizontal Datum

NAD 83 (2011) Epoch 2010.000 – US State Plane 1983_ Florida East (0901).

## Vertical Datum

Orthometric elevations are based on the North American Vertical Datum of 1988 (NAVD 88) calculated by holding the Florida Permanent Reference Network geoid model “FPRNGD16B”.

# CERTIFICATION

METADATA DIRECTORY

a) GPS Observations
b) Field Notes, Pictures & Sky Plots
c) Google Earth KMZ file of point locations
d) Target Values

20200210 Survey Report (MiamiDadeOrthos)

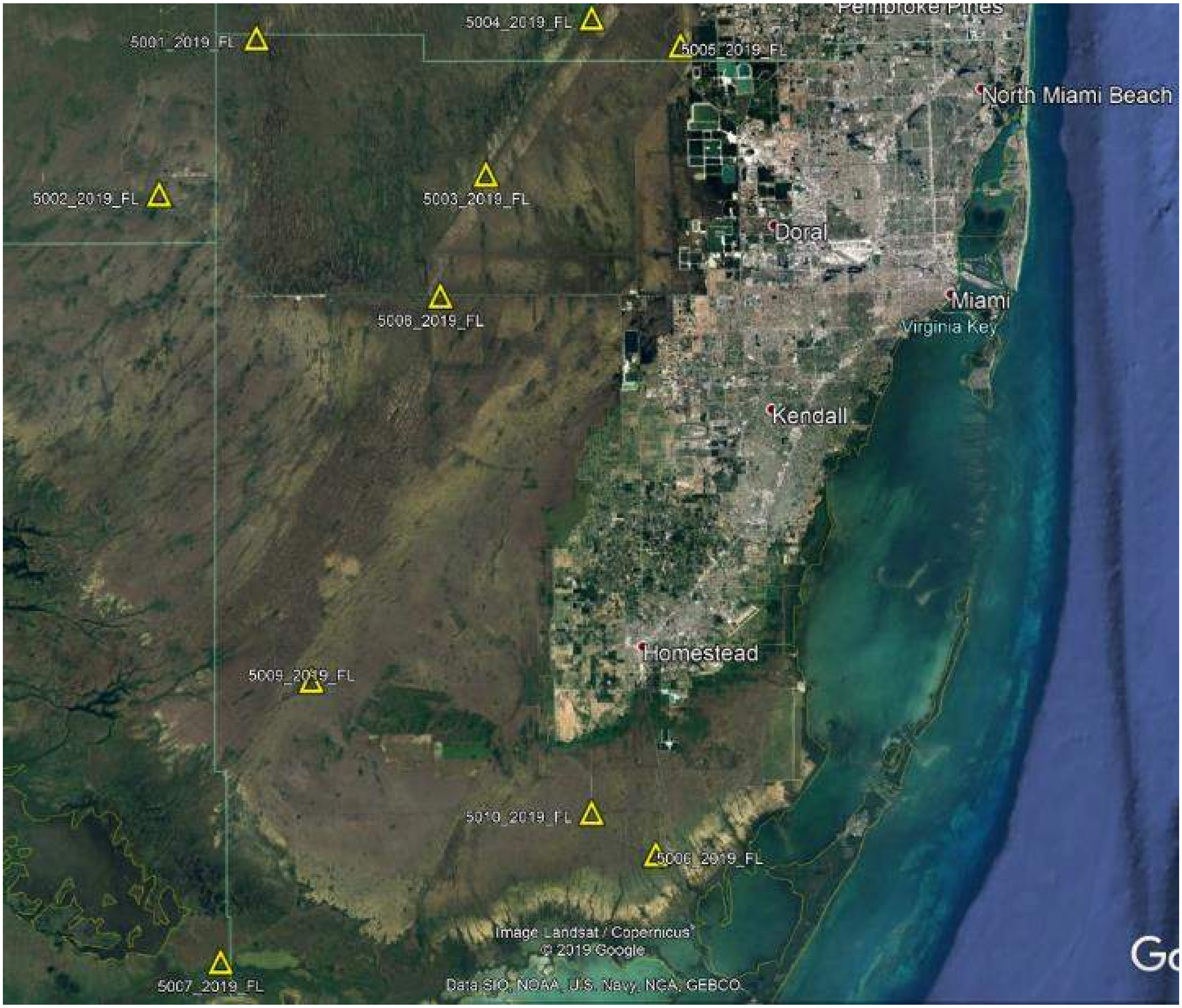
SURVEYOR’S CERTIFICATION: PAGES 1-364

I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THE SURVEY SHOWN HEREON WAS PREPARED IN ACCORDANCE WITH THE “STANDARDS OF PRACTICE” FOR SURVEYING AND MAPPING IN THE STATE OF FLORIDA AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472, FLORIDA STATUTES.

DATE JOSE SANFIEL, P.S.M.
FLORIDA SURVEYOR AND MAPPER
REGISTRATION No. 5636 WOOLPERT INC. (LB6777)

DIGITAL MEDIA IS NOT VALID WITHOUT THE ELECTRONIC SIGNTURE OF THE LICENSED FLORIDA SURVEYOR & MAPPER NAMED ABOVE DATED 2/11/2020.

# NETWORK MAP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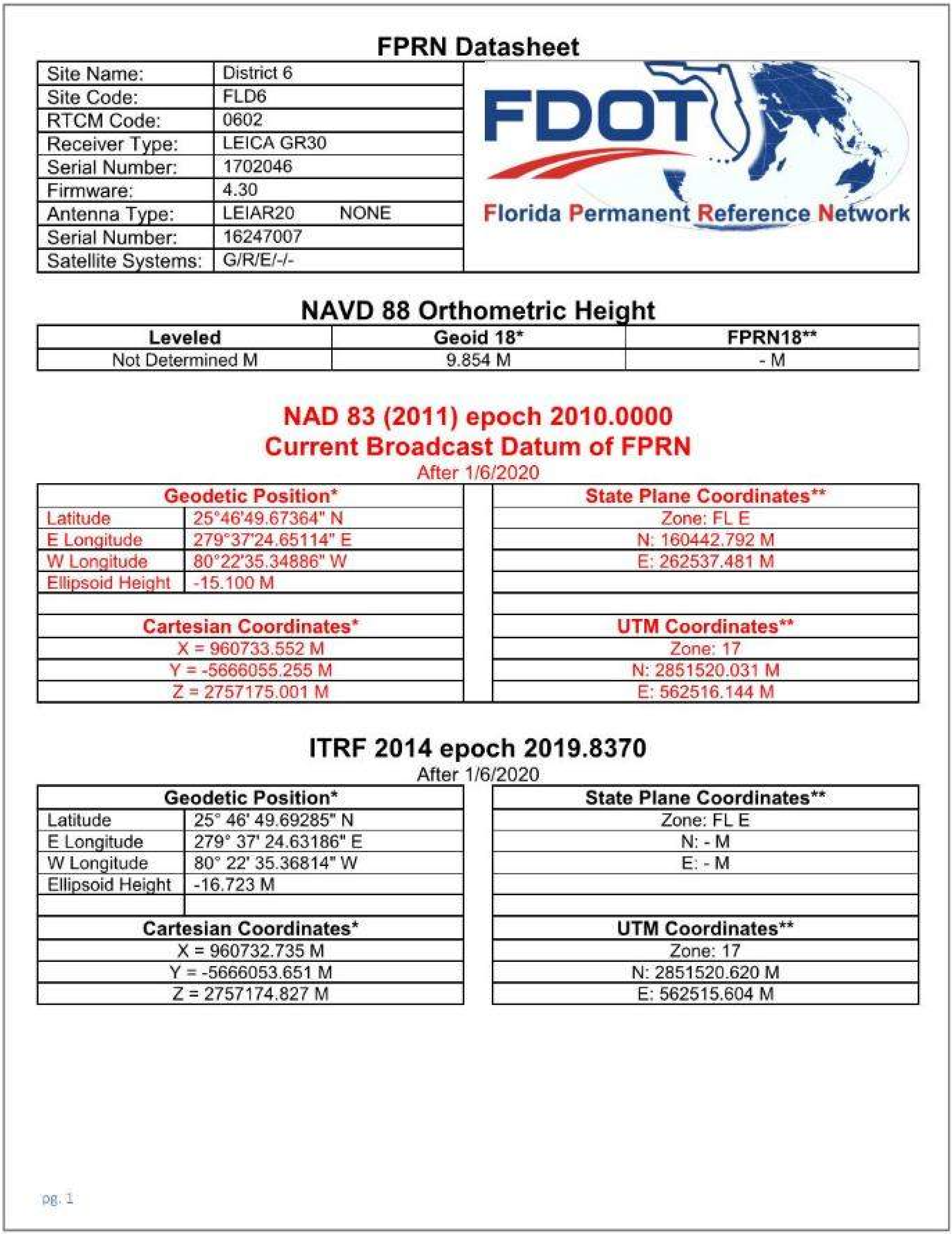
5004_2019_FL
Pembroke Pines
5005_2019_FL
North Miami Beach
5002_2019_FL
5003_2019_FL
Doral
5008_2019_FL
Miami
Virginia Key
Kendall
Homestead
5009_2019_FL
5010_2019_FL
5006_2019_FL
5007_2019_FL
Image Landsat / Copernicus
© 2019 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Go



## FPRN Datasheet

| | |
|---|---|
| Site Name: | District 6 |
| Site Code: | FLD6 |
| RTCM Code: | 0602 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702046 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16247007 |
| Satellite Systems: | G/R/E/-/- |

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| Not Determined M | 9.854 M | - M |

## NAD 83 (2011) epoch 2010.0000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°46'49.67364" N |
| E Longitude | 279°37'24.65114" E |
| W Longitude | 80°22'35.34886" W |
| Ellipsoid Height | -15.100 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: 160442.792 M |
| E: 262537.481 M |

| Cartesian Coordinates* |
|---|
| X = 960733.552 M |
| Y = -5666055.255 M |
| Z = 2757175.001 M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2851520.031 M |
| E: 562516.144 M |

## ITRF 2014 epoch 2019.8370

After 1/6/2020

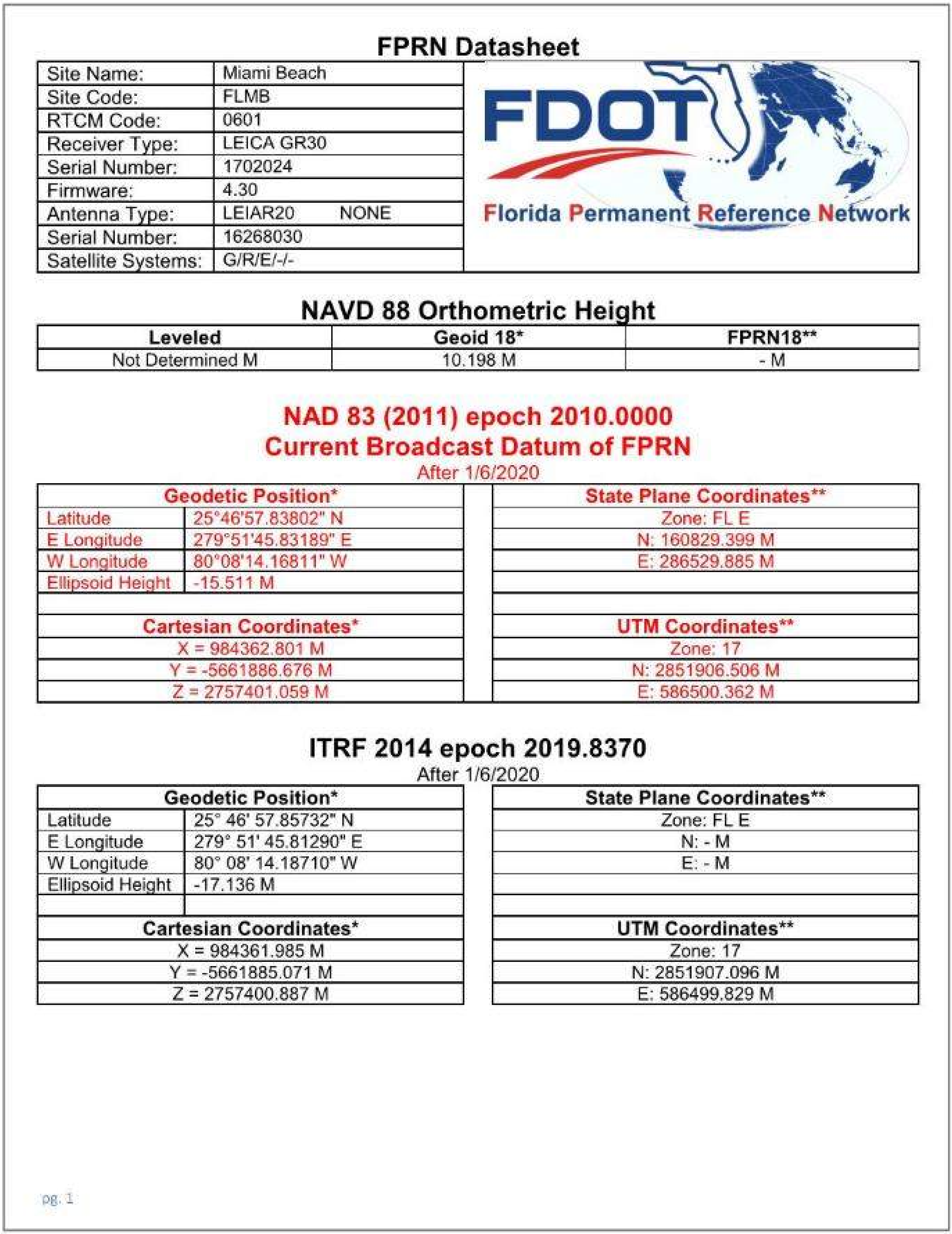
| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 49.69285" N |
| E Longitude | 279° 37' 24.63186" E |
| W Longitude | 80° 22' 35.36814" W |
| Ellipsoid Height | -16.723 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: - M |
| E: - M |

| Cartesian Coordinates* |
|---|
| X = 960732.735 M |
| Y = -5666053.651 M |
| Z = 2757174.827 M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2851520.620 M |
| E: 562515.604 M |

pg. 1



## FPRN Datasheet

| | |
|---|---|
| Site Name: | Miami Beach |
| Site Code: | FLMB |
| RTCM Code: | 0601 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702024 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268030 |
| Satellite Systems: | G/R/E/-/- |

FDOT

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| Not Determined M | 10.198 M | - M |

## NAD 83 (2011) epoch 2010.0000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°46'57.83802" N |
| E Longitude | 279°51'45.83189" E |
| W Longitude | 80°08'14.16811" W |
| Ellipsoid Height | -15.511 M |

| Cartesian Coordinates* |
|---|
| X = 984362.801 M |
| Y = -5661886.676 M |
| Z = 2757401.059 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: 160829.399 M |
| E: 286529.885 M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2851906.506 M |
| E: 586500.362 M |

## ITRF 2014 epoch 2019.8370

After 1/6/2020

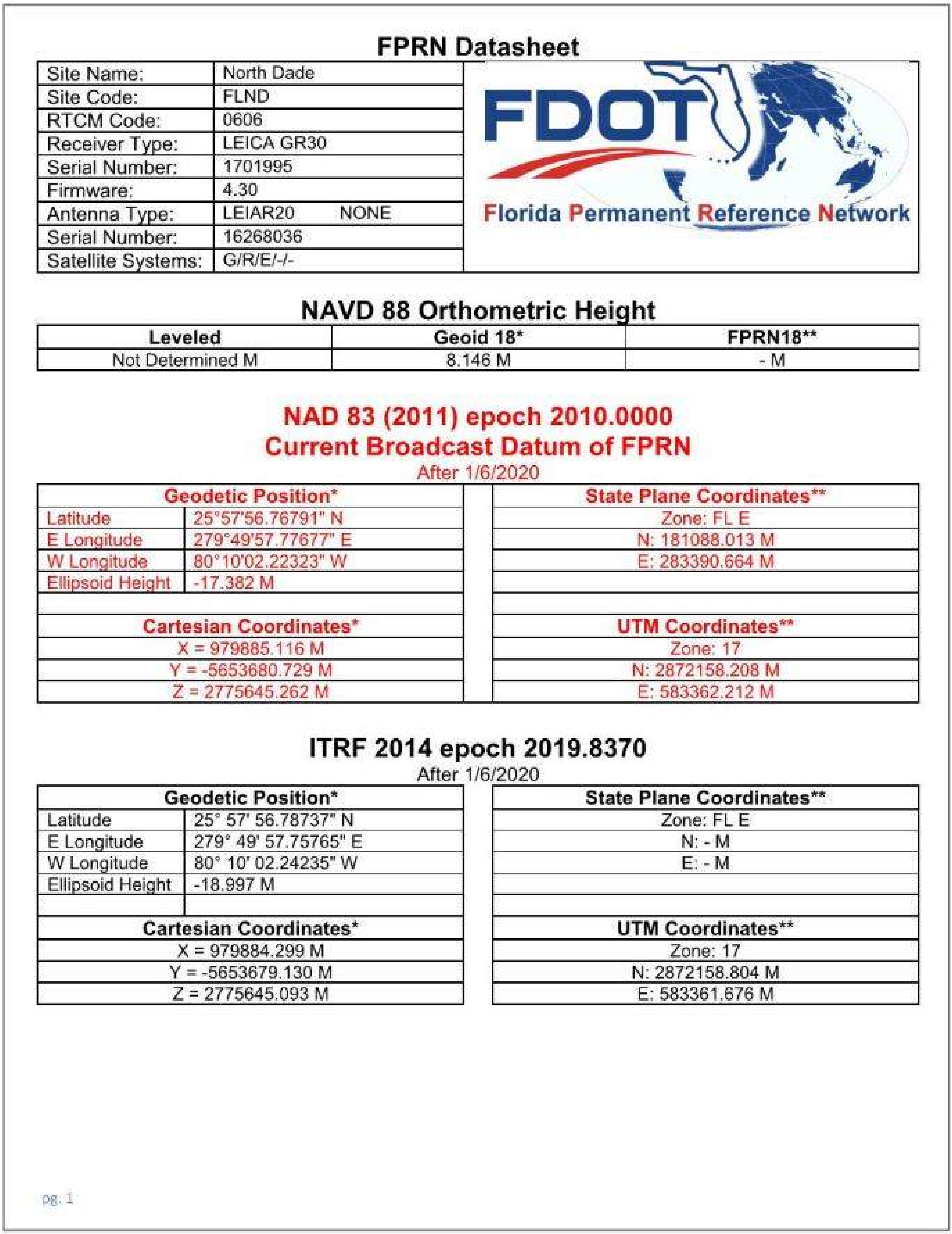
| Geodetic Position* | |
|---|---|
| Latitude | 25° 46' 57.85732" N |
| E Longitude | 279° 51' 45.81290" E |
| W Longitude | 80° 08' 14.18710" W |
| Ellipsoid Height | -17.136 M |

| Cartesian Coordinates* |
|---|
| X = 984361.985 M |
| Y = -5661885.071 M |
| Z = 2757400.887 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: - M |
| E: - M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2851907.096 M |
| E: 586499.829 M |

pg. 1



## FPRN Datasheet

| | |
|---|---|
| Site Name: | North Dade |
| Site Code: | FLND |
| RTCM Code: | 0606 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1701995 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268036 |
| Satellite Systems: | G/R/E/-/- |

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| Not Determined M | 8.146 M | - M |

## NAD 83 (2011) epoch 2010.0000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°57'56.76791" N |
| E Longitude | 279°49'57.77677" E |
| W Longitude | 80°10'02.22323" W |
| Ellipsoid Height | -17.382 M |

**Cartesian Coordinates***

X = 979885.116 M

Y = -5653680.729 M

Z = 2775645.262 M

**State Plane Coordinates****

Zone: FL E

N: 181088.013 M

E: 283390.664 M

**UTM Coordinates****

Zone: 17

N: 2872158.208 M

E: 583362.212 M

## ITRF 2014 epoch 2019.8370

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 57' 56.78737" N |
| E Longitude | 279° 49' 57.75765" E |
| W Longitude | 80° 10' 02.24235" W |
| Ellipsoid Height | -18.997 M |

**Cartesian Coordinates***

X = 979884.299 M

Y = -5653679.130 M

Z = 2775645.093 M

**State Plane Coordinates****

Zone: FL E

N: - M

E: - M

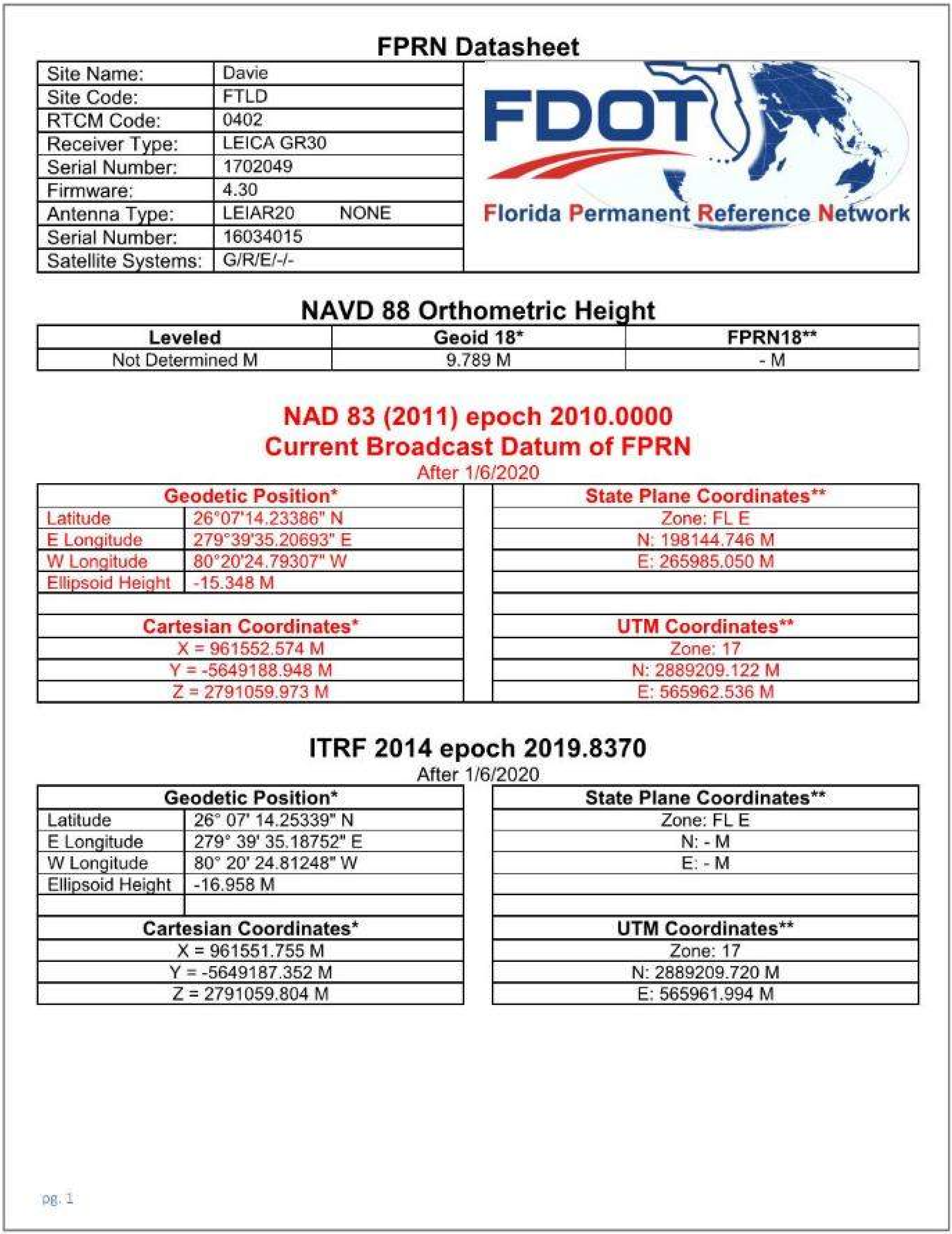
**UTM Coordinates****

Zone: 17

N: 2872158.804 M

E: 583361.676 M

pg. 1



## FPRN Datasheet

| | |
|---|---|
| Site Name: | Davie |
| Site Code: | FTLD |
| RTCM Code: | 0402 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702049 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16034015 |
| Satellite Systems: | G/R/E/-/- |

FDOT
Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| Not Determined M | 9.789 M | - M |

## NAD 83 (2011) epoch 2010.0000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 26°07'14.23386" N |
| E Longitude | 279°39'35.20693" E |
| W Longitude | 80°20'24.79307" W |
| Ellipsoid Height | -15.348 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: 198144.746 M |
| E: 265985.050 M |

| Cartesian Coordinates* |
|---|
| X = 961552.574 M |
| Y = -5649188.948 M |
| Z = 2791059.973 M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2889209.122 M |
| E: 565962.536 M |

## ITRF 2014 epoch 2019.8370

After 1/6/2020

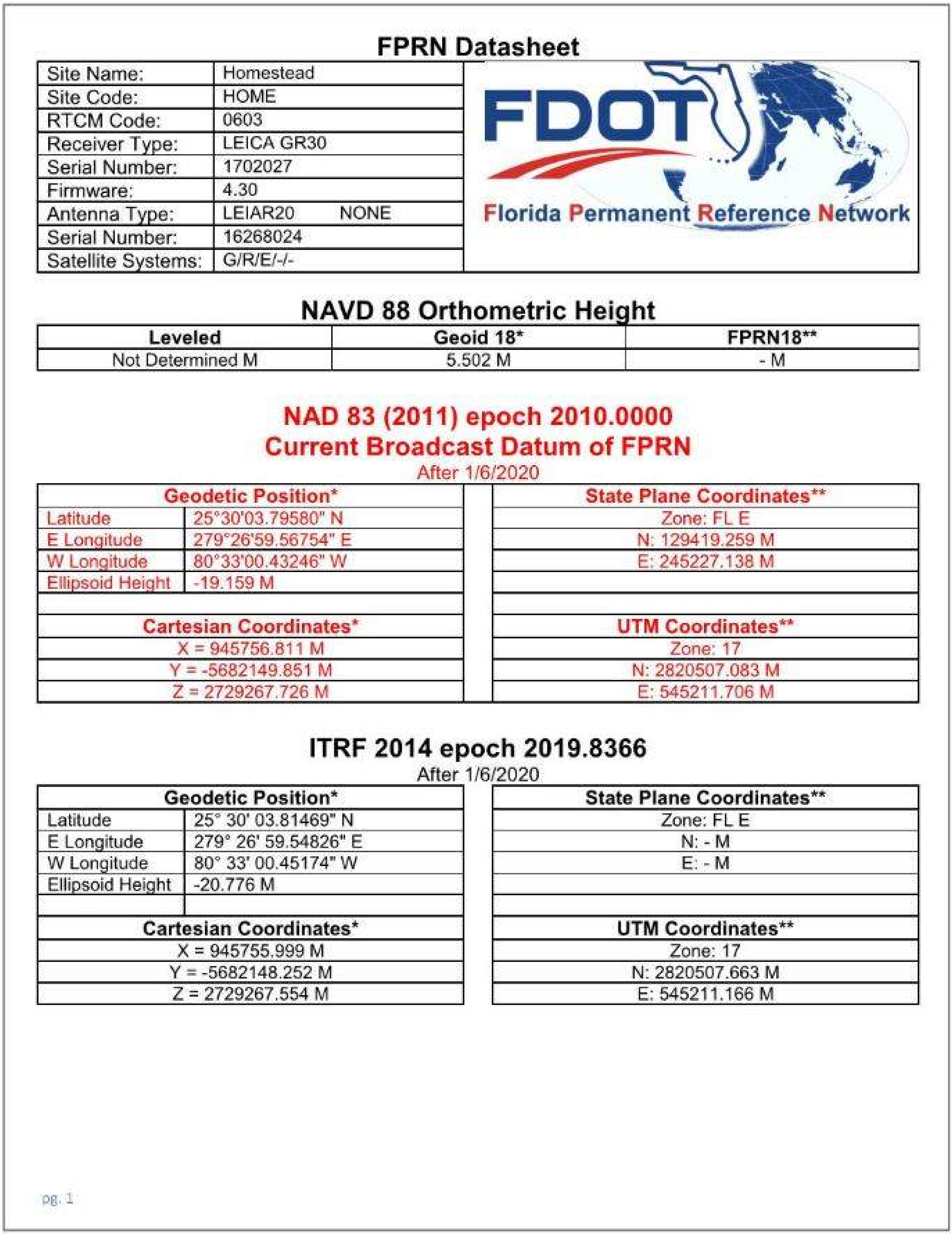
| Geodetic Position* | |
|---|---|
| Latitude | 26° 07' 14.25339" N |
| E Longitude | 279° 39' 35.18752" E |
| W Longitude | 80° 20' 24.81248" W |
| Ellipsoid Height | -16.958 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: - M |
| E: - M |

| Cartesian Coordinates* |
|---|
| X = 961551.755 M |
| Y = -5649187.352 M |
| Z = 2791059.804 M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2889209.720 M |
| E: 565961.994 M |

pg. 1



## FPRN Datasheet

| | |
|---|---|
| Site Name: | Homestead |
| Site Code: | HOME |
| RTCM Code: | 0603 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702027 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268024 |
| Satellite Systems: | G/R/E/-/- |

FDOT

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| Not Determined M | 5.502 M | - M |

## NAD 83 (2011) epoch 2010.0000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°30'03.79580" N |
| E Longitude | 279°26'59.56754" E |
| W Longitude | 80°33'00.43246" W |
| Ellipsoid Height | -19.159 M |

| Cartesian Coordinates* |
|---|
| X = 945756.811 M |
| Y = -5682149.851 M |
| Z = 2729267.726 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: 129419.259 M |
| E: 245227.138 M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2820507.083 M |
| E: 545211.706 M |

## ITRF 2014 epoch 2019.8366

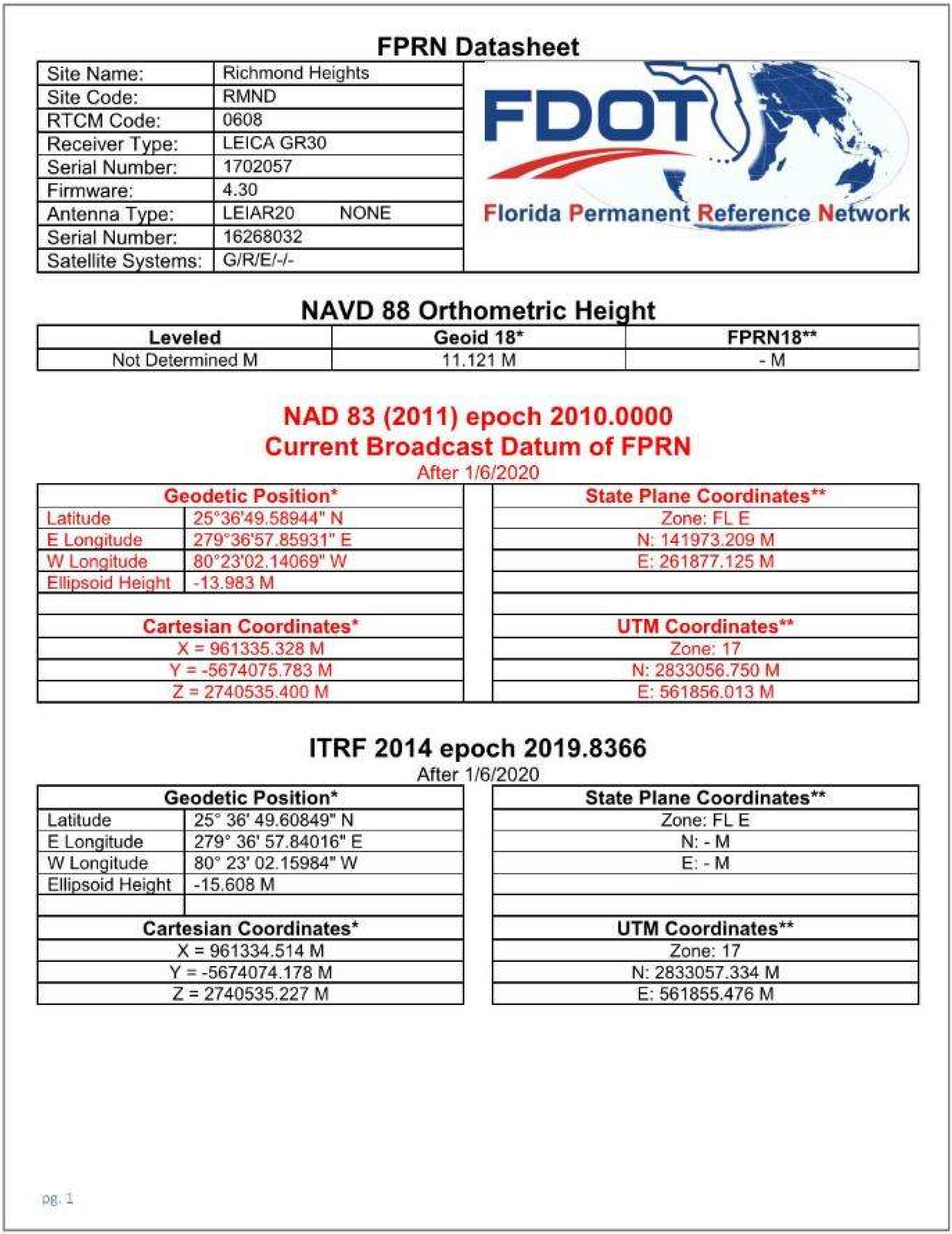
After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 30' 03.81469" N |
| E Longitude | 279° 26' 59.54826" E |
| W Longitude | 80° 33' 00.45174" W |
| Ellipsoid Height | -20.776 M |

| Cartesian Coordinates* |
|---|
| X = 945755.999 M |
| Y = -5682148.252 M |
| Z = 2729267.554 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: - M |
| E: - M |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2820507.663 M |
| E: 545211.166 M |



## FPRN Datasheet

| | |
|---|---|
| Site Name: | Richmond Heights |
| Site Code: | RMND |
| RTCM Code: | 0608 |
| Receiver Type: | LEICA GR30 |
| Serial Number: | 1702057 |
| Firmware: | 4.30 |
| Antenna Type: | LEIAR20 NONE |
| Serial Number: | 16268032 |
| Satellite Systems: | G/R/E/-/- |

FDOT

Florida Permanent Reference Network

## NAVD 88 Orthometric Height

| Leveled | Geoid 18* | FPRN18** |
|---|---|---|
| Not Determined M | 11.121 M | - M |

## NAD 83 (2011) epoch 2010.0000
## Current Broadcast Datum of FPRN

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25°36'49.58944" N |
| E Longitude | 279°36'57.85931" E |
| W Longitude | 80°23'02.14069" W |
| Ellipsoid Height | -13.983 M |
| | |

| Cartesian Coordinates* |
|---|
| X = 961335.328 M |
| Y = -5674075.783 M |
| Z = 2740535.400 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: 141973.209 M |
| E: 261877.125 M |
| |
| |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2833056.750 M |
| E: 561856.013 M |

## ITRF 2014 epoch 2019.8366

After 1/6/2020

| Geodetic Position* | |
|---|---|
| Latitude | 25° 36' 49.60849" N |
| E Longitude | 279° 36' 57.84016" E |
| W Longitude | 80° 23' 02.15984" W |
| Ellipsoid Height | -15.608 M |
| | |

| Cartesian Coordinates* |
|---|
| X = 961334.514 M |
| Y = -5674074.178 M |
| Z = 2740535.227 M |

| State Plane Coordinates** |
|---|
| Zone: FL E |
| N: - M |
| E: - M |
| |
| |

| UTM Coordinates** |
|---|
| Zone: 17 |
| N: 2833057.334 M |
| E: 561855.476 M |

pg. 1

# SURVEYED IMAGERY TEMPORARY POINTS

| **GPS Control Station - Geographic** | | | | **GPS Control Station - US Ft** | | | **GPS Control Station - Metric** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Photo ID** | **Latitude** | **Longitude** | **Ellipsoid Height (Meters)** | **Northing** | **Easting** | **Ortho Height** | **Northing** | **Easting** | **Ortho Height** |
| 5001_2019_FL | N25°58'34.90208" | W80°50'06.59094" | -19.404 | 597133.200 | 710317.914 | 16.612 | 182006.563 | 216505.333 | 5.063 |
| 5002_2019_FL | N25°50'45.64734" | W80°55'30.80986" | -21.546 | 549730.758 | 680758.479 | 9.088 | 167558.270 | 207495.599 | 2.770 |
| 5003_2019_FL | N25°51'45.00950" | W80°37'19.73230" | -19.500 | 555895.556 | 780416.961 | 16.450 | 169437.304 | 237871.565 | 5.014 |
| 5004_2019_FL | N25°59'34.74182" | W80°31'25.46353" | -19.561 | 603425.435 | 812604.817 | 16.978 | 183924.441 | 247682.444 | 5.175 |
| 5005_2019_FL | N25°58'11.63759" | W80°26'28.48798" | -19.511 | 595142.283 | 839737.872 | 17.515 | 181399.731 | 255952.615 | 5.339 |
| 5006_2019_FL | N25°17'44.37333" | W80°27'55.15784" | -23.637 | 350058.570 | 832817.500 | 2.973 | 106698.066 | 253843.282 | 0.906 |
| 5007_2019_FL | N25°12'19.47164" | W80°52'02.73497" | -22.058 | 316929.297 | 699999.271 | 3.736 | 96600.243 | 213360.205 | 1.139 |
| 5008_2019_FL | N25°45'39.23644" | W80°39'51.69780" | -21.738 | 518930.014 | 766630.134 | 8.618 | 158170.185 | 233669.332 | 2.627 |
| 5009_2019_FL | N25°26'26.41938" | W80°47'00.80171" | -22.928 | 402465.466 | 727591.109 | 3.069 | 122671.720 | 221770.213 | 0.935 |
| 5010_2019_FL | N25°19'49.24933" | W80°31'28.96221" | -23.235 | 362591.228 | 813150.757 | 3.888 | 110518.027 | 247848.846 | 1.185 |

# SURVEYED IMAGERY PERMANENT POINTS

| **GPS Control Station - Geographic** | | | | **GPS Control Station - US Ft** | | | **GPS Control Station - Metric** | | |
|---|---|---|---|---|---|---|---|---|---|
| Photo ID | Latitude | **Longitude** | **Ellipsoid Height (Meters)** | **Northing** | **Easting** | **Ortho Height** | **Northing** | **Easting** | **Ortho Height** |
| 6001_2019_FL | N25°45'39.87620" | W80°30'07.73641" | -21.857 | 519163.374 | 820016.576 | 9.246 | 158241.313 | 249941.552 | 2.818 |
| 6002_2019_FL | N25°31'41.31956" | W80°31'04.73685" | -22.439 | 434485.684 | 815113.725 | 7.597 | 132431.501 | 248447.160 | 2.316 |
| 6003_2019_FL | N25°23'45.18319" | W80°35'01.24030" | -22.885 | 386344.567 | 793600.322 | 5.053 | 117758.060 | 241889.862 | 1.540 |
| 6004_2019_FL | N25°20'29.16424" | W80°48'52.94876" | -22.647 | 366384.441 | 717361.248 | 3.266 | 111674.201 | 218652.146 | 0.995 |
| 6005_2019_FL | N25°23'22.00960" | W80°40'51.40391" | -22.802 | 383916.762 | 761496.272 | 4.390 | 117018.063 | 232104.528 | 1.338 |
| 6006_2019_FL | N25°14'08.92225" | W80°26'00.11663" | -22.853 | 328351.519 | 843467.340 | 5.303 | 100081.743 | 257089.360 | 1.616 |
| 6007_2019_FL | N25°18'29.97803" | W80°17'34.44947" | -23.897 | 354926.384 | 889759.847 | 3.918 | 108181.778 | 271199.344 | 1.194 |
| 6008_2019_FL | N25°40'00.89414" | W80°09'31.83368" | -23.410 | 485512.679 | 933225.680 | 7.777 | 147984.561 | 284447.756 | 2.370 |
| 6009_2019_FL | N25°58'51.17271" | W80°07'12.46099" | -25.131 | 599714.067 | 945214.608 | 1.844 | 182793.213 | 288101.989 | 0.562 |
| 6010_2019_FL | N25°58'42.19629" | W80°21'54.15186" | -23.182 | 598341.804 | 864759.493 | 5.949 | 182374.947 | 263579.221 | 1.813 |
| 6011_2020_FL | N25°36'30.22303" | W80°34'29.88706" | -22.398 | 463588.015 | 796228.712 | 6.922 | 141301.910 | 242690.997 | 2.110 |
| 6012_2019_FL | N25°28'10.75113" | W80°28'34.40843" | -22.699 | 413279.708 | 828967.439 | 7.071 | 125967.907 | 252669.781 | 2.155 |
| 6013_2019_FL | N25°32'16.48148" | W80°19'51.19347" | -23.934 | 438302.658 | 876792.774 | 4.842 | 133594.917 | 267246.972 | 1.476 |
| 6014_2019_FL | N25°37'04.18657" | W80°26'44.89474" | -22.178 | 467174.104 | 838779.146 | 8.874 | 142394.952 | 255660.395 | 2.705 |
| 6015_2019_FL | N25°46'03.69916" | W80°17'42.65577" | -23.391 | 521879.300 | 888121.312 | 5.850 | 159069.129 | 270699.917 | 1.783 |
| 6016_2019_FL | N25°49'35.02804" | W80°22'10.38447" | -22.861 | 543091.261 | 863543.715 | 7.097 | 165534.547 | 263208.651 | 2.163 |
| *6017_2019_FL | N25°53'00.74092" | W80°14'34.41249" | -23.219 | 564080.517 | 905088.028 | 6.661 | 171932.086 | 275871.383 | 2.030 |
| 6018_2019_FL | N25°53'01.00598" | W80°29'05.01265" | -22.136 | 563721.852 | 825576.452 | 8.616 | 171822.764 | 251636.206 | 2.626 |
| 6019_2019_FL | N25°52'53.83837" | W80°07'26.70796" | -24.781 | 563626.629 | 944155.675 | 2.991 | 171793.740 | 287779.225 | 0.912 |
| 6020_2019_FL | N25°58'18.21363" | W80°13'31.98145" | -23.914 | 596167.294 | 910600.472 | 4.625 | 181712.155 | 277551.579 | 1.410 |

*Points falling outside the limit of 0.04 feet RMSEh or 0.05 feet RMSEz are denoted with an "*".*

# SURVEYED IMAGERY PERMANENT QC POINTS

| GPS Control Station - Geographic | | | | GPS Control Station - US Ft | | | GPS Control Station - Metric | | |
|---|---|---|---|---|---|---|---|---|---|
| Photo ID | Latitude | Longitude | Ellipsoid Height (Meters) | Northing | Easting | Ortho Height | Northing | Easting | Ortho Height |
| 8001_2019_FL | N25°48'47.35166" | W80°53'00.29443" | -21.020 | 537797.916 | 694519.384 | 10.435 | 163921.133 | 211689.932 | 3.181 |
| 8002_2019_FL | N25°45'43.01384" | W80°49'38.47094" | -20.114 | 519207.954 | 712986.451 | 13.254 | 158254.901 | 217318.705 | 4.040 |
| 8003_2019_FL | N25°45'38.33486" | W80°33'39.20352" | -22.290 | 518939.059 | 800684.380 | 7.469 | 158172.942 | 244049.087 | 2.276 |
| 8004_2019_FL | N25°55'39.04857" | W80°25'13.47259" | -22.899 | 579766.316 | 846652.134 | 6.446 | 176713.126 | 258060.087 | 1.965 |
| 8005_2019_FL | N25°57'33.65317" | W80°24'21.66367" | -23.295 | 591358.258 | 851329.554 | 5.306 | 180246.358 | 259485.767 | 1.617 |
| 8006_2019_FL | N25°57'29.11395" | W80°22'28.63763" | -23.657 | 590948.017 | 861647.716 | 4.290 | 180121.316 | 262630.749 | 1.308 |
| *8007_2019_FL | N25°56'36.51326" | W80°20'51.26787" | -23.309 | 585680.659 | 870561.318 | 5.552 | 178515.822 | 265347.620 | 1.692 |
| 8008_2019_FL | N25°57'23.60704" | W80°19'40.80868" | -23.404 | 590467.935 | 876968.681 | 5.358 | 179974.986 | 267300.589 | 1.633 |
| 8009_2019_FL | N25°55'37.80758" | W80°16'40.88293" | -23.455 | 579873.437 | 893450.091 | 5.453 | 176745.777 | 272324.132 | 1.662 |
| 8010_2019_FL | N25°57'50.30539" | W80°14'54.99682" | -23.921 | 593305.363 | 903040.420 | 4.255 | 180839.836 | 275247.270 | 1.297 |
| 8011_2019_FL | N25°56'01.66057" | W80°13'20.46726" | -23.743 | 582386.449 | 911733.191 | 5.202 | 177511.745 | 277896.832 | 1.586 |
| 8012_2019_FL | N25°57'22.59308" | W80°11'43.86751" | -24.204 | 590611.075 | 920501.839 | 3.982 | 180018.616 | 280569.522 | 1.214 |
| 8013_2019_FL | N25°57'52.98033" | W80°09'22.19319" | -24.179 | 593760.578 | 933413.492 | 4.477 | 180978.586 | 284505.002 | 1.365 |
| 8014_2019_FL | N25°53'50.20666" | W80°22'47.94592" | -23.043 | 568838.197 | 859989.989 | 6.199 | 173382.229 | 262125.473 | 1.889 |
| 8015_2019_FL | N25°53'05.40745" | W80°20'16.32790" | -23.560 | 564382.817 | 873858.409 | 5.023 | 172024.227 | 266352.576 | 1.531 |
| 8016_2019_FL | N25°54'56.82460" | W80°18'33.01447" | -23.319 | 575680.470 | 883234.665 | 6.042 | 175467.758 | 269210.464 | 1.842 |
| 8017_2019_FL | N25°53'42.89335" | W80°14'36.69107" | -23.398 | 568335.187 | 904855.388 | 6.078 | 173228.912 | 275800.474 | 1.852 |
| 8018_2019_FL | N25°53'22.53583" | W80°11'03.95499" | -23.374 | 566396.200 | 924295.711 | 6.806 | 172637.907 | 281725.896 | 2.074 |
| 8019_2019_FL | N25°50'53.43534" | W80°11'11.40888" | -24.302 | 551338.133 | 923708.232 | 3.808 | 168048.199 | 281546.832 | 1.161 |
| 8020_2019_FL | N25°50'40.40208" | W80°15'58.20352" | -22.997 | 549867.997 | 897514.500 | 7.462 | 167600.101 | 273562.967 | 2.274 |
| 8021_2019_FL | N25°50'16.55378" | W80°18'50.58707" | -22.702 | 547375.154 | 881778.055 | 8.024 | 166840.281 | 268766.489 | 2.446 |
| 8022_2019_FL | N25°47'40.96695" | W80°11'26.17438" | -22.830 | 531897.485 | 922478.850 | 8.820 | 162122.678 | 281172.116 | 2.688 |
| 8023_2019_FL | N25°52'35.16776" | W80°17'45.16228" | -23.372 | 561401.592 | 887680.592 | 5.952 | 171115.547 | 270565.586 | 1.814 |
| 8024_2019_FL | N25°47'10.22998" | W80°22'12.74677" | -23.151 | 528471.270 | 863397.821 | 5.964 | 161078.365 | 263164.182 | 1.818 |
| 8025_2019_FL | N25°49'11.92731" | W80°23'02.44814" | -23.156 | 540736.444 | 858797.412 | 6.042 | 164816.798 | 261761.975 | 1.842 |
| 8026_2019_FL | N25°48'09.09394" | W80°19'09.90108" | -23.319 | 534497.404 | 880080.010 | 6.000 | 162915.135 | 268248.924 | 1.829 |
| 8027_2019_FL | N25°48'44.77475" | W80°15'16.52912" | -23.547 | 538215.362 | 901388.074 | 5.787 | 164048.370 | 274743.635 | 1.764 |
| 8028_2019_FL | N25°45'38.86024" | W80°26'38.21781" | -22.406 | 519137.371 | 839171.694 | 7.752 | 158233.387 | 255780.044 | 2.363 |
| 8029_2019_FL | N25°44'50.12211" | W80°21'01.52049" | -22.710 | 514357.503 | 869977.924 | 7.630 | 156776.480 | 265169.802 | 2.326 |
| 8030_2019_FL | N25°45'12.14020" | W80°17'15.29777" | -21.668 | 516687.281 | 890650.491 | 11.613 | 157486.598 | 271470.813 | 3.540 |
| 8031_2019_FL | N25°46'31.74646" | W80°14'17.48423" | -21.849 | 524815.385 | 906861.632 | 11.667 | 159964.049 | 276411.978 | 3.556 |
| 8032_2019_FL | N25°45'15.79204" | W80°12'02.47482" | -21.143 | 517219.936 | 919249.916 | 14.298 | 157648.952 | 280187.935 | 4.358 |

*Points falling outside the limit of 0.04 feet RMSEh or 0.05 feet RMSEz are denoted with an "*".*

| GPS Control Station - Geographic | | | | GPS Control Station - US Ft | | | GPS Control Station - Metric | | |
|---|---|---|---|---|---|---|---|---|---|
| Photo ID | Latitude | Longitude | Ellipsoid Height (Meters) | Northing | Easting | Ortho Height | Northing | Easting | Ortho Height |
| 8033_2019_FL | N25°43'31.59041" | W80°26'51.89721" | -22.488 | 506283.047 | 837974.877 | 7.470 | 154315.382 | 255415.253 | 2.277 |
| 8034_2019_FL | N25°43'16.87645" | W80°22'24.79619" | -23.018 | 504906.592 | 862408.381 | 6.449 | 153895.837 | 262862.600 | 1.966 |
| 8035_2019_FL | N25°41'49.22992" | W80°20'20.32300" | -22.824 | 496113.302 | 873836.235 | 7.514 | 151215.637 | 266345.817 | 2.290 |
| 8036_2019_FL | N25°41'00.05453" | W80°26'29.98177" | -22.274 | 490992.601 | 840043.706 | 8.359 | 149654.844 | 256045.834 | 2.548 |
| 8037_2019_FL | N25°40'47.72335" | W80°23'04.72229" | -22.286 | 489831.014 | 858827.130 | 8.878 | 149300.792 | 261771.033 | 2.706 |
| 8038_2019_FL | N25°41'47.62011" | W80°17'41.06399" | -22.518 | 496026.095 | 888405.006 | 8.985 | 151189.056 | 270786.387 | 2.739 |
| 8039_2019_FL | N25°44'19.92172" | W80°15'13.17190" | -22.079 | 511476.978 | 901846.350 | 10.886 | 155898.495 | 274883.317 | 3.318 |
| 8040_2019_FL | N25°38'15.16582" | W80°30'28.93518" | -22.727 | 474259.012 | 818245.718 | 6.391 | 144554.436 | 249401.794 | 1.948 |
| 8041_2019_FL | N25°39'01.37304" | W80°24'55.70501" | -22.280 | 479047.971 | 848721.304 | 8.715 | 146014.114 | 258690.771 | 2.656 |
| 8042_2019_FL | N25°38'38.85198" | W80°19'40.74335" | -22.096 | 476911.071 | 877554.360 | 10.315 | 145362.785 | 267479.104 | 3.144 |
| 8043_2019_FL | N25°36'53.18124" | W80°19'21.22375" | -22.780 | 466251.744 | 879395.227 | 8.241 | 142113.816 | 268040.201 | 2.512 |
| 8044_2019_FL | N25°36'44.16734" | W80°23'01.42805" | -22.372 | 465243.335 | 859242.979 | 8.982 | 141806.452 | 261897.784 | 2.738 |
| 8045_2019_FL | N25°39'39.69984" | W80°22'24.69737" | -22.659 | 482980.619 | 862521.355 | 7.888 | 147212.787 | 262897.035 | 2.404 |
| 8046_2019_FL | N25°36'30.34960" | W80°29'11.63396" | -22.547 | 463703.917 | 825361.067 | 7.284 | 141337.237 | 251570.556 | 2.220 |
| 8047_2019_FL | N25°34'20.31517" | W80°21'56.61823" | -23.298 | 450748.277 | 865244.927 | 6.367 | 137388.350 | 263727.181 | 1.941 |
| 8048_2019_FL | N25°34'49.66342" | W80°25'46.93693" | -21.650 | 453615.496 | 844142.557 | 11.006 | 138262.280 | 257295.166 | 3.355 |
| 8049_2019_FL | N25°33'01.23146" | W80°30'23.72635" | -22.472 | 442567.039 | 818840.320 | 7.604 | 134894.703 | 249583.029 | 2.318 |
| 8050_2019_FL | N25°32'10.82277" | W80°27'13.17032" | -21.923 | 437546.255 | 836312.953 | 10.000 | 133364.365 | 254908.698 | 3.048 |
| 8051_2019_FL | N25°30'21.47662" | W80°32'32.66777" | -22.594 | 426396.660 | 807087.029 | 6.850 | 129965.962 | 246000.618 | 2.088 |
| 8052_2019_FL | N25°29'57.98004" | W80°27'11.04541" | -22.165 | 424135.771 | 836562.735 | 9.306 | 129276.842 | 254984.831 | 2.837 |
| 8053_2019_FL | N25°29'52.57797" | W80°24'18.72464" | -23.348 | 423658.121 | 852353.586 | 5.933 | 129131.254 | 259797.893 | 1.808 |
| 8054_2019_FL | N25°26'38.37370" | W80°28'50.23461" | -23.028 | 403948.068 | 827553.397 | 5.940 | 123123.618 | 252238.780 | 1.811 |
| 8055_2019_FL | N25°28'06.40580" | W80°31'26.43041" | -22.964 | 412781.878 | 813204.200 | 5.885 | 125816.168 | 247865.136 | 1.794 |
| 8056_2019_FL | N25°25'06.20613" | W80°31'37.24699" | -23.203 | 394586.407 | 812277.437 | 4.675 | 120270.177 | 247582.658 | 1.425 |
| 8057_2019_FL | N25°27'46.72919" | W80°25'41.00553" | -23.182 | 410919.905 | 844869.285 | 6.191 | 125248.638 | 257516.673 | 1.887 |
| 8058_2019_FL | N25°16'04.13260" | W80°26'24.17329" | -23.657 | 339973.048 | 841209.937 | 2.918 | 103623.992 | 256401.302 | 0.889 |
| 8059_2019_FL | N25°24'13.08244" | W80°33'27.96584" | -22.225 | 389188.578 | 802144.208 | 7.519 | 118624.916 | 244494.044 | 2.292 |
| 8060_2019_FL | N25°24'12.99951" | W80°31'46.16774" | -22.165 | 389212.101 | 811478.486 | 7.950 | 118632.086 | 247339.137 | 2.423 |
| 8061_2019_FL | N25°29'05.78261" | W80°29'40.41066" | -22.414 | 418812.056 | 822897.631 | 7.828 | 127654.170 | 250819.699 | 2.386 |
| 8062_2019_FL | N25°32'46.58241" | W80°22'51.52317" | -23.355 | 441261.518 | 860261.533 | 6.108 | 134496.780 | 262208.240 | 1.862 |
| 8063_2019_FL | N25°37'33.20059" | W80°26'47.06657" | -22.833 | 470102.459 | 838568.115 | 6.687 | 143287.516 | 255596.073 | 2.038 |
| 8064_2019_FL | N25°43'50.76069" | W80°24'20.53875" | -23.398 | 508278.586 | 851807.906 | 4.880 | 154923.623 | 259631.569 | 1.487 |
| 8065_2019_FL | N25°51'36.51050" | W80°13'18.18315" | -24.413 | 555617.010 | 912100.545 | 3.060 | 169352.403 | 278008.802 | 0.933 |

# GPS STATION RECOVERY LOG SHEETS

## GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5001_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/9/2019
GPS Session File Name: 5001343t.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **182006.563** | **597133.200** | **Datum (Epoch)** |
| **Easting** | **216505.333** | **710317.914** | **Datum (Epoch)** |
| **Orthometric Height** | **5.063** | **16.612** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
Other
FDOT FPRN
OPUS X

Mark Stamping
Latitude: N25°58'34.90208"
Longitude: W80°50'06.59094"
Ellipsoidal Height: -19.404 m
Type of Mark: Set PK Nail in Vinyl Aerial Target
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 2:23:32 PM Stop Time : 2:49:57 PM
PDOP Max: 2.032
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

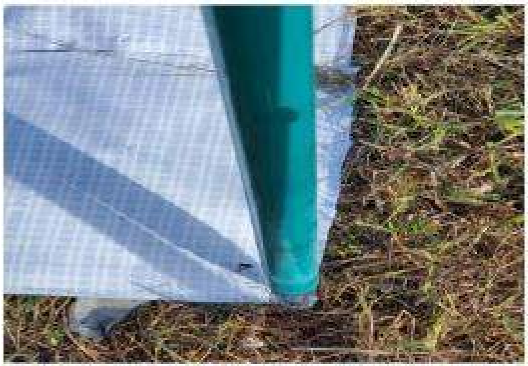
PHOTOS

⇧

NORTH


5001_2019_FL, 1, 20191209

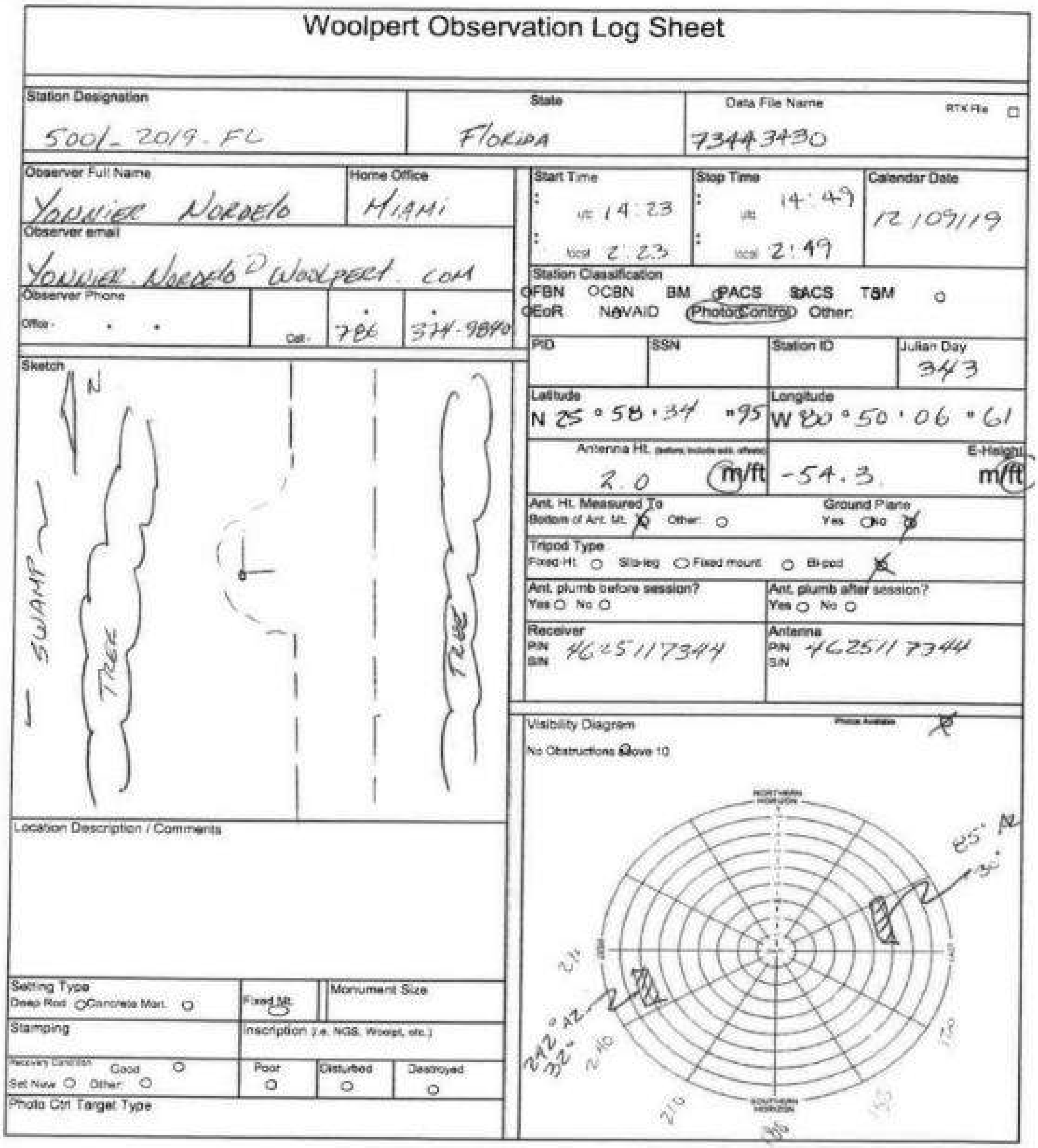

5001_2019_FL, W, 20191209


5001_2019_FL, 2, 20191209


5001_2019_FL, N, 20191209

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/9/2019 |
| Project Point Name | 5001_2019_FL | GPS Session File Name | 5001343t.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 5001_2019_FL
State: FLORIDA
Data File Name: 73443430
RTX File ☐

Observer Full Name: YONNIER NORDELO
Home Office: MIAMI
Observer email: YONNIER.NORDELO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 786 . 374-9840

Start Time: utc 14:23 local 2:23
Stop Time: utc 14:49 local 2:49
Calendar Date: 12/09/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 343

Latitude: N 25° 58' 34" 95
Longitude: W 80° 50' 06" 61

Antenna Ht. (before, include adj. offsets): 2.0 [✓ m]/ft
E-Height: -54.3 [✓ m]/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: 4625117344 S/N
Antenna P/N: 4625117344 S/N

Visibility Diagram
Photos Available ☒
No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Yonnier Nordello |
| Project Number | 80569 | | Date of Field Survey | 12/9/2019 |
| Project Point Name | 5002_2019_FL | | GPS Session File Name | 5002343u.19o.xml |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **167558.270** | **549730.758** | **Datum (Epoch)** |
| **Easting** | **207495.599** | **680758.479** | **Datum (Epoch)** |
| **Orthometric Height** | **2.770** | **9.088** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

RTK Base ☐ FDOT FPRN ☐

Network Adjustment ☐ OPUS X

Other

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°50'45.64734" | Start Time : | 3:52:02 PM Stop Time : 4:19:37 PM |
| Longitude | W80°55'30.80986" | PDOP Max: | 3.171 |
| Ellipsoidal Height | -21.546 m | Start Time : | Stop Time : |
| Type of Mark | Set PK Nail in Painted Aerial Target | PDOP Max: | |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Sunny |

PHOTOS

NORTH

5002_2019_FL, 1, 20191209

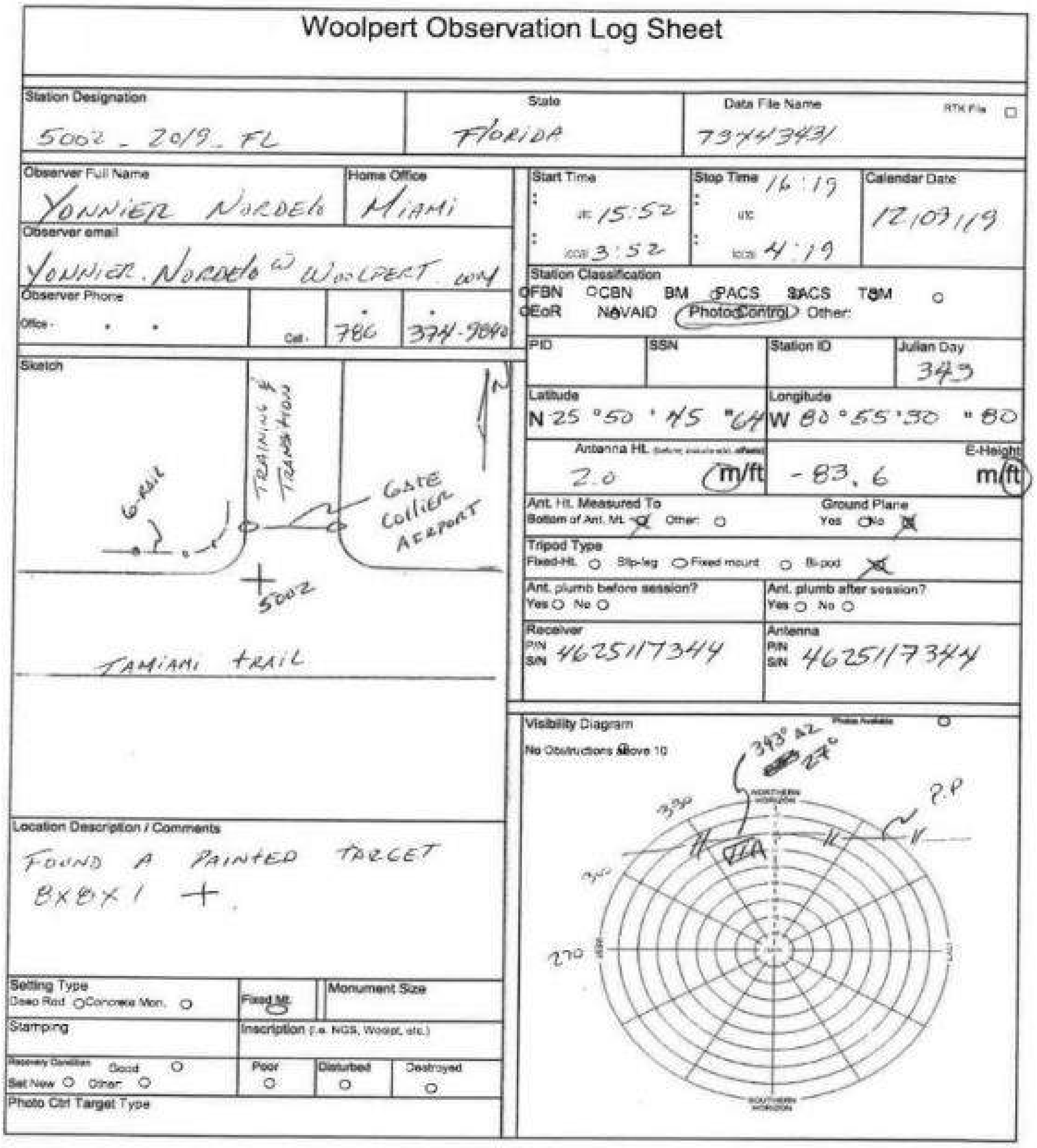
5002_2019_FL, W, 20191209

5002_2019_FL, 2, 20191209

5002_2019_FL, N, 20191209

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/9/2019 |
| Project Point Name | 5002_2019_FL | GPS Session File Name | 5002343u.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 5002 _ 2019 _ FL

State: FLORIDA

Data File Name: 73443431

RTK File ☐

Observer Full Name: YONNIER NORDELO

Home Office: MIAMI

Observer email: YONNIER.NORDELO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 786 . 374-9840

Start Time: utc 15:52 local 3:52

Stop Time 16:19 utc local 4:19

Calendar Date: 12/03/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 343

Latitude: N 25 ° 50 ' 45 " 64

Longitude: W 80 ° 55 ' 30 " 80

Antenna Ht. 2.0 [✓ m]/ft

E-Height -83.6 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344

Antenna P/N S/N 4625117344

Sketch

Visibility Diagram

Photos Available ○

No Obstructions Above 10

Location Description / Comments: FOUND A PAINTED TARGET 8X8X1 +.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5003_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/10/2019
GPS Session File Name: 5003344q.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **169437.304** | **555895.556** | **Datum (Epoch)** |
| **Easting** | **237871.565** | **780416.961** | **Datum (Epoch)** |
| **Orthometric Height** | **5.014** | **16.450** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN
OPUS X
Other

Mark Stamping:
Latitude: N25°51'45.00950"
Longitude: W80°37'19.73230"
Ellipsoidal Height: -19.500 m
Type of Mark: Set PK Nail in Vinyl Aerial Target
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 11:00:08 AM Stop Time : 11:26:58 AM
PDOP Max: 2.107
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

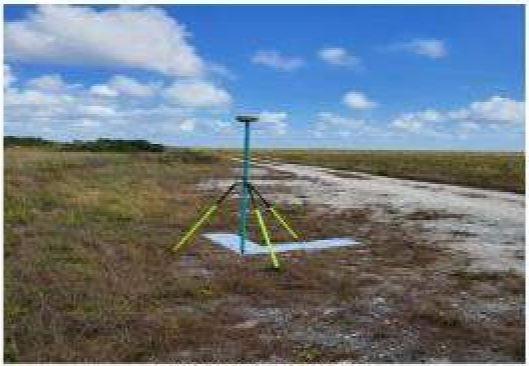
PHOTOS

NORTH

5003_2019_FL, 1, 20191210

5003_2019_FL, W, 20191210

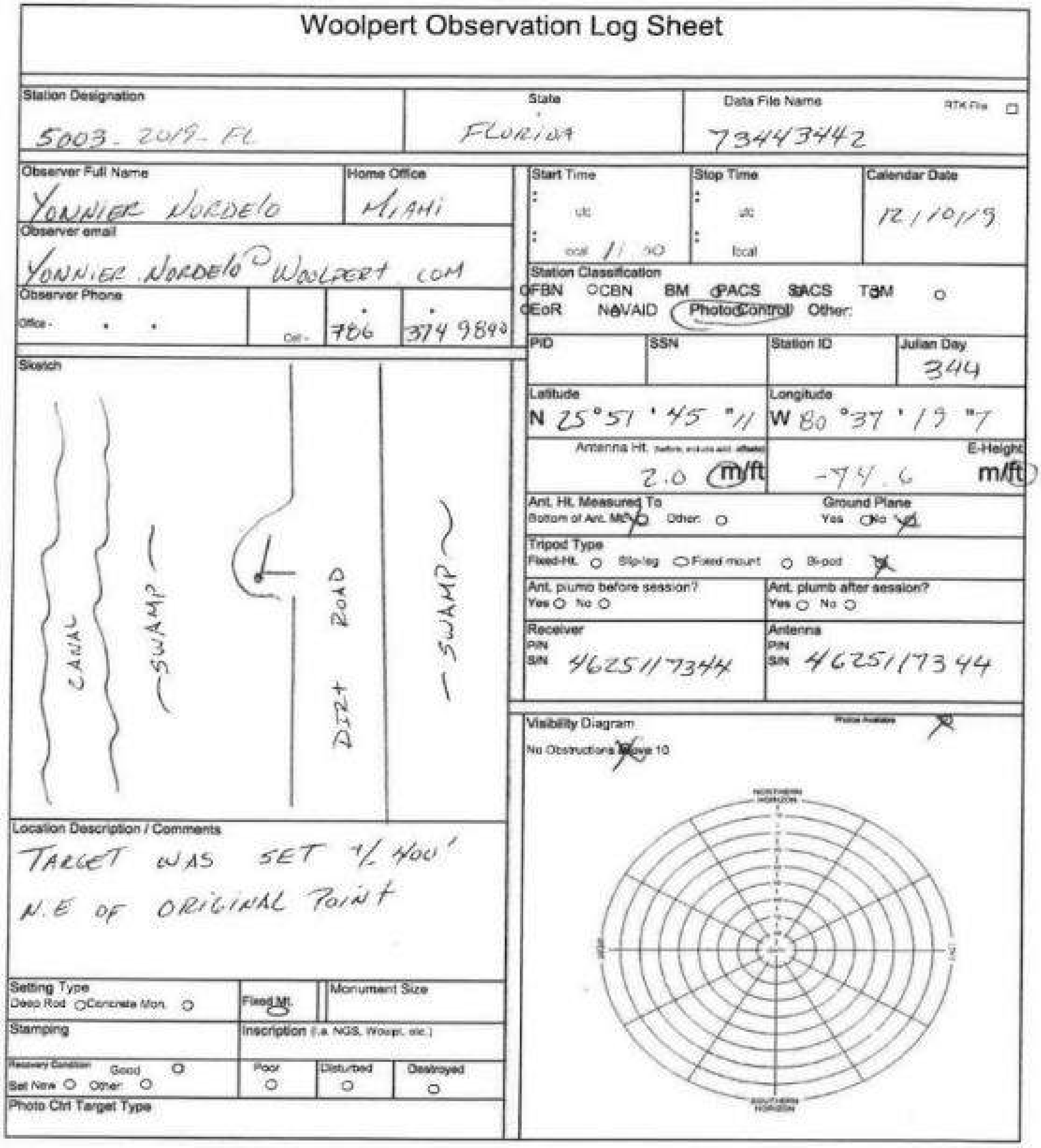
5003_2019_FL, 2, 20191210



5003_2019_FL, N, 20191210

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/10/2019 |
| Project Point Name | 5003_2019_FL | GPS Session File Name | 5003344q.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 5003_2019_FL
State: FLORIDA
Data File Name: 73443442
RTK File ☐

Observer Full Name: YONNIER NORDELO
Home Office: MIAMI
Observer email: YONNIER NORDELO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 786 374 9840

Start Time: : utc : local 11 50
Stop Time: : utc : local
Calendar Date: 12/10/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] ○ Other:

PID:
SSN:
Station ID:
Julian Day: 344

Latitude: N 25° 51' 45" 11
Longitude: W 80° 37' 19" 7
Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: -74.6 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver P/N S/N 46251173444
Antenna P/N S/N 46251173444

Sketch

Location Description / Comments: TARGET WAS SET +/- 40' N.E OF ORIGINAL POINT

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt. etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

Visibility Diagram
No Obstructions Above 10 ☒
Photos Available ☒

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | | |
|---|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Yonnier Nordello | |
| Project Number | 80569 | | Date of Field Survey | 12/10/2019 | |
| Project Point Name | 5004_2019_FL | | GPS Session File Name | 50043440.19o.xml | |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **183924.441** | **603425.435** | **Datum (Epoch)** |
| **Easting** | **247682.444** | **812604.817** | **Datum (Epoch)** |
| **Orthometric Height** | **5.175** | **16.978** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | ☐ |
| Network Adjustment | ☐ | OPUS | X |
| Other | | | |

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25°59'34.74182" |
| Longitude | W80°31'25.46353" |
| Ellipsoidal Height | -19.561 m |
| Type of Mark | Set PK Nail in Vinyl Aerial Target |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal | | |
| Start Time : | 9:32:07 AM | Stop Time : | 10:00:21 AM |
| PDOP Max: | 2.269 | | |
| Start Time : | | Stop Time : | |
| PDOP Max: | | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Sunny | | |

PHOTOS

NORTH


5004_2019_FL, 1, 20191210

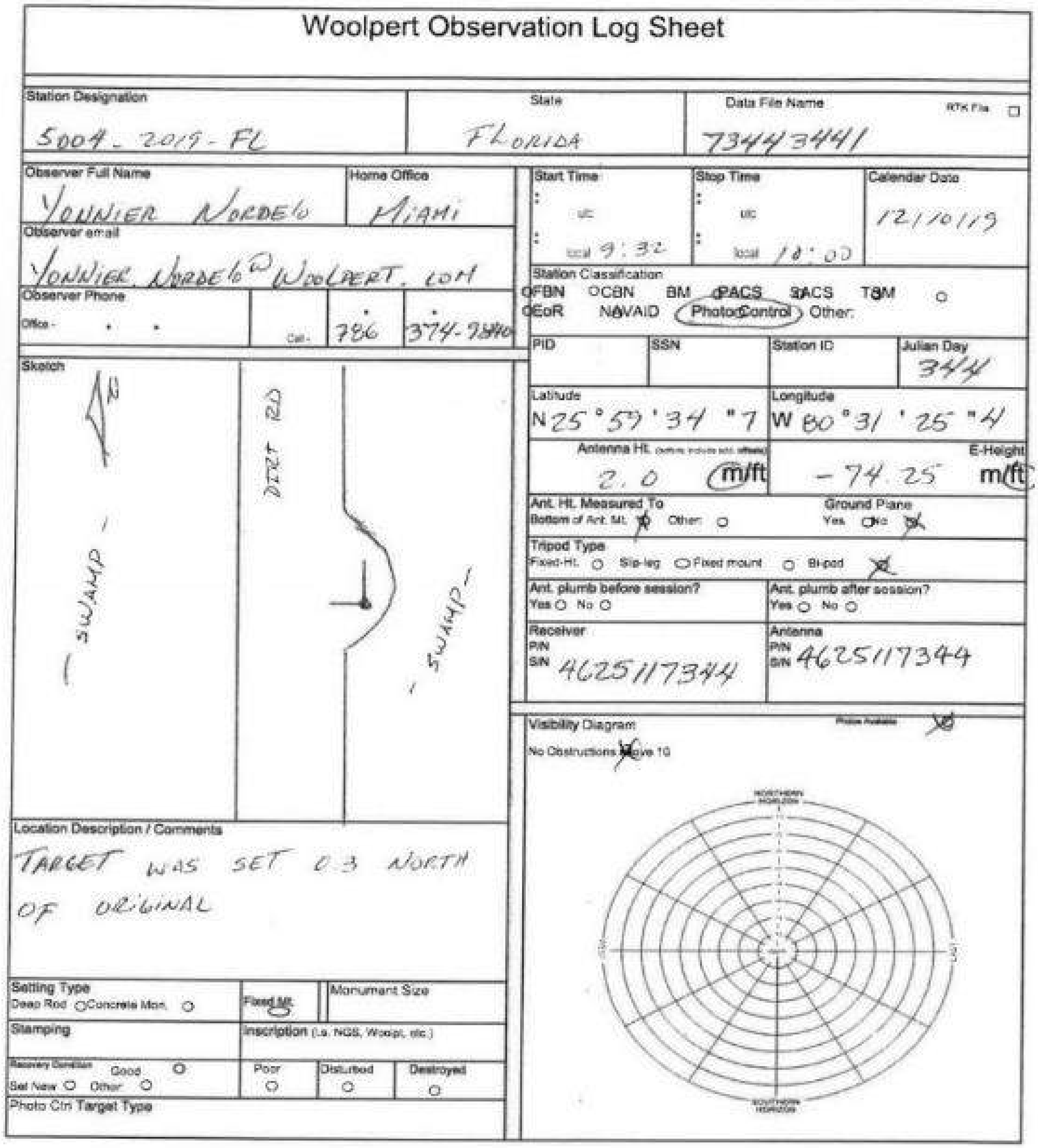

5004_2019_FL, N, 20191210


5004_2019_FL, 2, 20191210


5004_2019_FL, E, 20191210

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/10/2019 |
| Project Point Name | 5004_2019_FL | GPS Session File Name | 5004344o.19o.xml |



### Woolpert Observation Log Sheet

Station Designation: 5004_2019_FL
State: FLORIDA
Data File Name: 73443441
RTK File ☐

Observer Full Name: YONNIER NORDELLO
Home Office: MIAMI
Observer email: YONNIER.NORDELLO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 786 . 374 . 7840

Start Time: utc : local 9:32
Stop Time: utc : local 10:00
Calendar Date: 12/10/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 344

Latitude: N 25° 59' 34" 7
Longitude: W 80° 31' 25" 4

Antenna Ht. (antenna include add. offsets): 2.0 [✓ m]/ft
E-Height: -74.25 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117344

Sketch

Visibility Diagram
Photo Available ☒
No Obstructions Above 10 ☒

Location Description / Comments: TARGET WAS SET 0.3 NORTH OF ORIGINAL

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5005_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/10/2019
GPS Session File Name: 5005344n.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **181399.731** | **595142.283** | **Datum (Epoch)** |
| **Easting** | **255952.615** | **839737.872** | **Datum (Epoch)** |
| **Orthometric Height** | **5.339** | **17.515** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS X
Other

Mark Stamping:
Latitude: N25°58'11.63759"
Longitude: W80°26'28.48798"
Ellipsoidal Height: -19.511 m
Type of Mark: Set PK Nail in Vinyl Aerial Target
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time: 8:10:07 AM Stop Time: 8:37:27 AM
PDOP Max: 1.840
Start Time: Stop Time:
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧
NORTH


5005_2019_FL, 1, 20191210

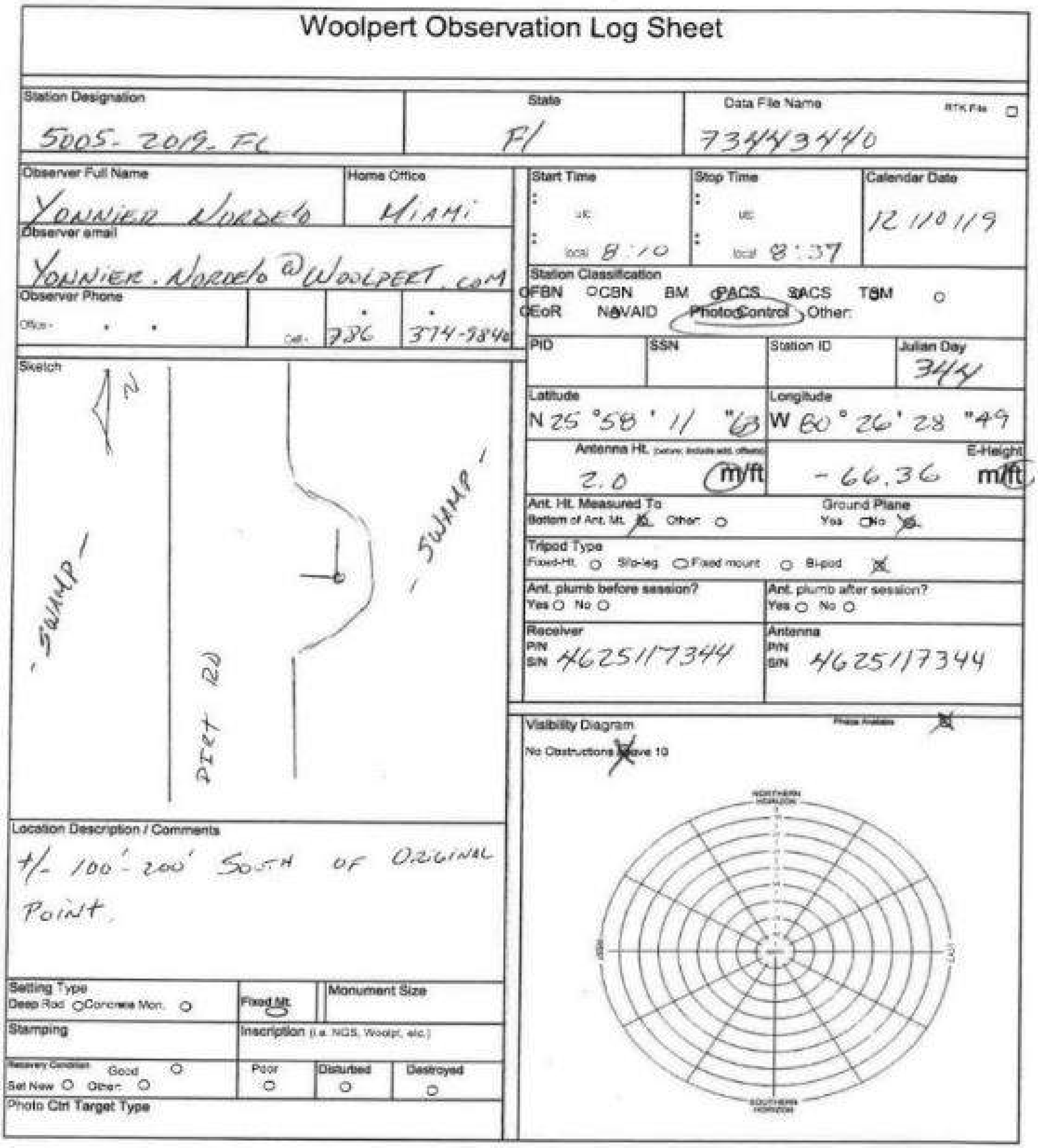

5005_2019_FL, N, 20191210


5005_2019_FL, 2, 20191210


5005_2019_FL, E, 20191210

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/10/2019 |
| Project Point Name | 5005_2019_FL | GPS Session File Name | 5005344n.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 5005-2019-FL
State: Fl
Data File Name: 73443440
RTK File ☐

Observer Full Name: YONNIER NORDELLO
Home Office: MIAMI
Observer email: YONNIER.NORDELLO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 786 . 374-9840

Start Time: : utc : local 8:10
Stop Time: : utc : local 8:37
Calendar Date: 12/10/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 344

Latitude: N 25° 58' 11" 63
Longitude: W 80° 26' 28" 49

Antenna Ht. (above; include add. offsets): 2.0 [✓ m]/ft
E-Height: -66.36 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117344

Sketch

Visibility Diagram
Phase Analysis ☒
No Obstructions above 10 ☒

Location Description / Comments: +/- 100'-200' SOUTH OF ORIGINAL POINT.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Ht. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5006_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/14/2019
GPS Session File Name: 80569_20191212_YN.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **106698.066** | **350058.570** | **Datum (Epoch)** |
| **Easting** | **253843.282** | **832817.500** | **Datum (Epoch)** |
| **Orthometric Height** | **0.906** | **2.973** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping:
Latitude: N25°17'44.37333"
Longitude: W80°27'55.15784"
Ellipsoidal Height: -23.637 m
Type of Mark: Set PK Nail In Painted Aerial Target
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 9:51:02 AM Stop Time : 9:54:12 AM
PDOP Max: 1.586
Start Time : 12:41:12 PM Stop Time : 12:44:29 PM
PDOP Max: 1.566
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH


5006_2019_FL, 1, 20191211

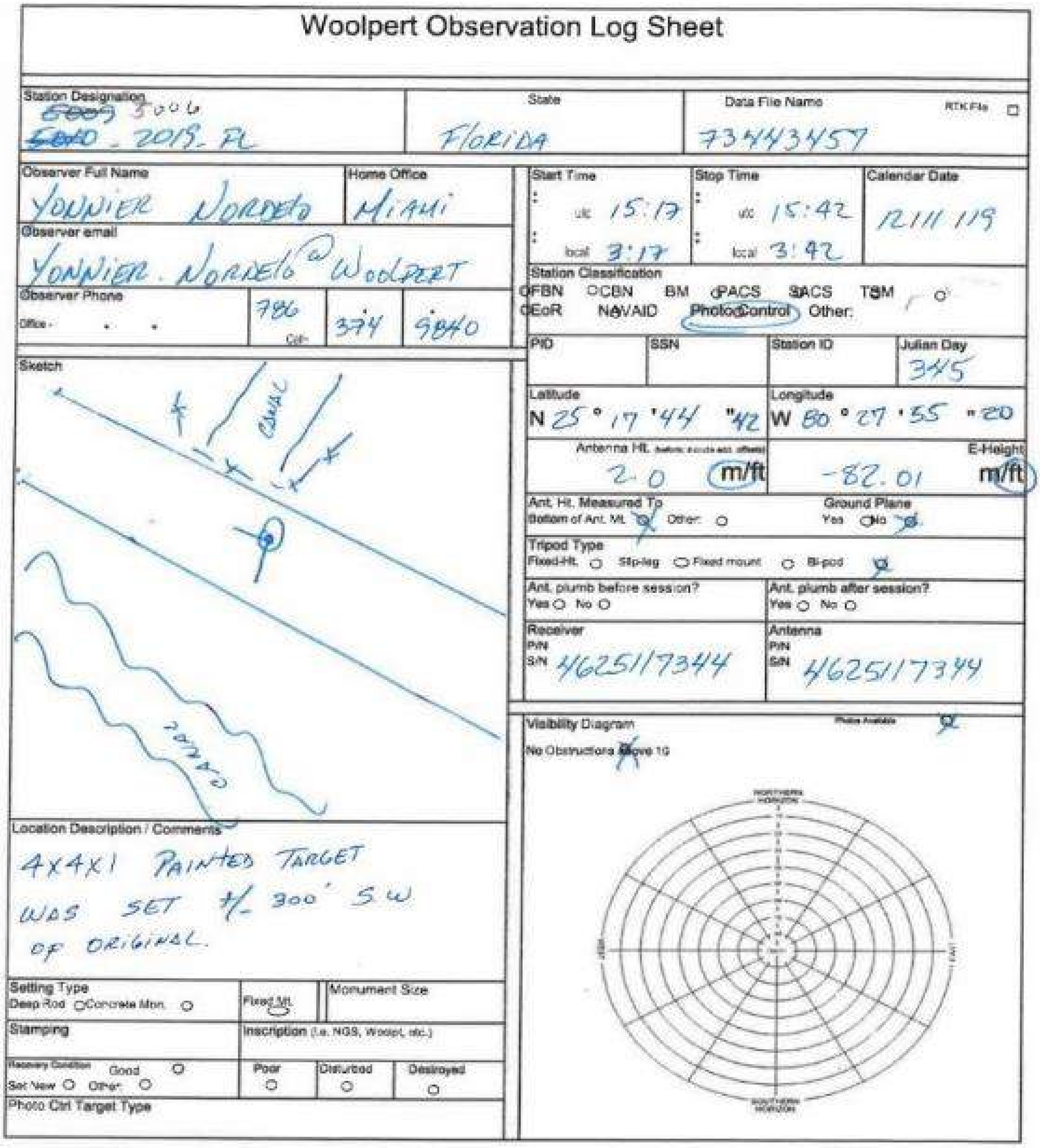

5006_2019_FL, W, 20191211


5006_2019_FL, 2, 20191211


5006_2019_FL, NE, 20191211

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/14/2019 |
| Project Point Name | 5006_2019_FL | GPS Session File Name | 80569_20191212_YN.job |



### Woolpert Observation Log Sheet

Station Designation: ~~5009~~ 5006 ~~5010~~_2019_FL
State: FLORIDA
Data File Name: 73443457
RTK File ☐

Observer Full Name: YONNIER NORDELO
Home Office: MIAMI
Observer email: YONNIER.NORDELO@WOOLPERT
Observer Phone: Office - . . Cell - 786 374 9840

Start Time: utc 15:17 local 3:17
Stop Time: utc 15:42 local 3:42
Calendar Date: 12/11/19

Station Classification: ○ FBN ○ CBN ○ BM ○ PACS ○ SACS ○ TBM ○ EoR ○ NAVAID [✓ Photo Control] Other: ○

PID:
SSN:
Station ID:
Julian Day: 345

Latitude: N 25 ° 17 ' 44 " 42
Longitude: W 80 ° 27 ' 55 " 20

Antenna Ht. (before session and offsets): 2.0 [✓ m/ft]
E-Height: -82.01 [✓ m/ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117394

Sketch

Visibility Diagram
No Obstructions Above 10 ☒
Photo Available ☒

Location Description / Comments
4X4X1 PAINTED TARGET WAS SET +/- 300' SW OF ORIGINAL.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5007_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/11/2019
GPS Session File Name: 5007345n.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **96600.243** | **316929.297** | **Datum (Epoch)** |
| **Easting** | **213360.205** | **699999.271** | **Datum (Epoch)** |
| **Orthometric Height** | **1.139** | **3.736** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN
OPUS X
Other

Mark Stamping:
Latitude: N25°12'19.47164"
Longitude: W80°52'02.73497"
Ellipsoidal Height: -22.058 m
Type of Mark: Set PK Nail in Painted Aerial Target
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 8:47:15 AM Stop Time : 9:14:39 AM
PDOP Max: 2.493
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH

5007_2019_FL, 1, 20191211

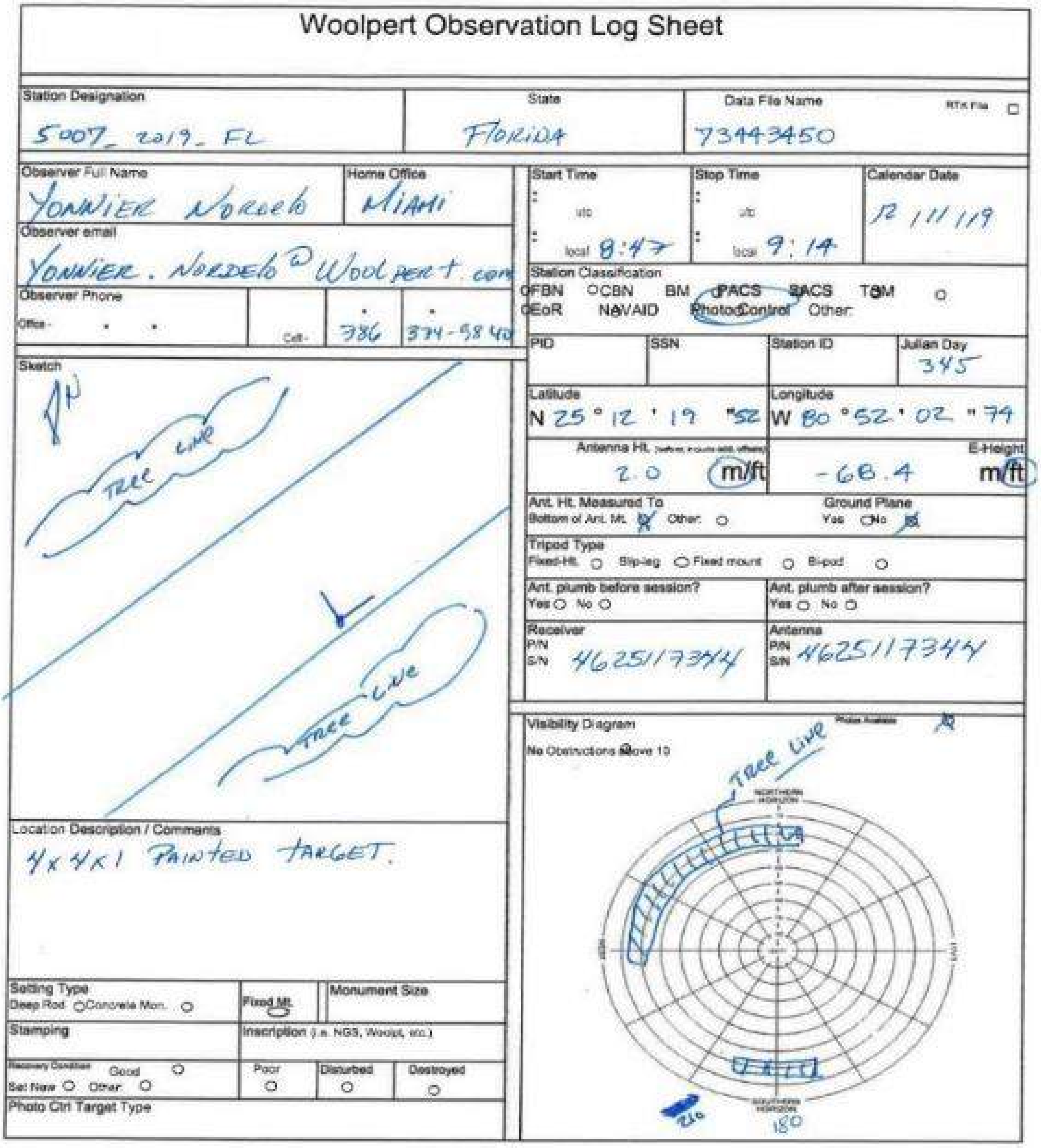
5007_2019_FL, SE, 20191211

5007_2019_FL, 2, 20191211

5007_2019_FL, N, 20191211

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/11/2019 |
| Project Point Name | 5007_2019_FL | GPS Session File Name | 5007345n.19o.xml |



### Woolpert Observation Log Sheet

Station Designation: 5007_2019_FL
State: FLORIDA
Data File Name: 73443450
RTK File ☐

Observer Full Name: YONNIER NORDELO
Home Office: MIAMI
Observer email: YONNIER.NORDELO@WOOLPERT.com
Observer Phone: Office - . . Cell - 786 . 374-5840

Start Time: utc : local 8:47
Stop Time: utc : local 9:14
Calendar Date: 12/11/19

Station Classification
○FBN ○CBN BM ○PACS ○SACS TBM ○
○EoR NAVAID PhotoControl Other:

| PID | SSN | Station ID | Julian Day |
|---|---|---|---|
| | | | 345 |

Latitude: N 25 ° 12 ' 19 ".52
Longitude: W 80 ° 52 ' 02 ".79

Antenna Ht. (before mount add offsets): 2.0 [✓ m]/ft
E-Height: -68.4 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ○

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 46251173444
Antenna P/N S/N 46251173444

Sketch

Location Description / Comments: 4x4x1 PAINTED TARGET.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type

Visibility Diagram
Photos Available ☒
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5008_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/10/2019
GPS Session File Name: 5008344t.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **158170.185** | **518930.014** | **Datum (Epoch)** |
| **Easting** | **233669.332** | **766630.134** | **Datum (Epoch)** |
| **Orthometric Height** | **2.627** | **8.618** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☒
Other

Mark Stamping
Latitude: N25°45'39.23644"
Longitude: W80°39'51.69780"
Ellipsoidal Height: -21.738 m
Type of Mark: Set PK Nail in Painted Aerial Target
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 2:08:07 PM Stop Time : 2:33:56 PM
PDOP Max: 2.216
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

5008_2019_FL, 1, 20191210

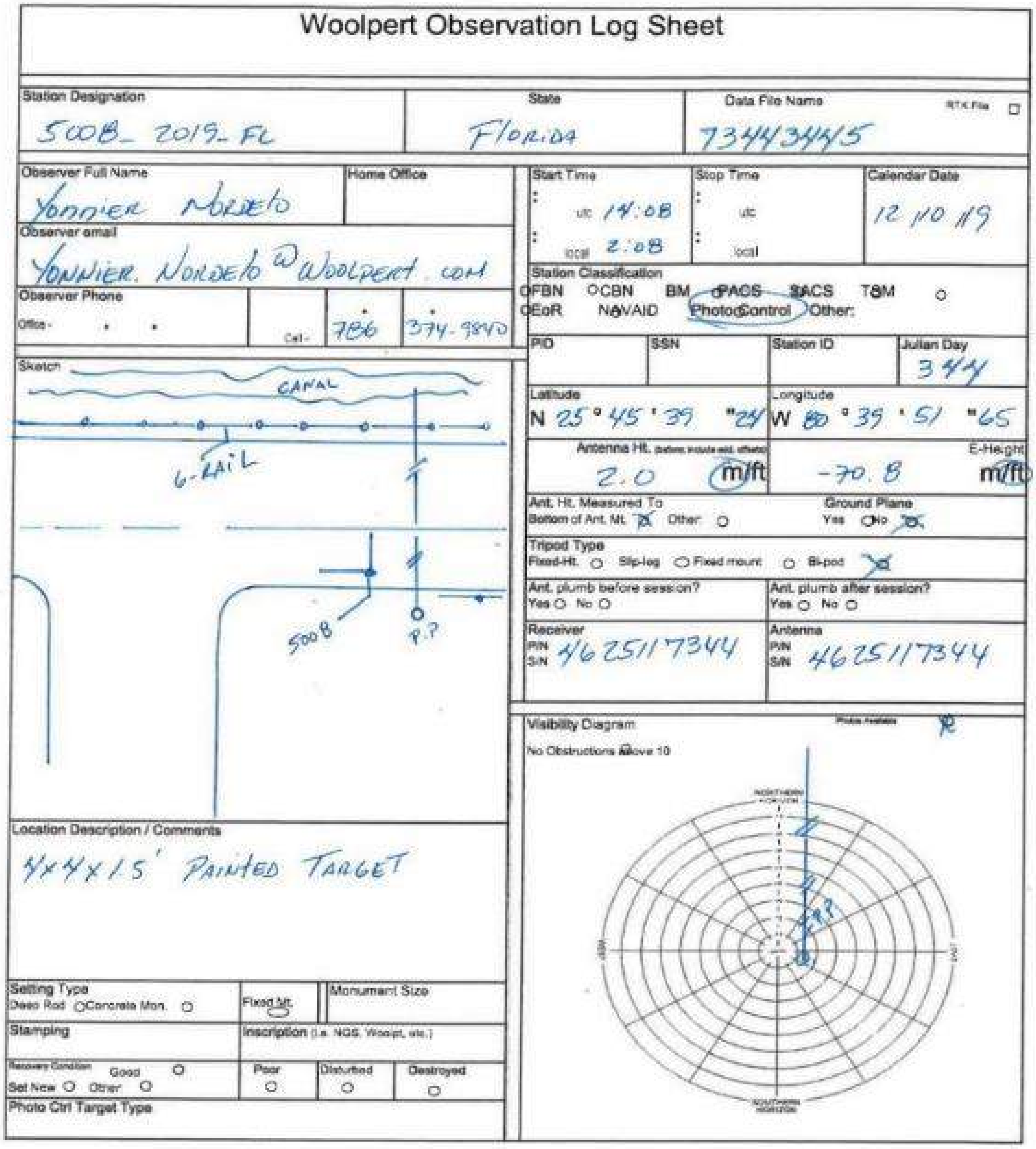
5008_2019_FL, N, 20191210

5008_2019_FL, 2, 20191210

5008_2019_FL, E, 20191210

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/10/2019 |
| Project Point Name | 5008_2019_FL | GPS Session File Name | 5008344t.19o.xml |



## Woolpert Observation Log Sheet

| | | | |
|---|---|---|---|
| Station Designation<br>5008_2019_FL | State<br>Florida | Data File Name<br>73443445 | RTK File ☐ |

Observer Full Name: Yonnier Nordelo

Home Office:

Observer email: Yonnier.Nordelo@Woolpert.com

Observer Phone: Office - . . Cell - 786 374-9840

| | | |
|---|---|---|
| Start Time<br>utc 14:08<br>local 2:08 | Stop Time<br>utc<br>local | Calendar Date<br>12 10 19 |

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo○Control] Other:

| | | | |
|---|---|---|---|
| PID | SSN | Station ID | Julian Day<br>344 |

Latitude: N 25 ° 45 ' 39 " 24

Longitude: W 80 ° 39 ' 51 " 65

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: -70.8 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344

Antenna P/N S/N 4625117344

Sketch

Visibility Diagram

Photo Available ☒

No Obstructions ○Above 10

Location Description / Comments

4x4x1.5' PAINTED TARGET

| | | |
|---|---|---|
| Setting Type<br>Deep Rod ○ Concrete Mon. ○ | Fixed Mt. ○ | Monument Size |
| Stamping | Inscription (i.e. NGS, Woolpert, etc.) | |

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5009_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/11/2019
GPS Session File Name: 5009345p.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **122671.720** | **402465.466** | **Datum (Epoch)** |
| **Easting** | **221770.213** | **727591.109** | **Datum (Epoch)** |
| **Orthometric Height** | **0.935** | **3.069** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☒ X
Other

Mark Stamping
Latitude: N25°26'26.41938"
Longitude: W80°47'00.80171"
Ellipsoidal Height: -22.928 m
Type of Mark: Set PK Nail in Painted Aerial Target
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:34:15 AM Stop Time : 11:00:54 AM
PDOP Max: 0.000
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

5009_2019_FL, 1, 20191211

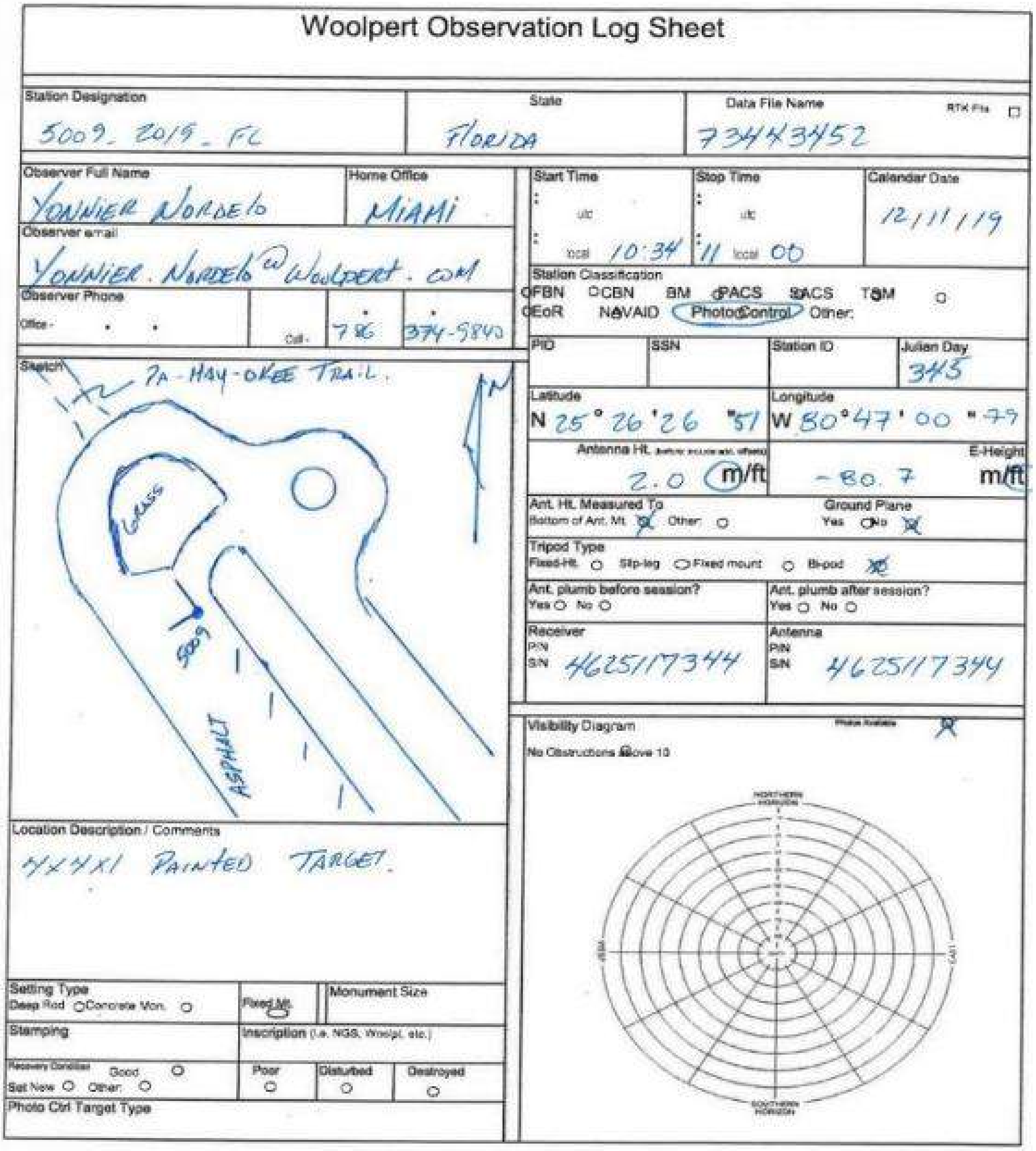
5009_2019_FL, N, 20191211

5009_2019_FL, 2, 20191211

5009_2019_FL, E, 20191211

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/11/2019 |
| Project Point Name | 5009_2019_FL | GPS Session File Name | 5009345p.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 5009_2019_FL

State: FLORIDA

Data File Name: 73443452

RTX File ☐

Observer Full Name: YONNIER NORDELO

Home Office: MIAMI

Observer email: YONNIER.NORDELO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 786 374-9840

Start Time: : utc : local 10:34

Stop Time: : utc : 11 local 00

Calendar Date: 12/11/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ PhotoControl] Other:

PID:

SSN:

Station ID:

Julian Day: 345

Latitude: N 25° 26' 26 ".57

Longitude: W 80° 47' 00 ".79

Antenna Ht. (before including offsets): 2.0 [✓ m]/ft

E-Height: -80.7 [✓ m]/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver: P/N S/N 4625117344

Antenna: P/N S/N 4625117344

Sketch

Visibility Diagram

Photos Available ☒

No Obstructions Above 10

Location Description / Comments: 4X4X1 PAINTED TARGET.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 5010_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/14/2019
GPS Session File Name: 80569_20191212_YN.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **110518.027** | **362591.228** | **Datum (Epoch)** |
| **Easting** | **247848.846** | **813150.757** | **Datum (Epoch)** |
| **Orthometric Height** | **1.185** | **3.888** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°19'49.24933"
Longitude: W80°31'28.96221"
Ellipsoidal Height: -23.235 m
Type of Mark: Set PK Nail in Painted Aerial Target
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:06:34 AM Stop Time : 10:09:40 AM
PDOP Max: 1.517
Start Time : 12:14:52 PM Stop Time : 12:20:41 PM
PDOP Max: 1.820
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH


5010_2019_FL, 1, 20191211

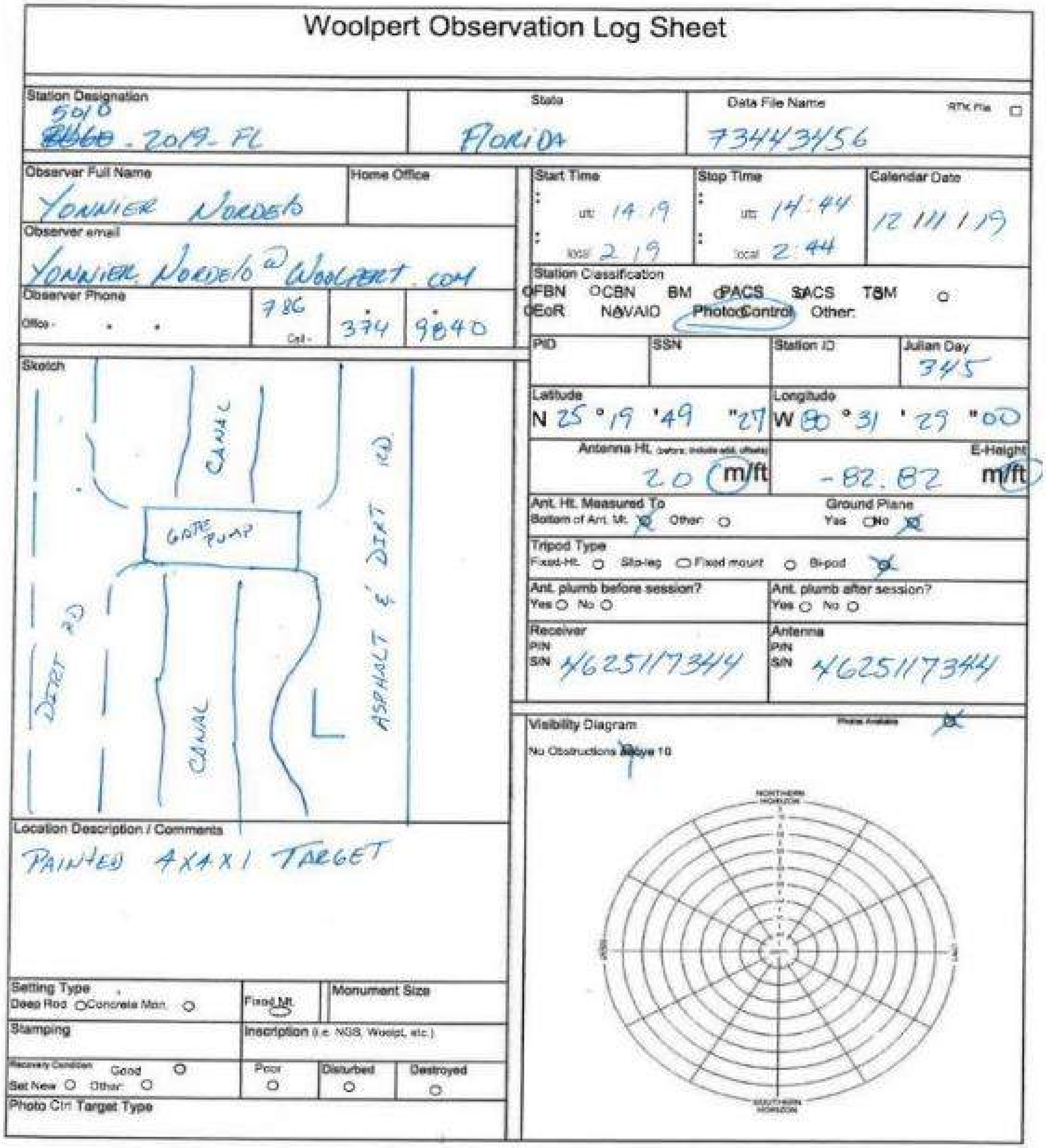

5010_2019_FL, W, 20191211


5010_2019_FL, 2, 20191211


5010_2019_FL, N, 20191211

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/14/2019 |
| Project Point Name | 5010_2019_FL | GPS Session File Name | 80569_20191212_YN.job |



## Woolpert Observation Log Sheet

Station Designation: 5010 ~~[illegible]~~ . 2019- FL
State: FlORIDA
Data File Name: 73443456
RTK File ☐

Observer Full Name: YONNIER NORDElo
Home Office:
Observer email: YONNIER. NORDElo@WOOLPERT.COM
Observer Phone: Office - . . Cell - 786 374 9840

Start Time: utc 14:19 local 2:19
Stop Time: utc 14:44 local 2:44
Calendar Date: 12/11/19

Station Classification
○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○
○EoR ○NAVAID [✓ ○Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 345

Latitude: N 25 ° 19 ' 49 " 27
Longitude: W 80 ° 31 ' 29 " 00

Antenna Ht. (before, include add. offsets): 2.0 [✓ m]/ft
E-Height: -82.82 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117344

Sketch

Location Description / Comments: PAINTED 4X4X1 TARGET

Visibility Diagram
Photo Available ☒
No Obstructions Above 10 ✓

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6001_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191219_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **158241.313** | **519163.374** | **Datum (Epoch)** |
| **Easting** | **249941.552** | **820016.576** | **Datum (Epoch)** |
| **Orthometric Height** | **2.818** | **9.246** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°45'39.87620"
Longitude: W80°30'07.73641"
Ellipsoidal Height: -21.857 m
Type of Mark: Set PK Nail at Point of Arrow
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 11:29:37 AM Stop Time : 11:29:50 AM
PDOP Max: 2.035
Start Time : 3:06:06 PM Stop Time : 3:06:22 PM
PDOP Max: 1.353
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

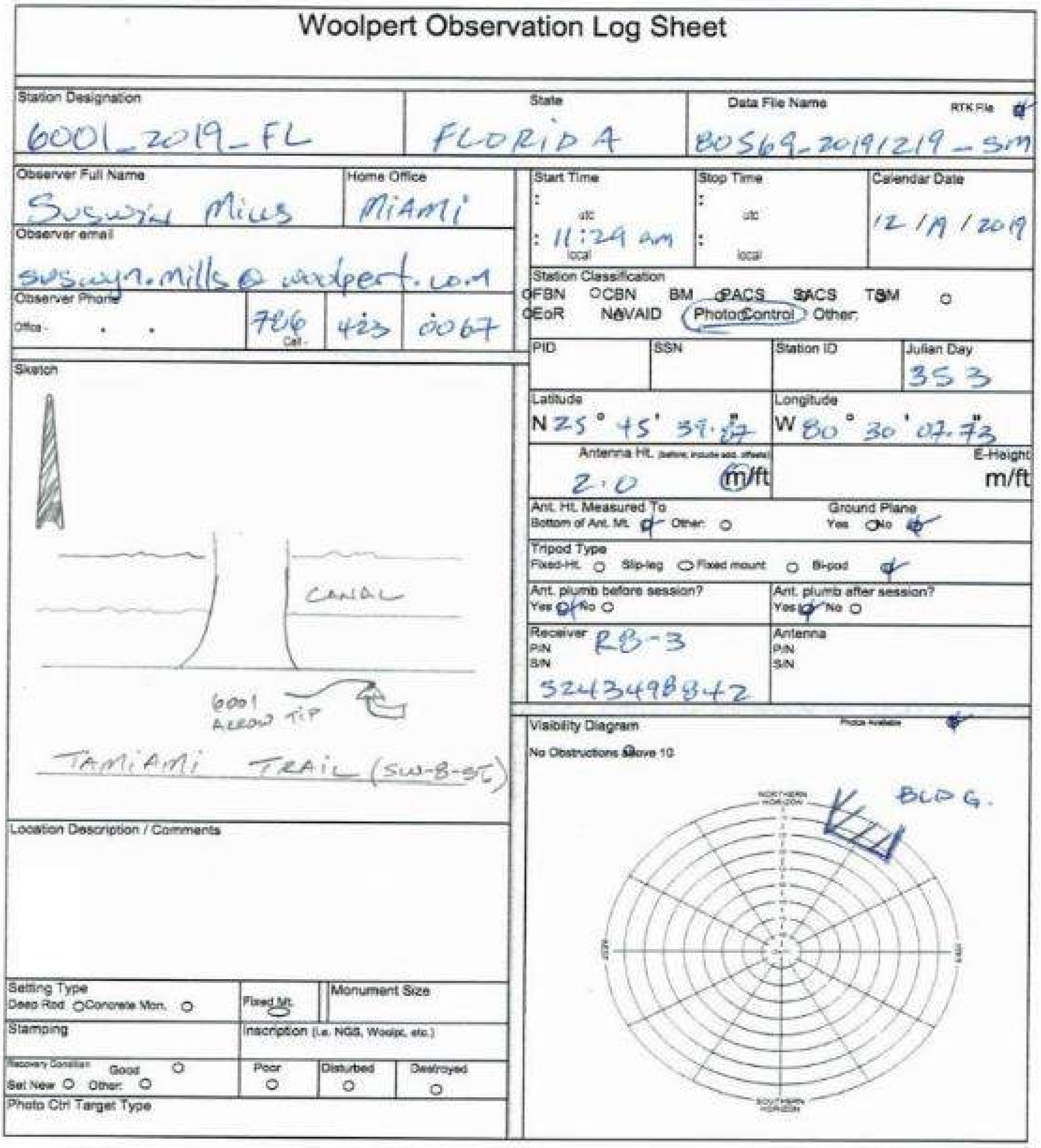
6001_2019_FL, 1, 20191219

6001_2019_FL, 3N, 20191219

6001_2019_FL, 3E, 20191219

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 6001_2019_FL | GPS Session File Name | 80569_20191219_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 6001_2019_FL
State: FLORIDA
Data File Name: 80569_20191219_SM
RTK File ✓

Observer Full Name: Suswyn Mills
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 11:29 am local
Stop Time: : utc : local
Calendar Date: 12/19/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N 25° 45' 39.27"
Longitude: W 80° 30' 07.73"

Antenna Ht. (before; include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○
Ant. plumb after session? Yes ✓ No ○

Receiver P/N: RB-3 S/N: 5243498842
Antenna P/N: S/N:

Sketch

Visibility Diagram
Photos Available ✓
No Obstructions Above 10 ○

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6002_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **132431.501** | **434485.684** | **Datum (Epoch)** |
| **Easting** | **248447.160** | **815113.725** | **Datum (Epoch)** |
| **Orthometric Height** | **2.316** | **7.597** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

Mark Stamping:
Latitude: N25°31'41.31956"
Longitude: W80°31'04.73685"
Ellipsoidal Height: -22.439 m
Type of Mark: Corner of Driveway

Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 10:56:14 AM Stop Time : 10:56:24 AM
PDOP Max: 1.484
Start Time : 1:41:10 PM Stop Time : 1:41:20 PM
PDOP Max: 1.584
Antenna Height: 2.00 m
Weather Conditions: Cloudy

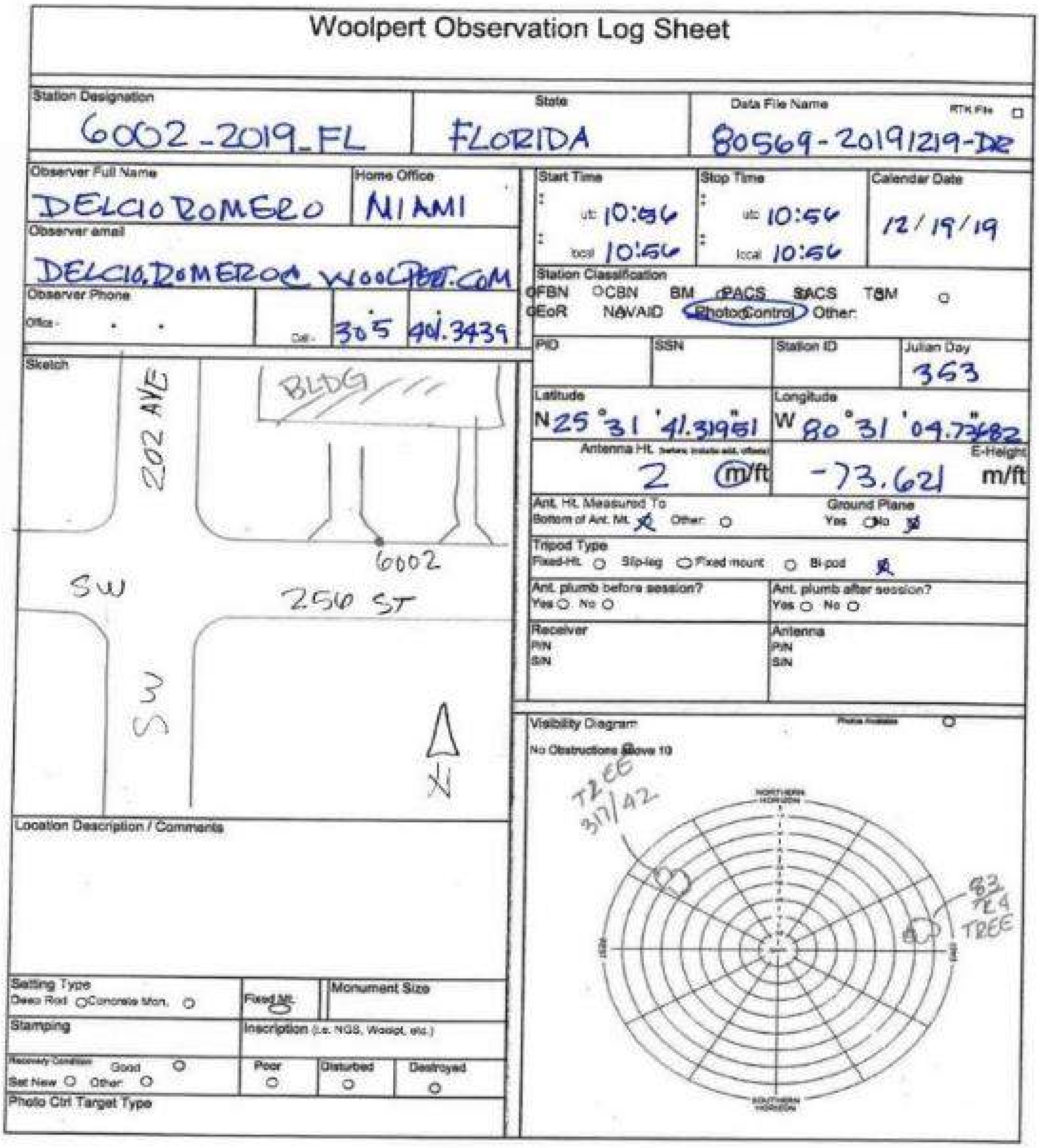
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6002_2019_FL
Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job



## Woolpert Observation Log Sheet

Station Designation: 6002-2019_FL
State: FLORIDA
Data File Name: 80569-20191219-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 305 401.3439

Start Time: utc 10:56 local 10:56
Stop Time: utc 10:56 local 10:56
Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 363

Latitude: N 25° 31' 41.31981"
Longitude: W 80° 31' 04.73682"
Antenna Ht. (before include add. offsets): 2 [✓ m]/ft
E-Height: -73.621 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver: P/N S/N
Antenna: P/N S/N

Sketch

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type

Visibility Diagram
Photos Available ○
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6003_2019_FL
Operator Name: Yonnier Nordello
Date of Field Survey: 12/11/2019
GPS Session File Name: 6003345r.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **117758.060** | **386344.567** | **Datum (Epoch)** |
| **Easting** | **241889.862** | **793600.322** | **Datum (Epoch)** |
| **Orthometric Height** | **1.540** | **5.053** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☒
Other

Mark Stamping
Latitude: N25°23'45.18319"
Longitude: W80°35'01.24030"
Ellipsoidal Height: -22.885 m
Type of Mark: Found Survey Cap at Corner of Sidewalk
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 12:18:16 PM Stop Time : 12:47:08 PM
PDOP Max: 1.996
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧
NORTH

6003_2019_FL. 1. 20191211

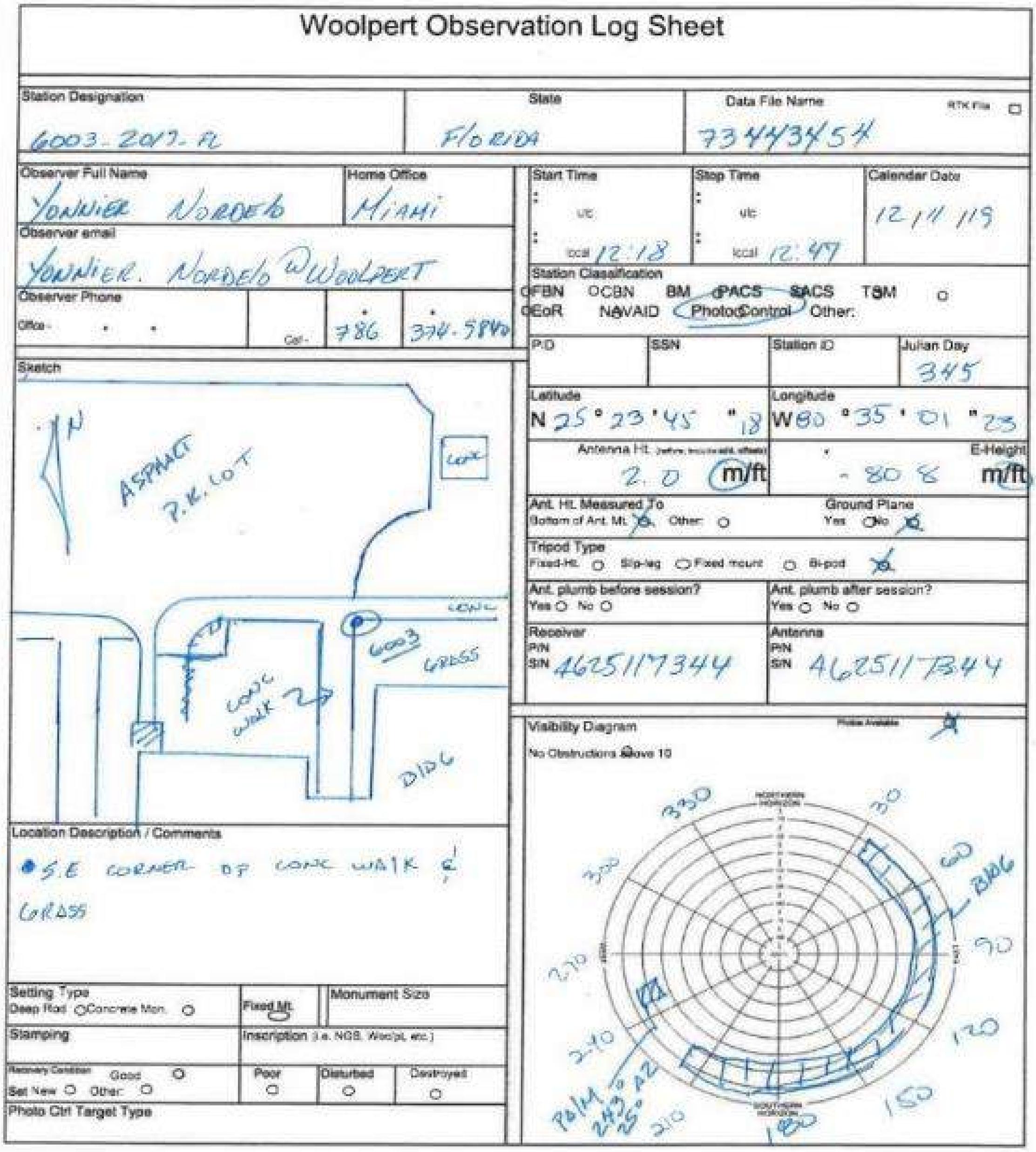
6003_2019_FL. N. 20191211

6003_2019_FL. 2. 20191211

6003_2019_FL. E. 20191211

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/11/2019 |
| Project Point Name | 6003_2019_FL | GPS Session File Name | 6003345r.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 6003-2017-FL
State: Florida
Data File Name: 73443454
RTK File ☐

Observer Full Name: Yonnier Nordelo
Home Office: Miami
Observer email: Yonnier. Nordelo@Woolpert
Observer Phone: Office - . . Cell - 786 . 374-5840

Start Time: : utc : local 12:18
Stop Time: : utc : local 12:47
Calendar Date: 12/11/19

Station Classification: ○FBN ○CBN BM [✓ ○PACS ○SACS] T○M ○ ○EoR N○VAID [✓ Photo○Control] Other:

| P/D | SSN | Station ID | Julian Day |
|---|---|---|---|
| | | | 345 |

Latitude: N 25° 23' 45.18"
Longitude: W 80° 35' 01.25"
Antenna Ht. (before including offsets): 2.0 [✓ m/ft]
E-Height: -80.8 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117344

Sketch

Location Description / Comments: ● S.E CORNER OF CONC WALK & GRASS

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type

Visibility Diagram
Photos Available ☒
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6004_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/11/2019
GPS Session File Name: 60043450.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | 111674.201 | 366384.441 | Datum (Epoch) |
| **Easting** | 218652.146 | 717361.248 | Datum (Epoch) |
| **Orthometric Height** | 0.995 | 3.266 | Datum (Epoch) |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS X
Other

Mark Stamping:
Latitude: N25°20'29.16424"
Longitude: W80°48'52.94876"
Ellipsoidal Height: -22.647 m
Type of Mark: Found PK Nail at Corner of Stop Bar
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 9:38:56 AM Stop Time : 10:05:37 AM
PDOP Max: 0.000
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

6004_2019_FL, 1, 20191211

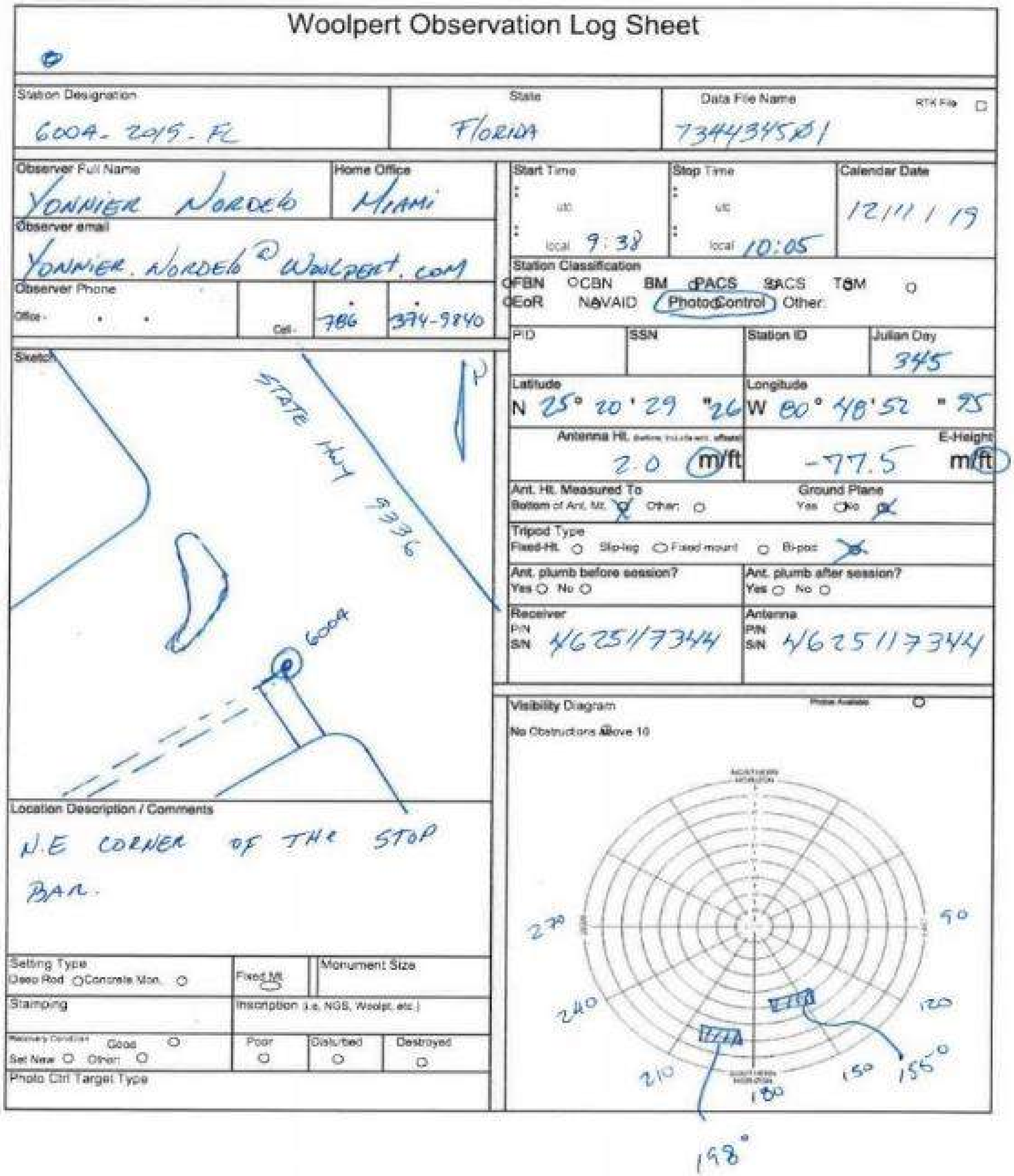
6004_2019_FL, N, 20191211

6004_2019_FL, 2, 20191211

6004_2019_FL, E, 20191211

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/11/2019 |
| Project Point Name | 6004_2019_FL | GPS Session File Name | 6004345o.19o.xml |



### Woolpert Observation Log Sheet

Station Designation: 6004-2019-FL

State: Florida

Data File Name: 73443450 1

RTK File ☐

Observer Full Name: Yonnier Nordello

Home Office: Miami

Observer email: Yonnier.Nordello@Woolpert.com

Observer Phone: Office - . . Cell - 786 . 374-9840

Start Time: : utc : local 9:38

Stop Time: : utc : local 10:05

Calendar Date: 12/11/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo○Control] Other:

PID:

SSN:

Station ID:

Julian Day: 345

Latitude: N 25° 20' 29 " 26

Longitude: W 80° 48' 52 " 75

Antenna Ht. (before, include ant. offset): 2.0 [✓ m]/ft

E-Height: -77.5 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed-mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344

Antenna P/N S/N 4625117344

Sketch

Location Description / Comments: N.E CORNER OF THE STOP BAR.

Setting Type: ○Deep Rod ○Concrete Mon. ○ Fixed Mt ○ Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt. etc.):

Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

Visibility Diagram

Photo Available ○

No Obstructions ○Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/11/2019 |
| Project Point Name | 6005_2019_FL | GPS Session File Name | 6005345q.19o.xml |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **117018.063** | **383916.762** | **Datum (Epoch)** |
| **Easting** | **232104.528** | **761496.272** | **Datum (Epoch)** |
| **Orthometric Height** | **1.338** | **4.390** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | |
| Network Adjustment | ☐ | OPUS | X |
| Other | | | |

| | | |
|---|---|---|
| Mark Stamping | | |
| Latitude | N25°23'22.00960" | |
| Longitude | W80°40'51.40391" | |
| Ellipsoidal Height | -22.802 | m |
| Type of Mark | Found PK Nail at Corner of Stop Bar | |
| Notes | | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal | | |
| Start Time : | 11:34:10 AM | Stop Time : | 12:00:40 PM |
| PDOP Max: | 2.095 | | |
| Start Time : | | Stop Time : | |
| PDOP Max: | | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Sunny | | |

PHOTOS

NORTH

6005_2019_FL, 1, 20191211

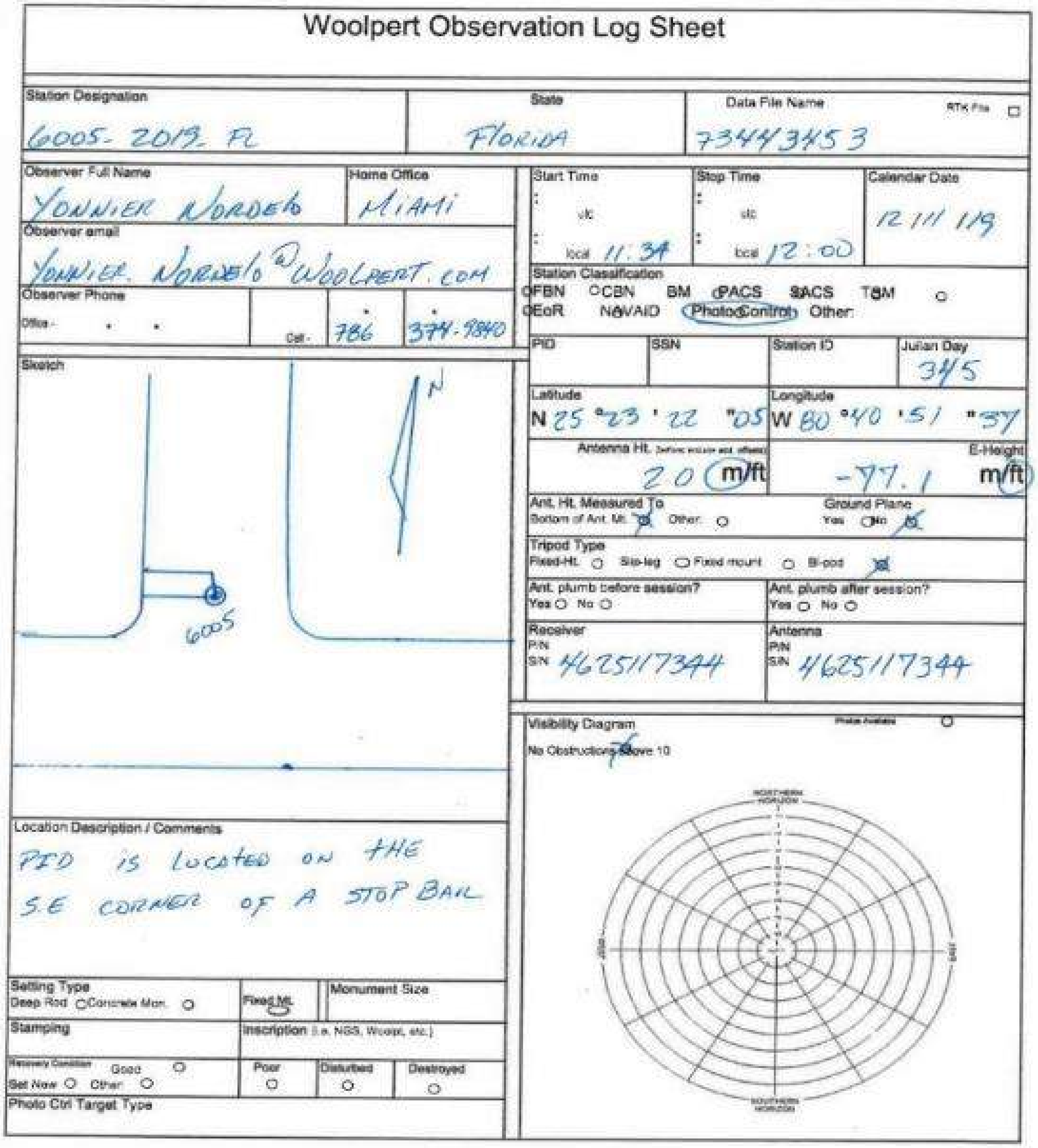
6005_2019_FL, N, 20191211

6005_2019_FL, 2, 20191211

6005_2019_FL, E, 20191211

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/11/2019 |
| Project Point Name | 6005_2019_FL | GPS Session File Name | 6005345q.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 6005- 2019- FL

State: FLORIDA

Data File Name: 73443453

RTK File ☐

Observer Full Name: YONNIER NORDELO

Home Office: MIAMI

Observer email: YONNIER. NORDELO@WOOLPERT. COM

Observer Phone: Office - . . Cell - 786 . 374-9840

Start Time: utc local 11:34

Stop Time: utc local 12:00

Calendar Date: 12/11/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 345

Latitude: N 25 ° 23 ' 22 " 05

Longitude: W 80 ° 40 ' 51 " 37

Antenna Ht. (before include add. offsets): 2 0 [✓ m]/ft

E-Height: -77.1 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344

Antenna P/N S/N 4625117344

Sketch

N

6005

Visibility Diagram

Photo Available ○

[✓ No Obstructions Above 10]

NORTHERN HORIZON

SOUTHERN HORIZON

EAST

WEST

Location Description / Comments

PID IS LOCATED ON THE S.E CORNER OF A STOP BAIL

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6006_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/12/2019
GPS Session File Name: Report_22796381.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **100081.743** | **328351.519** | **Datum (Epoch)** |
| **Easting** | **257089.360** | **843467.340** | **Datum (Epoch)** |
| **Orthometric Height** | **1.616** | **5.303** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☐
Other: **Trimble RTX Solution**

Mark Stamping
Latitude: N25°14'08.92225"
Longitude: W80°26'00.11663"
Ellipsoidal Height: -22.853 m
Type of Mark: Set PK Nail at Point of Arrow

Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:51:41 AM Stop Time : 11:20:33 AM
PDOP Max: 0.000
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH

6006_2019_FL, 1, 20191213

6006_2019_FL, S, 20191213

6006_2019_FL, 2, 20191213

6006_2019_FL, E, 20191213

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/12/2019 |
| Project Point Name | 6006_2019_FL | GPS Session File Name | Report_22796381.xml |

### Woolpert Observation Log Sheet

Station Designation: 6006- 2019_FL
State: Florida
Data File Name: 73443460
RTK File ☐

Observer Full Name: Yonnier Nordelo
Home Office: Miami
Observer email: Yonnier. Nardelo@Woolpert. com
Observer Phone: Office - . . Cell - 786 . 374 . 9840

Start Time: utc : local 10:51
Stop Time: utc : local 11:20
Calendar Date: 12/12/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 346

Latitude: N 25° 14' 08 "93
Longitude: W 80° 26' 00 "11

Antenna Ht. (before; include adj. offsets): 2.0 m/ft
E-Height: -80.4 m/[✓ ft]

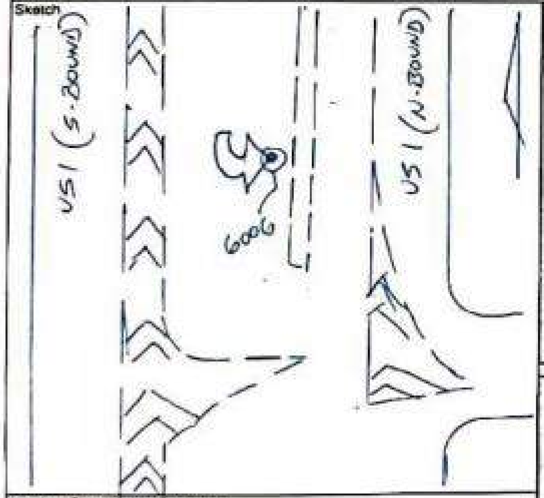
Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

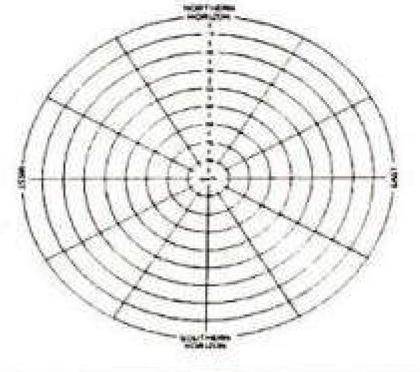
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117344

Sketch



Visibility Diagram
Photo Available ☒
No Obstructions Above 10 ✓



Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6007_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/14/2019
GPS Session File Name: 6007348n.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **108181.778** | **354926.384** | **Datum (Epoch)** |
| **Easting** | **271199.344** | **889759.847** | **Datum (Epoch)** |
| **Orthometric Height** | **1.194** | **3.918** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN:
OPUS: X
Other

Mark Stamping:
Latitude: 25°18'29.97803"
Longitude: -80°17'34.44947"
Ellipsoidal Height: -78.402 m
Type of Mark: Set PK Nail at Point of Chevron
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 8:35:52 AM Stop Time : 9:01:23 AM
PDOP Max: 0.000
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH

6007_2019_FL, 1, 20191214

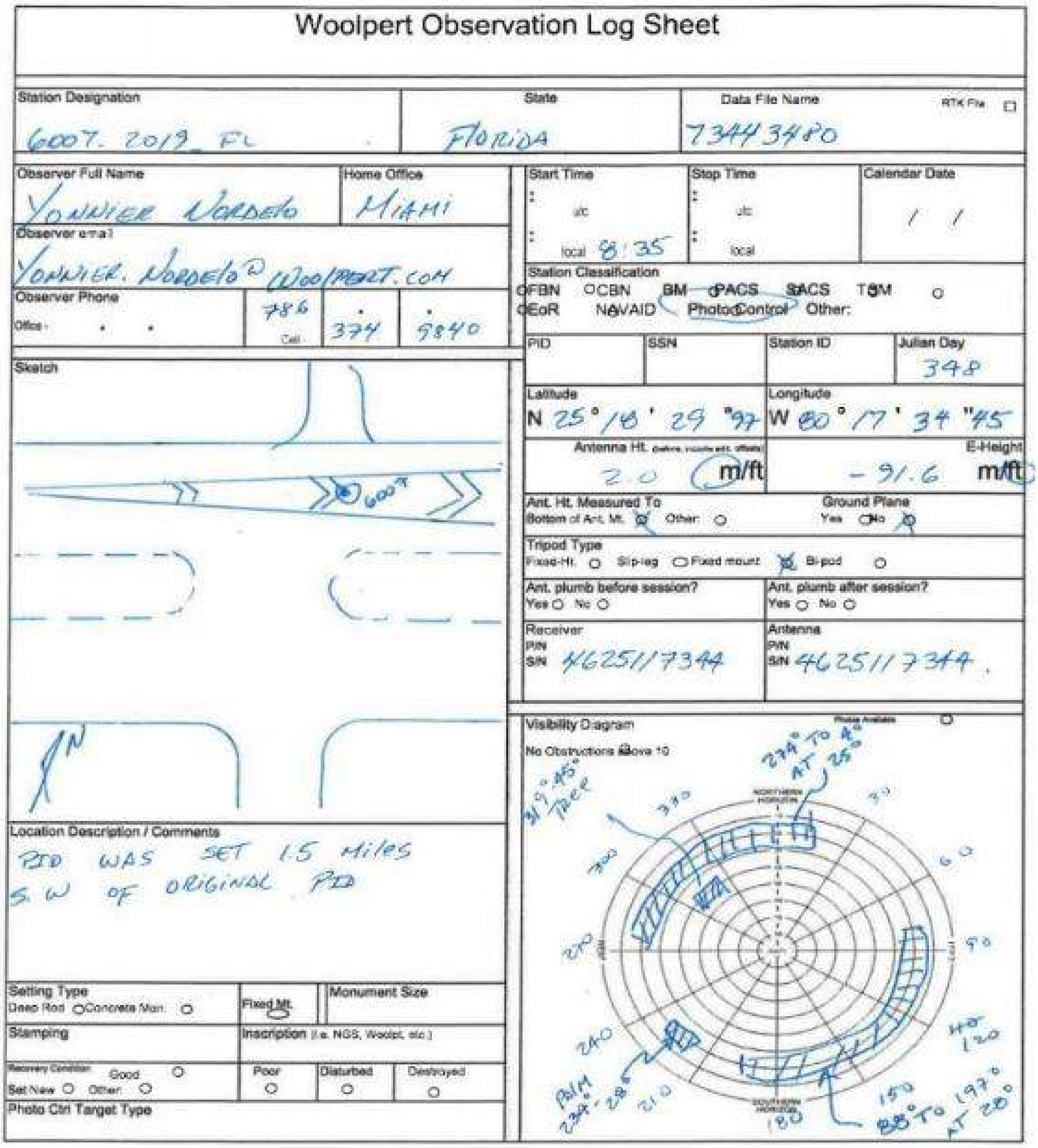
6007_2019_FL, N, 20191214

6007_2019_FL, 2, 20191214

6007_2019_FL, E, 20191214

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/14/2019 |
| Project Point Name | 6007_2019_FL | GPS Session File Name | 6007348n.19o.xml |



## Woolpert Observation Log Sheet

Station Designation: 6007_2019_FL

State: FLORIDA

Data File Name: 73443480

RTK File ☐

Observer Full Name: YONNIER NORDELO

Home Office: MIAMI

Observer e-mail: YONNIER.NORDELO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 786 . 374 . 9840

Start Time: : utc : local 8:35

Stop Time: : utc : local

Calendar Date: / /

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo○Control] Other:

PID:

SSN:

Station ID:

Julian Day: 348

Latitude: N 25° 18' 29 ".97

Longitude: W 80° 17' 34 ".45

Antenna Ht. (before, no pole ant. offsets): 2.0 [✓ m]/ft

E-Height: -91.6 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ☒ Bi-pod ○

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 46251/7344

Antenna P/N S/N 46251/7344

Sketch

Visibility Diagram

No Obstructions Above 10

Photo Available ○

Location Description / Comments:

PID WAS SET 1.5 Miles S.W OF ORIGINAL PID

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6008_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/30/2019
GPS Session File Name: 80569_20191230_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **147984.561** | **485512.679** | **Datum (Epoch)** |
| **Easting** | **284447.756** | **933225.680** | **Datum (Epoch)** |
| **Orthometric Height** | **2.370** | **7.777** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°40'00.89414"
Longitude: W80°09'31.83368"
Ellipsoidal Height: -23.410 m
Type of Mark: Set Drill Hole

Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:04:58 AM Stop Time : 10:06:55 AM
PDOP Max: 1.776
Start Time : 3:16:08 PM Stop Time : 3:16:22 PM
PDOP Max: 1.528
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

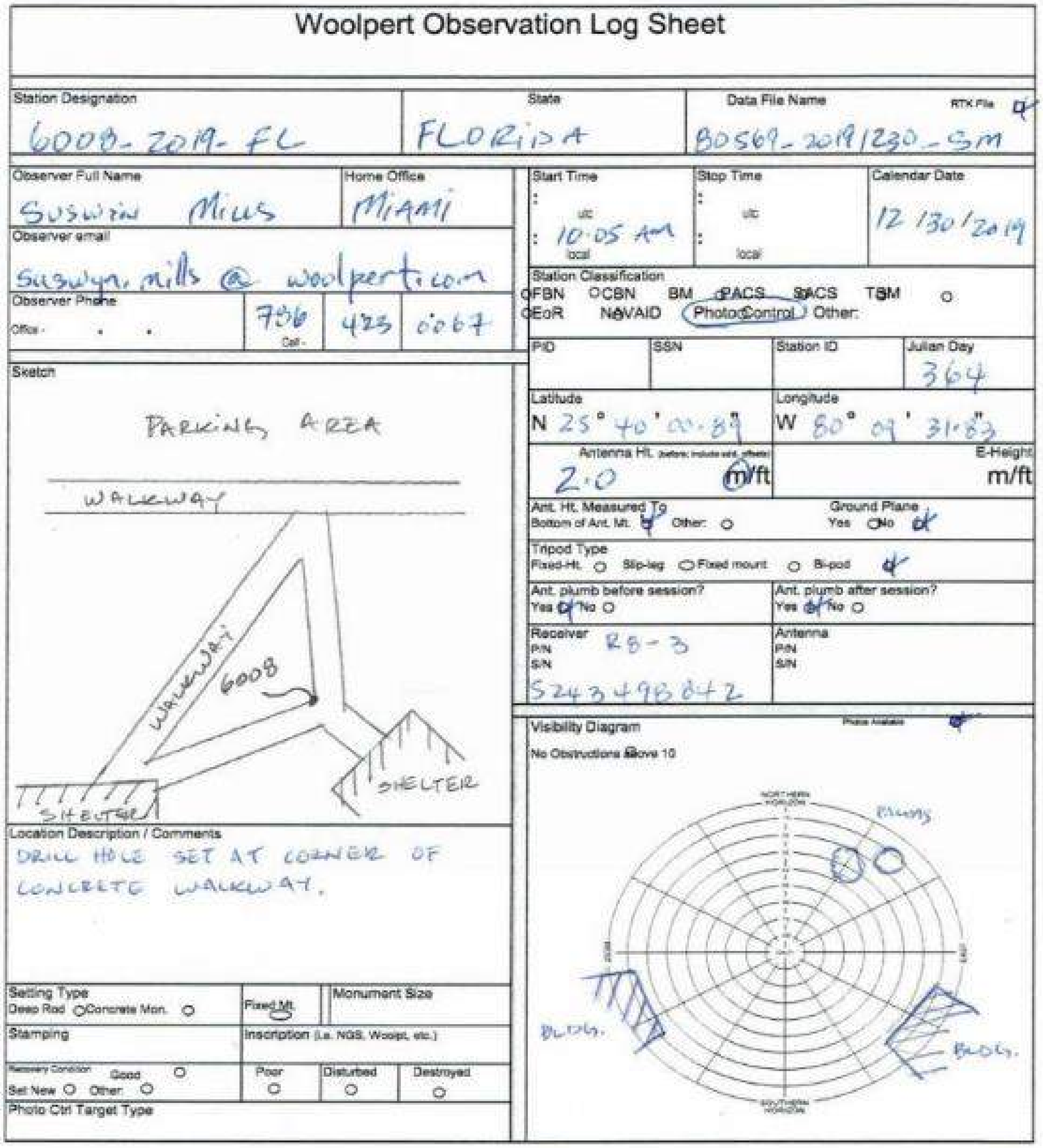
6008_2019_FL, 1, 20191230

6008_2019_FL, 3N, 20191230

6008_2019_FL, 3E, 20191230

## GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6008_2019_FL
Operator Name: Suswyn Mills
Date of Field Survey: 12/30/2019
GPS Session File Name: 80569_20191230_SM.job



### Woolpert Observation Log Sheet

Station Designation: 6008-2019-FL
State: FLORIDA
Data File Name: 80569-20191230-SM
RTX File ✓

Observer Full Name: Suswin Mills
Home Office: Miami
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . ; Cell - 786 423 0067

Start Time: : utc : 10:05 AM local
Stop Time: : utc : local
Calendar Date: 12/30/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 364

Latitude: N 25° 40' 00.89"
Longitude: W 80° 09' 31.83"

Antenna Ht. (before; include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: [✓ Bottom of Ant. Mt.] Other: ○
Ground Plane: Yes ○ [✓ No]

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ [✓ Bi-pod]

Ant. plumb before session? [✓ Yes] No ○
Ant. plumb after session? [✓ Yes] No ○

Receiver: RS-3
P/N
S/N: 5243498842

Antenna
P/N
S/N

Sketch

Location Description / Comments: DRILL HOLE SET AT CORNER OF CONCRETE WALKWAY.

Visibility Diagram
No Obstructions Above 10
[✓ Photo Available]

Setting Type: Deep Rod ○ Concrete Mon. ○
[✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 6009_2019_FL | GPS Session File Name | 80569_20191217_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **182793.213** | **599714.067** | **Datum (Epoch)** |
| **Easting** | **288101.989** | **945214.608** | **Datum (Epoch)** |
| **Orthometric Height** | **0.562** | **1.844** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°58'51.17271" | Start Time : | 8:06:46 AM Stop Time : 8:06:58 AM |
| Longitude | W80°07'12.46099" | PDOP Max: | 1.836 |
| Ellipsoidal Height | -25.131 m | Start Time : | 1:38:25 PM Stop Time : 1:38:39 PM |
| Type of Mark | Set PK Nail | PDOP Max: | 2.022 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Sunny |

PHOTOS

NORTH

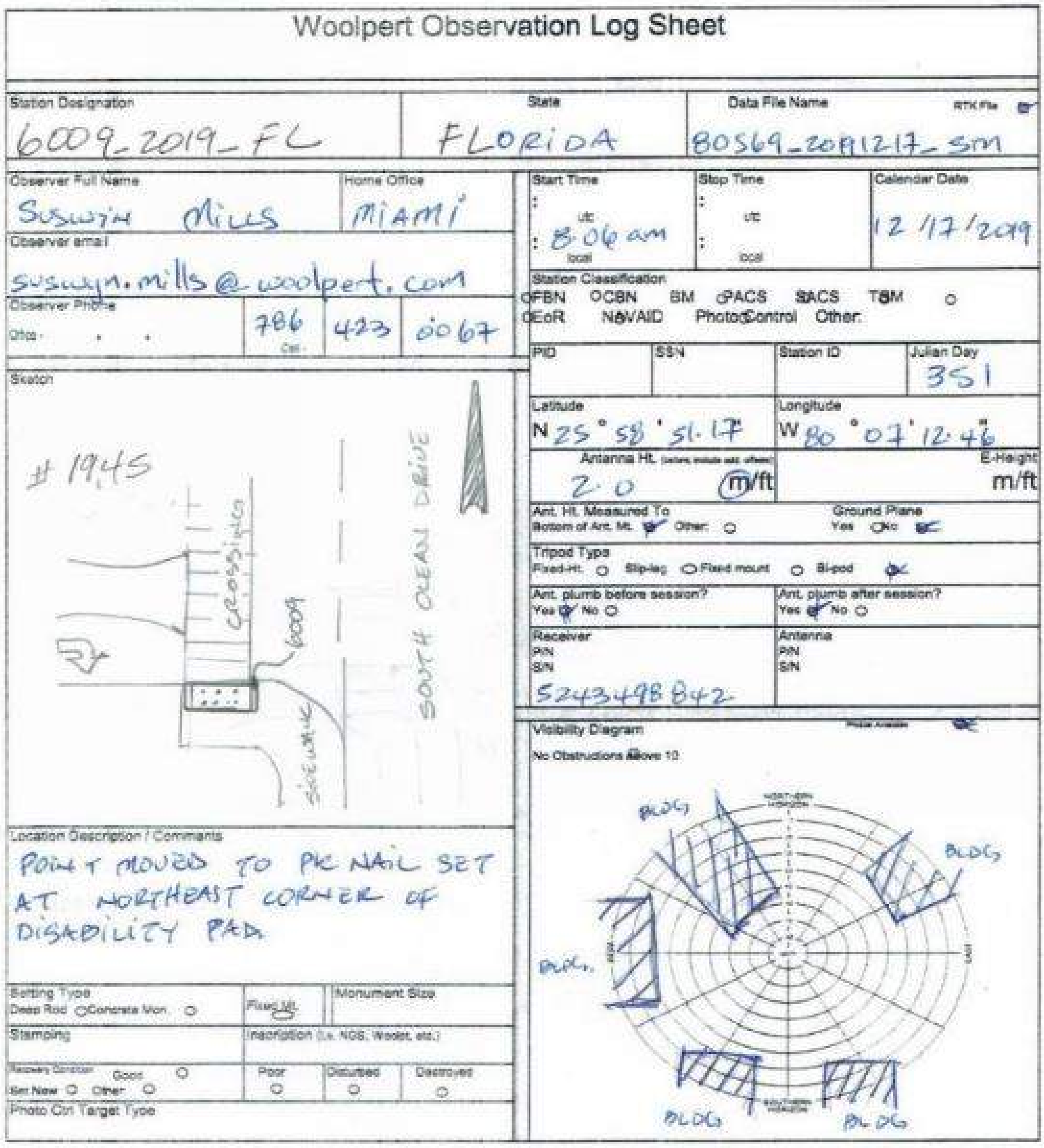
6009_2019_FL, 1, 20191217

6009_2019_FL, 3W, 20191217

6009_2019_FL, 3S, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 6009_2019_FL | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 6009_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: Miami
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . .   Cell - 786 423 0067

Start Time: : utc : 8:06 am local
Stop Time: : utc : local
Calendar Date: 12/17/2019

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID ○Photo Control Other:

PID:
SSN:
Station ID:
Julian Day: 351

Latitude: N 25° 58' 51.17"
Longitude: W 80° 07' 12.46"

Antenna Ht. (before, include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver P/N: S/N: 5243498842
Antenna P/N: S/N:

Sketch

Visibility Diagram
Photo Available ☑
No Obstructions Above 10

Location Description / Comments:
POINT MOVED TO PK NAIL SET
AT NORTHEAST CORNER OF
DISABILITY PAD

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6010_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | 182374.947 | 598341.804 | Datum (Epoch) |
| **Easting** | 263579.221 | 864759.493 | Datum (Epoch) |
| **Orthometric Height** | 1.813 | 5.949 | Datum (Epoch) |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°58'42.19629"
Longitude: W80°21'54.15186"
Ellipsoidal Height: -23.182 m
Type of Mark: Found PK Nail at Corner of Stop Bar
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 8:59:35 AM Stop Time : 9:00:09 AM
PDOP Max: 1.686
Start Time : 2:07:34 PM Stop Time : 2:07:46 PM
PDOP Max: 1.991
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH

6010_2019_FL, 1, 20191218

6010_2019_FL, 3S, 20191218

6010_2019_FL, 3E, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6010_2019_FL
Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

## Woolpert Observation Log Sheet

Station Designation: 6010-2019-FL
State: FLORIDA
Data File Name: 80569-20191218-SM
RTK File ✓

Observer Full Name: Suswyn Mills
Home Office: Miami
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 8 59 am local
Stop Time: : utc : local
Calendar Date: 12/18/2019

Station Classification
○FBN ○CBN BM ○PACS SACS TBM ○
○EoR NAVAID [✓ PhotoControl] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N 25° 58' 42.19"
Longitude: W 80° 21' 54.15"

Antenna Ht. (before, include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓

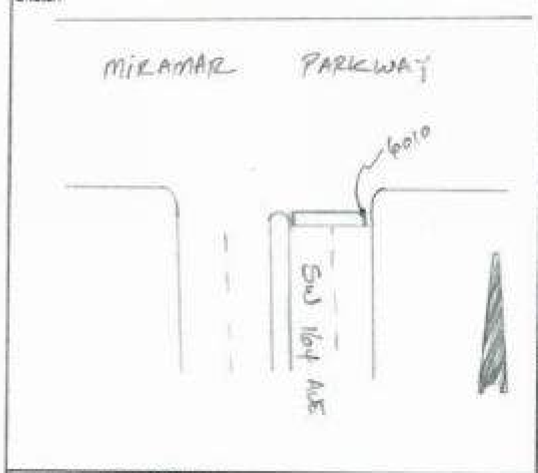
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver RB-3
P/N
S/N

Antenna
P/N
S/N

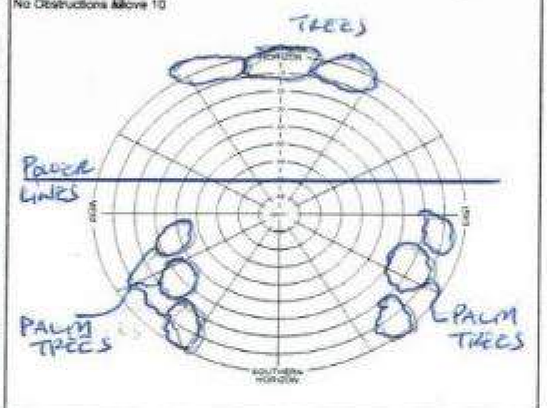
Sketch



Location Description / Comments
POINT MOVED 10 FT WEST TO PICNAIL FOUND AT NORTHEAST CORNER OF STOP BAR

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt.
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpert, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

Visibility Diagram
Photo Available ✓
No Obstructions Above 10



# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6011_2020_FL

Operator Name: Suswyn Mills
Date of Field Survey: 1/2/2020
GPS Session File Name: 80569_20200102_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **141301.910** | **463588.015** | **Datum (Epoch)** |
| **Easting** | **242690.997** | **796228.712** | **Datum (Epoch)** |
| **Orthometric Height** | **2.110** | **6.922** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°36'30.22303"
Longitude: W80°34'29.88706"
Ellipsoidal Height: -22.398 m
Type of Mark: Set PK Nail at Corner of Stop Bar
Notes:

Receiver: (e.g. R8, R10) Trimble R8 GNSS/SPS88x Internal
Start Time : 10:26:24 AM Stop Time : 10:26:43 AM
PDOP Max: 1.510
Start Time : 2:55:11 PM Stop Time : 2:56:22 PM
PDOP Max: 2.001
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

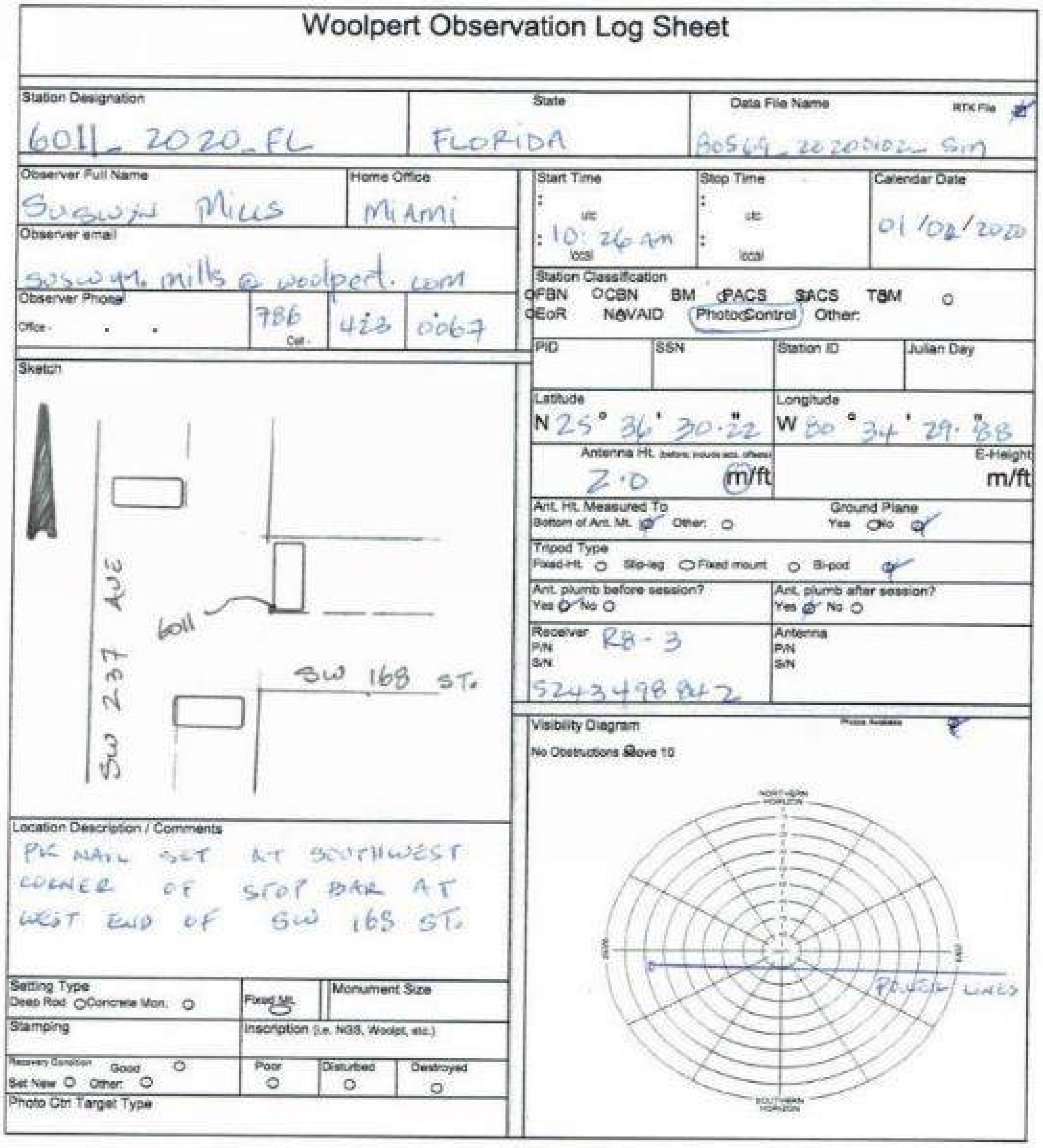
6011_2020_FL, 1, 20200102

6011_2020_FL, 3W, 20200102

6011_2020_FL, 3E, 20200102

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 1/2/2020 |
| Project Point Name | 6011_2020_FL | GPS Session File Name | 80569_20200102_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 6011_2020_FL
State: FLORIDA
Data File Name: 80569_20200102_SM
RTK File ✓

Observer Full Name: Suswyn Mills
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 10:26 am local
Stop Time: : utc : local
Calendar Date: 01/02/2020

Station Classification
○ FBN ○ CBN BM ○ PACS ○ SACS TBM ○
○ EoR NAVAID [✓ Photo Control] Other:

PID | SSN | Station ID | Julian Day

Latitude: N 25° 36' 30.22"
Longitude: W 80° 34' 29.88"

Antenna Ht. (before, include ant. offset): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○
Ant. plumb after session? Yes ✓ No ○

Receiver P/N: R8-3
S/N: 5243498842
Antenna P/N S/N

Sketch

Visibility Diagram — Photo Available ✓
No Obstructions Above 10

Location Description / Comments
PK NAIL SET AT SOUTHWEST CORNER OF STOP BAR AT WEST END OF SW 168 ST.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6012_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **125967.907** | **413279.708** | **Datum (Epoch)** |
| **Easting** | **252669.781** | **828967.439** | **Datum (Epoch)** |
| **Orthometric Height** | **2.155** | **7.071** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°28'10.75113"
Longitude: W80°28'34.40843"
Ellipsoidal Height: -22.699 m
Type of Mark: Set PK Nail at Corner of Sidewalk
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 9:40:20 AM Stop Time : 9:40:30 AM
PDOP Max: 1.396
Start Time : 12:59:37 PM Stop Time : 12:59:47 PM
PDOP Max: 1.685
Antenna Height: 2.00 m
Weather Conditions: Sunny

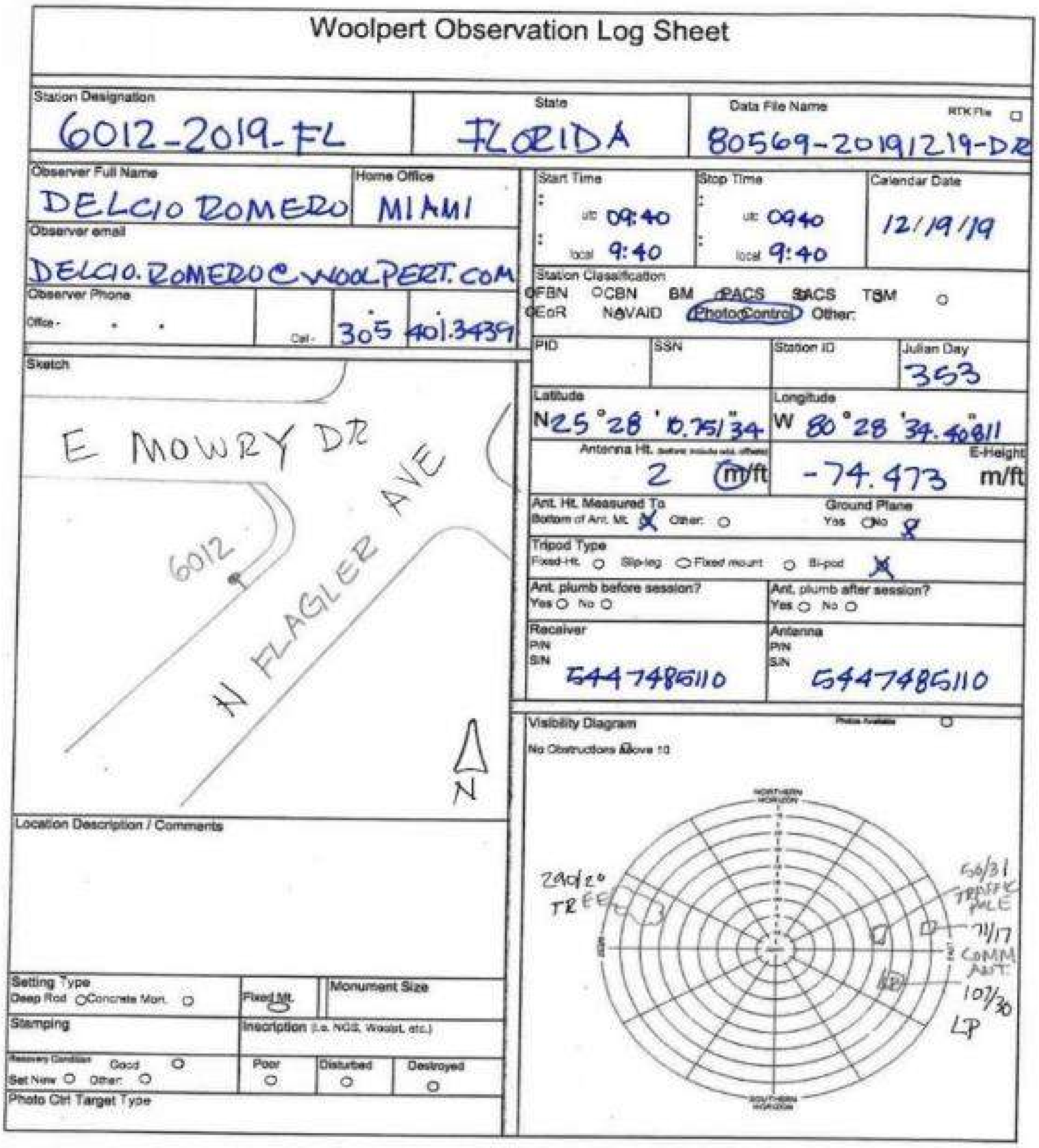
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 6012_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 6012-2019-FL

State: FLORIDA

Data File Name: 80569-20191219-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 305 401.3439

Start Time: utc 09:40 local 9:40

Stop Time: utc 0940 local 9:40

Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 353

Latitude: N25°28'10.75134"

Longitude: W 80°28'34.40811"

Antenna Ht. (before include add. offsets): 2 [✓ m]/ft

E-Height: -74.473 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 5447486110

Antenna P/N S/N 5447486110

Sketch

Location Description / Comments

Visibility Diagram

Photos Available ○

No Obstructions Above 10

Setting Type: Deep Rod ○ Concrete Mon. ○

Fixed Mt. ○

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | | |
|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | |
| Project Number | 80569 | |
| Project Point Name | 6013_2019_FL | |

| | | |
|---|---|---|
| Operator Name | Suswyn Mills |
| Date of Field Survey | 12/27/2019 |
| GPS Session File Name | 80569_20191230_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **133594.917** | **438302.658** | **Datum (Epoch)** |
| **Easting** | **267246.972** | **876792.774** | **Datum (Epoch)** |
| **Orthometric Height** | **1.476** | **4.842** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25°32'16.48148" |
| Longitude | W80°19'51.19347" |
| Ellipsoidal Height | -23.934 m |
| Type of Mark | Set Drill Hole |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 10:19:02 AM | Stop Time : | 10:19:12 AM |
| PDOP Max: | 1.407 | | |
| Start Time : | 1:58:28 PM | Stop Time : | 1:58:43 PM |
| PDOP Max: | 1.681 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Sunny | | |

PHOTOS

NORTH

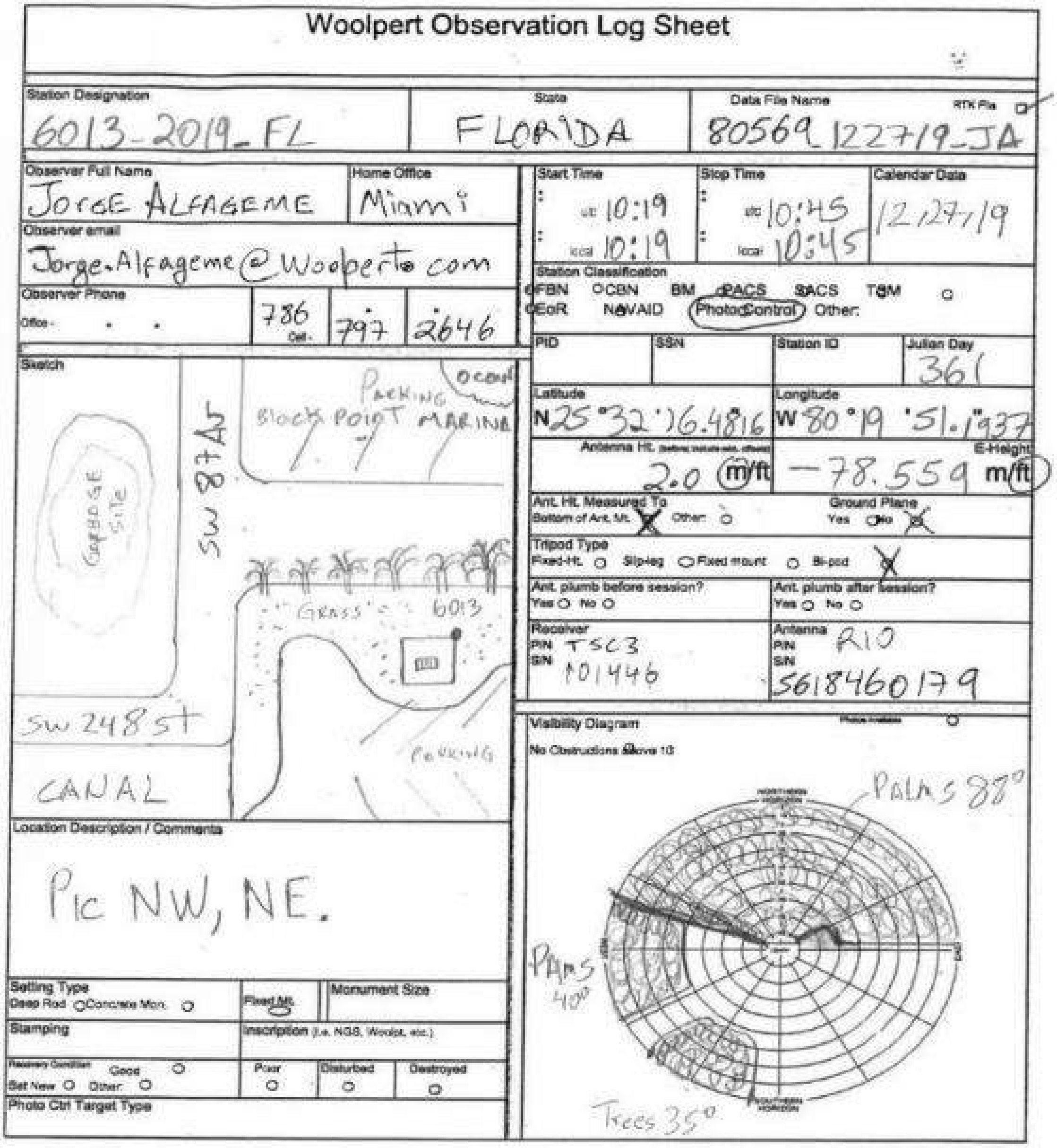
6013_2019_FL, 1, 20191227

6013_2019_FL, 3NW, 20191227

6013_2019_FL, 3NE, 20191227

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 6013_2019_FL | GPS Session File Name | 80569_20191230_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 6013-2019_FL
State: FLORIDA
Data File Name: 80569_122719_JA
RTK File ☐

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell. 786 797 2646

Start Time: utc 10:19 local 10:19
Stop Time: utc 10:45 local 10:45
Calendar Date: 12/27/19

Station Classification
○ FBN ○ CBN ○ BM ○ PACS ○ SACS ○ TBM ○
○ EoR ○ NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 361

Latitude: N25°32'26.4816"
Longitude: W80°19'51.1937"
Antenna Ht. (before/outside adj. offsets): 2.0 [✓ m]/ft
E-Height: -78.559 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3
S/N: 101446
Antenna P/N: R10
S/N: 5618460179

Sketch

Visibility Diagram
Photos Available ○
No Obstructions Above 10

Location Description / Comments

Pic NW, NE.

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Ht.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | |
|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos |
| Project Number | 80569 |
| Project Point Name | 6014_2019_FL |

| | |
|---|---|
| Operator Name | Jorge Alfageme |
| Date of Field Survey | 12/23/2019 |
| GPS Session File Name | 80569_20191223_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **142394.952** | **467174.104** | **Datum (Epoch)** |
| **Easting** | **255660.395** | **838779.146** | **Datum (Epoch)** |
| **Orthometric Height** | **2.705** | **8.874** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

RTK Base ☐

Network Adjustment ☐

FDOT FPRN X

OPUS

Other

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25°37'04.18657" |
| Longitude | W80°26'44.89474" |
| Ellipsoidal Height | -22.178 m |
| Type of Mark | Set Drill Hole |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 2:23:21 PM | Stop Time : | 2:23:34 PM |
| PDOP Max: | 1.187 | | |
| Start Time : | 9:06:17 AM | Stop Time : | 9:06:29 AM |
| PDOP Max: | 1.258 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Sunny | | |

PHOTOS

NORTH

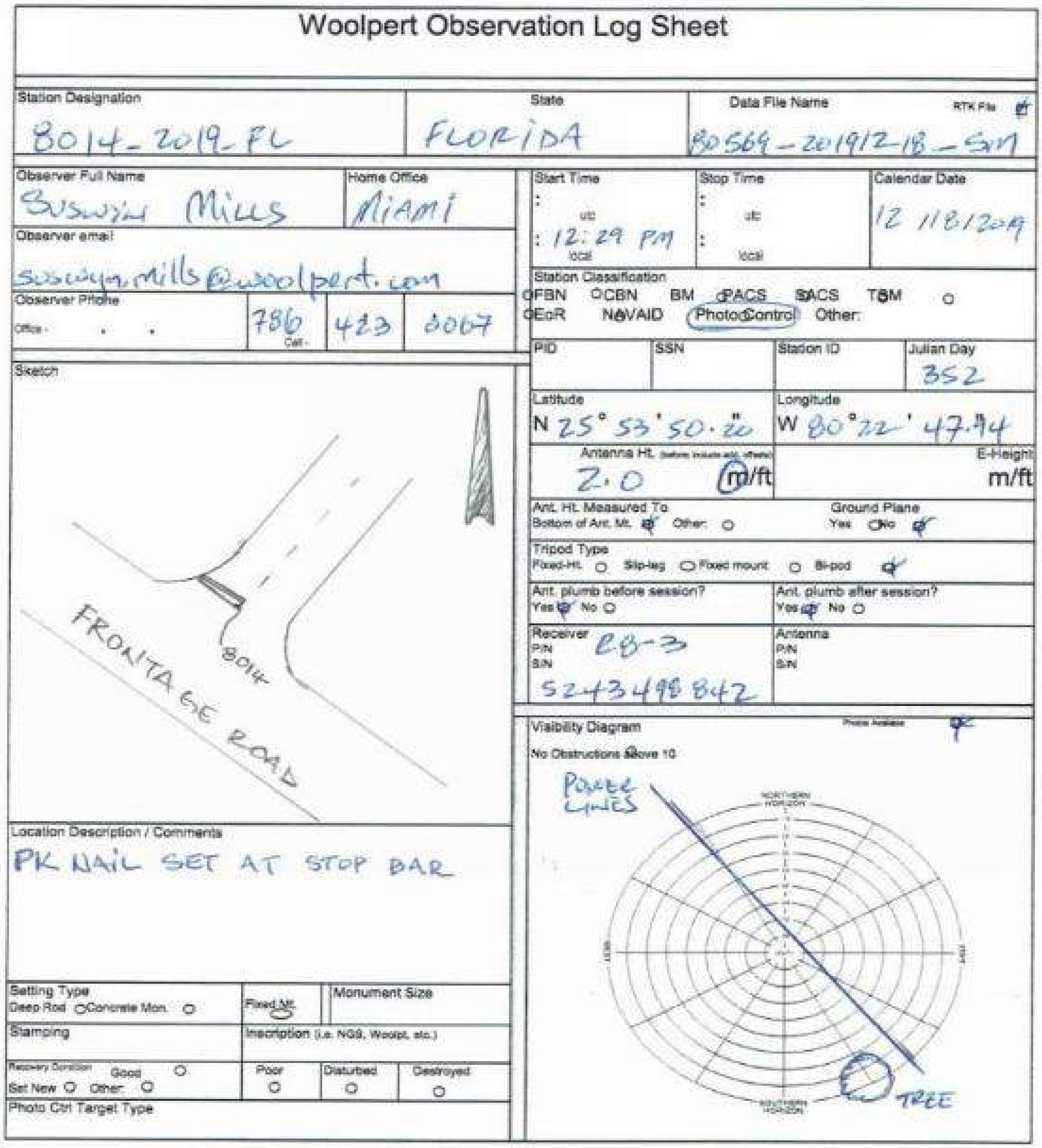
6014_2019_FL, 1, 20191220

6014_2019_FL, 3N, 20191220

6014_2019_FL, 3E, 20191220

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/23/2019 |
| Project Point Name | 6014_2019_FL | GPS Session File Name | 80569_20191223_JA.job |



### Woolpert Observation Log Sheet

Station Designation: 8014_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 12:29 PM local

Stop Time: : utc : local

Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 53' 50.20"

Longitude: W 80° 22' 47.94

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N: RB-3 S/N: 5243498842

Antenna P/N: S/N:

Sketch

Visibility Diagram

Photo Available ☑

No Obstructions Above 10

Location Description / Comments: PK NAIL SET AT STOP BAR

Setting Type: Deep Rod ○Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Jorge Alfageme |
| Project Number | 80569 | | Date of Field Survey | 12/13/2019 |
| Project Point Name | 6015_2019_FL | | GPS Session File Name | 80569_20191216_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **159069.129** | **521879.300** | **Datum (Epoch)** |
| **Easting** | **270699.917** | **888121.312** | **Datum (Epoch)** |
| **Orthometric Height** | **1.783** | **5.850** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal |
| Latitude | N25°46'03.69916" | Start Time : | 3:13:40 PM Stop Time : 3:13:52 PM |
| Longitude | W80°17'42.65577" | PDOP Max: | 1.221 |
| Ellipsoidal Height | -23.391 m | Start Time : | 9:40:59 AM Stop Time : 9:41:10 AM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.326 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Sunny |

PHOTOS

NORTH

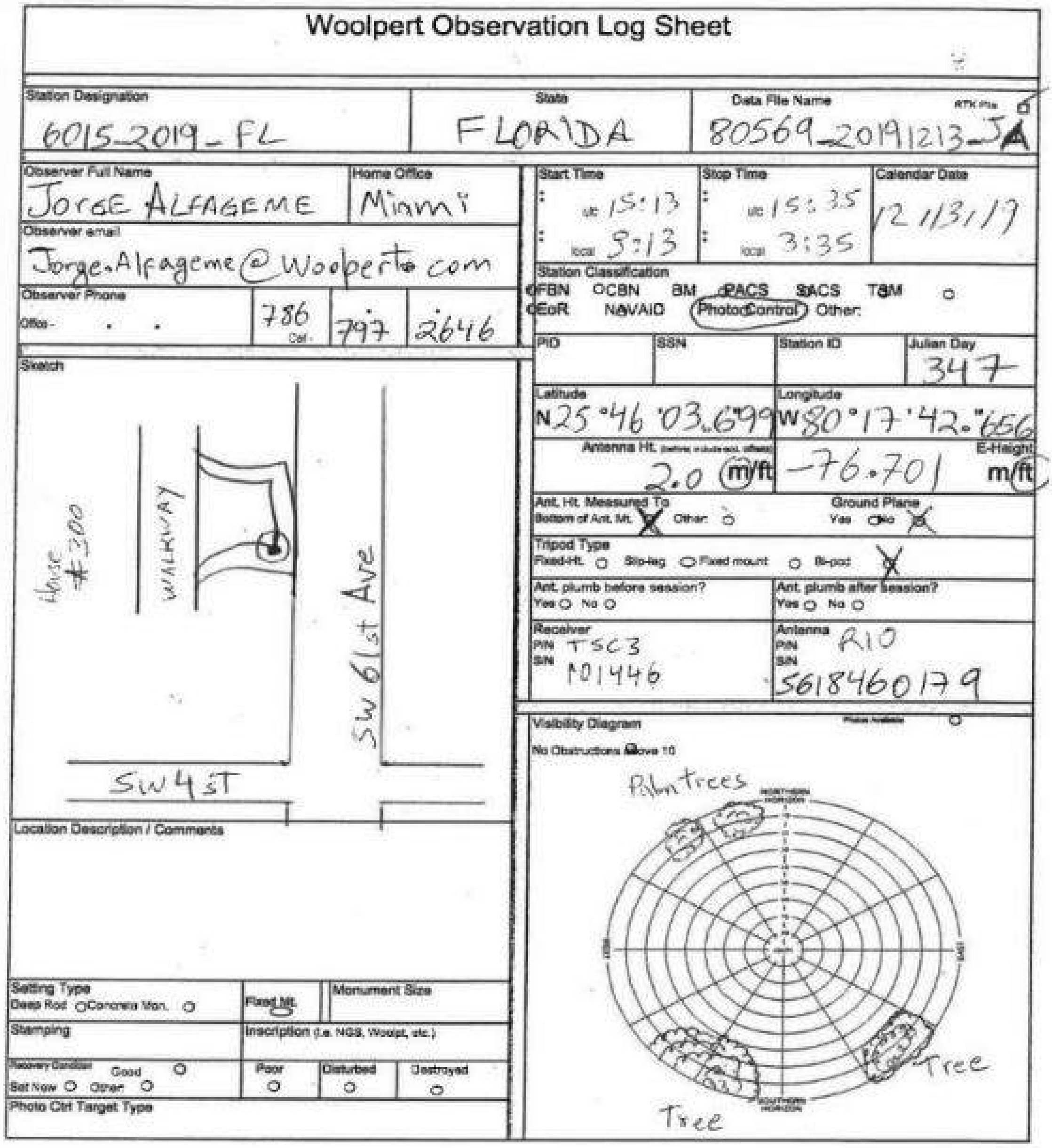
6015_2019_FL, 1, 20191213

6015_2019_FL, 3W, 20191213

6015_2019_FL, 3N, 20191213

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/13/2019 |
| Project Point Name | 6015_2019_FL | GPS Session File Name | 80569_20191216_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 6015_2019_FL

State: FLORIDA

Data File Name: 80569_20191213_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolperto.com

Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 15:13 local 9:13

Stop Time: utc 15:35 local 3:35

Calendar Date: 12/13/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 347

Latitude: N25°46'03.699"

Longitude: W80°17'42."656

Antenna Ht. (before, includes ext. offsets): 2.0 [✓ m]/ft

E-Height: -76.701 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram: No Obstructions Above 10 ● Photos Available ○

Location Description / Comments:

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6016_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191218_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **165534.547** | **543091.261** | **Datum (Epoch)** |
| **Easting** | **263208.651** | **863543.715** | **Datum (Epoch)** |
| **Orthometric Height** | **2.163** | **7.097** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°49'35.02804"
Longitude: W80°22'10.38447"
Ellipsoidal Height: -22.861 m
Type of Mark: Set PK Nail at Corner of Stop Bar
Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 1:04:52 PM Stop Time : 1:05:03 PM
PDOP Max: 1.331
Start Time : 9:32:12 AM Stop Time : 9:32:23 AM
PDOP Max: 1.171
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧
NORTH

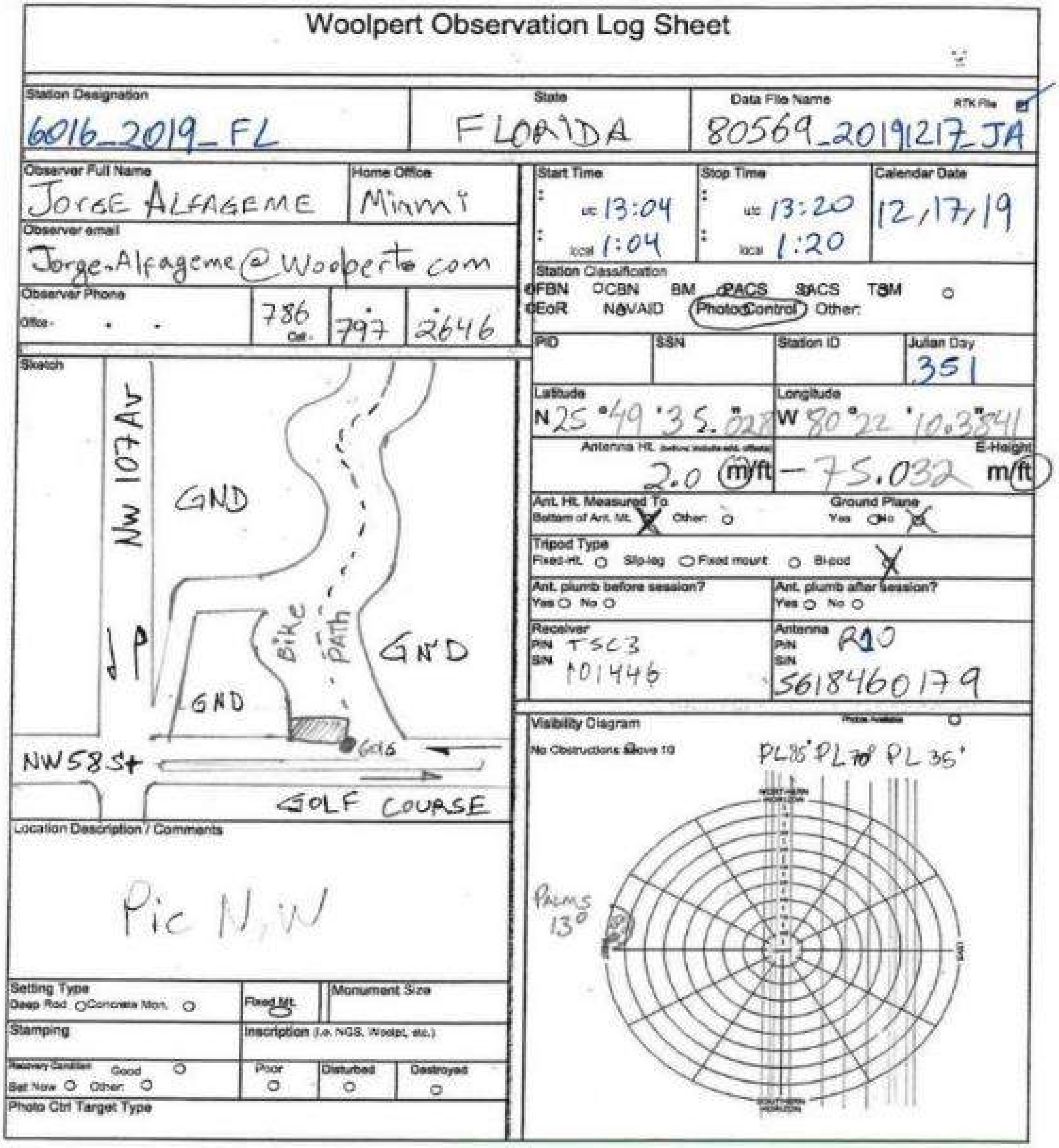
6016_2019_FL, 1, 20191217

6016_2019_FL, 3W, 20191217

6016_2019_FL, 3N, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 6016_2019_FL | GPS Session File Name | 80569_20191218_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 6016_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_JA
RTK File ☑

Observer Full Name: JorGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 . 797 . 2646

Start Time: utc 13:04 local 1:04
Stop Time: utc 13:20 local 1:20
Calendar Date: 12/17/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ ○Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 351

Latitude: N25°49'35.028"
Longitude: W80°22'10.3841"

Antenna Ht. (before installed adj. offsets): 2.0 [✓ m]/ft
E-Height: −75.032 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver: P/N TSC3 S/N 101446
Antenna: P/N R10 S/N 5618460179

Sketch

Location Description / Comments: Pic N, W

Visibility Diagram
No Obstructions Above 10
Photos Available ○

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set Now ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6017_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569-20191218-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **171932.086** | **564080.517** | **Datum (Epoch)** |
| **Easting** | **275871.383** | **905088.028** | **Datum (Epoch)** |
| **Orthometric Height** | **2.030** | **6.661** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

Mark Stamping
Latitude: N25°53'00.74092"
Longitude: W80°14'34.41249"
Ellipsoidal Height: -23.219 m
Type of Mark: Set PK Nail

Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 10:17:34 AM Stop Time : 10:17:44 AM
PDOP Max: 1.516
Start Time : 1:26:10 PM Stop Time : 1:26:20 PM
PDOP Max: 1.452
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧
NORTH

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 6017_2019_FL | GPS Session File Name | 80569-20191218-DR.job |

### Woolpert Observation Log Sheet

Station Designation: 6017_2019_FL
State: FLORIDA
Data File Name: 80569-20191218-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell- 305 401.3439

Start Time: utc 10:17 local 10:17
Stop Time: utc 10:17 local 10:17
Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N25°53'00.74092"
Longitude: W 80°14'34.41249"
Antenna Ht. (before, include add. offsets): 2 [✓ m]/ft
E-Height: -76.178 m/ft

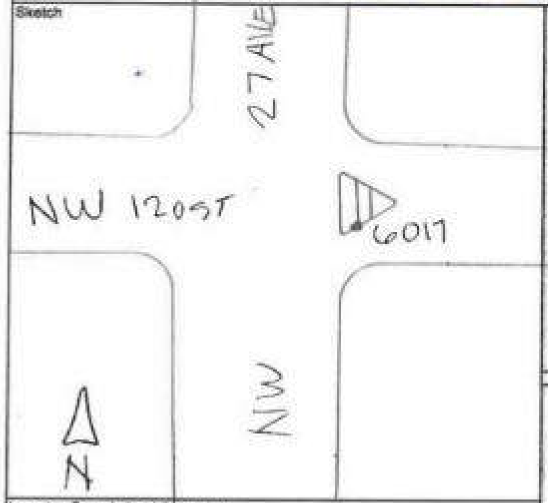
Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

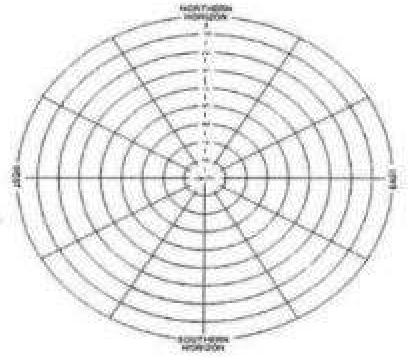
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 5447486110
Antenna P/N S/N 5447486110

Sketch



Visibility Diagram
No Obstructions Above 10 N/A
Photo Available ○



Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 6018_2019_FL | GPS Session File Name | 80569_20191218_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **171822.764** | **563721.852** | **Datum (Epoch)** |
| **Easting** | **251636.206** | **825576.452** | **Datum (Epoch)** |
| **Orthometric Height** | **2.626** | **8.616** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

RTK Base ☐

Network Adjustment ☐

FDOT FPRN X

OPUS

Other

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°53'01.00598" | Start Time : | 8:06:12 AM Stop Time : 8:07:23 AM |
| Longitude | W80°29'05.01265" | PDOP Max: | 1.588 |
| Ellipsoidal Height | -22.136 m | Start Time : | 1:36:25 PM Stop Time : 1:36:36 PM |
| Type of Mark | Found PK Nail at Corner of Stop Bar | PDOP Max: | 1.413 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Cloudy |

PHOTOS

⇧

NORTH

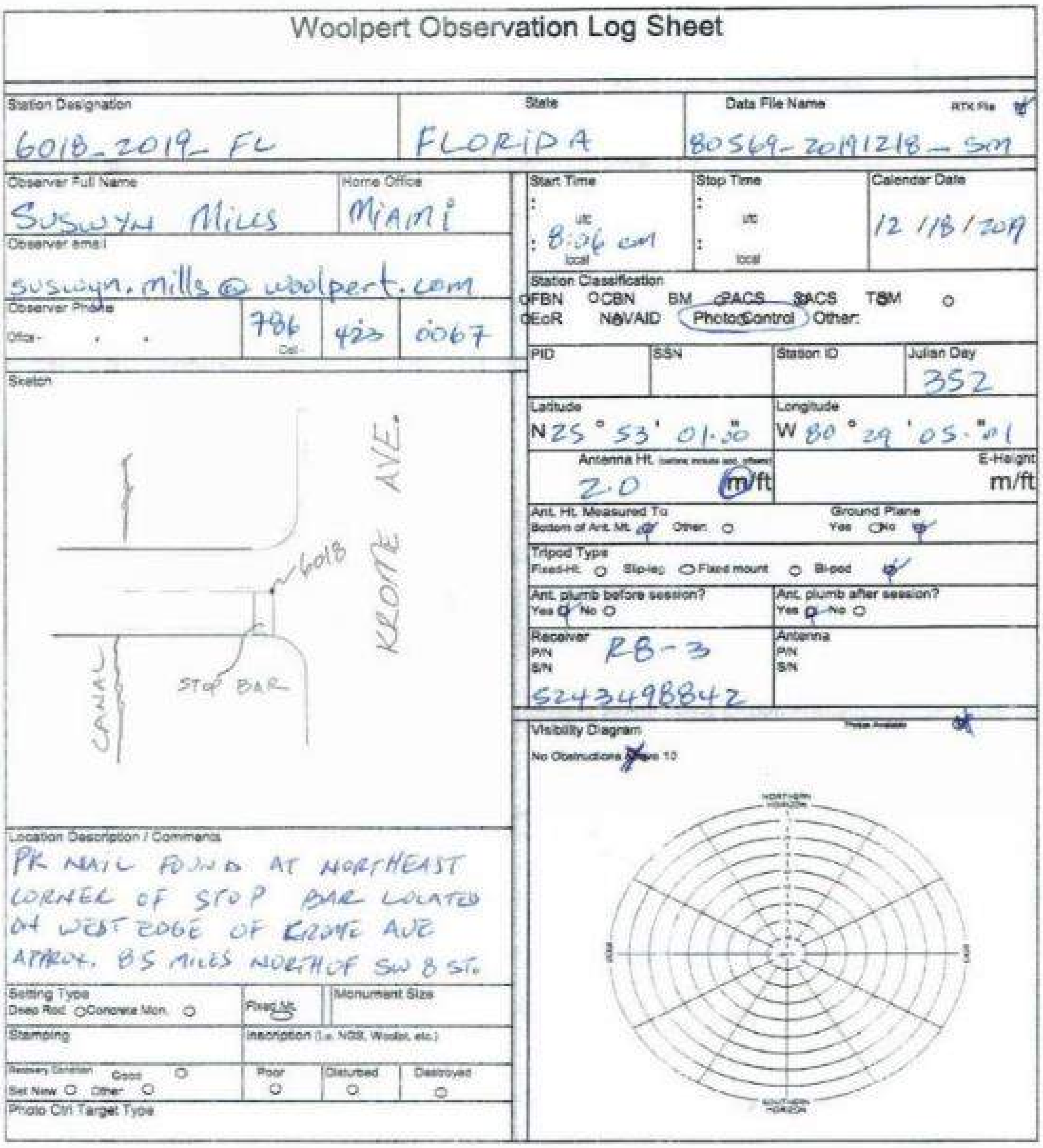
**6018_2019_FL, 1, 20191218**

**6018_2019_FL, 3W, 20191218**

**6018_2019_FL, 3S, 20191218**

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 6018_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 6018_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_SM

RTX File ✓

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 8:06 am local

Stop Time: : utc : local

Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 53' 01.30"

Longitude: W 80° 29' 05.01"

Antenna Ht. (antenna includes app. offset): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○

Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○

Ant. plumb after session? Yes ✓ No ○

Receiver P/N RB-3 S/N 5243498842

Antenna P/N S/N

Sketch

Visibility Diagram

Photos Available ✓

No Obstructions ✓ above 10

Location Description / Comments:
PK NAIL FOUND AT NORTHEAST CORNER OF STOP BAR LOCATED ON WEST EDGE OF KROME AVE APPROX. 8.5 MILES NORTH OF SW 8 ST.

Setting Type: Deep Rod ○ Concrete Mon. ○

Fixed Mt.

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6019_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191219_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **171793.740** | **563626.629** | **Datum (Epoch)** |
| **Easting** | **287779.225** | **944155.675** | **Datum (Epoch)** |
| **Orthometric Height** | **0.912** | **2.991** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS
Other

Mark Stamping
Latitude: N25"52'53.83837"
Longitude: W80°07'26.70796"
Ellipsoidal Height: -24.781 m
Type of Mark: Set Chisseled X at Center of Manhole
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 7:40:27 AM Stop Time : 7:40:38 AM
PDOP Max: 1.945
Start Time : 12:57:40 PM Stop Time : 1:01:13 PM
PDOP Max: 2.029
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

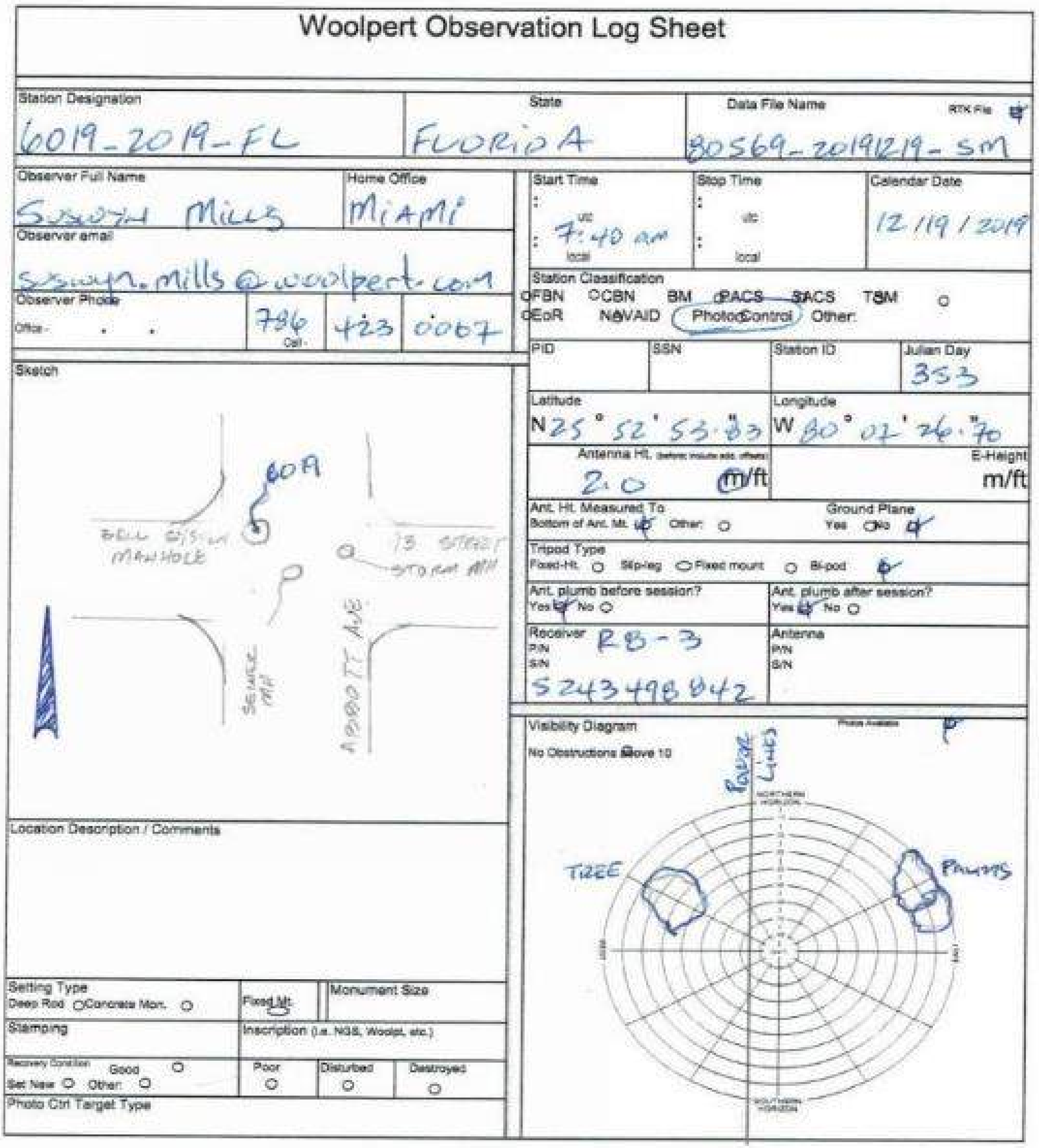
**6019_2019_FL, 1, 20191219**

**6019_2019_FL, 3N, 20191219**

**6019_2019_FL, 3E, 20191219**

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 6019_2019_FL | GPS Session File Name | 80569_20191219_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 6019_2019_FL
State: FLORIDA
Data File Name: 80569_20191219_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 7:40 am local
Stop Time: : utc : local
Calendar Date: 12/19/2019

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N 25° 52' 53.83"
Longitude: W 80° 07' 26.70"

Antenna Ht. (before include adj. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver: RB-3
P/N
S/N: 5243498842

Antenna
P/N
S/N

Sketch

Visibility Diagram
No Obstructions Above 10
Photos Available ☑

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○
Fixed Ht.
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 6020_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **181712.155** | **596167.294** | **Datum (Epoch)** |
| **Easting** | **277551.579** | **910600.472** | **Datum (Epoch)** |
| **Orthometric Height** | **1.410** | **4.625** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude: N25°58'18.21363"
Longitude: W80°13'31.98145"
Ellipsoidal Height: -23.914 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:21:37 AM Stop Time : 10:22:08 AM
PDOP Max: 1.760
Start Time : 2:41:57 PM Stop Time : 2:42:08 PM
PDOP Max: 1.578
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

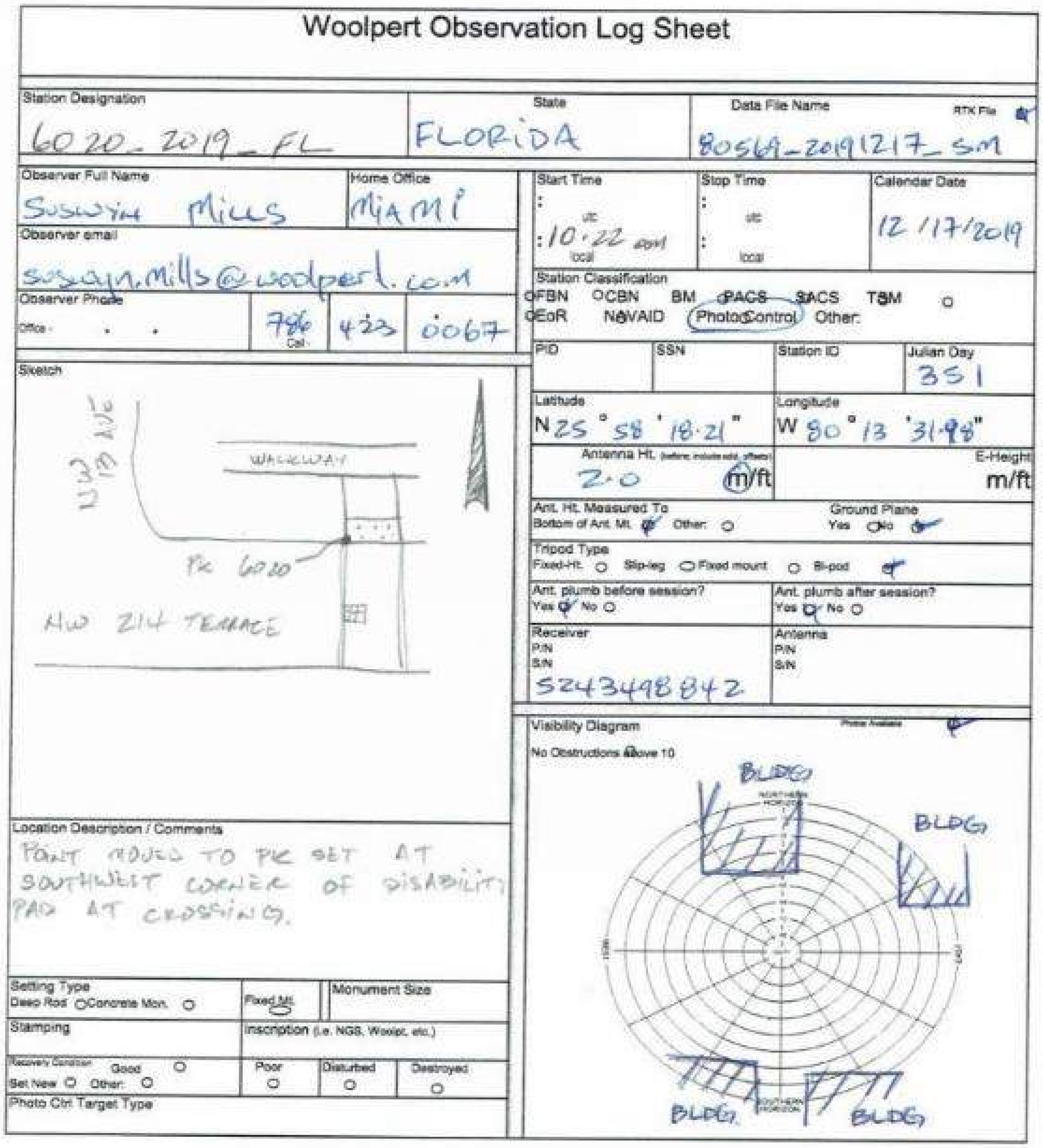
6020_2019_FL, 1, 20191217

6020_2019_FL, 3W, 20191217

6020_2019_FL, 3S, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 6020_2019_FL | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 6020_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_SM
RTK File ✓

Observer Full Name: SUSWYN MILLS
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc :10:22 AM local
Stop Time: : utc : local
Calendar Date: 12/17/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 351

Latitude: N 25 ° 58 ' 18.21 "
Longitude: W 80 ° 13 ' 31.98 "

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○
Ant. plumb after session? Yes ✓ No ○

Receiver P/N: S/N: 5243498842
Antenna P/N: S/N:

Sketch

Location Description / Comments: POINT MOVED TO PK SET AT SOUTHWEST CORNER OF DISABILITY PAD AT CROSSING.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

Visibility Diagram
Photo Available ✓
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8001_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/10/2019
GPS Session File Name: 8001344r.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **163921.133** | **537797.916** | **Datum (Epoch)** |
| **Easting** | **211689.932** | **694519.384** | **Datum (Epoch)** |
| **Orthometric Height** | **3.181** | **10.435** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☒
Other

Mark Stamping:
Latitude: N25°48'47.35166"
Longitude: W80°53'00.29443"
Ellipsoidal Height: -21.020 m
Type of Mark: Set PK Nail at Corner of Sidewalk
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 12:32:01 PM Stop Time : 12:58:18 PM
PDOP Max: 1.945
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH


8001_2019_FL, 1, 20191210

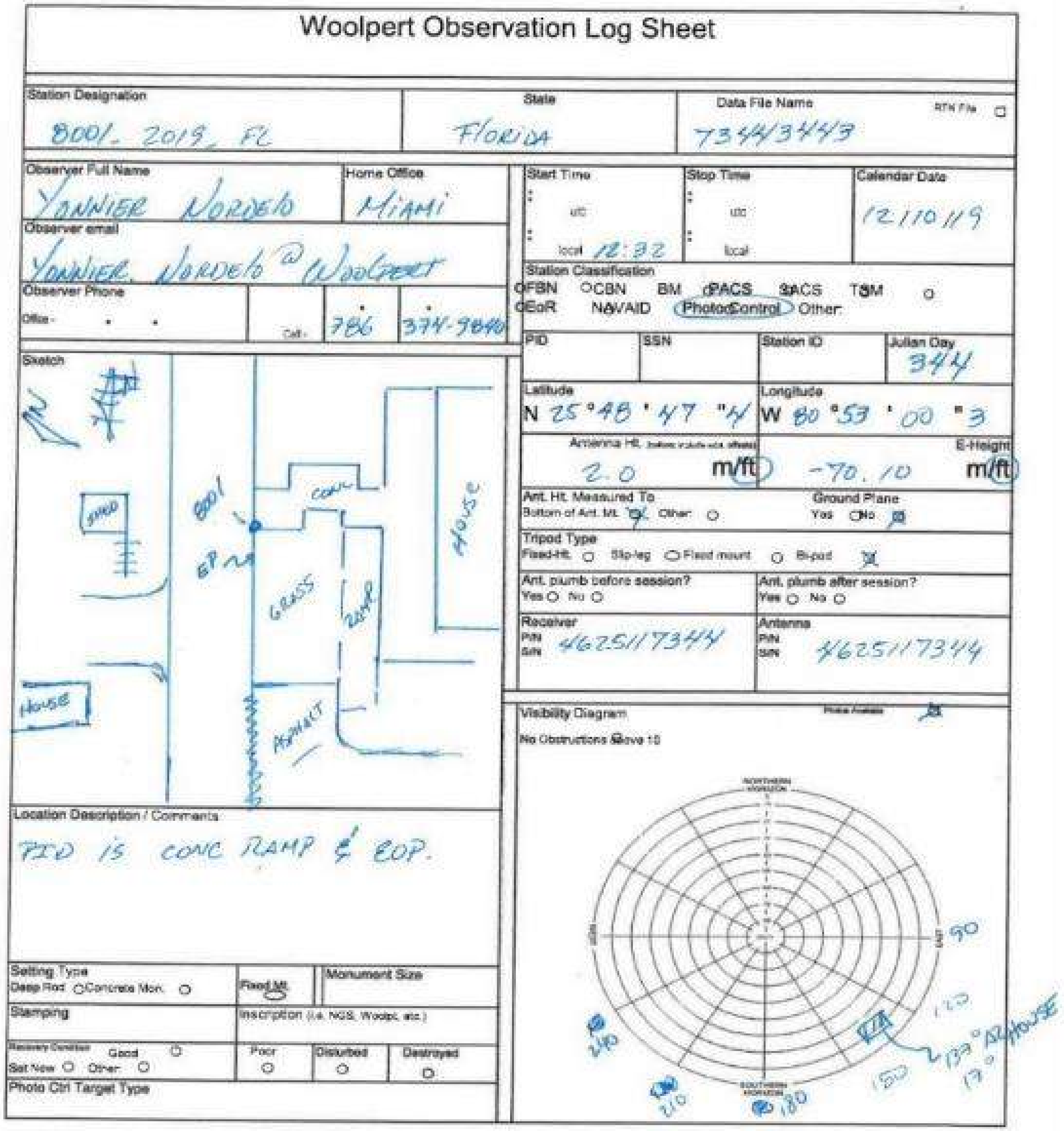

8001_2019_FL, SE, 20191210


8001_2019_FL, 2, 20191210


8001_2019_FL, NE, 20191210

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/10/2019 |
| Project Point Name | 8001_2019_FL | GPS Session File Name | 8001344r.19o.xml |



### Woolpert Observation Log Sheet

Station Designation: 8001_2019_FL

State: FLORIDA

Data File Name: 73443443

RTN File ☐

Observer Full Name: YONNIER NORDELO

Home Office: MIAMI

Observer email: YONNIER.NORDELO@WOOLPERT

Observer Phone: Office - . . Cell - 786 . 374-9840

Start Time: : utc : local 12:32

Stop Time: : utc : local

Calendar Date: 12/10/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 344

Latitude: N 25°48'47"4

Longitude: W 80°53'00"3

Antenna Ht. (before include ant. offsets): 2.0 m/[✓ ft]

E-Height: -70.10 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N: 4625117344

Antenna P/N S/N: 4625117344

Sketch

Location Description / Comments: PID IS CONC RAMP & EOP.

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

Visibility Diagram

Photo Available ☒

No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Yonnier Nordello |
| Project Number | 80569 | | Date of Field Survey | 12/10/2019 |
| Project Point Name | 8002_2019_FL | | GPS Session File Name | 8002344s.19o.xml |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **158254.901** | **519207.954** | **Datum (Epoch)** |
| **Easting** | **217318.705** | **712986.451** | **Datum (Epoch)** |
| **Orthometric Height** | **4.040** | **13.254** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☒ X
Other

| | | | | |
|---|---|---|---|---|
| Mark Stamping | | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°45'43.01384" | | Start Time : | 1:10:32 PM Stop Time : 1:35:32 PM |
| Longitude | W80°49'38.47094" | | PDOP Max: | 3.011 |
| Ellipsoidal Height | -20.114 | m | Start Time : | Stop Time : |
| Type of Mark | Set PK Nail at Corner of Stop Bar | | PDOP Max: | |
| | | | Antenna Height: | 2.00 m |
| Notes | | | Weather Conditions | Sunny |

PHOTOS

NORTH

8002_2019_FL, 1, 20191210

8002_2019_FL, N, 20191210

8002_2019_FL, 2, 20191210

8002_2019_FL, E, 20191210

## GPS STATION RECOVERY - GPS LOG SHEET

Project Name Miami-Dade Counrty, FL Orthos
Project Number 80569
Project Point Name 8002_2019_FL
Operator Name Yonnier Nordello
Date of Field Survey 12/10/2019
GPS Session File Name 8002344s.19o.xml

### Woolpert Observation Log Sheet

Station Designation 8002_2019_FL
State FLORIDA
Data File Name 734434434
RTK File ☐

Observer Full Name YONNIER NORDELO
Home Office MIAMI
Observer email YONNIER.NORDELO@WOOLPERT.COM
Observer Phone Office - . . Cel - 786 374 5890

Start Time utc 13:10 local 1:10
Stop Time utc 13:35 local 1:35
Calendar Date 12/10/19

Station Classification
○FBN ○CBN BM ○PACS ○SACS T○M ○
○EoR N○VAID [✓ Photo○Control] Other:

PID
SSN
Station ID
Julian Day 344

Latitude N 25 ° 45 ' 43 " 10
Longitude W 80 ° 49 ' 38 " 44

Antenna Ht. (before include ant. offsets) 2.0 [✓ m]/ft
E-Height -59.6 m/[✓ ft]

Ant. Ht. Measured To
Bottom of Ant. Mt. ☒ Other: ○
Ground Plane
Yes ○ No ☒

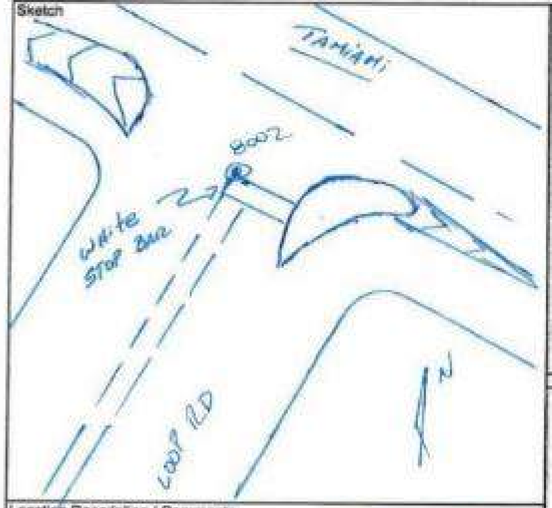
Tripod Type
Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

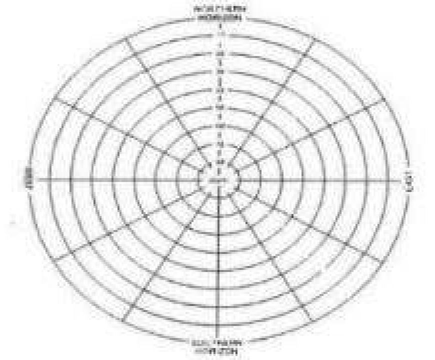
Receiver
P/N
S/N 4625117344

Antenna
P/N
S/N 4625117344

Sketch



Visibility Diagram
Photo Available ☒
No Obstructions Above 10 ☒



Location Description / Comments
N.W CORNER OF THE WHITE STOP BAR.

Setting Type
Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8003_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191219_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **158172.942** | **518939.059** | **Datum (Epoch)** |
| **Easting** | **244049.087** | **800684.380** | **Datum (Epoch)** |
| **Orthometric Height** | **2.276** | **7.469** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°45'38.33486"
Longitude: W80°33'39.20352"
Ellipsoidal Height: -22.290 m
Type of Mark: Found PK Nail at Point of Arrow
Notes:

Receiver: (e.g. R8, R10) Trimble R8 GNSS/SPS88x Internal
Start Time : 10:59:01 AM Stop Time : 11:01:57 AM
PDOP Max: 5.441
Start Time : 2:49:58 PM Stop Time : 2:50:11 PM
PDOP Max: 1.508
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

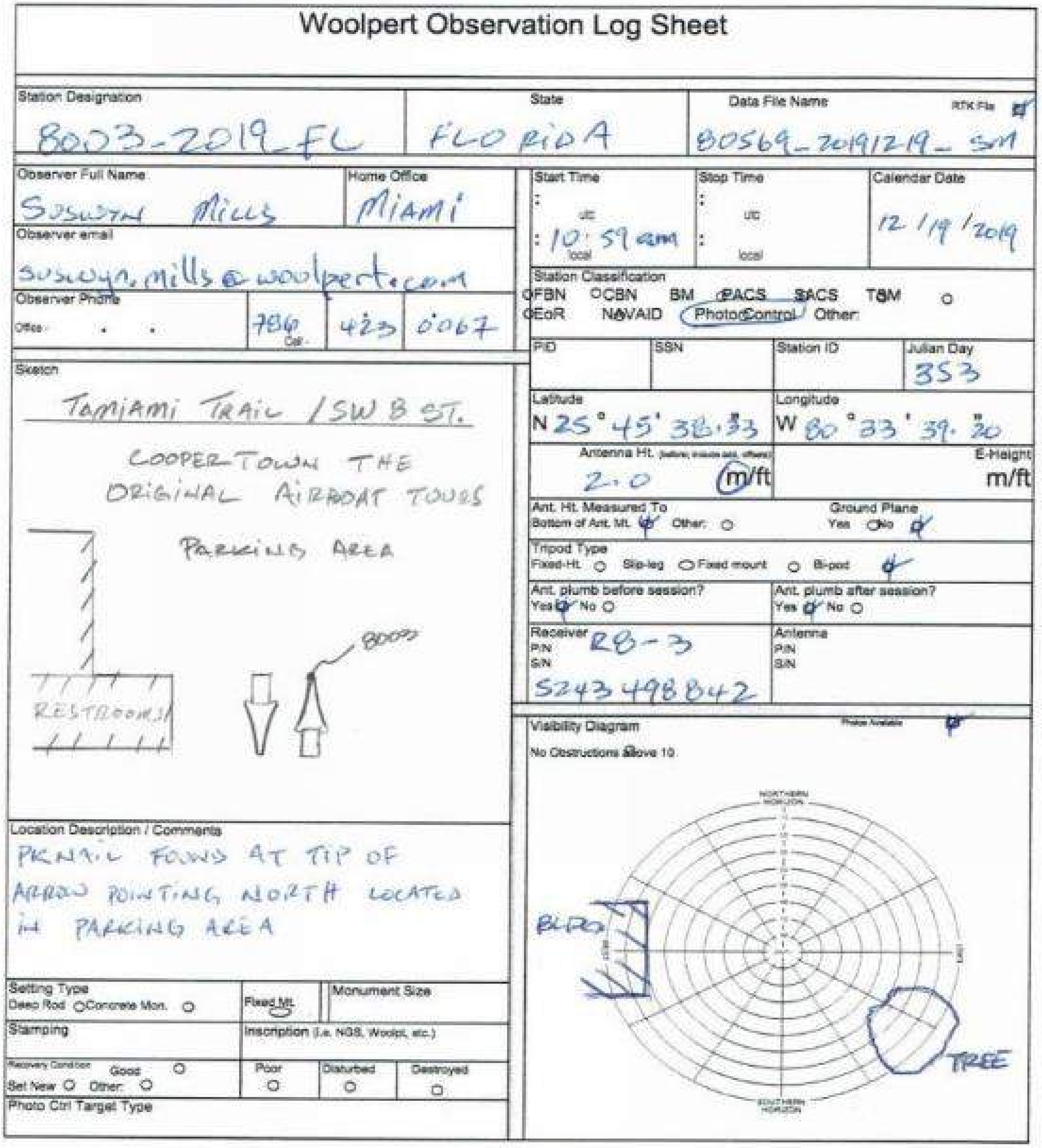
8003_2019_FL, 1, 20191219

8003_2019_FL, 3S, 20191219

8003_2019_FL, 3N, 20191219

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8003_2019_FL | GPS Session File Name | 80569_20191219_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8003-2019_FL
State: FLORIDA
Data File Name: 80569_20191219_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: Miami
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office: . . Cell: 786 423 0067

Start Time: : utc : 10:59 am local
Stop Time: : utc : local
Calendar Date: 12/19/2019

Station Classification: ○ FBN ○ CBN BM ○ PACS ○ SACS TBM ○ ○ EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N 25° 45' 38.33"
Longitude: W 80° 33' 39.30"

Antenna Ht. (before, include adj. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○
Ant. plumb after session? Yes ✓ No ○

Receiver P/N: R8-3
S/N: 5243498842

Antenna P/N:
S/N:

Sketch

Visibility Diagram
Photos Available ✓
No Obstructions Above 10

Location Description / Comments: PK NAIL FOUND AT TIP OF ARROW POINTING NORTH LOCATED IN PARKING AREA

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt.
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8004_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **176713.126** | **579766.316** | **Datum (Epoch)** |
| **Easting** | **258060.087** | **846652.134** | **Datum (Epoch)** |
| **Orthometric Height** | **1.965** | **6.446** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude: N25°55'39.04857"
Longitude: W80°25'13.47259"
Ellipsoidal Height: -22.899 m
Type of Mark: Set PK Nail at Corner of Stop Bar
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 12:56:30 PM Stop Time : 12:56:42 PM
PDOP Max: 1.546
Start Time : 4:14:58 PM Stop Time : 4:15:10 PM
PDOP Max: 1.572
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

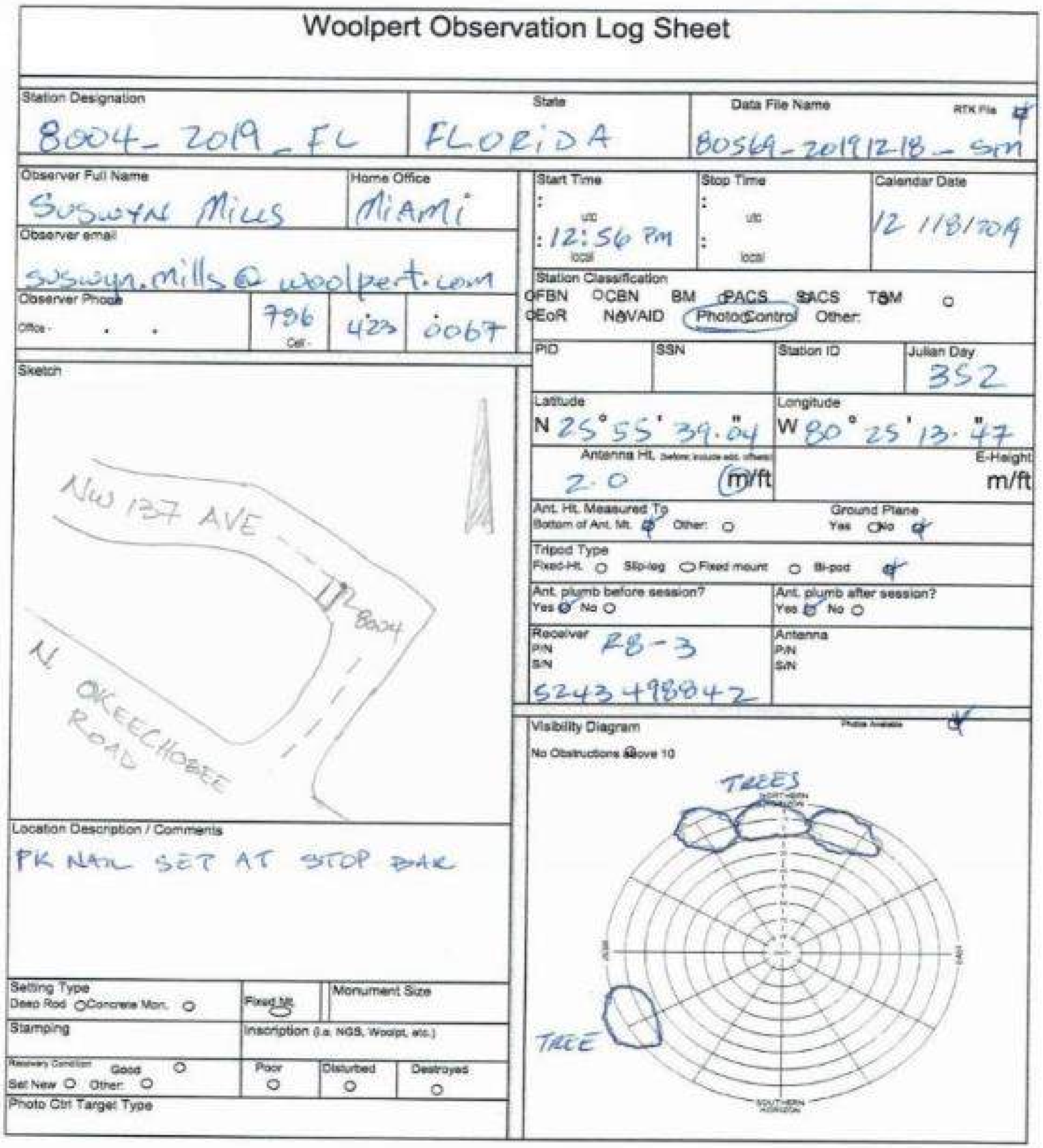
8004_2019_FL, 1, 20191218

8004_2019_FL, 3W, 20191218

8004_2019_FL, 3S, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8004_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8004_2019_FL
State: FLORIDA
Data File Name: 80569-20191218-SM
RTK File: ☑

Observer Full Name: SUSWYN MILLS
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 12:56 PM local
Stop Time: : utc : local
Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] ○Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N 25° 55' 39.04"
Longitude: W 80° 25' 13.47"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver P/N: R8-3
S/N: 5243498842
Antenna P/N:
S/N:

Sketch

Location Description / Comments: PK NAIL SET AT STOP BAR

Visibility Diagram
Photos Available ☑
No Obstructions Above 10 ○

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Ht.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8005_2019_FL | GPS Session File Name | 80569_20191218_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **180246.358** | **591358.258** | **Datum (Epoch)** |
| **Easting** | **259485.767** | **851329.554** | **Datum (Epoch)** |
| **Orthometric Height** | **1.617** | **5.306** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | | | | | |
|---|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal | | |
| Latitude | N25°57'33.65317" | Start Time : | 9:47:06 AM | Stop Time : | 9:47:19 AM |
| Longitude | W80°24'21.66367" | PDOP Max: | 1.407 | | |
| Ellipsoidal Height | -23.295 m | Start Time : | 2:30:43 PM | Stop Time : | 2:30:56 PM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.785 | | |
| | | Antenna Height: | 2.00 m | | |
| Notes | | Weather Conditions | Cloudy | | |

PHOTOS

⇧

NORTH

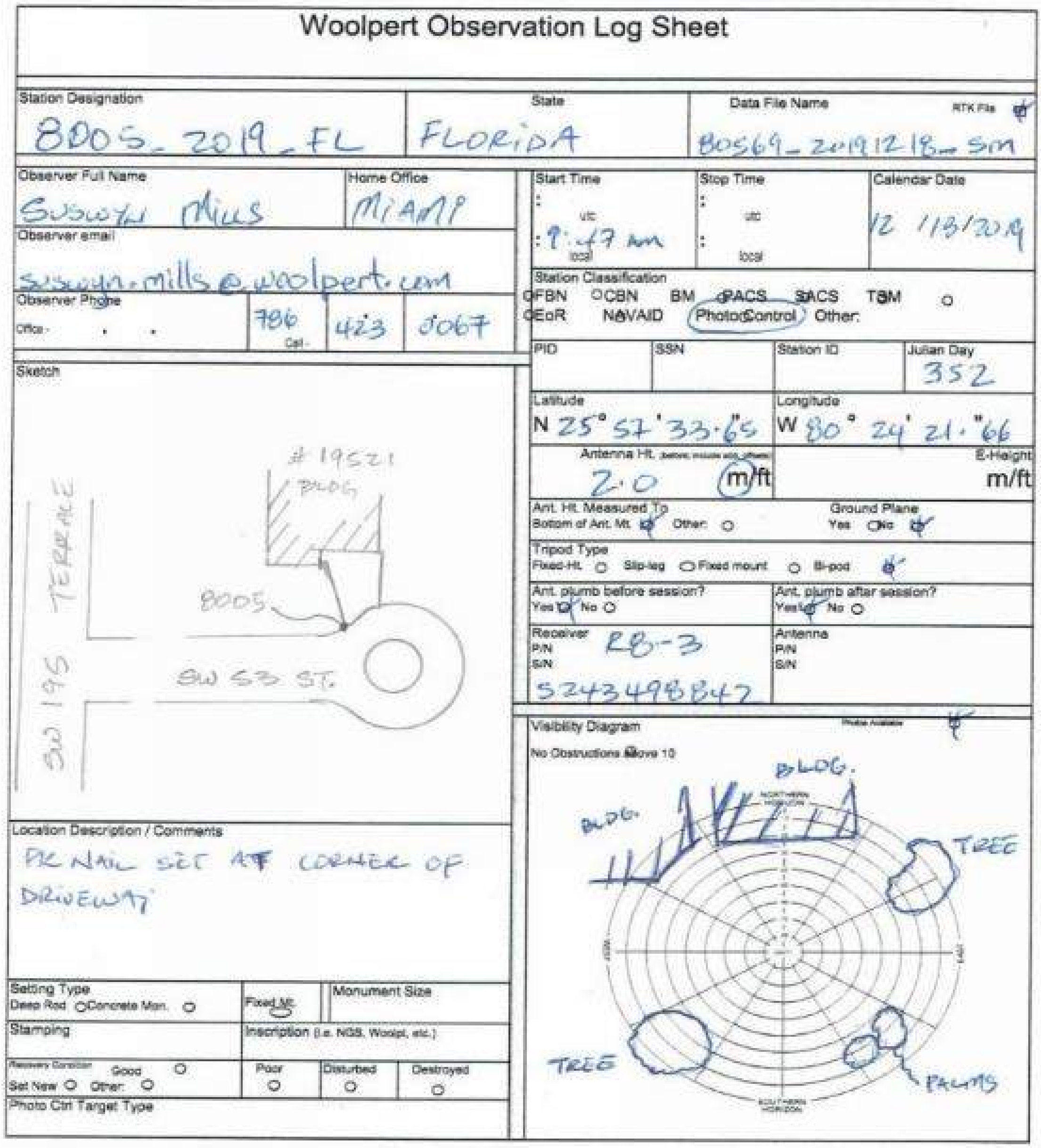
8005_2019_FL, 1, 20191218

8005_2019_FL, 3W, 20191218

8005_2019_FL, 3N, 20191218

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8005_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 8005_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: MIAMI

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 9:47 am local

Stop Time: : utc : local

Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo○Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 57' 33.65"

Longitude: W 80° 24' 21."66

Antenna Ht. (before include ant. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N R8-3 S/N 5243498847

Antenna P/N S/N

Sketch

Location Description / Comments: PK NAIL SET AT CORNER OF DRIVEWAY

Setting Type: Deep Rod ○Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

Visibility Diagram

Photo Available ☑

No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8006_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **180121.316** | **590948.017** | **Datum (Epoch)** |
| **Easting** | **262630.749** | **861647.716** | **Datum (Epoch)** |
| **Orthometric Height** | **1.308** | **4.290** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°57'29.11395"
Longitude: W80°22'28.63763"
Ellipsoidal Height: -23.657 m
Type of Mark: Set PK Nail
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:19:41 AM Stop Time : 10:21:05 AM
PDOP Max: 2.037
Start Time : 2:56:34 PM Stop Time : 2:57:48 PM
PDOP Max: 1.884
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

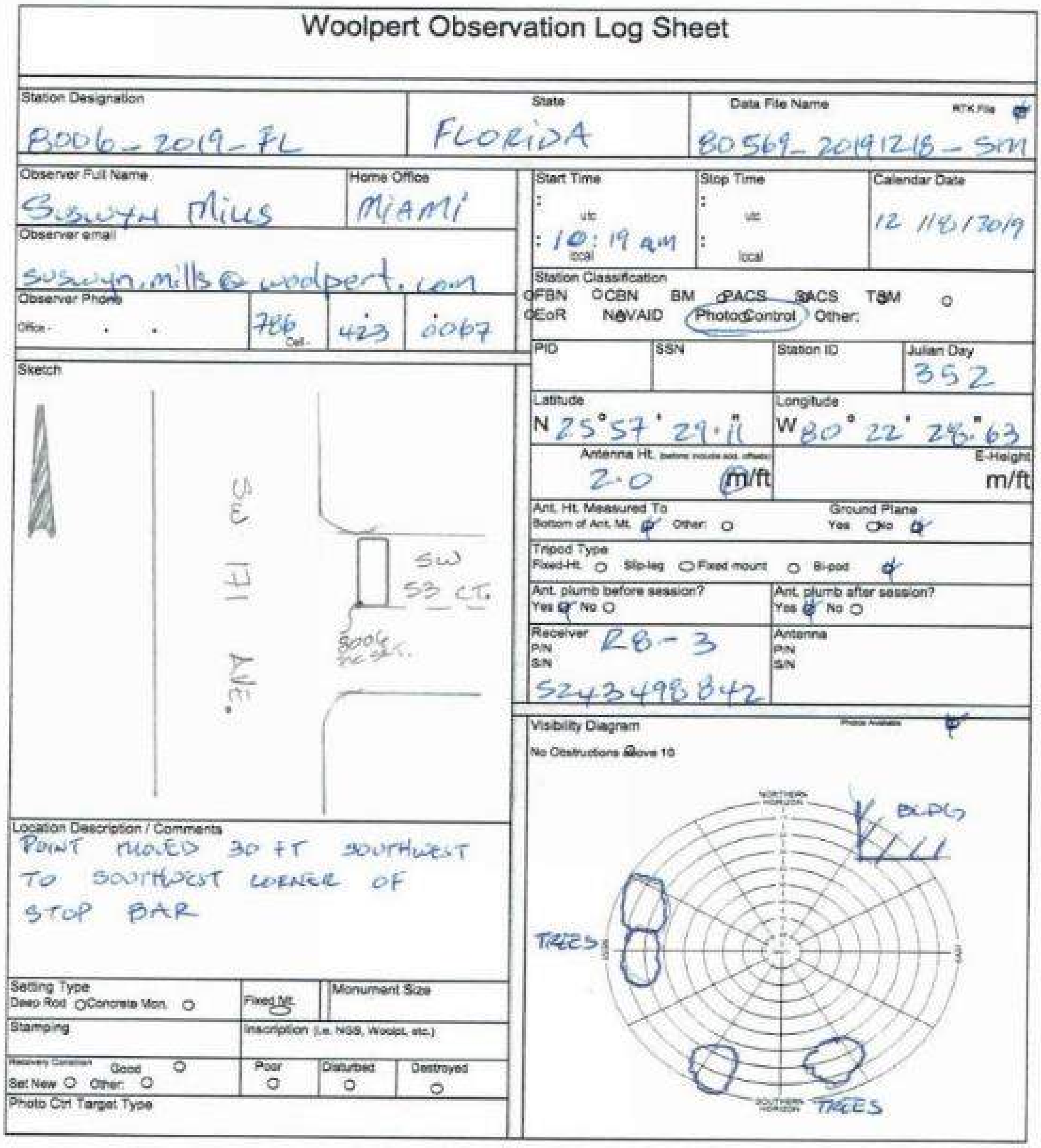

8006_2019_FL, 1, 20191218


8006_2019_FL, 3N, 20191218


8006_2019_FL, 3E, 20191218

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8006_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 8006_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: MIAMI

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 10:19 AM local

Stop Time: : utc : local

Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN BM PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 57' 29.11"

Longitude: W 80° 22' 28.63"

Antenna Ht. (before include ant. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N: R8-3

S/N: 5243498842

Antenna P/N:

S/N:

Sketch

SW 17 AVE.

SW 53 CT.

8006 SE SET.

Visibility Diagram

Photo Available ☑

No Obstructions Above 10

NORTHERN HORIZON

BLDG

TREES

SOUTHERN HORIZON

TREES

Location Description / Comments:

POINT MOVED 30 FT SOUTHWEST TO SOUTHWEST CORNER OF STOP BAR

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8007_2019_FL | GPS Session File Name | 80569_20191218_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **178515.822** | **585680.659** | **Datum (Epoch)** |
| **Easting** | **265347.620** | **870561.318** | **Datum (Epoch)** |
| **Orthometric Height** | **1.692** | **5.552** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°56'36.51326" | Start Time : | 11:17:36 AM Stop Time : 11:18:45 AM |
| Longitude | W80°20'51.26787" | PDOP Max: | 1.378 |
| Ellipsoidal Height | -23.309 m | Start Time : | 3:24:38 PM Stop Time : 3:25:20 PM |
| Type of Mark | Set PK Nail | PDOP Max: | 3.167 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Cloudy |

PHOTOS

⇧

NORTH

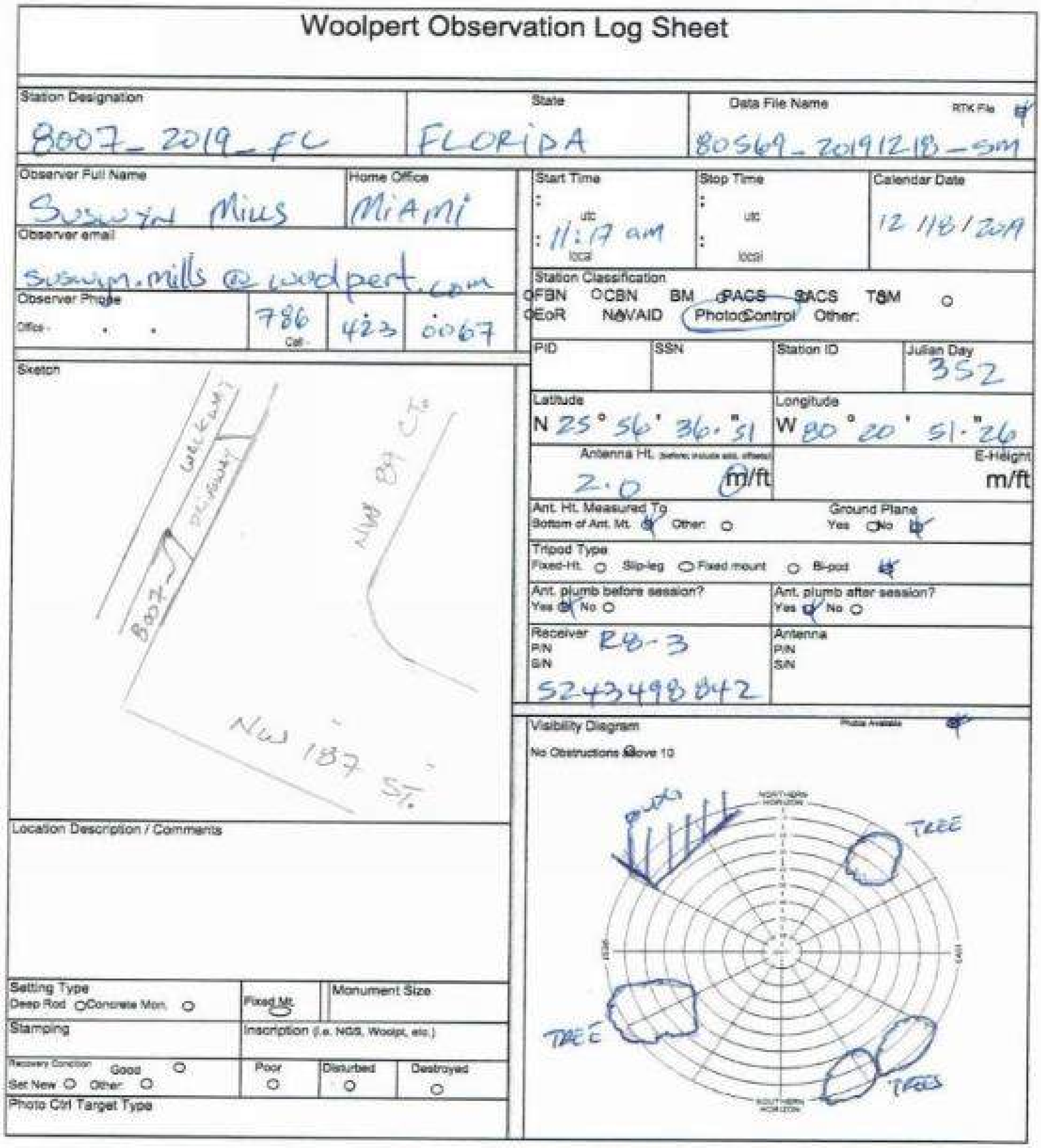
8007_2019_FL, 1, 20191218

8007_2019_FL, 3SE, 20191218

8007_2019_FL, 3NE, 20191218

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8007_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 8007_2019_FL
State: FLORIDA
Data File Name: 80569_20191218_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 11:17 am local
Stop Time: : utc : local
Calendar Date: 12/18/2019

Station Classification
○ FBN ○ CBN BM ○ PACS ○ SACS T○M ○
○ EoR N○VAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N 25° 56' 36.51"
Longitude: W 80° 20' 51.26"

Antenna Ht. (before include any offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver R8-3
P/N
S/N 5243498842

Antenna
P/N
S/N

Sketch

Visibility Diagram
Photo Available ☑
No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8008_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **179974.986** | **590467.935** | **Datum (Epoch)** |
| **Easting** | **267300.589** | **876968.681** | **Datum (Epoch)** |
| **Orthometric Height** | **1.633** | **5.358** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping:
Latitude: N25°57'23.60704"
Longitude: W80°19'40.80868"
Ellipsoidal Height: -23.404 m
Type of Mark: Set PK Nail
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 11:50:45 AM Stop Time : 11:50:59 AM
PDOP Max: 1.432
Start Time : 3:42:09 PM Stop Time : 3:42:41 PM
PDOP Max: 1.790
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

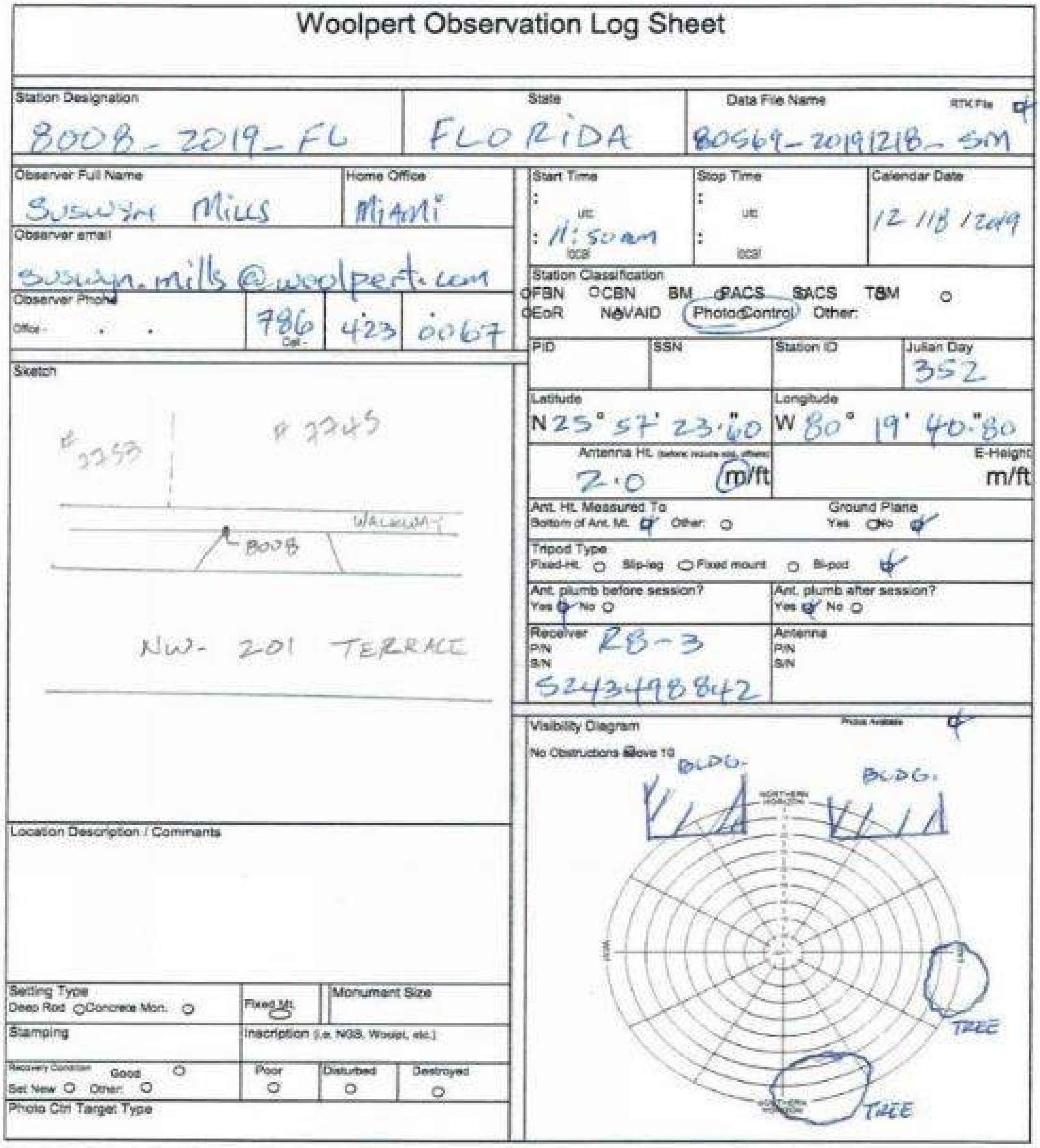
8008_2019_FL, 1, 20191218

8008_2019_FL, 3W, 20191218

8008_2019_FL, 3N, 20191218

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8008_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 8008_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_SM

RTK File ✓

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 11:50am local

Stop Time: : utc : local

Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N25° 57' 23."60

Longitude: W 80° 19' 40."80

Antenna Ht. (before Include any offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○

Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○

Ant. plumb after session? Yes ✓ No ○

Receiver P/N: RB-3 S/N: 5243498842

Antenna P/N: S/N:

Sketch

Visibility Diagram

Photos Available ✓

No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8009_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **176745.777** | **579873.437** | **Datum (Epoch)** |
| **Easting** | **272324.132** | **893450.091** | **Datum (Epoch)** |
| **Orthometric Height** | **1.662** | **5.453** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS ☐
Other

Mark Stamping
Latitude: N25"55'37.80758"
Longitude: W80°16'40.88293"
Ellipsoidal Height: -23.455 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 11:26:46 AM Stop Time : 11:26:59 AM
PDOP Max: 1.671
Start Time : 3:12:42 PM Stop Time : 3:13:07 PM
PDOP Max: 1.497
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧
NORTH

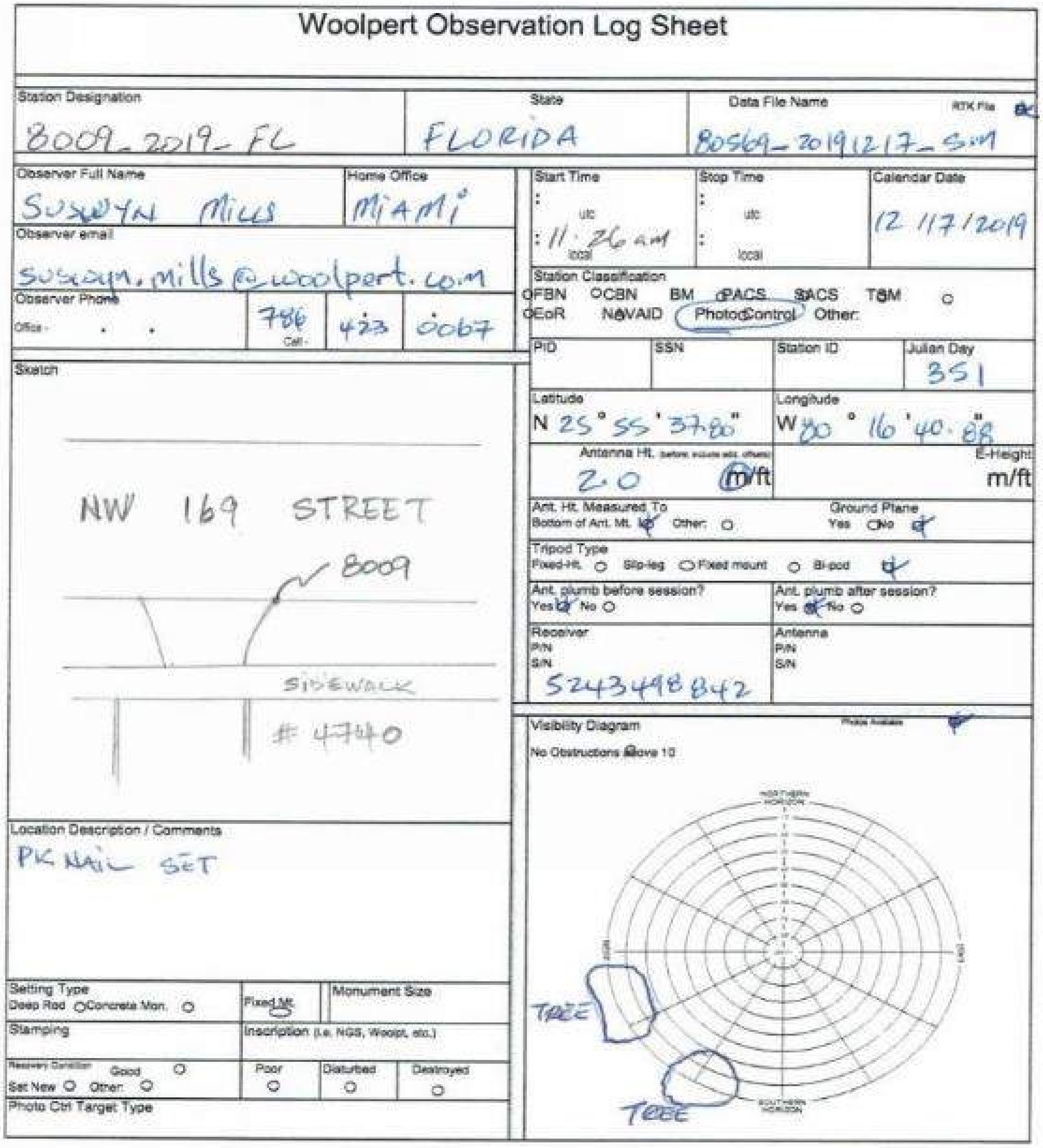
8009_2019_FL, 1, 20191217

8009_2019_FL, 3S, 20191217

8009_2019_FL, 3E, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8009_2019_FL | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8009_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_SM
RTK File ✓

Observer Full Name: SUSWYN MILLS
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc :11:26 AM local
Stop Time: : utc : local
Calendar Date: 12/17/2019

Station Classification
○FBN ○CBN BM ○PACS ○SACS TBM ○
○EoR NAVAID [✓ Photo Control] Other:

PID: SSN: Station ID: Julian Day: 351

Latitude: N 25° 55' 37.80"
Longitude: W 80° 16' 40.88"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○
Ant. plumb after session? Yes ✓ No ○

Receiver P/N S/N 5243498842
Antenna P/N S/N

Sketch

NW 169 STREET

8009

SIDEWALK

# 4740

Visibility Diagram
Photo Available ✓
No Obstructions Above 10

NORTHERN HORIZON
WEST
EAST
SOUTHERN HORIZON
TREE
TREE

Location Description / Comments: PK NAIL SET

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.] Monument Size
Stamping: Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8010_2019_FL | GPS Session File Name | 80569_20191217_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **180839.836** | **593305.363** | **Datum (Epoch)** |
| **Easting** | **275247.270** | **903040.420** | **Datum (Epoch)** |
| **Orthometric Height** | **1.297** | **4.255** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | ☐ |
| Other | | | |

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°57'50.30539" | Start Time : | 10:58:41 AM Stop Time : 10:58:55 AM |
| Longitude | W80°14'54.99682" | PDOP Max: | 1.717 |
| Ellipsoidal Height | -23.921 m | Start Time : | 2:54:21 PM Stop Time : 2:54:32 PM |
| Type of Mark | Set Drill Hole | PDOP Max: | 1.383 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Cloudy |

PHOTOS

NORTH

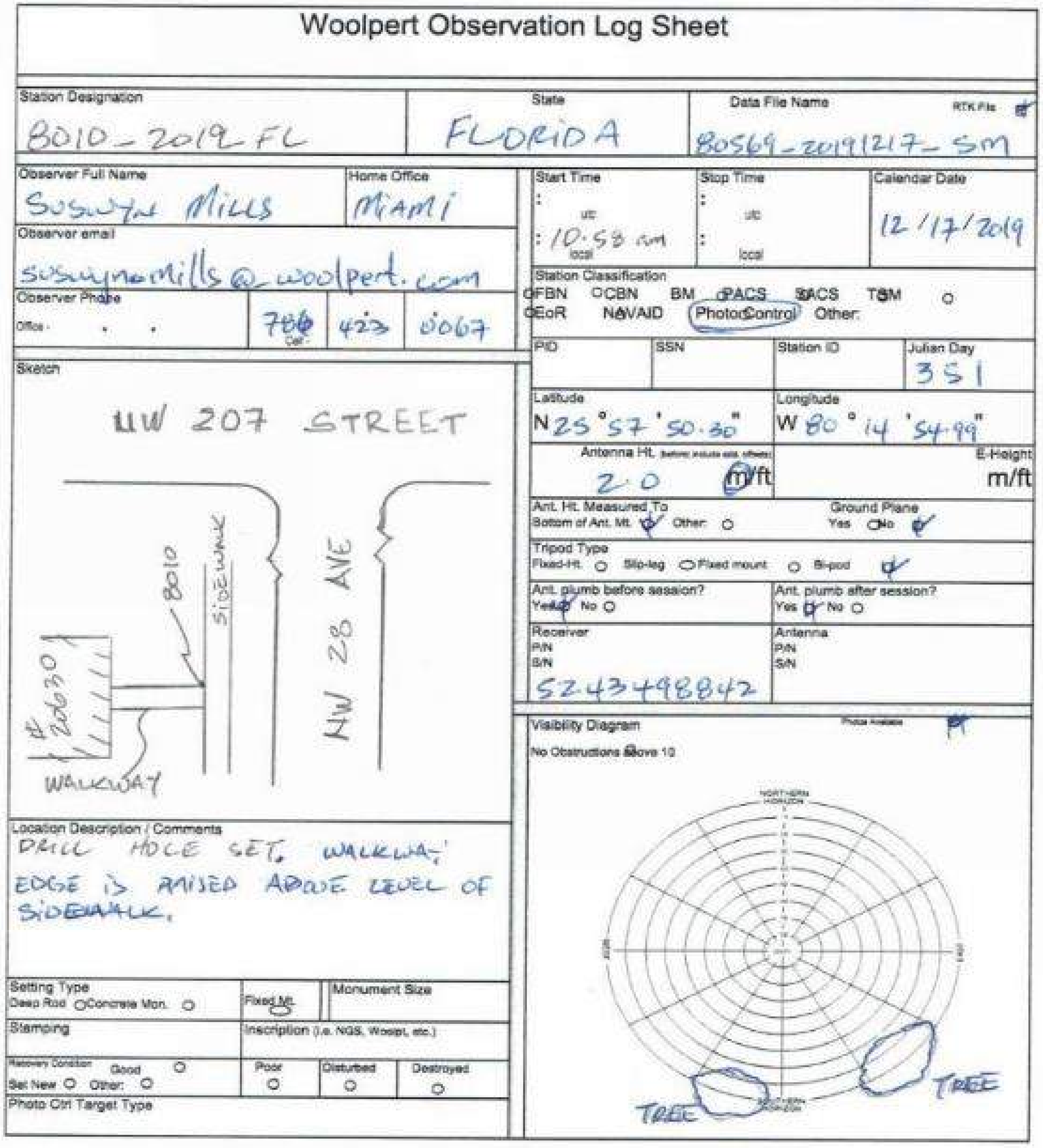
8010_2019_FL, 1, 20191217

8010_2019_FL, 3W, 20191217

8010_2019_FL, 3S, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8010_2019_FL | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8010-2019-FL

State: FLORIDA

Data File Name: 80569-20191217-SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswynmills@woolpert.com

Observer Phone: Office - . . Cell 786 423 0067

Start Time: : utc : 10.53 am local

Stop Time: : utc : local

Calendar Date: 12/17/2019

Station Classification

○FBN ○CBN BM ○PACS ○SACS T○BM ○

○EoR N○VAID [✓ Photo Control] Other:

| PID | SSN | Station ID | Julian Day |
|---|---|---|---|
| | | | 351 |

Latitude: N 25° 57' 50.30"

Longitude: W 80° 14' 54.99"

Antenna Ht. (before include adj. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N S/N 5243498842

Antenna P/N S/N

Sketch

Location Description / Comments

DRILL HOLE SET, WALKWAY EDGE IS RAISED ABOVE LEVEL OF SIDEWALK.

Visibility Diagram

Photos Available ☑

No Obstructions Above 10

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8011_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **177511.745** | **582386.449** | **Datum (Epoch)** |
| **Easting** | **277896.832** | **911733.191** | **Datum (Epoch)** |
| **Orthometric Height** | **1.586** | **5.202** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°56'01.66057"
Longitude: W80°13'20.46726"
Ellipsoidal Height: -23.743 m
Type of Mark: Set PK Nail

Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 12:27:07 PM Stop Time : 12:27:19 PM
PDOP Max: 1.340
Start Time : 4:31:24 PM Stop Time : 4:31:38 PM
PDOP Max: 2.372
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

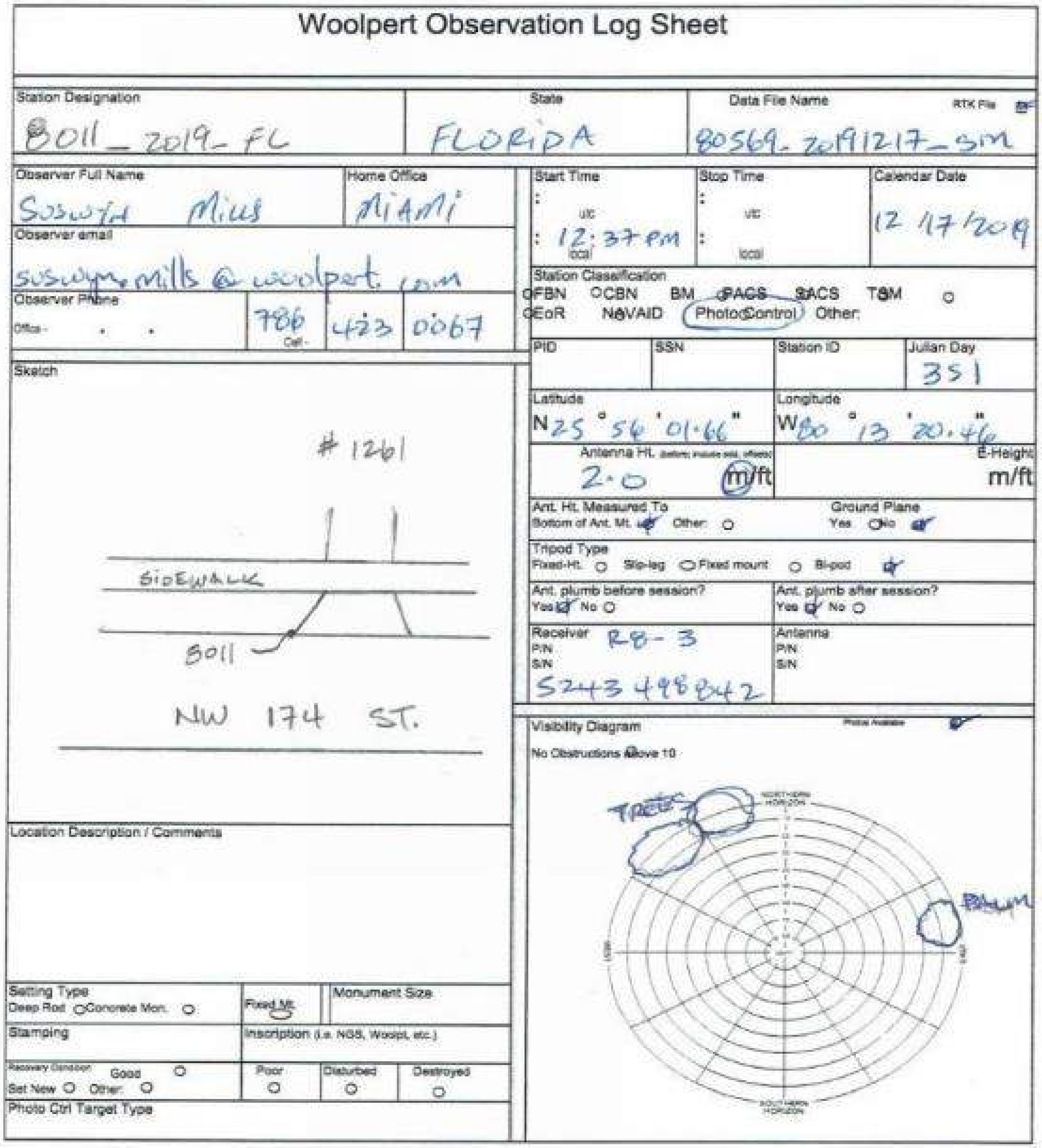
8011_2019_FL, 1, 20191217

8011_2019_FL, 3W, 20191217

8011_2019_FL, 3N, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8011_2019_FL | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8011_2019_FL

State: FLORIDA

Data File Name: 80569_20191217_SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 12:37 PM local

Stop Time: : utc : local

Calendar Date: 12/17/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo○Control] Other:

PID:

SSN:

Station ID:

Julian Day: 351

Latitude: N 25° 56' 01.66"

Longitude: W 80° 13' 20.46"

Antenna Ht. (before; include slnt. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○

Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○

Ant. plumb after session? Yes ✓ No ○

Receiver: R8-3
P/N
S/N 5243498842

Antenna
P/N
S/N

Sketch

Visibility Diagram

Photos Available ✓

No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ✓

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8012_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **180018.616** | **590611.075** | **Datum (Epoch)** |
| **Easting** | **280569.522** | **920501.839** | **Datum (Epoch)** |
| **Orthometric Height** | **1.214** | **3.982** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25"57'22.59308"
Longitude: W80°11'43.86751"
Ellipsoidal Height: -24.204 m
Type of Mark: Set Drill Hole

Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 9:46:25 AM Stop Time : 9:47:55 AM
PDOP Max: 1.415
Start Time : 2:23:44 PM Stop Time : 2:24:35 PM
PDOP Max: 1.760
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

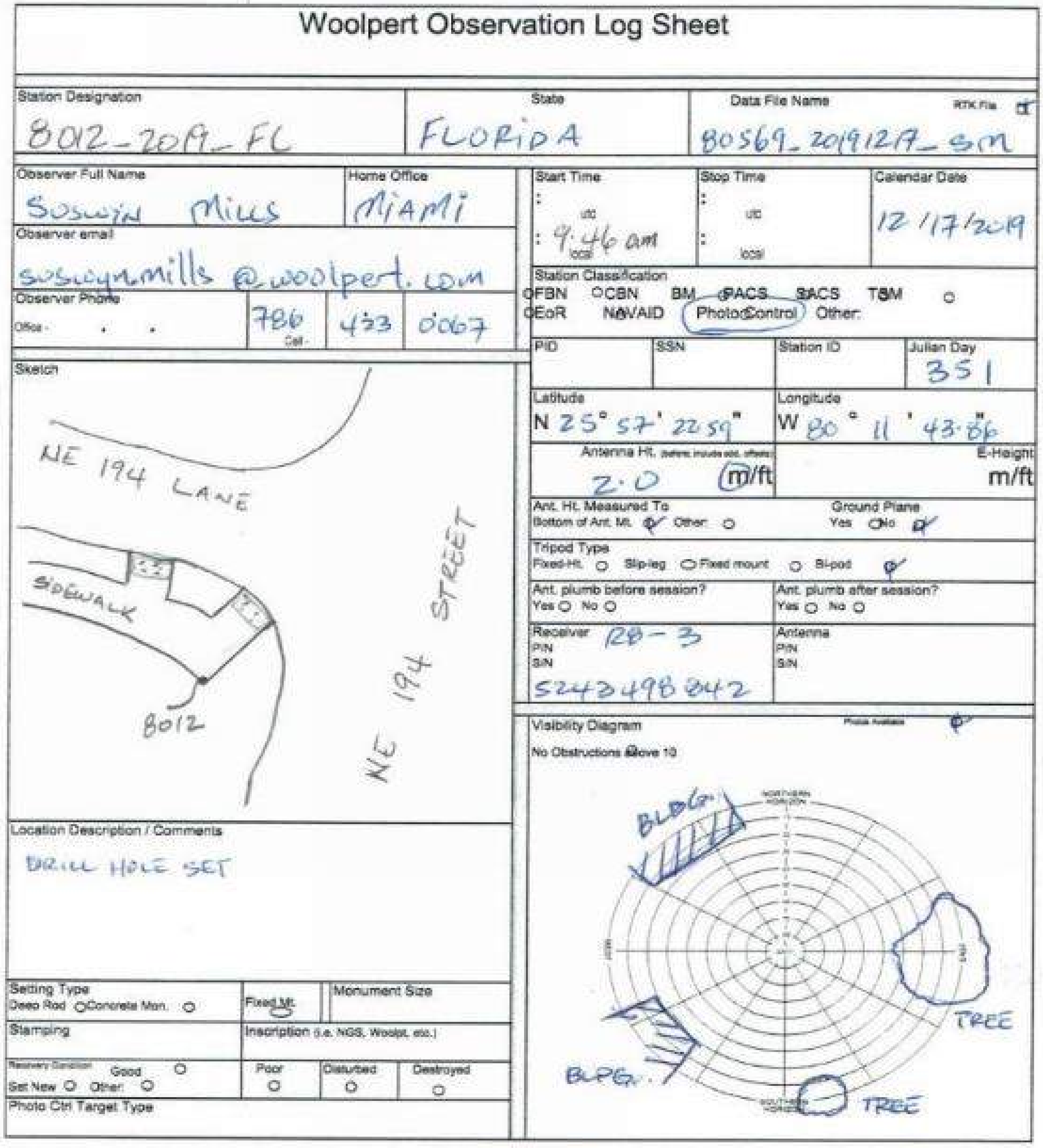
8012_2019_FL, 1, 20191217

8012_2019_FL, 3W, 20191217

8012_2019_FL, 3N, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8012_2019_FL | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8012-2019-FL

State: FLORIDA

Data File Name: 80569_20191217_SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 433 0067

Start Time: : utc : 9:46 am local

Stop Time: : utc : local

Calendar Date: 12/17/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 351

Latitude: N 25° 57' 22.59"

Longitude: W 80° 11' 43.86"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○

Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver: RB-3 P/N S/N 5243498842

Antenna: P/N S/N

Sketch

Location Description / Comments: DRILL HOLE SET

Setting Type: Deep Rod ○ Concrete Mon. ○

Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

Visibility Diagram

Photos Available ✓

No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8013_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **180978.586** | **593760.578** | **Datum (Epoch)** |
| **Easting** | **284505.002** | **933413.492** | **Datum (Epoch)** |
| **Orthometric Height** | **1.365** | **4.477** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude: N25°57'52.98033"
Longitude: W80°09'22.19319"
Ellipsoidal Height: -24.179 m
Type of Mark: Set PK Nail

Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 8:53:55 AM Stop Time : 8:54:56 AM
PDOP Max: 1.302
Start Time : 2:01:45 PM Stop Time : 2:01:56 PM
PDOP Max: 1.331
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

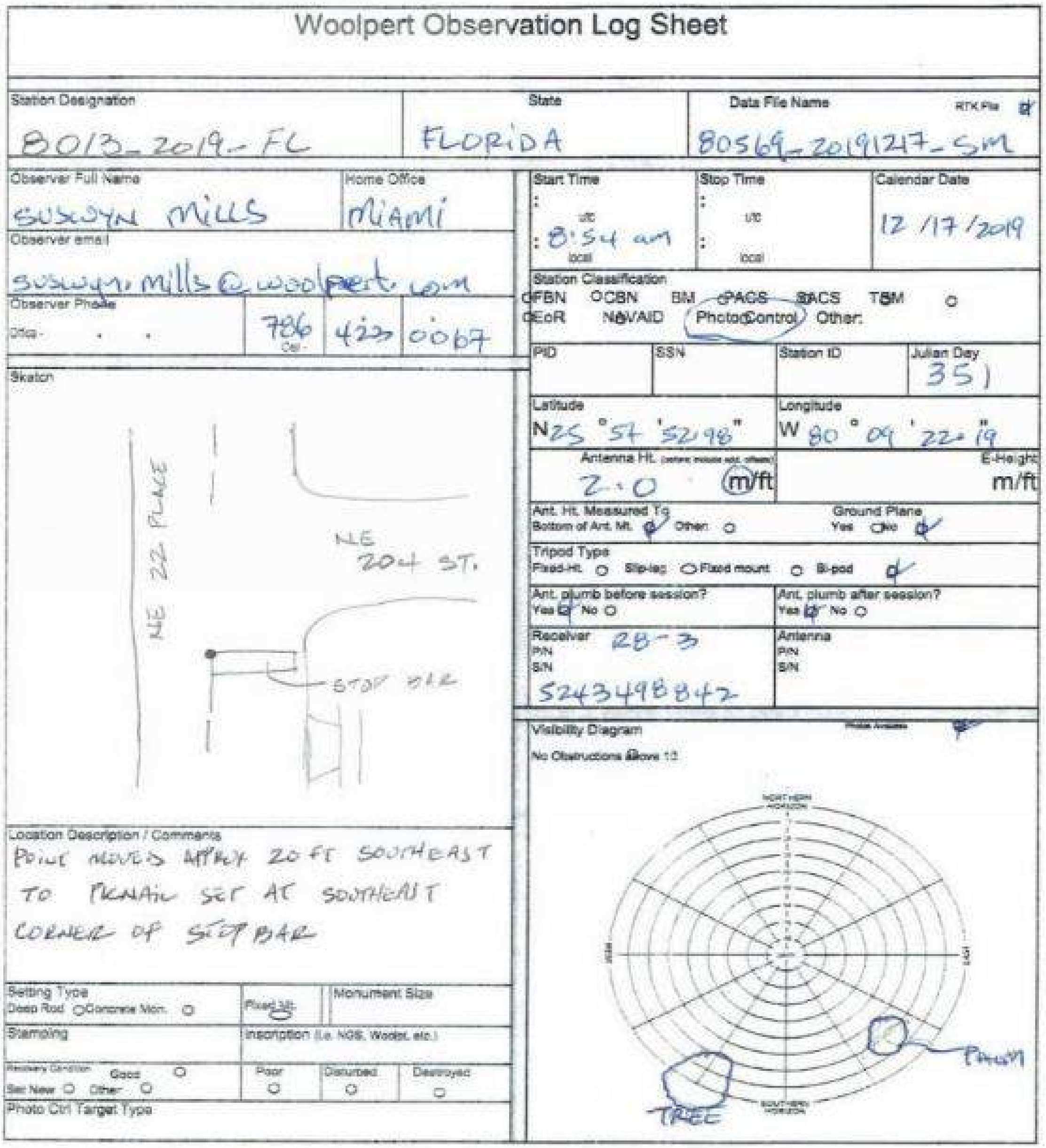
8013_2019_FL, 1, 20191217

8013_2019_FL, 3W, 20191217

8013_2019_FL, 3S, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8013_2019_FL
Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job



## Woolpert Observation Log Sheet

Station Designation: 8013_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_SM
RTK File ☑

Observer Full Name: SUSWYN MILLS
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 8:54 am local
Stop Time: : utc : local
Calendar Date: 12/17/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ PhotoControl] Other:

PID:
SSN:
Station ID:
Julian Day: 351

Latitude: N 25 ° 57 ' 52.98 "
Longitude: W 80 ° 09 ' 22.19 "
Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑
Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○
Receiver: RB-3 P/N S/N 524349842
Antenna: P/N S/N

Sketch

Location Description / Comments: POINT MOVED APPROX 20 FT SOUTHEAST TO PKNAIL SET AT SOUTHEAST CORNER OF STOP BAR

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Ht.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpert, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

Visibility Diagram
No Obstructions Above 15
Photo Available ☑

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8014_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **173382.229** | **568838.197** | **Datum (Epoch)** |
| **Easting** | **262125.473** | **859989.989** | **Datum (Epoch)** |
| **Orthometric Height** | **1.889** | **6.199** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°53'50.20666"
Longitude: W80°22'47.94592"
Ellipsoidal Height: -23.043 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 12:28:47 PM Stop Time : 12:29:12 PM
PDOP Max: 1.426
Start Time : 4:03:21 PM Stop Time : 4:03:33 PM
PDOP Max: 1.328
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH

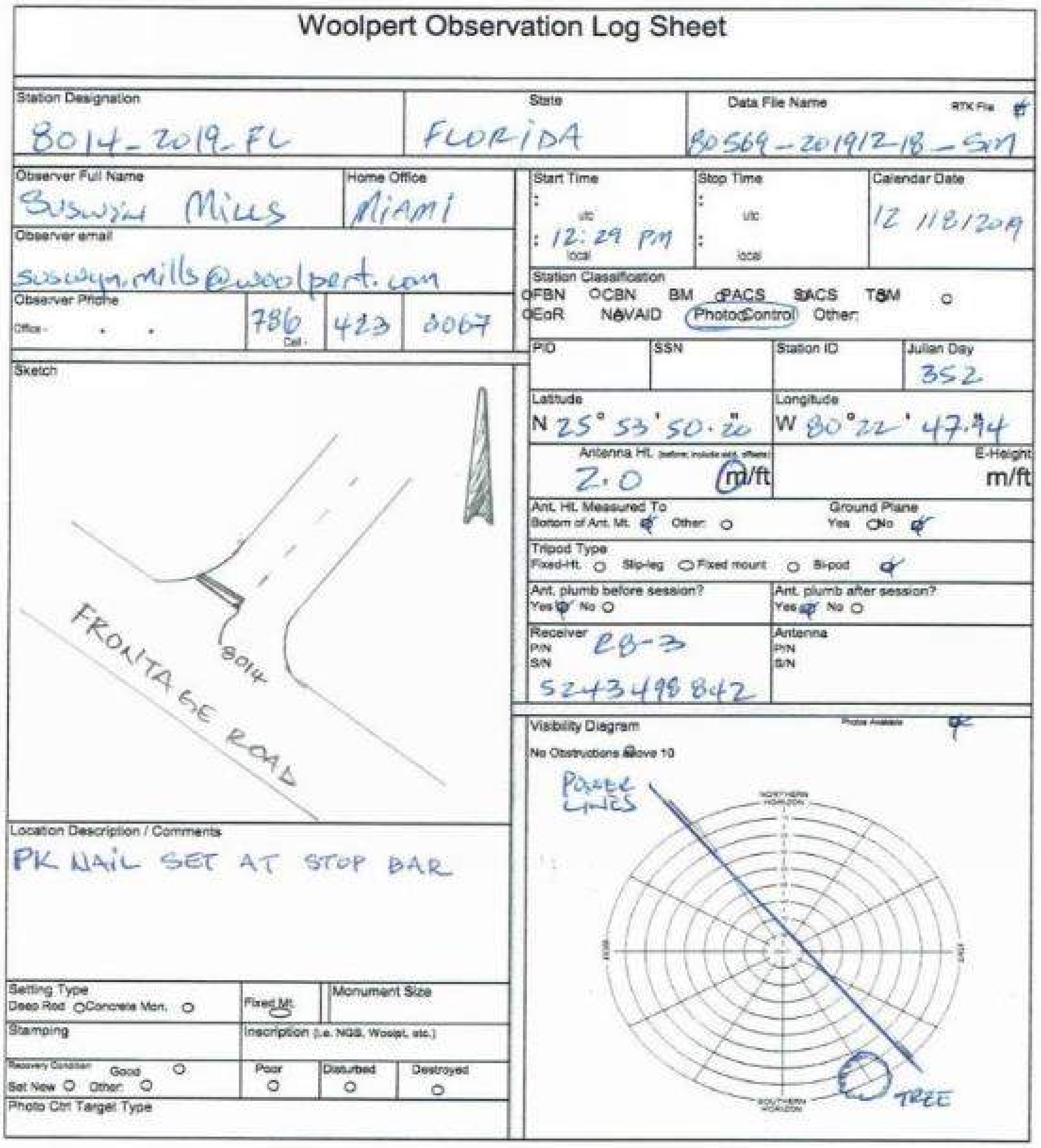
8014_2019_FL, 1, 20191218

8014_2019_FL, 3W, 20191218

8014_2019_FL, 3N, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8014_2019_FL | GPS Session File Name | 80569_20191218_SM.job |



## Woolpert Observation Log Sheet

| Station Designation | State | Data File Name | RTK File ☑ |
|---|---|---|---|
| 8014_2019_FL | FLORIDA | 80569 – 20191218 – SM | |

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 8067

| Start Time | Stop Time | Calendar Date |
|---|---|---|
| : utc<br>: 12:29 pm local | : utc<br>: local | 12/18/2019 |

Station Classification
○FBN ○CBN BM ○PACS SACS TBM ○
○EoR NAVAID [✓ Photo Control] Other:

| PID | SSN | Station ID | Julian Day |
|---|---|---|---|
| | | | 352 |

| Latitude | Longitude |
|---|---|
| N 25° 53' 50.20" | W 80° 22' 47.94 |

Antenna Ht. (before; include any offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N: R8-3 S/N: 5243498842

Antenna P/N: S/N:

Sketch

Visibility Diagram — Photos Available ☑

No Obstructions Above 10

Location Description / Comments: PK NAIL SET AT STOP BAR

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8015_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569-20191218-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **172024.227** | **564382.817** | **Datum (Epoch)** |
| **Easting** | **266352.576** | **873858.409** | **Datum (Epoch)** |
| **Orthometric Height** | **1.531** | **5.023** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping:
Latitude: N25°53'05.40745"
Longitude: W80°20'16.32790"
Ellipsoidal Height: -23.560 m
Type of Mark: Set Drill Hole

Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:58:24 AM Stop Time : 11:58:36 AM
PDOP Max: 1.407
Start Time : 2:23:31 PM Stop Time : 2:23:41 PM
PDOP Max: 1.822
Antenna Height: 2.00 m
Weather Conditions: Sunny

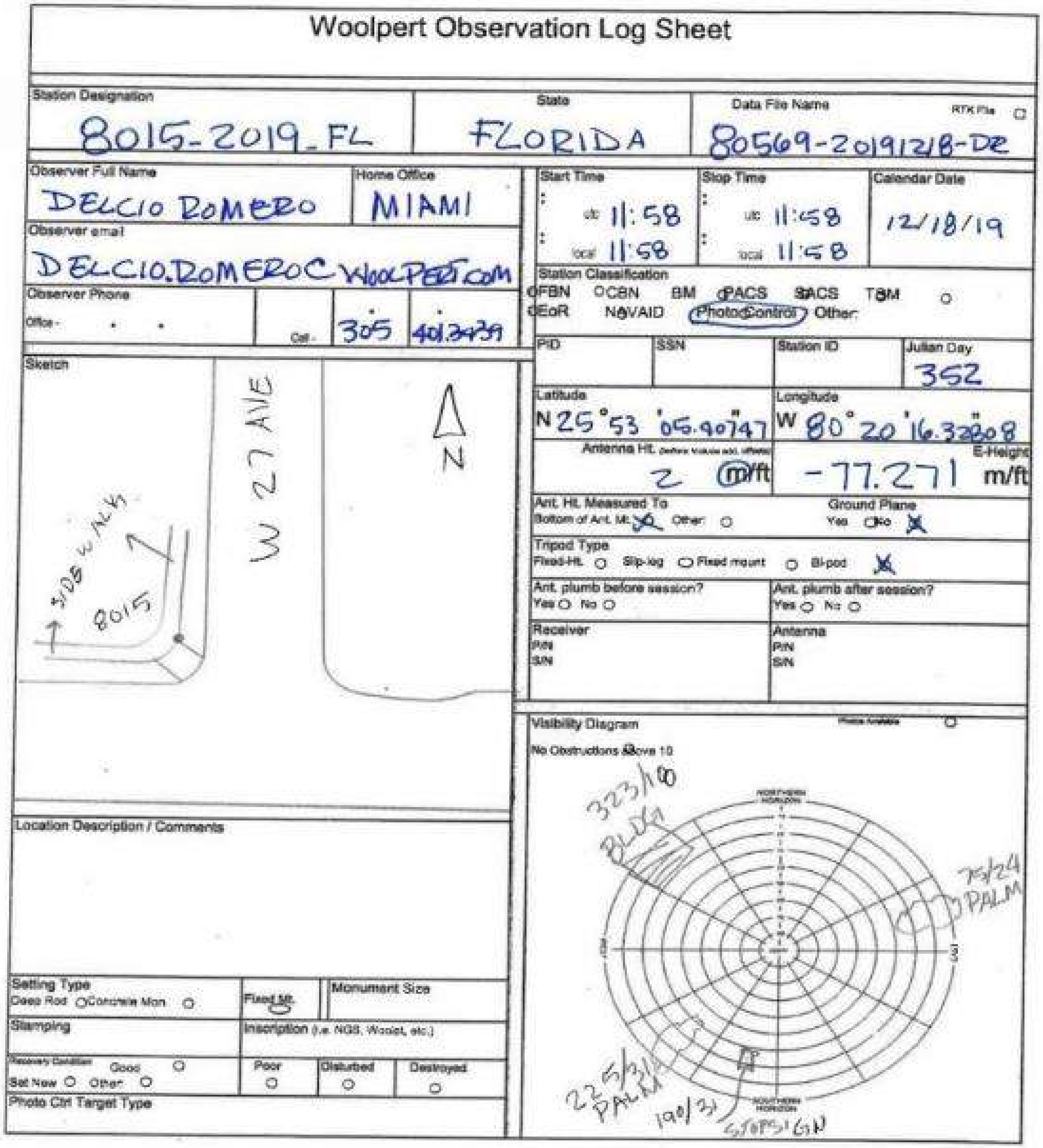
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8015_2019_FL | GPS Session File Name | 80569-20191218-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8015-2019_FL
State: FLORIDA
Data File Name: 80569-20191218-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 305 401.3439

Start Time: utc 11:58 local 11:58
Stop Time: utc 11:58 local 11:58
Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID: SSN: Station ID: Julian Day: 352

Latitude: N 25°53'05.90747"
Longitude: W 80°20'16.32808"
Antenna Ht. (before variable add. offsets): 2 [✓ m]/ft
E-Height: -77.271 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver: P/N S/N
Antenna: P/N S/N

Sketch:
W 27 AVE
N
SIDE WALK
8015

Location Description / Comments:

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpert, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

Visibility Diagram
Photo Available ○
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8016_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **175467.758** | **575680.470** | **Datum (Epoch)** |
| **Easting** | **269210.464** | **883234.665** | **Datum (Epoch)** |
| **Orthometric Height** | **1.842** | **6.042** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°54'56.82460"
Longitude: W80°18'33.01447"
Ellipsoidal Height: -23.319 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 11:54:20 AM Stop Time : 11:55:55 AM
PDOP Max: 1.708
Start Time : 3:54:57 PM Stop Time : 3:58:32 PM
PDOP Max: 2.416
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧
NORTH

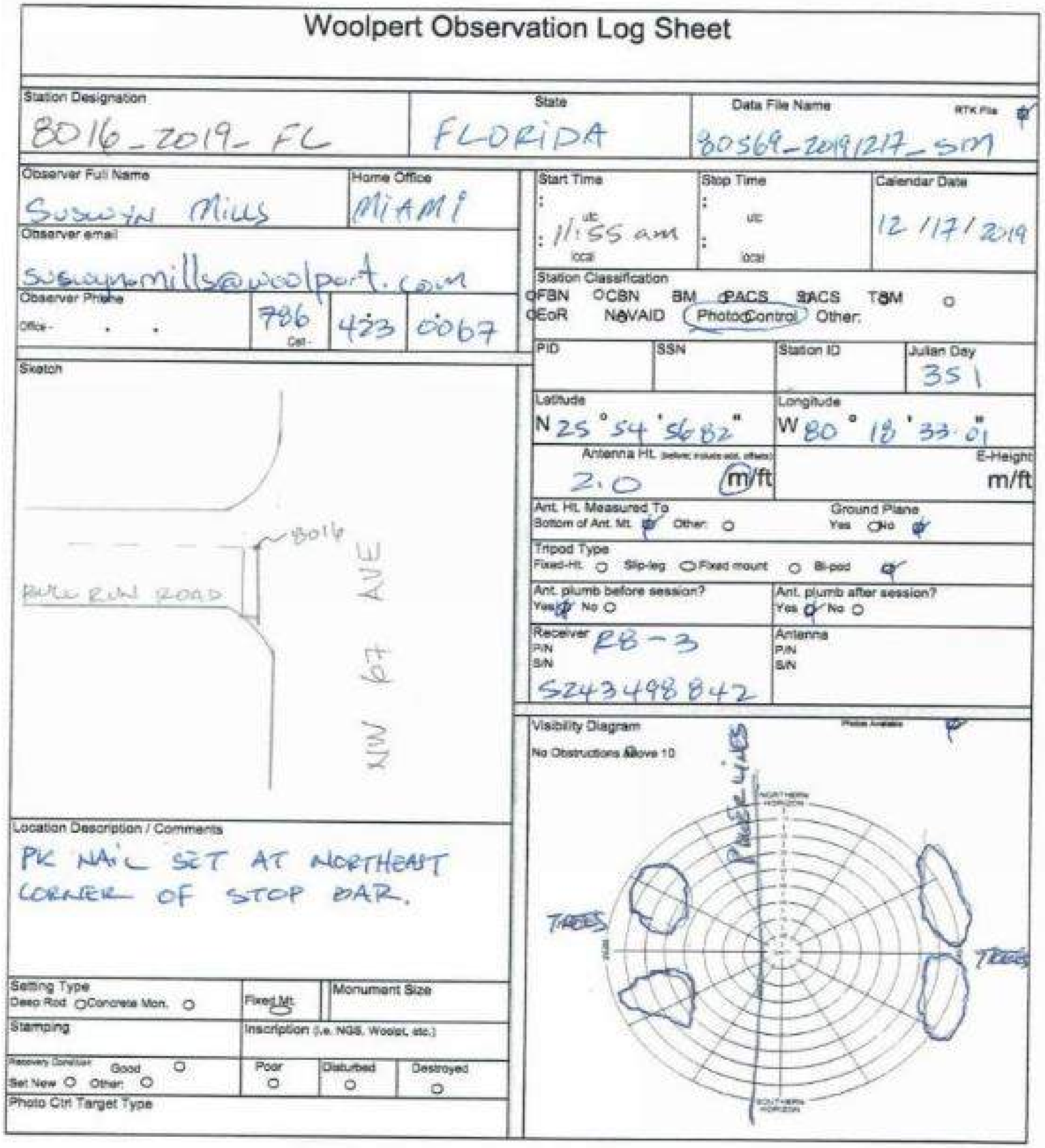
8016_2019_FL, 1, 20191217

8016_2019_FL, 3N, 20191217

8016_2019_FL, 3E, 20191217

## GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8016_2019_FL
Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job



### Woolpert Observation Log Sheet

Station Designation: 8016_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_SM
RTK File ✓
Observer Full Name: Suswyn Mills
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067
Start Time: : utc : 11:55 am local
Stop Time: : utc : local
Calendar Date: 12/17/2019
Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo ○Control] Other:
PID:
SSN:
Station ID:
Julian Day: 351
Latitude: N 25° 54' 56.82"
Longitude: W 80° 18' 33.01"
Antenna Ht. (before; include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft
Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○ No ✓
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓
Ant. plumb before session? Yes ✓ No ○
Ant. plumb after session? Yes ✓ No ○
Receiver P/N: RB-3
S/N: 5243498842
Antenna P/N:
S/N:

Sketch

Location Description / Comments: PK NAIL SET AT NORTHEAST CORNER OF STOP BAR.

Visibility Diagram
No Obstructions Above 10
Photos Available ✓

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8017_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569-20191218-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **173228.912** | **568335.187** | **Datum (Epoch)** |
| **Easting** | **275800.474** | **904855.388** | **Datum (Epoch)** |
| **Orthometric Height** | **1.852** | **6.078** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°53'42.89335"
Longitude: W80°14'36.69107"
Ellipsoidal Height: -23.398 m
Type of Mark: Set PK Nail at Point of Arrow
Notes:

Receiver: (e.g. R8, R10) Trimble R10 Internal
Start Time : 10:32:21 AM Stop Time : 10:32:31 AM
PDOP Max: 1.694
Start Time : 1:42:24 PM Stop Time : 1:42:34 PM
PDOP Max: 1.578
Antenna Height: 2.00 m
Weather Conditions: Partly Sunny

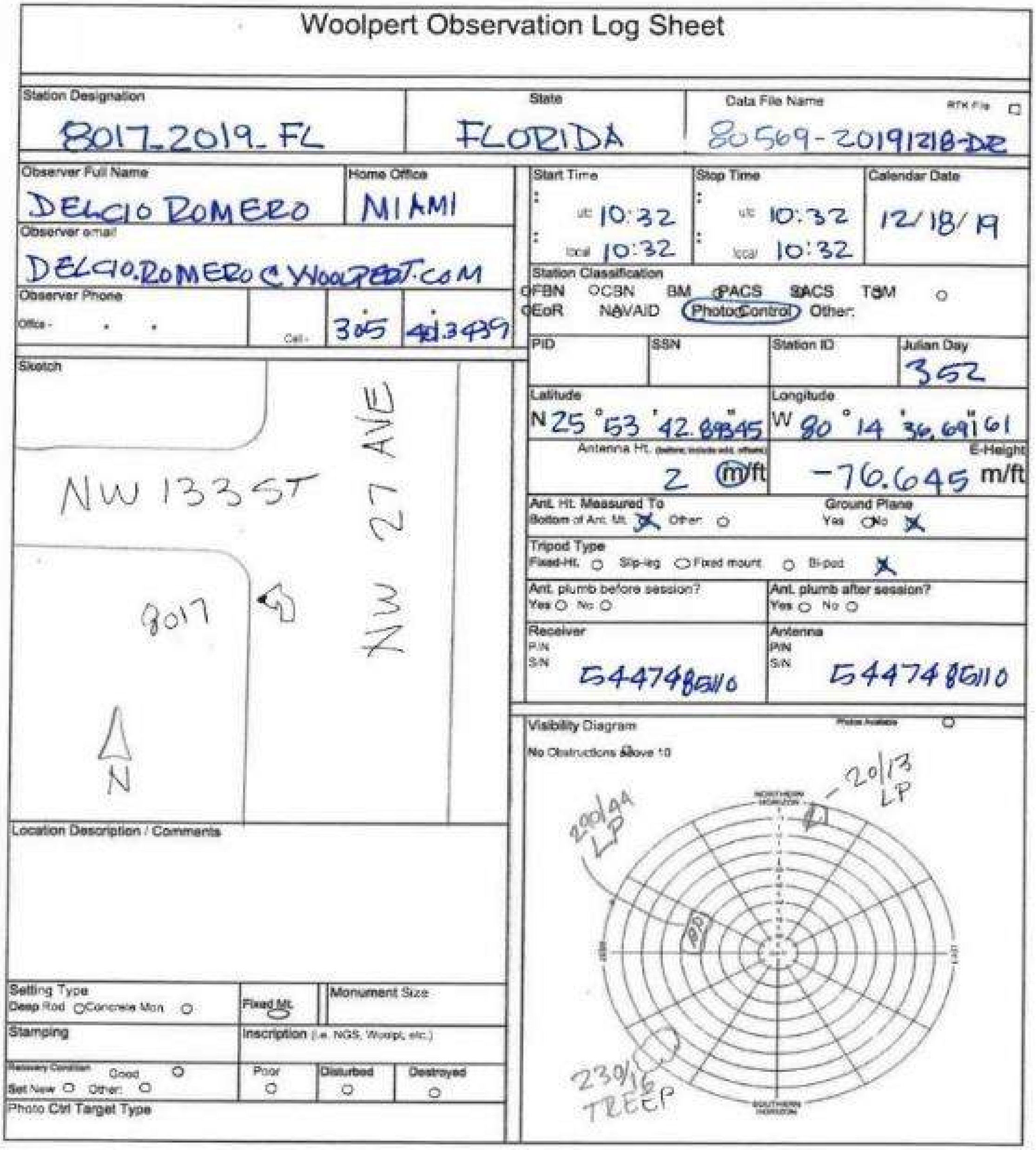
PHOTOS

⇧

NORTH

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8017_2019_FL | GPS Session File Name | 80569-20191218-DR.job |



### Woolpert Observation Log Sheet

Station Designation: 8017_2019_FL

State: FLORIDA

Data File Name: 80569-20191218-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 305 413439

Start Time: utc 10:32 local 10:32

Stop Time: utc 10:32 local 10:32

Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TGM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25 ° 53 ' 42.89845 "

Longitude: W 80 ° 14 ' 36.69161 "

Antenna Ht. (before; include add. offsets): 2 [✓ m]/ft

E-Height: -76.645 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 54474 86110

Antenna P/N S/N 54474 86110

Sketch

NW 133 ST

NW 27 AVE

8017

N

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon ○ Fixed Mt. ○

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other: ○

Photo Ctrl Target Type

Visibility Diagram

Photos Available ○

No Obstructions Above 10

20/13 LP

290/44 LP

230/16 TREE P

NORTHERN HORIZON

SOUTHERN HORIZON

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8018_2019_FL | GPS Session File Name | 80569_20191219_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **172637.907** | **566396.200** | **Datum (Epoch)** |
| **Easting** | **281725.896** | **924295.711** | **Datum (Epoch)** |
| **Orthometric Height** | **2.074** | **6.806** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25"53'22.53583" |
| Longitude | W80°11'03.95499" |
| Ellipsoidal Height | -23.374 m |
| Type of Mark | Set PK Nail at Point of Arrow |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal | | |
| Start Time : | 8:35:07 AM | Stop Time : | 8:35:35 AM |
| PDOP Max: | 1.831 | | |
| Start Time : | 1:24:37 PM | Stop Time : | 1:24:50 PM |
| PDOP Max: | 1.378 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Cloudy | | |

PHOTOS

⇧

NORTH

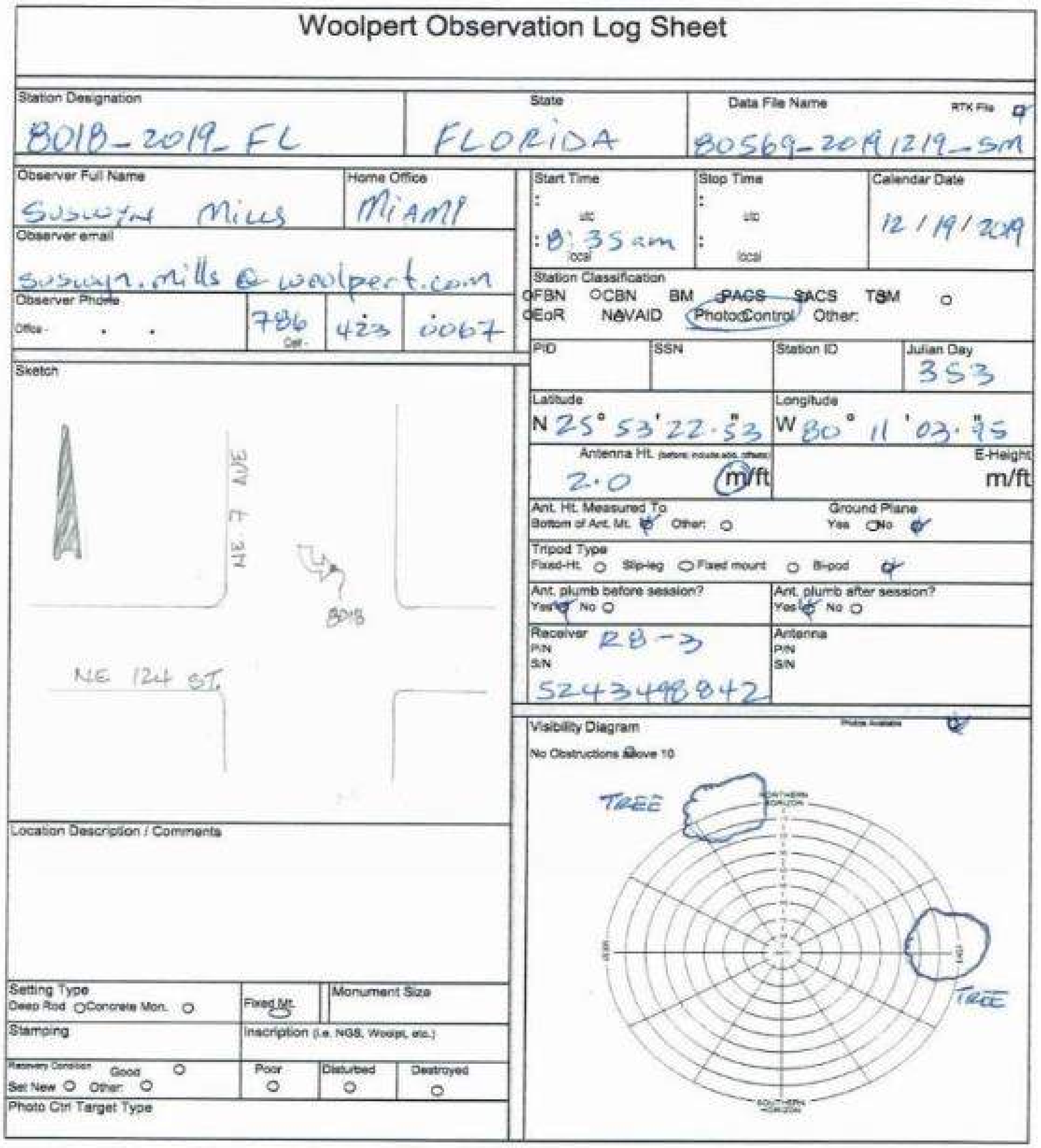
8018_2019_FL, 1, 20191219

8018_2019_FL, 3S, 20191219

8018_2019_FL, 3N, 20191219

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8018_2019_FL | GPS Session File Name | 80569_20191219_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8018_2019_FL

State: FLORIDA

Data File Name: 80569_20191219_SM

RTK File ✓

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 8:35 am local

Stop Time: : utc : local

Calendar Date: 12/19/2019

Station Classification: ○FBN ○CBN BM PACS SACS TSM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 353

Latitude: N 25° 53' 22.53"

Longitude: W 80° 11' 03.95"

Antenna Ht. (before include ARP offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○

Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○

Ant. plumb after session? Yes ✓ No ○

Receiver RB-3 P/N S/N 5243498842

Antenna P/N S/N

Sketch

Visibility Diagram

Photos Available ✓

No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8019_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191219_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **168048.199** | **551338.133** | **Datum (Epoch)** |
| **Easting** | **281546.832** | **923708.232** | **Datum (Epoch)** |
| **Orthometric Height** | **1.161** | **3.808** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25"50'53.43534"
Longitude: W80°11'11.40888"
Ellipsoidal Height: -24.302 m
Type of Mark: Set PK Nail at Point of Arrow
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 9:17:57 AM Stop Time : 9:18:10 AM
PDOP Max: 1.771
Start Time : 1:43:18 PM Stop Time : 1:43:29 PM
PDOP Max: 1.489
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

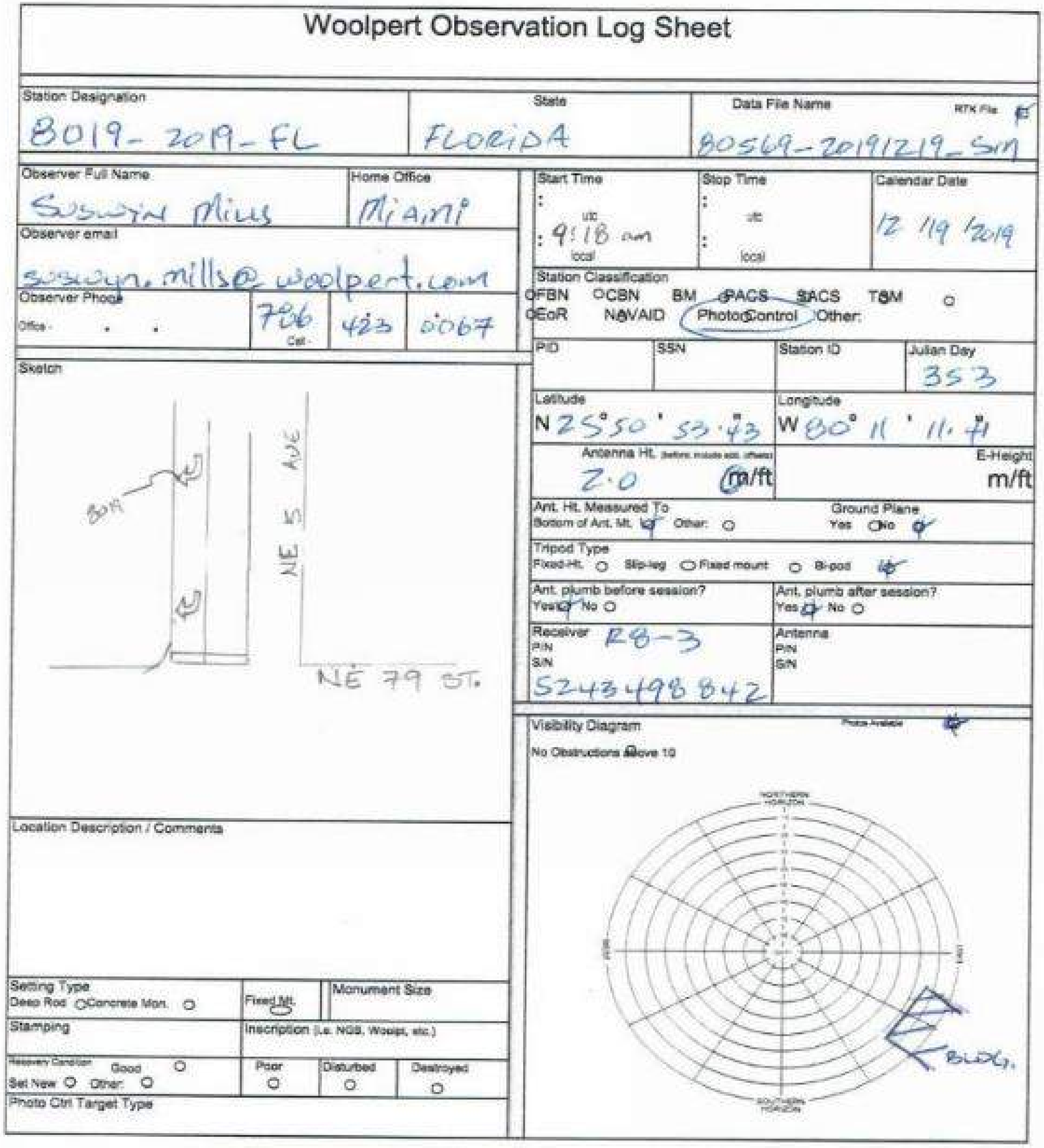
8019_2019_FL, 1, 20191219

8019_2019_FL, 3S, 20191219

8019_2019_FL, 3N, 20191219

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8019_2019_FL | GPS Session File Name | 80569_20191219_SM.job |



## Woolpert Observation Log Sheet

Station Designation: 8019-2019-FL

State: FLORIDA

Data File Name: 80569-20191219-SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 9:18 am local

Stop Time: : utc : local

Calendar Date: 12/19/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo ○Control] Other:

PID:

SSN:

Station ID:

Julian Day: 353

Latitude: N 25° 50' 53.43"

Longitude: W 80° 11' 11.71"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver R8-3
P/N
S/N 5243498842

Antenna
P/N
S/N

Sketch

Visibility Diagram Photo Available ☑

No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Delcio Romero |
| Project Number | 80569 | | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8020_2019_FL | | GPS Session File Name | 80569-20191218-DR.job |

| | **Metric** | **US Survey Feet** | |
|---|---|---|---|
| **Northing** | **167600.101** | **549867.997** | **Datum (Epoch)** |
| **Easting** | **273562.967** | **897514.500** | **Datum (Epoch)** |
| **Orthometric Height** | **2.274** | **7.462** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

| | | | | |
|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | |
| Latitude | N25°50'40.40208" | Start Time : | 9:41:57 AM | Stop Time : 9:42:07 AM |
| Longitude | W80°15'58.20352" | PDOP Max: | 1.457 | |
| Ellipsoidal Height | -22.997 m | Start Time : | 1:09:15 PM | Stop Time : 1:09:25 PM |
| Type of Mark | Set PK Nail at Point of Arrow | PDOP Max: | 1.676 | |
| | | Antenna Height: | 2.00 m | |
| Notes | | Weather Conditions | Cloudy | |

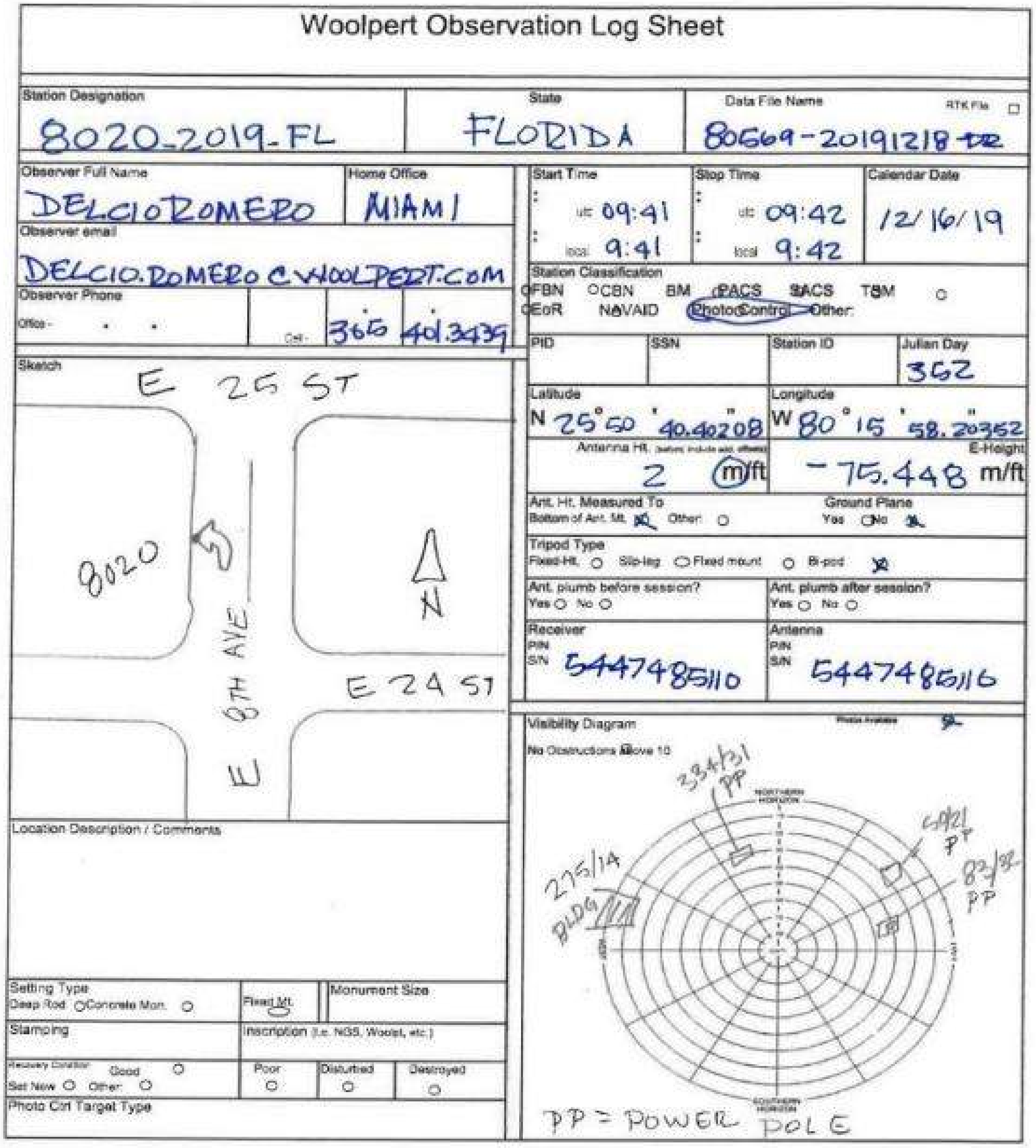
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8020_2019_FL | GPS Session File Name | 80569-20191218-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8020-2019-FL

State: FLORIDA

Data File Name: 80569-20191218-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 305 401 3439

Start Time: utc 09:41 local 9:41

Stop Time: utc 09:42 local 9:42

Calendar Date: 12/16/19

Station Classification: ○ FBN ○ CBN ○ BM ○ PACS ○ SACS ○ TBM ○ ○ EoR ○ NAVAID [✓ ○ Photo Control] ○ Other:

PID:

SSN:

Station ID:

Julian Day: 362

Latitude: N 25° 50 ' 40.40208 "

Longitude: W 80° 15 ' 58.20352 "

Antenna Ht. (before) include add. offsets: 2 [✓ m]/ft

E-Height: -75.448 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 5447485110

Antenna P/N S/N 5447486116

Sketch

Location Description / Comments

Visibility Diagram

Photo Available ☒

No Obstructions Above 10 ○

PP = POWER POLE

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8021_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569-20191218-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **166840.281** | **547375.154** | **Datum (Epoch)** |
| **Easting** | **268766.489** | **881778.055** | **Datum (Epoch)** |
| **Orthometric Height** | **2.446** | **8.024** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°50'16.55378"
Longitude: W80°18'50.58707"
Ellipsoidal Height: -22.702 m
Type of Mark: Set PK Nail at Point of Arrow
Notes:

Receiver: (e.g. R8, R10) Trimble R10 Internal
Start Time : 8:33:26 AM Stop Time : 8:33:59 AM
PDOP Max: 1.907
Start Time : 12:49:58 PM Stop Time : 12:50:09 PM
PDOP Max: 2.656
Antenna Height: 2.00 m
Weather Conditions: Cloudy

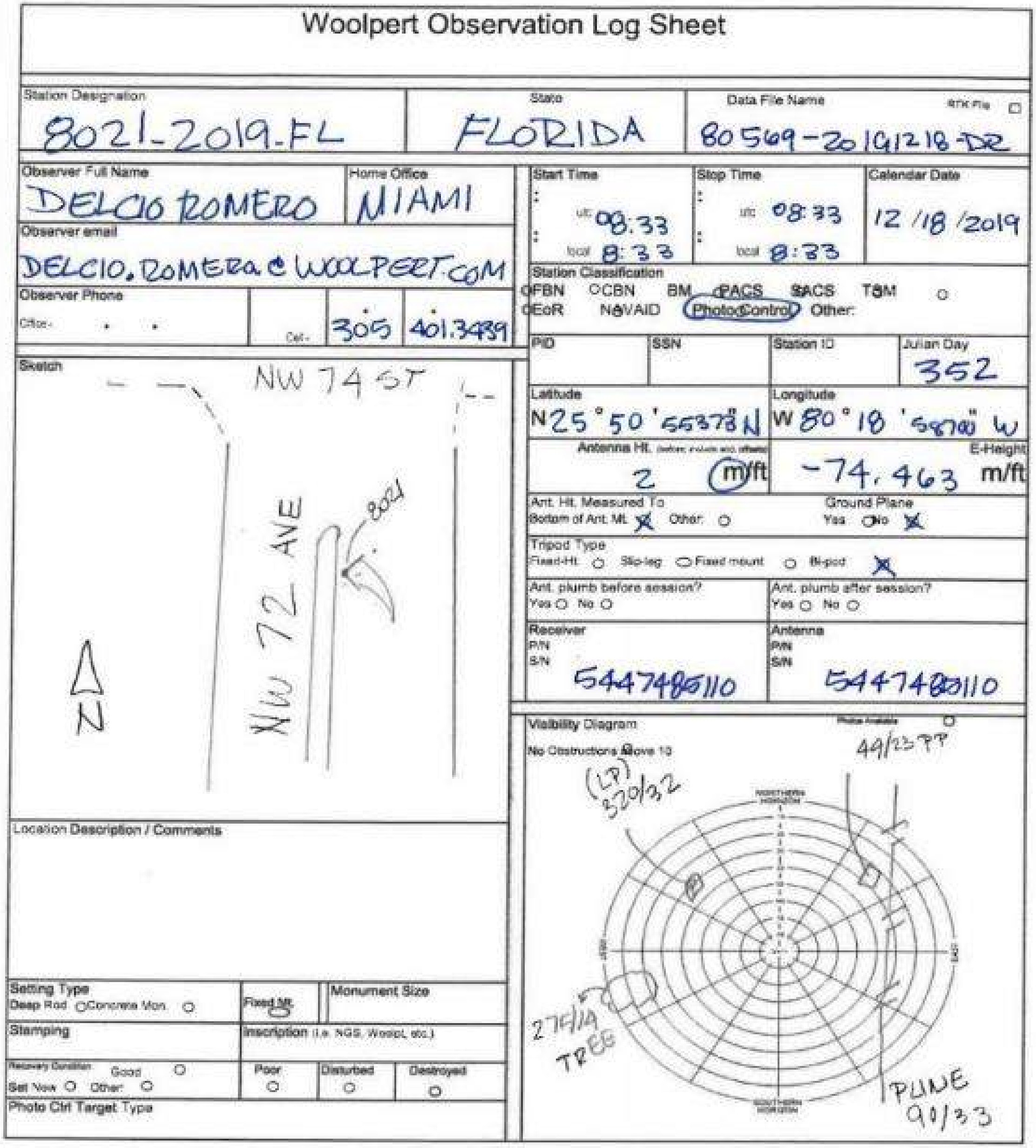
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8021_2019_FL
Operator Name: Delcio Romero
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569-20191218-DR.job



## Woolpert Observation Log Sheet

Station Designation: 8021-2019-FL
State: FLORIDA
Data File Name: 80569-20191218-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERAC WOOLPERT.COM
Observer Phone: Office- . . Cell- 305 401.3439

Start Time: utc 08:33 local 8:33
Stop Time: utc 08:33 local 8:33
Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ ○Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N25°50'55378" N
Longitude: W 80°18'58700" W
Antenna Ht. (before, include ant. offsets): 2 [✓ m]/ft
E-Height: -74.463 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: S/N: 5447480110
Antenna P/N: S/N: 5447480110

Sketch

Visibility Diagram

No Obstructions Above 10 ○
Photo Available ○

Location Description / Comments:

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8022_2019_FL | GPS Session File Name | 80569_20191219_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **162122.678** | **531897.485** | **Datum (Epoch)** |
| **Easting** | **281172.116** | **922478.850** | **Datum (Epoch)** |
| **Orthometric Height** | **2.688** | **8.820** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | ☐ |
| Other | | | |

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal |
| Latitude | N25°47'40.96695" | Start Time : | 2:44:12 PM Stop Time : 2:44:23 PM |
| Longitude | W80°11'26.17438" | PDOP Max: | 1.310 |
| Ellipsoidal Height | -22.830 m | Start Time : | 10:07:31 AM Stop Time : 10:07:41 AM |
| Type of Mark | Set Drill Hole | PDOP Max: | 1.465 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Cloudy |

PHOTOS

⇧

NORTH

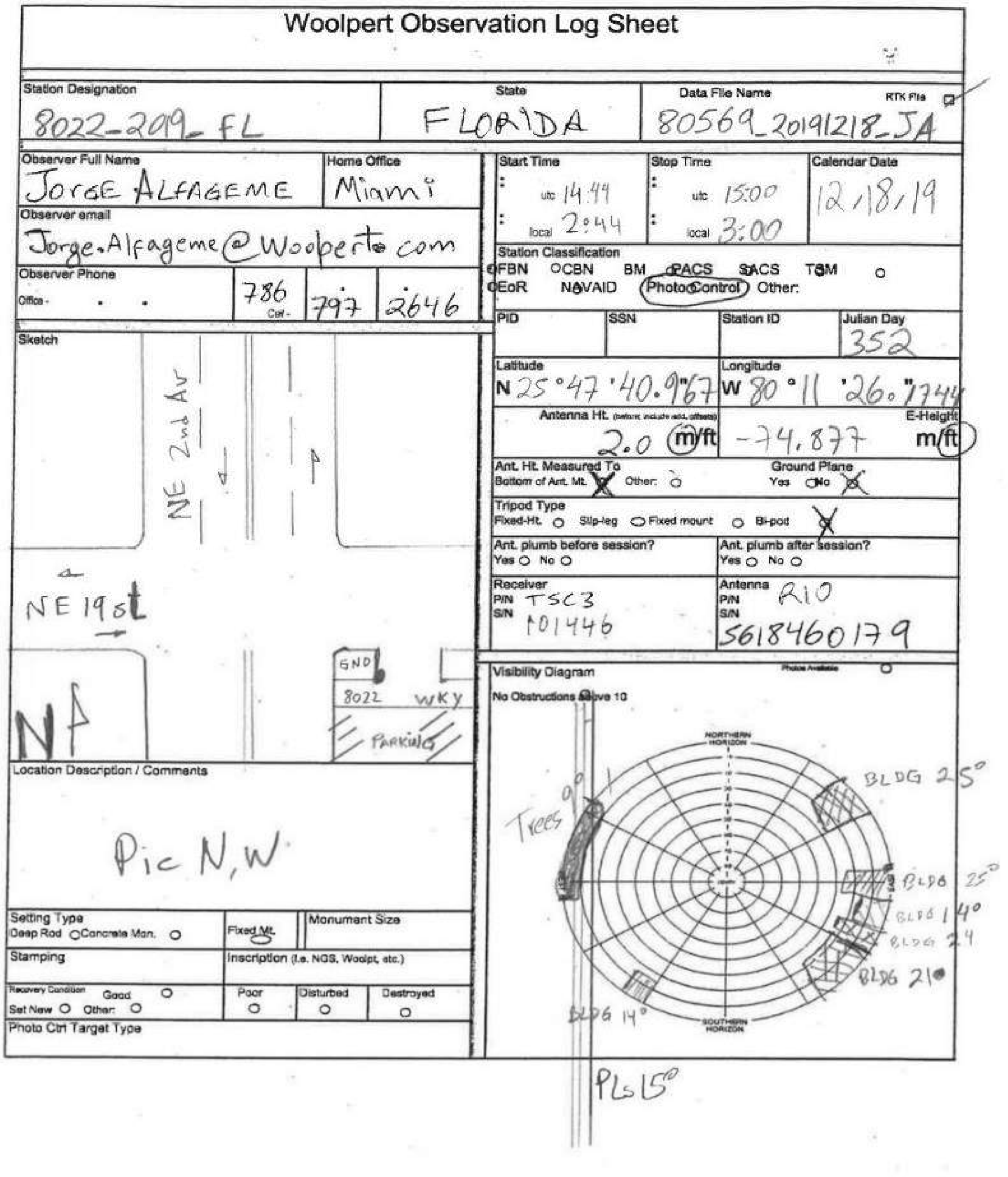

8022_2019_FL, 1, 20191218


8022_2019_FL, 3W, 20191218


8022_2019_FL, 3N, 20191218

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8022_2019_FL | GPS Session File Name | 80569_20191219_JA.job |



### Woolpert Observation Log Sheet

Station Designation: 8022-209-FL

State: FLORIDA

Data File Name: 80569_20191218_JA

RTK File ☑

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 14:44 local 2:44

Stop Time: utc 15:00 local 3:00

Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 47' 40.967"

Longitude: W 80° 11' 26.7744"

Antenna Ht. (before; include add. offsets): 2.0 [✓ m]/ft

E-Height: -74.877 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram Photos Available ○

No Obstructions above 10

Location Description / Comments: Pic N,W

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8023_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569-20191218-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **171115.547** | **561401.592** | **Datum (Epoch)** |
| **Easting** | **270565.586** | **887680.592** | **Datum (Epoch)** |
| **Orthometric Height** | **1.814** | **5.952** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping:
Latitude: N25°52'35.16776"
Longitude: W80°17'45.16228"
Ellipsoidal Height: -23.372 m
Type of Mark: Set PK Nail at Corner of Sidewalk
Notes:

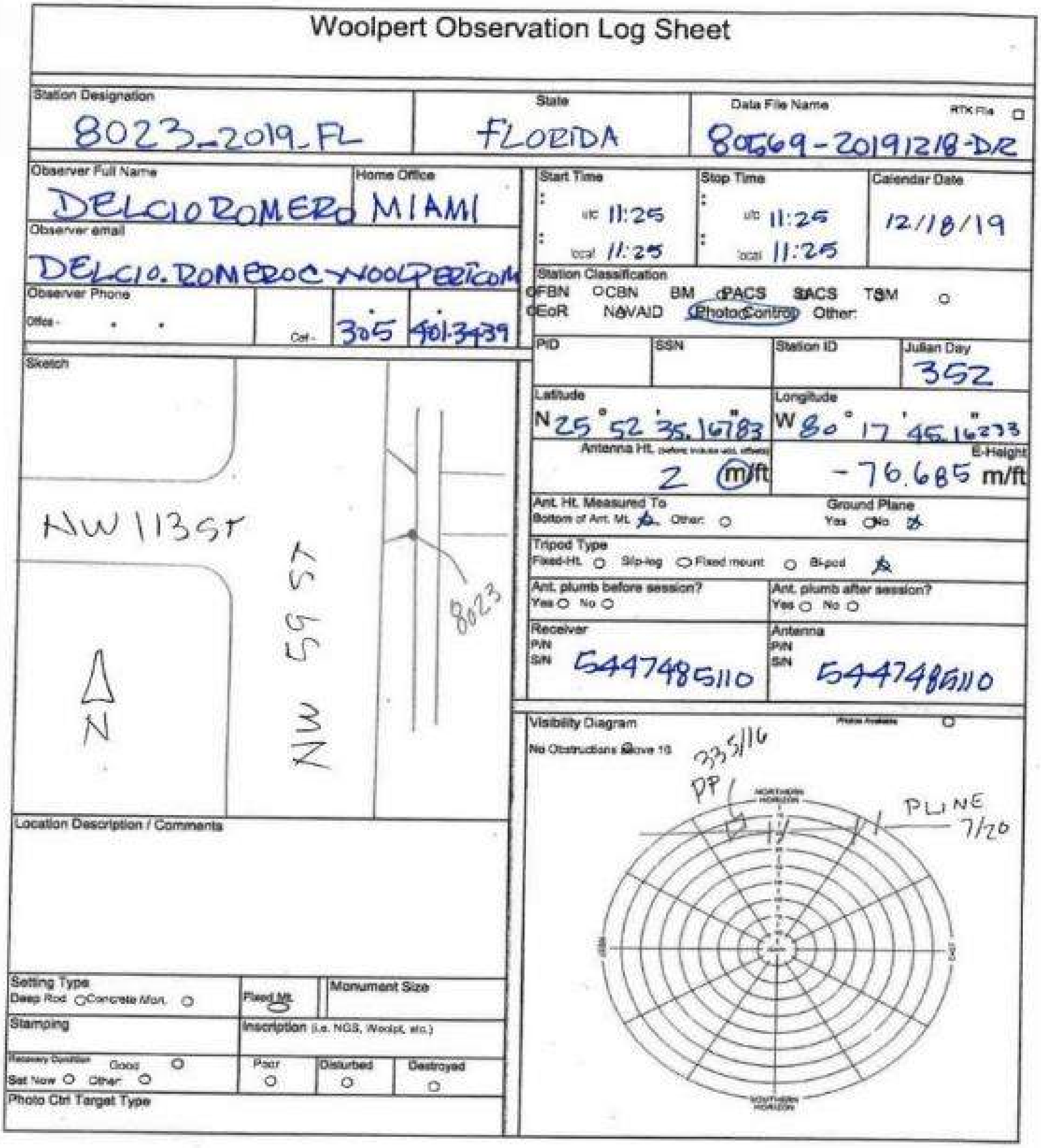
Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:25:42 AM Stop Time : 11:25:52 AM
PDOP Max: 1.394
Start Time : 1:58:58 PM Stop Time : 1:59:08 PM
PDOP Max: 1.419
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8023_2019_FL | GPS Session File Name | 80569-20191218-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8023_2019_FL
State: FLORIDA
Data File Name: 80569-20191218-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMEROC WOOLPERTCOM
Observer Phone: Office - . . Cell - 305 401-3439

Start Time: utc 11:25 local 11:25
Stop Time: utc 11:25 local 11:25
Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TGM ○ ○EoR NAVAID [✓ ○Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N 25° 52' 35.16783"
Longitude: W 80° 17' 45.16233"
Antenna Ht. (before in-house adj. offsets): 2 [✓ m]/ft
E-Height: -76.685 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. [✓] Other: ○
Ground Plane: Yes ○ No [✓]
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod [✓]
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N: 544748S110
Antenna P/N S/N: 544748S110

Visibility Diagram Photo Available ○
No Obstructions Above 15

Sketch

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set Now ○ Other ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | |
|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos |
| Project Number | 80569 |
| Project Point Name | 8024_2019_FL |

| | |
|---|---|
| Operator Name | Jorge Alfageme |
| Date of Field Survey | 12/17/2019 |
| GPS Session File Name | 80569_20191218_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **161078.365** | **528471.270** | **Datum (Epoch)** |
| **Easting** | **263164.182** | **863397.821** | **Datum (Epoch)** |
| **Orthometric Height** | **1.818** | **5.964** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25°47'10.22998" |
| Longitude | W80°22'12.74677" |
| Ellipsoidal Height | -23.151 m |
| Type of Mark | Set PK Nail at Point of Arrow |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 2:24:47 PM | Stop Time : | 2:24:58 PM |
| PDOP Max: | 1.534 | | |
| Start Time : | 10:05:29 AM | Stop Time : | 10:05:39 AM |
| PDOP Max: | 1.120 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Sunny | | |

PHOTOS

NORTH


8024_2019_FL, 1, 20191217


8024_2019_FL, 3N, 20191217


8024_2019_FL, 3E, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8024_2019_FL | GPS Session File Name | 80569_20191218_JA.job |

## Woolpert Observation Log Sheet

Station Designation: 8024_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_JA
RTK File ☒

Observer Full Name: Jorge Alfageme
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell. 786 797 2646

Start Time: utc 14:24 local 2:24
Stop Time: utc 14.42 local 2:42
Calendar Date: 12/17/19

Station Classification
○FBN ○CBN BM ○PACS SACS TBM ○
○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 351

Latitude: N25°47'10.223"
Longitude: W80°22'12.347"
Antenna Ht. (before include adj offsets): 2.0 [✓ m]/ft
E-Height: -75.954 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

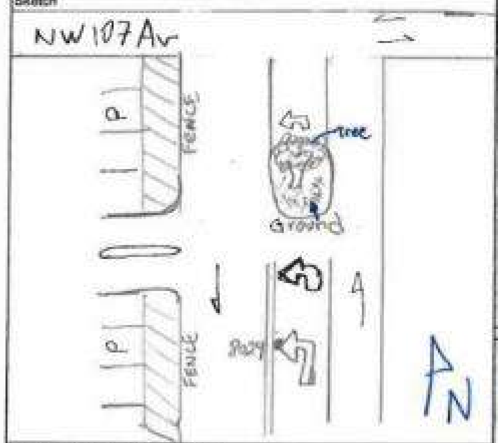
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

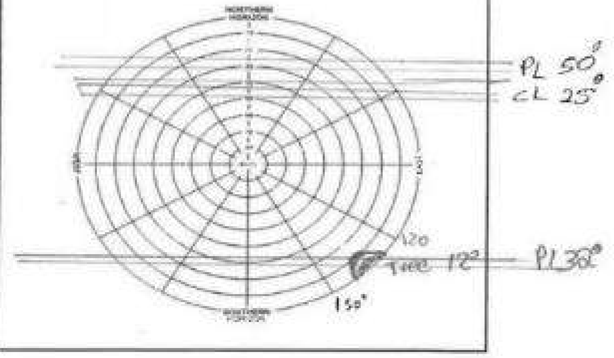
Receiver TSC3
P/N
S/N 101446

Antenna
P/N R10
S/N 5618460179

Sketch



Visibility Diagram
Photo Indicate ○
No Obstructions Above 10



Location Description / Comments

Pic N, E.

Setting Type: Deep Rod ○ Concrete Mon. ○
Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8025_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191218_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **164816.798** | **540736.444** | **Datum (Epoch)** |
| **Easting** | **261761.975** | **858797.412** | **Datum (Epoch)** |
| **Orthometric Height** | **1.842** | **6.042** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°49'11.92731"
Longitude: W80°23'02.44814"
Ellipsoidal Height: -23.156 m
Type of Mark: Set PK Nail at Corner of Stop Bar

Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 1:37:12 PM Stop Time : 1:37:23 PM
PDOP Max: 1.329
Start Time : 9:47:57 AM Stop Time : 9:48:11 AM
PDOP Max: 1.153
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

8025_2019_FL, 1, 20191217

8025_2019_FL, 3N, 20191217

8025_2019_FL, 3E, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8025_2019_FL | GPS Session File Name | 80569_20191218_JA.job |

## Woolpert Observation Log Sheet

Station Designation: 8025_2019_FL

State: FLORIDA

Data File Name: 80569_20191217_JA RTK File ☐

Observer Full Name: Jorge Alfageme

Home Office: Miami

Observer email: Jorge.Alfageme@woolpert.com

Observer Phone: Office- . . Cell- 786 797 2646

Start Time: utc 13:37 local 1:37

Stop Time: utc 13:55 local 1:55

Calendar Date: 12,17,19

Station Classification: ○FBN ○CBN BM ●PACS ○SACS T○M ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 351

Latitude: N25°49'11.927

Longitude: W80°23'02."418

Antenna Ht. (before, outside, add. offsets): 2.0 [✓ m]/ft

E-Height: -76.015 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ● Other: ○

Ground Plane: Yes ○ No ●

Tripod Type: Fixed Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ●

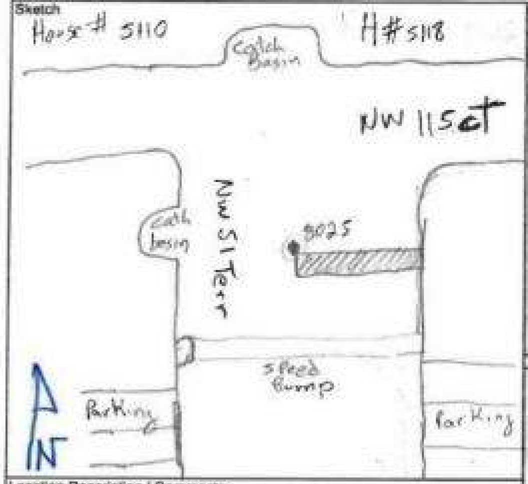
Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 10144 6

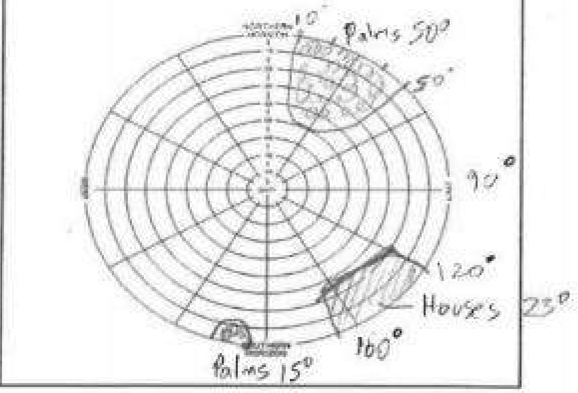
Antenna P/N: R10 S/N: 5618460179

Sketch



Visibility Diagram Photo Available ○

No Obstructions Above 10



Location Description / Comments

Pic N, E,

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | |
|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos |
| Project Number | 80569 |
| Project Point Name | 8026_2019_FL |

| | |
|---|---|
| Operator Name | Jorge Alfageme |
| Date of Field Survey | 12/16/2019 |
| GPS Session File Name | 80569_20191217_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **162915.135** | **534497.404** | **Datum (Epoch)** |
| **Easting** | **268248.924** | **880080.010** | **Datum (Epoch)** |
| **Orthometric Height** | **1.829** | **6.000** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25°48'09.09394" |
| Longitude | W80°19'09.90108" |
| Ellipsoidal Height | -23.319 m |
| Type of Mark | Set PK Nail |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 1:43:29 PM | Stop Time : | 1:43:41 PM |
| PDOP Max: | 3.142 | | |
| Start Time : | 10:29:33 AM | Stop Time : | 10:29:43 AM |
| PDOP Max: | 1.379 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Sunny | | |

PHOTOS

NORTH

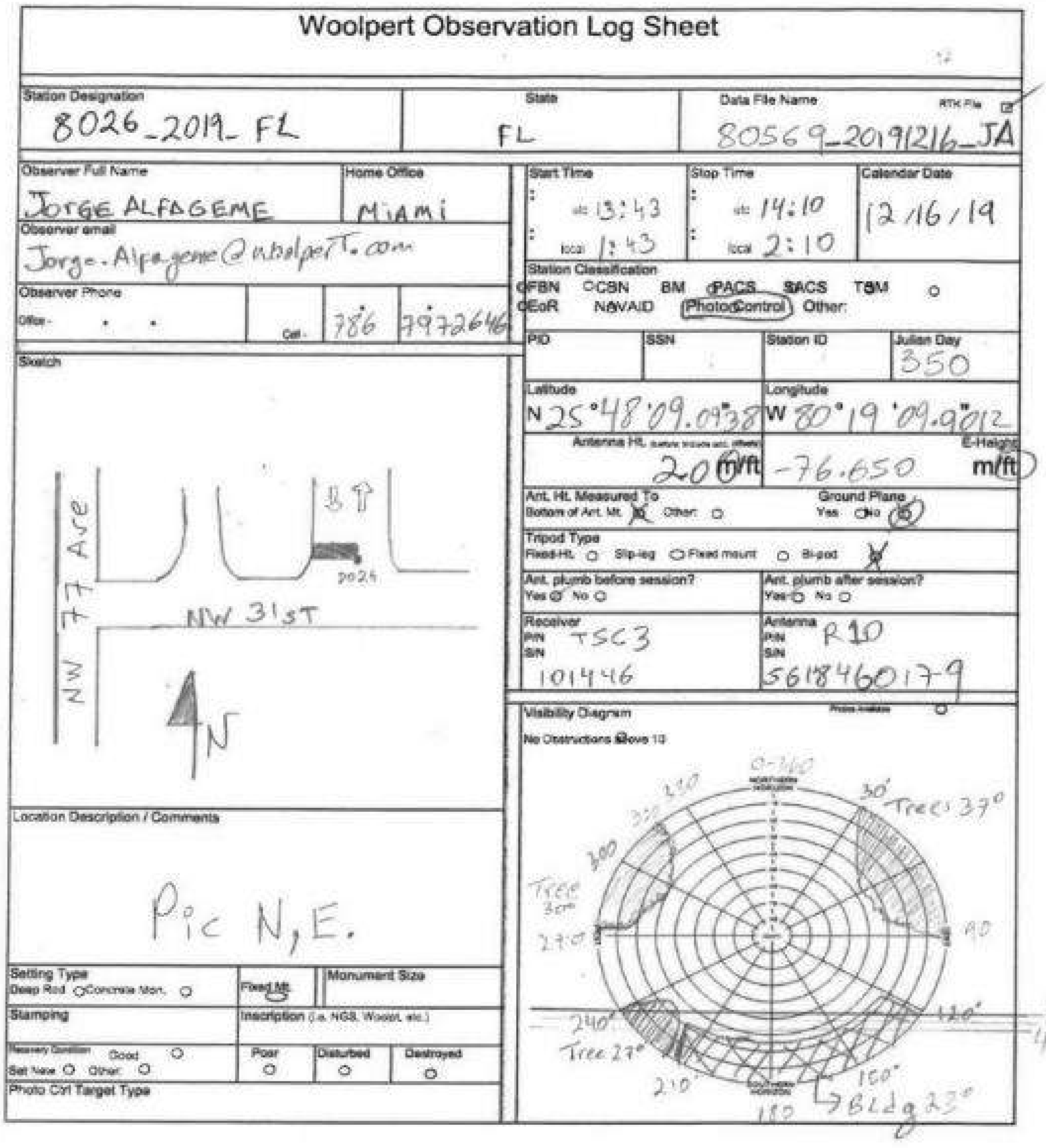
8026_2019_FL_1, 20191216

8026_2019_FL_3N, 20191216

8026_2019_FL_3E, 20191216

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8026_2019_FL
Operator Name: Jorge Alfageme
Date of Field Survey: 12/16/2019
GPS Session File Name: 80569_20191217_JA.job



## Woolpert Observation Log Sheet

Station Designation: 8026_2019_FL
State: FL
Data File Name: 80569_20191216_JA
RTK File ☑

Observer Full Name: JORGE ALFAGEME
Home Office: MIAMI
Observer email: Jorge.Alfagene@woolperT.com
Observer Phone: Office - . . Cell - 786 7972646

Start Time: utc 13:43 local 1:43
Stop Time: utc 14:10 local 2:10
Calendar Date: 12/16/19

Station Classification: ○ FBN ○ CBN BM ○ PACS SACS TBM ○ ○ EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 350

Latitude: N 25°48'09.0938"
Longitude: W 80°19'09.9012"
Antenna Ht. (before travel w/ offsets): 2.00 [✓ m]/ft
E-Height: -76.650 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ [✓ No ○]
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ● No ○
Ant. plumb after session? Yes ○ No ○
Receiver: P/N TSC3 S/N 101446
Antenna: P/N R10 S/N 5618460179

Sketch

Location Description / Comments: Pic N, E.

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

Visibility Diagram
Photo Available ○
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8027_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/16/2019
GPS Session File Name: 80569_20191216_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **164048.370** | **538215.362** | **Datum (Epoch)** |
| **Easting** | **274743.635** | **901388.074** | **Datum (Epoch)** |
| **Orthometric Height** | **1.764** | **5.787** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude: N25°48'44.77475"
Longitude: W80°15'16.52912"
Ellipsoidal Height: -23.547 m
Type of Mark: Set PK Nail at Corner of Stop Bar
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 2:58:27 PM Stop Time : 2:58:39 PM
PDOP Max: 1.660
Start Time : 10:52:56 AM Stop Time : 10:53:07 AM
PDOP Max: 1.779
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

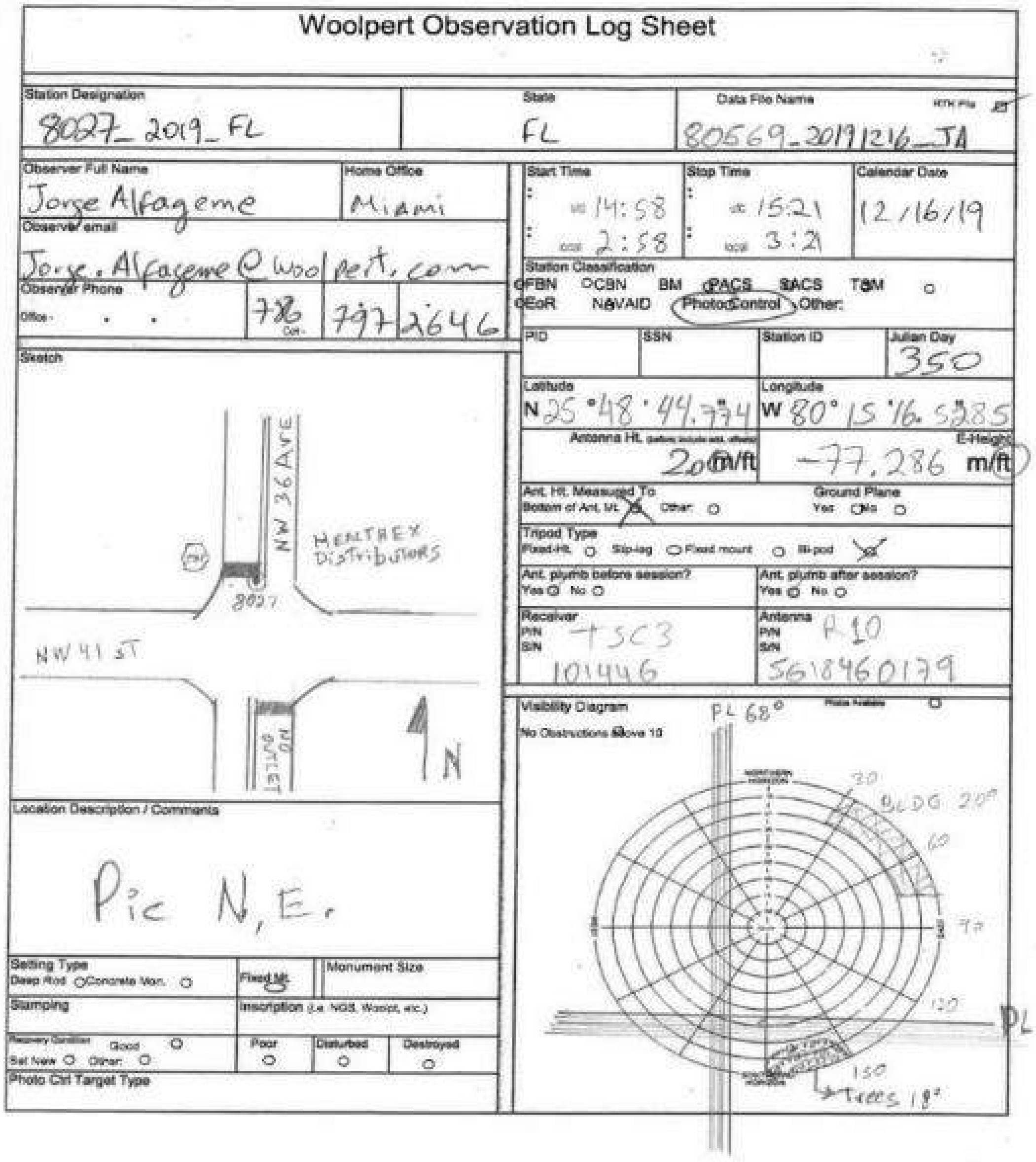
8027_2019_FL, 1, 20191216

8027_2019_FL, 3N, 20191216

8027_2019_FL, 3E, 20191216

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/16/2019 |
| Project Point Name | 8027_2019_FL | GPS Session File Name | 80569_20191216_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8027_2019_FL
State: FL
Data File Name: 80569_20191216_JA
RTK File ☒

Observer Full Name: Jorge Alfageme
Home Office: Miami
Observer email: Jorge.Alfageme@woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 14:58 local 2:58
Stop Time: utc 15:21 local 3:21
Calendar Date: 12/16/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] ○Other:

PID: 
SSN: 
Station ID: 
Julian Day: 350

Latitude: N 25° 48' 44.774"
Longitude: W 80° 15' 16.5385"
Antenna Ht. (before include ant. offsets): 2.0 [✓ m]/ft
E-Height: -77.286 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ○
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3
S/N: 101446
Antenna P/N: R10
S/N: 5618460179

Sketch

Visibility Diagram
No Obstructions Above 10
Photo Available ○

Location Description / Comments: Pic N, E.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt.
Monument Size: 
Stamping: 
Inscription (i.e. NGS, Woolpert, etc.): 
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8028_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191220_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **158233.387** | **519137.371** | **Datum (Epoch)** |
| **Easting** | **255780.044** | **839171.694** | **Datum (Epoch)** |
| **Orthometric Height** | **2.363** | **7.752** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

Mark Stamping
Latitude: N25°45'38.86024"
Longitude: W80°26'38.21781"
Ellipsoidal Height: -22.406 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:08:20 AM Stop Time : 11:08:32 AM
PDOP Max: 1.518
Start Time : 7:17:38 AM Stop Time : 7:17:49 AM
PDOP Max: 1.329
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

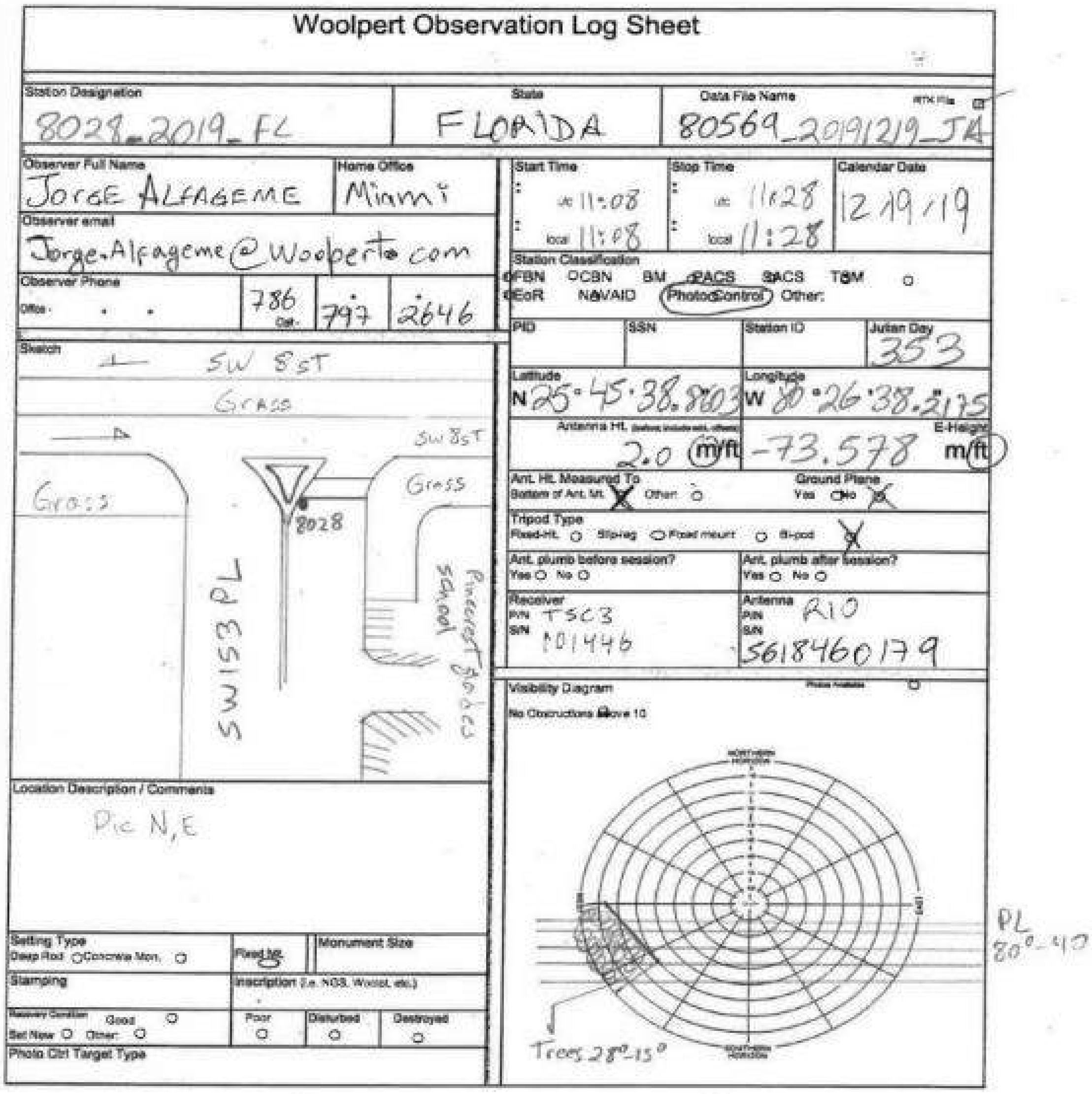
8028_2019_FL_1_20191219


8028_2019_FL_3N_20191219


8028_2019_FL_3E_20191219

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8028_2019_FL
Operator Name: Jorge Alfageme
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191220_JA.job



## Woolpert Observation Log Sheet

Station Designation: 8028_2019_FL
State: FLORIDA
Data File Name: 80569_20191219_JA
RTK File ☑

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office · · Cell 786 797 2646

Start Time: utc 11:08 local 11:08
Stop Time: utc 11:28 local 11:28
Calendar Date: 12 19 19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○EoR ○NAVAID [✓ Photo Control] ○Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N 25°45·38.8803
Longitude: W 80°26·38.2175
Antenna Ht. (before including antenna offsets): 2.0 [✓ m]/ft
E-Height: -73.578 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver P/N: TSC3 S/N: 101446
Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments: Pic N,E

Visibility Diagram
No Obstructions Above 10°
Photo Available ○

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed ht. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpert, etc.):
Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8029_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/13/2019
GPS Session File Name: 80569_20191216_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **156776.480** | **514357.503** | **Datum (Epoch)** |
| **Easting** | **265169.802** | **869977.924** | **Datum (Epoch)** |
| **Orthometric Height** | **2.326** | **7.630** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°44'50.12211"
Longitude: W80°21'01.52049"
Ellipsoidal Height: -22.710 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 2:43:28 PM Stop Time : 2:43:39 PM
PDOP Max: 1.274
Start Time : 9:16:05 AM Stop Time : 9:16:16 AM
PDOP Max: 1.359
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

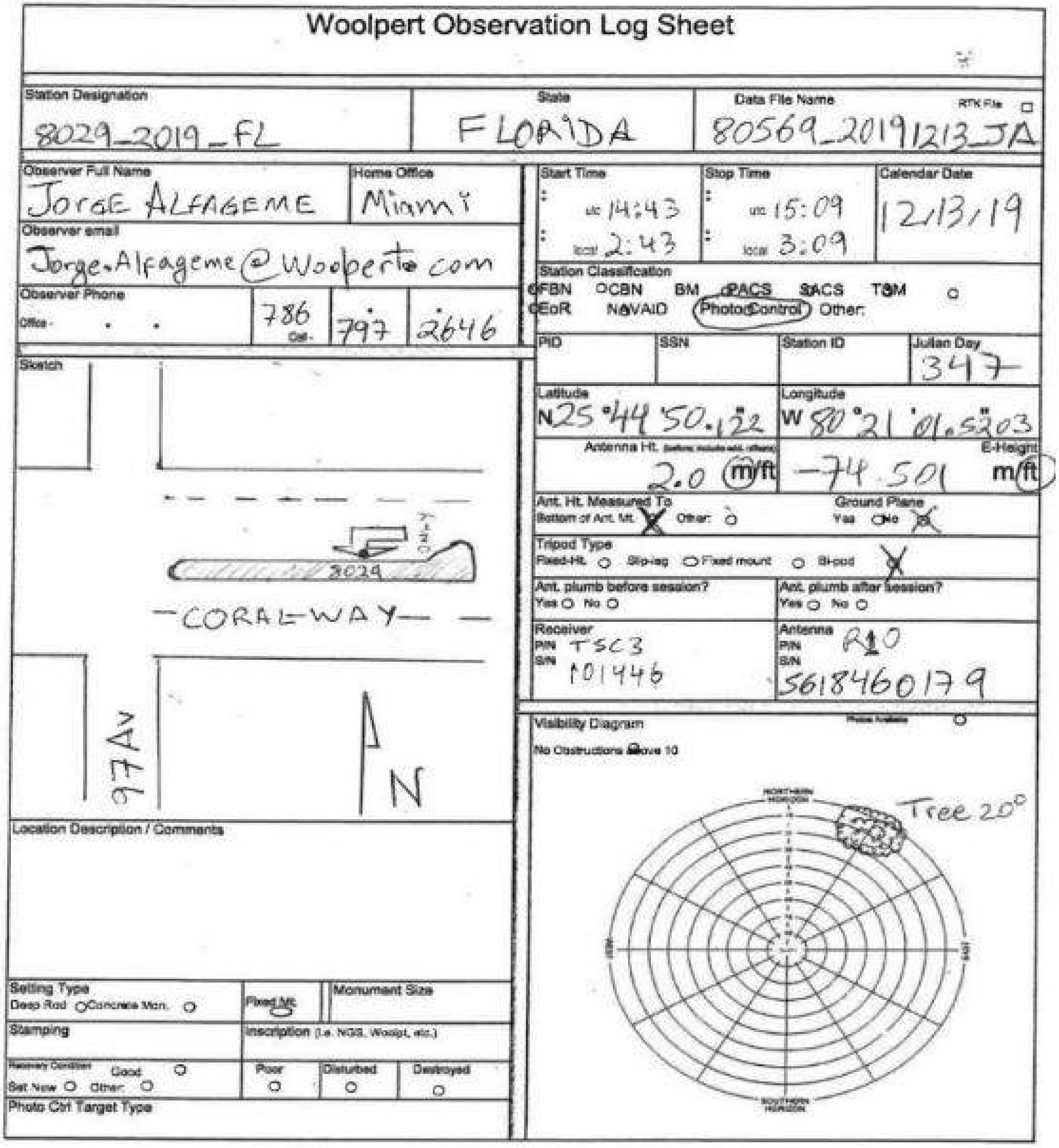
8029_2019_FL, 1, 20191213

8029_2019_FL, 3W, 20191213

8029_2019_FL, 3N, 20191213

## GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8029_2019_FL
Operator Name: Jorge Alfageme
Date of Field Survey: 12/13/2019
GPS Session File Name: 80569_20191216_JA.job



### Woolpert Observation Log Sheet

Station Designation: 8029_2019_FL
State: FLORIDA
Data File Name: 80569_20191213_JA
RTK File ☐

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 14:43 local 2:43
Stop Time: utc 15:09 local 3:09
Calendar Date: 12/13/19

Station Classification: ○FBN ○CBN BM ○PACS SACS T&M ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 347

Latitude: N25°44'50.122"
Longitude: W 80°21'01.5203"
Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: -74.501 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver: P/N TSC3 S/N 101446
Antenna: P/N R10 S/N 5618460179

Sketch

Visibility Diagram
Photos Available ○
No Obstructions Above 10

Location Description / Comments:

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8030_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/13/2019
GPS Session File Name: 80569_20191216_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **157486.598** | **516687.281** | **Datum (Epoch)** |
| **Easting** | **271470.813** | **890650.491** | **Datum (Epoch)** |
| **Orthometric Height** | **3.540** | **11.613** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°45'12.14020"
Longitude: W80°17'15.29777"
Ellipsoidal Height: -21.668 m
Type of Mark: Set Drill Hole

Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 1:06:17 PM Stop Time : 1:06:51 PM
PDOP Max: 1.451
Start Time : 8:54:02 AM Stop Time : 8:54:14 AM
PDOP Max: 1.496
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

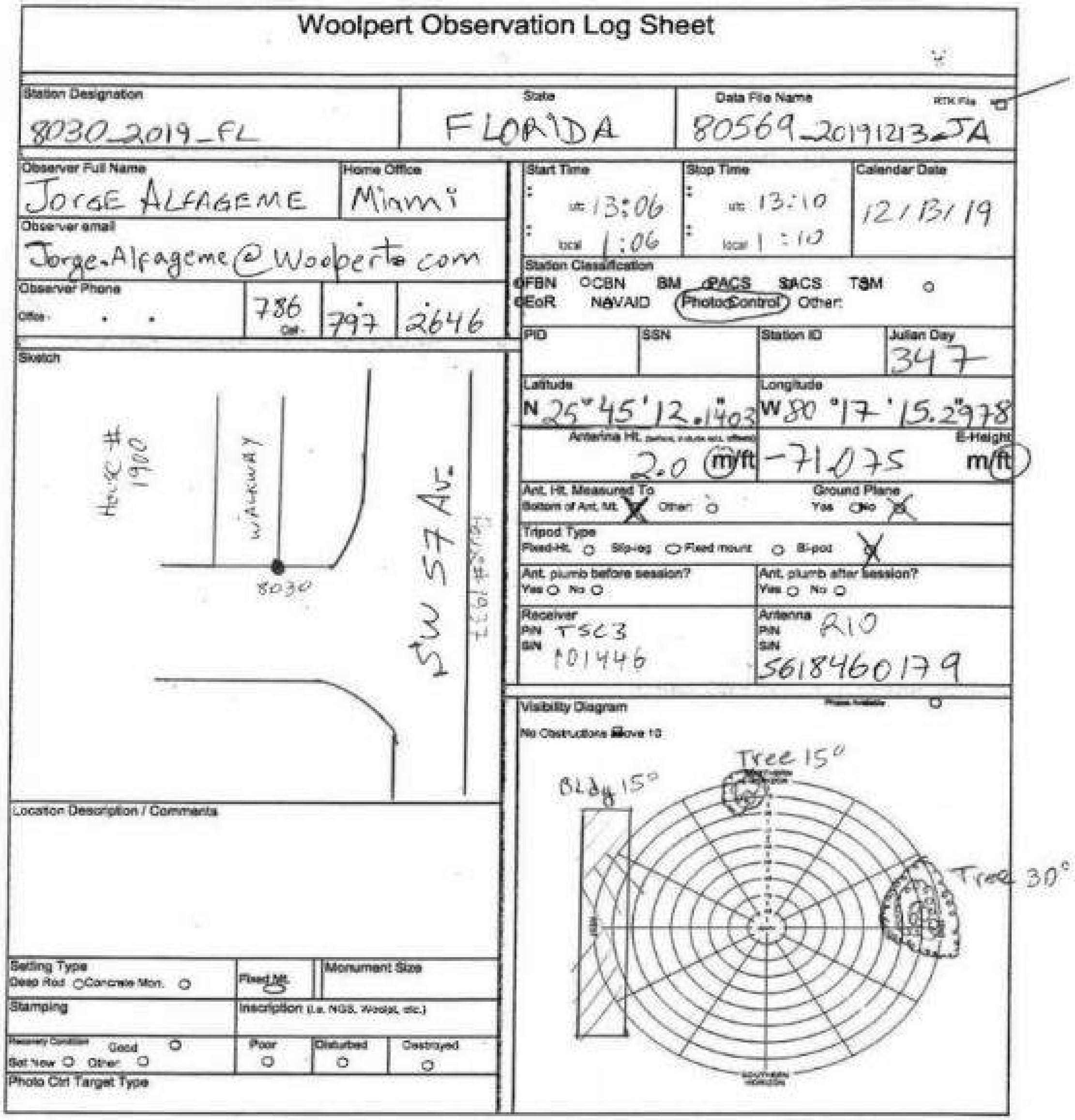
8030_2019_FL, 1, 20191213

8030_2019_FL, 3W, 20191213

8030_2019_FL, 3N, 20191213

## GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8030_2019_FL
Operator Name: Jorge Alfageme
Date of Field Survey: 12/13/2019
GPS Session File Name: 80569_20191216_JA.job



### Woolpert Observation Log Sheet

Station Designation: 8030_2019_FL
State: FLORIDA
Data File Name: 80569_20191213_JA
RTK File ☐

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office: . . Cell: 786 797 2646

Start Time: utc 13:06 local 1:06
Stop Time: utc 13:10 local 1:10
Calendar Date: 12/13/19

Station Classification: ○FBN ○CBN BM PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 347

Latitude: N 25° 45' 12.1403"
Longitude: W 80° 17' 15.2978"
Antenna Ht. (before, include ant. offset): 2.0 [✓ m]/ft
E-Height: -71.075 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446
Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments:

Visibility Diagram ○
No Obstructions Above 10 ☐

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Jorge Alfageme |
| Project Number | 80569 | | Date of Field Survey | 12/13/2019 |
| Project Point Name | 8031_2019_FL | | GPS Session File Name | 80569_20191216_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **159964.049** | **524815.385** | **Datum (Epoch)** |
| **Easting** | **276411.978** | **906861.632** | **Datum (Epoch)** |
| **Orthometric Height** | **3.556** | **11.667** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | |
|---|---|---|
| Mark Stamping | | |
| Latitude | N25°46'31.74646" | |
| Longitude | W80°14'17.48423" | |
| Ellipsoidal Height | -21.849 | m |
| Type of Mark | Set PK Nail | |
| Notes | | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 12:05:24 PM | Stop Time : | 12:05:51 PM |
| PDOP Max: | 1.326 | | |
| Start Time : | 8:23:45 AM | Stop Time : | 8:23:57 AM |
| PDOP Max: | 1.426 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Cloudy | | |

PHOTOS

⇧

NORTH

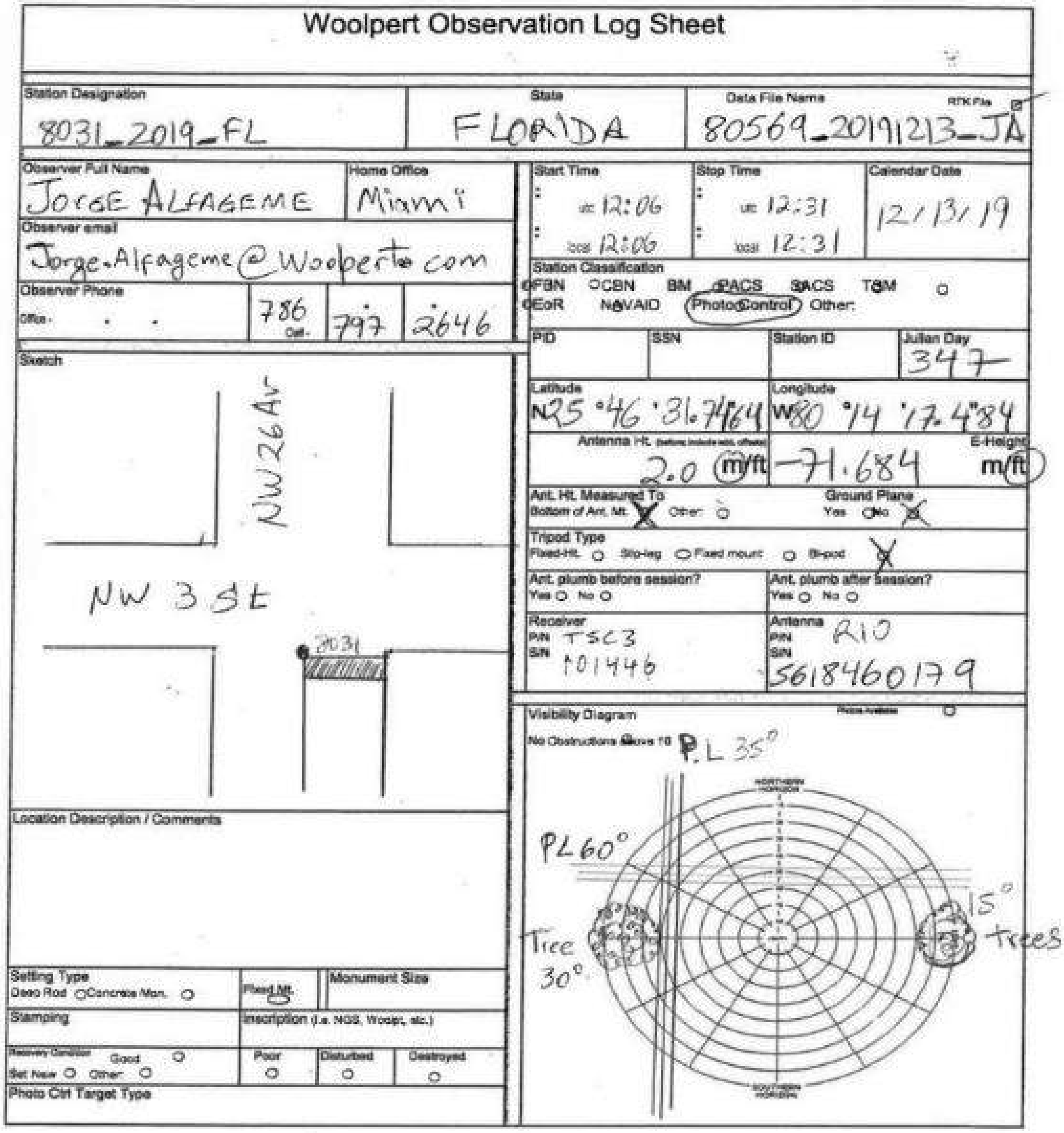
8031_2019_FL, 1, 20191213

8031_2019_FL, 3N, 20191213

8031_2019_FL, 3E, 20191213

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/13/2019 |
| Project Point Name | 8031_2019_FL | GPS Session File Name | 80569_20191216_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8031_2019_FL
State: FLORIDA
Data File Name: 80569_20191213_JA
RTK File ☑

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 12:06 local 12:06
Stop Time: utc 12:31 local 12:31
Calendar Date: 12/13/19

Station Classification
○FBN ○CBN BM ○PACS ○SACS TBM ○
○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 347

Latitude: N25°46'31.7464
Longitude: W80°14'17.484

Antenna Ht. (before include ant. offsets): 2.0 [✓ m]/ft
E-Height: -71.684 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N TSC3 S/N 101446
Antenna P/N R10 S/N 5618460179

Sketch

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type

Visibility Diagram
Photo Available ○
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8032_2019_FL | GPS Session File Name | 80569_20191218_JA.job |

| | **Metric** | **US Survey Feet** | |
|---|---|---|---|
| **Northing** | **157648.952** | **517219.936** | **Datum (Epoch)** |
| **Easting** | **280187.935** | **919249.916** | **Datum (Epoch)** |
| **Orthometric Height** | **4.358** | **14.298** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | | | | | |
|---|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Latitude | N25°45'15.79204" | Start Time : | 9:48:02 AM | Stop Time : | 9:48:13 AM |
| Longitude | W80°12'02.47482" | PDOP Max: | 1.313 | | |
| Ellipsoidal Height | -21.143 m | Start Time : | 1:58:00 PM | Stop Time : | 1:58:11 PM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.211 | | |
| | | Antenna Height: | 2.00 m | | |
| Notes | | Weather Conditions | Sunny | | |

PHOTOS

⇧

NORTH

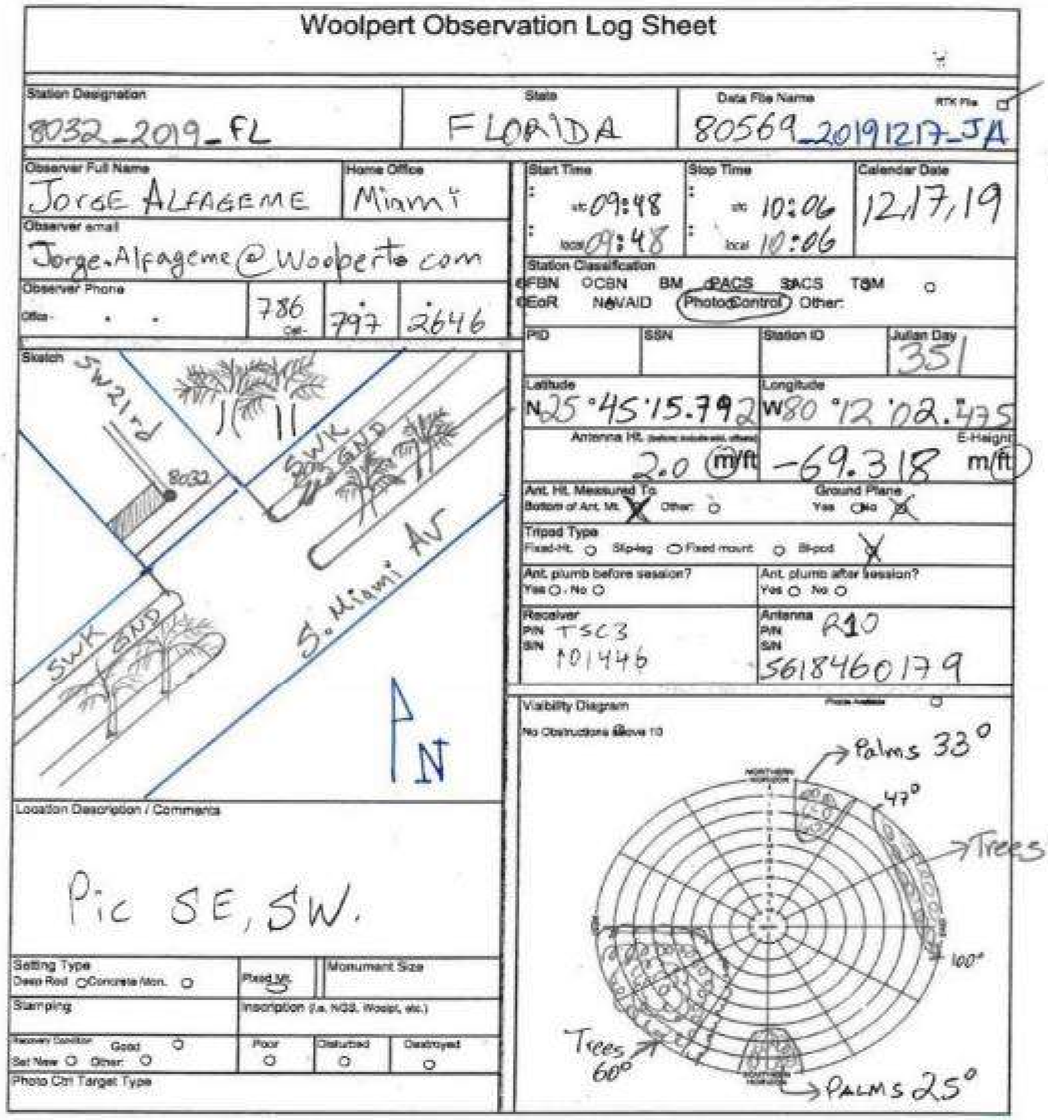
8032_2019_FL, 1, 20191217

8032_2019_FL, 3SW, 20191217

8032_2019_FL, 3SE, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8032_2019_FL | GPS Session File Name | 80569_20191218_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8032_2019_FL
State: FLORIDA
Data File Name: 80569_20191217_JA
RTK File ☐

Observer Full Name: Jorge Alfageme
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office- . . Cell- 786 797 2646

Start Time: utc 09:48 local 09:48
Stop Time: utc 10:06 local 10:06
Calendar Date: 12/17/19

Station Classification
FBN ○CBN BM PACS SACS TBM ○
EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 351

Latitude: N25°45'15.792
Longitude: W80°12'02.475

Antenna Ht.: 2.0 [✓ m]/ft
E-Height: -69.318 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N TSC3 S/N 101446
Antenna P/N R10 S/N 5618460179

Sketch

Visibility Diagram
No Obstructions Above 10
Photo Available ○

Location Description / Comments

Pic SE, SW.

Setting Type: Deep Rod ○Concrete Mon. ○
Fixed Mt.
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8033_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191220_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **154315.382** | **506283.047** | **Datum (Epoch)** |
| **Easting** | **255415.253** | **837974.877** | **Datum (Epoch)** |
| **Orthometric Height** | **2.277** | **7.470** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

Mark Stamping
Latitude: N25°43'31.59041"
Longitude: W80°26'51.89721"
Ellipsoidal Height: -22.488 m
Type of Mark: Set PK Nail

Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:50:50 AM Stop Time : 11:51:00 AM
PDOP Max: 1.192
Start Time : 7:33:06 AM Stop Time : 7:33:17 AM
PDOP Max: 1.236
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

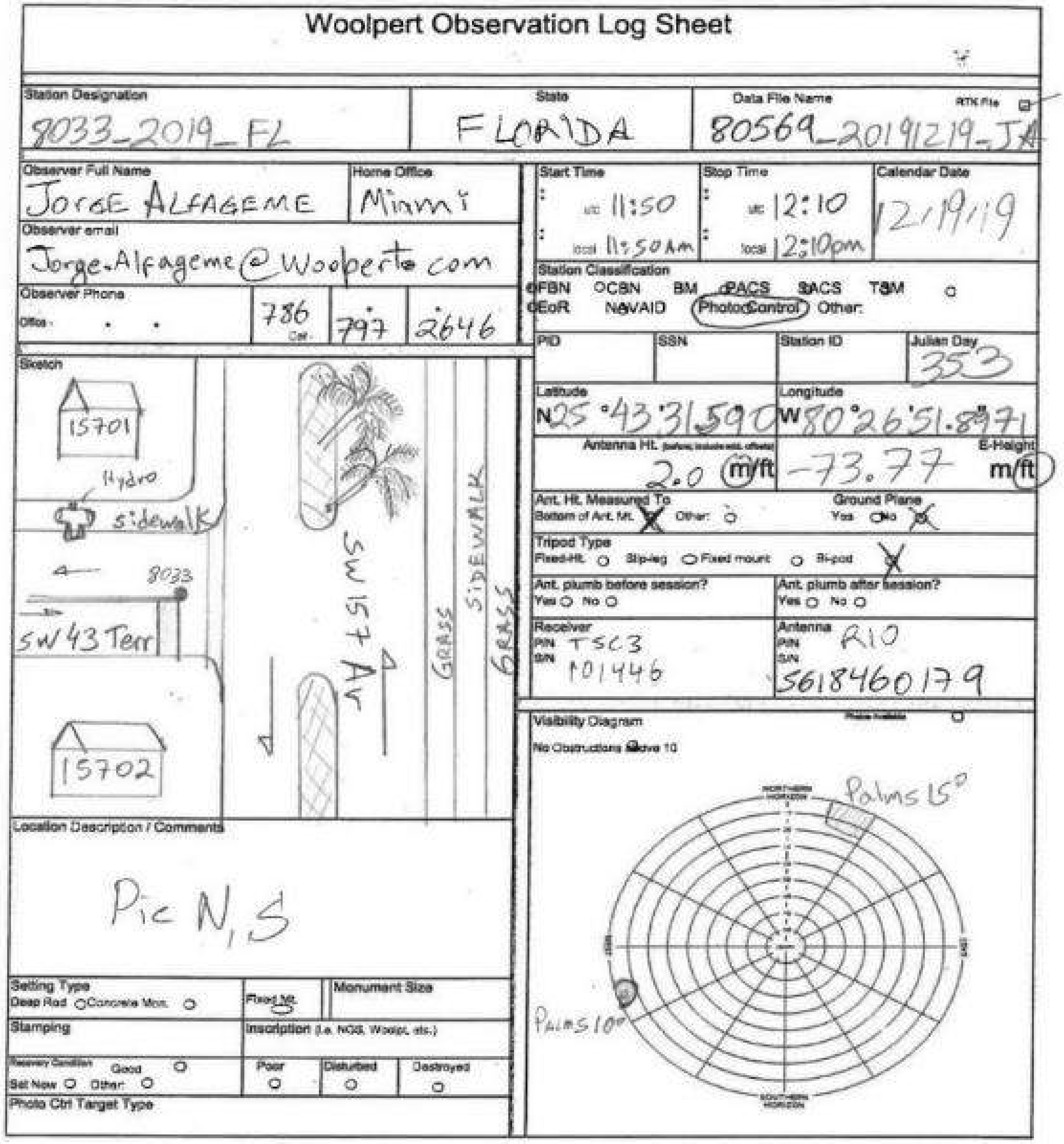
8033_2019_FL, 1, 20191219

8033_2019_FL, 3S, 20191219

8033_2019_FL, 3N, 20191219

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8033_2019_FL | GPS Session File Name | 80569_20191220_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8033_2019_FL
State: FLORIDA
Data File Name: 80569_20191219_JA
RTK File ☐

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolperte.com
Observer Phone: Office . . Cel. 786 797 2646

Start Time: utc 11:50 local 11:50 AM
Stop Time: utc 12:10 local 12:10 pm
Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N25°43'31.590"
Longitude: W80°26'51.8971"

Antenna Ht. (before; include ant. offsets): 2.0 [✓ m]/ft
E-Height: -73.77 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N TSC3 S/N 101446
Antenna P/N R10 S/N 5618460179

Visibility Diagram
Photo Available ○
No Obstructions above 10

Sketch

Location Description / Comments: Pic N, S

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Set Now ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8034_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **153895.837** | **504906.592** | **Datum (Epoch)** |
| **Easting** | **262862.600** | **862408.381** | **Datum (Epoch)** |
| **Orthometric Height** | **1.966** | **6.449** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°43'16.87645"
Longitude: W80°22'24.79619"
Ellipsoidal Height: -23.018 m
Type of Mark: Set Drill Hole
Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:20:23 AM Stop Time : 11:20:34 AM
PDOP Max: 1.104
Start Time : 3:26:10 PM Stop Time : 3:26:21 PM
PDOP Max: 1.319
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

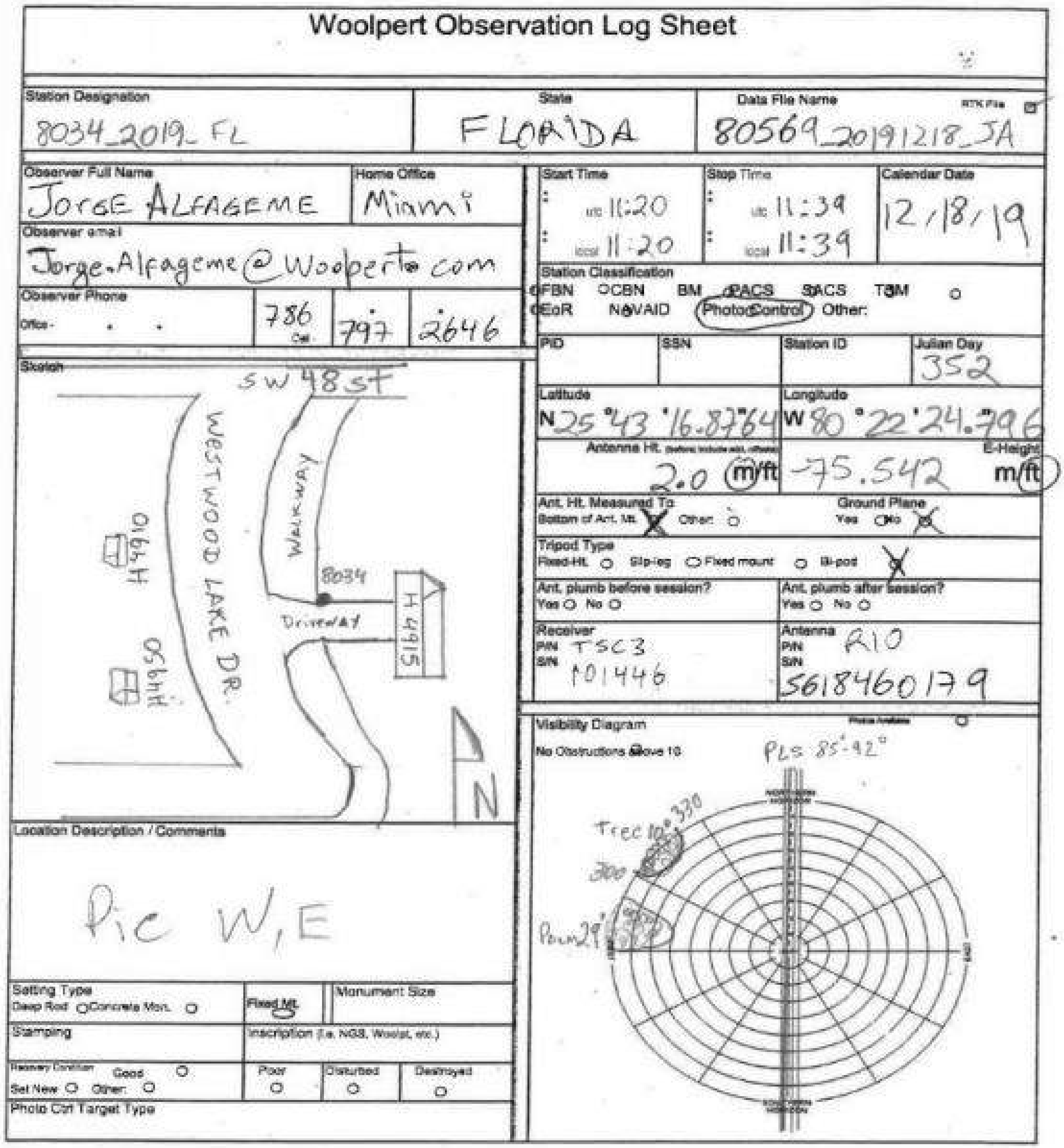
8034_2019_FL, 1, 20191218

8034_2019_FL, 3W, 20191218

8034_2019_FL, 3E, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8034_2019_FL
Operator Name: Jorge Alfageme
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_JA.job



## Woolpert Observation Log Sheet

Station Designation: 8034_2019_FL
State: FLORIDA
Data File Name: 80569_20191218_JA
RTK File ☑

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell 786 797 2646

Start Time: utc 11:20 local 11:20
Stop Time: utc 11:39 local 11:39
Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N 25° 43' 16.8764"
Longitude: W 80° 22' 24.796"
Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: -75.542 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446
Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram
No Obstructions Above 10 ○
Photos Available ○

PLS 85°-92°

Location Description / Comments: Pic W, E

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8035_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191219_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **151215.637** | **496113.302** | **Datum (Epoch)** |
| **Easting** | **266345.817** | **873836.235** | **Datum (Epoch)** |
| **Orthometric Height** | **2.290** | **7.514** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°41'49.22992"
Longitude: W80°20'20.32300"
Ellipsoidal Height: -22.824 m
Type of Mark: Set Drill Hole
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 12:05:25 PM Stop Time : 12:05:36 PM
PDOP Max: 1.299
Start Time : 3:52:36 PM Stop Time : 3:52:53 PM
PDOP Max: 1.077
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

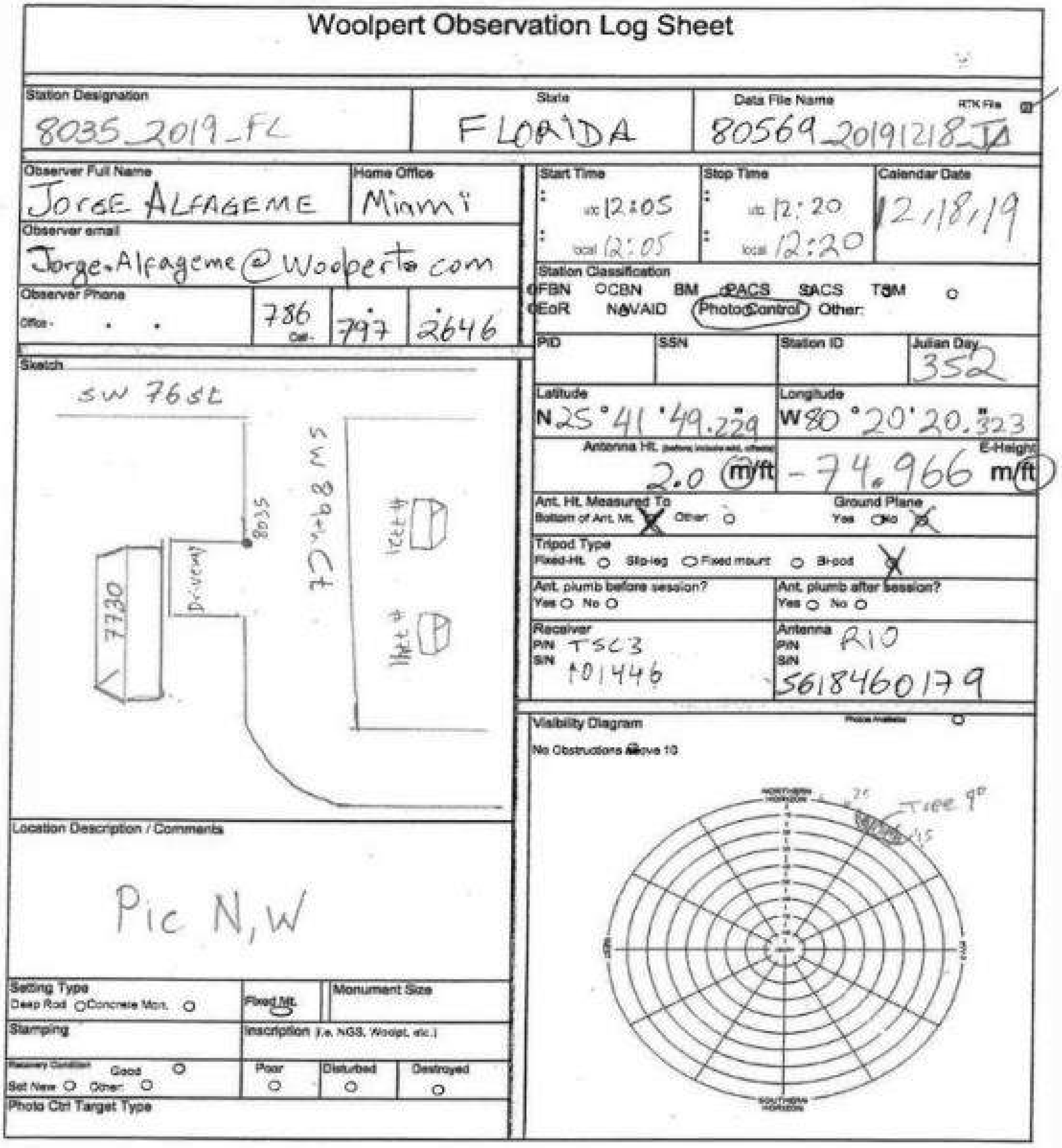
8035_2019_FL. 1, 20191218

8035_2019_FL. 3W, 20191218

8035_2019_FL. 3N, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8035_2019_FL | GPS Session File Name | 80569_20191219_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8035_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_JA

RTK File ☑

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell - 786 . 797 . 2646

Start Time: utc 12:05 local 12:05

Stop Time: utc 12:20 local 12:20

Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 41' 49.229"

Longitude: W 80° 20' 20.323"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: -74.966 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Ht. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: t01446

Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram

Photo Available ○

No Obstructions Above 10

Location Description / Comments: Pic N,W

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Ht.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Jorge Alfageme |
| Project Number | 80569 | | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8036_2019_FL | | GPS Session File Name | 80569_20191220_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **149654.844** | **490992.601** | **Datum (Epoch)** |
| **Easting** | **256045.834** | **840043.706** | **Datum (Epoch)** |
| **Orthometric Height** | **2.548** | **8.359** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | | | |
|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | |
| Latitude | N25°41'00.05453" | Start Time : | 12:37:59 PM | Stop Time : 12:38:09 PM |
| Longitude | W80°26'29.98177" | PDOP Max: | 1.278 | |
| Ellipsoidal Height | -22.274 m | Start Time : | 7:47:35 AM | Stop Time : 7:47:46 AM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.240 | |
| | | Antenna Height: | 2.00 m | |
| Notes | | Weather Conditions | Cloudy | |

PHOTOS

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NORTH

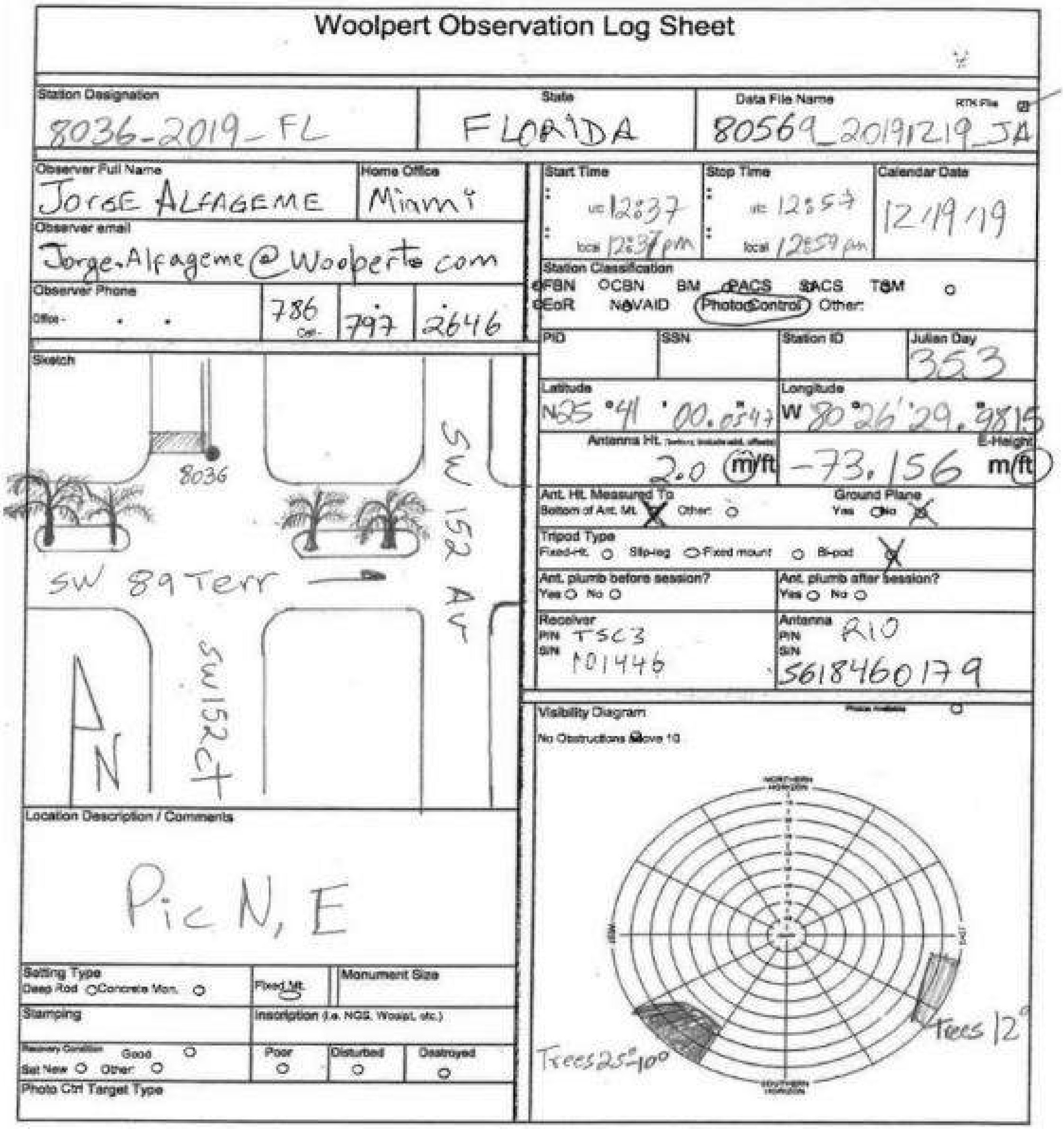

8036_2019_FL, 1, 20191219


8036_2019_FL, 3N, 20191219


8036_2019_FL, 3E, 20191219

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8036_2019_FL | GPS Session File Name | 80569_20191220_JA.job |



### Woolpert Observation Log Sheet

Station Designation: 8036-2019-FL
State: FLORIDA
Data File Name: 80569_20191219_JA
RTK File ☑

Observer Full Name: JorGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 12:37 local 12:37 pm
Stop Time: utc 12:57 local 12:59 pm
Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N25 °41 '00.0347 "
Longitude: W 80 °26 '29.9815 "
Antenna Ht. (before, include add. offsets): 2.0 [✓ m]/ft
E-Height: -73.156 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N TSC3 S/N 101446
Antenna P/N R10 S/N 5618460179

Sketch

Location Description / Comments: Pic N, E

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type:

Visibility Diagram
Photos Available ○
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Jorge Alfageme |
| Project Number | 80569 | | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8037_2019_FL | | GPS Session File Name | 80569_20191220_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **149300.792** | **489831.014** | **Datum (Epoch)** |
| **Easting** | **261771.033** | **858827.130** | **Datum (Epoch)** |
| **Orthometric Height** | **2.706** | **8.878** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | | | | |
|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | |
| Latitude | N25°40'47.72335" | Start Time : | 1:17:32 PM | Stop Time : 1:17:43 PM |
| Longitude | W80°23'04.72229" | PDOP Max: | 1.107 | |
| Ellipsoidal Height | -22.286 m | Start Time : | 8:07:45 AM | Stop Time : 8:07:57 AM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.253 | |
| | | Antenna Height: | 2.00 m | |
| Notes | | Weather Conditions | Cloudy | |

PHOTOS

⇧

NORTH

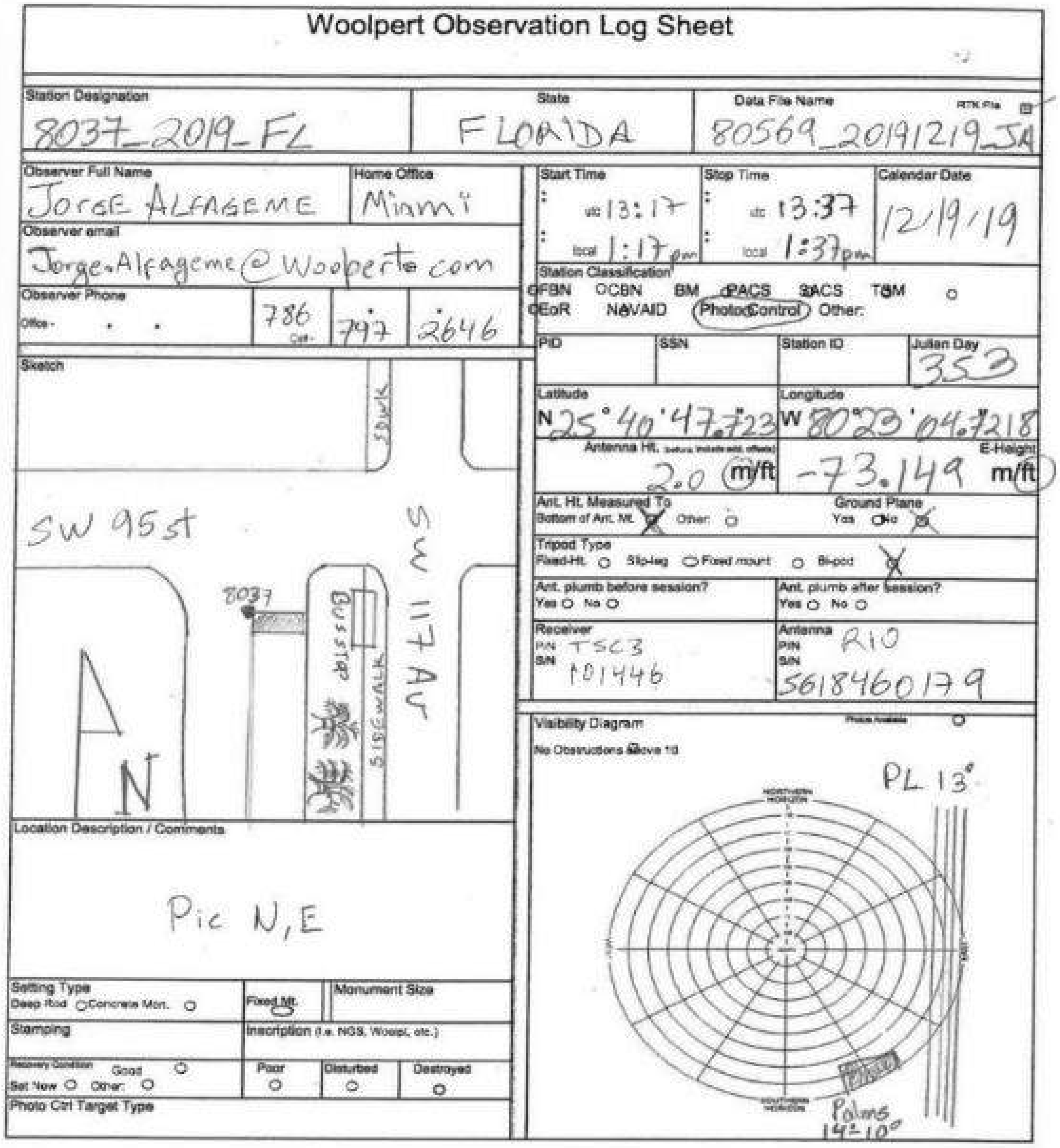

8037_2019_FL. 1. 20191219


8037_2019_FL. 3N. 20191219


8037_2019_FL. 3E. 20191219

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8037_2019_FL | GPS Session File Name | 80569_20191220_JA.job |



### Woolpert Observation Log Sheet

Station Designation: 8037_2019_FL

State: FLORIDA

Data File Name: 80569_20191219_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell - 786 . 797 . 2646

Start Time: utc 13:17 local 1:17 pm

Stop Time: utc 13:37 local 1:37 pm

Calendar Date: 12/19/19

Station Classification: ○ FBN ○ CBN ○ BM ○ PACS ○ SACS ○ TBM ○ ○ EoR ○ NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 353

Latitude: N 25° 40' 47.723"

Longitude: W 80° 23' 04.7218"

Antenna Ht. (before include ant. offsets): 2.0 [✓ m]/ft

E-Height: -73.149 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram

Photo Available ○

No Obstructions above 10

Location Description / Comments: Pic N,E

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | |
|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | |
| Project Number | 80569 | |
| Project Point Name | 8038_2019_FL | |

| Operator Name | Jorge Alfageme |
|---|---|
| Date of Field Survey | 12/18/2019 |
| GPS Session File Name | 80569_20191219_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **151189.056** | **496026.095** | **Datum (Epoch)** |
| **Easting** | **270786.387** | **888405.006** | **Datum (Epoch)** |
| **Orthometric Height** | **2.739** | **8.985** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | |
|---|---|---|
| Mark Stamping | | |
| Latitude | N25°41'47.62011" | |
| Longitude | W80°17'41.06399" | |
| Ellipsoidal Height | -22.518 | m |
| Type of Mark | Set PK Nail | |
| Notes | | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 12:56:13 PM | Stop Time : | 12:56:24 PM |
| PDOP Max: | 1.295 | | |
| Start Time : | 9:15:15 AM | Stop Time : | 9:15:27 AM |
| PDOP Max: | 1.340 | | |
| Antenna Height: | 2.00 | m | |
| Weather Conditions | Cloudy | | |

PHOTOS

⇧

NORTH

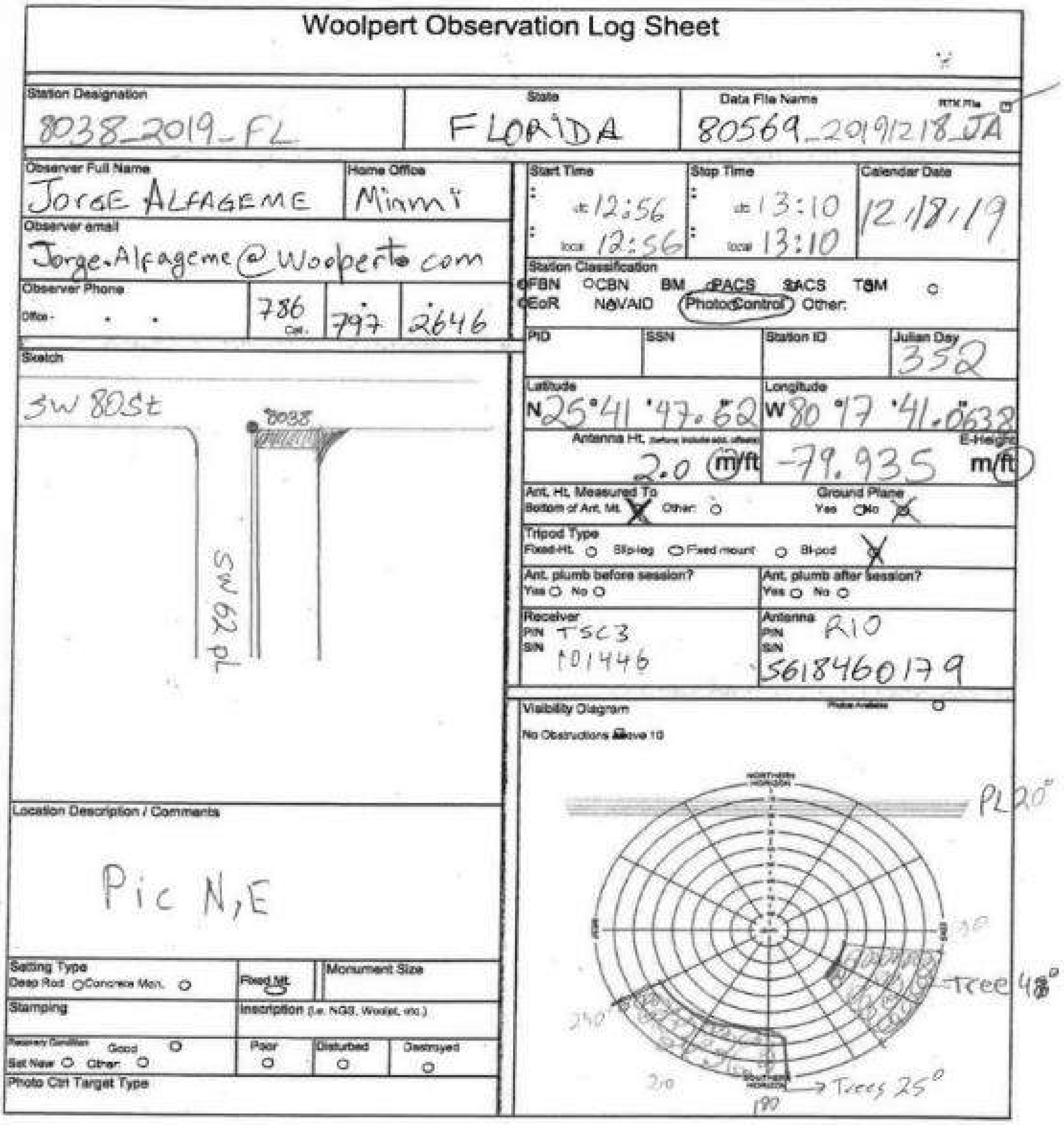
8038_2019_FL, 1, 20191218

8038_2019_FL, 3N, 20191218

8038_2019_FL, 3E, 20191218

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8038_2019_FL | GPS Session File Name | 80569_20191219_JA.job |



### Woolpert Observation Log Sheet

Station Designation: 8038_2019_FL

State: FLORIDA

Data File Name: 80569_20191218_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell. 786 797 2646

Start Time: utc 12:56 local 12:56

Stop Time: utc 13:10 local 13:10

Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 41' 47.62"

Longitude: W 80° 17' 41.0638"

Antenna Ht. (before include adj. offsets): 2.0 [✓ m]/ft

E-Height: -79.935 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N TSC3 S/N 101446

Antenna P/N R10 S/N 5618460179

Sketch

Location Description / Comments

Pic N,E

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpert, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other ○

Photo Ctrl Target Type:

Visibility Diagram

No Obstructions Above 10

Photo Available ○

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8039_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191218_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **155898.495** | **511476.978** | **Datum (Epoch)** |
| **Easting** | **274883.317** | **901846.350** | **Datum (Epoch)** |
| **Orthometric Height** | **3.318** | **10.886** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°44'19.92172"
Longitude: W80°15'13.17190"
Ellipsoidal Height: -22.079 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 9:00:11 AM Stop Time : 9:00:25 AM
PDOP Max: 1.210
Start Time : 1:35:47 PM Stop Time : 1:35:57 PM
PDOP Max: 1.397
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

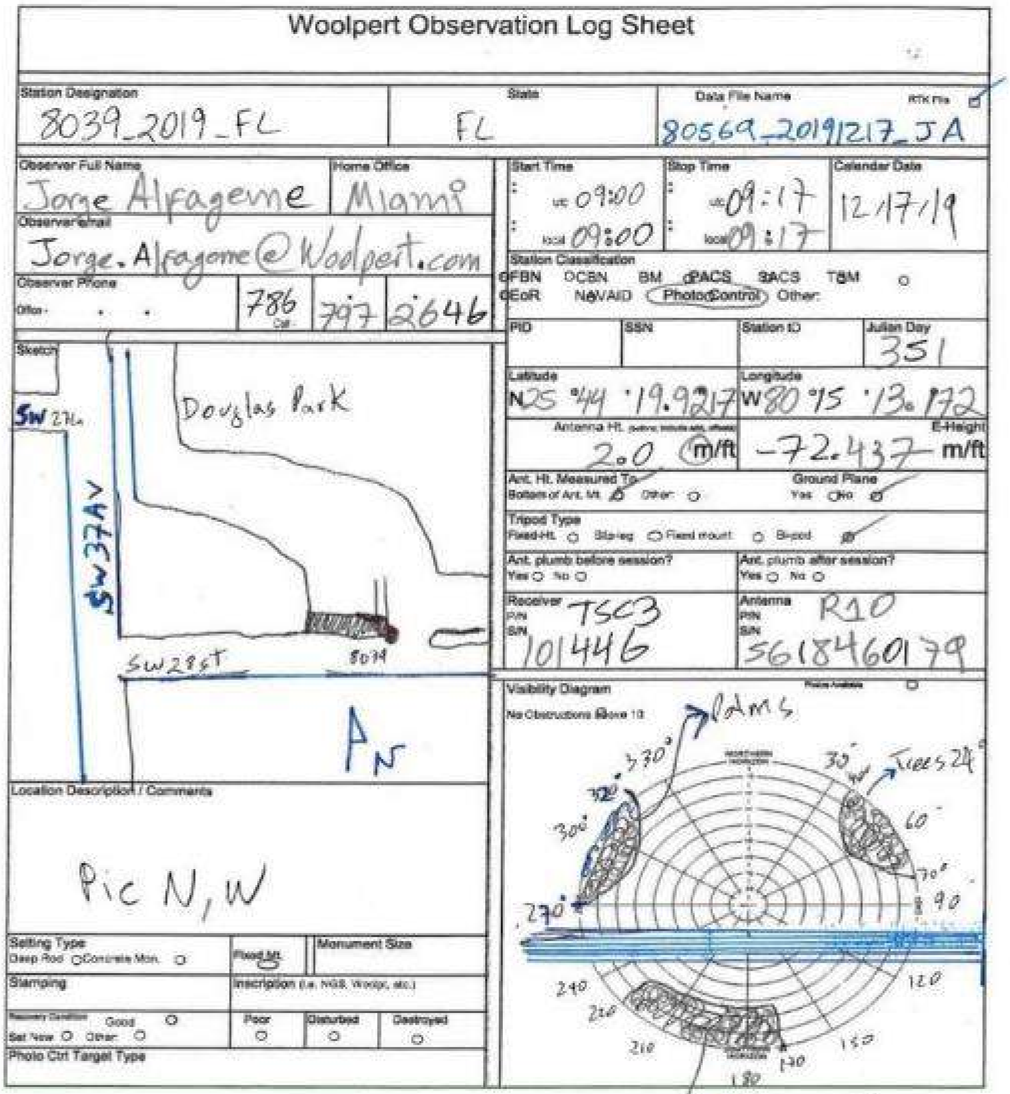
8039_2019_FL, 1, 20191217

8039_2019_FL, 3W, 20191217

8039_2019_FL, 3N, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | 8039_2019_FL | GPS Session File Name | 80569_20191218_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8039_2019_FL

State: FL

Data File Name: 80569_20191217_JA

RTK File ☑

Observer Full Name: Jorge Alfageme

Home Office: Miami

Observer email: Jorge.Alfagome@Woolpert.com

Observer Phone: Office - . . Cell 786 797 2646

Start Time: utc 09:00 local 09:00

Stop Time: utc 09:17 local 09:17

Calendar Date: 12/17/19

Station Classification: ○ FBN ○ CBN ○ BM ○ PACS ○ SACS ○ TBM ○ EoR ○ NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 351

Latitude: N25°44'19.9217

Longitude: W80°15'13.172

Antenna Ht. (vertical, include adj. offsets): 2.0 [✓ m]/ft

E-Height: -72.437 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bipod ☑

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments: Pic N, W

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○

Photo Ctrl Target Type:

Visibility Diagram

No Obstructions Above 10 ○

Photo Available ○

PL 70° (6)

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Delcio Romero |
| Project Number | 80569 | | Date of Field Survey | 12/20/2019 |
| Project Point Name | 8040_2019_FL | | GPS Session File Name | 80569-20191220-DR.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **144554.436** | **474259.012** | **Datum (Epoch)** |
| **Easting** | **249401.794** | **818245.718** | **Datum (Epoch)** |
| **Orthometric Height** | **1.948** | **6.391** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

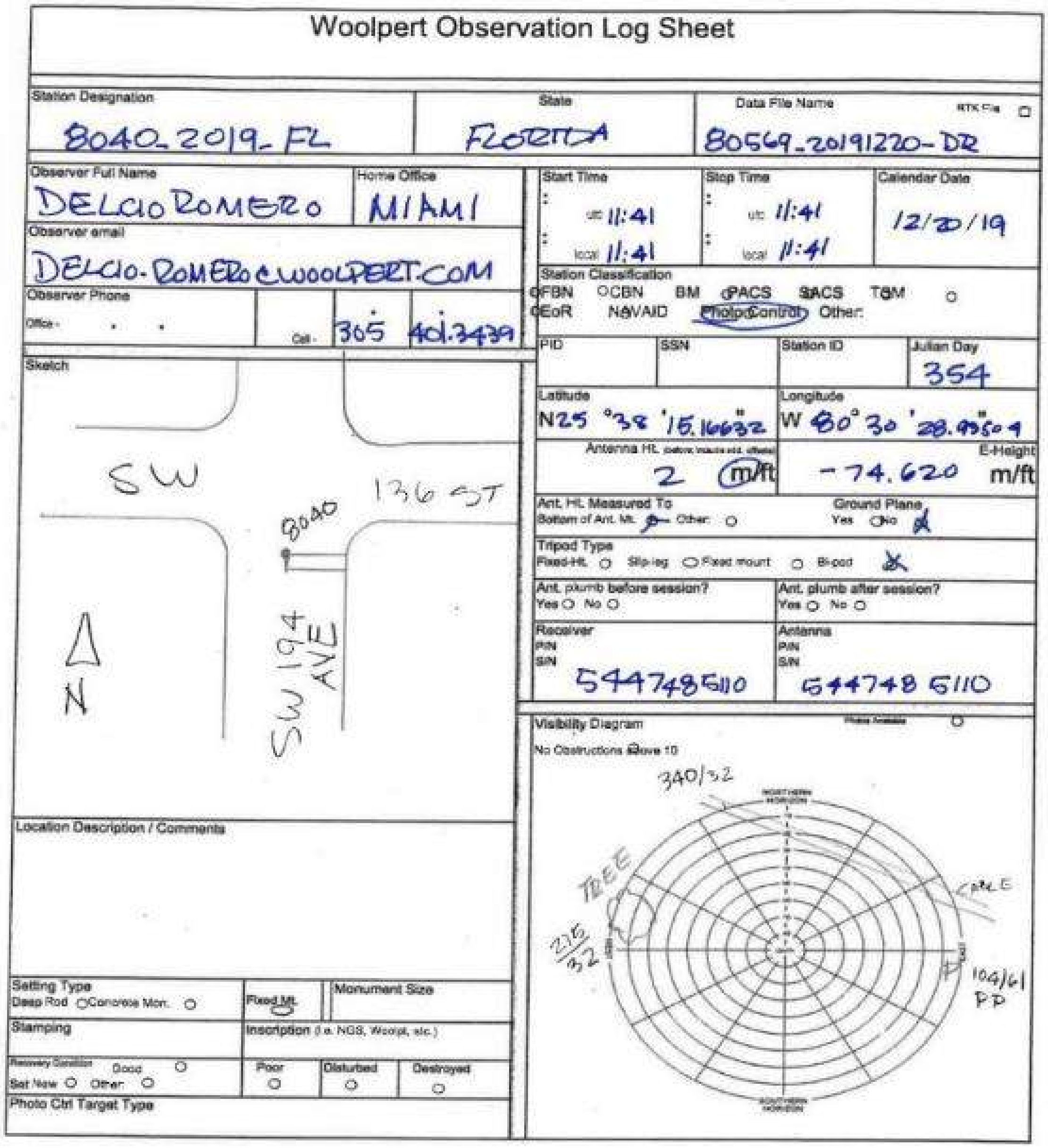
| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal |
| Latitude | N25°38'15.16582" | Start Time : | 11:41:27 AM Stop Time : 11:41:37 AM |
| Longitude | W80°30'28.93518" | PDOP Max: | 1.711 |
| Ellipsoidal Height | -22.727 m | Start Time : | 3:18:10 PM Stop Time : 3:18:20 PM |
| Type of Mark | Set PK Nail at Corner of Stop Bar | PDOP Max: | 1.698 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Cloudy |

PHOTOS

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

|  |  |  |  |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/20/2019 |
| Project Point Name | 8040_2019_FL | GPS Session File Name | 80569-20191220-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8040_2019_FL
State: FLORIDA
Data File Name: 80569_20191220-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 305 401.3439

Start Time: utc 11:41 local 11:41
Stop Time: utc 11:41 local 11:41
Calendar Date: 12/20/19

Station Classification:
○FBN ○CBN BM ○PACS ○SACS TBM ○
○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 354

Latitude: N25 °38 '15.16632"
Longitude: W 80° 30 '28.93504"

Antenna Ht. (before mounts etc. offsets): 2 [✓ m]/ft
E-Height: -74.620 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○
Ground Plane: Yes ○No ✗

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✗

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 544748 6110
Antenna P/N S/N 544748 6110

Sketch

Visibility Diagram
Photo Available ○
No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8041_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/23/2019
GPS Session File Name: 80569_20191223_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **146014.114** | **479047.971** | **Datum (Epoch)** |
| **Easting** | **258690.771** | **848721.304** | **Datum (Epoch)** |
| **Orthometric Height** | **2.656** | **8.715** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°39'01.37304"
Longitude: W80°24'55.70501"
Ellipsoidal Height: -22.280 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 1:42:18 PM Stop Time : 1:42:29 PM
PDOP Max: 1.200
Start Time : 10:23:20 AM Stop Time : 10:23:31 AM
PDOP Max: 1.351
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

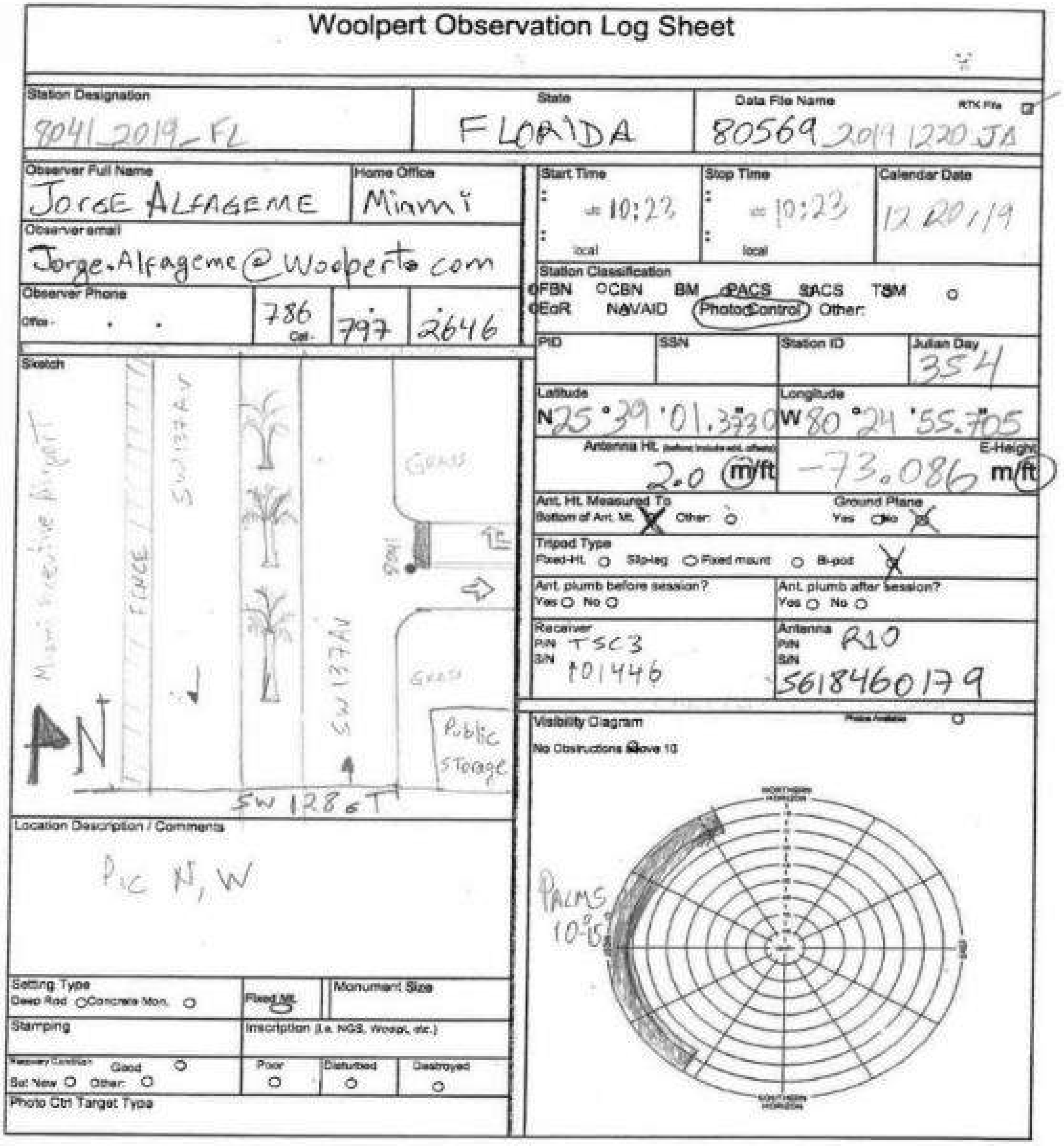
8041_2019_FL, 1, 20191220

8041_2019_FL, 3W, 20191220

8041_2019_FL, 3N, 20191220

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/23/2019 |
| Project Point Name | 8041_2019_FL | GPS Session File Name | 80569_20191223_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8041_2019_FL

State: FLORIDA

Data File Name: 80569_20191220_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell - 786 797 2646

Start Time: 10:22 local

Stop Time: 10:23 local

Calendar Date: 12/20/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TSM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 354

Latitude: N25°39'01.3730"

Longitude: W80°24'55.705"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: -73.086 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments: Pic N, W

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

Visibility Diagram

No Obstructions Above 10 ○

Photo Available ○

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8042_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/26/2019
GPS Session File Name: 80569_20191227_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **145362.785** | **476911.071** | **Datum (Epoch)** |
| **Easting** | **267479.104** | **877554.360** | **Datum (Epoch)** |
| **Orthometric Height** | **3.144** | **10.315** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°38'38.85198"
Longitude: W80°19'40.74335"
Ellipsoidal Height: -22.096 m
Type of Mark: Set PK Nail
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 9:07:48 AM Stop Time : 9:07:59 AM
PDOP Max: 1.214
Start Time : 1:43:52 PM Stop Time : 1:44:04 PM
PDOP Max: 1.386
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

NORTH

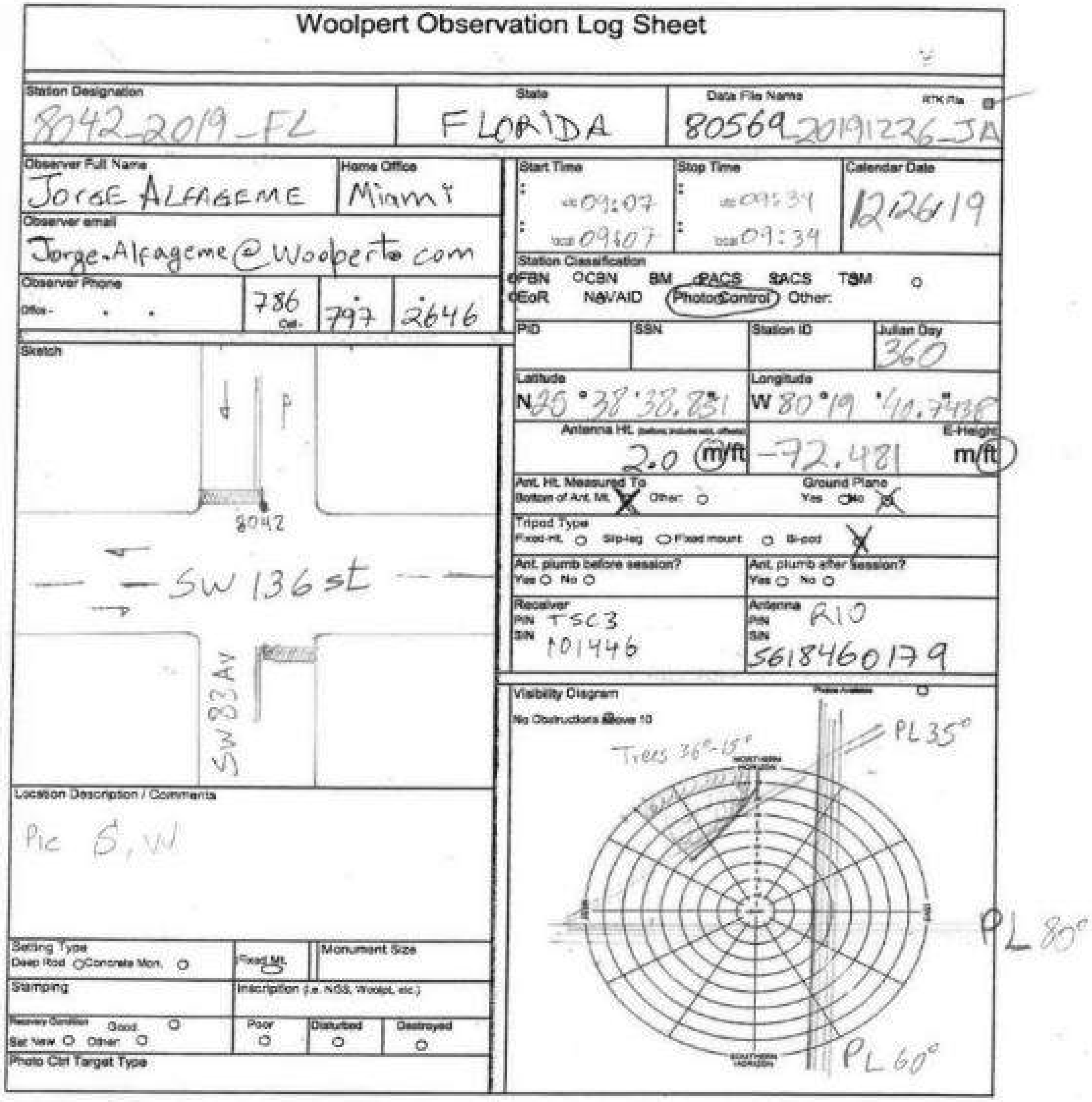
8042_2019_FL, 1, 20191226

8042_2019_FL, 3W, 20191226

8042_2019_FL, 3S, 20191226

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/26/2019 |
| Project Point Name | 8042_2019_FL | GPS Session File Name | 80569_20191227_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8042_2019_FL
State: FLORIDA
Data File Name: 80569_20191226_JA
RTK File ☒

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 09:07 local 09:07
Stop Time: utc 09:34 local 09:34
Calendar Date: 12/26/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 360

Latitude: N 25°38'38.831"
Longitude: W 80°19'40.7438"

Antenna Ht. (before; include ant. offsets): 2.0 [✓ m]/ft
E-Height: -72.481 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446
Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram
Photo Available ○
No Obstructions Above 10

Location Description / Comments: Pic S, W

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8043_2019_FL

Operator Name: Jorge Alfageme
Date of Field Survey: 12/26/2019
GPS Session File Name: 80569_20191227_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **142113.816** | **466251.744** | **Datum (Epoch)** |
| **Easting** | **268040.201** | **879395.227** | **Datum (Epoch)** |
| **Orthometric Height** | **2.512** | **8.241** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping:
Latitude: N25°36'53.18124"
Longitude: W80°19'21.22375"
Ellipsoidal Height: -22.780 m
Type of Mark: Set PK Nail
Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 10:04:50 AM Stop Time : 10:05:01 AM
PDOP Max: 1.384
Start Time : 1:55:12 PM Stop Time : 1:55:23 PM
PDOP Max: 1.310
Antenna Height: 2.00 m
Weather Conditions: Mostly Sunny

PHOTOS

⇧

NORTH

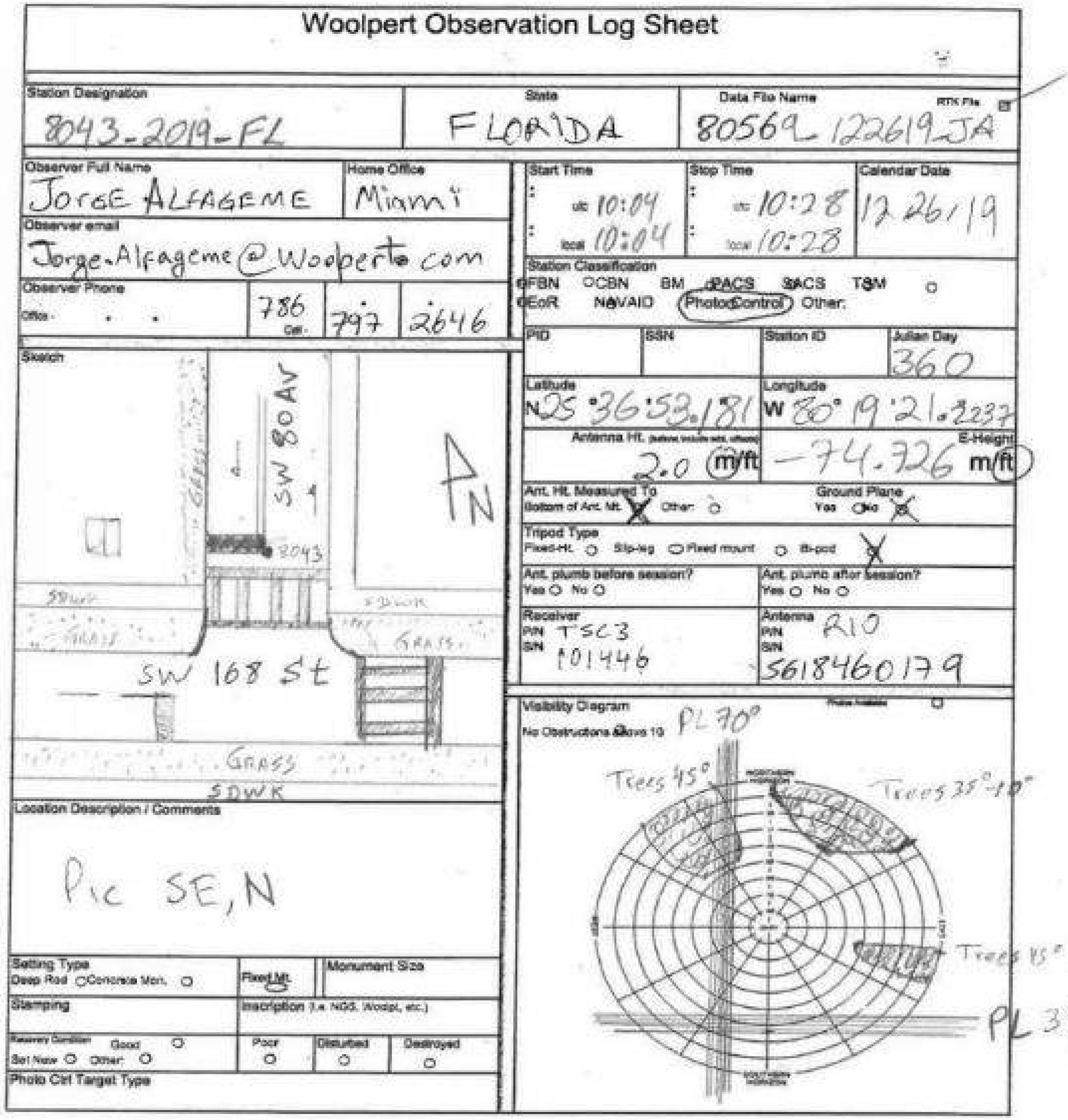
8043_2019_FL, 1, 20191226

8043_2019_FL, 3SE, 20191226

8043_2019_FL, 3N, 20191226

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/26/2019 |
| Project Point Name | 8043_2019_FL | GPS Session File Name | 80569_20191227_JA.job |



### Woolpert Observation Log Sheet

| | | |
|---|---|---|
| Station Designation<br>8043-2019-FL | State<br>FLORIDA | Data File Name<br>80569_122619_JA<br>RTK File ☑ |

| | |
|---|---|
| Observer Full Name | JORGE ALFAGEME |
| Home Office | Miami |
| Observer email | Jorge.Alfageme@Woolpert.com |
| Observer Phone | Office - . . ; Cell - 786 797 2646 |
| Start Time | utc 10:04; local 10:04 |
| Stop Time | utc 10:28; local 10:28 |
| Calendar Date | 12 26 19 |
| Station Classification | ○FBN ○CBN BM ○PACS ○SACS TSM ○ ○EoR NAVAID [✓ Photo Control] Other: |
| PID | |
| SSN | |
| Station ID | |
| Julian Day | 360 |
| Latitude | N25°36'53.181 |
| Longitude | W 80° 19'21.2237 |
| Antenna Ht. | 2.0 [✓ m]/ft |
| E-Height | -74.726 m/[✓ ft] |
| Ant. Ht. Measured To | Bottom of Ant. Mt. ☒ Other: ○ |
| Ground Plane | Yes ○ No ☒ |
| Tripod Type | Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒ |
| Ant. plumb before session? | Yes ○ No ○ |
| Ant. plumb after session? | Yes ○ No ○ |
| Receiver | P/N TSC3; S/N 101446 |
| Antenna | P/N R10; S/N 5618460179 |
| Location Description / Comments | Pic SE, N |
| Setting Type | Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.] |
| Monument Size | |
| Stamping | |
| Inscription (i.e. NGS, Woolpt, etc.) | |
| Recovery Condition | Good ○ Set Now ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○ |
| Photo Ctrl Target Type | |

Sketch

Visibility Diagram

No Obstructions Above 10 ○ PL 70°

Photo Available ○

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name Miami-Dade Counrty, FL Orthos
Project Number 80569
Project Point Name 8044_2019_FL

Operator Name Suswyn Mills
Date of Field Survey 12/26/2019
GPS Session File Name 80569_20191230_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **141806.452** | **465243.335** | **Datum (Epoch)** |
| **Easting** | **261897.784** | **859242.979** | **Datum (Epoch)** |
| **Orthometric Height** | **2.738** | **8.982** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude N25°36'44.16734"
Longitude W80°23'01.42805"
Ellipsoidal Height -22.372 m
Type of Mark Set PK Nail
Notes

Receiver: (e.g. R8, R10) Trimble R10 Internal
Start Time : 11:02:35 AM Stop Time : 11:02:46 AM
PDOP Max: 1.204
Start Time : 8:34:26 AM Stop Time : 8:34:37 AM
PDOP Max: 1.359
Antenna Height: 2.00 m
Weather Conditions Sunny

PHOTOS

⇧

NORTH

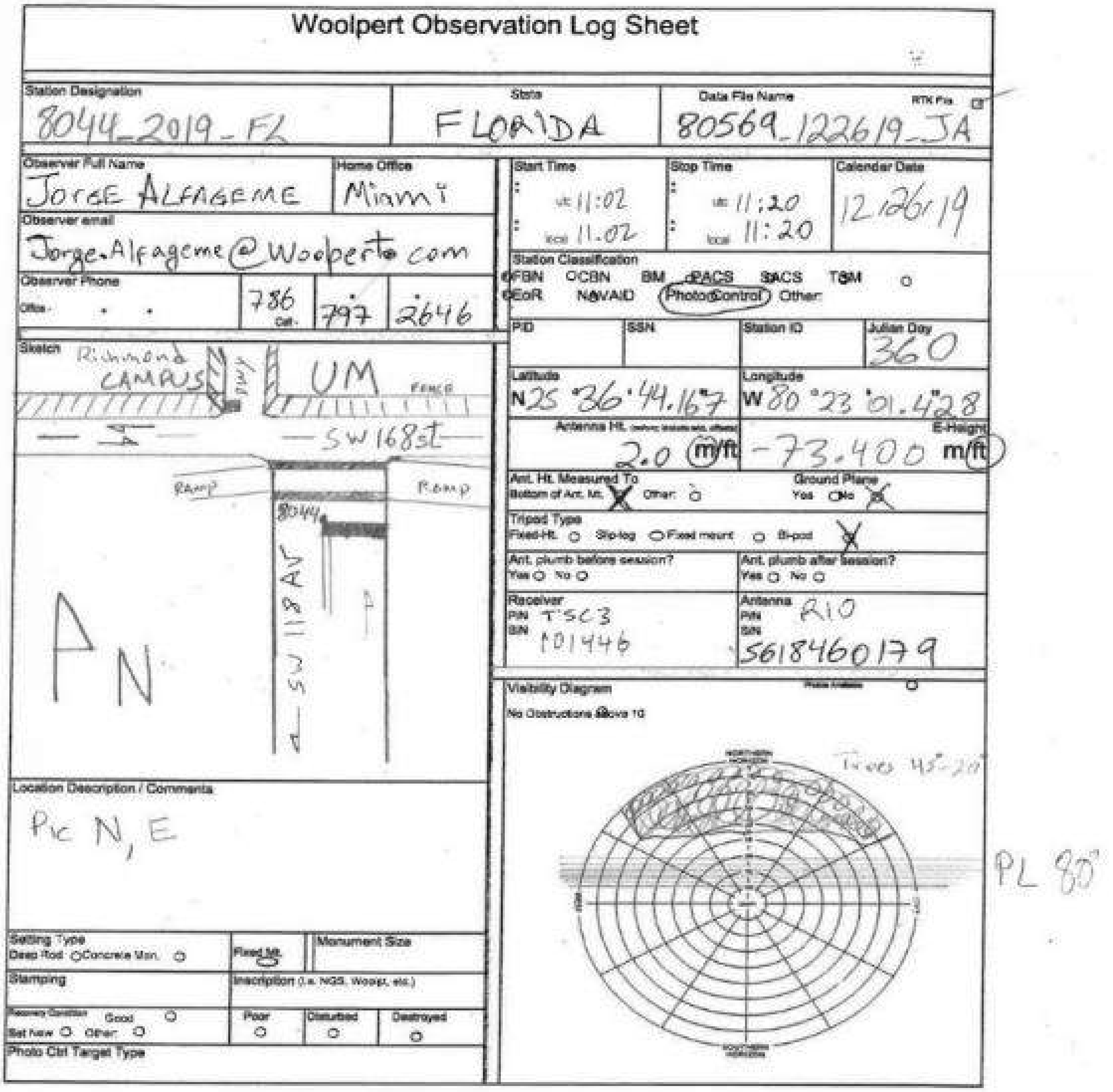
8044_2019_FL_1_20191226

8044_2019_FL_3N_20191226

8044_2019_FL_3E_20191226

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/26/2019 |
| Project Point Name | 8044_2019_FL | GPS Session File Name | 80569_20191230_SM.job |



## Woolpert Observation Log Sheet

| Station Designation | State | Data File Name | RTK Fix ☐ |
|---|---|---|---|
| 8044_2019_FL | FLORIDA | 80569_122619_JA | |

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office: . . Cell: 786 797 2646

| Start Time | Stop Time | Calendar Date |
|---|---|---|
| utc 11:02<br>local 11.02 | utc 11:20<br>local 11:20 | 12/26/19 |

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

| PID | SSN | Station ID | Julian Day |
|---|---|---|---|
| | | | 360 |

| Latitude | Longitude |
|---|---|
| N25°36'44.167" | W80°23'01.428" |

Antenna Ht.: 2.0 [✓ m]/ft
E-Height: -73.400 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3
S/N: 101446

Antenna P/N: R10
S/N: 5618460179

Sketch

Visibility Diagram
No Obstructions Above 10 ○

Location Description / Comments: Pic N, E

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Jorge Alfageme |
| Project Number | 80569 | | Date of Field Survey | 12/26/2019 |
| Project Point Name | 8045_2019_FL | | GPS Session File Name | 80569_20191227_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **147212.787** | **482980.619** | **Datum (Epoch)** |
| **Easting** | **262897.035** | **862521.355** | **Datum (Epoch)** |
| **Orthometric Height** | **2.404** | **7.888** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Latitude | N25°39'39.69984" | Start Time : | 8:25:59 AM | Stop Time : | 8:26:10 AM |
| Longitude | W80°22'24.69737" | PDOP Max: | 1.347 | | |
| Ellipsoidal Height | -22.659 m | Start Time : | 2:20:41 PM | Stop Time : | 2:20:51 PM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.214 | | |
| | | Antenna Height: | 2.00 m | | |
| Notes | | Weather Conditions | Mostly Sunny | | |

PHOTOS

⇧

NORTH

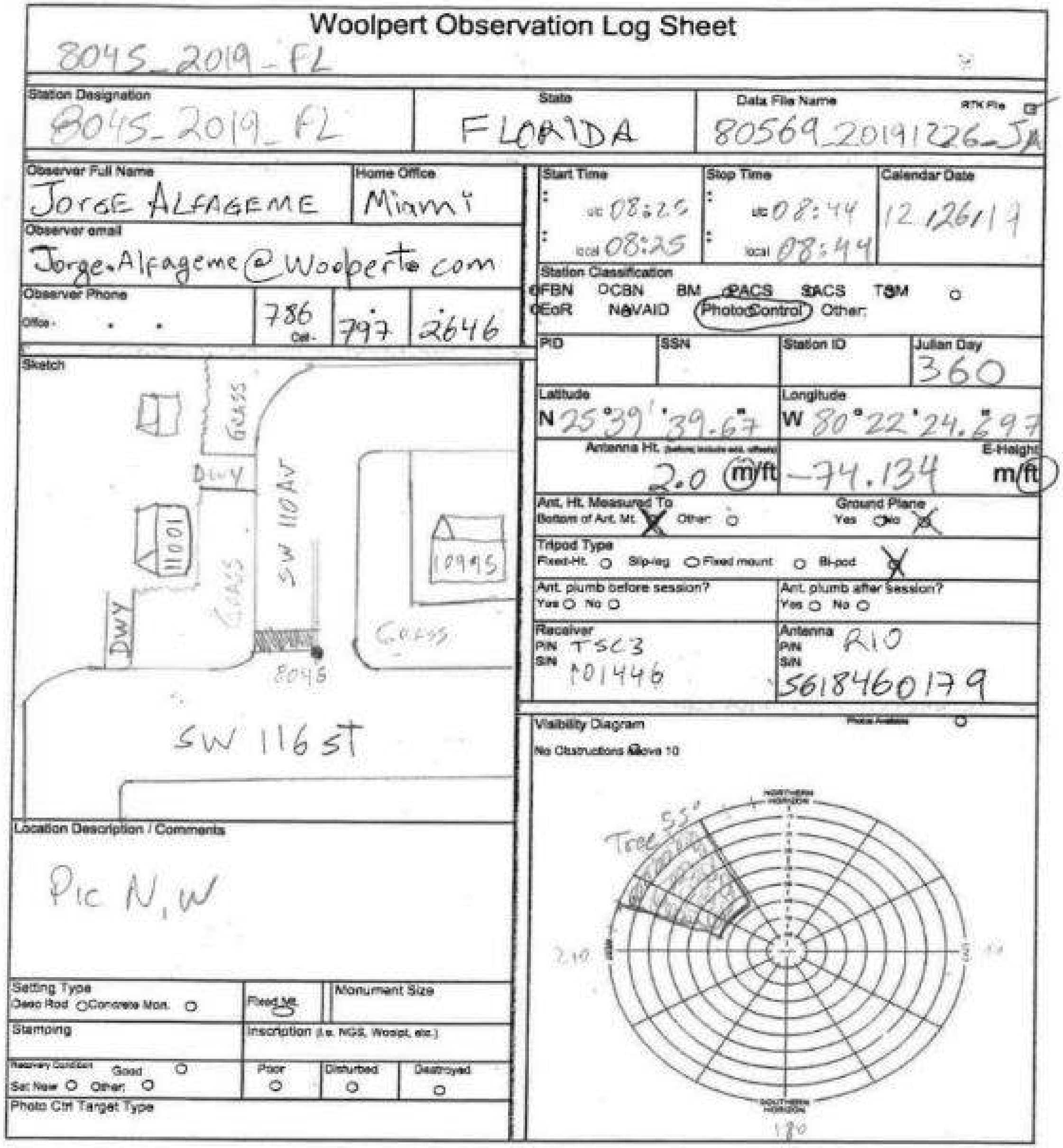
8045_2019_FL, 1, 20191226

8045_2019_FL, 3W, 20191226

8045_2019_FL, 3N, 20191226

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/26/2019 |
| Project Point Name | 8045_2019_FL | GPS Session File Name | 80569_20191227_JA.job |



## Woolpert Observation Log Sheet

8045_2019_FL

Station Designation: 8045_2019_FL

State: FLORIDA

Data File Name: 80569_20191226_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cel - 786 797 2646

Start Time: utc 08:25 local 08:25

Stop Time: utc 08:44 local 08:44

Calendar Date: 12/26/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TSM ○ ○EoR ○NAVAID [✓ ○Photo Control] ○Other:

PID:

SSN:

Station ID:

Julian Day: 360

Latitude: N 25° 39' 39.67"

Longitude: W 80° 22' 24.297"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft

E-Height: -74.134 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Visibility Diagram

Photo Available ○

No Obstructions Above 10 ○

Sketch

Location Description / Comments

Pic N, W

Setting Type: Geo Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8046_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 1/2/2020
GPS Session File Name: 80569_20200102_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **141337.237** | **463703.917** | **Datum (Epoch)** |
| **Easting** | **251570.556** | **825361.067** | **Datum (Epoch)** |
| **Orthometric Height** | **2.220** | **7.284** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°36'30.34960"
Longitude: W80°29'11.63396"
Ellipsoidal Height: -22.547 m
Type of Mark: Set Drill Hole at Corner of Sidewalk
Notes:

Receiver: (e.g. R8, R10) Trimble R8 GNSS/SPS88x Internal
Start Time : 10:56:38 AM Stop Time : 10:56:51 AM
PDOP Max: 1.431
Start Time : 3:13:22 PM Stop Time : 3:13:33 PM
PDOP Max: 1.723
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

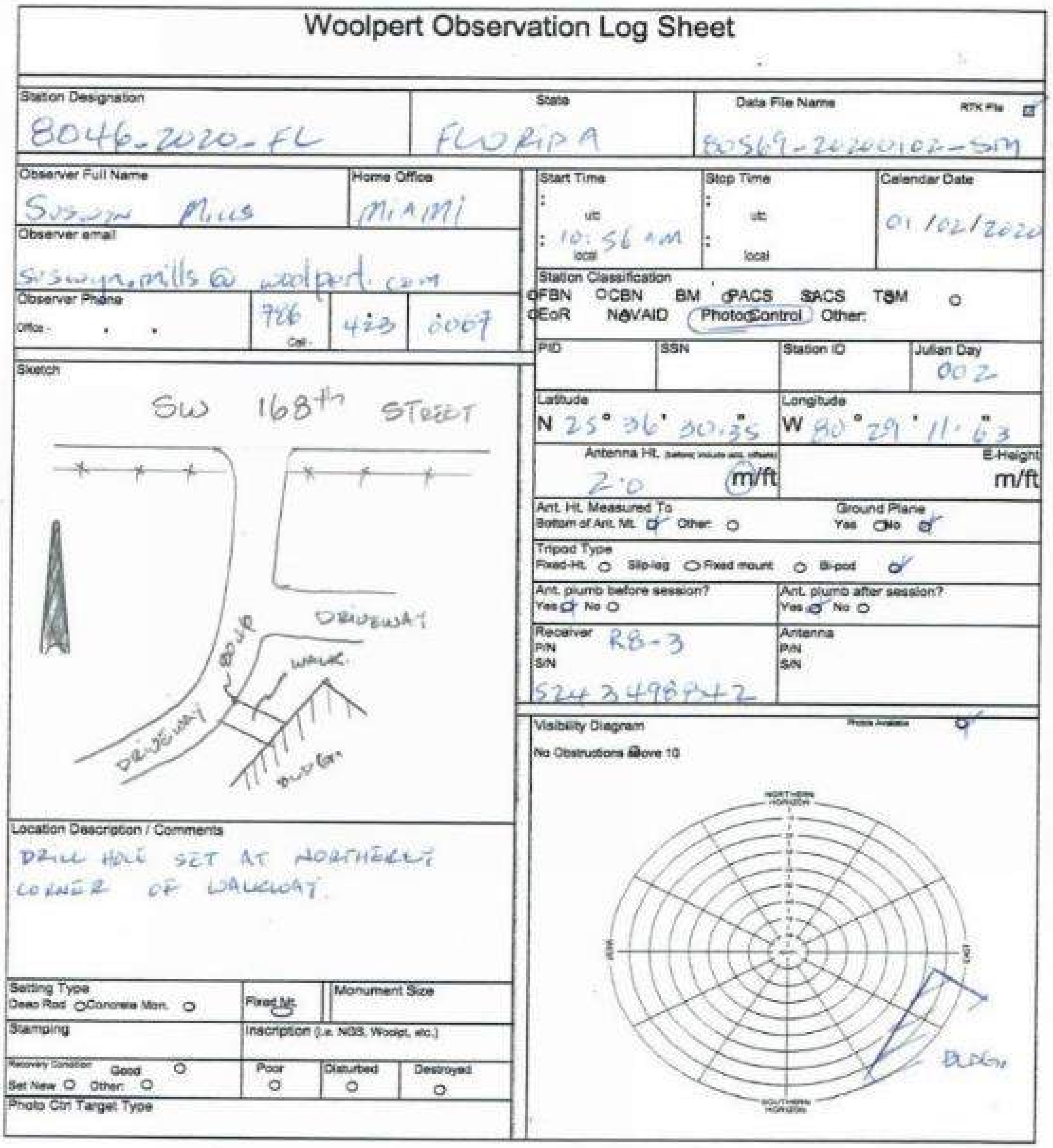
8046_2020_FL, 1, 20200102

8046_2020_FL, 3N, 20200102

8046_2020_FL, 3E, 20200102

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 1/2/2020 |
| Project Point Name | 8046_2019_FL | GPS Session File Name | 80569_20200102_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 8046-2020-FL

State: FLORIDA

Data File Name: 80569-20200102-SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: MIAMI

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0007

Start Time: : utc : 10:56 AM local

Stop Time: : utc : local

Calendar Date: 01/02/2020

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 002

Latitude: N 25° 36' 30.35"

Longitude: W 80° 29' 11.63"

Antenna Ht. (before include any offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N S/N: R8-3 5243498242

Antenna P/N S/N:

Sketch

Visibility Diagram

Photo Available ☑

No Obstructions Above 10

Location Description / Comments: DRILL HOLE SET AT NORTHERLY CORNER OF WALKWAY.

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 8047_2019_FL | GPS Session File Name | 80569_20191227_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **137388.350** | **450748.277** | **Datum (Epoch)** |
| **Easting** | **263727.181** | **865244.927** | **Datum (Epoch)** |
| **Orthometric Height** | **1.941** | **6.367** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | | | | | |
|---|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Latitude | N25°34'20.31517" | Start Time : | 8:38:26 AM | Stop Time : | 8:38:36 AM |
| Longitude | W80°21'56.61823" | PDOP Max: | 1.278 | | |
| Ellipsoidal Height | -23.298 m | Start Time : | 12:59:06 PM | Stop Time : | 12:59:17 PM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.469 | | |
| | | Antenna Height: | 2.00 m | | |
| Notes | | Weather Conditions | Sunny | | |

PHOTOS

⇧

NORTH

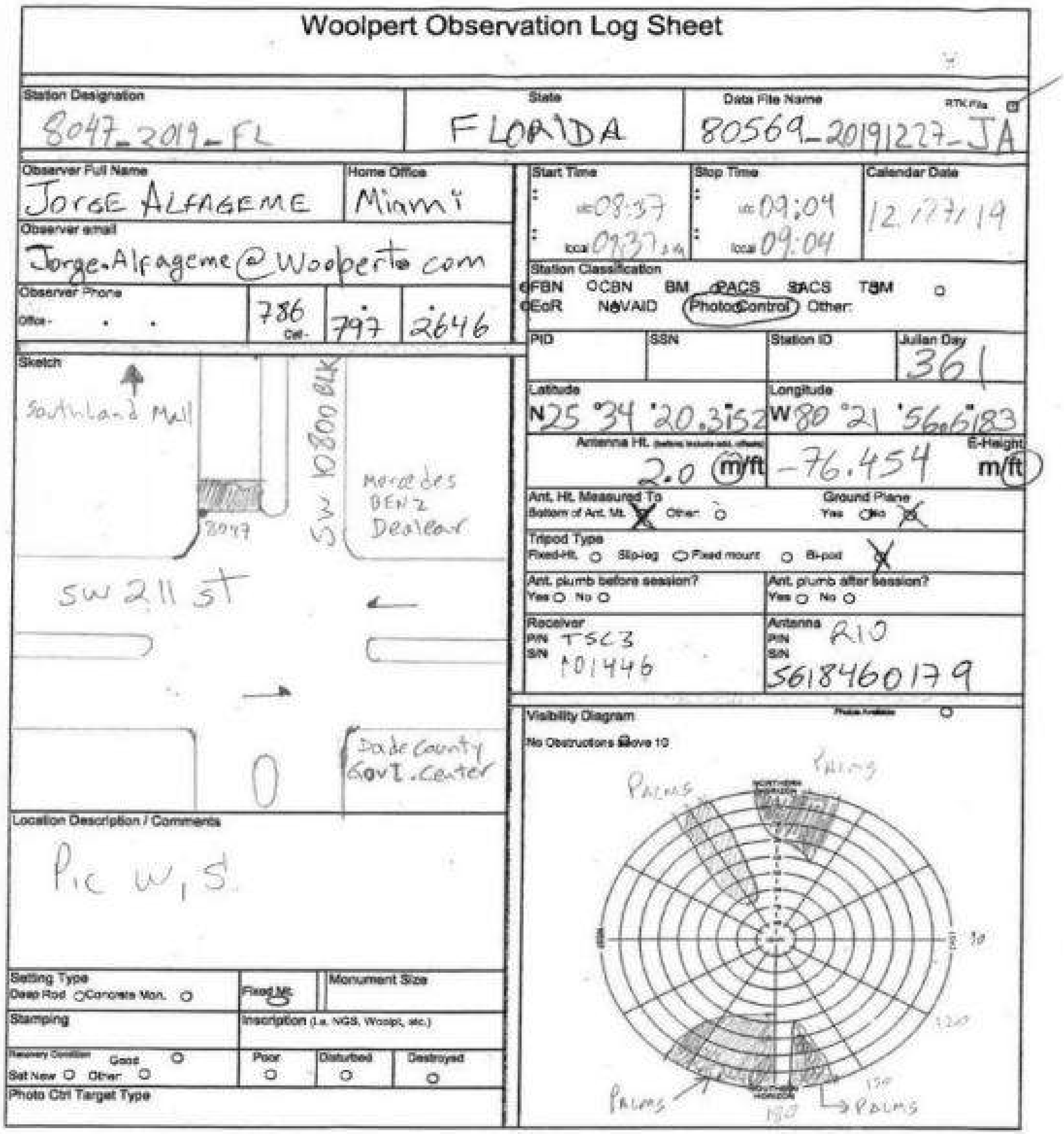
8047_2019_FL_1_20191227

8047_2019_FL_3W_20191227

8047_2019_FL_3S_20191227

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 8047_2019_FL | GPS Session File Name | 80569_20191227_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8047_2019_FL

State: FLORIDA

Data File Name: 80569_20191227_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 08:37 local 09:37 am

Stop Time: utc 09:04 local 09:04

Calendar Date: 12/27/14

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 361

Latitude: N25°34'20.3152

Longitude: W80°21'56.6183

Antenna Ht. (before mount add. offsets): 2.0 [✓ m]/ft

E-Height: -76.454 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments: Pic W, S

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

Visibility Diagram

Photos Available ○

No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8048_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/20/2019
GPS Session File Name: 80569-20191220-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **138262.280** | **453615.496** | **Datum (Epoch)** |
| **Easting** | **257295.166** | **844142.557** | **Datum (Epoch)** |
| **Orthometric Height** | **3.355** | **11.006** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude: N25°34'49.66342"
Longitude: W80°25'46.93693"
Ellipsoidal Height: -21.650 m
Type of Mark: Found PK Nail at Corner of Storm Inlet
Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 12:22:59 PM Stop Time : 12:23:09 PM
PDOP Max: 1.336
Start Time : 3:46:18 PM Stop Time : 3:46:28 PM
PDOP Max: 1.435
Antenna Height: 2.00 m
Weather Conditions: Sunny

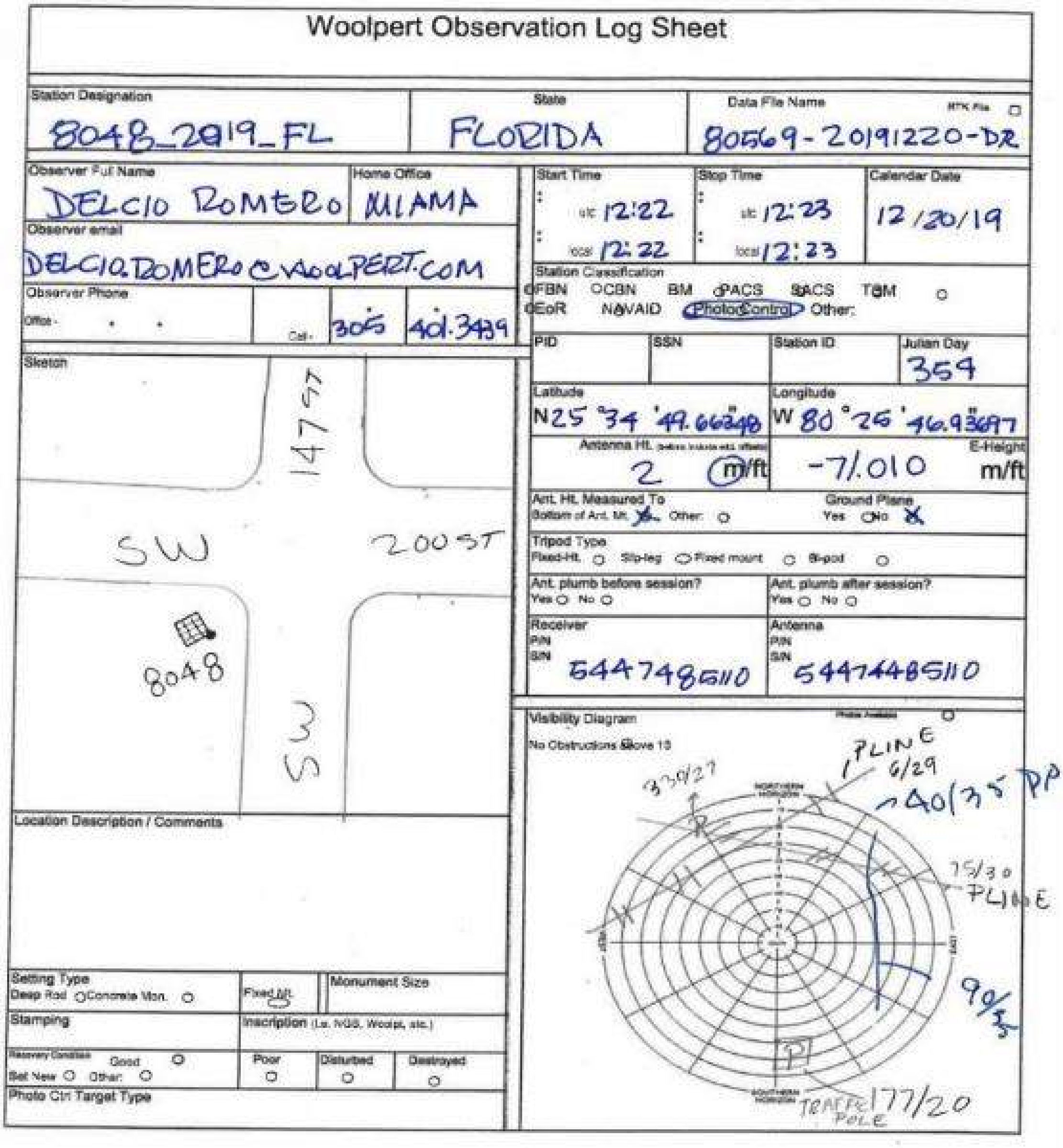
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/20/2019 |
| Project Point Name | 8048_2019_FL | GPS Session File Name | 80569-20191220-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8048_2019_FL
State: FLORIDA
Data File Name: 80569-20191220-DR RTK File ☐
Observer Full Name: DELCIO ROMERO
Home Office: MIAMA
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 305 401.3439
Start Time: utc 12:22 local 12:22
Stop Time: utc 12:23 local 12:23
Calendar Date: 12/20/19
Station Classification: ○ FBN ○ CBN BM ○ PACS SACS TBM ○ ○ EoR NAVAID [✓ Photo Control] Other:
PID:
SSN:
Station ID:
Julian Day: 354
Latitude: N25°34'49.66348"
Longitude: W80°26'46.93697"
Antenna Ht.: 2 [✓ m]/ft
E-Height: -71.010 m/ft
Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ○
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver P/N: S/N: 544748G110
Antenna P/N: S/N: 5447448S110
Sketch
Visibility Diagram Photo Available ○
No Obstructions Above 15 ○
Location Description / Comments:
Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Ht. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8049_2019_FL | GPS Session File Name | 80569-20191219-DR.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **134894.703** | **442567.039** | **Datum (Epoch)** |
| **Easting** | **249583.029** | **818840.320** | **Datum (Epoch)** |
| **Orthometric Height** | **2.318** | **7.604** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

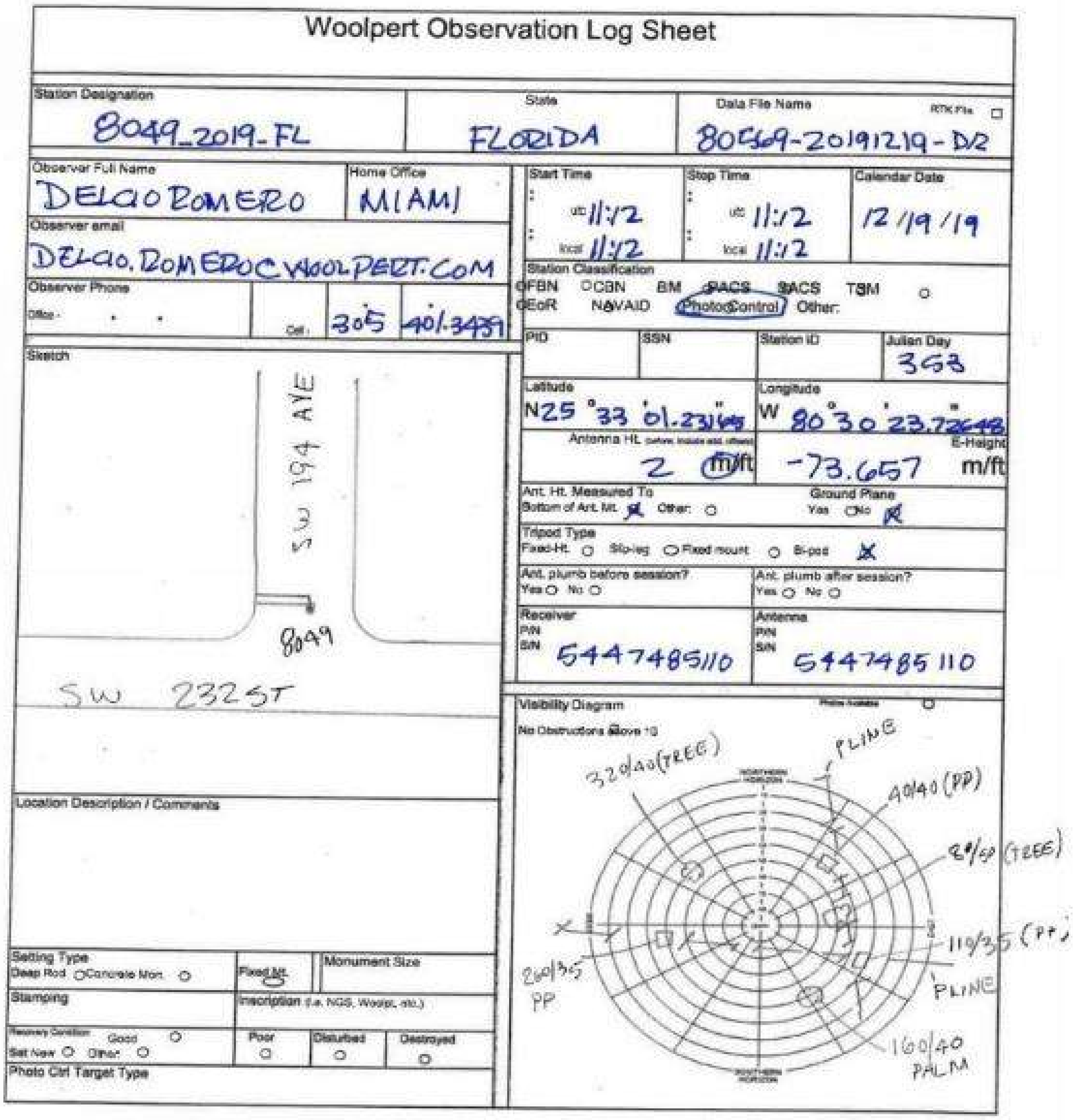
| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal |
| Latitude | N25°33'01.23146" | Start Time : | 11:12:04 AM Stop Time : 11:12:14 AM |
| Longitude | W80°30'23.72635" | PDOP Max: | 1.635 |
| Ellipsoidal Height | -22.472 m | Start Time : | 2:58:58 PM Stop Time : 2:59:08 PM |
| Type of Mark | Set PK Nail at Corner of Stop Bar | PDOP Max: | 1.703 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Sunny |

PHOTOS

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8049_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



## Woolpert Observation Log Sheet

| | | |
|---|---|---|
| Station Designation<br>8049_2019_FL | State<br>FLORIDA | Data File Name<br>80569-20191219-DR<br>RTK File ☐ |

| | |
|---|---|
| Observer Full Name<br>DELCIO ROMERO | Home Office<br>MIAMI |
| Observer email<br>DELCIO.ROMERO@WOOLPERT.COM | |
| Observer Phone<br>Office - . . | Cell . 305 401.3439 |

| | | |
|---|---|---|
| Start Time<br>utc 11:12<br>local 11:12 | Stop Time<br>utc 11:12<br>local 11:12 | Calendar Date<br>12/19/19 |

Station Classification
○FBN ○CBN BM ○PACS ○SACS TSM ○
○EoR NAVAID [✓ PhotoControl] Other:

| | | | |
|---|---|---|---|
| PID | SSN | Station ID | Julian Day<br>353 |

| | |
|---|---|
| Latitude<br>N25 ° 33 ' 01.23165 " | Longitude<br>W 80 ° 30 ' 23.72648 " |
| Antenna Ht. (before include add. offset)<br>2 [✓ m]/ft | E-Height<br>-73.657 m/ft |

Ant. Ht. Measured To
Bottom of Ant. Mt. ☒ Other: ○

Ground Plane
Yes ○ No ☒

Tripod Type
Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session?
Yes ○ No ○

Ant. plumb after session?
Yes ○ No ○

| | |
|---|---|
| Receiver<br>P/N<br>S/N 5447485110 | Antenna<br>P/N<br>S/N 5447485 110 |

Sketch

SW 194 AVE

8049

SW 232ST

Visibility Diagram

Photos Available ○

No Obstructions Above 10

NORTHERN HORIZON

SOUTHERN HORIZON

320/40(TREE)

PLINE

40/40 (PP)

80/50 (TREE)

110/35 (PP)

PLINE

160/40
PALM

260/35
PP

Location Description / Comments

Setting Type
Deep Rod ○Concrete Mon. ○ | Fixed Mt. ○ | Monument Size

Stamping | Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition Good ○ | Poor ○ | Disturbed ○ | Destroyed ○
Set New ○ Other ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8050_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **133364.365** | **437546.255** | **Datum (Epoch)** |
| **Easting** | **254908.698** | **836312.953** | **Datum (Epoch)** |
| **Orthometric Height** | **3.048** | **10.000** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°32'10.82277"
Longitude: W80°27'13.17032"
Ellipsoidal Height: -21.923 m
Type of Mark: Set PK Nail

Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:35:30 AM Stop Time : 11:35:40 AM
PDOP Max: 1.352
Start Time : 2:21:47 PM Stop Time : 2:21:57 PM
PDOP Max: 1.823
Antenna Height: 2.00 m
Weather Conditions: Cloudy

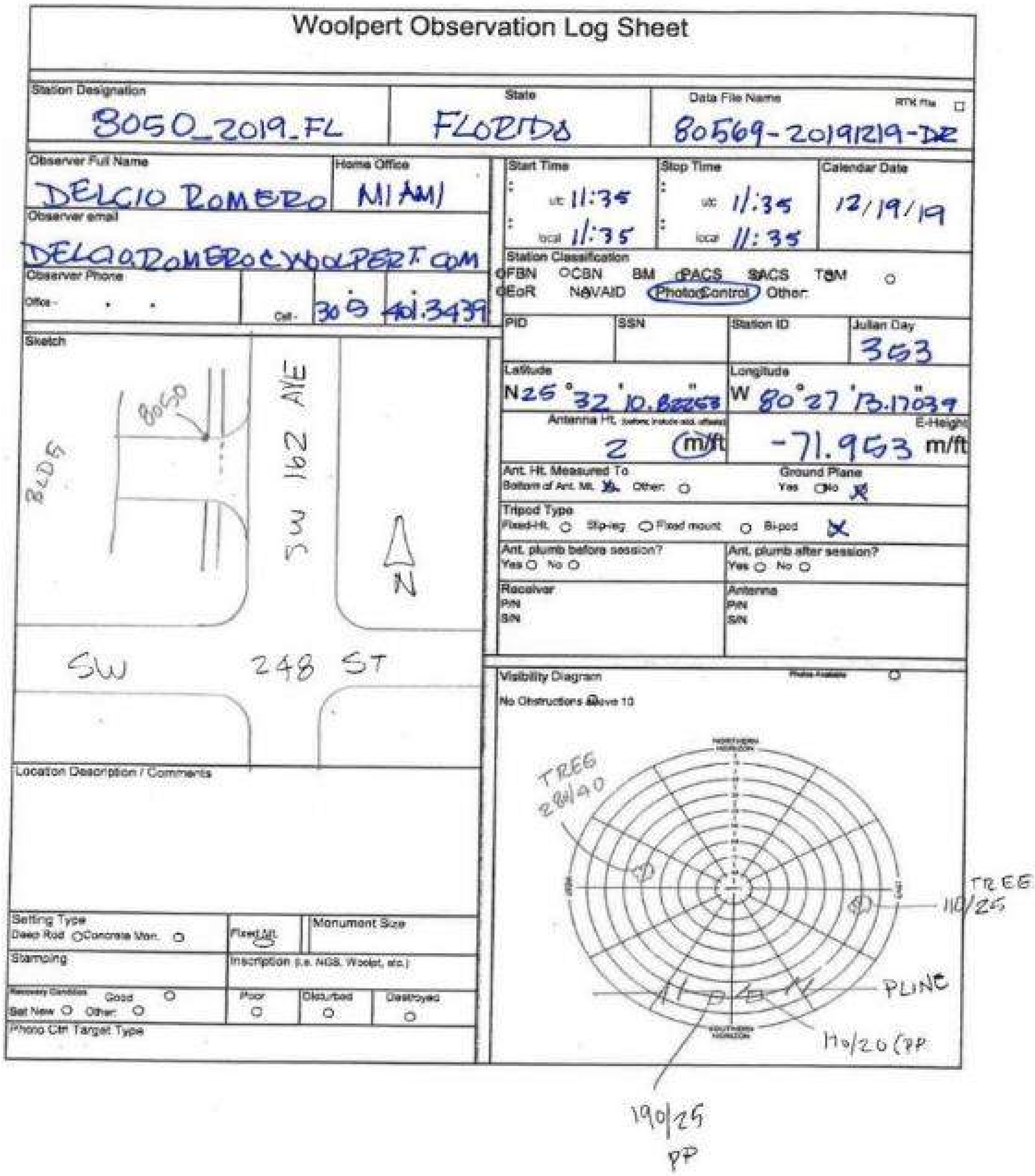
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8050_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8050_2019_FL

State: FLORIDA

Data File Name: 80569-20191219-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone

Office - . .

Cell - 305 401.3439

Start Time: utc 11:35 local 11:35

Stop Time: utc 11:35 local 11:35

Calendar Date: 12/19/19

Station Classification

○FBN ○CBN BM ○PACS SACS TBM ○

○EoR NAVAID [✓ Photo Control] Other:

PID

SSN

Station ID

Julian Day: 363

Latitude: N25° 32' 10.82253"

Longitude: W 80° 27' 13.17039"

Antenna Ht. (before; include add. offsets): 2 [✓ m]/ft

E-Height: -71.953 m/ft

Ant. Ht. Measured To

Bottom of Ant. Mt. X Other: ○

Ground Plane

Yes ○No X

Tripod Type

Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod X

Ant. plumb before session?

Yes ○ No ○

Ant. plumb after session?

Yes ○ No ○

Receiver

P/N

S/N

Antenna

P/N

S/N

Sketch

Location Description / Comments

Visibility Diagram

Photo Available ○

No Obstructions Above 10

Setting Type

Deep Rod ○Concrete Mon. ○

Fixed Mt.

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition Good ○

Set New ○ Other: ○

Poor ○

Disturbed ○

Destroyed ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8051_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **129965.962** | **426396.660** | **Datum (Epoch)** |
| **Easting** | **246000.618** | **807087.029** | **Datum (Epoch)** |
| **Orthometric Height** | **2.088** | **6.850** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°30'21.47662"
Longitude: W80°32'32.66777"
Ellipsoidal Height: -22.594 m
Type of Mark: Set PK Nail

Notes:

Receiver: (e.g. R8, R10) Trimble R10 Internal
Start Time : 10:41:08 AM Stop Time : 10:41:18 AM
PDOP Max: 1.729
Start Time : 1:33:38 PM Stop Time : 1:33:48 PM
PDOP Max: 1.617
Antenna Height: 2.00 m
Weather Conditions: Cloudy

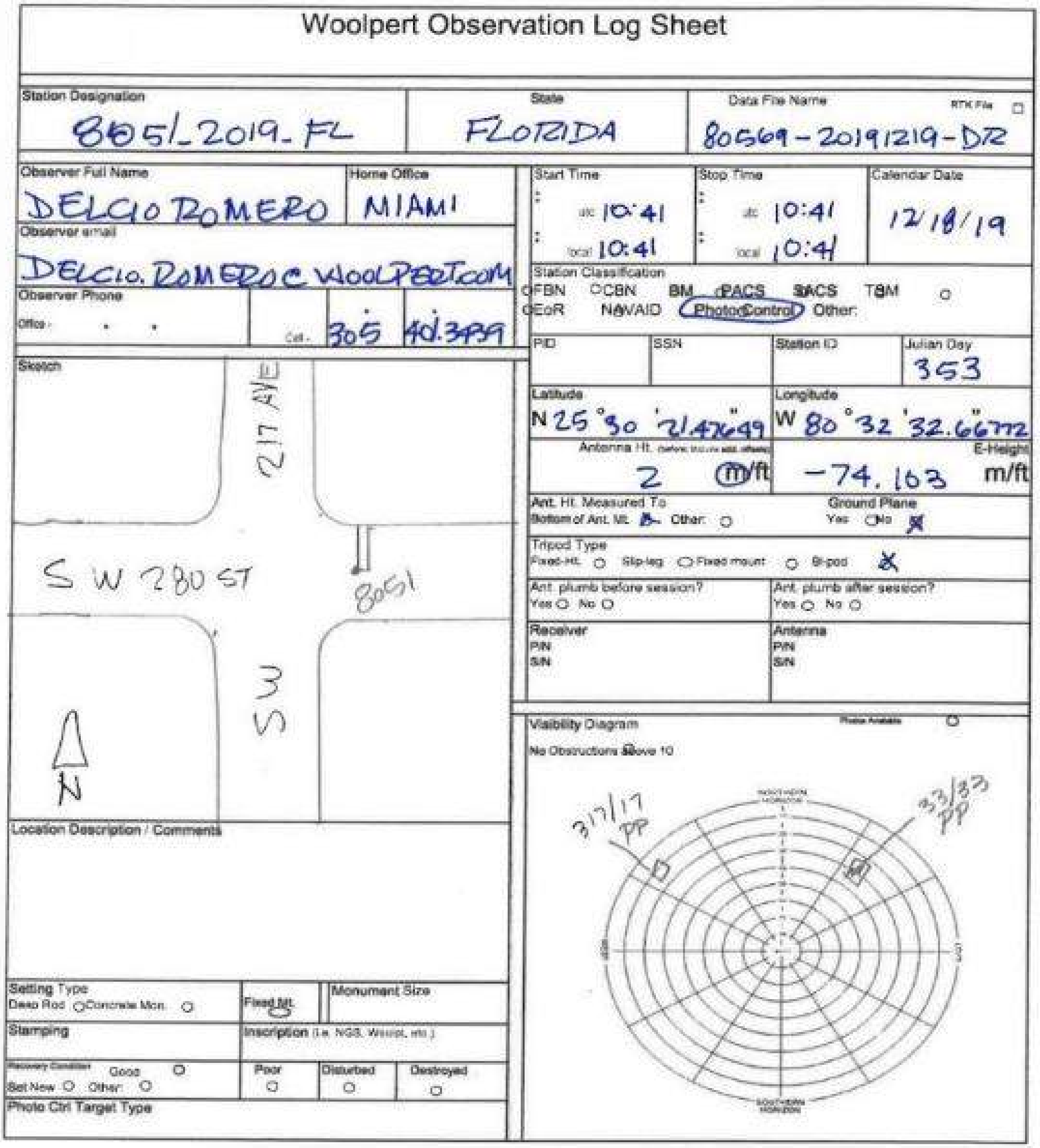
PHOTOS

⇧

NORTH

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8051_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



### Woolpert Observation Log Sheet

Station Designation: 8051_2019_FL

State: FLORIDA

Data File Name: 80569-20191219-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone

Office - . .

Cell - 305 401.3439

Start Time: utc 10:41 local 10:41

Stop Time: utc 10:41 local 10:41

Calendar Date: 12/18/19

Station Classification

○FBN ○CBN BM ○PACS ○SACS TBM ○

○EoR NAVAID [✓ Photo Control] Other:

PID

SSN

Station ID

Julian Day: 353

Latitude: N 25° 30' 21.47649"

Longitude: W 80° 32' 32.66772"

Antenna Ht. (before ... offsets): 2 [✓ m]/ft

E-Height: -74.163 m/ft

Ant. Ht. Measured To

Bottom of Ant. Mt. [✓] Other: ○

Ground Plane

Yes ○ No ☒

Tripod Type

Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver

P/N

S/N

Antenna

P/N

S/N

Sketch

Visibility Diagram

Photos Available ○

No Obstructions Above 10

Location Description / Comments

Setting Type

Deep Rod ○ Concrete Mon. ○

Fixed Mt.

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8052_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **129276.842** | **424135.771** | **Datum (Epoch)** |
| **Easting** | **254984.831** | **836562.735** | **Datum (Epoch)** |
| **Orthometric Height** | **2.837** | **9.306** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS ☐
Other

Mark Stamping:
Latitude: N25°29'57.98004"
Longitude: W80°27'11.04541"
Ellipsoidal Height: -22.165 m
Type of Mark: Set PK Nail
Notes:

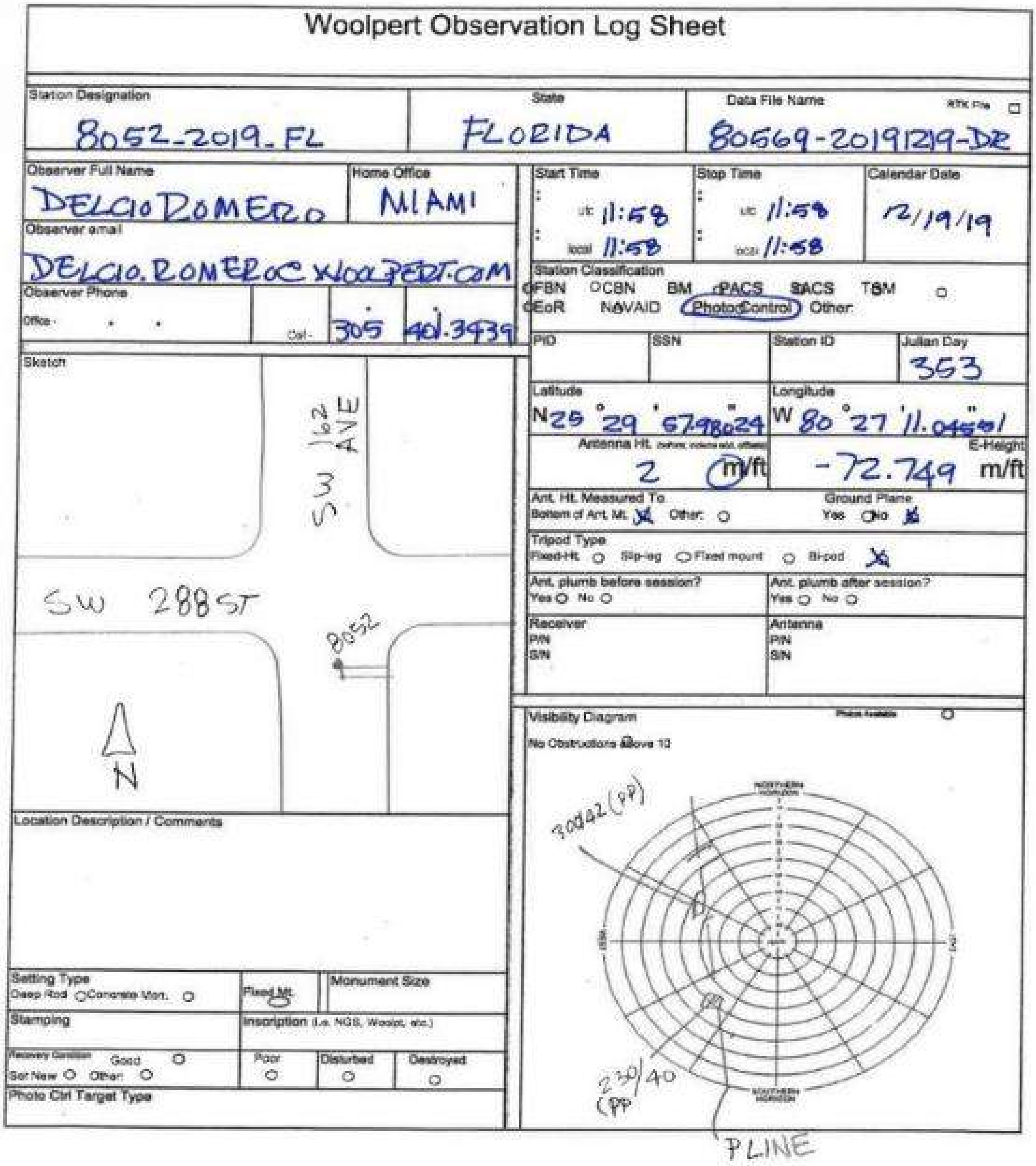
Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:58:25 AM Stop Time : 11:58:35 AM
PDOP Max: 1.383
Start Time : 2:30:23 PM Stop Time : 2:30:33 PM
PDOP Max: 1.432
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8052_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8052-2019-FL

State: FLORIDA

Data File Name: 80569-20191219-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 305 401.3939

Start Time: utc 11:58 local 11:58

Stop Time: utc 11:58 local 11:58

Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 353

Latitude: N 25° 29' 57.98024"

Longitude: W 80° 27' 11.04591"

Antenna Ht. (before, volume add, offsets): 2 [✓ m]/ft

E-Height: -72.749 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N

Antenna P/N S/N

Sketch

Visibility Diagram

Photo Available ○

No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8053_2019_FL

Operator Name: Suswyn Mills
Date of Field Survey: 12/30/2019
GPS Session File Name: 80569_20200102_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **129131.254** | **423658.121** | **Datum (Epoch)** |
| **Easting** | **259797.893** | **852353.586** | **Datum (Epoch)** |
| **Orthometric Height** | **1.808** | **5.933** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒
OPUS ☐
Other

Mark Stamping
Latitude: N25°29'52.57797"
Longitude: W80°24'18.72464"
Ellipsoidal Height: -23.348 m
Type of Mark: Set PK Nail at Corner of Stop Bar
Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 11:59:53 AM Stop Time : 12:05:24 PM
PDOP Max: 1.799
Start Time : 8:43:46 AM Stop Time : 8:44:37 AM
PDOP Max: 1.459
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

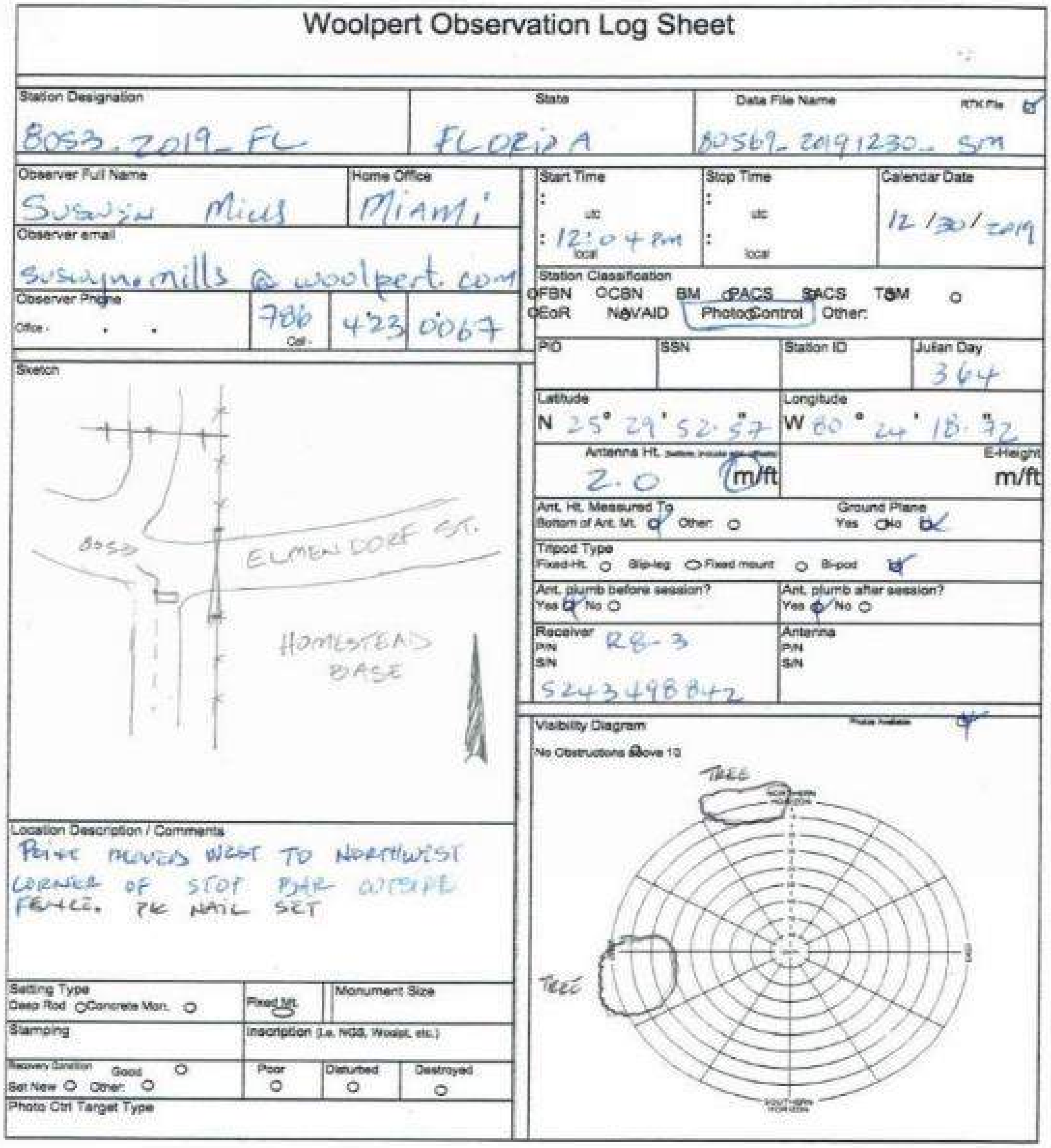
8053_2019_FL, 1, 20191230

8053_2019_FL, 3W, 20191230

8053_2019_FL, 3N, 20191230

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/30/2019 |
| Project Point Name | 8053_2019_FL | GPS Session File Name | 80569_20200102_SM.job |



### Woolpert Observation Log Sheet

Station Designation: 8053_2019_FL
State: FLORIDA
Data File Name: 80569_20191230_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: Miami
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 12:04 PM local
Stop Time: : utc : local
Calendar Date: 12/30/2019

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] ○Other:

PID: 
SSN: 
Station ID: 
Julian Day: 364

Latitude: N 25° 29' 52.57"
Longitude: W 80° 24' 18.72"

Antenna Ht. (always include any offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver R8-3
P/N
S/N 5243498842

Antenna
P/N
S/N

Sketch

Visibility Diagram
No Obstructions Above 10 ○
Photos Available ☑

Location Description / Comments: POINT MOVED WEST TO NORTHWEST CORNER OF STOP BAR OUTSIDE FENCE. PK NAIL SET

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Set New ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8054_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **123123.618** | **403948.068** | **Datum (Epoch)** |
| **Easting** | **252238.780** | **827553.397** | **Datum (Epoch)** |
| **Orthometric Height** | **1.811** | **5.940** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping:
Latitude: N25°26'38.37370"
Longitude: W80°28'50.23461"
Ellipsoidal Height: -23.028 m
Type of Mark: Set Drill Hole

Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 9:14:12 AM Stop Time : 9:14:22 AM
PDOP Max: 1.339
Start Time : 12:50:03 PM Stop Time : 12:50:13 PM
PDOP Max: 1.681
Antenna Height: 2.00 m
Weather Conditions: Cloudy

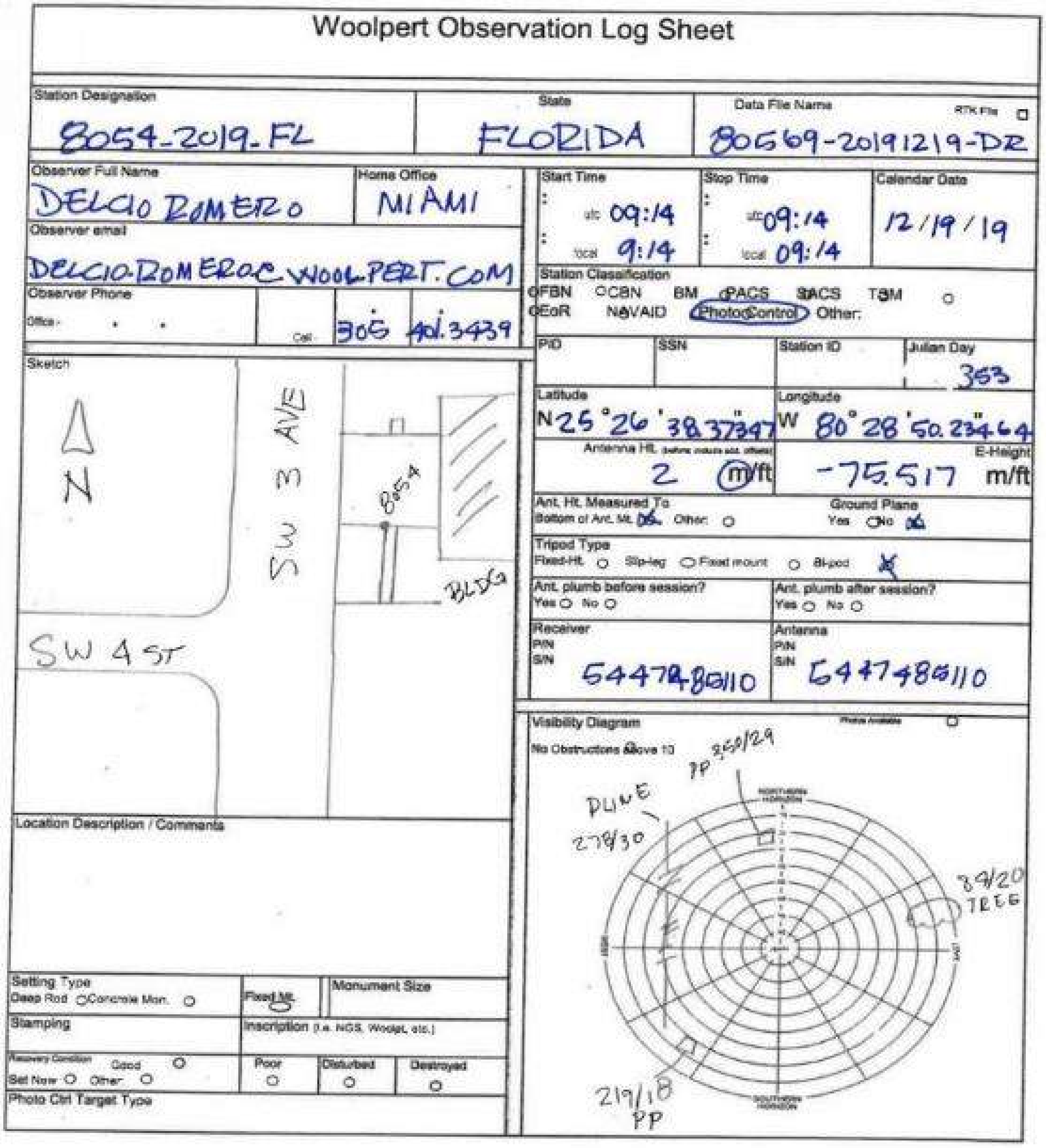
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8054_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8054-2019-FL
State: FLORIDA
Data File Name: 80569-20191219-DR RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office: . . Cell: 305 401.3439

Start Time: utc 09:14 local 9:14
Stop Time: utc 09:14 local 09:14
Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N25°26'38.37347"
Longitude: W 80°28'50.23464"
Antenna Ht. (before include ant. offsets): 2 [✓ m]/ft
E-Height: -75.517 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver: P/N S/N 5447480110
Antenna: P/N S/N 6447480110

Sketch

Visibility Diagram Photo Available ☐
No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name Miami-Dade Counrty, FL Orthos
Project Number 80569
Project Point Name 8055_2019_FL

Operator Name Delcio Romero
Date of Field Survey 12/19/2019
GPS Session File Name 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **125816.168** | **412781.878** | **Datum (Epoch)** |
| **Easting** | **247865.136** | **813204.200** | **Datum (Epoch)** |
| **Orthometric Height** | **1.794** | **5.885** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude N25°28'06.40580"
Longitude W80°31'26.43041"
Ellipsoidal Height -22.964 m
Type of Mark Corner of Brick Pavers

Notes

Receiver: (e.g. R8, R10) Trimble R10 Internal
Start Time : 10:23:04 AM Stop Time : 10:23:14 AM
PDOP Max: 1.633
Start Time : 1:23:55 PM Stop Time : 1:24:05 PM
PDOP Max: 1.378
Antenna Height: 2.00 m
Weather Conditions Cloudy

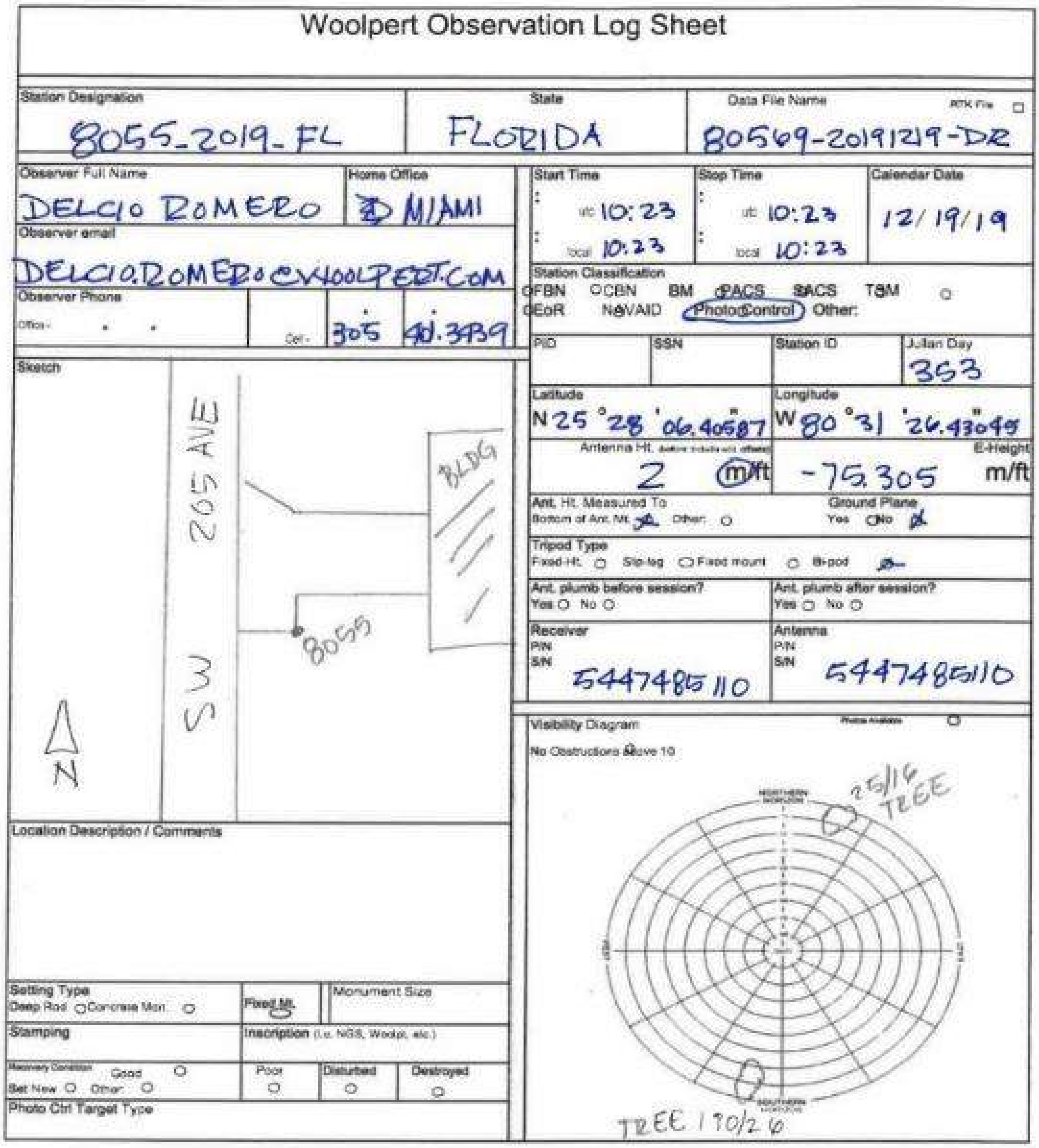
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8055_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



## Woolpert Observation Log Sheet

Station Designation: 8055_2019_FL
State: FLORIDA
Data File Name: 80569-20191219-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 305 . 401.3939

Start Time: utc 10:23 local 10:23
Stop Time: utc 10:23 local 10:23
Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR N○VAID [✓ Photo○Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N25°28'06.40587"
Longitude: W80°31'26.43049"

Antenna Ht.: 2 [✓ m]/ft
E-Height: -75.305 m/ft

Ant. Ht. Measured To: [✓ Bottom of Ant. Mt.] Other: ○
Ground Plane: Yes ○ [✓ No]

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ [✓ Bi-pod]

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 5447485110
Antenna P/N S/N 5447485110

Sketch

Visibility Diagram
Photos Available ○
No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8056_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/14/2019
GPS Session File Name: 80569_20191212_YN.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **120270.177** | **394586.407** | **Datum (Epoch)** |
| **Easting** | **247582.658** | **812277.437** | **Datum (Epoch)** |
| **Orthometric Height** | **1.425** | **4.675** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS ☐
Other

Mark Stamping
Latitude: N25°25'06.20613"
Longitude: W80°31'37.24699"
Ellipsoidal Height: -23.203 m
Type of Mark: Corner of Driveway

Notes

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 10:47:29 AM Stop Time : 10:52:46 AM
PDOP Max: 1.636
Start Time : 1:33:43 PM Stop Time : 1:36:43 PM
PDOP Max: 1.504
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH


8056_2019_FL, 1, 20191214

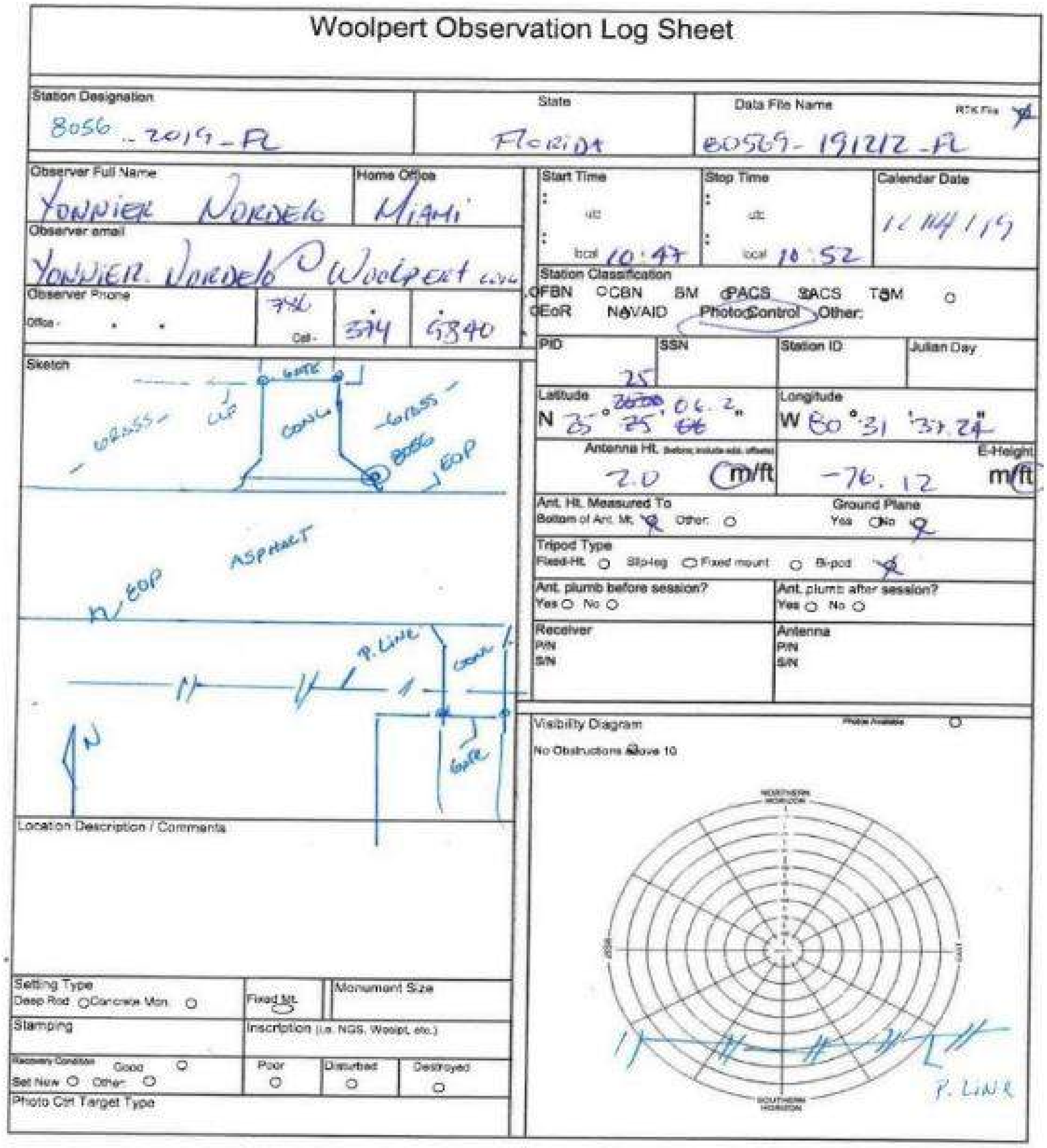

8056_2019_FL, W, 20191214


8056_2019_FL, 2, 20191214


8056_2019_FL, N, 20191214

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/14/2019 |
| Project Point Name | 8056_2019_FL | GPS Session File Name | 80569_20191212_YN.job |



## Woolpert Observation Log Sheet

Station Designation: 8056_2019_FL

State: Florida

Data File Name: 80569-191212_FL

RTK File: ☒

Observer Full Name: Yonnier Nordelo

Home Office: Miami

Observer email: Yonnier. Nordelo@Woolpert.com

Observer Phone: Office - . . Cell - 786 . 374 . 5840

Start Time: : utc : local 10:47

Stop Time: : utc : local 10:52

Calendar Date: 12/14/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS T○M ○ ○EoR N○VAID [✓ Photo○Control] ○Other:

| PID | SSN | Station ID | Julian Day |
|---|---|---|---|
| 25 | | | |

Latitude: N 25 ° ~~2630~~ 25 ' 06.2 ~~66~~ "

Longitude: W 80 ° 31 ' 37.24 "

Antenna Ht. (before; include add. offsets): 2.0 [✓ m]/ft

E-Height: -76.12 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N

Antenna P/N S/N

Sketch

Visibility Diagram

Photos Available ○

No Obstructions ○Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○

Fixed Mt. ○

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 8057_2019_FL | GPS Session File Name | 80569_20191230_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **125248.638** | **410919.905** | **Datum (Epoch)** |
| **Easting** | **257516.673** | **844869.285** | **Datum (Epoch)** |
| **Orthometric Height** | **1.887** | **6.191** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

RTK Base ☐

Network Adjustment ☐

FDOT FPRN X

OPUS ☐

Other

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal |
| Latitude | N25°27'46.72919" | Start Time : | 11:55:01 AM Stop Time : 11:55:11 AM |
| Longitude | W80°25'41.00553" | PDOP Max: | 1.277 |
| Ellipsoidal Height | -23.182 m | Start Time : | 8:06:59 AM Stop Time : 8:08:18 AM |
| Type of Mark | Set Drill Hole | PDOP Max: | 1.413 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Cloudy |

PHOTOS

NORTH

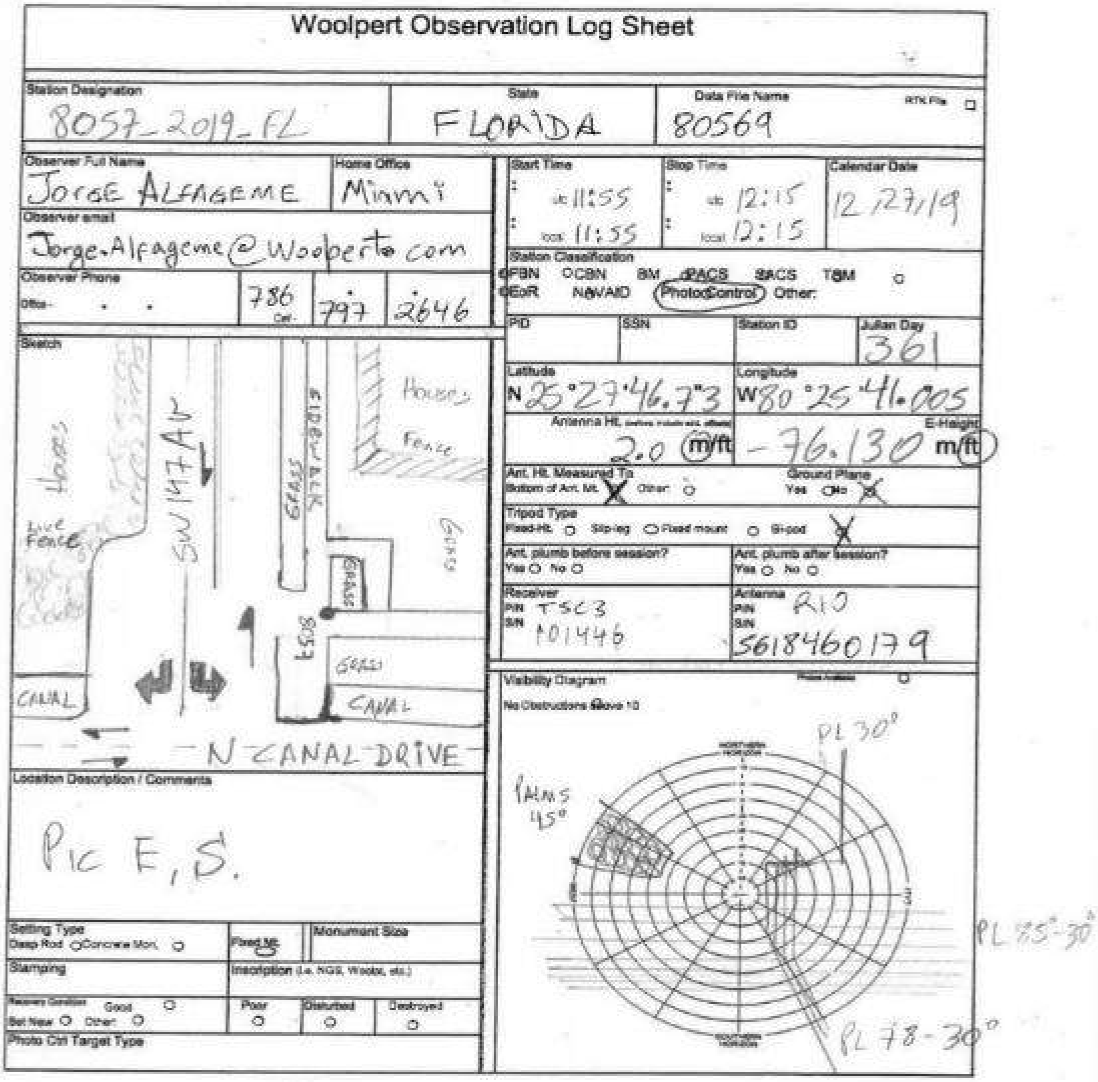
8057_2019_FL, 1, 20191227

8057_2019_FL, 3S, 20191227

8057_2019_FL, 3E, 20191227

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 8057_2019_FL | GPS Session File Name | 80569_20191230_SM.job |



## Woolpert Observation Log Sheet

| | | | |
|---|---|---|---|
| Station Designation<br>8057_2019_FL | State<br>FLORIDA | Data File Name<br>80569 | RTK File ☐ |

| | |
|---|---|
| Observer Full Name | JORGE ALFAGEME |
| Home Office | Miami |
| Observer email | Jorge.Alfageme@Woolpert.com |
| Observer Phone | Office- . . Cell- 786 797 2646 |
| Start Time | utc 11:55<br>local 11:55 |
| Stop Time | utc 12:15<br>local 12:15 |
| Calendar Date | 12/27/19 |
| Station Classification | ○FBN ○CBN BM PACS SACS TBM ○<br>○EoR NAVAID [✓ Photo Control] Other: |
| PID | |
| SSN | |
| Station ID | |
| Julian Day | 361 |
| Latitude | N 25°27'46.773 |
| Longitude | W80°25'41.005 |
| Antenna Ht. | 2.0 [✓ m]/ft |
| E-Height | -76.130 m/[✓ ft] |
| Ant. Ht. Measured To | Bottom of Ant. Mt. ☒ Other ○ |
| Ground Plane | Yes ○ No ☒ |
| Tripod Type | Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒ |
| Ant. plumb before session? | Yes ○ No ○ |
| Ant. plumb after session? | Yes ○ No ○ |
| Receiver | P/N TSC3<br>S/N 101446 |
| Antenna | P/N R10<br>S/N 5618460179 |

Sketch

Location Description / Comments

Pic E, S.

| | |
|---|---|
| Setting Type | Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○ |
| Monument Size | |
| Stamping | |
| Inscription (i.e. NGS, Woolpt, etc.) | |
| Recovery Condition | Good ○ Set New ○ Other ○ Poor ○ Disturbed ○ Destroyed ○ |
| Photo Ctrl Target Type | |

Visibility Diagram

No Obstructions Above 10

Photo Available ○

203381

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | | |
|---|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | | Operator Name | Yonnier Nordello |
| Project Number | 80569 | | | Date of Field Survey | 12/12/2019 |
| Project Point Name | 8058_2019_FL | | | GPS Session File Name | Report_22796382.xml |
| | **Metric** | **US Survey Feet** | | | |
| **Northing** | **103623.992** | **339973.048** | **Datum (Epoch)** | | |
| **Easting** | **256401.302** | **841209.937** | **Datum (Epoch)** | | |
| **Orthometric Height** | **0.889** | **2.918** | **Datum (Epoch)** | | |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☐
OPUS ☐
Other **Trimble RTX Solution**

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal |
| Latitude | N25°16'04.13260" | Start Time : | 11:30:27 AM Stop Time : 11:59:37 AM |
| Longitude | W80°26'24.17329" | PDOP Max: | 1.529 |
| Ellipsoidal Height | -23.657 m | Start Time : | Stop Time : |
| Type of Mark | Set PK Nail at Corner of Stop Bar | PDOP Max: | |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Sunny |

PHOTOS

⇧

NORTH


8058_2019_FL, 1, 20191213

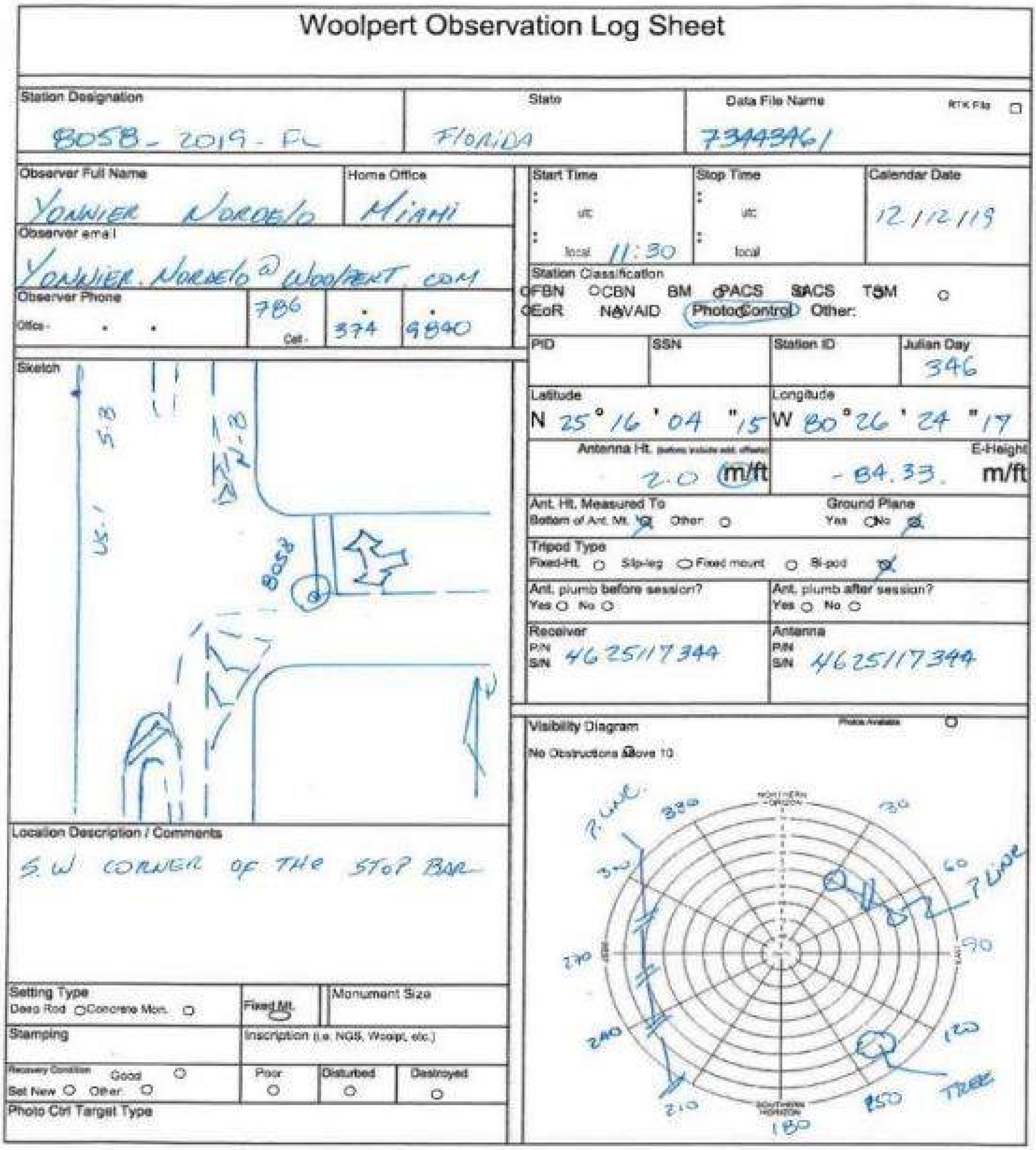

8058_2019_FL, W, 20191213


8058_2019_FL, 2, 20191213


8058_2019_FL, N, 20191213

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8058_2019_FL
Operator Name: Yonnier Nordello
Date of Field Survey: 12/12/2019
GPS Session File Name: Report_22796382.xml



## Woolpert Observation Log Sheet

Station Designation: 8058 - 2019 - FL
State: FLORIDA
Data File Name: 7344346 / RTK File ☐

Observer Full Name: YONNIER NORDELLO
Home Office: MIAMI
Observer email: YONNIER.NORDELLO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 786 . 374 . 9840

Start Time: : utc : local 11:30
Stop Time: : utc : local
Calendar Date: 12/12/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 346

Latitude: N 25° 16' 04" 15
Longitude: W 80° 26' 24" 17

Antenna Ht. (before include add. offsets): 2.0 [✓ m/ft]
E-Height: -84.33 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver: P/N S/N 4625117344
Antenna: P/N S/N 4625117344

Visibility Diagram
Photo Available ○
No Obstructions Above 10

Sketch

Location Description / Comments: S.W CORNER OF THE STOP BAR

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8059_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/11/2019
GPS Session File Name: 8059345s.19o.xml

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **118624.916** | **389188.578** | **Datum (Epoch)** |
| **Easting** | **244494.044** | **802144.208** | **Datum (Epoch)** |
| **Orthometric Height** | **2.292** | **7.519** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN
OPUS X
Other

Mark Stamping:
Latitude: N25°24'13.08244"
Longitude: W80°33'27.96584"
Ellipsoidal Height: -22.225 m
Type of Mark: Set PK Nail at Corner of Crosswalk Paint
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 1:04:30 PM Stop Time : 1:29:28 PM
PDOP Max: 3.011
Start Time : Stop Time :
PDOP Max:
Antenna Height: 2.00 m
Weather Conditions: Sunny

PHOTOS

⇧

NORTH

8059_2019_FL, 1, 20191211

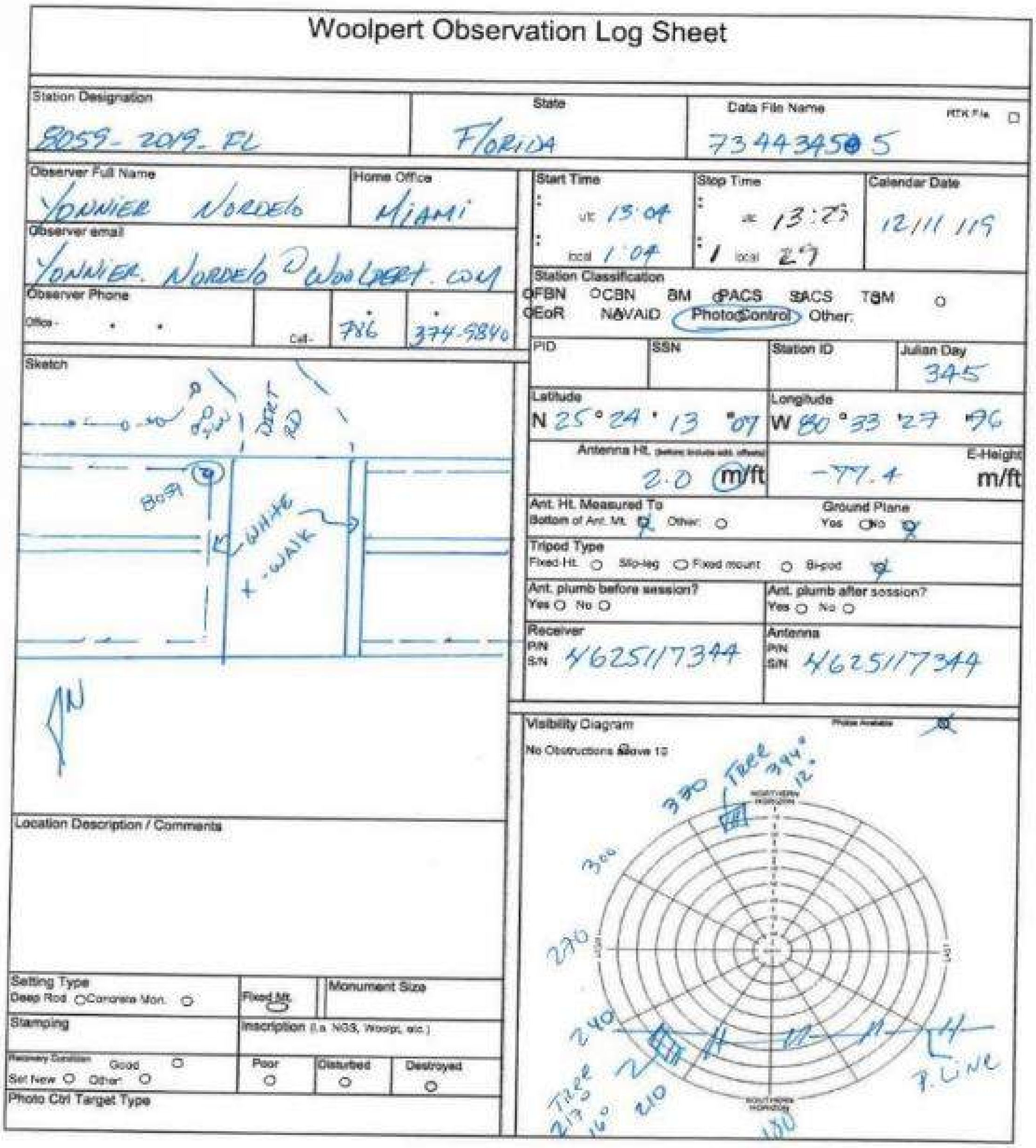
8059_2019_FL, W, 20191211

8059_2019_FL, 2, 20191211

8059_2019_FL, N, 20191211

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8059_2019_FL
Operator Name: Yonnier Nordello
Date of Field Survey: 12/11/2019
GPS Session File Name: 8059345s.19o.xml



## Woolpert Observation Log Sheet

Station Designation: 8059-2019-FL
State: FLORIDA
Data File Name: 73443450 5
RTK File ☐

Observer Full Name: YONNIER NORDELO
Home Office: MIAMI
Observer email: YONNIER.NORDELO@WOOLPERT.COM
Observer Phone: Office- . . Cell- 786 374-9840

Start Time: utc 13:04 local 1:04
Stop Time: utc 13:27 local 1:27
Calendar Date: 12/11/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 345

Latitude: N 25° 24' 13" .07
Longitude: W 80° 33' 27" .96

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: -77.4 m/ft

Ant. Ht. Measured To: [✓ Bottom of Ant. Mt.] Other: ○
Ground Plane: Yes ○ [✓ No]

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ [✓ Bi-pod]

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N 4625117344
Antenna P/N S/N 4625117344

Sketch

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size
Stamping
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type

Visibility Diagram
[✓ Photo Available]
No Obstructions Above 12 ○

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8060_2019_FL

Operator Name: Yonnier Nordello
Date of Field Survey: 12/25/2019
GPS Session File Name: 80569_20191212_YN.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **118632.086** | **389212.101** | **Datum (Epoch)** |
| **Easting** | **247339.137** | **811478.486** | **Datum (Epoch)** |
| **Orthometric Height** | **2.423** | **7.950** | **Datum (Epoch)** |

Agency:
PID:
Designation:
Hor. Order:
Ver. Order:

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping:
Latitude: N25°24'12.99951"
Longitude: W80°31'46.16774"
Ellipsoidal Height: -22.165 m
Type of Mark: Set PK Nail at Corner of Stop Bar

Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 1:08:53 PM Stop Time : 1:12:02 PM
PDOP Max: 1.533
Start Time : 10:34:00 AM Stop Time : 10:37:12 AM
PDOP Max: 1.695
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧

NORTH

8060_2019_FL, 1, 20191214

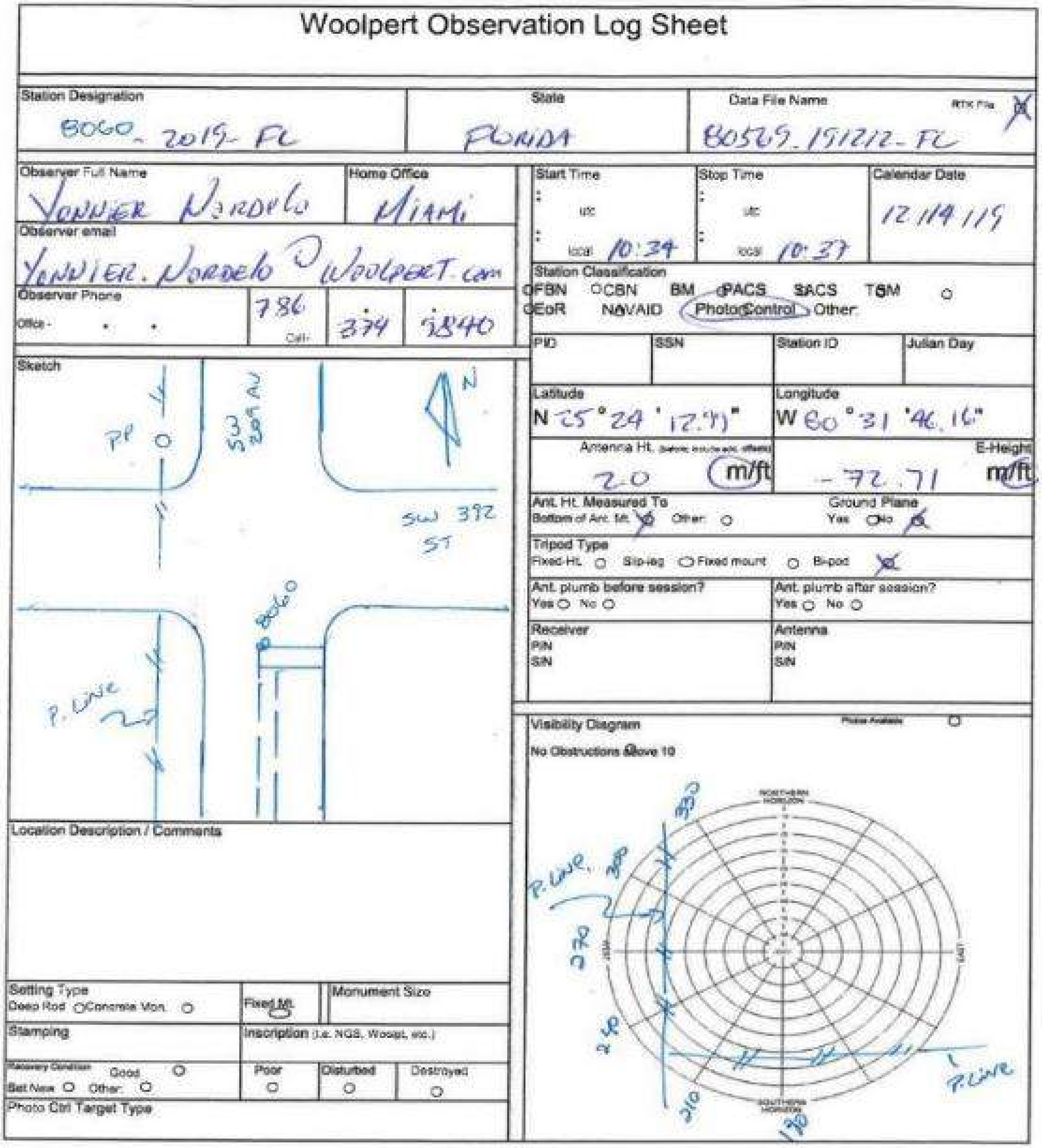
8060_2019_FL, N, 20191214

8060_2019_FL, 2, 20191214

8060_2019_FL, E, 20191214

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/25/2019 |
| Project Point Name | 8060_2019_FL | GPS Session File Name | 80569_20191212_YN.job |



## Woolpert Observation Log Sheet

Station Designation: 8060_2019_FL

State: FLORIDA

Data File Name: 80569_191212_FL

RTK File: ☒

Observer Full Name: Yonnier Nordelo

Home Office: Miami

Observer email: Yonnier.Nordelo@Woolpert.com

Observer Phone: Office - . . Cell: 786 . 374 . 5840

Start Time: : utc : local 10:34

Stop Time: : utc : local 10:37

Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TGM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day:

Latitude: N 25°24'12.77"

Longitude: W 80°31'46.16"

Antenna Ht. (before include adc offsets): 2.0 [✓ m]/ft

E-Height: -72.71 [✓ m]/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N

Antenna P/N S/N

Sketch

Visibility Diagram

Photos Available ○

No Obstructions Above 10

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○

[✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8061_2019_FL

Operator Name: Delcio Romero
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569-20191219-DR.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **127654.170** | **418812.056** | **Datum (Epoch)** |
| **Easting** | **250819.699** | **822897.631** | **Datum (Epoch)** |
| **Orthometric Height** | **2.386** | **7.828** | **Datum (Epoch)** |

Agency
PID
Designation
Hor. Order
Ver. Order

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS
Other

Mark Stamping
Latitude: N25°29'05.78261"
Longitude: W80°29'40.41066"
Ellipsoidal Height: -22.414 m
Type of Mark: Corner of Driveway

Notes

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 10:03:00 AM  Stop Time : 10:03:10 AM
PDOP Max: 1.377
Start Time : 1:11:54 PM  Stop Time : 1:12:04 PM
PDOP Max: 1.761
Antenna Height: 2.00 m
Weather Conditions: Cloudy

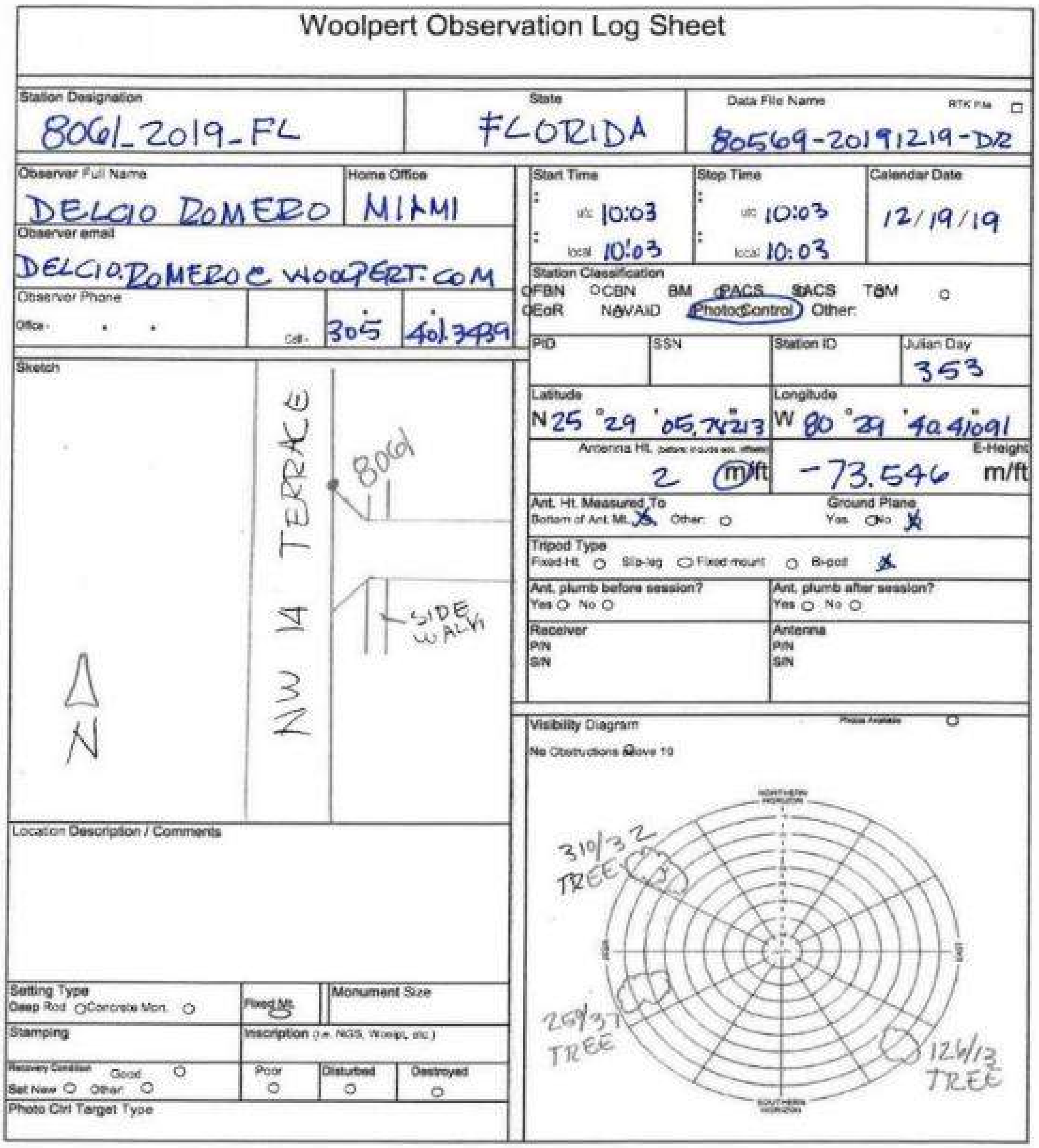
PHOTOS

⇧

NORTH

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/19/2019 |
| Project Point Name | 8061_2019_FL | GPS Session File Name | 80569-20191219-DR.job |



### Woolpert Observation Log Sheet

Station Designation: 8061_2019_FL
State: FLORIDA
Data File Name: 80569-20191219-DR
RTK File ☐

Observer Full Name: DELCIO ROMERO
Home Office: MIAMI
Observer email: DELCIO.ROMERO@WOOLPERT.COM
Observer Phone: Office - . . Cell - 305 . 401 . 3439

Start Time: utc 10:03 local 10:03
Stop Time: utc 10:03 local 10:03
Calendar Date: 12/19/19

Station Classification: ○FBN ○CBN BM PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N25 °29 '05.74213"
Longitude: W 80 °29 '40.41091"

Antenna Ht. (before: include acc. offsets): 2 [✓ m]/ft
E-Height: -73.546 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N S/N
Antenna P/N S/N

Sketch

Visibility Diagram
Photos Available ○
No Obstructions Above 10 ○

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○
Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 8062_2019_FL | GPS Session File Name | 80569_20191227_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **134496.780** | **441261.518** | **Datum (Epoch)** |
| **Easting** | **262208.240** | **860261.533** | **Datum (Epoch)** |
| **Orthometric Height** | **1.862** | **6.108** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

RTK Base ☐ FDOT FPRN ☒

Network Adjustment ☐ OPUS ☐

Other

| | | | |
|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal |
| Latitude | N25°32'46.58241" | Start Time : | 9:29:57 AM Stop Time : 9:30:07 AM |
| Longitude | W80°22'51.52317" | PDOP Max: | 1.305 |
| Ellipsoidal Height | -23.355 m | Start Time : | 1:13:30 PM Stop Time : 1:13:40 PM |
| Type of Mark | Set Drill Hole | PDOP Max: | 1.326 |
| | | Antenna Height: | 2.00 m |
| Notes | | Weather Conditions | Sunny |

PHOTOS

NORTH

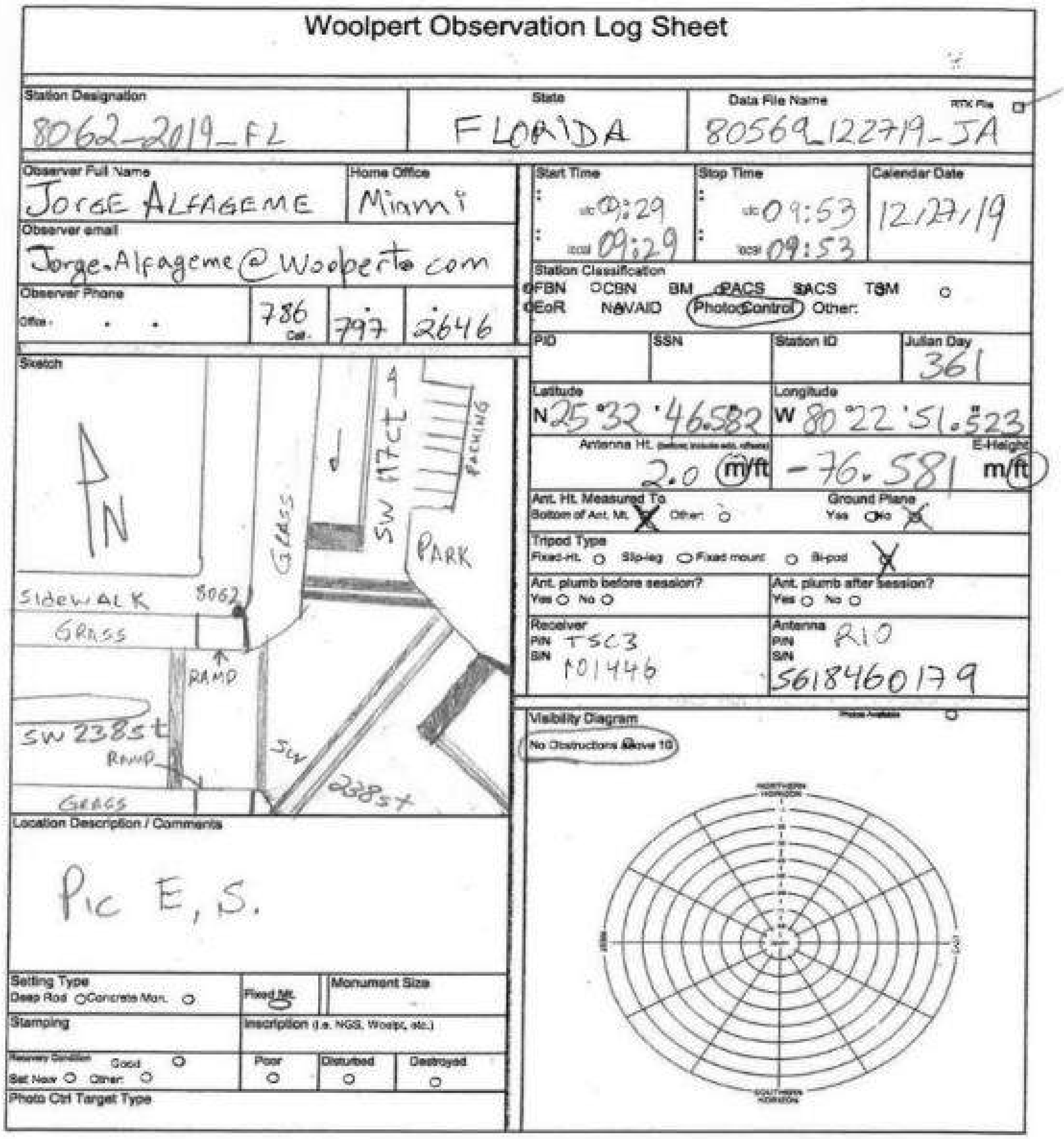
8062_2019_FL, 1, 20191227

8062_2019_FL, 3S, 20191227

8062_2019_FL, 3E, 20191227

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/27/2019 |
| Project Point Name | 8062_2019_FL | GPS Session File Name | 80569_20191227_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8062_2019_FL

State: FLORIDA

Data File Name: 80569_122719_JA

RTK File ☐

Observer Full Name: JORGE ALFAGEME

Home Office: Miami

Observer email: Jorge.Alfageme@Woolpert.com

Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 09:29 local 09:29

Stop Time: utc 09:53 local 09:53

Calendar Date: 12/27/19

Station Classification: ○FBN ○CBN ○BM ○PACS ○SACS ○TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:

SSN:

Station ID:

Julian Day: 361

Latitude: N 25°32'46.582"

Longitude: W 80°22'51.523"

Antenna Ht.: 2.0 [✓ m]/ft

E-Height: -76.581 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446

Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments: Pic E, S.

Visibility Diagram: [✓ No Obstructions Above 10] Photos Available ○

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Set Now ○ Other: ○ Poor ○ Disturbed ○ Destroyed ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/23/2019 |
| Project Point Name | 8063_2019_FL | GPS Session File Name | 80569_20191223_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **143287.516** | **470102.459** | **Datum (Epoch)** |
| **Easting** | **255596.073** | **838568.115** | **Datum (Epoch)** |
| **Orthometric Height** | **2.038** | **6.687** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | |
| PID | |
| Designation | |
| Hor. Order | |
| Ver. Order | |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mark Stamping | | Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Latitude | N25°37'33.20059" | Start Time : | 2:05:20 PM | Stop Time : | 2:05:31 PM |
| Longitude | W80°26'47.06657" | PDOP Max: | 1.336 | | |
| Ellipsoidal Height | -22.833 m | Start Time : | 9:33:45 AM | Stop Time : | 9:33:55 AM |
| Type of Mark | Set PK Nail | PDOP Max: | 1.290 | | |
| | | Antenna Height: | 2.00 m | | |
| Notes | | Weather Conditions | Cloudy | | |

PHOTOS

NORTH

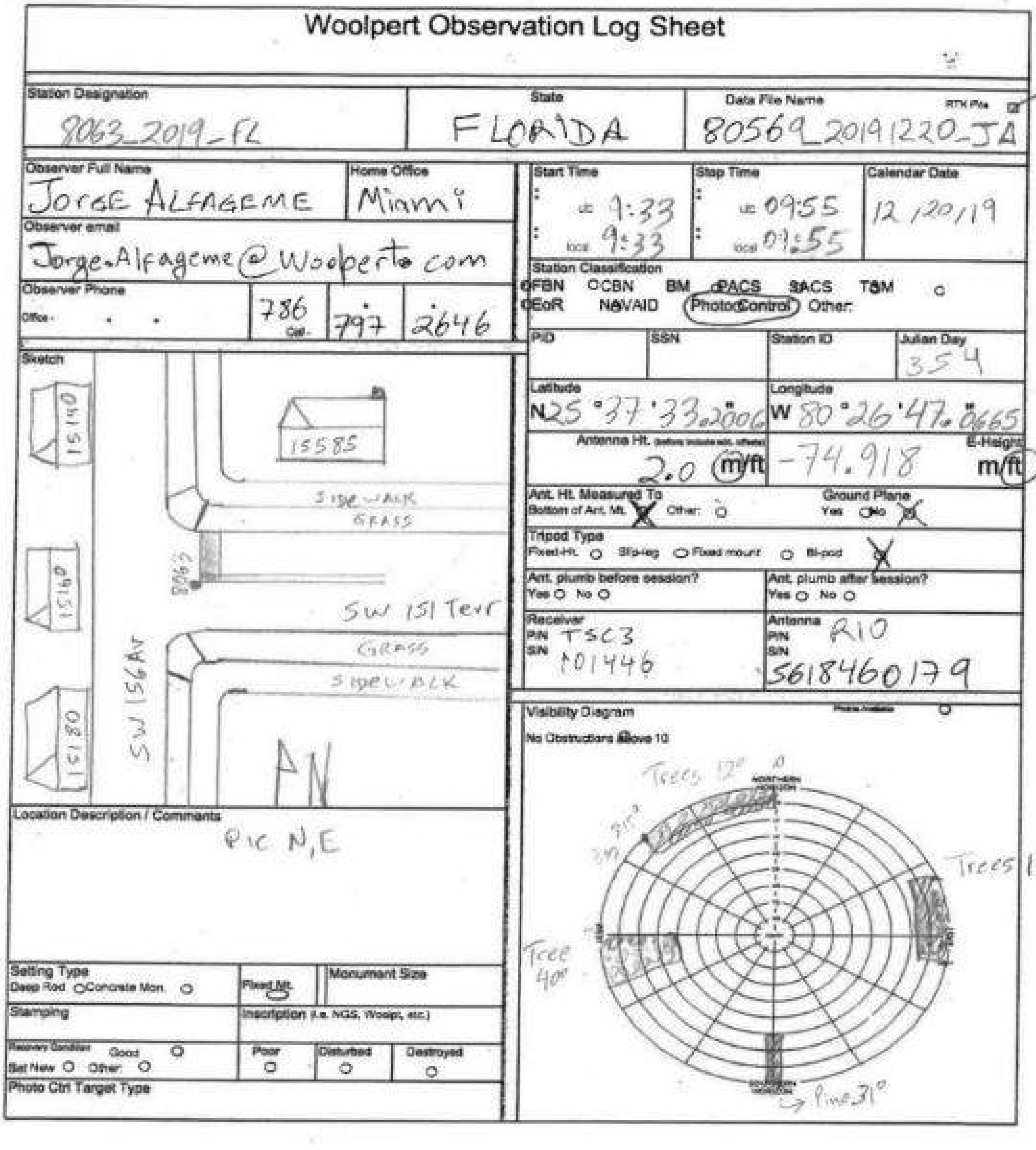
8063_2019_FL. 1, 20191220

8063_2019_FL. 3N,20191220

8063_2019_FL. 3E, 20191220

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/23/2019 |
| Project Point Name | 8063_2019_FL | GPS Session File Name | 80569_20191223_JA.job |



### Woolpert Observation Log Sheet

Station Designation: 8063_2019_FL
State: FLORIDA
Data File Name: 80569_20191220_JA
RTK File ☑

Observer Full Name: Jorge Alfageme
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 9:33 local 9:33
Stop Time: utc 09:55 local 09:55
Calendar Date: 12/20/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR ○NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 354

Latitude: N25°37'33.2006"
Longitude: W80°26'47.0665"
Antenna Ht. (before include ant. offsets): 2.0 [✓ m]/ft
E-Height: -74.918 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒
Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒
Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○
Receiver P/N: TSC3 S/N: 101446
Antenna P/N: R10 S/N: 5618460179

Sketch

Location Description / Comments: Pic N,E

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

Visibility Diagram
Photo Available ○
No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Jorge Alfageme |
| Project Number | 80569 | | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8064_2019_FL | | GPS Session File Name | 80569_20191219_JA.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **154923.623** | **508278.586** | **Datum (Epoch)** |
| **Easting** | **259631.569** | **851807.906** | **Datum (Epoch)** |
| **Orthometric Height** | **1.487** | **4.880** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | |
|---|---|---|
| Mark Stamping | | |
| Latitude | N25°43'50.76069" | |
| Longitude | W80°24'20.53875" | |
| Ellipsoidal Height | -23.398 | m |
| Type of Mark | Corner of Driveway | |
| Notes | | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Start Time : | 10:32:25 AM | Stop Time : | 10:32:36 AM |
| PDOP Max: | 1.114 | | |
| Start Time : | 3:06:47 PM | Stop Time : | 3:06:59 PM |
| PDOP Max: | 1.098 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Cloudy | | |

PHOTOS

⇧

NORTH

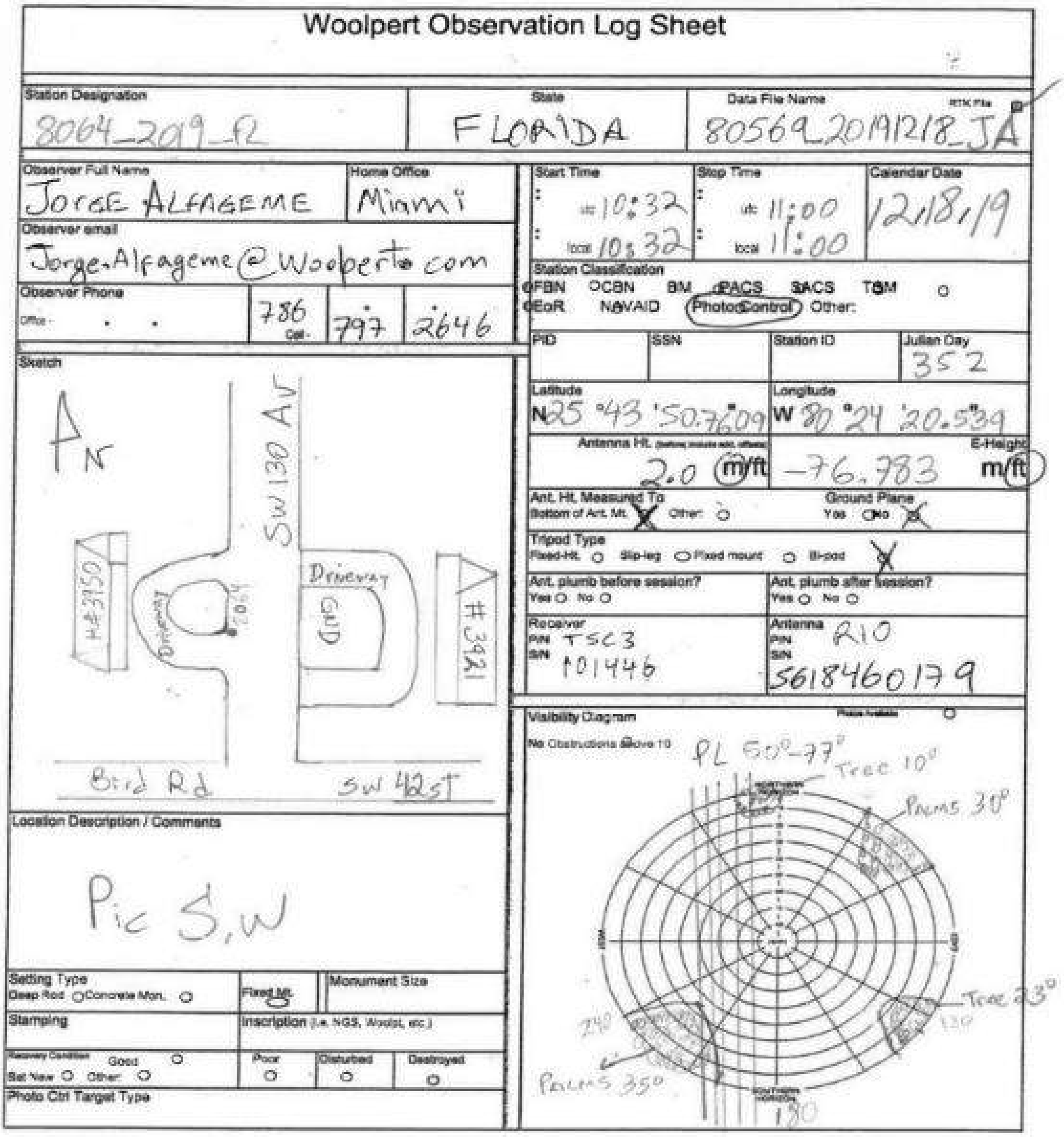
8064_2019_FL, 1, 20191218

8064_2019_FL, 3W, 20191218

8064_2019_FL, 3S, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | 8064_2019_FL | GPS Session File Name | 80569_20191219_JA.job |



## Woolpert Observation Log Sheet

Station Designation: 8064_2019_FL
State: FLORIDA
Data File Name: 80569_20191218_JA
RTK File ☒

Observer Full Name: JORGE ALFAGEME
Home Office: Miami
Observer email: Jorge.Alfageme@Woolpert.com
Observer Phone: Office - . . Cell - 786 797 2646

Start Time: utc 10:32 local 10:32
Stop Time: utc 11:00 local 11:00
Calendar Date: 12/18/19

Station Classification: ○FBN ○CBN BM PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 352

Latitude: N 25° 43' 50.76209"
Longitude: W 80° 24' 20.539"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: -76.783 m/[✓ ft]

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other: ○
Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TSC3 S/N: 101446
Antenna P/N: R10 S/N: 5618460179

Sketch

Visibility Diagram
Photo Available ○
No Obstructions Above 10

Location Description / Comments: Pic S,W

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | |
|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos |
| Project Number | 80569 |
| Project Point Name | 8065_2019_FL |

| | |
|---|---|
| Operator Name | Suswyn Mills |
| Date of Field Survey | 12/19/2019 |
| GPS Session File Name | 80569_20191219_SM.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **169352.403** | **555617.010** | **Datum (Epoch)** |
| **Easting** | **278008.802** | **912100.545** | **Datum (Epoch)** |
| **Orthometric Height** | **0.933** | **3.060** | **Datum (Epoch)** |

Agency

PID

Designation

Hor. Order

Ver. Order

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |

Other

| | |
|---|---|
| Mark Stamping | |
| Latitude | N25°51'36.51050" |
| Longitude | W80°13'18.18315" |
| Ellipsoidal Height | -24.413 m |
| Type of Mark | Set Drill Hole at Corner of Sidewalk |
| Notes | |

| | | | |
|---|---|---|---|
| Receiver: (e.g. R8, R10) | Trimble R8 GNSS/SPS88x Internal | | |
| Start Time : | 9:53:00 AM | Stop Time : | 9:53:15 AM |
| PDOP Max: | 1.999 | | |
| Start Time : | 2:00:20 PM | Stop Time : | 2:00:30 PM |
| PDOP Max: | 1.397 | | |
| Antenna Height: | 2.00 m | | |
| Weather Conditions | Cloudy | | |

PHOTOS

NORTH

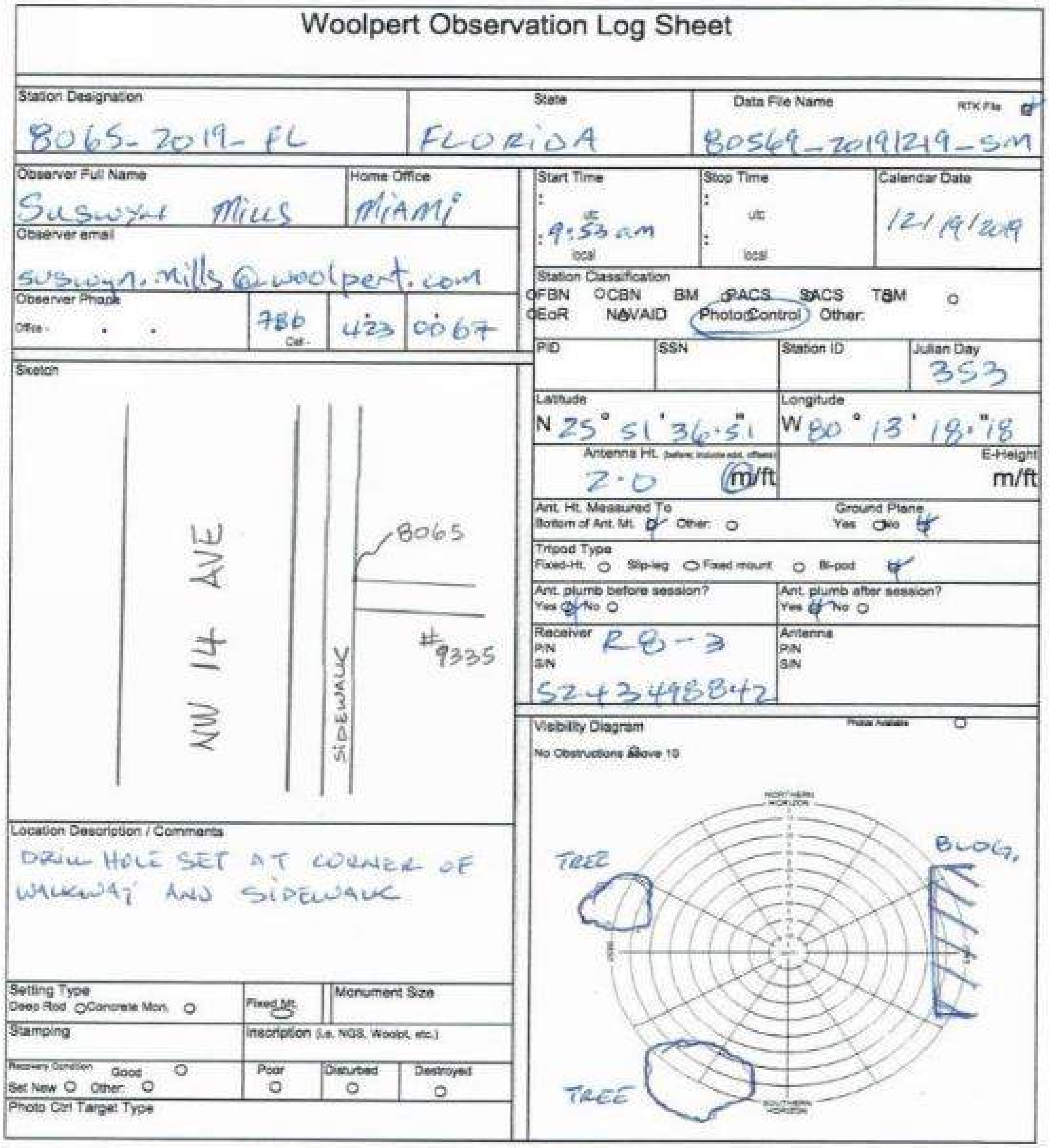
8065_2019_FL, 1, 20191219

8065_2019_FL, 3N, 20191219

8065_2019_FL, 3E, 20191219

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: 8065_2019_FL
Operator Name: Suswyn Mills
Date of Field Survey: 12/19/2019
GPS Session File Name: 80569_20191219_SM.job



## Woolpert Observation Log Sheet

Station Designation: 8065-2019-FL
State: FLORIDA
Data File Name: 80569_20191219_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: MIAMI
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 9:53 am local
Stop Time: : utc : local
Calendar Date: 12/19/2019

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID:
SSN:
Station ID:
Julian Day: 353

Latitude: N 25° 51' 36.51"
Longitude: W 80° 13' 19.18"

Antenna Ht. (before include add. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver P/N: R8-3
S/N: 5243498842
Antenna P/N:
S/N:

Sketch

Visibility Diagram
Photos Available ○
No Obstructions Above 10

Location Description / Comments: DRILL HOLE SET AT CORNER OF WALKWAY AND SIDEWALK

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt.
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: AB7766

Operator Name: Suswyn Mills
Date of Field Survey: 12/18/2019
GPS Session File Name: 80569_20191218_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **177213.251** | **581407.141** | **Datum (Epoch)** |
| **Easting** | **257297.890** | **844151.493** | **Datum (Epoch)** |
| **Orthometric Height** | **2.334** | **7.658** | **Datum (Epoch)** |

Agency: National Geodetic Survey
PID: **AB7766**
Designation: **87 93 A 27**
Hor. Order:
Ver. Order: **First Order Class II**

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

Mark Stamping: "FLDT" / "87 93 A 27"
Latitude: N25°55'55.40900"
Longitude: W80°25'40.78440"
Ellipsoidal Height: -22.518 m
Type of Mark: Brass NGS Benchmark Disk

Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 1:16:54 PM Stop Time : 1:20:44 PM
PDOP Max: 1.625
Start Time : 4:23:38 PM Stop Time : 4:26:40 PM
PDOP Max: 1.465
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH


AB7766_2019_FL, 1, 20191218

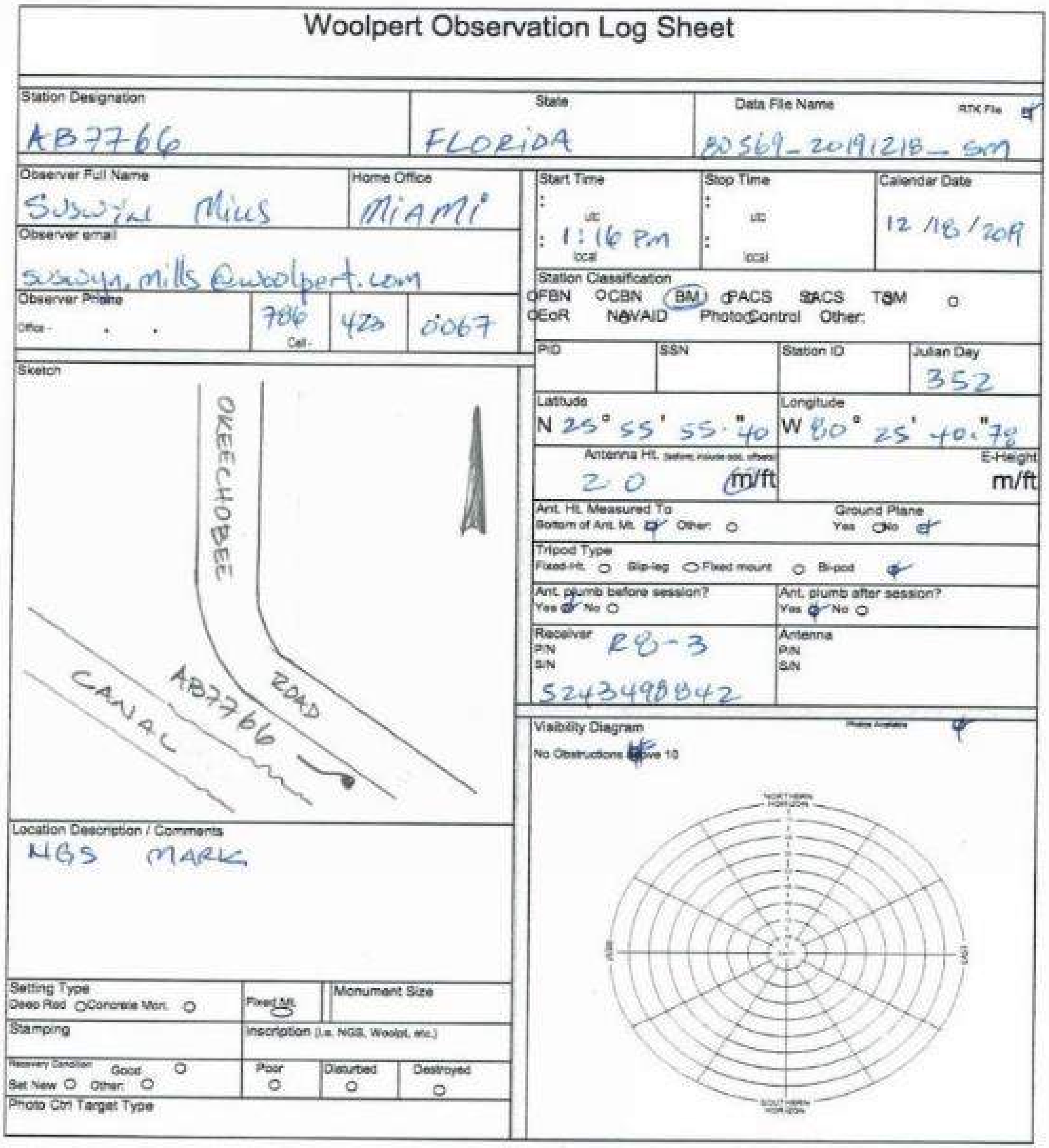

AB7766_2019_FL, 3S, 20191218


AB7766_2019_FL, 2, 20191218


AB7766_2019_FL, 3E, 20191218

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/18/2019 |
| Project Point Name | AB7766 | GPS Session File Name | 80569_20191218_SM.job |



## Woolpert Observation Log Sheet

Station Designation: AB7766

State: FLORIDA

Data File Name: 80569_20191218_SM

RTK File ☑

Observer Full Name: Suswyn Mills

Home Office: MIAMI

Observer email: suswyn.mills@woolpert.com

Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 1:16 PM local

Stop Time: : utc : local

Calendar Date: 12/18/2019

Station Classification: ○FBN ○CBN [✓ BM] ○PACS ○SACS TBM ○ ○EoR NAVAID Photo Control Other:

PID:

SSN:

Station ID:

Julian Day: 352

Latitude: N 25° 55' 55."40

Longitude: W 80° 25' 40."78

Antenna Ht. (before, include ant. offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○

Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○

Ant. plumb after session? Yes ☑ No ○

Receiver P/N: R8-3 S/N: 5243498842

Antenna P/N: S/N:

Sketch

Visibility Diagram

Photos Available ☑

No Obstructions above 10 ☑

Location Description / Comments: NGS MARK

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○

Photo Ctrl Target Type

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: AC2377

Operator Name: Suswyn Mills
Date of Field Survey: 12/17/2019
GPS Session File Name: 80569_20191217_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **180978.467** | **593760.187** | **Datum (Epoch)** |
| **Easting** | **285362.869** | **936228.013** | **Datum (Epoch)** |
| **Orthometric Height** | **2.108** | **6.917** | **Datum (Epoch)** |

Agency: National Geodetic Survey
PID: **AC2377**
Designation: **Y 238**
Hor. Order:
Ver. Order: **First Order Class I**

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping: "Y 238 1965"
Latitude: N25°57'52.79580"
Longitude: W80°08'51.35709"
Ellipsoidal Height: -23.469 m
Type of Mark: Brass NGS Benchmark Disk
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 7:21:02 AM Stop Time : 7:25:26 AM
PDOP Max: 2.301
Start Time : 5:37:47 PM Stop Time : 5:40:48 PM
PDOP Max: 2.456
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

⇧ NORTH

AC2377_2019_FL, 1, 20191217

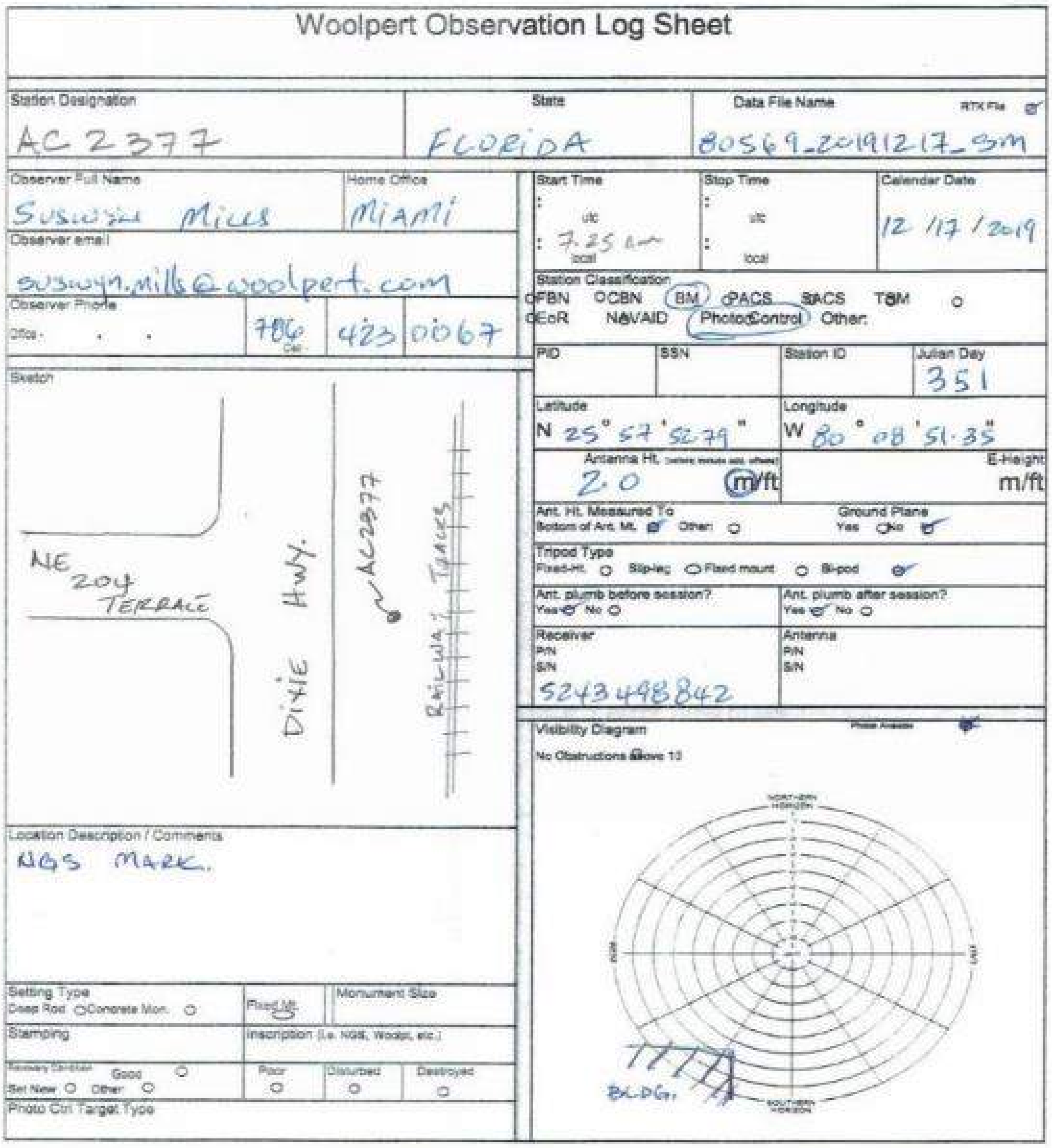
AC2377_2019_FL, 3S, 20191217

AC2377_2019_FL, 3E, 20191217

AC377_2019_FL, 3N, 20191217

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/17/2019 |
| Project Point Name | AC2377 | GPS Session File Name | 80569_20191217_SM.job |



## Woolpert Observation Log Sheet

Station Designation: AC 2377

State: FLORIDA

Data File Name: 80569_20191217_SM

RTX File ✓

Observer Full Name: Suswyn Mills

Home Office: Miami

Observer email: suswyn.mills@woolpert.com

Observer Phone

Office - . .

Cell - 786 423 0067

Start Time: : utc : 7.25 am local

Stop Time: : utc : local

Calendar Date: 12/17/2019

Station Classification

○FBN ○CBN [✓ BM] ○PACS ○SACS T○M ○

○EoR N○VAID [✓ Photo○Control] Other:

PID:

SSN:

Station ID:

Julian Day: 351

Latitude: N 25° 57' 52.79"

Longitude: W 80° 08' 51.35"

Antenna Ht. (vertical measure and offsets): 2.0 [✓ m]/ft

E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ✓ Other: ○

Ground Plane: Yes ○ No ✓

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ✓

Ant. plumb before session? Yes ✓ No ○

Ant. plumb after session? Yes ✓ No ○

Receiver

P/N

S/N 5243498842

Antenna

P/N

S/N

Sketch

Visibility Diagram

Photo Available ✓

No Obstructions Above 15

Location Description / Comments: NGS MARK.

Setting Type: Deep Rod ○ Concrete Mon. ○ [✓ Fixed Mt.]

Monument Size:

Stamping:

Inscription (i.e. NGS, Woolpt, etc.):

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○

Set New ○ Other ○

Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name Miami-Dade Counrty, FL Orthos
Project Number 80569
Project Point Name AC3226

Operator Name Suswyn Mills
Date of Field Survey 12/30/2019
GPS Session File Name 80569_20191230_SM.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **141831.689** | **465326.134** | **Datum (Epoch)** |
| **Easting** | **262354.770** | **860742.273** | **Datum (Epoch)** |
| **Orthometric Height** | **2.860** | **9.383** | **Datum (Epoch)** |

Agency National Geodetic Survey
PID **AC2377**
Designation **Y 238**
Hor. Order
Ver. Order **First Order Class I**

**Coordinate Source**

RTK Base ☐
Network Adjustment ☐
FDOT FPRN ☒ X
OPUS ☐
Other

Mark Stamping "Y 238 1965"
Latitude N25°36'44.91815"
Longitude W80°22'45.04505"
Ellipsoidal Height -22.265 m
Type of Mark Brass NGS Benchmark Disk

Notes

Receiver: (e.g. R8, R10) Trimble R8 GNSS/SPS88x Internal
Start Time : 8:59:33 AM Stop Time : 9:02:34 AM
PDOP Max: 1.561
Start Time : 9:32:41 AM Stop Time : 9:35:55 AM
PDOP Max: 2.180
Antenna Height: 2.00 m
Weather Conditions Cloudy

PHOTOS

⇧

NORTH

AC3226_2019_FL, 1, 20191230

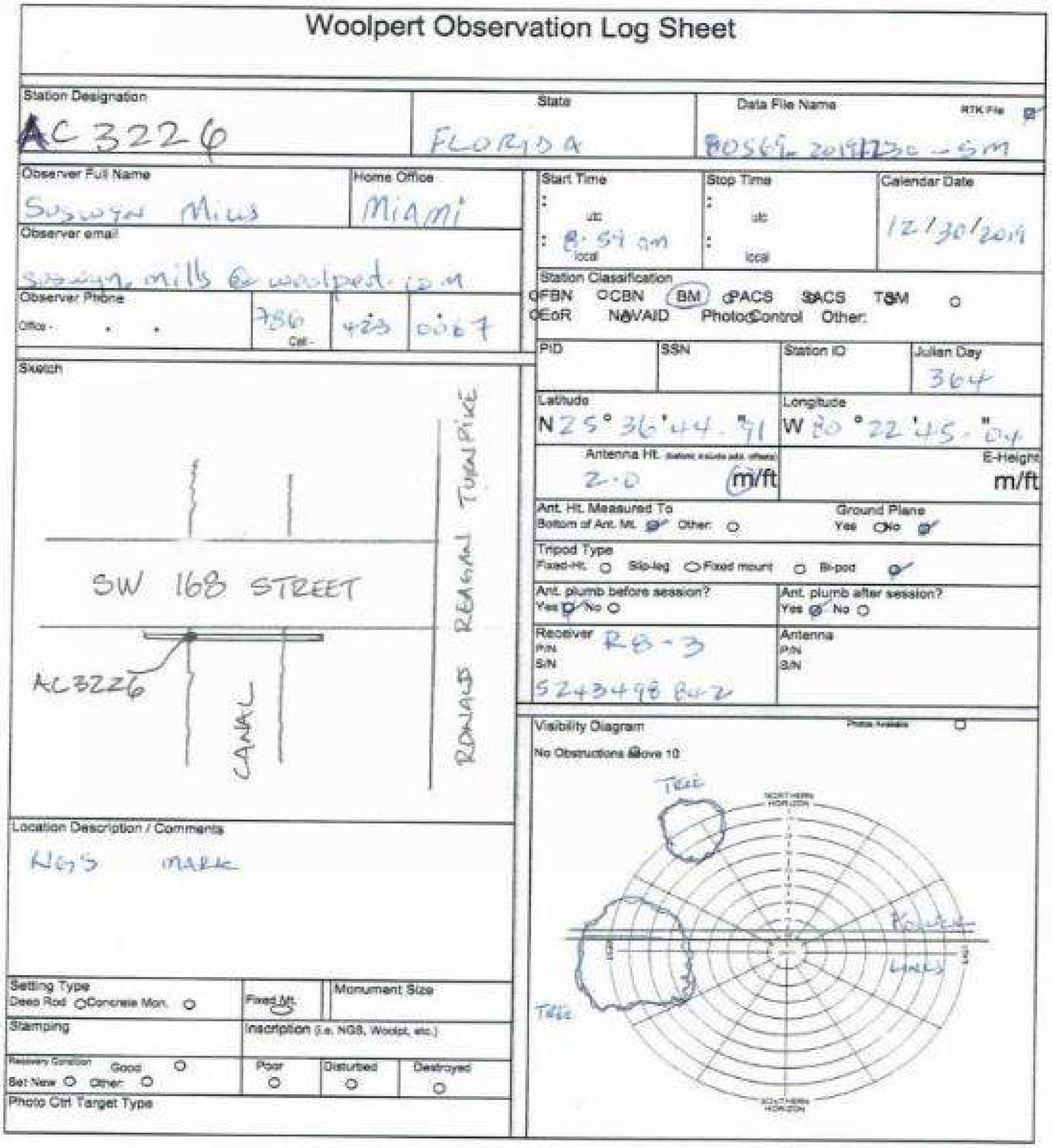
AC3226_2019_FL, 3S, 20191230

AC3226_2019_FL, 2, 20191230

AC3226_2019_FL, 3E, 20191230

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Suswyn Mills |
| Project Number | 80569 | Date of Field Survey | 12/30/2019 |
| Project Point Name | AC3226 | GPS Session File Name | 80569_20191230_SM.job |



## Woolpert Observation Log Sheet

Station Designation: AC3226
State: FLORIDA
Data File Name: 80569_20191230_SM
RTK File ☑

Observer Full Name: Suswyn Mills
Home Office: Miami
Observer email: suswyn.mills@woolpert.com
Observer Phone: Office - . . Cell - 786 423 0067

Start Time: : utc : 8:59 am local
Stop Time: : utc : local
Calendar Date: 12/30/2019

Station Classification
○FBN ○CBN [✓ BM] ○PACS ○SACS TBM ○
○EoR NAVAID Photo Control Other:

PID:
SSN:
Station ID:
Julian Day: 364

Latitude: N 25° 36' 44.91"
Longitude: W 80° 22' 45.04"

Antenna Ht. (before include adj. offsets): 2.0 [✓ m]/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☑

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ☑ No ○

Receiver: R8-3
P/N
S/N 5243498 B4-2

Antenna
P/N
S/N

Sketch

Visibility Diagram
Photos Available ☐
No Obstructions Above 10

Location Description / Comments: NGS MARK

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.):
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | | |
|---|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | | Operator Name | Delcio Romero |
| Project Number | 80569 | | Date of Field Survey | 12/20/2019 |
| Project Point Name | AC4724 | | GPS Session File Name | 80569-20191220-DR.job |

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **142024.665** | **465959.256** | **Datum (Epoch)** |
| **Easting** | **265619.418** | **871453.041** | **Datum (Epoch)** |
| **Orthometric Height** | **2.792** | **9.160** | **Datum (Epoch)** |

| | |
|---|---|
| Agency | National Geodetic Survey |
| PID | **AC4724** |
| Designation | **J 399** |
| Hor. Order | |
| Ver. Order | **First Order  Class II** |

**Coordinate Source**

| | | | |
|---|---|---|---|
| RTK Base | ☐ | FDOT FPRN | X |
| Network Adjustment | ☐ | OPUS | |
| Other | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mark Stamping | "J 399 1991" | Receiver: (e.g. R8, R10) | Trimble R10 Internal | | |
| Latitude | N25°36'50.67916" | Start Time : | 10:37:04 AM | Stop Time : | 10:40:39 AM |
| Longitude | W80°20'48.00346" | PDOP Max: | 1.801 | | |
| Ellipsoidal Height | -22.415 m | Start Time : | 2:38:47 PM | Stop Time : | 2:41:46 PM |
| Type of Mark | Brass NGS Benchmark Disk | PDOP Max: | 1.429 | | |
| | | Antenna Height: | 2.00 m | | |
| Notes | | Weather Conditions | Cloudy | | |

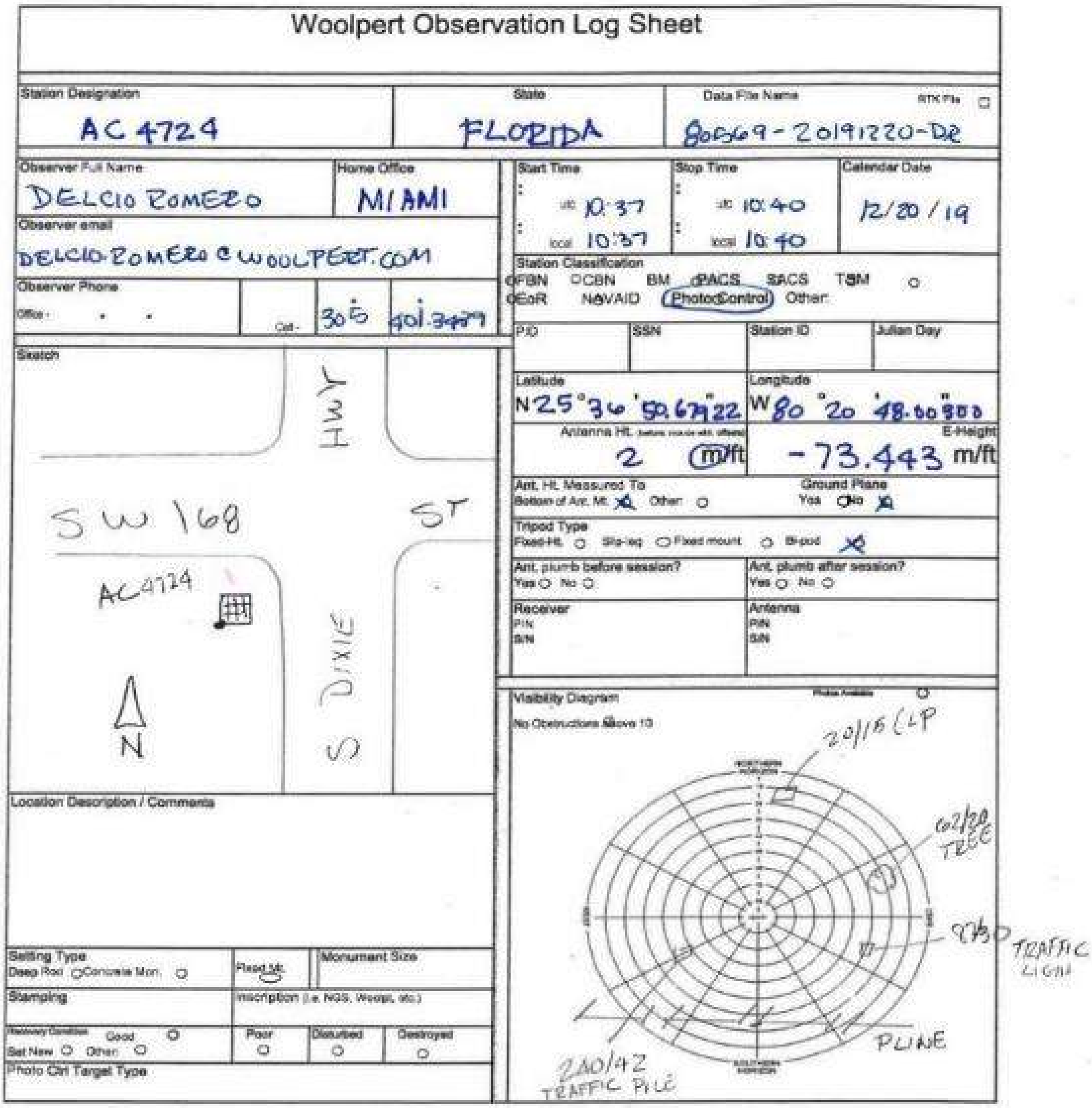
PHOTOS

⇧

NORTH

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Delcio Romero |
| Project Number | 80569 | Date of Field Survey | 12/20/2019 |
| Project Point Name | AC4724 | GPS Session File Name | 80569-20191220-DR.job |



## Woolpert Observation Log Sheet

Station Designation: AC 4724

State: FLORIDA

Data File Name: 80569-20191220-DR

RTK File ☐

Observer Full Name: DELCIO ROMERO

Home Office: MIAMI

Observer email: DELCIO.ROMERO@WOOLPERT.COM

Observer Phone: Office - . . Cell - 305 401.3479

Start Time: utc 10:37 local 10:37

Stop Time: utc 10:40 local 10:40

Calendar Date: 12/20/19

Station Classification: ○FBN ○CBN BM ○PACS SACS TBM ○ ○EoR NAVAID [✓ Photo Control] Other:

PID

SSN

Station ID

Julian Day

Latitude: N25°36'50.67922"

Longitude: W80°20'48.00800"

Antenna Ht. (before vs. with offset): 2 [✓ m]/ft

E-Height: -73.443 m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☒ Other ○

Ground Plane: Yes ○ No ☒

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session? Yes ○ No ○

Ant. plumb after session? Yes ○ No ○

Receiver: P/N S/N

Antenna: P/N S/N

Sketch

Location Description / Comments

Setting Type: Deep Rod ○ Concrete Mon. ○ Flush Mt. ○

Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other ○

Photo Ctrl Target Type

Visibility Diagram

Photos Available ○

No Obstructions Above 10

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: DAWAL 3

Operator Name: Yonnier Nordello
Date of Field Survey: 12/25/2019
GPS Session File Name: 80569_20191212_YN.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **110516.712** | **362586.914** | **Datum (Epoch)** |
| **Easting** | **247781.351** | **812929.317** | **Datum (Epoch)** |
| **Orthometric Height** | **1.199** | **3.934** | **Datum (Epoch)** |

Agency: National Geodetic Survey
PID: **AC4350**
Designation: **DAWAL 3**
Hor. Order: **First Order**
Ver. Order: **First Order Class II**

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN X
OPUS ☐
Other

Mark Stamping: "DAWAL 3 1972"
Latitude: N25°19'49.21437"
Longitude: W80°31'31.37588"
Ellipsoidal Height: -23.223 m
Type of Mark: Brass NGS Benchmark Disk
Notes:

Receiver: (e.g. R8, R10): Trimble R8 GNSS/SPS88x Internal
Start Time : 12:25:10 PM Stop Time : 12:28:10 PM
PDOP Max: 1.514
Start Time : 10:14:49 AM Stop Time : 10:17:49 AM
PDOP Max: 1.510
Antenna Height: 2.00 m
Weather Conditions: Cloudy

PHOTOS

NORTH


DAWAL 3_2019_FL, 1, 20191214

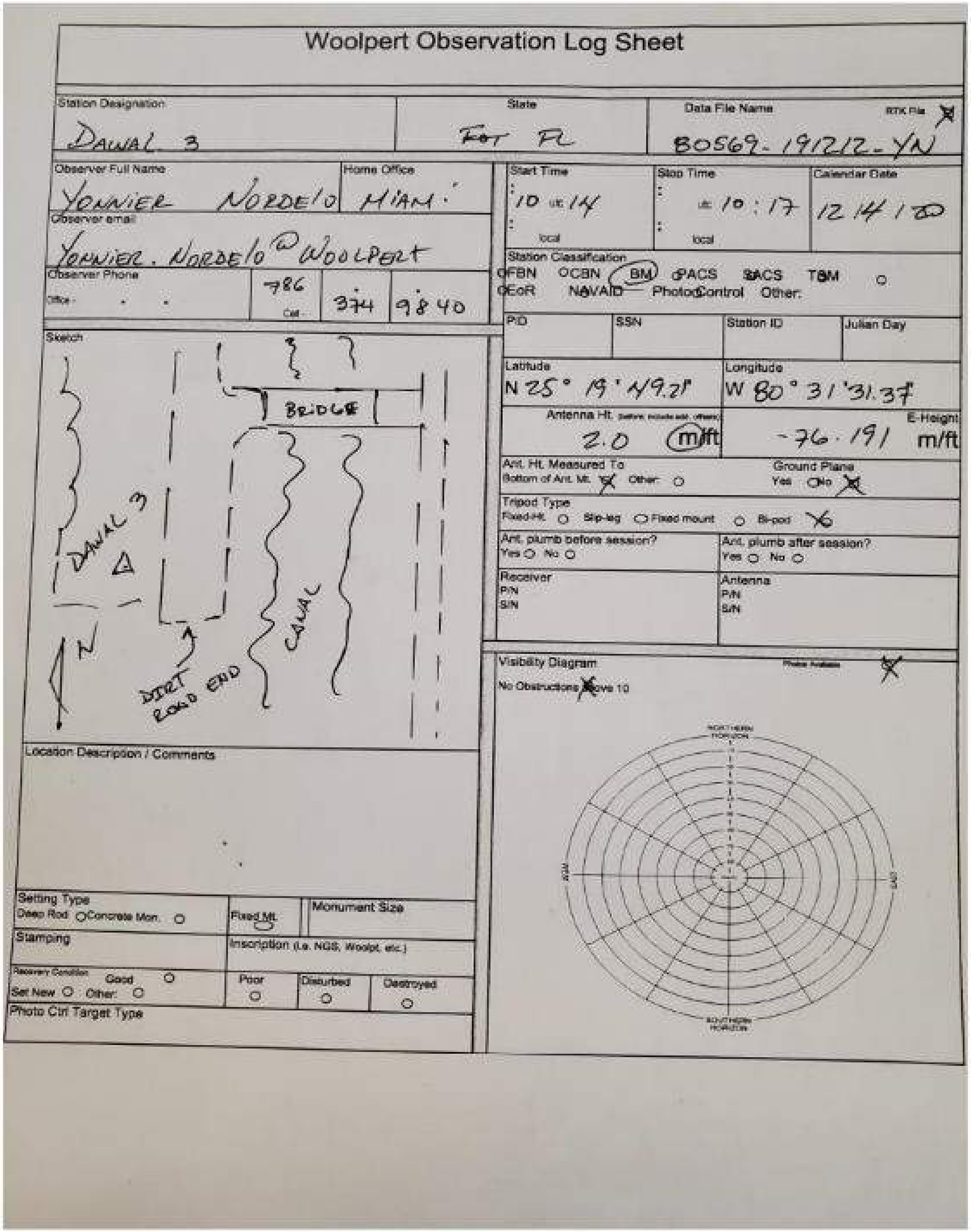

DAWAL 3_2019_FL, N, 20191214


DAWAL 3_2019_FL, 2, 20191214


DAWAL 3_2019_FL, E, 20191214

# GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Yonnier Nordello |
| Project Number | 80569 | Date of Field Survey | 12/25/2019 |
| Project Point Name | DAWAL 3 | GPS Session File Name | 80569_20191212_YN.job |



## Woolpert Observation Log Sheet

Station Designation: DAWAL 3
State: FOT FL
Data File Name: 80569-191212-YN
RTK File ☒

Observer Full Name: YONNIER NORDE/O
Home Office: MIAM·
Observer email: YONNIER. NORDE/O@WOOLPERT
Observer Phone
Office - . .
Cell - 786 374 9840

Start Time: 10 utc 14 : local
Stop Time: utc 10 : 17 : local
Calendar Date: 12 14 / 20

Station Classification
○FBN ○CBN [✓ BM] ○PACS ○SACS TBM ○
○EoR NAVAID PhotoControl Other:

PID:
SSN:
Station ID:
Julian Day:

Latitude: N 25° 19' 49.21"
Longitude: W 80° 31' 31.37

Antenna Ht. (before include adj. offsets): 2.0 [✓ m]/ft
E-Height: -76.191 m/ft

Ant. Ht. Measured To
Bottom of Ant. Mt. ☒ Other: ○

Ground Plane
Yes ○ No ☒

Tripod Type
Fixed-Ht ○ Slip-leg ○ Fixed mount ○ Bi-pod ☒

Ant. plumb before session?
Yes ○ No ○

Ant. plumb after session?
Yes ○ No ○

Receiver
P/N
S/N

Antenna
P/N
S/N

Sketch

Location Description / Comments

Setting Type
Deep Rod ○ Concrete Mon. ○ Fixed Mt. ○
Monument Size

Stamping

Inscription (i.e. NGS, Woolpt, etc.)

Recovery Condition
Good ○ Poor ○ Disturbed ○ Destroyed ○
Set New ○ Other: ○

Photo Ctrl Target Type

Visibility Diagram
Photo Available ☒
No Obstructions Above 10 ☒

# GPS STATION RECOVERY - GPS LOG SHEET

Project Name: Miami-Dade Counrty, FL Orthos
Project Number: 80569
Project Point Name: DH9616

Operator Name: Jorge Alfageme
Date of Field Survey: 12/13/2019
GPS Session File Name: 80569_20191213_JA.job

| | Metric | US Survey Feet | |
|---|---|---|---|
| **Northing** | **160734.947** | **527344.573** | **Datum (Epoch)** |
| **Easting** | **274624.346** | **900996.707** | **Datum (Epoch)** |
| **Orthometric Height** | **1.345** | **4.414** | **Datum (Epoch)** |

Agency: National Geodetic Survey
PID: **DH9616**
Designation: **D 627**
Hor. Order:
Ver. Order: **First Order Class II**

**Coordinate Source**
RTK Base ☐
Network Adjustment ☐
FDOT FPRN: X
OPUS:
Other

Mark Stamping:
Latitude: N25°46'57.12845"
Longitude: W80°15'21.48386"
Ellipsoidal Height: -23.989 m
Type of Mark: Stainless Steel Rod in Sleeve
Notes:

Receiver: (e.g. R8, R10): Trimble R10 Internal
Start Time : 11:17:50 AM Stop Time : 11:21:08 AM
PDOP Max: 1.588
Start Time : 3:42:47 PM Stop Time : 3:45:52 PM
PDOP Max: 1.274
Antenna Height: 2.00 m
Weather Conditions: Cloudy

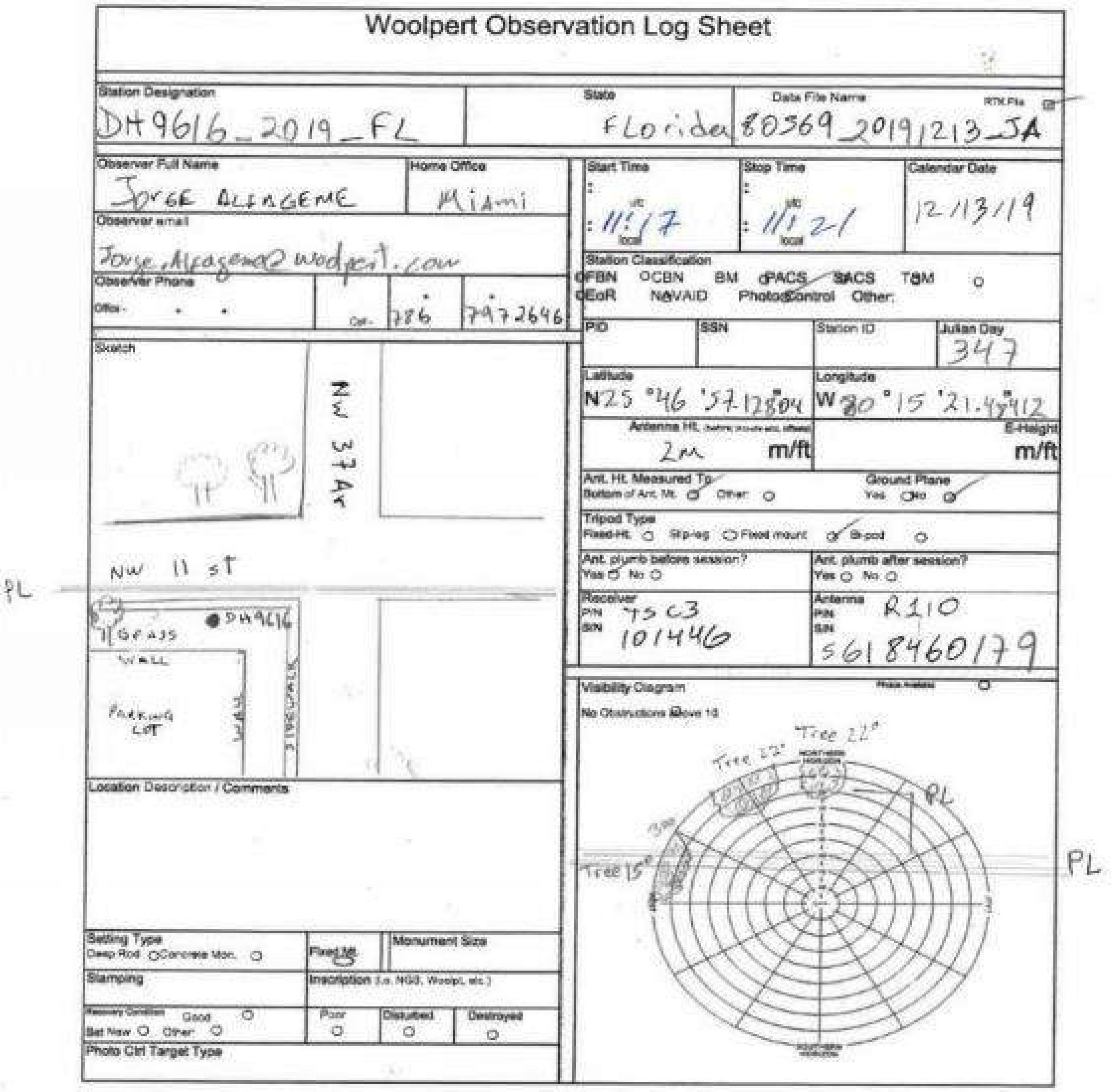
PHOTOS

⇧

NORTH

## GPS STATION RECOVERY - GPS LOG SHEET

| | | | |
|---|---|---|---|
| Project Name | Miami-Dade Counrty, FL Orthos | Operator Name | Jorge Alfageme |
| Project Number | 80569 | Date of Field Survey | 12/13/2019 |
| Project Point Name | DH9616 | GPS Session File Name | 80569_20191213_JA.job |



### Woolpert Observation Log Sheet

Station Designation: DH9616_2019_FL
State: Florida
Data File Name: 80569_20191213_JA
RTK File ☑

Observer Full Name: Jorge Alfageme
Home Office: Miami
Observer email: Jorge.Alfageme@woolpert.com
Observer Phone: Office- . . Cell- 786 . 7972646

Start Time: utc : local : 11:17
Stop Time: utc : local : 11:21
Calendar Date: 12/13/19

Station Classification: ○FBN ○CBN BM ○PACS ○SACS TBM ○ ○EoR NAVAID Photo Control Other:

PID:
SSN:
Station ID:
Julian Day: 347

Latitude: N25°46'57.12804"
Longitude: W80°15'21.48412"

Antenna Ht. (before mount and offsets): 2m m/ft
E-Height: m/ft

Ant. Ht. Measured To: Bottom of Ant. Mt. ☑ Other: ○
Ground Plane: Yes ○ No ☑

Tripod Type: Fixed-Ht. ○ Slip-leg ○ Fixed mount ☑ Bi-pod ○

Ant. plumb before session? Yes ☑ No ○
Ant. plumb after session? Yes ○ No ○

Receiver P/N: TS C3
S/N: 101446

Antenna P/N: R10
S/N: 5618460179

Sketch

Location Description / Comments:

Setting Type: Deep Rod ○ Concrete Mon. ○ Fixed Mt.
Monument Size:
Stamping:
Inscription (i.e. NGS, Woolpt, etc.)
Recovery Condition: Good ○ Poor ○ Disturbed ○ Destroyed ○ Set New ○ Other: ○
Photo Ctrl Target Type:

Visibility Diagram
Photo Available ○
No Obstructions Above 10

# POINT DERIVATION REPORT

| Project File Data | |
|---|---|
| Name: | G:\GS\Projects\80569_Miami_Dade_Ortho_2019\Trimble\80569.vce |
| Size: | 198 KB |
| Modified: | 2/7/2020 12:43:21 PM (UTC:-4) |
| Time zone: | Eastern Standard Time |
| Reference number: | |
| Description: | |

| Coordinate System | |
|---|---|
| Name: | United States/State Plane 1983 |
| Datum: | NAD 1983 (Conus) |
| Zone: | Florida East 0901 |
| Geoid: | FPRNGD16B |
| Vertical datum: | NAVD 1988 |
| Calibrated site: | |

## Resultant Coordinates for point:5001_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **710317.914 ft** | **597133.200 ft** | **16.612 ft** | **-63.661 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Local (5001343t.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5001_2019_FL*

Precision Confidence Level: **95%**

| | Coordinates | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5001343t.19o.xml) | 710317.914 ft | 597133.200 ft | 16.612 ft | -63.661 ft |

## Resultant Coordinates for point:5002_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **680758.479 ft** | **549730.758 ft** | **9.088 ft** | **-70.689 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (5002343u.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5002_2019_FL*

Precision Confidence Level: **95%**

| *Coordinates* | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5002343u.19o.xml) | 680758.479 ft | 549730.758 ft | 9.088 ft | -70.689 ft |

## Resultant Coordinates for point:5003_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **780416.961 ft** | **555895.556 ft** | **16.450 ft** | **-63.976 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (5003344q.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5003_2019_FL*

Precision Confidence Level: **95%**

| *Coordinates* | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5003344q.19o.xml) | 780416.961 ft | 555895.556 ft | 16.450 ft | -63.976 ft |

## Resultant Coordinates for point:5004_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **812604.817 ft** | **603425.435 ft** | **16.978 ft** | **-64.176 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (5004344o.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5004_2019_FL*

Precision Confidence Level: **95%**

| Coordinates | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5004344o.19o.xml) | 812604.817 ft | 603425.435 ft | 16.978 ft | -64.176 ft |

## Resultant Coordinates for point:5005_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **839737.872 ft** | **595142.283 ft** | **17.515 ft** | **-64.012 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (5005344n.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5005_2019_FL*

Precision Confidence Level: **95%**

| Coordinates | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5005344n.19o.xml) | 839737.872 ft | 595142.283 ft | 17.515 ft | -64.012 ft |

**Resultant Coordinates for point:5006_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **832817.500 ft** | **350058.570 ft** | **2.973 ft** | **-77.548 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191226_YN.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0603 → 5006_2019_FL | | Enabled | -0.019 ft | -0.028 ft | 0.034 ft | 0.018 ft | 0.018 ft |

*Survey Data used to calculate point:5006_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| | | | | | | |
|---|---|---|---|---|---|---|
| **RTCM0603 → 5006_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 79726.177 ft | 32888.634 ft | -26949.863 ft | -67441.129 ft |
| **σ:** | | | | 0.019 ft | 0.042 ft | 0.027 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-5006_2019_FL (V1) | 0.034 ft | 0.018 ft | 0.038 ft | 0.014 ft | 0.031 ft | 0.018 ft |
| RTCM0603-5006_2019_FL (V131) | 0.029 ft | 0.003 ft | 0.029 ft | -0.013 ft | -0.016 ft | -0.021 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-5006_2019_FL (V1) | 0.054 ft | 0.085 ft | 79726.197 ft | 32888.620 ft | -26949.894 ft | -67441.147 ft |
| RTCM0603-5006_2019_FL (V131) | 0.072 ft | 0.083 ft | 79726.159 ft | 32888.647 ft | -26949.847 ft | -67441.108 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191226_YN.job) | 832817.500 ft | 350058.570 ft | 2.973 ft | -77.548 ft |

## Resultant Coordinates for point:5007_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **699999.271 ft** | **316929.297 ft** | **3.736 ft** | **-72.369 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (5007345n.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5007_2019_FL*

Precision Confidence Level: **95%**

| | *Coordinates* | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5007345n.19o.xml) | 699999.271 ft | 316929.297 ft | 3.736 ft | -72.369 ft |

## Resultant Coordinates for point:5008_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **766630.134 ft** | **518930.014 ft** | **8.618 ft** | **-71.319 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (5008344t.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5008_2019_FL*

Precision Confidence Level: **95%**

| | *Coordinates* | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5008344t.19o.xml) | 766630.134 ft | 518930.014 ft | 8.618 ft | -71.319 ft |

## Resultant Coordinates for point:5009_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **727591.109 ft** | **402465.466 ft** | **3.069 ft** | **-75.223 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Local (5009345p.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:5009_2019_FL*

Precision Confidence Level: **95%**

| Coordinates | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (5009345p.19o.xml) | 727591.109 ft | 402465.466 ft | 3.069 ft | -75.223 ft |

## Resultant Coordinates for point:5010_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **813150.757 ft** | **362591.228 ft** | **3.888 ft** | **-76.231 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191226_YN.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0603 → 5010_2019_FL | | Enabled | -0.040 ft | 0.018 ft | 0.044 ft | 0.060 ft | 0.060 ft |

*Survey Data used to calculate point:5010_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 5010_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 62607.248 ft | 12648.261 ft | -24874.632 ft | -56044.104 ft |
| **σ:** | | | 0.021 ft | 0.053 ft | 0.035 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-5010_2019_FL (V2) | 0.044 ft | 0.060 ft | 0.075 ft | 0.032 ft | 0.052 ft | -0.042 ft |
| RTCM0603-5010_2019_FL (V129) | 0.022 ft | 0.033 ft | 0.039 ft | -0.015 ft | -0.028 ft | 0.022 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-5010_2019_FL (V2) | 0.054 ft | 0.087 ft | 62607.224 ft | 12648.229 ft | -24874.684 ft | -56044.062 ft |
| RTCM0603-5010_2019_FL (V129) | 0.067 ft | 0.082 ft | 62607.260 ft | 12648.276 ft | -24874.604 ft | -56044.127 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191226_YN.job) | 813150.757 ft | 362591.228 ft | 3.888 ft | -76.231 ft |

**Resultant Coordinates for point:6001_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **820016.576 ft** | **519163.374 ft** | **9.246 ft** | **-71.711 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 6001_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[6001_2019_FL]

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 6001_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 41952.318 ft | -40276.247 ft | -9870.505 ft | -6355.634 ft |
| **σ:** | | | | 0.020 ft | 0.047 ft | 0.025 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-6001_2019_FL (V99) | 0.034 ft | 0.004 ft | 0.034 ft | 0.032 ft | 0.004 ft | -0.011 ft |
| RTCM0602-6001_2019_FL (V106) | 0.035 ft | 0.022 ft | 0.041 ft | -0.031 ft | -0.022 ft | 0.017 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-6001_2019_FL (V99) | 0.074 ft | 0.113 ft | 41952.348 ft | -40276.279 ft | -9870.510 ft | -6355.623 ft |
| RTCM0602-6001_2019_FL (V106) | 0.087 ft | 0.098 ft | 41952.286 ft | -40276.216 ft | -9870.483 ft | -6355.651 ft |

**Resultant Coordinates for point:6002_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **815113.725 ft** | **434485.684 ft** | **7.597 ft** | **-73.618 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 6002_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6002_2019_FL*

Precision Confidence Level: **95%**

## GNSS vectors

| **RTCM0603 → 6002_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 14466.651 ft | 9755.739 ft | 5936.068 ft | 8881.028 ft |
| **σ:** | | | | 0.004 ft | 0.010 ft | 0.005 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-6002_2019_FL (V186) | 0.005 ft | 0.003 ft | 0.006 ft | -0.002 ft | -0.001 ft | 0.006 ft |
| RTCM0603-6002_2019_FL (V196) | 0.006 ft | 0.001 ft | 0.006 ft | 0.004 ft | -0.002 ft | -0.005 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-6002_2019_FL (V186) | 0.054 ft | 0.099 ft | 14466.650 ft | 9755.741 ft | 5936.068 ft | 8881.023 ft |
| RTCM0603-6002_2019_FL (V196) | 0.070 ft | 0.120 ft | 14466.653 ft | 9755.736 ft | 5936.070 ft | 8881.033 ft |

## Resultant Coordinates for point:6003_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **793600.322 ft** | **386344.567 ft** | **5.053 ft** | **-75.082 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| Local (6003345r.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6003_2019_FL*
Precision Confidence Level: **95%**

| Coordinates |  |  |  |  |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (6003345r.19o.xml) | 793600.322 ft | 386344.567 ft | 5.053 ft | -75.082 ft |

## Resultant Coordinates for point:6004_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **717361.248 ft** | **366384.441 ft** | **3.266 ft** | **-74.301 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Local (6004345o.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6004_2019_FL*
Precision Confidence Level: **95%**

| Coordinates |  |  |  |  |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (6004345o.19o.xml) | 717361.248 ft | 366384.441 ft | 3.266 ft | -74.301 ft |

## Resultant Coordinates for point:6005_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **761496.272 ft** | **383916.762 ft** | **4.390 ft** | **-74.810 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|

| | | | | | (US survey foot) | | |
|---|---|---|---|---|---|---|---|
| Local (6005345q.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6005_2019_FL*

Precision Confidence Level: **95%**

| Coordinates | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (6005345q.19o.xml) | 761496.272 ft | 383916.762 ft | 4.390 ft | -74.810 ft |

**6006_2019_FL Point could not be computed.**

**6007_2019_FL Point could not be computed.**

**Resultant Coordinates for point:6008_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **933225.680 ft** | **485512.679 ft** | **7.777 ft** | **-76.805 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 6008_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6008_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0601 → 6008_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 42690.354 ft | -3875.741 ft | -19194.306 ft | -37934.464 ft |
| **σ:** | | | | 0.018 ft | 0.038 ft | 0.029 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-6008_2019_FL (V149) | 0.040 ft | 0.116 ft | 0.123 ft | -0.011 ft | 0.087 ft | -0.086 ft |
| RTCM0601-6008_2019_FL (V152) | 0.045 ft | 0.044 ft | 0.063 ft | 0.021 ft | -0.019 ft | 0.056 ft |
| RTCM0601-6008_2019_FL (V153) | 0.022 ft | 0.058 ft | 0.062 ft | 0.007 ft | -0.042 ft | 0.045 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-6008_2019_FL (V149) | 0.091 ft | 0.118 ft | 42690.316 ft | -3875.730 ft | -19194.393 ft | -37934.378 ft |
| RTCM0601-6008_2019_FL (V152) | 0.096 ft | 0.122 ft | 42690.398 ft | -3875.763 ft | -19194.287 ft | -37934.520 ft |
| RTCM0601-6008_2019_FL (V153) | 0.091 ft | 0.103 ft | 42690.376 ft | -3875.749 ft | -19194.264 ft | -37934.509 ft |

**Resultant Coordinates for point:6009_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **945214.609 ft** | **599714.067 ft** | **1.844 ft** | **-82.451 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 6009_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6009_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 6009_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 16437.741 ft | 14848.373 ft | 5044.715 ft | 4927.070 ft |
| **σ:** | | | | 0.026 ft | 0.042 ft | 0.022 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6009_2019_FL (V31) | 0.034 ft | 0.032 ft | 0.047 ft | 0.021 ft | 0.023 ft | -0.035 ft |
| RTCM0606-6009_2019_FL (V39) | 0.023 ft | 0.031 ft | 0.039 ft | -0.014 ft | -0.025 ft | 0.027 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6009_2019_FL (V31) | 0.091 ft | 0.117 ft | 16437.726 ft | 14848.352 ft | 5044.692 ft | 4927.105 ft |
| RTCM0606-6009_2019_FL (V39) | 0.090 ft | 0.105 ft | 16437.753 ft | 14848.387 ft | 5044.739 ft | 4927.043 ft |

**Resultant Coordinates for point:6010_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **864759.493 ft** | **598341.804 ft** | **5.949 ft** | **-76.055 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0402 → 6010_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6010_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0402 → 6010_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 52336.892 ft | -4233.756 ft | -23725.186 ft | -46457.950 ft |
| **σ:** | | | | 0.013 ft | 0.031 ft | 0.015 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0402-6010_2019_FL (V64) | 0.008 ft | 0.055 ft | 0.055 ft | 0.016 ft | -0.047 ft | 0.024 ft |
| RTCM0402-6010_2019_FL (V73) | 0.011 ft | 0.045 ft | 0.046 ft | -0.018 ft | 0.038 ft | -0.020 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0402-6010_2019_FL (V64) | 0.095 ft | 0.133 ft | 52336.893 ft | -4233.772 ft | -23725.139 ft | -46457.974 ft |
| RTCM0402-6010_2019_FL (V73) | 0.093 ft | 0.120 ft | 52336.890 ft | -4233.737 ft | -23725.224 ft | -46457.930 ft |

**Resultant Coordinates for point:6011_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **796228.712 ft** | **463588.015 ft** | **6.922 ft** | **-73.485 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 6011_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6011_2019_FL*
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0603 → 6011_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 39864.352 ft | -10842.747 ft | 15267.735 ft | 35192.295 ft |
| **σ:** | | | | 0.009 ft | 0.022 ft | 0.014 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-6011_2019_FL (V157) | 0.010 ft | 0.065 ft | 0.065 ft | 0.009 ft | -0.054 ft | 0.037 ft |
| RTCM0603-6011_2019_FL (V158) | 0.021 ft | 0.021 ft | 0.030 ft | 0.023 ft | -0.014 ft | 0.013 ft |
| RTCM0603-6011_2019_FL (V160) | 0.034 ft | 0.070 ft | 0.077 ft | -0.018 ft | 0.046 ft | -0.059 ft |
| RTCM0603-6011_2019_FL (V161) | 0.025 ft | 0.048 ft | 0.055 ft | -0.015 ft | 0.032 ft | -0.042 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-6011_2019_FL (V157) | 0.077 ft | 0.121 ft | 39864.343 ft | -10842.756 ft | 15267.789 ft | 35192.259 ft |
| RTCM0603-6011_2019_FL (V158) | 0.070 ft | 0.112 ft | 39864.352 ft | -10842.770 ft | 15267.749 ft | 35192.282 ft |
| RTCM0603-6011_2019_FL (V160) | 0.107 ft | 0.111 ft | 39864.382 ft | -10842.729 ft | 15267.689 ft | 35192.355 ft |
| RTCM0603-6011_2019_FL (V161) | 0.097 ft | 0.105 ft | 39864.373 ft | -10842.731 ft | 15267.704 ft | 35192.337 ft |

**Resultant Coordinates for point:6012_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **828967.439 ft** | **413279.708 ft** | **7.071 ft** | **-74.472 ft** |

| Data | Used to calc. | Status | ∆East (US survey foot) | ∆North (US survey foot) | Distance (Horiz) (US survey foot) | ∆Elevation (US survey foot) | ∆Height (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 6012_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:[6012_2019_FL]*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 6012_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 26916.420 ft | 24851.336 ft | -815.291 ft | -10307.282 ft |
| **σ:** | | | | 0.021 ft | 0.046 ft | 0.029 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-6012_2019_FL (V182) | 0.037 ft | 0.001 ft | 0.037 ft | -0.028 ft | -0.015 ft | -0.019 ft |
| RTCM0603-6012_2019_FL (V191) | 0.039 ft | 0.024 ft | 0.046 ft | 0.035 ft | -0.008 ft | 0.028 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-6012_2019_FL (V182) | 0.074 ft | 0.087 ft | 26916.438 ft | 24851.364 ft | -815.275 ft | -10307.263 ft |
| RTCM0603-6012_2019_FL (V191) | 0.074 ft | 0.132 ft | 26916.398 ft | 24851.301 ft | -815.283 ft | -10307.310 ft |

## Resultant Coordinates for point:6013_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **876792.774 ft** | **438302.658 ft** | **4.842 ft** | **-78.524 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 6013_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[6013_2019_FL]

Precision Confidence Level: **95%**

### GNSS vectors

| **RTCM0608 → 6013_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 32649.095 ft | 19226.168 ft | -8777.516 ft | -24885.198 ft |
| **σ:** | | | | 0.045 ft | 0.112 ft | 0.060 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| [RTCM0608-6013_2019_FL (V137)] | 0.031 ft | 0.035 ft | 0.047 ft | 0.033 ft | -0.033 ft | 0.001 ft |
| [RTCM0608-6013_2019_FL (V151)] | 0.149 ft | 0.072 ft | 0.166 ft | -0.155 ft | 0.057 ft | 0.005 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| [RTCM0608-6013_2019_FL (V137)] | 0.052 ft | 0.097 ft | 32649.067 ft | 19226.135 ft | -8777.483 ft | -24885.199 ft |
| [RTCM0608-6013_2019_FL (V151)] | 0.098 ft | 0.134 ft | 32649.205 ft | 19226.324 ft | -8777.573 ft | -24885.203 ft |

## Resultant Coordinates for point:[6014_2019_FL]

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **838779.146 ft** | **467174.104 ft** | **8.874 ft** | **-72.763 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 6014_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[6014_2019_FL]
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0608 → 6014_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 20443.287 ft | -20215.547 ft | -2743.066 ft | 1317.290 ft |
| **σ:** | | | | 0.014 ft | 0.027 ft | 0.015 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-6014_2019_FL (V112) | 0.021 ft | 0.006 ft | 0.022 ft | 0.000 ft | -0.014 ft | -0.016 ft |
| RTCM0608-6014_2019_FL (V121) | 0.020 ft | 0.003 ft | 0.020 ft | -0.009 ft | 0.004 ft | 0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-6014_2019_FL (V112) | 0.060 ft | 0.079 ft | 20443.287 ft | -20215.547 ft | -2743.052 ft | 1317.306 ft |
| RTCM0608-6014_2019_FL (V121) | 0.049 ft | 0.060 ft | 20443.278 ft | -20215.538 ft | -2743.070 ft | 1317.272 ft |

## Resultant Coordinates for point:6015_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **888121.312 ft** | **521879.300 ft** | **5.850 ft** | **-76.743 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 6015_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6015_2019_FL*
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0602 → 6015_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 27156.154 ft | 26711.510 ft | 2526.158 ft | -4191.709 ft |
| **σ:** | | | | 0.010 ft | 0.019 ft | 0.012 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6015_2019_FL (V17) | 0.004 ft | 0.027 ft | 0.027 ft | 0.000 ft | -0.025 ft | 0.011 ft |
| RTCM0602-6015_2019_FL (V11) | 0.011 ft | 0.043 ft | 0.044 ft | 0.005 ft | 0.040 ft | -0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6015_2019_FL (V17) | 0.055 ft | 0.075 ft | 27156.157 ft | 26711.510 ft | 2526.182 ft | -4191.720 ft |
| RTCM0602-6015_2019_FL (V11) | 0.070 ft | 0.089 ft | 27156.143 ft | 26711.506 ft | 2526.118 ft | -4191.691 ft |

**Resultant Coordinates for point:6016_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **863543.715 ft** | **543091.261 ft** | **7.097 ft** | **-75.003 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 6016_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6016_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0602 → 6016_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 16849.862 ft | 1030.281 ft | 7568.725 ft | 15019.014 ft |
| **σ:** | | | | 0.020 ft | 0.042 ft | 0.027 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6016_2019_FL (V51) | 0.036 ft | 0.010 ft | 0.037 ft | 0.029 ft | 0.021 ft | 0.009 ft |
| RTCM0602-6016_2019_FL (V26) | 0.031 ft | 0.029 ft | 0.043 ft | -0.023 ft | -0.035 ft | 0.003 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6016_2019_FL (V51) | 0.049 ft | 0.064 ft | 16849.843 ft | 1030.251 ft | 7568.705 ft | 15019.004 ft |
| RTCM0602-6016_2019_FL (V26) | 0.048 ft | 0.075 ft | 16849.877 ft | 1030.304 ft | 7568.761 ft | 15019.011 ft |

## Resultant Coordinates for point:6017_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **905088.029 ft** | **564080.517 ft** | **6.661 ft** | **-76.178 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 6017_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0602 → 6017_2019_FL |  | Enabled | -0.020 ft | -0.076 ft | 0.078 ft | 0.056 ft | 0.056 ft |

*Survey Data used to calculate point:*[6017_2019_FL]

Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0606 → 6017_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6017_2019_FL (V166) | 0.084 ft | 0.115 ft | 38869.822 ft | -22268.494 ft | -17086.973 ft | -26888.893 ft |

| **RTCM0602 → 6017_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-6017_2019_FL (V172) | 0.104 ft | 0.154 ft | 57745.929 ft | 40564.615 ft | 23511.841 ft | 33709.015 ft |

## Resultant Coordinates for point:6018_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **825576.452 ft** | **563721.852 ft** | **8.616 ft** | **-72.625 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 6018_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6018_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 6018_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 51703.033 ft | -37827.618 ft | 10210.372 ft | 33734.599 ft |
| **σ:** | | | | 0.007 ft | 0.013 ft | 0.008 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6018_2019_FL (V63) | 0.010 ft | 0.002 ft | 0.010 ft | 0.007 ft | 0.000 ft | -0.007 ft |
| RTCM0602-6018_2019_FL (V72) | 0.011 ft | 0.003 ft | 0.012 ft | -0.011 ft | 0.004 ft | 0.003 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6018_2019_FL (V63) | 0.065 ft | 0.085 ft | 51703.043 ft | -37827.626 ft | 10210.372 ft | 33734.606 ft |
| RTCM0602-6018_2019_FL (V72) | 0.102 ft | 0.099 ft | 51703.022 ft | -37827.608 ft | 10210.368 ft | 33734.596 ft |

## Resultant Coordinates for point:6019_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **944155.675 ft** | **563626.628 ft** | **2.991 ft** | **-81.301 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 6019_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:6019_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 6019_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 33720.093 ft | 16273.637 ft | -10722.214 ft | -27518.131 ft |
| **σ:** | | | 0.021 ft | 0.042 ft | 0.033 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6019_2019_FL (V94) | 0.027 ft | 0.105 ft | 0.108 ft | -0.005 ft | -0.103 ft | 0.033 ft |
| RTCM0606-6019_2019_FL (V100) | 0.014 ft | 0.121 ft | 0.122 ft | -0.027 ft | 0.101 ft | -0.063 ft |
| RTCM0606-6019_2019_FL (V101) | 0.024 ft | 0.050 ft | 0.056 ft | 0.008 ft | 0.055 ft | -0.008 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6019_2019_FL (V94) | 0.088 ft | 0.102 ft | 33720.090 ft | 16273.643 ft | -10722.111 ft | -27518.164 ft |
| RTCM0606-6019_2019_FL (V100) | 0.089 ft | 0.139 ft | 33720.087 ft | 16273.664 ft | -10722.315 ft | -27518.068 ft |
| RTCM0606-6019_2019_FL (V101) | 0.107 ft | 0.143 ft | 33720.100 ft | 16273.629 ft | -10722.269 ft | -27518.123 ft |

## Resultant Coordinates for point:6020_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **910600.472 ft** | **596167.294 ft** | **4.624 ft** | **-78.458 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 6020_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

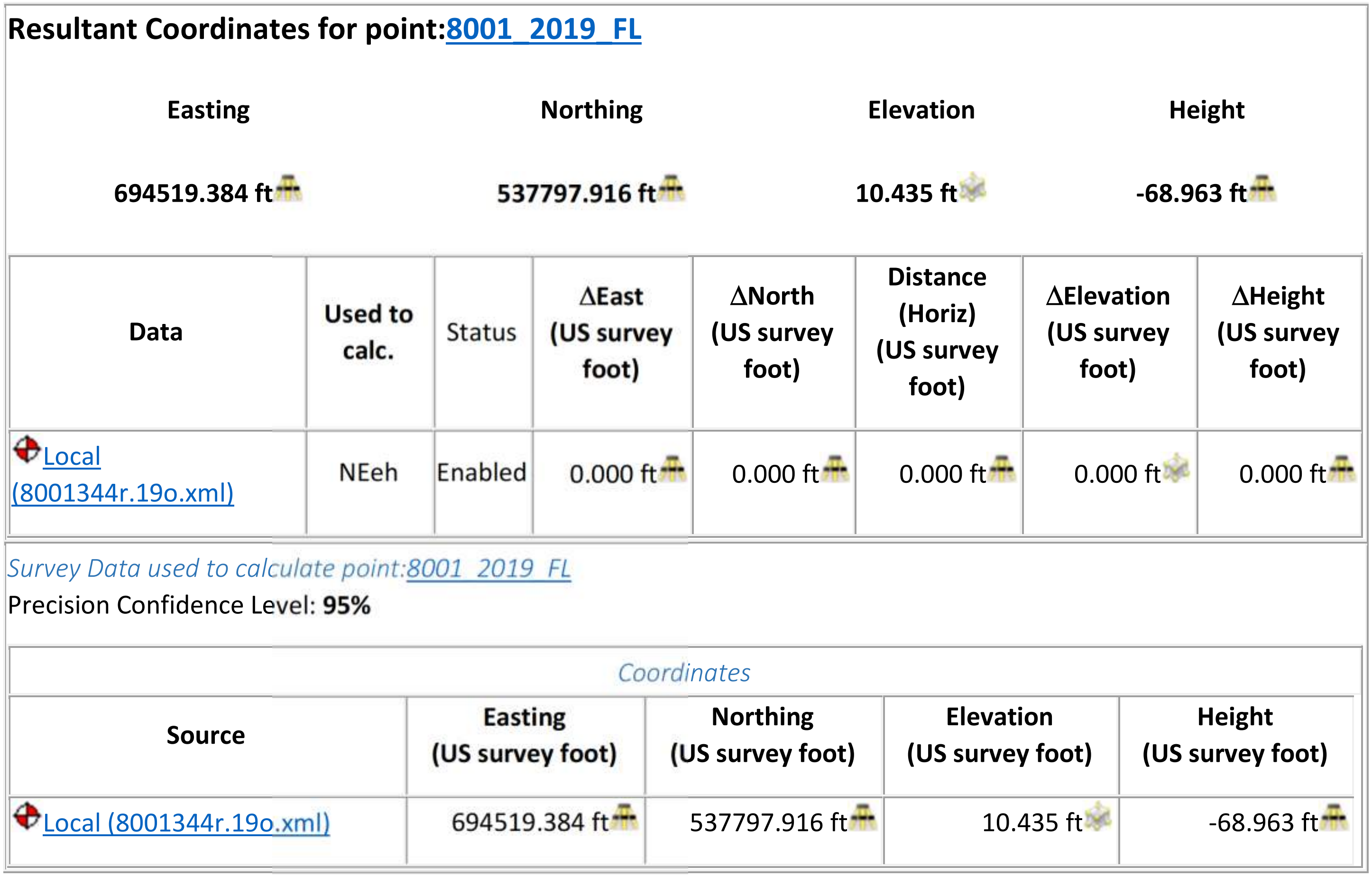
*Survey Data used to calculate point:6020_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 6020_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 19265.795 ft | -19028.890 ft | -2306.329 ft | 1937.283 ft |
| **σ:** | | | 0.019 ft | 0.044 ft | 0.026 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6020_2019_FL (V34) | 0.030 ft | 0.013 ft | 0.033 ft | 0.029 ft | -0.003 ft | 0.015 ft |
| RTCM0606-6020_2019_FL (V42) | 0.034 ft | 0.010 ft | 0.035 ft | -0.035 ft | 0.003 ft | -0.005 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-6020_2019_FL (V34) | 0.096 ft | 0.151 ft | 19265.822 ft | -19028.919 ft | -2306.326 ft | 1937.268 ft |
| RTCM0606-6020_2019_FL (V42) | 0.060 ft | 0.089 ft | 19265.762 ft | -19028.855 ft | -2306.332 ft | 1937.288 ft |



**Resultant Coordinates for point:8001_2019_FL**

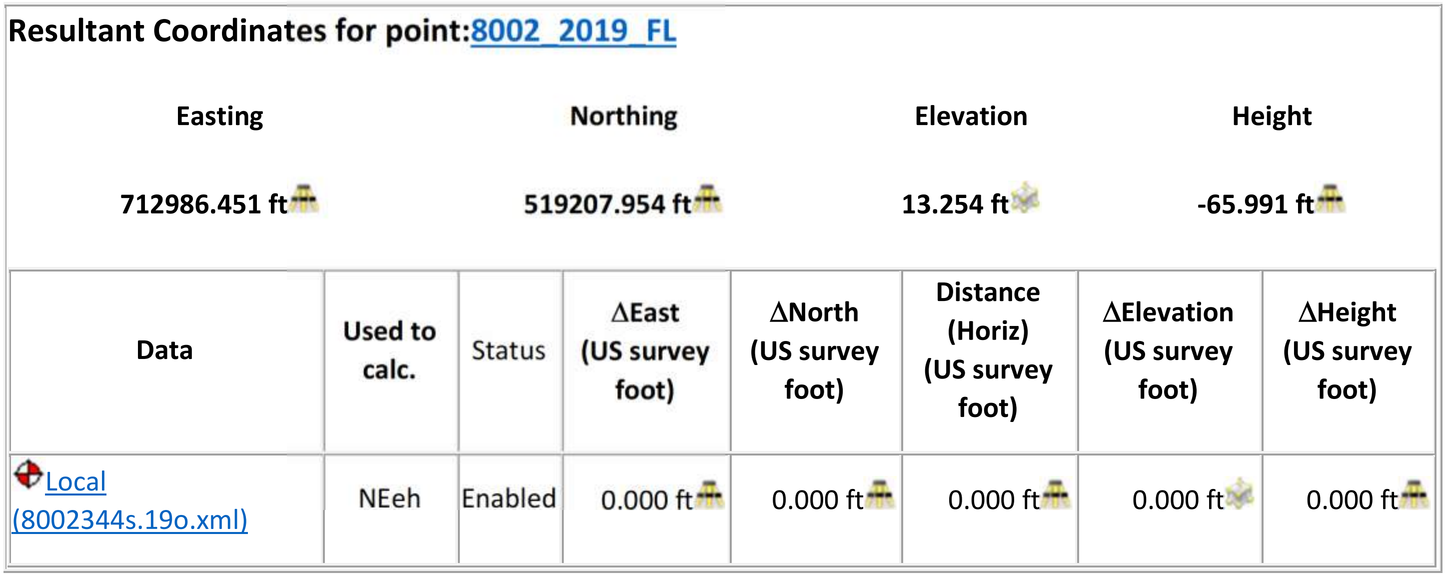
| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **694519.384 ft** | **537797.916 ft** | **10.435 ft** | **-68.963 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (8001344r.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8001_2019_FL*

Precision Confidence Level: **95%**

|  | *Coordinates* |  |  |  |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (8001344r.19o.xml) | 694519.384 ft | 537797.916 ft | 10.435 ft | -68.963 ft |



**Resultant Coordinates for point:8002_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **712986.451 ft** | **519207.954 ft** | **13.254 ft** | **-65.991 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Local (8002344s.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8002_2019_FL*

Precision Confidence Level: **95%**

| Coordinates | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (8002344s.19o.xml) | 712986.451 ft | 519207.954 ft | 13.254 ft | -65.991 ft |

## Resultant Coordinates for point:8003_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **800684.380 ft** | **518939.059 ft** | **7.469 ft** | **-73.130 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8003_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8003_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| | | | | | | |
|---|---|---|---|---|---|---|
| **RTCM0602 → 8003_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 61114.049 ft | -59335.350 ft | -13116.400 ft | -6496.402 ft |
| **σ:** | | | | 0.023 ft | 0.059 ft | 0.033 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8003_2019_FL (V98) | 0.036 ft | 0.025 ft | 0.044 ft | -0.003 ft | -0.008 ft | 0.043 ft |
| RTCM0602-8003_2019_FL (V105) | 0.033 ft | 0.010 ft | 0.035 ft | -0.004 ft | -0.024 ft | -0.024 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8003_2019_FL (V98) | 0.104 ft | 0.148 ft | 61114.049 ft | -59335.347 ft | -13116.393 ft | -6496.446 ft |
| RTCM0602-8003_2019_FL (V105) | 0.085 ft | 0.107 ft | 61114.037 ft | -59335.346 ft | -13116.376 ft | -6496.378 ft |

**Resultant Coordinates for point:8004_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **846652.134 ft** | **579766.316 ft** | **6.446 ft** | **-75.128 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8004_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*8004_2019_FL

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0602 → 8004_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 55365.204 ft | -18134.277 ft | 20594.149 ft | 48086.743 ft |
| **σ:** | | | | 0.010 ft | 0.023 ft | 0.017 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8004_2019_FL (V70) | 0.016 ft | 0.006 ft | 0.017 ft | -0.001 ft | -0.013 ft | -0.011 ft |
| RTCM0602-8004_2019_FL (V80) | 0.023 ft | 0.007 ft | 0.025 ft | -0.003 ft | 0.017 ft | 0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8004_2019_FL (V70) | 0.105 ft | 0.130 ft | 55365.219 ft | -18134.277 ft | 20594.162 ft | 48086.754 ft |
| RTCM0602-8004_2019_FL (V80) | 0.084 ft | 0.102 ft | 55365.182 ft | -18134.275 ft | 20594.133 ft | 48086.725 ft |

## Resultant Coordinates for point:8005_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **851329.554 ft** | **591358.258 ft** | **5.306 ft** | **-76.429 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0402 → 8005_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8005_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0402 → 8005_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 62473.644 ft | -17001.292 ft | -28961.149 ft | -52679.827 ft |
| **σ:** | | | | 0.021 ft | 0.042 ft | 0.024 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0402-8005_2019_FL (V65) | 0.021 ft | 0.045 ft | 0.050 ft | -0.007 ft | 0.049 ft | -0.001 ft |
| RTCM0402-8005_2019_FL (V74) | 0.021 ft | 0.083 ft | 0.086 ft | 0.013 ft | -0.083 ft | 0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0402-8005_2019_FL (V65) | 0.079 ft | 0.110 ft | 62473.664 ft | -17001.284 ft | -28961.198 ft | -52679.826 ft |
| RTCM0402-8005_2019_FL (V74) | 0.086 ft | 0.122 ft | 62473.625 ft | -17001.305 ft | -28961.067 ft | -52679.845 ft |

### Resultant Coordinates for point:8006_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **861647.716 ft** | **590948.017 ft** | **4.290 ft** | **-77.615 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0402 → 8006_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8006_2019_FL*
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0402 → 8006_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 60147.458 ft | -6796.506 ft | -27435.748 ft | -53092.409 ft |
| **σ:** | | | | 0.014 ft | 0.032 ft | 0.020 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0402-8006_2019_FL (V66) | 0.027 ft | 0.065 ft | 0.070 ft | 0.001 ft | -0.048 ft | 0.052 ft |
| RTCM0402-8006_2019_FL (V75) | 0.002 ft | 0.067 ft | 0.067 ft | -0.012 ft | 0.059 ft | -0.029 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0402-8006_2019_FL (V66) | 0.083 ft | 0.129 ft | 60147.482 ft | -6796.507 ft | -27435.700 ft | -53092.461 ft |
| RTCM0402-8006_2019_FL (V75) | 0.110 ft | 0.142 ft | 60147.458 ft | -6796.494 ft | -27435.807 ft | -53092.380 ft |

## Resultant Coordinates for point:8007_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **870561.318 ft** | **585680.659 ft** | **5.552 ft** | **-76.474 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8007_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0402 → 8007_2019_FL | | Enabled | -0.062 ft | -0.080 ft | 0.101 ft | -0.017 ft | -0.017 ft |

*Survey Data used to calculate point:8007_2019_FL*

Precision Confidence Level: **95%**

### GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0602 → 8007_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8007_2019_FL (V67) | 0.103 ft | 0.151 ft | 60007.412 ft | 5042.240 ft | 27095.725 ft | 53303.724 ft |

| **RTCM0402 → 8007_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0402-8007_2019_FL (V77) | 0.077 ft | 0.145 ft | 64433.217 ft | 2355.210 ft | -28239.766 ft | -57867.159 ft |

## Resultant Coordinates for point:8008_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **876968.681 ft** | **590467.934 ft** | **5.358 ft** | **-76.786 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8008_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0402 → 8008_2019_FL | | Enabled | 0.022 ft | -0.005 ft | 0.022 ft | 0.002 ft | 0.002 ft |

*Survey Data used to calculate point:*8008_2019_FL

Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0606 → 8008_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8008_2019_FL (V68) | 0.065 ft | 0.103 ft | 52914.272 ft | -51799.859 ft | -10372.142 ft | -3018.864 ft |

| **RTCM0402 → 8008_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0402-8008_2019_FL (V78) | 0.085 ft | 0.111 ft | 59768.005 ft | 8346.134 ft | -25108.933 ft | -53591.958 ft |

## Resultant Coordinates for point:8009_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **893450.091 ft** | **579873.437 ft** | **5.452 ft** | **-76.951 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8009_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8009_2019_FL]

Precision Confidence Level: **95%**

**GNSS vectors**

| RTCM0606 → 8009_2019_FL | | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|
| **Mean:** | | 39001.641 ft | -34822.745 ft | -12211.628 ft | -12624.603 ft |
| **σ:** | | | 0.018 ft | 0.038 ft | 0.021 ft |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0606-8009_2019_FL (V36) | 0.022 ft | 0.003 ft | 0.022 ft | 0.018 ft | -0.006 ft | -0.011 ft |
| RTCM0606-8009_2019_FL (V44) | 0.042 ft | 0.008 ft | 0.043 ft | -0.040 ft | 0.009 ft | 0.013 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0606-8009_2019_FL (V36) | 0.069 ft | 0.106 ft | 39001.652 ft | -34822.763 ft | -12211.622 ft | -12624.592 ft |
| RTCM0606-8009_2019_FL (V44) | 0.096 ft | 0.102 ft | 39001.613 ft | -34822.705 ft | -12211.637 ft | -12624.616 ft |

## Resultant Coordinates for point:8010_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **903040.420 ft** | **593305.362 ft** | **4.254 ft** | **-78.481 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8010_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8010_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 8010_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 26728.993 ft | -26286.434 ft | -4806.999 ft | -596.001 ft |
| **σ:** | | | | 0.029 ft | 0.067 ft | 0.038 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8010_2019_FL (V35) | 0.045 ft | 0.034 ft | 0.056 ft | 0.039 ft | 0.036 ft | -0.017 ft |
| RTCM0606-8010_2019_FL (V43) | 0.055 ft | 0.021 ft | 0.059 ft | -0.051 ft | -0.027 ft | 0.011 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8010_2019_FL (V35) | 0.078 ft | 0.116 ft | 26729.037 ft | -26286.473 ft | -4807.035 ft | -595.983 ft |
| RTCM0606-8010_2019_FL (V43) | 0.069 ft | 0.092 ft | 26728.938 ft | -26286.383 ft | -4806.972 ft | -596.012 ft |

## Resultant Coordinates for point:8011_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **911733.191 ft** | **582386.449 ft** | **5.201 ft** | **-77.898 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8011_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0602 → 8011_2019_FL | | Enabled | 0.036 ft | -0.001 ft | 0.036 ft | -0.041 ft | -0.041 ft |

*Survey Data used to calculate point:8011_2019_FL*

Precision Confidence Level: **95%**

### GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0606 → 8011_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8011_2019_FL (V38) | 0.064 ft | 0.080 ft | 21506.339 ft | -16968.582 ft | -8074.381 ft | -10459.168 ft |

| **RTCM0602 → 8011_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8011_2019_FL (V48) | 0.097 ft | 0.133 ft | 75334.406 ft | 45864.491 ft | 32524.305 ft | 50138.715 ft |

## Resultant Coordinates for point:8012_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **920501.839 ft** | **590611.075 ft** | **3.982 ft** | **-79.409 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8012_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8012_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 8012_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 9898.162 ft | -8887.232 ft | -3050.542 ft | -3112.059 ft |
| **σ:** | | | | 0.011 ft | 0.021 ft | 0.014 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8012_2019_FL (V33) | 0.013 ft | 0.022 ft | 0.025 ft | 0.000 ft | 0.015 ft | -0.021 ft |
| RTCM0606-8012_2019_FL (V41) | 0.010 ft | 0.049 ft | 0.051 ft | 0.001 ft | -0.041 ft | 0.029 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8012_2019_FL (V33) | 0.044 ft | 0.065 ft | 9898.160 ft | -8887.232 ft | -3050.556 ft | -3112.039 ft |
| RTCM0606-8012_2019_FL (V41) | 0.092 ft | 0.136 ft | 9898.160 ft | -8887.234 ft | -3050.500 ft | -3112.089 ft |

**Resultant Coordinates for point:8013_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **933413.492 ft** | **593760.578 ft** | **4.477 ft** | **-79.329 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8013_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8013_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 8013_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 3673.434 ft | 3624.860 ft | 479.061 ft | -353.557 ft |
| **σ:** | | | | 0.007 ft | 0.015 ft | 0.008 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8013_2019_FL (V32) | 0.007 ft | 0.007 ft | 0.010 ft | 0.004 ft | -0.009 ft | -0.002 ft |
| RTCM0606-8013_2019_FL (V40) | 0.013 ft | 0.018 ft | 0.023 ft | -0.009 ft | 0.021 ft | 0.003 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8013_2019_FL (V32) | 0.042 ft | 0.055 ft | 3673.431 ft | 3624.856 ft | 479.069 ft | -353.554 ft |
| RTCM0606-8013_2019_FL (V40) | 0.052 ft | 0.063 ft | 3673.440 ft | 3624.869 ft | 479.040 ft | -353.559 ft |

**Resultant Coordinates for point:8014_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **859989.989 ft** | **568838.197 ft** | **6.199 ft** | **-75.601 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8014_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*8014_2019_FL
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8014_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 42474.015 ft | -4231.719 ft | 18075.557 ft | 38202.209 ft |
| **σ:** | | | | 0.010 ft | 0.024 ft | 0.016 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8014_2019_FL (V69) | 0.014 ft | 0.032 ft | 0.035 ft | 0.011 ft | -0.033 ft | 0.002 ft |
| RTCM0602-8014_2019_FL (V79) | 0.017 ft | 0.021 ft | 0.027 ft | -0.011 ft | 0.024 ft | 0.005 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8014_2019_FL (V69) | 0.073 ft | 0.102 ft | 42474.028 ft | -4231.730 ft | 18075.590 ft | 38202.207 ft |
| RTCM0602-8014_2019_FL (V79) | 0.080 ft | 0.091 ft | 42474.000 ft | -4231.708 ft | 18075.533 ft | 38202.204 ft |

## Resultant Coordinates for point:8015_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **873858.409 ft** | **564382.817 ft** | **5.023 ft** | **-77.298 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8015_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*8015_2019_FL
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8015_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 40005.458 ft | 9749.780 ft | 18448.850 ft | 34132.366 ft |
| **σ:** | | | 0.013 ft | 0.028 ft | 0.014 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8015_2019_FL (V169) | 0.016 ft | 0.027 ft | 0.031 ft | 0.012 ft | 0.025 ft | -0.014 ft |
| RTCM0602-8015_2019_FL (V176) | 0.022 ft | 0.015 ft | 0.027 ft | -0.020 ft | -0.015 ft | 0.009 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8015_2019_FL (V169) | 0.092 ft | 0.121 ft | 40005.455 ft | 9749.768 ft | 18448.824 ft | 34132.380 ft |
| RTCM0602-8015_2019_FL (V176) | 0.092 ft | 0.139 ft | 40005.462 ft | 9749.799 ft | 18448.865 ft | 34132.356 ft |

## Resultant Coordinates for point:8016_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **883234.665 ft** | **575680.470 ft** | **6.042 ft** | **-76.506 ft** |

| **Data** | **Used to calc.** | Status | **∆East (US survey foot)** | **∆North (US survey foot)** | **Distance (Horiz) (US survey foot)** | **∆Elevation (US survey foot)** | **∆Height (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8016_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8016_2019_FL*
Precision Confidence Level: **95%**

## GNSS vectors

| **RTCM0606 → 8016_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 50042.981 ft | -44608.964 ft | -15721.021 ft | -16345.939 ft |
| **σ:** | | | | 0.020 ft | 0.044 ft | 0.032 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8016_2019_FL (V37) | 0.079 ft | 0.174 ft | 0.192 ft | 0.099 ft | -0.158 ft | 0.045 ft |
| RTCM0606-8016_2019_FL (V45) | 0.014 ft | 0.018 ft | 0.023 ft | 0.007 ft | 0.022 ft | 0.000 ft |
| RTCM0606-8016_2019_FL (V46) | 0.024 ft | 0.116 ft | 0.118 ft | -0.038 ft | 0.105 ft | -0.039 ft |
| RTCM0606-8016_2019_FL (V47) | 0.050 ft | 0.032 ft | 0.059 ft | -0.042 ft | -0.028 ft | 0.029 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8016_2019_FL (V37) | 0.091 ft | 0.130 ft | 50043.034 ft | -44609.064 ft | -15720.864 ft | -16345.984 ft |
| RTCM0606-8016_2019_FL (V45) | 0.115 ft | 0.125 ft | 50042.994 ft | -44608.971 ft | -15721.043 ft | -16345.939 ft |
| RTCM0606-8016_2019_FL (V46) | 0.119 ft | 0.121 ft | 50042.967 ft | -44608.926 ft | -15721.126 ft | -16345.900 ft |
| RTCM0606-8016_2019_FL (V47) | 0.131 ft | 0.146 ft | 50042.944 ft | -44608.922 ft | -15720.993 ft | -16345.968 ft |

**Resultant Coordinates for point:8017_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **904855.388 ft** | **568335.187 ft** | **6.077 ft** | **-76.765 ft** |

| Data | Used to calc. | Status | ∆East (US survey foot) | ∆North (US survey foot) | Distance (Horiz) (US survey foot) | ∆Elevation (US survey foot) | ∆Height (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8017_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8017_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → 8017_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 35845.443 ft | -22788.581 ft | -15290.331 ft | -23060.401 ft |
| **σ:** | | | | 0.036 ft | 0.076 ft | 0.047 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8017_2019_FL (V167) | 0.051 ft | 0.120 ft | 0.130 ft | 0.031 ft | 0.111 ft | -0.062 ft |
| RTCM0606-8017_2019_FL (V173) | 0.052 ft | 0.055 ft | 0.076 ft | -0.036 ft | -0.067 ft | 0.003 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8017_2019_FL (V167) | 0.087 ft | 0.133 ft | 35845.470 ft | -22788.613 ft | -15290.441 ft | -23060.340 ft |
| RTCM0606-8017_2019_FL (V173) | 0.081 ft | 0.121 ft | 35845.394 ft | -22788.546 ft | -15290.264 ft | -23060.405 ft |

## Resultant Coordinates for point:8018_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **924295.711 ft** | **566396.200 ft** | **6.806 ft** | **-76.686 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8018_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0606 → 8018_2019_FL | | Enabled | -0.017 ft | -0.014 ft | 0.022 ft | -0.117 ft | -0.117 ft |

*Survey Data used to calculate point:*[8018_2019_FL]

Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0601 → 8018_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8018_2019_FL (V95) | 0.103 ft | 0.141 ft | 41823.775 ft | -18181.300 ft | 14049.596 ft | 34946.778 ft |

| **RTCM0606 → 8018_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8018_2019_FL (V102) | 0.079 ft | 0.101 ft | 28255.456 ft | -3490.728 ft | -12872.834 ft | -24909.350 ft |

## Resultant Coordinates for point:8019_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **923708.232 ft** | **551338.133 ft** | **3.808 ft** | **-79.731 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8019_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8019_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0601 → 8019_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 28777.490 ft | -17733.057 ft | 7464.226 ft | 21400.186 ft |
| **σ:** | | | | 0.010 ft | 0.021 ft | 0.012 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8019_2019_FL (V96) | 0.015 ft | 0.017 ft | 0.023 ft | -0.015 ft | 0.010 ft | -0.014 ft |
| RTCM0601-8019_2019_FL (V103) | 0.013 ft | 0.027 ft | 0.030 ft | 0.017 ft | -0.020 ft | 0.015 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8019_2019_FL (V96) | 0.081 ft | 0.103 ft | 28777.489 ft | -17733.042 ft | 7464.216 ft | 21400.201 ft |
| RTCM0601-8019_2019_FL (V103) | 0.072 ft | 0.096 ft | 28777.495 ft | -17733.073 ft | 7464.246 ft | 21400.172 ft |

## Resultant Coordinates for point:8020_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **897514.500 ft** | **549867.997 ft** | **7.462 ft** | **-75.448 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8020_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0602 → 8020_2019_FL | | Enabled | -0.008 ft | -0.032 ft | 0.033 ft | 0.053 ft | 0.053 ft |

*Survey Data used to calculate point:8020_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0601 → 8020_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8020_2019_FL (V165) | 0.082 ft | 0.099 ft | 47991.523 ft | -43456.159 ft | 2447.218 ft | 20217.805 ft |

| **RTCM0602 → 8020_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8020_2019_FL (V171) | 0.078 ft | 0.129 ft | 43126.163 ft | 34067.479 ft | 16123.674 ft | 20959.482 ft |

**Resultant Coordinates for point:8021_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **881778.055 ft** | **547375.154 ft** | **8.024 ft** | **-74.482 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8021_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8021_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0601 → 8021_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 61523.819 ft | -58802.943 ft | -1244.428 ft | 18051.192 ft |
| **σ:** | | | | 0.009 ft | 0.020 ft | 0.012 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8021_2019_FL (V164) | 0.008 ft | 0.019 ft | 0.020 ft | -0.010 ft | 0.018 ft | -0.004 ft |
| RTCM0601-8021_2019_FL (V170) | 0.012 ft | 0.029 ft | 0.032 ft | 0.013 ft | -0.029 ft | 0.005 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8021_2019_FL (V164) | 0.074 ft | 0.125 ft | 61523.811 ft | -58802.934 ft | -1244.446 ft | 18051.196 ft |
| RTCM0601-8021_2019_FL (V170) | 0.102 ft | 0.175 ft | 61523.829 ft | -58802.956 ft | -1244.400 ft | 18051.187 ft |

**Resultant Coordinates for point:8022_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **922478.850 ft** | **531897.485 ft** | **8.820 ft** | **-74.901 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8022_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8022_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0601 → 8022_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 18082.315 ft | -17619.508 ft | -1110.219 ft | 3910.304 ft |
| **σ:** | | | | 0.006 ft | 0.012 ft | 0.008 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8022_2019_FL (V84) | 0.005 ft | 0.020 ft | 0.021 ft | 0.002 ft | -0.016 ft | 0.013 ft |
| RTCM0601-8022_2019_FL (V60) | 0.003 ft | 0.023 ft | 0.023 ft | -0.002 ft | 0.020 ft | -0.012 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8022_2019_FL (V84) | 0.047 ft | 0.068 ft | 18082.314 ft | -17619.510 ft | -1110.203 ft | 3910.291 ft |
| RTCM0601-8022_2019_FL (V60) | 0.061 ft | 0.079 ft | 18082.317 ft | -17619.506 ft | -1110.239 ft | 3910.316 ft |

**Resultant Coordinates for point:8023_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **887680.592 ft** | **561401.591 ft** | **5.952 ft** | **-76.678 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0606 → 8023_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8023_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| RTCM0606 → 8023_2019_FL | | | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| **Mean:** | | | 53299.513 ft | -39249.332 ft | -21141.888 ft | -29212.131 ft |
| **σ:** | | | | 0.008 ft | 0.019 ft | 0.009 ft |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0606-8023_2019_FL (V168) | 0.009 ft | 0.007 ft | 0.011 ft | 0.006 ft | -0.009 ft | -0.003 ft |
| RTCM0606-8023_2019_FL (V174) | 0.022 ft | 0.034 ft | 0.040 ft | -0.023 ft | 0.033 ft | -0.004 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0606-8023_2019_FL (V168) | 0.075 ft | 0.109 ft | 53299.512 ft | -39249.338 ft | -21141.880 ft | -29212.127 ft |
| RTCM0606-8023_2019_FL (V174) | 0.118 ft | 0.182 ft | 53299.507 ft | -39249.309 ft | -21141.921 ft | -29212.127 ft |

## Resultant Coordinates for point:8024_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **863397.821 ft** | **528471.270 ft** | **5.964 ft** | **-75.955 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8024_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8024_2019_FL]
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8024_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 2928.547 ft | 1881.933 ft | 1258.958 ft | 1857.348 ft |
| **σ:** | | | | 0.009 ft | 0.018 ft | 0.012 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8024_2019_FL (V53) | 0.012 ft | 0.008 ft | 0.014 ft | -0.010 ft | 0.002 ft | -0.010 ft |
| RTCM0602-8024_2019_FL (V28) | 0.018 ft | 0.000 ft | 0.018 ft | 0.016 ft | 0.006 ft | 0.006 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8024_2019_FL (V53) | 0.027 ft | 0.037 ft | 2928.559 ft | 1881.943 ft | 1258.956 ft | 1857.358 ft |
| RTCM0602-8024_2019_FL (V28) | 0.032 ft | 0.048 ft | 2928.531 ft | 1881.918 ft | 1258.952 ft | 1857.342 ft |

**Resultant Coordinates for point:8025_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **858797.412 ft** | **540736.444 ft** | **6.042 ft** | **-75.972 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8025_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8025_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| | | | | | | |
|---|---|---|---|---|---|---|
| **RTCM0602 → 8025_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 14574.368 ft | -3490.527 ft | 5772.641 ft | 12919.173 ft |
| **σ:** | | | | 0.010 ft | 0.020 ft | 0.013 ft |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8025_2019_FL (V52) | 0.006 ft | 0.026 ft | 0.027 ft | 0.000 ft | 0.026 ft | -0.007 ft |
| RTCM0602-8025_2019_FL (V27) | 0.011 ft | 0.043 ft | 0.045 ft | -0.001 ft | -0.043 ft | 0.013 ft |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8025_2019_FL (V52) | 0.053 ft | 0.068 ft | 14574.364 ft | -3490.527 ft | 5772.615 ft | 12919.180 ft |
| RTCM0602-8025_2019_FL (V27) | 0.055 ft | 0.079 ft | 14574.373 ft | -3490.526 ft | 5772.684 ft | 12919.160 ft |

## Resultant Coordinates for point:8026_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **880080.010 ft** | **534497.404 ft** | **6.000 ft** | **-76.507 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8026_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8026_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8026_2019_FL** |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** |  | 20418.601 ft | 17923.391 ft | 6611.802 ft | 7208.009 ft |
| **σ:** |  |  | 0.032 ft | 0.065 ft | 0.038 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8026_2019_FL (V24) | 0.027 ft | 0.094 ft | 0.098 ft | -0.014 ft | 0.072 ft | -0.065 ft |
| RTCM0602-8026_2019_FL (V19) | 0.014 ft | 0.143 ft | 0.143 ft | 0.033 ft | -0.122 ft | 0.068 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8026_2019_FL (V24) | 0.068 ft | 0.095 ft | 20418.613 ft | 17923.405 ft | 6611.730 ft | 7208.074 ft |
| RTCM0602-8026_2019_FL (V19) | 0.074 ft | 0.135 ft | 20418.587 ft | 17923.358 ft | 6611.924 ft | 7207.941 ft |

## Resultant Coordinates for point:8027_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **901388.074 ft** | **538215.362 ft** | **5.787 ft** | **-77.255 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8027_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8027_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0601 → 8027_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 40084.025 ft | -38842.963 ft | -1919.833 ft | 9709.145 ft |
| **σ:** | | | | 0.021 ft | 0.050 ft | 0.027 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8027_2019_FL (V25) | 0.023 ft | 0.000 ft | 0.023 ft | 0.022 ft | 0.003 ft | -0.002 ft |
| RTCM0601-8027_2019_FL (V20) | 0.049 ft | 0.031 ft | 0.058 ft | -0.044 ft | -0.034 ft | 0.017 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8027_2019_FL (V25) | 0.073 ft | 0.133 ft | 40084.047 ft | -38842.985 ft | -1919.836 ft | 9709.147 ft |
| RTCM0601-8027_2019_FL (V20) | 0.092 ft | 0.135 ft | 40083.976 ft | -38842.919 ft | -1919.799 ft | 9709.127 ft |

**Resultant Coordinates for point:8028_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **839171.694 ft** | **519137.371 ft** | **7.752 ft** | **-73.511 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8028_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

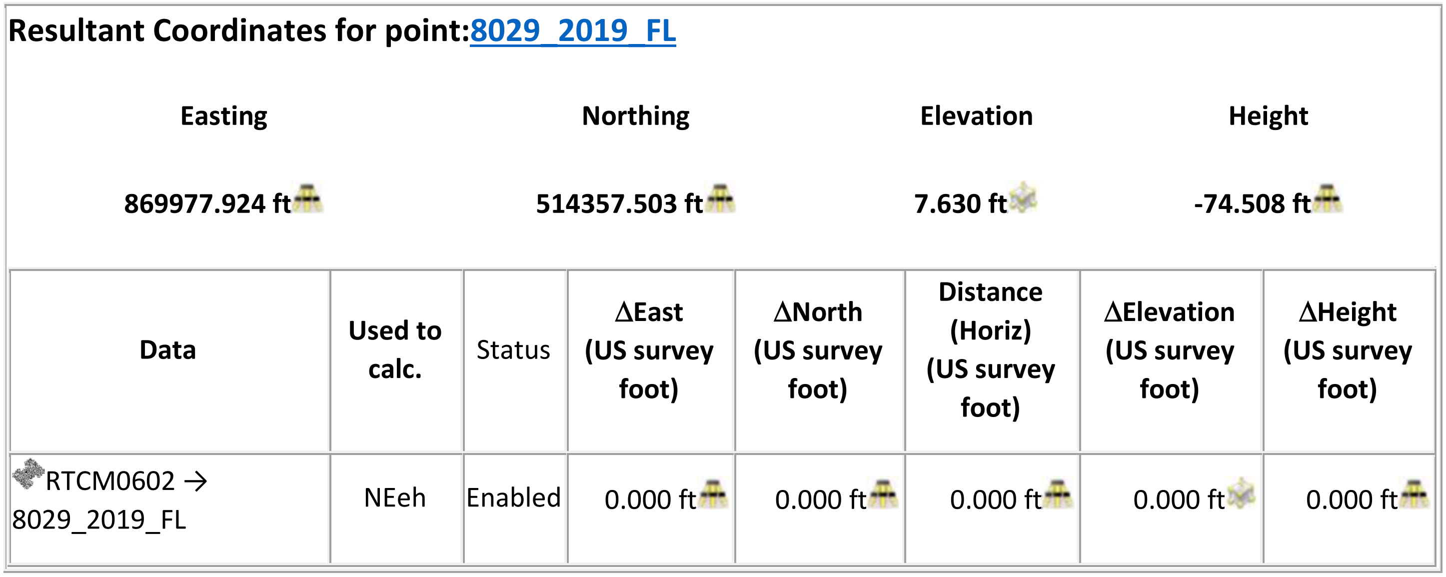
*Survey Data used to calculate point:8028_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8028_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 23325.298 ft | -21378.070 ft | -6742.455 ft | -6448.796 ft |
| **σ:** | | | | 0.024 ft | 0.056 ft | 0.034 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8028_2019_FL (V108) | 0.036 ft | 0.026 ft | 0.045 ft | 0.027 ft | 0.035 ft | 0.003 ft |
| RTCM0602-8028_2019_FL (V85) | 0.030 ft | 0.067 ft | 0.074 ft | -0.017 ft | -0.069 ft | 0.018 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8028_2019_FL (V108) | 0.068 ft | 0.079 ft | 23325.334 ft | -21378.097 ft | -6742.491 ft | -6448.799 ft |
| RTCM0602-8028_2019_FL (V85) | 0.048 ft | 0.090 ft | 23325.268 ft | -21378.053 ft | -6742.386 ft | -6448.814 ft |



**Resultant Coordinates for point:8029_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| 869977.924 ft | 514357.503 ft | 7.630 ft | -74.508 ft |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8029_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8029_2019_FL*

Precision Confidence Level: **95%**

| GNSS vectors | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0602 → 8029_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 14807.827 ft | 9331.458 ft | -3714.336 ft | -10881.146 ft |
| **σ:** | | | | 0.011 ft | 0.022 ft | 0.012 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8029_2019_FL (V16) | 0.020 ft | 0.013 ft | 0.024 ft | 0.021 ft | -0.010 ft | 0.002 ft |
| RTCM0602-8029_2019_FL (V10) | 0.015 ft | 0.007 ft | 0.016 ft | -0.015 ft | 0.007 ft | 0.002 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8029_2019_FL (V16) | 0.055 ft | 0.081 ft | 14807.812 ft | 9331.436 ft | -3714.326 ft | -10881.148 ft |
| RTCM0602-8029_2019_FL (V10) | 0.043 ft | 0.061 ft | 14807.839 ft | 9331.473 ft | -3714.343 ft | -10881.148 ft |

## Resultant Coordinates for point:8030_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **890650.491 ft** | **516687.281 ft** | **11.613 ft** | **-71.089 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8030_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8030_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8030_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 30871.803 ft | 29559.283 ft | 712.971 ft | -8877.422 ft |
| **σ:** | | | | 0.012 ft | 0.031 ft | 0.017 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8030_2019_FL (V15) | 0.021 ft | 0.007 ft | 0.022 ft | -0.012 ft | -0.001 ft | 0.019 ft |
| RTCM0602-8030_2019_FL (V9) | 0.015 ft | 0.014 ft | 0.020 ft | 0.006 ft | 0.008 ft | -0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8030_2019_FL (V15) | 0.066 ft | 0.122 ft | 30871.819 ft | 29559.295 ft | 712.973 ft | -8877.441 ft |
| RTCM0602-8030_2019_FL (V9) | 0.049 ft | 0.082 ft | 30871.792 ft | 29559.278 ft | 712.963 ft | -8877.405 ft |

## Resultant Coordinates for point:8031_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **906861.632 ft** | **524815.385 ft** | **11.667 ft** | **-71.684 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191216_JA.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0601 → 8031_2019_FL |  | Enabled | 0.013 ft | 0.021 ft | 0.025 ft | 0.001 ft | 0.001 ft |

*Survey Data used to calculate point:8031_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0601 → 8031_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 33315.555 ft | -32533.356 ft | -6770.311 ft | -2381.140 ft |
| **σ:** | | | | 0.020 ft | 0.053 ft | 0.027 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8031_2019_FL (V14) | 0.046 ft | 0.029 ft | 0.054 ft | 0.029 ft | -0.005 ft | 0.046 ft |
| RTCM0601-8031_2019_FL (V8) | 0.025 ft | 0.001 ft | 0.025 ft | -0.012 ft | -0.011 ft | -0.019 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8031_2019_FL (V14) | 0.115 ft | 0.154 ft | 33315.586 ft | -32533.386 ft | -6770.306 ft | -2381.185 ft |
| RTCM0601-8031_2019_FL (V8) | 0.083 ft | 0.145 ft | 33315.540 ft | -32533.345 ft | -6770.301 ft | -2381.121 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191216_JA.job) | 906861.632 ft | 524815.385 ft | 11.667 ft | -71.684 ft |

**Resultant Coordinates for point:8032_2019_FL**

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|

|  |  |  |  |
|---|---|---|---|
| **919249.916 ft** | **517219.936 ft** | **14.298 ft** | **-69.368 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8032_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8032_2019_FL]

Precision Confidence Level: **95%**

| **GNSS vectors** |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |
| **RTCM0601 → 8032_2019_FL** |  |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** |  |  | 23276.066 ft | -19803.296 ft | -7960.521 ft | -9286.273 ft |
| **σ:** |  |  |  | 0.015 ft | 0.028 ft | 0.017 ft |
|  |  |  |  |  |  |  |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8032_2019_FL (V23) | 0.017 ft | 0.050 ft | 0.053 ft | 0.006 ft | 0.042 ft | -0.032 ft |
| RTCM0601-8032_2019_FL (V59) | 0.012 ft | 0.031 ft | 0.033 ft | -0.007 ft | -0.028 ft | 0.017 ft |
|  |  |  |  |  |  |  |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8032_2019_FL (V23) | 0.070 ft | 0.088 ft | 23276.073 ft | -19803.302 ft | -7960.562 ft | -9286.241 ft |
| RTCM0601-8032_2019_FL (V59) | 0.053 ft | 0.076 ft | 23276.058 ft | -19803.289 ft | -7960.493 ft | -9286.289 ft |

**Resultant Coordinates for point:8033_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **837974.877 ft** | **506283.047 ft** | **7.470 ft** | **-73.779 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8033_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8033_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0602 → 8033_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 30824.771 ft | -21685.259 ft | -12453.388 ft | -18023.017 ft |
| **σ:** | | | | 0.007 ft | 0.015 ft | 0.009 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8033_2019_FL (V109) | 0.017 ft | 0.016 ft | 0.024 ft | 0.016 ft | -0.017 ft | -0.003 ft |
| RTCM0602-8033_2019_FL (V86) | 0.007 ft | 0.009 ft | 0.011 ft | -0.007 ft | 0.009 ft | 0.001 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8033_2019_FL (V109) | 0.071 ft | 0.081 ft | 30824.773 ft | -21685.275 ft | -12453.371 ft | -18023.014 ft |
| RTCM0602-8033_2019_FL (V86) | 0.055 ft | 0.079 ft | 30824.770 ft | -21685.252 ft | -12453.397 ft | -18023.018 ft |

## Resultant Coordinates for point:8034_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **862408.381 ft** | **504906.592 ft** | **6.449 ft** | **-75.517 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8034_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8034_2019_FL]

Precision Confidence Level: **95%**

## GNSS vectors

| **RTCM0602 → 8034_2019_FL** |  |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** |  |  | 21506.079 ft | 2507.973 ft | -9018.352 ft | -19362.098 ft |
| **σ:** |  |  |  | 0.009 ft | 0.023 ft | 0.013 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8034_2019_FL (V55) | 0.003 ft | 0.025 ft | 0.025 ft | 0.007 ft | -0.021 ft | 0.011 ft |
| RTCM0602-8034_2019_FL (V90) | 0.011 ft | 0.060 ft | 0.061 ft | -0.015 ft | 0.048 ft | -0.034 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-8034_2019_FL (V55) | 0.062 ft | 0.104 ft | 21506.079 ft | 2507.966 ft | -9018.330 ft | -19362.109 ft |
| RTCM0602-8034_2019_FL (V90) | 0.110 ft | 0.158 ft | 21506.070 ft | 2507.988 ft | -9018.400 ft | -19362.064 ft |

## Resultant Coordinates for point:8035_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **873836.235 ft** | **496113.302 ft** | **7.514 ft** | **-74.882 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8035_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*8035_2019_FL

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8035_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 32749.964 ft | 14375.147 ft | -10896.146 ft | -27334.763 ft |
| **σ:** | | | | 0.023 ft | 0.056 ft | 0.033 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8035_2019_FL (V56) | 0.017 ft | 0.085 ft | 0.086 ft | 0.006 ft | -0.069 ft | 0.051 ft |
| RTCM0602-8035_2019_FL (V91) | 0.039 ft | 0.077 ft | 0.086 ft | -0.007 ft | 0.052 ft | -0.068 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8035_2019_FL (V56) | 0.048 ft | 0.082 ft | 32749.981 ft | 14375.141 ft | -10896.077 ft | -27334.814 ft |
| RTCM0602-8035_2019_FL (V91) | 0.056 ft | 0.068 ft | 32749.927 ft | 14375.154 ft | -10896.198 ft | -27334.695 ft |

## Resultant Coordinates for point:8036_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **840043.706 ft** | **490992.601 ft** | **8.359 ft** | **-73.077 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8036_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8036_2019_FL*
Precision Confidence Level: **95%**

| GNSS vectors | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0608 → 8036_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 31641.642 ft | -20581.211 ft | 7649.099 ft | 22783.734 ft |
| **σ:** | | | | 0.017 ft | 0.036 ft | 0.023 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8036_2019_FL (V110) | 0.019 ft | 0.029 ft | 0.035 ft | 0.008 ft | 0.034 ft | 0.000 ft |
| RTCM0608-8036_2019_FL (V87) | 0.027 ft | 0.078 ft | 0.083 ft | -0.008 ft | -0.081 ft | 0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8036_2019_FL (V110) | 0.062 ft | 0.068 ft | 31641.638 ft | -20581.219 ft | 7649.064 ft | 22783.734 ft |
| RTCM0608-8036_2019_FL (V87) | 0.058 ft | 0.094 ft | 31641.643 ft | -20581.203 ft | 7649.179 ft | 22783.715 ft |

**Resultant Coordinates for point:8037_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **858827.130 ft** | **489831.014 ft** | **8.878 ft** | **-73.117 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8037_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0602 → 8037_2019_FL | | Enabled | -0.048 ft | 0.036 ft | 0.060 ft | 0.032 ft | 0.032 ft |

*Survey Data used to calculate point:8037_2019_FL*
Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**
Max horizontal tolerance of mean: **0.164**
Max vertical tolerance of mean: **0.262**

| **RTCM0608 → 8037_2019_FL** | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0608-8037_2019_FL (V111) | 0.055 ft | 0.062 ft | 24043.349 ft | -1975.298 ft | 10244.523 ft | 21661.731 ft |

| **RTCM0602 → 8037_2019_FL** | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-8037_2019_FL (V88) | 0.065 ft | 0.103 ft | 36641.744 ft | -0.914 ft | -16069.469 ft | -32930.071 ft |

**Resultant Coordinates for point:8038_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **888405.006 ft** | **496026.095 ft** | **8.985 ft** | **-73.876 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8038_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8038_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8038_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 42054.491 ft | 26773.346 ft | 17797.845 ft | 27110.973 ft |
| **σ:** | | | | 0.020 ft | 0.047 ft | 0.028 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8038_2019_FL (V83) | 0.031 ft | 0.054 ft | 0.063 ft | 0.022 ft | 0.052 ft | -0.026 ft |
| RTCM0608-8038_2019_FL (V57) | 0.020 ft | 0.059 ft | 0.062 ft | -0.011 ft | -0.053 ft | 0.032 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8038_2019_FL (V83) | 0.082 ft | 0.122 ft | 42054.471 ft | 26773.323 ft | 17797.793 ft | 27110.999 ft |
| RTCM0608-8038_2019_FL (V57) | 0.066 ft | 0.113 ft | 42054.499 ft | 26773.356 ft | 17797.898 ft | 27110.942 ft |

## Resultant Coordinates for point:8039_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **901846.350 ft** | **511476.978 ft** | **10.886 ft** | **-72.436 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8039_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0601 → 8039_2019_FL | | Enabled | -0.031 ft | 0.024 ft | 0.039 ft | -0.032 ft | -0.032 ft |

*Survey Data used to calculate point:8039_2019_FL*

Precision Confidence Level: **95%**

### GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0602 → 8039_2019_FL** | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-8039_2019_FL (V22) | 0.072 ft | 0.112 ft | 43161.227 ft | 40952.238 ft | 344.122 ft | -13626.715 ft |

| **RTCM0601 → 8039_2019_FL** | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0601-8039_2019_FL (V58) | 0.080 ft | 0.120 ft | 41492.963 ft | -36571.367 ft | -13332.306 ft | -14368.395 ft |

## Resultant Coordinates for point:8040_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **818245.718 ft** | **474259.012 ft** | **6.391 ft** | **-74.562 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8040_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8040_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8040_2019_FL** | | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|
| **Mean:** | | 41797.207 ft | -40951.746 ft | -3077.262 ft | 7777.624 ft |
| σ: | | | 0.028 ft | 0.063 ft | 0.036 ft |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0608-8040_2019_FL (V202) | 0.052 ft | 0.058 ft | 0.078 ft | -0.001 ft | -0.076 ft | -0.020 ft |
| RTCM0608-8040_2019_FL (V205) | 0.039 ft | 0.004 ft | 0.039 ft | 0.005 ft | 0.014 ft | 0.036 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0608-8040_2019_FL (V202) | 0.081 ft | 0.119 ft | 41797.204 ft | -40951.745 ft | -3077.186 ft | 7777.645 ft |
| RTCM0608-8040_2019_FL (V205) | 0.082 ft | 0.123 ft | 41797.206 ft | -40951.751 ft | -3077.276 ft | 7777.588 ft |

**Resultant Coordinates for point:8041_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **848721.304 ft** | **479047.971 ft** | **8.715 ft** | **-73.096 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8041_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8041_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8041_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 16883.578 ft | -11212.286 ft | 3965.741 ft | 11983.854 ft |
| **σ:** | | | | 0.004 ft | 0.009 ft | 0.006 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8041_2019_FL (V114) | 0.004 ft | 0.011 ft | 0.011 ft | -0.004 ft | 0.010 ft | -0.002 ft |
| RTCM0608-8041_2019_FL (V119) | 0.006 ft | 0.018 ft | 0.019 ft | 0.008 ft | -0.016 ft | 0.004 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8041_2019_FL (V114) | 0.042 ft | 0.066 ft | 16883.574 ft | -11212.282 ft | 3965.731 ft | 11983.856 ft |
| RTCM0608-8041_2019_FL (V119) | 0.055 ft | 0.080 ft | 16883.584 ft | -11212.293 ft | 3965.757 ft | 11983.850 ft |

## Resultant Coordinates for point:8042_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **877554.360 ft** | **476911.071 ft** | **10.315 ft** | **-72.492 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8042_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8042_2019_FL]

Precision Confidence Level: **95%**

### GNSS vectors

| **RTCM0608 → 8042_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 21481.736 ft | 17369.164 ft | 7815.684 ft | 9934.394 ft |
| **σ:** | | | | 0.020 ft | 0.038 ft | 0.021 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8042_2019_FL (V125) | 0.056 ft | 0.011 ft | 0.058 ft | 0.039 ft | 0.033 ft | 0.027 ft |
| RTCM0608-8042_2019_FL (V141) | 0.017 ft | 0.013 ft | 0.021 ft | -0.012 ft | -0.018 ft | -0.002 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8042_2019_FL (V125) | 0.100 ft | 0.127 ft | 21481.680 ft | 17369.125 ft | 7815.652 ft | 9934.367 ft |
| RTCM0608-8042_2019_FL (V141) | 0.057 ft | 0.080 ft | 21481.753 ft | 17369.176 ft | 7815.702 ft | 9934.396 ft |

## Resultant Coordinates for point:8043_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **879395.227 ft** | **466251.744 ft** | **8.241 ft** | **-74.736 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8043_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8043_2019_FL*
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0608 → 8043_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 20225.323 ft | 19905.474 ft | 3568.873 ft | 314.548 ft |
| **σ:** | | | | 0.011 ft | 0.024 ft | 0.014 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8043_2019_FL (V126) | 0.012 ft | 0.010 ft | 0.016 ft | -0.004 ft | 0.014 ft | 0.007 ft |
| RTCM0608-8043_2019_FL (V142) | 0.018 ft | 0.024 ft | 0.030 ft | 0.003 ft | -0.030 ft | -0.006 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8043_2019_FL (V126) | 0.046 ft | 0.079 ft | 20225.325 ft | 19905.478 ft | 3568.859 ft | 314.541 ft |
| RTCM0608-8043_2019_FL (V142) | 0.065 ft | 0.088 ft | 20225.326 ft | 19905.471 ft | 3568.903 ft | 314.554 ft |

## Resultant Coordinates for point:8044_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| 859242.979 ft | 465243.335 ft | 8.982 ft | -73.398 ft |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8044_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8044_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8044_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 551.941 ft | 99.643 ft | -197.971 ft | -505.488 ft |
| **σ:** | | | | 0.005 ft | 0.013 ft | 0.006 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8044_2019_FL (V147) | 0.023 ft | 0.001 ft | 0.023 ft | 0.014 ft | 0.010 ft | 0.015 ft |
| RTCM0608-8044_2019_FL (V127) | 0.003 ft | 0.002 ft | 0.004 ft | -0.001 ft | -0.003 ft | -0.002 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8044_2019_FL (V147) | 0.042 ft | 0.059 ft | 551.956 ft | 99.629 ft | -197.982 ft | -505.503 ft |
| RTCM0608-8044_2019_FL (V127) | 0.017 ft | 0.027 ft | 551.939 ft | 99.644 ft | -197.968 ft | -505.486 ft |

**Resultant Coordinates for point:8045_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **862521.355 ft** | **482980.619 ft** | **7.888 ft** | **-74.341 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191227_JA.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0608 → 8045_2019_FL | | Enabled | -0.004 ft | -0.001 ft | 0.004 ft | -0.018 ft | -0.018 ft |

*Survey Data used to calculate point:8045_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8045_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 17513.003 ft | 2132.285 ft | 7924.415 ft | 15471.337 ft |
| **σ:** | | | 0.013 ft | 0.027 ft | 0.014 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8045_2019_FL (V124) | 0.037 ft | 0.189 ft | 0.192 ft | -0.061 ft | 0.156 ft | -0.095 ft |
| RTCM0608-8045_2019_FL (V143) | 0.004 ft | 0.000 ft | 0.004 ft | 0.001 ft | 0.002 ft | 0.004 ft |
| RTCM0608-8045_2019_FL (V144) | 0.008 ft | 0.041 ft | 0.042 ft | 0.013 ft | -0.037 ft | 0.015 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8045_2019_FL (V124) | 0.097 ft | 0.154 ft | 17513.023 ft | 2132.346 ft | 7924.259 ft | 15471.431 ft |
| RTCM0608-8045_2019_FL (V143) | 0.044 ft | 0.061 ft | 17512.998 ft | 2132.284 ft | 7924.414 ft | 15471.333 ft |
| RTCM0608-8045_2019_FL (V144) | 0.051 ft | 0.071 ft | 17513.004 ft | 2132.272 ft | 7924.452 ft | 15471.322 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191227_JA.job) | 862521.355 ft | 482980.619 ft | 7.888 ft | -74.341 ft |

## Resultant Coordinates for point:8046_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **825361.067 ft** | **463703.917 ft** | **7.284 ft** | **-73.972 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8046_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0608 → 8046_2019_FL | | Enabled | -0.032 ft | 0.012 ft | 0.034 ft | 0.027 ft | 0.027 ft |

*Survey Data used to calculate point:8046_2019_FL*

Precision Confidence Level: **95%**

### GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **RTCM0603 → 8046_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8046_2019_FL (V159) | 0.072 ft | 0.110 ft | 44295.714 ft | 17892.693 ft | 20066.583 ft | 35203.609 ft |

| **RTCM0608 → 8046_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8046_2019_FL (V162) | 0.092 ft | 0.110 ft | 33879.032 ft | -33217.787 ft | -6423.133 ft | -1763.742 ft |

## Resultant Coordinates for point:8047_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|

|  |  |  |  |
|---|---|---|---|
| **865244.927 ft** | **450748.277 ft** | **6.367 ft** | **-76.438 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8047_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8047_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8047_2019_FL** |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** |  | 16220.707 ft | 6998.201 ft | -5388.376 ft | -13605.217 ft |
| **σ:** |  |  | 0.007 ft | 0.016 ft | 0.009 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8047_2019_FL (V135) | 0.006 ft | 0.015 ft | 0.017 ft | 0.008 ft | -0.014 ft | 0.004 ft |
| RTCM0608-8047_2019_FL (V139) | 0.009 ft | 0.028 ft | 0.030 ft | -0.012 ft | 0.026 ft | -0.008 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8047_2019_FL (V135) | 0.047 ft | 0.068 ft | 16220.702 ft | 6998.193 ft | -5388.362 ft | -13605.220 ft |
| RTCM0608-8047_2019_FL (V139) | 0.056 ft | 0.096 ft | 16220.714 ft | 6998.213 ft | -5388.402 ft | -13605.209 ft |

**Resultant Coordinates for point:8048_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **844142.557 ft** | **453615.496 ft** | **11.006 ft** | **-71.029 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8048_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8048_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8048_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 19344.780 ft | -14008.237 ft | -7649.820 ft | -10930.236 ft |
| **σ:** | | | | 0.009 ft | 0.019 ft | 0.013 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8048_2019_FL (V203) | 0.008 ft | 0.019 ft | 0.021 ft | 0.001 ft | 0.015 ft | -0.014 ft |
| RTCM0608-8048_2019_FL (V206) | 0.016 ft | 0.034 ft | 0.038 ft | 0.000 ft | -0.024 ft | 0.029 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8048_2019_FL (V203) | 0.065 ft | 0.091 ft | 19344.778 ft | -14008.238 ft | -7649.834 ft | -10930.221 ft |
| RTCM0608-8048_2019_FL (V206) | 0.077 ft | 0.107 ft | 19344.786 ft | -14008.236 ft | -7649.796 ft | -10930.265 ft |

## Resultant Coordinates for point:8049_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **818840.320 ft** | **442567.039 ft** | **7.604 ft** | **-73.727 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8049_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8049_2019_FL]

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0603 → 8049_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 22955.738 ft | 12887.318 ft | 9986.040 ft | 16160.506 ft |
| **σ:** | | | | 0.015 ft | 0.036 ft | 0.022 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8049_2019_FL (V187) | 0.023 ft | 0.070 ft | 0.074 ft | 0.003 ft | 0.057 ft | -0.047 ft |
| RTCM0603-8049_2019_FL (V199) | 0.020 ft | 0.030 ft | 0.036 ft | 0.006 ft | -0.018 ft | 0.031 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8049_2019_FL (V187) | 0.089 ft | 0.182 ft | 22955.745 ft | 12887.315 ft | 9985.984 ft | 16160.553 ft |
| RTCM0603-8049_2019_FL (V199) | 0.111 ft | 0.129 ft | 22955.721 ft | 12887.313 ft | 9986.058 ft | 16160.475 ft |

### Resultant Coordinates for point:8050_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **836312.953 ft** | **437546.255 ft** | **10.000 ft** | **-71.927 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8050_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8050_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 8050_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 34300.252 ft | 30463.396 ft | 10706.806 ft | 11569.488 ft |
| **σ:** | | | 0.017 ft | 0.036 ft | 0.017 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8050_2019_FL (V188) | 0.025 ft | 0.026 ft | 0.036 ft | 0.008 ft | -0.012 ft | 0.033 ft |
| RTCM0603-8050_2019_FL (V197) | 0.017 ft | 0.036 ft | 0.040 ft | -0.020 ft | 0.027 ft | -0.022 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8050_2019_FL (V188) | 0.086 ft | 0.120 ft | 34300.237 ft | 30463.388 ft | 10706.818 ft | 11569.455 ft |
| RTCM0603-8050_2019_FL (V197) | 0.086 ft | 0.119 ft | 34300.269 ft | 30463.416 ft | 10706.780 ft | 11569.510 ft |

**Resultant Coordinates for point:8051_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **807087.029 ft** | **426396.660 ft** | **6.850 ft** | **-74.126 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8051_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8051_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0603 → 8051_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 3107.631 ft | 2381.311 ft | 1186.048 ft | 1606.243 ft |
| **σ:** | | | | 0.012 ft | 0.030 ft | 0.018 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8051_2019_FL (V185) | 0.013 ft | 0.023 ft | 0.026 ft | -0.008 ft | 0.025 ft | 0.002 ft |
| RTCM0603-8051_2019_FL (V195) | 0.018 ft | 0.056 ft | 0.058 ft | 0.019 ft | -0.054 ft | 0.011 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8051_2019_FL (V185) | 0.038 ft | 0.065 ft | 3107.627 ft | 2381.319 ft | 1186.023 ft | 1606.241 ft |
| RTCM0603-8051_2019_FL (V195) | 0.042 ft | 0.071 ft | 3107.631 ft | 2381.292 ft | 1186.102 ft | 1606.232 ft |

## Resultant Coordinates for point:8052_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **836562.735 ft** | **424135.771 ft** | **9.306 ft** | **-72.721 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8052_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8052_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 8052_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 32017.500 ft | 31613.469 ft | 5042.174 ft | -534.200 ft |
| **σ:** | | | | 0.018 ft | 0.038 ft | 0.018 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8052_2019_FL (V189) | 0.022 ft | 0.027 ft | 0.035 ft | 0.014 ft | -0.032 ft | -0.007 ft |
| RTCM0603-8052_2019_FL (V198) | 0.038 ft | 0.045 ft | 0.059 ft | -0.042 ft | 0.042 ft | -0.004 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8052_2019_FL (V189) | 0.076 ft | 0.097 ft | 32017.491 ft | 31613.455 ft | 5042.206 ft | -534.193 ft |
| RTCM0603-8052_2019_FL (V198) | 0.084 ft | 0.106 ft | 32017.534 ft | 31613.510 ft | 5042.132 ft | -534.196 ft |

## Resultant Coordinates for point:8053_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **852353.586 ft** | **423658.121 ft** | **5.933 ft** | **-76.600 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8053_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*[8053_2019_FL]()
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 8053_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 47814.503 ft | 47221.040 ft | 7439.288 ft | -1028.131 ft |
| **σ:** | | | | 0.036 ft | 0.078 ft | 0.060 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8053_2019_FL (V155) | 0.107 ft | 0.001 ft | 0.107 ft | 0.014 ft | -0.045 ft | -0.096 ft |
| RTCM0603-8053_2019_FL (V150) | 0.020 ft | 0.051 ft | 0.055 ft | -0.021 ft | 0.050 ft | -0.008 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8053_2019_FL (V155) | 0.075 ft | 0.109 ft | 47814.494 ft | 47221.026 ft | 7439.333 ft | -1028.035 ft |
| RTCM0603-8053_2019_FL (V150) | 0.106 ft | 0.155 ft | 47814.516 ft | 47221.062 ft | 7439.238 ft | -1028.123 ft |

## Resultant Coordinates for point:8054_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **827553.397 ft** | **403948.068 ft** | **5.940 ft** | **-75.549 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8054_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8054_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 8054_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 30916.962 ft | 24083.700 ft | -5007.760 ft | -18728.490 ft |
| **σ:** | | | | 0.017 ft | 0.039 ft | 0.025 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8054_2019_FL (V181) | 0.023 ft | 0.033 ft | 0.040 ft | -0.004 ft | 0.039 ft | 0.007 ft |
| RTCM0603-8054_2019_FL (V190) | 0.031 ft | 0.021 ft | 0.037 ft | -0.001 ft | -0.032 ft | -0.018 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8054_2019_FL (V181) | 0.077 ft | 0.106 ft | 30916.976 ft | 24083.703 ft | -5007.799 ft | -18728.496 ft |
| RTCM0603-8054_2019_FL (V190) | 0.085 ft | 0.145 ft | 30916.947 ft | 24083.701 ft | -5007.727 ft | -18728.471 ft |

## Resultant Coordinates for point:8055_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **813204.200 ft** | **412781.878 ft** | **5.885 ft** | **-75.342 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8055_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8055_2019_FL*
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0603 → 8055_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 14651.155 ft | 9333.175 ft | -3602.583 ft | -10703.718 ft |
| **σ:** | | | | 0.008 ft | 0.019 ft | 0.012 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8055_2019_FL (V184) | 0.008 ft | 0.037 ft | 0.038 ft | -0.001 ft | 0.031 ft | -0.022 ft |
| RTCM0603-8055_2019_FL (V194) | 0.003 ft | 0.039 ft | 0.039 ft | 0.008 ft | -0.034 ft | 0.017 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8055_2019_FL (V184) | 0.060 ft | 0.085 ft | 14651.147 ft | 9333.176 ft | -3602.614 ft | -10703.696 ft |
| RTCM0603-8055_2019_FL (V194) | 0.053 ft | 0.089 ft | 14651.154 ft | 9333.167 ft | -3602.549 ft | -10703.736 ft |

**Resultant Coordinates for point:8056_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| 812277.437 ft | 394586.407 ft | 4.675 ft | -76.127 ft |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191226_YN.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0603 → 8056_2019_FL |  | Enabled | -0.019 ft | 0.008 ft | 0.021 ft | 0.044 ft | 0.044 ft |

*Survey Data used to calculate point:8056_2019_FL*

Precision Confidence Level: **95%**

| GNSS vectors | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0603 → 8056_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 30996.353 ft | 9641.634 ft | -11474.318 ft | -27132.136 ft |
| **σ:** | | | | 0.015 ft | 0.038 ft | 0.021 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8056_2019_FL (V5) | 0.021 ft | 0.044 ft | 0.048 ft | 0.013 ft | 0.039 ft | -0.026 ft |
| RTCM0603-8056_2019_FL (V133) | 0.029 ft | 0.029 ft | 0.041 ft | -0.024 ft | -0.032 ft | 0.010 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8056_2019_FL (V5) | 0.052 ft | 0.073 ft | 30996.341 ft | 9641.622 ft | -11474.356 ft | -27132.111 ft |
| RTCM0603-8056_2019_FL (V133) | 0.059 ft | 0.076 ft | 30996.358 ft | 9641.659 ft | -11474.286 ft | -27132.147 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191226_YN.job) | 812277.437 ft | 394586.407 ft | 4.675 ft | -76.127 ft |

## Resultant Coordinates for point:8057_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|

|  |  |  |  |
|---|---|---|---|
| **844869.285 ft** | **410919.905 ft** | **6.191 ft** | **-76.055 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8057_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8057_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 8057_2019_FL** |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** |  | 42579.338 ft | 40696.210 ft | 793.850 ft | -12497.533 ft |
| **σ:** |  |  | 0.038 ft | 0.098 ft | 0.050 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8057_2019_FL (V146) | 0.050 ft | 0.030 ft | 0.058 ft | 0.002 ft | 0.049 ft | 0.031 ft |
| RTCM0603-8057_2019_FL (V138) | 0.073 ft | 0.075 ft | 0.105 ft | 0.000 ft | -0.099 ft | -0.032 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8057_2019_FL (V146) | 0.096 ft | 0.130 ft | 42579.344 ft | 40696.208 ft | 793.800 ft | -12497.564 ft |
| RTCM0603-8057_2019_FL (V138) | 0.088 ft | 0.145 ft | 42579.330 ft | 40696.210 ft | 793.949 ft | -12497.500 ft |

**8058_2019_FL Point could not be computed.**

**Resultant Coordinates for point:8059_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **802144.208 ft** | **389188.578 ft** | **7.519 ft** | **-72.917 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Local (8059345s.19o.xml) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8059_2019_FL*
Precision Confidence Level: **95%**

| | *Coordinates* | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Local (8059345s.19o.xml) | 802144.208 ft | 389188.578 ft | 7.519 ft | -72.917 ft |

**Resultant Coordinates for point:8060_2019_FL**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **811478.486 ft** | **389212.101 ft** | **7.950 ft** | **-72.719 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191226_YN.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0603 → 8060_2019_FL | | Enabled | -0.001 ft | -0.002 ft | 0.002 ft | 0.063 ft | 0.063 ft |

*Survey Data used to calculate point:8060_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0603 → 8060_2019_FL** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 36063.867 ft | 9214.627 ft | -13885.513 ft | -31982.584 ft |
| **σ:** | | | 0.015 ft | 0.033 ft | 0.020 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8060_2019_FL (V4) | 0.002 ft | 0.063 ft | 0.063 ft | -0.009 ft | 0.057 ft | -0.025 ft |
| RTCM0603-8060_2019_FL (V132) | 0.013 ft | 0.062 ft | 0.063 ft | 0.018 ft | -0.058 ft | 0.018 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-8060_2019_FL (V4) | 0.057 ft | 0.088 ft | 36063.869 ft | 9214.636 ft | -13885.571 ft | -31982.559 ft |
| RTCM0603-8060_2019_FL (V132) | 0.079 ft | 0.097 ft | 36063.856 ft | 9214.609 ft | -13885.455 ft | -31982.602 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191226_YN.job) | 811478.486 ft | 389212.101 ft | 7.950 ft | -72.719 ft |

## Resultant Coordinates for point:8061_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **822897.631 ft** | **418812.056 ft** | **7.828 ft** | **-73.535 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0603 → 8061_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8061_2019_FL*
Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0603 → 8061_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 19240.885 ft | 18491.115 ft | 541.065 ft | -5291.276 ft |
| **σ:** | | | | 0.021 ft | 0.047 ft | 0.031 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8061_2019_FL (V183) | 0.054 ft | 0.011 ft | 0.055 ft | 0.021 ft | 0.015 ft | 0.048 ft |
| RTCM0603-8061_2019_FL (V193) | 0.025 ft | 0.007 ft | 0.026 ft | -0.014 ft | -0.017 ft | -0.014 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8061_2019_FL (V183) | 0.077 ft | 0.096 ft | 19240.878 ft | 18491.094 ft | 541.051 ft | -5291.324 ft |
| RTCM0603-8061_2019_FL (V193) | 0.055 ft | 0.094 ft | 19240.896 ft | 18491.129 ft | 541.082 ft | -5291.262 ft |

### Resultant Coordinates for point:8062_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **860261.533 ft** | **441261.518 ft** | **6.108 ft** | **-76.623 ft** |

| Data | Used to calc. | Status | ∆East (US survey foot) | ∆North (US survey foot) | Distance (Horiz) (US survey foot) | ∆Elevation (US survey foot) | ∆Height (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8062_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8062_2019_FL*

Precision Confidence Level: **95%**

| **GNSS vectors** | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **RTCM0608 → 8062_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 24553.157 ft | 2723.605 ft | -10254.408 ft | -22142.417 ft |
| **σ:** | | | | 0.013 ft | 0.027 ft | 0.017 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8062_2019_FL (V136) | 0.028 ft | 0.042 ft | 0.050 ft | -0.034 ft | 0.035 ft | -0.012 ft |
| RTCM0608-8062_2019_FL (V140) | 0.012 ft | 0.017 ft | 0.021 ft | 0.014 ft | -0.015 ft | 0.003 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8062_2019_FL (V136) | 0.100 ft | 0.113 ft | 24553.165 ft | 2723.638 ft | -10254.444 ft | -22142.405 ft |
| RTCM0608-8062_2019_FL (V140) | 0.049 ft | 0.076 ft | 24553.153 ft | 2723.591 ft | -10254.393 ft | -22142.420 ft |

## Resultant Coordinates for point:8063_2019_FL

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **838568.115 ft** | **470102.459 ft** | **6.687 ft** | **-74.912 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| RTCM0608 → 8063_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:*8063_2019_FL
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → 8063_2019_FL** |  |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** |  |  | 21053.762 ft | -20622.142 ft | -1525.019 ft | 3957.581 ft |
| **σ:** |  |  |  | 0.004 ft | 0.008 ft | 0.005 ft |
|  |  |  |  |  |  |  |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8063_2019_FL (V113) | 0.004 ft | 0.005 ft | 0.007 ft | -0.003 ft | -0.005 ft | 0.003 ft |
| RTCM0608-8063_2019_FL (V120) | 0.008 ft | 0.007 ft | 0.010 ft | 0.006 ft | 0.006 ft | -0.005 ft |
|  |  |  |  |  |  |  |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8063_2019_FL (V113) | 0.054 ft | 0.074 ft | 21053.758 ft | -20622.139 ft | -1525.014 ft | 3957.578 ft |
| RTCM0608-8063_2019_FL (V120) | 0.063 ft | 0.086 ft | 21053.769 ft | -20622.149 ft | -1525.025 ft | 3957.586 ft |

## Resultant Coordinates for point:8064_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **851807.906 ft** | **508278.586 ft** | **4.880 ft** | **-76.766 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0602 → 8064_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:8064_2019_FL*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0602 → 8064_2019_FL** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 20464.188 ft | -8176.437 ft | -9320.242 ft | -16280.723 ft |
| **σ:** | | | | 0.010 ft | 0.023 ft | 0.014 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8064_2019_FL (V54) | 0.016 ft | 0.017 ft | 0.024 ft | 0.008 ft | -0.021 ft | -0.006 ft |
| RTCM0602-8064_2019_FL (V89) | 0.014 ft | 0.018 ft | 0.023 ft | -0.005 ft | 0.022 ft | 0.005 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8064_2019_FL (V54) | 0.049 ft | 0.075 ft | 20464.176 ft | -8176.445 ft | -9320.221 ft | -16280.717 ft |
| RTCM0602-8064_2019_FL (V89) | 0.050 ft | 0.070 ft | 20464.200 ft | -8176.432 ft | -9320.264 ft | -16280.728 ft |

## Resultant Coordinates for point:8065_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **912100.545 ft** | **555617.010 ft** | **3.060 ft** | **-80.095 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0601 → 8065_2019_FL | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0606 → 8065_2019_FL |  | Enabled | -0.021 ft | 0.008 ft | 0.022 ft | -0.067 ft | -0.067 ft |

*Survey Data used to calculate point:8065_2019_FL*
Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**
Max horizontal tolerance of mean: **0.164**
Max vertical tolerance of mean: **0.262**

| **RTCM0601 → 8065_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8065_2019_FL (V97) | 0.094 ft | 0.115 ft | 39539.530 ft | -29468.211 ft | 7362.999 ft | 25313.736 ft |

| **RTCM0606 → 8065_2019_FL** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-8065_2019_FL (V104) | 0.089 ft | 0.113 ft | 42357.153 ft | -14777.642 ft | -19559.395 ft | -34542.435 ft |

## Resultant Coordinates for point:AB7766

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **844151.493 ft** | **581407.141 ft** | **7.658 ft** | **-73.878 ft** |

| Data | Used to calc. | Status | ∆East (US survey foot) | ∆North (US survey foot) | Distance (Horiz) (US survey foot) | ∆Elevation (US survey foot) | ∆Height (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191219_SM.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191218_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0602 → AB7766 | | Enabled | -0.055 ft | -0.006 ft | 0.055 ft | 0.127 ft | 0.127 ft |

*Survey Data used to calculate point:AB7766*

Precision Confidence Level: **95%**

## GNSS vectors

| **RTCM0602 → AB7766** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 57644.616 ft | -20712.910 ft | 20890.603 ft | 49572.773 ft |
| **σ:** | | | 0.008 ft | 0.019 ft | 0.013 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-AB7766 (V71) | 0.022 ft | 0.040 ft | 0.046 ft | -0.024 ft | 0.039 ft | -0.006 ft |
| RTCM0602-AB7766 (V107) | 0.020 ft | 0.010 ft | 0.022 ft | 0.013 ft | -0.015 ft | -0.011 ft |
| RTCM0602-AB7766 (V81) | 0.012 ft | 0.011 ft | 0.016 ft | 0.006 ft | -0.014 ft | -0.005 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0602-AB7766 (V71) | 0.076 ft | 0.086 ft | 57644.598 ft | -20712.885 ft | 20890.564 ft | 49572.778 ft |
| RTCM0602-AB7766 (V107) | 0.079 ft | 0.107 ft | 57644.635 ft | -20712.922 ft | 20890.617 ft | 49572.783 ft |
| RTCM0602-AB7766 (V81) | 0.071 ft | 0.082 ft | 57644.627 ft | -20712.915 ft | 20890.617 ft | 49572.778 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191219_SM.job) | 844151.493 ft | 581407.141 ft | 7.658 ft | -73.878 ft |
| Global (80569_20191218_SM.job) | 844151.493 ft | 581407.141 ft | 7.658 ft | -73.878 ft |

## Resultant Coordinates for point:AC2369

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **934400.788 ft** | **580667.904 ft** | **7.761 ft** | **-76.145 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191218_SM.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191217_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:AC2369*

Precision Confidence Level: **95%**

| | Coordinates | | | |
|---|---|---|---|---|
| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
| Global (80569_20191218_SM.job) | 934400.788 ft | 580667.904 ft | 7.761 ft | -76.145 ft |
| Global (80569_20191217_SM.job) | 934400.788 ft | 580667.904 ft | 7.761 ft | -76.145 ft |

## Resultant Coordinates for point:AC2377

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **936228.013 ft** | **593760.187 ft** | **6.917 ft** | **-76.998 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569_20191219_SM.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191218_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Global (80569_20191217_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0606 → AC2377 | | Enabled | -0.053 ft | 0.009 ft | 0.054 ft | -0.001 ft | -0.001 ft |

*Survey Data used to calculate point:AC2377*
Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0606 → AC2377** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 6480.266 ft | 6399.559 ft | 950.323 ft | -369.294 ft |
| **σ:** | | | | 0.011 ft | 0.022 ft | 0.016 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-AC2377 (V93) | 0.021 ft | 0.015 ft | 0.026 ft | 0.006 ft | -0.004 ft | 0.025 ft |
| RTCM0606-AC2377 (V30) | 0.048 ft | 0.033 ft | 0.058 ft | 0.016 ft | 0.013 ft | -0.055 ft |
| RTCM0606-AC2377 (V62) | 0.027 ft | 0.013 ft | 0.030 ft | -0.018 ft | -0.007 ft | 0.023 ft |
| RTCM0606-AC2377 (V49) | 0.026 ft | 0.030 ft | 0.040 ft | -0.025 ft | 0.031 ft | 0.003 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-AC2377 (V93) | 0.082 ft | 0.079 ft | 6480.263 ft | 6399.554 ft | 950.327 ft | -369.320 ft |
| RTCM0606-AC2377 (V30) | 0.082 ft | 0.091 ft | 6480.246 ft | 6399.543 ft | 950.310 ft | -369.240 ft |
| RTCM0606-AC2377 (V62) | 0.055 ft | 0.062 ft | 6480.287 ft | 6399.578 ft | 950.330 ft | -369.317 ft |
| RTCM0606-AC2377 (V49) | 0.081 ft | 0.139 ft | 6480.287 ft | 6399.584 ft | 950.292 ft | -369.297 ft |

*Coordinates*

| Source | Easting<br>(US survey foot) | Northing<br>(US survey foot) | Elevation<br>(US survey foot) | Height<br>(US survey foot) |
|---|---|---|---|---|
| Global (80569_20191219_SM.job) | 936228.013 ft | 593760.187 ft | 6.917 ft | -76.998 ft |
| Global (80569_20191218_SM.job) | 936228.013 ft | 593760.187 ft | 6.917 ft | -76.998 ft |
| Global (80569_20191217_SM.job) | 936228.013 ft | 593760.187 ft | 6.917 ft | -76.998 ft |

**Resultant Coordinates for point:AC3226**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **860742.273 ft** | **465326.134 ft** | **9.383 ft** | **-73.046 ft** |

| Data | Used to calc. | Status | ∆East (US survey foot) | ∆North (US survey foot) | Distance (Horiz) (US survey foot) | ∆Elevation (US survey foot) | ∆Height (US survey foot) |
|---|---|---|---|---|---|---|---|
| RTCM0608 → AC3226 | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:AC3226*

Precision Confidence Level: **95%**

**GNSS vectors**

| **RTCM0608 → AC3226** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 1634.582 ft | 1572.815 ft | 84.601 ft | -436.982 ft |
| **σ:** | | | | 0.007 ft | 0.016 ft | 0.011 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-AC3226 (V148) | 0.011 ft | 0.012 ft | 0.016 ft | 0.007 ft | 0.015 ft | 0.000 ft |
| RTCM0608-AC3226 (V156) | 0.011 ft | 0.028 ft | 0.030 ft | -0.015 ft | 0.025 ft | -0.009 ft |
| RTCM0608-AC3226 (V163) | 0.017 ft | 0.043 ft | 0.046 ft | 0.012 ft | -0.045 ft | 0.004 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-AC3226 (V148) | 0.057 ft | 0.089 ft | 1634.574 ft | 1572.808 ft | 84.586 ft | -436.982 ft |
| RTCM0608-AC3226 (V156) | 0.063 ft | 0.113 ft | 1634.592 ft | 1572.830 ft | 84.576 ft | -436.973 ft |
| RTCM0608-AC3226 (V163) | 0.063 ft | 0.077 ft | 1634.574 ft | 1572.803 ft | 84.645 ft | -436.986 ft |

## Resultant Coordinates for point:AC4324

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **836007.923 ft** | **421431.355 ft** | **8.652 ft** | **-73.353 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Global (80569-20191219-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:AC4324*

Precision Confidence Level: **95%**

| *Coordinates* | | | | |
|---|---|---|---|---|
| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
| Global (80569-20191219-DR.job) | 836007.923 ft | 421431.355 ft | 8.652 ft | -73.353 ft |

## Resultant Coordinates for point:AC4724

| **Easting** | **Northing** | **Elevation** | **Height** |
|---|---|---|---|
| **871453.041 ft** | **465959.256 ft** | **9.160 ft** | **-73.540 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Global (80569-20191220-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0608 → AC4724 | | Enabled | -0.048 ft | 0.005 ft | 0.048 ft | -0.084 ft | -0.084 ft |

*Survey Data used to calculate point:AC4724*

Precision Confidence Level: **95%**

**GNSS vectors**

| RTCM0608 → AC4724 | | | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| Mean: | | | 12279.090 ft | 12093.254 ft | 2126.411 ft | 87.313 ft |
| σ: | | | | 0.006 ft | 0.014 ft | 0.009 ft |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0608-AC4724 (V201) | 0.012 ft | 0.014 ft | 0.018 ft | 0.004 ft | 0.008 ft | -0.016 ft |
| RTCM0608-AC4724 (V204) | 0.013 ft | 0.000 ft | 0.013 ft | -0.010 ft | 0.002 ft | 0.008 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0608-AC4724 (V201) | 0.042 ft | 0.069 ft | 12279.084 ft | 12093.250 ft | 2126.403 ft | 87.329 ft |
| RTCM0608-AC4724 (V204) | 0.057 ft | 0.062 ft | 12279.099 ft | 12093.264 ft | 2126.409 ft | 87.304 ft |

*Coordinates*

| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
|---|---|---|---|---|
| Global (80569-20191220-DR.job) | 871453.041 ft | 465959.256 ft | 9.160 ft | -73.540 ft |

## Resultant Coordinates for point: DAWAL 3_2019_FL

| Easting | Northing | Elevation | Height |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **812929.317 ft** | **362586.914 ft** | **3.934 ft** | **-76.191 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| Global (80569_20191226_YN.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0603 → DAWAL 3_2019_FL | | Enabled | 0.001 ft | -0.016 ft | 0.016 ft | 0.024 ft | 0.024 ft |

*Survey Data used to calculate point: DAWAL 3_2019_FL*

Precision Confidence Level: **95%**

**GNSS vectors**

| RTCM0603 → DAWAL 3_2019_FL | | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|
| **Mean:** | | 62581.446 ft | 12430.040 ft | -24912.637 ft | -56047.231 ft |
| **σ:** | | | 0.011 ft | 0.026 ft | 0.018 ft |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0603-DAWAL 3_2019_FL (V3) | 0.016 ft | 0.024 ft | 0.029 ft | -0.005 ft | 0.028 ft | 0.004 ft |
| RTCM0603-DAWAL 3_2019_FL (V130) | 0.013 ft | 0.035 ft | 0.037 ft | 0.008 ft | -0.036 ft | 0.004 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0603-DAWAL 3_2019_FL (V3) | 0.053 ft | 0.085 ft | 62581.462 ft | 12430.045 ft | -24912.665 ft | -56047.234 ft |
| RTCM0603-DAWAL 3_2019_FL (V130) | 0.076 ft | 0.091 ft | 62581.433 ft | 12430.032 ft | -24912.601 ft | -56047.234 ft |

*Coordinates*

| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
|---|---|---|---|---|
| Global (80569_20191226_YN.job) | 812929.317 ft | 362586.914 ft | 3.934 ft | -76.191 ft |

**DH961 Point could not be computed.**

**Resultant Coordinates for point:DH9616**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **900996.707 ft** | **527344.573 ft** | **4.414 ft** | **-78.704 ft** |

| **Data** | **Used to calc.** | Status | **ΔEast (US survey foot)** | **ΔNorth (US survey foot)** | **Distance (Horiz) (US survey foot)** | **ΔElevation (US survey foot)** | **ΔHeight (US survey foot)** |
|---|---|---|---|---|---|---|---|
| RTCM0601 → DH9616 | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| RTCM0602 → DH9616 |  | Enabled | 0.021 ft | -0.015 ft | 0.026 ft | -0.079 ft | -0.079 ft |

*Survey Data used to calculate point:DH9616*
Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**
Max horizontal tolerance of mean: **0.164**
Max vertical tolerance of mean: **0.262**

| **RTCM0601 → DH9616** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 39060.423 ft | -38488.944 ft | -6656.725 ft | -76.584 ft |
| **σ:** | | | 0.007 ft | 0.015 ft | 0.009 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V13) | 0.017 ft | 0.116 ft | 0.117 ft | 0.005 ft | -0.100 ft | 0.062 ft |
| RTCM0601-DH9616 (V82) | 0.065 ft | 0.066 ft | 0.093 ft | 0.051 ft | -0.075 ft | -0.019 ft |
| RTCM0601-DH9616 (V21) | 0.036 ft | 0.005 ft | 0.036 ft | -0.025 ft | 0.013 ft | 0.024 ft |
| RTCM0601-DH9616 (V118) | 0.036 ft | 0.126 ft | 0.131 ft | -0.055 ft | 0.108 ft | -0.049 ft |
| RTCM0601-DH9616 (V180) | 0.029 ft | 0.013 ft | 0.031 ft | -0.010 ft | -0.002 ft | -0.030 ft |
| RTCM0601-DH9616 (V134) | 0.035 ft | 0.057 ft | 0.066 ft | -0.024 ft | -0.059 ft | 0.018 ft |
| RTCM0601-DH9616 (V50) | 0.018 ft | 0.054 ft | 0.057 ft | -0.011 ft | 0.056 ft | -0.008 ft |
| RTCM0601-DH9616 (V128) | 0.031 ft | 0.016 ft | 0.035 ft | -0.026 ft | 0.020 ft | 0.013 ft |
| RTCM0601-DH9616 (V116) | 0.034 ft | 0.015 ft | 0.037 ft | -0.029 ft | 0.019 ft | 0.014 ft |

| | | | | | | |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V12) | 0.045 ft | 0.037 ft | 0.058 ft | 0.042 ft | -0.039 ft | -0.010 ft |
| RTCM0601-DH9616 (V29) | 0.013 ft | 0.031 ft | 0.034 ft | -0.014 ft | 0.022 ft | -0.021 ft |
| RTCM0601-DH9616 (V18) | 0.044 ft | 0.009 ft | 0.045 ft | 0.033 ft | 0.025 ft | 0.017 ft |
| RTCM0601-DH9616 (V145) | 0.016 ft | 0.022 ft | 0.027 ft | 0.012 ft | 0.024 ft | -0.006 ft |
| RTCM0601-DH9616 (V61) | 0.038 ft | 0.063 ft | 0.074 ft | 0.014 ft | 0.046 ft | -0.056 ft |
| RTCM0601-DH9616 (V177) | 0.030 ft | 0.026 ft | 0.040 ft | 0.022 ft | -0.031 ft | -0.012 ft |
| RTCM0601-DH9616 (V154) | 0.038 ft | 0.182 ft | 0.186 ft | 0.049 ft | -0.172 ft | 0.050 ft |
| RTCM0601-DH9616 (V178) | 0.022 ft | 0.039 ft | 0.045 ft | 0.004 ft | 0.027 ft | -0.035 ft |
| RTCM0601-DH9616 (V92) | 0.029 ft | 0.050 ft | 0.058 ft | 0.009 ft | -0.032 ft | 0.048 ft |
| RTCM0601-DH9616 (V200) | 0.111 ft | 0.017 ft | 0.113 ft | 0.070 ft | 0.062 ft | 0.063 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V13) | 0.080 ft | 0.084 ft | 39060.411 ft | -38488.949 ft | -6656.625 ft | -76.646 ft |
| RTCM0601-DH9616 (V82) | 0.044 ft | 0.064 ft | 39060.460 ft | -38488.995 ft | -6656.650 ft | -76.565 ft |
| RTCM0601-DH9616 (V21) | 0.056 ft | 0.071 ft | 39060.401 ft | -38488.919 ft | -6656.738 ft | -76.608 ft |
| RTCM0601-DH9616 (V118) | 0.037 ft | 0.061 ft | 39060.387 ft | -38488.889 ft | -6656.833 ft | -76.535 ft |
| RTCM0601-DH9616 (V180) | 0.068 ft | 0.122 ft | 39060.413 ft | -38488.934 ft | -6656.723 ft | -76.554 ft |

| | | | | | | |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V134) | 0.043 ft | 0.059 ft | 39060.389 ft | -38488.919 ft | -6656.666 ft | -76.602 ft |
| RTCM0601-DH9616 (V50) | 0.047 ft | 0.067 ft | 39060.422 ft | -38488.933 ft | -6656.781 ft | -76.576 ft |
| RTCM0601-DH9616 (V128) | 0.055 ft | 0.088 ft | 39060.401 ft | -38488.918 ft | -6656.745 ft | -76.597 ft |
| RTCM0601-DH9616 (V116) | 0.047 ft | 0.069 ft | 39060.398 ft | -38488.915 ft | -6656.744 ft | -76.598 ft |
| RTCM0601-DH9616 (V12) | 0.086 ft | 0.121 ft | 39060.457 ft | -38488.985 ft | -6656.686 ft | -76.574 ft |
| RTCM0601-DH9616 (V29) | 0.049 ft | 0.075 ft | 39060.413 ft | -38488.930 ft | -6656.748 ft | -76.563 ft |
| RTCM0601-DH9616 (V18) | 0.050 ft | 0.069 ft | 39060.460 ft | -38488.977 ft | -6656.750 ft | -76.602 ft |
| RTCM0601-DH9616 (V145) | 0.094 ft | 0.123 ft | 39060.439 ft | -38488.956 ft | -6656.749 ft | -76.578 ft |
| RTCM0601-DH9616 (V61) | 0.078 ft | 0.107 ft | 39060.445 ft | -38488.958 ft | -6656.771 ft | -76.528 ft |
| RTCM0601-DH9616 (V177) | 0.081 ft | 0.116 ft | 39060.439 ft | -38488.965 ft | -6656.694 ft | -76.572 ft |
| RTCM0601-DH9616 (V154) | 0.051 ft | 0.088 ft | 39060.442 ft | -38488.993 ft | -6656.553 ft | -76.634 ft |
| RTCM0601-DH9616 (V178) | 0.055 ft | 0.105 ft | 39060.432 ft | -38488.948 ft | -6656.752 ft | -76.549 ft |
| RTCM0601-DH9616 (V92) | 0.100 ft | 0.125 ft | 39060.426 ft | -38488.952 ft | -6656.693 ft | -76.632 ft |
| RTCM0601-DH9616 (V200) | 0.094 ft | 0.109 ft | 39060.502 ft | -38489.013 ft | -6656.787 ft | -76.647 ft |
| | | | | | | |
| **RTCM0602 → DH9616** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 39666.410 ft | 39034.688 ft | 7019.602 ft | 665.135 ft |
| **σ:** | | | | 0.011 ft | 0.029 ft | 0.016 ft |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-DH9616 (V6) | 0.054 ft | 0.026 ft | 0.060 ft | 0.045 ft | 0.021 ft | -0.033 ft |
| RTCM0602-DH9616 (V123) | 0.033 ft | 0.022 ft | 0.040 ft | -0.036 ft | 0.017 ft | -0.003 ft |
| RTCM0602-DH9616 (V115) | 0.004 ft | 0.050 ft | 0.050 ft | 0.004 ft | -0.045 ft | 0.022 ft |
| RTCM0602-DH9616 (V122) | 0.014 ft | 0.027 ft | 0.030 ft | 0.001 ft | 0.019 ft | -0.023 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-DH9616 (V6) | 0.053 ft | 0.096 ft | 39666.362 ft | 39034.642 ft | 7019.580 ft | 665.169 ft |
| RTCM0602-DH9616 (V123) | 0.046 ft | 0.072 ft | 39666.442 ft | 39034.724 ft | 7019.584 ft | 665.138 ft |
| RTCM0602-DH9616 (V115) | 0.045 ft | 0.091 ft | 39666.413 ft | 39034.684 ft | 7019.647 ft | 665.113 ft |
| RTCM0602-DH9616 (V122) | 0.067 ft | 0.094 ft | 39666.406 ft | 39034.687 ft | 7019.583 ft | 665.159 ft |

**Resultant Coordinates for point:RTCM0402**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **872652.675 ft** | **650079.865 ft** | **32.241 ft** | **-50.348 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Global (80569_20191219_SM.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8007_2019_FL → RTCM0402 | | Enabled | 0.062 ft | 0.079 ft | 0.101 ft | 0.018 ft | 0.018 ft |
| 8008_2019_FL → RTCM0402 | | Enabled | -0.022 ft | 0.005 ft | 0.022 ft | -0.002 ft | -0.002 ft |
| Global (80569_20191218_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191216_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:RTCM0402*

Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **8007_2019_FL → RTCM0402** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0402-8007_2019_FL (V77) | 0.077 ft | 0.145 ft | 64433.217 ft | 2355.210 ft | -28239.766 ft | -57867.159 ft |

| **8008_2019_FL → RTCM0402** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0402-8008_2019_FL (V78) | 0.085 ft | 0.111 ft | 59768.005 ft | 8346.134 ft | -25108.933 ft | -53591.958 ft |

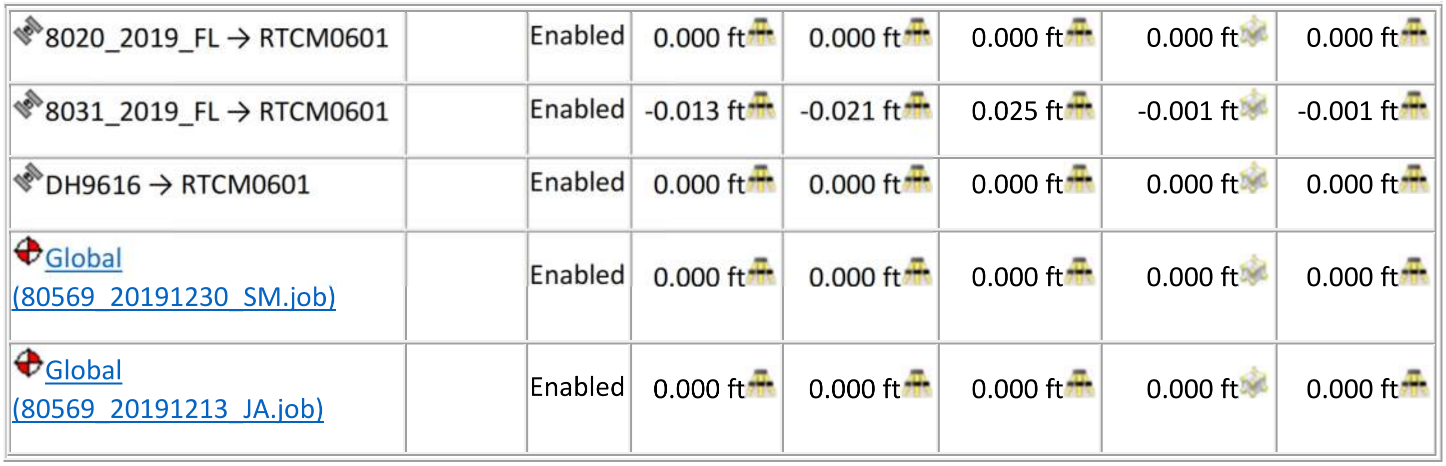
*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569_20191219_SM.job) | 872652.675 ft | 650079.865 ft | 32.241 ft | -50.348 ft |
| Global (80569_20191218_SM.job) | 872652.675 ft | 650079.865 ft | 32.241 ft | -50.348 ft |
| Global (80569_20191216_JA.job) | 872652.675 ft | 650079.865 ft | 32.241 ft | -50.348 ft |

## Resultant Coordinates for point:RTCM0601

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569-20191219-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191217_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191218_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191219_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191219_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191220_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191223_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191226_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191216_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191227_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569-20191218-DR.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8039_2019_FL → RTCM0601 | | Enabled | 0.031 ft | -0.024 ft | 0.039 ft | 0.032 ft | 0.032 ft |
| 8065_2019_FL → RTCM0601 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8018_2019_FL → RTCM0601 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8020_2019_FL → RTCM0601 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8031_2019_FL → RTCM0601 | | Enabled | -0.013 ft | -0.021 ft | 0.025 ft | -0.001 ft | -0.001 ft |
| DH9616 → RTCM0601 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191230_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191213_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:RTCM0601*
Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**
Max horizontal tolerance of mean: **0.164**
Max vertical tolerance of mean: **0.262**

| **8039_2019_FL → RTCM0601** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8039_2019_FL (V58) | 0.080 ft | 0.120 ft | 41492.963 ft | -36571.367 ft | -13332.306 ft | -14368.395 ft |

| **8065_2019_FL → RTCM0601** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8065_2019_FL (V97) | 0.094 ft | 0.115 ft | 39539.530 ft | -29468.211 ft | 7362.999 ft | 25313.736 ft |

| **8018_2019_FL → RTCM0601** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8018_2019_FL (V95) | 0.103 ft | 0.141 ft | 41823.775 ft | -18181.300 ft | 14049.596 ft | 34946.778 ft |

| **8020_2019_FL → RTCM0601** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0601-8020_2019_FL (V165) | 0.082 ft | 0.099 ft | 47991.523 ft | -43456.159 ft | 2447.218 ft | 20217.805 ft |

| **8031_2019_FL → RTCM0601** | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|
| **Mean:** | | 33315.555 ft | 32533.356 ft | 6770.311 ft | 2381.140 ft |

| | | | | | | |
|---|---|---|---|---|---|---|
| σ: | | | | 0.020 ft | 0.053 ft | 0.027 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8031_2019_FL (V14) | 0.046 ft | 0.029 ft | 0.054 ft | -65066.742 ft | -13540.617 ft | -4762.325 ft |
| RTCM0601-8031_2019_FL (V8) | 0.025 ft | 0.001 ft | 0.025 ft | -65066.701 ft | -13540.612 ft | -4762.260 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-8031_2019_FL (V14) | 0.115 ft | 0.154 ft | 33315.586 ft | -32533.386 ft | -6770.306 ft | -2381.185 ft |
| RTCM0601-8031_2019_FL (V8) | 0.083 ft | 0.145 ft | 33315.540 ft | -32533.345 ft | -6770.301 ft | -2381.121 ft |
| | | | | | | |
| **DH9616 → RTCM0601** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 39060.423 ft | 38488.944 ft | 6656.725 ft | 76.584 ft |
| σ: | | | | 0.007 ft | 0.015 ft | 0.009 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0601-DH9616 (V13) | 0.017 ft | 0.116 ft | 0.117 ft | -76977.893 ft | -13313.350 ft | -153.230 ft |
| RTCM0601-DH9616 (V82) | 0.065 ft | 0.066 ft | 0.093 ft | -76977.938 ft | -13313.375 ft | -153.150 ft |
| RTCM0601-DH9616 (V21) | 0.036 ft | 0.005 ft | 0.036 ft | -76977.863 ft | -13313.463 ft | -153.192 ft |
| RTCM0601-DH9616 (V118) | 0.036 ft | 0.126 ft | 0.131 ft | -76977.833 ft | -13313.558 ft | -153.119 ft |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V180) | 0.029 ft | 0.013 ft | 0.031 ft | -76977.878 ft | -13313.449 ft | -153.138 ft |
| RTCM0601-DH9616 (V134) | 0.035 ft | 0.057 ft | 0.066 ft | -76977.863 ft | -13313.391 ft | -153.186 ft |
| RTCM0601-DH9616 (V50) | 0.018 ft | 0.054 ft | 0.057 ft | -76977.876 ft | -13313.506 ft | -153.160 ft |
| RTCM0601-DH9616 (V128) | 0.031 ft | 0.016 ft | 0.035 ft | -76977.861 ft | -13313.470 ft | -153.181 ft |
| RTCM0601-DH9616 (V116) | 0.034 ft | 0.015 ft | 0.037 ft | -76977.858 ft | -13313.469 ft | -153.182 ft |
| RTCM0601-DH9616 (V12) | 0.045 ft | 0.037 ft | 0.058 ft | -76977.929 ft | -13313.411 ft | -153.158 ft |
| RTCM0601-DH9616 (V29) | 0.013 ft | 0.031 ft | 0.034 ft | -76977.873 ft | -13313.473 ft | -153.147 ft |
| RTCM0601-DH9616 (V18) | 0.044 ft | 0.009 ft | 0.045 ft | -76977.920 ft | -13313.475 ft | -153.186 ft |
| RTCM0601-DH9616 (V145) | 0.016 ft | 0.022 ft | 0.027 ft | -76977.899 ft | -13313.474 ft | -153.162 ft |
| RTCM0601-DH9616 (V61) | 0.038 ft | 0.063 ft | 0.074 ft | -76977.901 ft | -13313.496 ft | -153.112 ft |
| RTCM0601-DH9616 (V177) | 0.030 ft | 0.026 ft | 0.040 ft | -76977.909 ft | -13313.419 ft | -153.156 ft |
| RTCM0601-DH9616 (V154) | 0.038 ft | 0.182 ft | 0.186 ft | -76977.937 ft | -13313.278 ft | -153.218 ft |
| RTCM0601-DH9616 (V178) | 0.022 ft | 0.039 ft | 0.045 ft | -76977.891 ft | -13313.477 ft | -153.133 ft |
| RTCM0601-DH9616 (V92) | 0.029 ft | 0.050 ft | 0.058 ft | -76977.896 ft | -13313.418 ft | -153.216 ft |
| RTCM0601-DH9616 (V200) | 0.111 ft | 0.017 ft | 0.113 ft | -76977.957 ft | -13313.512 ft | -153.231 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V13) | 0.080 ft | 0.084 ft | 39060.411 ft | -38488.949 ft | -6656.625 ft | -76.646 ft |
| RTCM0601-DH9616 (V82) | 0.044 ft | 0.064 ft | 39060.460 ft | -38488.995 ft | -6656.650 ft | -76.565 ft |
| RTCM0601-DH9616 (V21) | 0.056 ft | 0.071 ft | 39060.401 ft | -38488.919 ft | -6656.738 ft | -76.608 ft |

| | | | | | | |
|---|---|---|---|---|---|---|
| RTCM0601-DH9616 (V118) | 0.037 ft | 0.061 ft | 39060.387 ft | -38488.889 ft | -6656.833 ft | -76.535 ft |
| RTCM0601-DH9616 (V180) | 0.068 ft | 0.122 ft | 39060.413 ft | -38488.934 ft | -6656.723 ft | -76.554 ft |
| RTCM0601-DH9616 (V134) | 0.043 ft | 0.059 ft | 39060.389 ft | -38488.919 ft | -6656.666 ft | -76.602 ft |
| RTCM0601-DH9616 (V50) | 0.047 ft | 0.067 ft | 39060.422 ft | -38488.933 ft | -6656.781 ft | -76.576 ft |
| RTCM0601-DH9616 (V128) | 0.055 ft | 0.088 ft | 39060.401 ft | -38488.918 ft | -6656.745 ft | -76.597 ft |
| RTCM0601-DH9616 (V116) | 0.047 ft | 0.069 ft | 39060.398 ft | -38488.915 ft | -6656.744 ft | -76.598 ft |
| RTCM0601-DH9616 (V12) | 0.086 ft | 0.121 ft | 39060.457 ft | -38488.985 ft | -6656.686 ft | -76.574 ft |
| RTCM0601-DH9616 (V29) | 0.049 ft | 0.075 ft | 39060.413 ft | -38488.930 ft | -6656.748 ft | -76.563 ft |
| RTCM0601-DH9616 (V18) | 0.050 ft | 0.069 ft | 39060.460 ft | -38488.977 ft | -6656.750 ft | -76.602 ft |
| RTCM0601-DH9616 (V145) | 0.094 ft | 0.123 ft | 39060.439 ft | -38488.956 ft | -6656.749 ft | -76.578 ft |
| RTCM0601-DH9616 (V61) | 0.078 ft | 0.107 ft | 39060.445 ft | -38488.958 ft | -6656.771 ft | -76.528 ft |
| RTCM0601-DH9616 (V177) | 0.081 ft | 0.116 ft | 39060.439 ft | -38488.965 ft | -6656.694 ft | -76.572 ft |
| RTCM0601-DH9616 (V154) | 0.051 ft | 0.088 ft | 39060.442 ft | -38488.993 ft | -6656.553 ft | -76.634 ft |
| RTCM0601-DH9616 (V178) | 0.055 ft | 0.105 ft | 39060.432 ft | -38488.948 ft | -6656.752 ft | -76.549 ft |
| RTCM0601-DH9616 (V92) | 0.100 ft | 0.125 ft | 39060.426 ft | -38488.952 ft | -6656.693 ft | -76.632 ft |
| RTCM0601-DH9616 (V200) | 0.094 ft | 0.109 ft | 39060.502 ft | -38489.013 ft | -6656.787 ft | -76.647 ft |

*Coordinates*

| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
|---|---|---|---|---|
| Global (80569-20191219-DR.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191217_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191218_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |

| | | | | |
|---|---|---|---|---|
| Global (80569_20191219_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191219_SM.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191220_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191223_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191226_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191216_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191227_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569-20191218-DR.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191230_SM.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |
| Global (80569_20191213_JA.job) | 940056.856 ft | 527654.427 ft | 33.591 ft | -50.886 ft |

**Resultant Coordinates for point:RTCM0602**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **861341.768 ft** | **526386.032 ft** | **32.258 ft** | **-49.564 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569-20191218-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191217_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191217_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191218_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191218_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191219_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| Global (80569_20191219_SM.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191220_JA.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191223_JA.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191226_JA.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191227_JA.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191230_SM.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| AB7766 → RTCM0602 |  | Enabled | 0.055 ft | 0.006 ft | 0.055 ft | -0.127 ft | -0.127 ft |
| 8007_2019_FL → RTCM0602 |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8011_2019_FL → RTCM0602 |  | Enabled | -0.036 ft | 0.001 ft | 0.036 ft | 0.041 ft | 0.041 ft |
| 8037_2019_FL → RTCM0602 |  | Enabled | 0.048 ft | -0.036 ft | 0.060 ft | -0.032 ft | -0.032 ft |
| 6017_2019_FL → RTCM0602 |  | Enabled | 0.020 ft | 0.076 ft | 0.078 ft | -0.056 ft | -0.056 ft |
| 8020_2019_FL → RTCM0602 |  | Enabled | 0.008 ft | 0.032 ft | 0.033 ft | -0.053 ft | -0.053 ft |
| 8039_2019_FL → RTCM0602 |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| DH9616 → RTCM0602 |  | Enabled | -0.021 ft | 0.015 ft | 0.026 ft | 0.079 ft | 0.079 ft |
| Global (80569_20191216_JA.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191213_JA.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:RTCM0602*

Precision Confidence Level: **95%**

## GNSS vectors

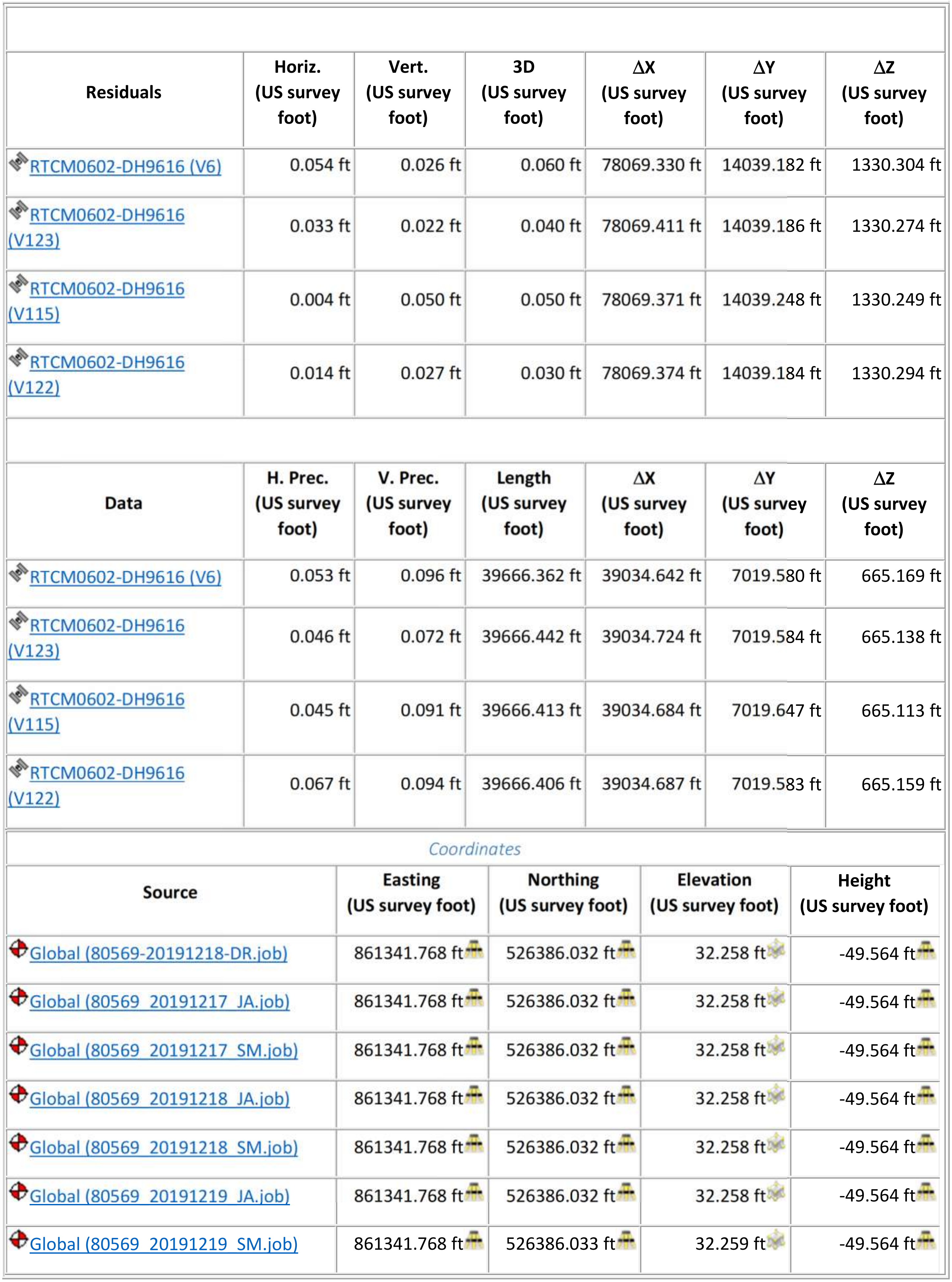
**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **AB7766 → RTCM0602** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 57644.616 ft | 20712.910 ft | -20890.603 ft | -49572.773 ft |
| **σ:** | | | | 0.008 ft | 0.019 ft | 0.013 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-AB7766 (V71) | 0.022 ft | 0.040 ft | 0.046 ft | -41425.795 ft | 41781.167 ft | 99145.551 ft |
| RTCM0602-AB7766 (V107) | 0.020 ft | 0.010 ft | 0.022 ft | -41425.832 ft | 41781.220 ft | 99145.556 ft |
| RTCM0602-AB7766 (V81) | 0.012 ft | 0.011 ft | 0.016 ft | -41425.825 ft | 41781.220 ft | 99145.551 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-AB7766 (V71) | 0.076 ft | 0.086 ft | 57644.598 ft | -20712.885 ft | 20890.564 ft | 49572.778 ft |
| RTCM0602-AB7766 (V107) | 0.079 ft | 0.107 ft | 57644.635 ft | -20712.922 ft | 20890.617 ft | 49572.783 ft |
| RTCM0602-AB7766 (V81) | 0.071 ft | 0.082 ft | 57644.627 ft | -20712.915 ft | 20890.617 ft | 49572.778 ft |
| | | | | | | |
| **8007_2019_FL → RTCM0602** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8007_2019_FL (V67) | 0.103 ft | 0.151 ft | 60007.412 ft | 5042.240 ft | 27095.725 ft | 53303.724 ft |
| | | | | | | |

| 8011_2019_FL → RTCM0602 | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-8011_2019_FL (V48) | 0.097 ft | 0.133 ft | 75334.406 ft | 45864.491 ft | 32524.305 ft | 50138.715 ft |
| | | | | | | |
| **8037_2019_FL → RTCM0602** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8037_2019_FL (V88) | 0.065 ft | 0.103 ft | 36641.744 ft | -0.914 ft | -16069.469 ft | -32930.071 ft |
| | | | | | | |
| **6017_2019_FL → RTCM0602** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-6017_2019_FL (V172) | 0.104 ft | 0.154 ft | 57745.929 ft | 40564.615 ft | 23511.841 ft | 33709.015 ft |
| | | | | | | |
| **8020_2019_FL → RTCM0602** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8020_2019_FL (V171) | 0.078 ft | 0.129 ft | 43126.163 ft | 34067.479 ft | 16123.674 ft | 20959.482 ft |
| | | | | | | |
| **8039_2019_FL → RTCM0602** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0602-8039_2019_FL (V22) | 0.072 ft | 0.112 ft | 43161.227 ft | 40952.238 ft | 344.122 ft | -13626.715 ft |
| | | | | | | |
| **DH9616 → RTCM0602** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 39666.410 ft | -39034.688 ft | -7019.602 ft | -665.135 ft |
| **σ:** | | | | 0.011 ft | 0.029 ft | 0.016 ft |



| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-DH9616 (V6) | 0.054 ft | 0.026 ft | 0.060 ft | 78069.330 ft | 14039.182 ft | 1330.304 ft |
| RTCM0602-DH9616 (V123) | 0.033 ft | 0.022 ft | 0.040 ft | 78069.411 ft | 14039.186 ft | 1330.274 ft |
| RTCM0602-DH9616 (V115) | 0.004 ft | 0.050 ft | 0.050 ft | 78069.371 ft | 14039.248 ft | 1330.249 ft |
| RTCM0602-DH9616 (V122) | 0.014 ft | 0.027 ft | 0.030 ft | 78069.374 ft | 14039.184 ft | 1330.294 ft |

| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0602-DH9616 (V6) | 0.053 ft | 0.096 ft | 39666.362 ft | 39034.642 ft | 7019.580 ft | 665.169 ft |
| RTCM0602-DH9616 (V123) | 0.046 ft | 0.072 ft | 39666.442 ft | 39034.724 ft | 7019.584 ft | 665.138 ft |
| RTCM0602-DH9616 (V115) | 0.045 ft | 0.091 ft | 39666.413 ft | 39034.684 ft | 7019.647 ft | 665.113 ft |
| RTCM0602-DH9616 (V122) | 0.067 ft | 0.094 ft | 39666.406 ft | 39034.687 ft | 7019.583 ft | 665.159 ft |

*Coordinates*

| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
|---|---|---|---|---|
| Global (80569-20191218-DR.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191217_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191217_SM.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191218_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191218_SM.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191219_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191219_SM.job) | 861341.768 ft | 526386.033 ft | 32.259 ft | -49.564 ft |

|  |  |  |  |  |
|---|---|---|---|---|
| Global (80569_20191220_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191223_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191226_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191227_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191230_SM.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191216_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |
| Global (80569_20191213_JA.job) | 861341.768 ft | 526386.032 ft | 32.258 ft | -49.564 ft |

**Resultant Coordinates for point:RTCM0603**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **804549.427 ft** | **424602.993 ft** | **18.087 ft** | **-62.802 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569-20191219-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 5006_2019_FL → RTCM0603 |  | Enabled | 0.019 ft | 0.028 ft | 0.034 ft | -0.018 ft | -0.018 ft |
| 5010_2019_FL → RTCM0603 |  | Enabled | 0.040 ft | -0.018 ft | 0.044 ft | -0.060 ft | -0.060 ft |
| DAWAL 3_2019_FL → RTCM0603 |  | Enabled | -0.001 ft | 0.016 ft | 0.016 ft | -0.024 ft | -0.024 ft |
| 8060_2019_FL → RTCM0603 |  | Enabled | 0.001 ft | 0.002 ft | 0.002 ft | -0.063 ft | -0.063 ft |
| 8056_2019_FL → RTCM0603 |  | Enabled | 0.019 ft | -0.008 ft | 0.021 ft | -0.044 ft | -0.044 ft |
| 8046_2019_FL → RTCM0603 |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20200102_SM.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191230_SM.job) |  | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Global (80569_20191227_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191226_YN.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191212_YN.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:RTCM0603*
Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**
Max horizontal tolerance of mean: **0.164**
Max vertical tolerance of mean: **0.262**

| **5006_2019_FL → RTCM0603** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 79726.177 ft | -32888.634 ft | 26949.863 ft | 67441.129 ft |
| **σ:** | | | | 0.019 ft | 0.042 ft | 0.027 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-5006_2019_FL (V1) | 0.034 ft | 0.018 ft | 0.038 ft | 65777.254 ft | -53899.757 ft | -134882.277 ft |
| RTCM0603-5006_2019_FL (V131) | 0.029 ft | 0.003 ft | 0.029 ft | 65777.281 ft | -53899.710 ft | -134882.238 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0603-5006_2019_FL (V1) | 0.054 ft | 0.085 ft | 79726.197 ft | 32888.620 ft | -26949.894 ft | -67441.147 ft |
| RTCM0603-5006_2019_FL (V131) | 0.072 ft | 0.083 ft | 79726.159 ft | 32888.647 ft | -26949.847 ft | -67441.108 ft |

| **5010_2019_FL → RTCM0603** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 62607.248 ft | -12648.261 ft | 24874.632 ft | 56044.104 ft |
| **σ:** | | | | 0.021 ft | 0.053 ft | 0.035 ft |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-5010_2019_FL (V2) | 0.044 ft | 0.060 ft | 0.075 ft | 25296.491 ft | -49749.317 ft | -112088.166 ft |
| RTCM0603-5010_2019_FL (V129) | 0.022 ft | 0.033 ft | 0.039 ft | 25296.538 ft | -49749.236 ft | -112088.231 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-5010_2019_FL (V2) | 0.054 ft | 0.087 ft | 62607.224 ft | 12648.229 ft | -24874.684 ft | -56044.062 ft |
| RTCM0603-5010_2019_FL (V129) | 0.067 ft | 0.082 ft | 62607.260 ft | 12648.276 ft | -24874.604 ft | -56044.127 ft |
| | | | | | | |
| **DAWAL 3_2019_FL → RTCM0603** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** | | | 62581.446 ft | -12430.040 ft | 24912.637 ft | 56047.231 ft |
| **σ:** | | | | 0.011 ft | 0.026 ft | 0.018 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-DAWAL 3_2019_FL (V3) | 0.016 ft | 0.024 ft | 0.029 ft | 24860.085 ft | -49825.302 ft | -112094.465 ft |
| RTCM0603-DAWAL 3_2019_FL (V130) | 0.013 ft | 0.035 ft | 0.037 ft | 24860.071 ft | -49825.237 ft | -112094.465 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| RTCM0603-DAWAL3_2019_FL (V3) | 0.053 ft | 0.085 ft | 62581.462 ft | 12430.045 ft | -24912.665 ft | -56047.234 ft |
| RTCM0603-DAWAL3_2019_FL (V130) | 0.076 ft | 0.091 ft | 62581.433 ft | 12430.032 ft | -24912.601 ft | -56047.234 ft |
|  |  |  |  |  |  |  |
| **8060_2019_FL → RTCM0603** |  |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** |  |  | 36063.867 ft | -9214.627 ft | 13885.513 ft | 31982.584 ft |
| **σ:** |  |  |  | 0.015 ft | 0.033 ft | 0.020 ft |
|  |  |  |  |  |  |  |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8060_2019_FL (V4) | 0.002 ft | 0.063 ft | 0.063 ft | 18429.263 ft | -27771.084 ft | -63965.143 ft |
| RTCM0603-8060_2019_FL (V132) | 0.013 ft | 0.062 ft | 0.063 ft | 18429.236 ft | -27770.969 ft | -63965.185 ft |
|  |  |  |  |  |  |  |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0603-8060_2019_FL (V4) | 0.057 ft | 0.088 ft | 36063.869 ft | 9214.636 ft | -13885.571 ft | -31982.559 ft |
| RTCM0603-8060_2019_FL (V132) | 0.079 ft | 0.097 ft | 36063.856 ft | 9214.609 ft | -13885.455 ft | -31982.602 ft |
|  |  |  |  |  |  |  |
| **8056_2019_FL → RTCM0603** |  |  | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| **Mean:** |  |  | 30996.353 ft | -9641.634 ft | 11474.318 ft | 27132.136 ft |
| **σ:** |  |  |  | 0.015 ft | 0.038 ft | 0.021 ft |
|  |  |  |  |  |  |  |

| Residuals | Horiz. (US survey foot) | Vert. (US survey foot) | 3D (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0603-8056_2019_FL (V5) | 0.021 ft | 0.044 ft | 0.048 ft | 19283.256 ft | -22948.674 ft | -54264.247 ft |
| RTCM0603-8056_2019_FL (V133) | 0.029 ft | 0.029 ft | 0.041 ft | 19283.293 ft | -22948.604 ft | -54264.283 ft |

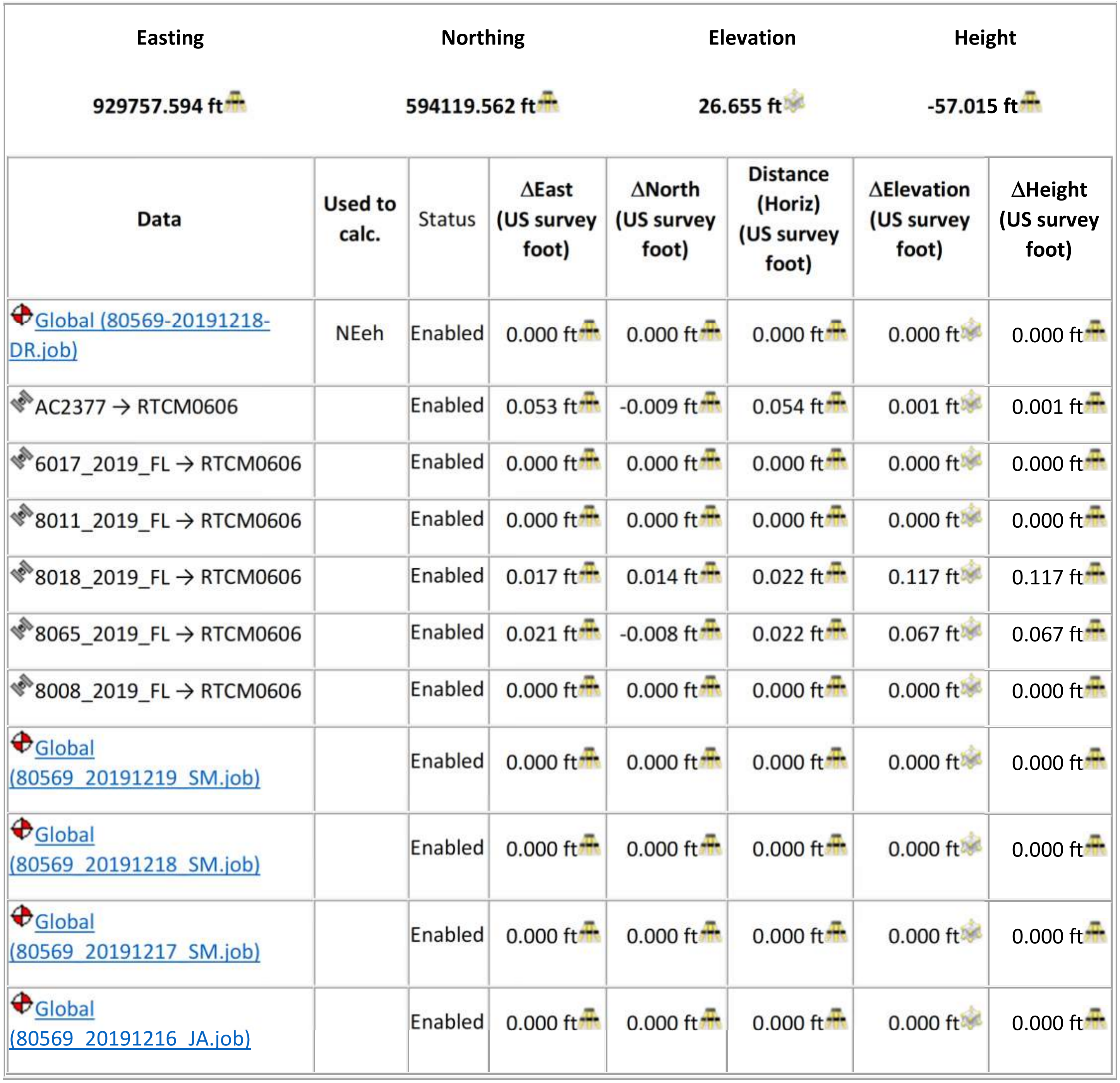
| Data | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0603-8056_2019_FL (V5) | 0.052 ft | 0.073 ft | 30996.341 ft | 9641.622 ft | -11474.356 ft | -27132.111 ft |
| RTCM0603-8056_2019_FL (V133) | 0.059 ft | 0.076 ft | 30996.358 ft | 9641.659 ft | -11474.286 ft | -27132.147 ft |

| 8046_2019_FL → RTCM0603 | H. Prec. (US survey foot) | V. Prec. (US survey foot) | Length (US survey foot) | ΔX (US survey foot) | ΔY (US survey foot) | ΔZ (US survey foot) |
|---|---|---|---|---|---|---|
| RTCM0603-8046_2019_FL (V159) | 0.072 ft | 0.110 ft | 44295.714 ft | 17892.693 ft | 20066.583 ft | 35203.609 ft |

*Coordinates*

| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
|---|---|---|---|---|
| Global (80569-20191219-DR.job) | 804549.427 ft | 424602.993 ft | 18.087 ft | -62.802 ft |
| Global (80569_20200102_SM.job) | 804549.427 ft | 424602.993 ft | 18.087 ft | -62.802 ft |
| Global (80569_20191230_SM.job) | 804549.427 ft | 424602.993 ft | 18.087 ft | -62.802 ft |
| Global (80569_20191227_JA.job) | 804549.427 ft | 424602.993 ft | 18.087 ft | -62.802 ft |
| Global (80569_20191226_YN.job) | 804549.427 ft | 424602.993 ft | 18.087 ft | -62.802 ft |
| Global (80569_20191212_YN.job) | 804549.427 ft | 424602.993 ft | 18.087 ft | -62.802 ft |

**Resultant Coordinates for point:RTCM0606**



| Easting | Northing | Elevation | Height |
|---|---|---|---|
| 929757.594 ft | 594119.562 ft | 26.655 ft | -57.015 ft |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569-20191218-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| AC2377 → RTCM0606 | | Enabled | 0.053 ft | -0.009 ft | 0.054 ft | 0.001 ft | 0.001 ft |
| 6017_2019_FL → RTCM0606 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8011_2019_FL → RTCM0606 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8018_2019_FL → RTCM0606 | | Enabled | 0.017 ft | 0.014 ft | 0.022 ft | 0.117 ft | 0.117 ft |
| 8065_2019_FL → RTCM0606 | | Enabled | 0.021 ft | -0.008 ft | 0.022 ft | 0.067 ft | 0.067 ft |
| 8008_2019_FL → RTCM0606 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191219_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191218_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191217_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191216_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:RTCM0606*

Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **AC2377 → RTCM0606** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 6480.266 ft | -6399.559 ft | -950.323 ft | 369.294 ft |
| **σ:** | | | | 0.011 ft | 0.022 ft | 0.016 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-AC2377 (V93) | 0.021 ft | 0.015 ft | 0.026 ft | 12799.113 ft | 1900.650 ft | -738.614 ft |
| RTCM0606-AC2377 (V30) | 0.048 ft | 0.033 ft | 0.058 ft | 12799.103 ft | 1900.633 ft | -738.534 ft |
| RTCM0606-AC2377 (V62) | 0.027 ft | 0.013 ft | 0.030 ft | 12799.137 ft | 1900.653 ft | -738.612 ft |
| RTCM0606-AC2377 (V49) | 0.026 ft | 0.030 ft | 0.040 ft | 12799.144 ft | 1900.615 ft | -738.592 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0606-AC2377 (V93) | 0.082 ft | 0.079 ft | 6480.263 ft | 6399.554 ft | 950.327 ft | -369.320 ft |
| RTCM0606-AC2377 (V30) | 0.082 ft | 0.091 ft | 6480.246 ft | 6399.543 ft | 950.310 ft | -369.240 ft |
| RTCM0606-AC2377 (V62) | 0.055 ft | 0.062 ft | 6480.287 ft | 6399.578 ft | 950.330 ft | -369.317 ft |
| RTCM0606-AC2377 (V49) | 0.081 ft | 0.139 ft | 6480.287 ft | 6399.584 ft | 950.292 ft | -369.297 ft |

| **6017_2019_FL → RTCM0606** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| RTCM0606-6017_2019_FL (V166) | 0.084 ft | 0.115 ft | 38869.822 ft | -22268.494 ft | -17086.973 ft | -26888.893 ft |
| | | | | | | |
| **8011_2019_FL → RTCM0606** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8011_2019_FL (V38) | 0.064 ft | 0.080 ft | 21506.339 ft | -16968.582 ft | -8074.381 ft | -10459.168 ft |
| | | | | | | |
| **8018_2019_FL → RTCM0606** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8018_2019_FL (V102) | 0.079 ft | 0.101 ft | 28255.456 ft | -3490.728 ft | -12872.834 ft | -24909.350 ft |
| | | | | | | |
| **8065_2019_FL → RTCM0606** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8065_2019_FL (V104) | 0.089 ft | 0.113 ft | 42357.153 ft | -14777.642 ft | -19559.395 ft | -34542.435 ft |
| | | | | | | |
| **8008_2019_FL → RTCM0606** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0606-8008_2019_FL (V68) | 0.065 ft | 0.103 ft | 52914.272 ft | -51799.859 ft | -10372.142 ft | -3018.864 ft |

*Coordinates*

| Source | Easting (US survey foot) | Northing (US survey foot) | Elevation (US survey foot) | Height (US survey foot) |
|---|---|---|---|---|
| Global (80569-20191218-DR.job) | 929757.594 ft | 594119.562 ft | 26.655 ft | -57.015 ft |
| Global (80569_20191219_SM.job) | 929757.594 ft | 594119.562 ft | 26.656 ft | -57.014 ft |
| Global (80569_20191218_SM.job) | 929757.594 ft | 594119.562 ft | 26.655 ft | -57.015 ft |
| Global (80569_20191217_SM.job) | 929757.594 ft | 594119.562 ft | 26.655 ft | -57.015 ft |

| | | | | |
|---|---|---|---|---|
| Global (80569_20191216_JA.job) | 929757.594 ft | 594119.562 ft | 26.655 ft | -57.015 ft |

**Resultant Coordinates for point:RTCM0608**

| Easting | Northing | Elevation | Height |
|---|---|---|---|
| **859175.262 ft** | **465790.411 ft** | **36.471 ft** | **-45.899 ft** |

| Data | Used to calc. | Status | ΔEast (US survey foot) | ΔNorth (US survey foot) | Distance (Horiz) (US survey foot) | ΔElevation (US survey foot) | ΔHeight (US survey foot) |
|---|---|---|---|---|---|---|---|
| Global (80569-20191220-DR.job) | NEeh | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| AC4724 → RTCM0608 | | Enabled | 0.048 ft | -0.005 ft | 0.048 ft | 0.083 ft | 0.083 ft |
| 8037_2019_FL → RTCM0608 | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| 8045_2019_FL → RTCM0608 | | Enabled | 0.004 ft | 0.001 ft | 0.004 ft | 0.018 ft | 0.018 ft |
| 8046_2019_FL → RTCM0608 | | Enabled | 0.032 ft | -0.012 ft | 0.034 ft | -0.027 ft | -0.027 ft |
| Global (80569_20200102_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191230_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191227_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191226_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191223_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191220_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191219_SM.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |
| Global (80569_20191219_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Global<br>(80569_20191218_JA.job) | | Enabled | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft | 0.000 ft |

*Survey Data used to calculate point:RTCM0608*

Precision Confidence Level: **95%**

## GNSS vectors

**Tolerance of meaned vectors (US survey foot)**

Max horizontal tolerance of mean: **0.164**

Max vertical tolerance of mean: **0.262**

| **AC4724 → RTCM0608** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| **Mean:** | | | 12279.090 ft | -12093.254 ft | -2126.411 ft | -87.313 ft |
| **σ:** | | | | 0.006 ft | 0.014 ft | 0.009 ft |

| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-AC4724 (V201) | 0.012 ft | 0.014 ft | 0.018 ft | 24186.504 ft | 4252.815 ft | 174.641 ft |
| RTCM0608-AC4724 (V204) | 0.013 ft | 0.000 ft | 0.013 ft | 24186.518 ft | 4252.821 ft | 174.617 ft |

| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-AC4724 (V201) | 0.042 ft | 0.069 ft | 12279.084 ft | 12093.250 ft | 2126.403 ft | 87.329 ft |
| RTCM0608-AC4724 (V204) | 0.057 ft | 0.062 ft | 12279.099 ft | 12093.264 ft | 2126.409 ft | 87.304 ft |

| **8037_2019_FL → RTCM0608** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|
| RTCM0608-8037_2019_FL (V111) | 0.055 ft | 0.062 ft | 24043.349 ft | -1975.298 ft | 10244.523 ft | 21661.731 ft |

| **8045_2019_FL → RTCM0608** | | | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| **Mean:** | | | 17513.003 ft | -2132.285 ft | -7924.415 ft | -15471.337 ft |
| **σ:** | | | | 0.013 ft | 0.027 ft | 0.014 ft |
| | | | | | | |
| **Residuals** | **Horiz. (US survey foot)** | **Vert. (US survey foot)** | **3D (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8045_2019_FL (V124) | 0.037 ft | 0.189 ft | 0.192 ft | 4264.631 ft | 15848.675 ft | 30942.768 ft |
| RTCM0608-8045_2019_FL (V143) | 0.004 ft | 0.000 ft | 0.004 ft | 4264.569 ft | 15848.829 ft | 30942.670 ft |
| RTCM0608-8045_2019_FL (V144) | 0.008 ft | 0.041 ft | 0.042 ft | 4264.556 ft | 15848.868 ft | 30942.658 ft |
| | | | | | | |
| **Data** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8045_2019_FL (V124) | 0.097 ft | 0.154 ft | 17513.023 ft | 2132.346 ft | 7924.259 ft | 15471.431 ft |
| RTCM0608-8045_2019_FL (V143) | 0.044 ft | 0.061 ft | 17512.998 ft | 2132.284 ft | 7924.414 ft | 15471.333 ft |
| RTCM0608-8045_2019_FL (V144) | 0.051 ft | 0.071 ft | 17513.004 ft | 2132.272 ft | 7924.452 ft | 15471.322 ft |
| | | | | | | |
| **8046_2019_FL → RTCM0608** | **H. Prec. (US survey foot)** | **V. Prec. (US survey foot)** | **Length (US survey foot)** | **ΔX (US survey foot)** | **ΔY (US survey foot)** | **ΔZ (US survey foot)** |
| RTCM0608-8046_2019_FL (V162) | 0.092 ft | 0.110 ft | 33879.032 ft | -33217.787 ft | -6423.133 ft | -1763.742 ft |

*Coordinates*

| **Source** | **Easting (US survey foot)** | **Northing (US survey foot)** | **Elevation (US survey foot)** | **Height (US survey foot)** |
|---|---|---|---|---|
| Global (80569-20191220-DR.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20200102_SM.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |

| | | | | |
|---|---|---|---|---|
| Global (80569_20191230_SM.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191227_JA.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191226_JA.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191223_JA.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191220_JA.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191219_SM.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191219_JA.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |
| Global (80569_20191218_JA.job) | 859175.262 ft | 465790.411 ft | 36.471 ft | -45.899 ft |

| | | |
|---|---|---|
| Date: 2/10/2020 3:08:45 PM | Project: C:\Users\perazzo\Desktop\Projects\80569_Miami_Dade_Ortho_2019\Trimble\80569.vce | Trimble Business Center |

</body></html>

# Appendix D

**PROJ. No.** 2020572
**POINT ID** VVA1
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 594,457.164
**EASTING** 882,305.969

**LATITUDE** 25°58'02.842744"N
**LONGITUDE** 80°18'42.104775"W
**CONVERGENCE** 54°36'30.326"
**SCALE FACTOR** 1.000003400781

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -74.8384
**ELEV** 7.56

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED 240' HEADING SOUTH OF THE INTERSATION FLAMINGO RD AND SILVER DALLS BLVD

**MONUMENT DESCRIPTION:**

SET_60D NL/1

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°49'24.739190"N |
| **POINT ID** | VVA10 | **LONGITUDE** | 80°10'46.882578"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°40'54.344" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000028514614 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 542,396.939 | **ELL. HEIGHT** | -80.2309 |
| **EASTING** | 926,004.806 | **ELEV** | 3.44 |
| **HORZ. DATUM** | 83/11 | | |

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 600' APPROXIMATELY 600' HEADING EAST OF THE INTERSATION OF THE NE 7TH AVE AND NE 52ND TH INSIDE OF THE Morningside Park

**MONUMENT DESCRIPTION:**

SET_60D NL /10

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

GPI

LiDAR | Photogrammetry | Asset Management

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°52'06.103900"N |
| **POINT ID** | VVA11 | **LONGITUDE** | 80°07'14.851589"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°38'54.637" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000040658648 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 558,814.332 | **ELL. HEIGHT** | -75.9709 |
| **EASTING** | 945,270.844 | **ELEV** | 8.39 |
| **HORZ. DATUM** | | 83/11 | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 145'HEADING EAST APPROXIMATELY 140' HEADING EAST OF THE INTERSATION OF THE 83RD ST AND COLLINGS AVE INSIDE OF North Shore Open Space Park

**MONUMENT DESCRIPTION:**

SET_60D NL /11

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI**

LiDAR | Photogrammetry | Asset Management

| | |
|---|---|
| **PROJ. No.** | 2020572 |
| **POINT ID** | VVA12 |
| **DATE** | 4/9/2021 |
| **COUNTY** | MIAMI DADE |
| **ROAD ID** | N/A |
| **UNITS** | US SURVEY FEET |
| **NORTHING** | 486,367.329 |
| **EASTING** | 826,859.139 |

| | |
|---|---|
| **LATITUDE** | 25°40"14.773186"N |
| **LONGITUDE** | 80°28'54.299752"W |
| **CONVERGENCE** | 54°48'4.582" |
| **SCALE FACTOR** | 0.999978197312 |
| **ELEVATION DETERMINATION** | GPS |
| **VERT. DATUM** | 88 |
| **ELL. HEIGHT** | -75.3709 |
| **ELEV** | 5.79 |

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 155' HEADING WEST APPROXIMATELY OF THE INNTERSATION SW 177 AVE SW 100TH ST

**MONUMENT DESCRIPTION:**

SET_60 D NL/12

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI** LiDAR | Photogrammetry | Asset Management

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°47'37.912877"N |
| **POINT ID** | VVA13 | **LONGITUDE** | 80°15'21.578994"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°42'28.994" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000013696134 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 531,462.211 | **ELL. HEIGHT** | -79.367 |
| **EASTING** | 900,964.748 | **ELEV** | 3.55 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 45' HEADING EAST OF THE INTERSATION OF THE NW 37TH AVE AND NW 20TH ST

**MONUMENT DESCRIPTION:**

SET_60D NL /13

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI**

LiDAR | Photogrammetry | Asset Management

**PROJ. No.** 2020572
**POINT ID** VVA14
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 498,248.601
**EASTING** 933,975.213

**LATITUDE** 25°42'06.986965"N
**LONGITUDE** 80°09'22.753864"W
**CONVERGENCE** 54°45'1.437"
**SCALE FACTOR** 1.000033590007

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -81.6482
**ELEV** 2.89

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED 1342' HEADING EAST OF THE INTERSATION OF THE RICKENBACKER CIR AND CRANDON BLVD

**MONUMENT DESCRIPTION:**
SET_60D NL /14

**REFERENCES** **DIST (ft)** **AZIMUTH**

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°45'38.915393"N |
| **POINT ID** | VVA15 | **LONGITUDE** | 80°26'59.123342"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°44'47.091" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.99998243983 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 519,134.919 | **ELL. HEIGHT** | -76.3554 |
| **EASTING** | 837,260.428 | **ELEV** | 4.96 |
| **HORZ. DATUM** | 83/11 | | |

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 270' APPROXIMATELY HEADING WEST ALONG OD THE SW 8TH ST WITH THE INTERSECTION OF THE SW 147TH AVE

**MONUMENT DESCRIPTION:**

SET_60 D NL/15

**REFERENCES** **DIST (ft)** **AZIMUTH**

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

| | |
|---|---|
| **PROJ. No.** | 2020572 |
| **POINT ID** | VVA16 |
| **DATE** | 4/9/2021 |
| **COUNTY** | MIAMI DADE |
| **ROAD ID** | N/A |
| **UNITS** | US SURVEY FEET |
| **NORTHING** | 505,172.124 |
| **EASTING** | 854,313.641 |

| | |
|---|---|
| **LATITUDE** | 25°43'19.879484"N |
| **LONGITUDE** | 80°23'53.293037"W |
| **CONVERGENCE** | 54°45'46.727" |
| **SCALE FACTOR** | 0.999989823655 |
| **ELEVATION DETERMINATION** | GPS |
| **VERT. DATUM** | 88 |
| **ELL. HEIGHT** | -75.6707 |
| **ELEV** | 6.11 |

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 380' APPROXIMATELY HEADING EAST OF THE INTERSATION OF THE SW 127TH ST SW 47TH STREET

**MONUMENT DESCRIPTION:**

SET_60 D NL/16

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°41'53.569083"N |
| **POINT ID** | VVA17 | **LONGITUDE** | 80°18'41.559508"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°46'15.341" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000003594761 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 496,597.519 | **ELL. HEIGHT** | -72.7307 |
| **EASTING** | 882,868.138 | **ELEV** | 9.98 |
| **HORZ. DATUM** | | 83/11 | |

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED APPROXIMATELY 515' HEADING SOUTH SW 76TH ST INSIDE OF THE Trinity Pineland County Park

**MONUMENT DESCRIPTION:**

SET_60 D NL/17

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°45'38.853570"N |
| **POINT ID** | VVA18 | **LONGITUDE** | 80°49'40.442250"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°47'0.167" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999948193033 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 518,787.711 | **ELL. HEIGHT** | -69.7023 |
| **EASTING** | 712,806.783 | **ELEV** | 9.53 |

**HORZ. DATUM** 83/11

---

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 465' APPROXIMATELY HEADING SOUTH OF THE INTERSATION OF THE TAMIAMI TRAIL E, ALONG OF TH LOOP RD BIG CYPRESS NATIONAL PRESERVE (SR94)

**MONUMENT DESCRIPTION:**

SET_60 D NL/18

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

---

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25 °42'46.875385"N |
| **POINT ID** | VVA19 | **LONGITUDE** | 80°27'09.465635"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°46'33.683" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999981965211 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 501,761.977 | **ELL. HEIGHT** | -73.9946 |
| **EASTING** | 836,386.964 | **ELEV** | 7.33 |
| **HORZ. DATUM** | 83/11 | | |

---

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 830' APPROXIMATELY HEADING EAST OF THE INTERSATION OF THE MILLER RD AND SW 162ND AVE

**MONUMENT DESCRIPTION:**

SET_60 D NL/19

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

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**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°56'24.574184"N |
| **POINT ID** | VVA2 | **LONGITUDE** | 80°09'37.754549"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°36'39.616" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000032125822 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 584,825.432 | **ELL. HEIGHT** | -76.6754 |
| **EASTING** | 932,050.454 | **ELEV** | 7.14 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED APPROXIMATELY 100' HEADING NORTH OF THE NE 20TH AVE WITH THE INTERSATION NE 178TH ST

**MONUMENT DESCRIPTION:**

SET_60D NL/2

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**PROJ. No.** 2020572
**POINT ID** VVA20
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 468,964.538
**EASTING** 812,228.991

**LATITUDE** 25°37'22.940891"N
**LONGITUDE** 80°31'34.886013"W
**CONVERGENCE** 54°50'4.66"
**SCALE FACTOR** 0.99997272187

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -75.503
**ELEV** 5.37

**HORZ. DATUM** 83/11

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED APPROXIMATELY 50' HEADING EAST ALONG SW 152ND ST WITH THE INTERSECTION WITH SW 206TH AVE

**MONUMENT DESCRIPTION:**

SET_60D NL/20

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

**GPI**

LiDAR | Photogrammetry | Asset Management

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°37'32.877189"N |
| **POINT ID** | VVA21 | **LONGITUDE** | 80°24'05.307864"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°49'18.068" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999989294165 |
| **ROAD ID** | N/A | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 470,134.189 | **ELL. HEIGHT** | -73.4983 |
| **EASTING** | 853,373.410 | **ELEV** | 8.62 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED APPROXIMATELY 500' HEADING EAST ALONG SW 152ND ST THE INTERSATION WITH SW 130TH PL

**MONUMENT DESCRIPTION:**

SET_60D NL/21

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI** LiDAR | Photogrammetry | Asset Management

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°34'50.215386"N |
| **POINT ID** | VVA22 | **LONGITUDE** | 80°26'19.443073"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°51'11.034" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999983937619 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 453,658.531 | **ELL. HEIGHT** | -73.3654 |
| **EASTING** | 841,166.039 | **ELEV** | 8.56 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED APPROXIMATELY 330' HEADING WEST ALONG OF THE SW 20TH ST WITH THE INTERSATION SW 152ND AVE

**MONUMENT DESCRIPTION:**

SET_60D NL/22

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

LiDAR | Photogrammetry | Asset Management

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°36'39.053885"N |
| **POINT ID** | VVA23 | **LONGITUDE** | 80°18'35.259587"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°49'17.479" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.00000388722 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 464,847.169 | **ELL. HEIGHT** | -70.7493 |
| **EASTING** | 883,610.020 | **ELEV** | 12.46 |
| **HORZ. DATUM** | 83/11 | | |

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 150' APPROXIMATELY HEADING EAST WITH THE INTERSATION OF OLD CUTLER TRAIL AND SW 173RD ST

**MONUMENT DESCRIPTION:**

SET_60D NL/23

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
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**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°32'40.326250"N |
| **POINT ID** | VVA24 | **LONGITUDE** | 80°21'03.187857"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°51'54.878" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999997537304 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 440,677.264 | **ELL. HEIGHT** | -80.0434 |
| **EASTING** | 870,186.762 | **ELEV** | 3.01 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 1060' APPROXIMATELY HEADING WEST ALONG SW 240TH ST WITH THE INTERSATION SW 97TH AVE

**MONUMENT DESCRIPTION:**

SET_60D NL/24

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|---|---|---|
| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°27'45.400473"N |
| **POINT ID** | VVA25R | **LONGITUDE** | 80°20'47.815539"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°54'47.159" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999998240642 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 410,909.298 | **ELL. HEIGHT** | -78.7251 |
| **EASTING** | 871,740.898 | **ELEV** | 4.36 |

**HORZ. DATUM** 83/11

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 250' APPROXIMATELY HEADING SOUTH N CANAL PATH WITH THE INTERSATION L-31 E/BISCAYNE TRAIL

**MONUMENT DESCRIPTION:**

SET_60 D NL/25R

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI** LiDAR | Photogrammetry | Asset Management

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°26'04.638833"N |
| **POINT ID** | VVA26R | **LONGITUDE** | 80°21'14.041239"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°55'41.039" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999997183224 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 400,725.055 | **ELL. HEIGHT** | -80.8138 |
| **EASTING** | 869,386.580 | **ELEV** | 2.05 |
| **HORZ. DATUM** | | 83/11 | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 470' APPROXIMATELY HEADING WEST OF ALONG LUCILE DR WITH THE INTERSATION WITH L-31E / BISCAYNE TRAIL

**MONUMENT DESCRIPTION:**

SET_60 D NL/26R

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°24'13.423692"N |
| **POINT ID** | VVA27 | **LONGITUDE** | 80°32'31.554620"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°57'55.06" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999970964393 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 389,240.459 | **ELL. HEIGHT** | -74.9189 |
| **EASTING** | 807,316.643 | **ELEV** | 5.70 |
| **HORZ. DATUM** | | 83/11 | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 145' APPROXIMATELY HEADING WEST ALONG INGRAHAM HWY WITH THE INTERSECTION OF THE SW 217TH AVE

**MONUMENT DESCRIPTION:**

SET_60 D NL/27

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°26'13.681133"N |
| **POINT ID** | VVA28 | **LONGITUDE** | 80°28'30.739355"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°56'20.35" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999979252284 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 401,462.231 | **ELL. HEIGHT** | -76.8555 |
| **EASTING** | 829,350.215 | **ELEV** | 4.70 |
| **HORZ. DATUM** | 83/11 | | |

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NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 70' APPROXIMATELY HEADING EAST ALONG SE 177TH AVE WITH THE INTERSATION S DIXIE HWY

**MONUMENT DESCRIPTION:**

SET_60 D NL/28

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

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**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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**PROJ. No.** 2020572
**POINT ID** VVA29
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 415,760.768
**EASTING** 806,752.324

**LATITUDE** 25°28'36.136298"N
**LONGITUDE** 80°32'36.719106"W
**CONVERGENCE** 54°55'25.353"
**SCALE FACTOR** 0.999970793247

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -75.4304
**ELEV** 5.53

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED 400' APPROXIMATELY HEADING WEST ALONG CAMPBEL DR WITH THE INTERSATION SW 217TH AVE

**MONUMENT DESCRIPTION:**
SET_60 D NL/29

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

**PROJ. No.** 2020572
**POINT ID** VVA3
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 570,330.309
**EASTING** 857,254.190

**HORZ. DATUM** 83/11

**LATITUDE** 25°54 05.112499"N
**LONGITUDE** 80°23'17.827881"W
**CONVERGENCE** 54°39'19.606"
**SCALE FACTOR** 0.999991347449

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -79.4113
**ELEV** 2.42

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED 360' APPROXIMATELY HEADING SOUTH ALONG NW 118TH AVE WITH N OKKECHOOBEE RD

**MONUMENT DESCRIPTION:**

SET_60D NL/3

**REFERENCES** **DIST (ft)** **AZIMUTH**

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

**GPI**

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|---|---|
| **PROJ. No.** | 2020572 |
| **POINT ID** | VVA30 |
| **DATE** | 4/9/2021 |
| **COUNTY** | MIAMI DADE |
| **ROAD ID** | N/A |
| **UNITS** | US SURVEY FEET |
| **NORTHING** | 442,357.396 |
| **EASTING** | 805,142.356 |

| | |
|---|---|
| **LATITUDE** | 25°32'59.637646"N |
| **LONGITUDE** | 80°32'53.301710"W |
| **CONVERGENCE** | 54°52'56.036" |
| **SCALE FACTOR** | 0.999970245901 |
| **ELEVATION DETERMINATION** | GPS |
| **VERT. DATUM** | 88 |
| **ELL. HEIGHT** | -75.5577 |
| **ELEV** | 5.30 |

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BELOCATED 320' APPROXIMATELY HEADING EAST ALONG SW 232ND ST WITH THE INTERSATION SW 170TH AVE

**MONUMENT DESCRIPTION:**

SET_60D NL/30

**REFERENCES** **DIST (ft)** **AZIMUTH**

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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|---|---|
| **PROJ. No.** | 2020572 |
| **POINT ID** | VVA31 |
| **DATE** | 4/9/2021 |
| **COUNTY** | MIAMI DADE |
| **ROAD ID** | N/A |
| **UNITS** | US SURVEY FEET |
| **NORTHING** | 434,021.894 |
| **EASTING** | 833,666.752 |

| | |
|---|---|
| **LATITUDE** | 25°31'36.020494"N |
| **LONGITUDE** | 80°27'42.216227"W |
| **CONVERGENCE** | 54°53'9.775" |
| **SCALE FACTOR** | 0.999980992423 |
| **ELEVATION DETERMINATION** | GPS |
| **VERT. DATUM** | 88 |
| **ELL. HEIGHT** | -76.9556 |
| **ELEV** | 4.90 |

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED 470' APPROXIMATELY HEADING NORTH ALONG SW 167TH AVE WITH THE INTERSATION SW 259TH ST

**MONUMENT DESCRIPTION:**

SET_60 D NL/31

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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|---|---|
| **PROJ. No.** | 2020572 |
| **POINT ID** | VVA32 |
| **DATE** | 4/9/2021 |
| **COUNTY** | MIAMI DADE |
| **ROAD ID** | N/A |
| **UNITS** | US SURVEY FEET |
| **NORTHING** | 524,081.322 |
| **EASTING** | 942,217.110 |

| | |
|---|---|
| **LATITUDE** | 25°46'22.308765"N |
| **LONGITUDE** | 80°07'50.793795"W |
| **CONVERGENCE** | 54°42'23.818" |
| **SCALE FACTOR** | 1.000038520763 |
| **ELEVATION DETERMINATION** | GPS |
| **VERT. DATUM** | 88 |
| **ELL. HEIGHT** | -73.351 |
| **ELEV** | 11.13 |

**HORZ. DATUM** 83/11

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 510' APPROXIMATELY HEADING EAST ALONG 4TH ST WITH THE INTERSATION OCEAN DR

**MONUMENT DESCRIPTION:**

SET_60D NL /32

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

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| **PROJ. No.** | 2020572 | **LATITUDE** | 25°46'07.548011"N |
| **POINT ID** | VVA33 | **LONGITUDE** | 80°22'02.034987"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°43'55.707" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999994485221 |
| **ROAD ID** | N/A | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 522,147.552 | **ELL. HEIGHT** | -74.7957 |
| **EASTING** | 864,407.317 | **ELEV** | 7.16 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 580' APPROXIMATELY HEADING EAST ALONG W FLAGLER ST WITH THE INTERSATION NEW 107TH AVE

**MONUMENT DESCRIPTION:**

SET_60 D NL/33

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI** LiDAR | Photogrammetry | Asset Management

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°31'07.224725"N |
| **POINT ID** | VVA34 | **LONGITUDE** | 80°23'16.699594"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°52'54.786" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999991580335 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 431,219.977 | **ELL. HEIGHT** | -76.9895 |
| **EASTING** | 858,001.882 | **ELEV** | 5.71 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 140' HEANDING NORTH ALONG SW 122ND AVE WITH THE INTERSATION WITH SW 268TH ST

**MONUMENT DESCRIPTION:**

SET_60 D NL/34

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI**

LiDAR | Photogrammetry | Asset Management

**PROJ. No.** 2020572
**POINT ID** VVA35
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 512,427.805
**EASTING** 913,236.814

**LATITUDE** 25°44'28.686035"N
**LONGITUDE** 80°13'08.549757"W
**CONVERGENCE** 54°44'5.943"
**SCALE FACTOR** 1.00002074211

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -79.001
**ELEV** 4.54

**HORZ. DATUM** 83/11

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED APPROXIMATELY 60' APPRIMATELY ALONG S MIAMI AVE WITH THE INTERSATION WITH GLENCOE ST

**MONUMENT DESCRIPTION:**

SET_60D NL /35

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

GPI

LiDAR | Photogrammetry | Asset Management

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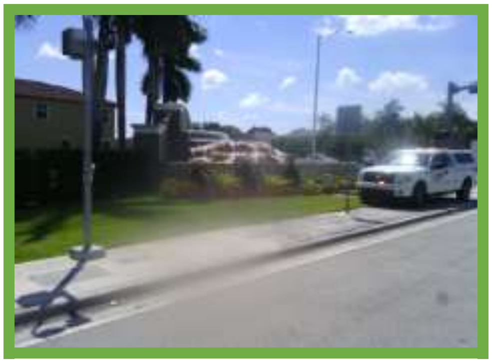
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°50'27.475098"N |
| **POINT ID** | VVA4 | **LONGITUDE** | 80°22'56.035228"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°41'29.928" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 0.999992140905 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 548,366.585 | **ELL. HEIGHT** | -75.7039 |
| **EASTING** | 859,347.578 | **ELEV** | 6.13 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED APPROXIMATELY 100' HEADING NORTH ALONG NW 114TH AVE WITH THE INTERSATION NW 74TH ST

**MONUMENT DESCRIPTION:**

SET_60D NL /4

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**PROJ. No.** 2020572
**POINT ID** VVA5
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 571,859.526
**EASTING** 878,483.000

**LATITUDE** 25°54'19.226034"N
**LONGITUDE** 80°19'25.270501"W
**CONVERGENCE** 54°38'51.345"
**SCALE FACTOR** 1.000001465227

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -75.4591
**ELEV** 6.80

**HORZ. DATUM** 83/11

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**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED APPROXIMATELY 270' HEADING EAST ALONG NW 145TH ST WITH THE INTERSATION PALMETTO EXPY

**MONUMENT DESCRIPTION:**
SET_60D NL/5

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

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|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°55'51.309097"N |
| **POINT ID** | VVA7 | **LONGITUDE** | 80°15'42.517743"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°37'36.976" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000012358181 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 576,129.955 | **ELL. HEIGHT** | -77.069 |
| **EASTING** | 934,555.858 | **ELEV** | 2.84 |
| **HORZ. DATUM** | | 83/11 | |

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED APPROXIMATELY 50' HEADING WEST ALONG NW 172ND TERRANCE WITH THE INTERSATION NW 37TH CT

**MONUMENT DESCRIPTION:**

SET_60D NL/6

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

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| **PROJ. No.** | 2020572 |
| **POINT ID** | VVA6 |
| **DATE** | 4/9/2021 |
| **COUNTY** | MIAMI DADE |
| **ROAD ID** | N/A |
| **UNITS** | US SURVEY FEET |
| **NORTHING** | 581,266.294 |
| **EASTING** | 898,770.976 |
| **HORZ. DATUM** | 83/11 |

| | |
|---|---|
| **LATITUDE** | 25°54 58.294964"N |
| **LONGITUDE** | 80°09'10.926470"W |
| **CONVERGENCE** | 54°37'41.733" |
| **SCALE FACTOR** | 1.000033928913 |
| **ELEVATION DETERMINATION** | GPS |
| **VERT. DATUM** | 88 |
| **ELL. HEIGHT** | -81.0661 |
| **ELEV** | 5.70 |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 310' APPROXIMATELY HEADING NORTH ALONG BISCAYNE LANDING BLVD WITH THE INTERSATION NE 151ST ST

**MONUMENT DESCRIPTION:**

SET_60D NL/6

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

**GPI**

LiDAR | Photogrammetry | Asset Management

**PROJ. No.** 2020572
**POINT ID** VVA8
**DATE** 4/9/2021
**COUNTY** MIAMI DADE
**ROAD ID** N/A

**UNITS** US SURVEY FEET
**NORTHING** 563,946.606
**EASTING** 909,191.737

**HORZ. DATUM** 83/11

**LATITUDE** 25°52'59.178240"N
**LONGITUDE** 80°13'49.490355"W
**CONVERGENCE** 54°39'13.836"
**SCALE FACTOR** 1.000018054616

**ELEVATION DETERMINATION** GPS
**VERT. DATUM** 88
**ELL. HEIGHT** -72.3325
**ELEV** 10.71

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
THIS POINT WILL BE LOCATED 110' APPROXIMATELY HEADING EAST ALONG NW 117TH ST WITH THE INTERSATION NW 19TH AVE

**MONUMENT DESCRIPTION:**

SET_60D NL/8

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**
**DATE APPROVED:**

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2020572 | **LATITUDE** | 25°52'25.496228"N |
| **POINT ID** | VVA9 | **LONGITUDE** | 80°10'42.441917"W |
| **DATE** | 4/9/2021 | **CONVERGENCE** | 54°39'7.417" |
| **COUNTY** | MIAMI DADE | **SCALE FACTOR** | 1.000028377748 |
| **ROAD ID** | N/A | | |
| | | **ELEVATION DETERMINATION** | GPS |
| **UNITS** | US SURVEY FEET | **VERT. DATUM** | 88 |
| **NORTHING** | 560,649.470 | **ELL. HEIGHT** | -73.618 |
| **EASTING** | 926,296.485 | **ELEV** | 9.99 |
| **HORZ. DATUM** | 83/11 | | |

NOT AVAILABLE

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

THIS POINT WILL BE LOCATED 70'APROXIMATELY HEADING EAST ALONGTHE RAILROAD WITH THE INTERSATION NE 107TH ST

**MONUMENT DESCRIPTION:**

SET_60D NL/9

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|

**CHECKED BY:**

**APRROVED BY:**

**DATE APPROVED:**

GPI #: 2020572.00

ITD MIAMI
Dade County
Aerial Targets
File: 0572.00 SM A

□: SM
φ : JS

Leica: TS-16 _ CS-20
NAVD_88 / NAD 83-11

04/05/2021
FB: 60MIA020
☀ 78°

| STA | HI | CODE | Epochs | SATS | Point ID | Residual. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1000 | 2M | CSTMD | 180 | 15 | PNC01 | H: 0.096 V: 0.065<br>Base – | FMD Alumn Disk IN CHON. STMD "148-86-19-PNC01." |
| 5000 | 2M | AT | 180 | 12 | VVA1 | FLD6 | Set 60.D NL. NO ID. |
| 5001 | 2M | AT | 180 | 11 | VVA-1 | FLND | ″ |
| 5002 | 2M | AT | 180 | 14 | VVA-6 | FLND | Set 60D NL NO ID |
| 5003 | 2M | AT | 180 | 15 | VVA-6 | FLD6 | ″ |
| 5004 | 2M | AT | 180 | 15 | VVA-2 | FLND | Set 60.D NL NO ID. |
| 5005 | 2M | AT | 180 | 13 | VVA-2 | FLMB | ″ |
| 5006 | 2M | AT | 180 | 13 | VVA-7 | FLMB | Set 60.D NL NO ID |
| 5007 | 2M | AT | 180 | 14 | VVA-7 | FLND | ″ |
| 5008 | 2M | AT | 180 | 17 | VVA-9 | FLND | Set 60D NL NO ID. |
| 5009 | 2M | AT | 180 | 16 | VVA-9 | FLMB | ″ |
| 5010 | 2M | AT | 180 | 15 | VVA-8 | FLMB | Set 60 D NL NO ID. |
| 5011 | 2M | AT | 180 | 17 | VVA-8 | FLND | ″ |
| 5012 | 2M | AT | 180 | 15 | VVA-5 | FLMB | Set 60 D NL NO ID. |
| 5013 | 2M | AT | 180 | 15 | VVA-5 | FLD6 | ″ |
| 5014 | 2M | AT | 180 | 14 | VVA-3 | FLD6 | Set 60 D NL NO ID. |
| 5015 | 2M | AT | 180 | 14 | VVA-3 | FLND | ″ |
| 1001 | 2M | CSTMD | 180 | 14 | PNC06 | Residual<br>H: 0.051 V: 0.076 | FMD Alumn Disk IN CHON. STMD "PC-6." |

GPI #: 2020 572.00

ITD MIAMI
Dade County
Aerial Target.
File: 0572.00 SM B.

∏: SM
φ: JS

Leica: GS-14 CS-20
NAVD_88 / NAD_83-11

04/06/2021
FB: 6e01MIA020
⛅ 78°

11

| STA | HI | Code | Epochs | SATS | Point ID | Residual | | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1002 | 2M | CSTMD | 180 | 15 | PBN27A | H: 0.038 | V: 0.100 | FND Alumn Disk In cmon. STMD "87-20-PBN27A" |
| | | | | | | BA | | |
| 5016 | 2M | AT | 180 | 15 | VVA-27 | Home | | Set 60D NL No ID |
| 5017 | 2M | AT | 180 | 14 | VVA-27 | RMND | | " |
| 5018 | 2M | AT | 180 | 14 | VVA-28 | RMND | | Set 60D NL No ID |
| 5019 | 2M | AT | 180 | 14 | VVA-28 | Home | | " |
| 5020 | 2M | AT | 180 | 12 | VVA-25R | HOME | | Set 60D NL No ID. |
| 5021 | 2M | AT | 180 | 13 | VVA-25R | RMND | | " |
| 5022 | 2M | AT | 180 | 14 | VVA-26R | RMND | | Set 60D NL No ID |
| 5023 | 2M | AT | 180 | 13 | VVA-26R | Home | | " |
| 5024 | 2M | AT | 180 | 16 | VVA-34 | Home | | Set 60D NL No ID. |
| 5025 | 2M | AT | 180 | 16 | VVA-34 | RMND | | " |
| 5026 | 2M | AT | 180 | 17 | VVA-31 | RMND | | Set 60D NC No ID |
| 5027 | 2M | AT | 180 | 16 | VVA-31 | HOME | | " |
| 5028 | 2M | AT | 180 | 14 | VVA-29 | Home | | Set 60D NL No ID |
| 5029 | 2M | AT | 180 | 12 | VVA-29 | RMND | | " |
| | | | | | | Residual | | |
| 1003 | 2M | CSTMD | 180 | 12 | PN17A | Y: 0.100 | Y: 0.089 | FND Disk In cmon. STMD "87-20-PN17A" |

GPI #: 2020 572.00

ITD MIAMI Dade County

AERIAL Targets

File: 0572.00 SM C

I: SM
φ: JS.

Leica: GS-14_CS-20

NAVD_88/NAD_83-11

07/07/2021

FB: 620MIA020

79°

| STA | HI | code | Epochs | SATS | POINT ID | Residual | Remarks. |
|---|---|---|---|---|---|---|---|
| 1004 | 2M | NLW | 180 | 14 | A20 | H: 0.026 V: 0.033 | FND Mag nlw. Illegible.ID. |
| | | | | | | Bases | |
| 5030 | 2M | AT | 180 | 13 | VVA-11 | FLMB | Set 60D NL NO ID |
| 5031 | 2M | AT | 180 | 14 | VVA-11 | FLND | ″ |
| 5032 | 2M | AT | 180 | 14 | VVA-32 | FL MB | Set 60D NL NO ID |
| 5033 | 2M | AT | 180 | 14 | VVA-32 | FL D6 | ″ |
| 5034 | 2M | AT | 180 | 12 | VVA-10 | FLD6 | Set 60D NL NO ID |
| 5039 | 2M | AT | 180 | 14 | VVA-10 | FLMB | ″ |
| 5036 | 2M | AT | 180 | 16 | VVA-35 | FLMB | Set 60D NL NO ID. |
| 5037 | 2M | AT | 180 | 15 | VVA-35 | FLD6 | ″ |
| 5038 | 2M | AT | 180 | 16 | VVA-14 | FLD6 | Set 60 D NL NO ID |
| 5039 | 2M | AT | 180 | 17 | VVA-14 | FLMB | ″ |
| 5040 | 2M | AT | 180 | 17 | VVA-13 | FLMB | Set 60D NL NO ID. |
| 5041 | 2M | AT | 180 | 16 | VVA-13 | FLD6 | ″ |
| 5042 | 2M | AT | 180 | 13 | VVA-4 | FLD6 | Set 60 D NL NO ID |
| 5043 | 2M | AT | 180 | 13 | VVA-4 | FLMB | ″ |
| | | | | | | Residuals | |
| 1005 | 2M | CSTMD | 180 | 14 | PNC107 | H: 0.196 V: 0.017 | FND BRASS DISK "58948-87-11-PM107" |

GPI #: 2020572.00

ITD MIAMI
Dade County

Aerial Targets.

File: 0572.00 SM D.

| STA | HI | Code | Epochs | SATS | Point ID |
|---|---|---|---|---|---|
| 1006 | 2M | CSTMD | 180 | 14 | A·237 |
| 5044 | 2M | AT | 180 | 13 | VVA-33 |
| 5045 | 2M | AT | 180 | 12 | VVA-33 |
| 5046 | 2M | AT | 180 | 13 | VVA-15 |
| 5047 | 2M | AT | 180 | 14 | VVA-15 |
| 5048 | 2M | AT | 180 | 12 | VVA-18 |
| 5049 | 2M | AT | 180 | 12 | VVA-18 |
| 5050 | 2M | AT | 180 | 16 | VVA-12 |
| 5051 | 2M | AT | 180 | 13 | VVA-12 |
| 5052 | 2M | AT | 180 | 16 | VVA-19 |
| 5053 | 2M | AT | 180 | 14 | VVA-19 |
| 5054 | 2M | AT | 180 | 18 | VVA-16 |
| 5055 | 2M | AT | 180 | 16 | VVA-16 |
| 5056 | 2M | AT | 180 | 11 | VVA-17 |
| 5057 | 2M | AT | 180 | 12 | VVA-17 |
| 1007 | 2M | AT | 180 | 9 | S 269 |

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[I]: SM
ϕ: JS.

Leica: CS-20- 65-14
NAVD_88 / NAD_83-11

04/08/2021
FB: 6CO MIA020
⛅ 84°

| Residual | Remarks |
|---|---|
| H: 0.036 V: 0.060 | FND BRASS DISK IN CMON. "A 237 1965." |
| Bases. | |
| FLD6 | Set 60D NC NO ID. |
| RMND | 〃 |
| RMND | Set 60D NL NO ID. |
| FLD6 | 〃 |
| FLD6 | Set 60D NL NO ID |
| RMND | 〃 |
| RMND | Set 60D NL NO ID. |
| FLD6 | 〃 |
| FLD6 | Set 60D NL NO ID. |
| RMND | 〃 |
| RMND | Set 60D NL NO ID. |
| FLD6 | 〃 |
| FLD6 | Set 60D NL NO ID: |
| RMND | 〃 |
| Residual | |
| H: 0.067 V: 0.162 | FND BRASS DISK IN CMON; STMD "S 269 RESET 1979." |

# Appendix E

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 26 26.613476 N |
| **POINT ID** | O-6 | **LONGITUDE** | 80 47 0.628428 W |
| **DATE** | 4/26/2018 12:30:07 PM | **CONVERGENCE** | 0 05 34.802 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99995062 |
| **ROAD ID** | STATE HWY 9336 | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 402485.087 | **ELL. HEIGHT** | -74.996 |
| **EASTING** | 727606.961 | **ELEV** | 3.364 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)

**TO REACH THIS STATION FROM THE INTERSECTION OF:**

FROM GATE FOR EVERGLADES NATIONAL PARK HEAD WEST ON INGRAHAM HWY 12.21 MILES THEN TAKE A RIGHT TURN TOWARDS PA-HAY-OKEE TRAILHEAD, GO 1.25 MILES INTO PARKING LOT, PID IS ON NORTHERN MOST PARKING PAINT STRIPE IN MIDDLE PARKING SPOTS

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHERN MOST PAINT STRIPE IN MIDDLE PARKING SPOTS

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| "HANDICAPPED ACCESS" SIGN | 85.1' | 140° |
| "HANDICAPPED PARKING" SIGN | 61.4 | 240° |
| TREE | 65.4' | 330° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

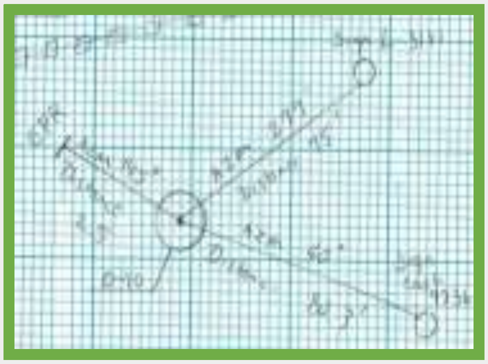
**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 23 53.279571 N |
| **POINT ID** | O-10 | **LONGITUDE** | 80 34 21.911310 W |
| **DATE** | 4/26/2018 12:15:19 PM | **CONVERGENCE** | 0 10 59.705 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99996746 |
| **ROAD ID** | INGRAHAM HWY | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 387173.31 | **ELL. HEIGHT** | -72.466 |
| **EASTING** | 797204.15 | **ELEV** | 7.826 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF INGRAHAM HWY AND SW 232ND AVE HEAD WEST 0.47 MILES, PID ON CORNER OF GORE WESTBOUND SIDE OF ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON CORNER OF GORE WESTBOUND SIDE OF ROAD

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| EDGE PAVED SURFACE | 2.5' | 145° |
| SIGN "L-31W" | 75' | 277° |
| SIGN "EAST 9336" | 80.3' | 40° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

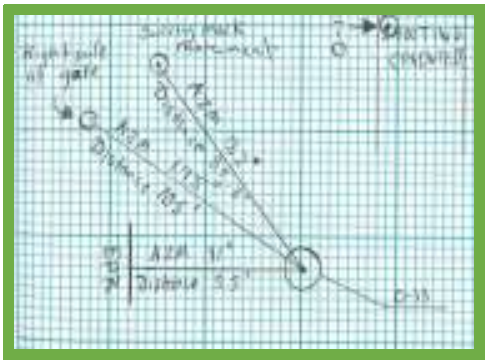
**CHECKED BY:** **SARAH STILLMAN**

**APRROVED BY:** **STEVE KUDA**
**DATE APPROVED:** **5/18/2018**

| | |
|---|---|
| **PROJ. No.** | 2013083.02 |
| **POINT ID** | O-13 |
| **DATE** | 4/25/2018 10:14:41 AM |
| **COUNTY** | DADE |
| **ROAD ID** | SW 237TH AVE |
| **UNITS** | US FEET |
| **NORTHING** | 468771.846 |
| **EASTING** | 795999.387 |

| | |
|---|---|
| **LATITUDE** | 25 37 21.577060 N |
| **LONGITUDE** | 80 34 32.210939 W |
| **CONVERGENCE** | 0 11 00.691 |
| **SCALE FACTOR** | 0.99996708 |
| **ELEVATION DETERMINATION:** | GPS DERIVED |
| **VERT. DATUM** | NAVD1988 |
| **ELL. HEIGHT** | -72.694 |
| **ELEV** | 7.716 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF RICHMOND DR AND SW 237TH AVE HEAD NORTH 0.99 MILES, PID IS ON TOP OF LETTER "S" OF PAINED NO SHOOTING IN ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHEAST CORNER OF PAINTED "S" IN PAINTED "NO SHOOTING"

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| RIGHT POLE OF GATE | 105' | 175° |
| SURVEY MARK MONUMENT | 87.3' | 182° |
| EDGE PAVED SURFACE | 3.5' | 91° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

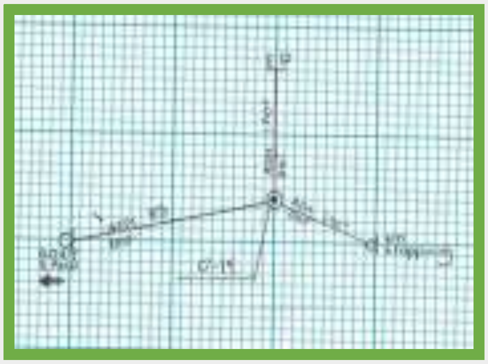
**PROJ. No.** 2013083.02
**POINT ID** O-14
**DATE** 4/25/2018 8:34:03 AM
**COUNTY** DADE
**ROAD ID** SW 8TH ST

**UNITS** US FEET
**NORTHING** 519298.47
**EASTING** 760087.325

**LATITUDE** 25 45 43.046149 N
**LONGITUDE** 80 41 3.255622 W
**CONVERGENCE** 0 08 14.071
**SCALE FACTOR** 0.99995675

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -66.698
**ELEV** 13.187

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF SHARK VALLEY LOOP RD AND SW 8TH ST HEAD EAST 5.12 MILES, PID IS ON CORNER OF GORE ON EASTBOUND SIDE OF ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON CORNER OF GORE EASTBOUND SIDE OF ROAD

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| "NO STOPPING" SIGN | 155' | 90° |
| EDGE PAVED SURFACE | 3.8' | 7° |
| "NO STOPPING EXCEPT ON SHOULDER" SIGN | 49.6' | 302° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

**PROJ. No.** 2013083.02
**POINT ID** O-16
**DATE** 4/24/2018 9:28:19 AM
**COUNTY** DADE
**ROAD ID** JOHNSON ST

**UNITS** US FEET
**NORTHING** 611516.067
**EASTING** 842195.626

**LATITUDE** 26 0 53.706258 N
**LONGITUDE** 80 26 0.780405 W
**CONVERGENCE** 0 14 54.436
**SCALE FACTOR** 0.99998434

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -72.718
**ELEV** 8.887

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)

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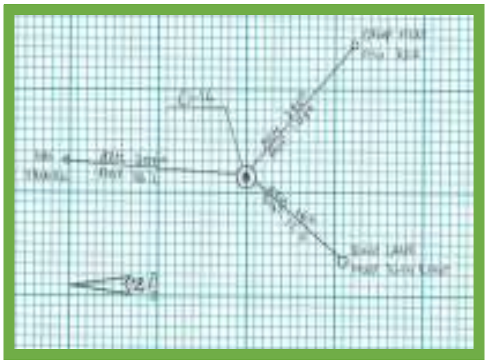


**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NW 215TH AVE AND JOHNSON ST, HEAD EAST 0.06 MILES, PID IS ON TIP OF FIRST RIGHT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK ON TIP OF TURN ARROW

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| "NO TRUCKS" SIGN | 46.2' | 200° |
| "STOP HERE ON RED" SIGN | 108' | 285° |
| "RIGHT LANE MUST TURN RIGHT" SIGN | 12.5' | 16° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

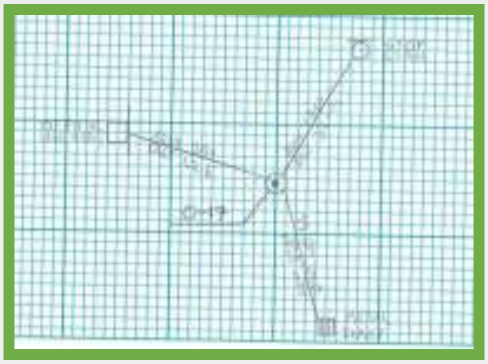
---

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 17 30.447370 N |
| **POINT ID** | O-17 | **LONGITUDE** | 80 26 42.592501 W |
| **DATE** | 4/26/2018 7:29:55 AM | **CONVERGENCE** | 0 14 13.371 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99998299 |
| **ROAD ID** | S DIXIE HWY | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 348679.757 | **ELL. HEIGHT** | -68.29 |
| **EASTING** | 839483.072 | **ELEV** | 12.323 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF S DIXIE HWY AND SW 424TH ST HEAD SOUTH 5.95 MILES AND DO A U-TURN, HEAD NORTH 0.35 MILES AND TURN RIGHT ONTO RAMP, PID IS ON TIP OF TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK ON TIP OF TURN ARROW

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| "STOP" SIGN | 32.45' | 175° |
| "OFFICIAL USE ONLY" SIGN | 42.6' | 30° |
| METAL INLET | 40.55' | 320° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

GPI

LiDAR | Photogrammetry | Asset Management

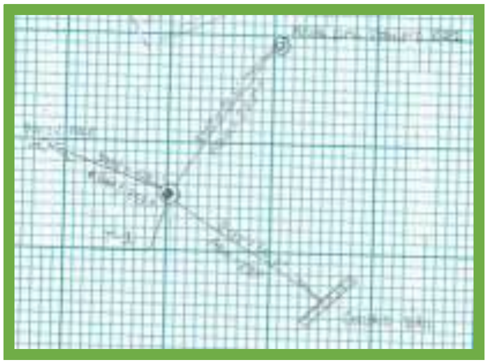
**PROJ. No.** 2013083.02
**POINT ID** T-1
**DATE** 4/26/2018 10:38:59 AM
**COUNTY** DADE
**ROAD ID** INGRAHAM HWY

**UNITS** US FEET
**NORTHING** 390772.231
**EASTING** 813323.456

**LATITUDE** 25 24 28.388437 N
**LONGITUDE** 80 31 25.986365 W
**CONVERGENCE** 0 12 15.428
**SCALE FACTOR** 0.99997307

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -74.594
**ELEV** 6.243

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF TOWER RD AND INGRAHAM HWY, HEAD WEST 1.71 MILES, PID IS ON WESTBOUND SIDE OF ROAD ON CORNER OF GORE

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON CORNER OF GORE WESTBOUND SIDE OF ROAD

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| POWER POLE | 68.1' | 355° |
| STAMPED METAL DISK "EG1" | 92.6' | 255° |
| GUARD RAIL | 36.2' | 290° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

GPI

LiDAR | Photogrammetry | Asset Management

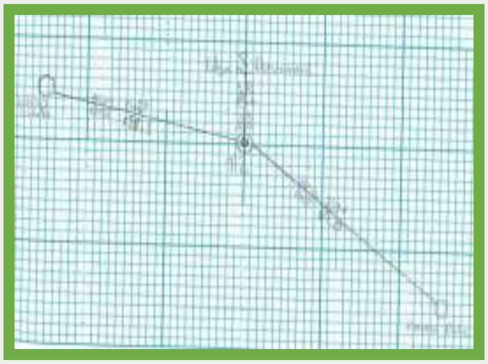
**PROJ. No.** 2013083.02
**POINT ID** T-2
**DATE** 4/26/2018 9:55:20 AM
**COUNTY** DADE
**ROAD ID** SW 376TH ST

**UNITS** US FEET
**NORTHING** 394651.624
**EASTING** 820927.233

**LATITUDE** 25 25 6.540120 N
**LONGITUDE** 80 30 2.900832 W
**CONVERGENCE** 0 12 51.379
**SCALE FACTOR** 0.99997596

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -76.339
**ELEV** 4.816

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF TOWER RD AND SW 376TH ST, HEAD EAST 0.04 MILES, PID IS AN EXISTING PAINTED CROSS IN WESTBOUND LANE

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET IN CENTER OF EXISTING CROSS TARGET

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| POWER POLE | 81' | 320° |
| "STOP" SIGN | 128.1' | 145° |
| EDGE PAVED SURFACE | 5.20' | 190° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

GPI

LiDAR | Photogrammetry | Asset Management

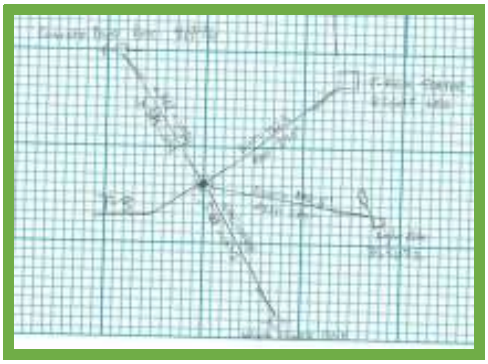
**PROJ. No.** 2013083.02
**POINT ID** T-3
**DATE** 4/26/2018 8:40:19 AM
**COUNTY** DADE
**ROAD ID** PALM DR

**UNITS** US FEET
**NORTHING** 401576.785
**EASTING** 875784.058

**LATITUDE** 25 26 12.763723 N
**LONGITUDE** 80 20 4.210197 W
**CONVERGENCE** 0 17 09.070
**SCALE FACTOR** 1.00000024

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -78.404
**ELEV** 4.702

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
AT INTERSECTION OF PALM DR AND SW 117TH AVE, HEAD EAST 3.17 MILES, PID IS ON TIP OF RIGHT TURN ARROW

**MONUMENT DESCRIPTION:**

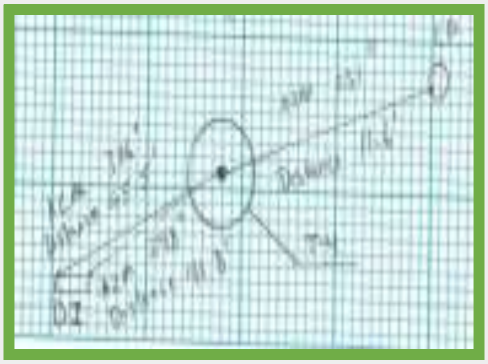
PK NAIL AND DISK SET ON TIP OF TURN ARROW

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| CONCRETE POWER POLE "41796" | 45.4' | 175° |
| LIGHT POLE "35SU71" | 102.5' | 275° |
| WOOD POWER POLE | 18.2' | 345° |
| T-REX STATUE RIGHT LEG | 122.3' | 240° |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 29 1.749962 N |
| **POINT ID** | T-4 | **LONGITUDE** | 80 25 28.756587 W |
| **DATE** | 4/26/2018 8:25:26 AM | **CONVERGENCE** | 0 14 51.190 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99998613 |
| **ROAD ID** | MALIBU WAY | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 418498.519 | **ELL. HEIGHT** | -76.025 |
| **EASTING** | 845959.189 | **ELEV** | 6.281 |
| **HORZ. DATUM** | FL EAST STATE PLANE NAD83(11) | | |



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF NE 11TH DR AND MALIBU WAY, HEAD NORTH 0.05 MILES TO ROUND ABOUT, TURN RIGHT THEN GO 0.03 MILES, PID IS ON TIP OF RIGHT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET AT THE TIP OF TURN ARROW

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| DRAIN INLET | 45.5' | 306° |
| DRAIN INLET | 41.8' | 298° |
| LIGHT POLE | 11.6' | 231° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

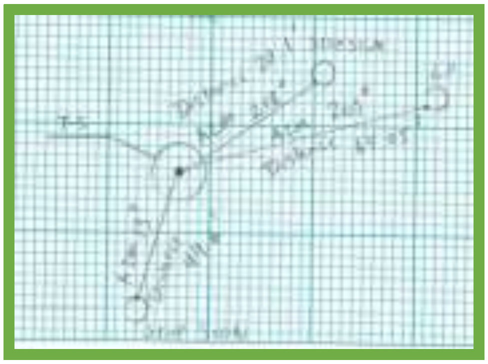
**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

| | |
|---|---|
| **PROJ. No.** | 2013083.02 |
| **POINT ID** | T-5 |
| **DATE** | 4/26/2018 9:51:50 AM |
| **COUNTY** | DADE |
| **ROAD ID** | SW 304TH ST |
| **UNITS** | US FEET |
| **NORTHING** | 418538.959 |
| **EASTING** | 817882.45 |

| | |
|---|---|
| **LATITUDE** | 25 29 3.263252 N |
| **LONGITUDE** | 80 30 35.152317 W |
| **CONVERGENCE** | 0 12 39.364 |
| **SCALE FACTOR** | 0.99997464 |
| **ELEVATION DETERMINATION:** | GPS DERIVED |
| **VERT. DATUM** | NAVD1988 |
| **ELL. HEIGHT** | -72.511 |
| **ELEV** | 8.834 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF SW 304TH ST AND SW 195TH AVE, HEAD WEST 0.11 MILES, PID IS ON SOUTHWEST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON SW CORNER OF STOP BAR

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| "STOP" SIGN | 20.1' | 218° |
| "STOP" SIGN | 49.6' | 13° |
| LIGHT POLE | 64.05' | 263° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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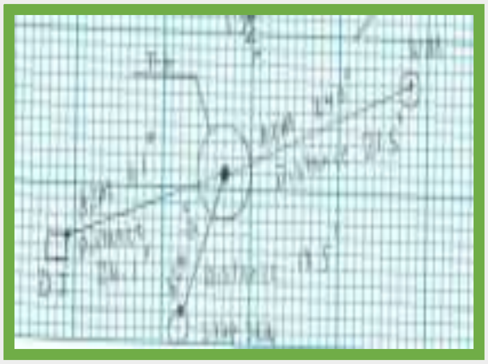
LiDAR | Photogrammetry | Asset Management

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 36 57.811357 N |
| **POINT ID** | T-6 | **LONGITUDE** | 80 26 45.326867 W |
| **DATE** | 4/27/2018 7:26:06 AM | **CONVERGENCE** | 0 14 22.396 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.9999829 |
| **ROAD ID** | SW 162ND ST | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 466530.313 | **ELL. HEIGHT** | -72.958 |
| **EASTING** | 838742.284 | **ELEV** | 8.752 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF SW 157TH AVE AND SW 162ND ST HEAD EAST 0.04 MILES, PID IS ON NORTHEAST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| DRAIN INLET | 26.1' | 61° |
| "STOP" SIGN | 18.5' | 10° |
| WATER METER | 21.5' | 240° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

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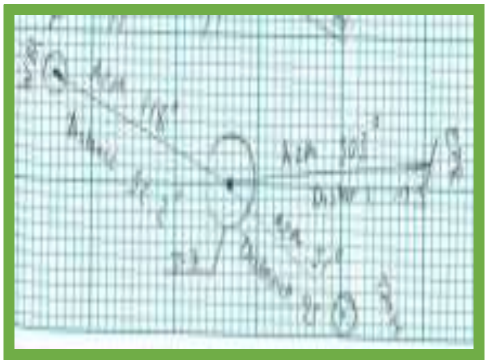
|---|---|
| **PROJ. No.** | 2013083.02 |
| **POINT ID** | T-7 |
| **DATE** | 4/26/2018 3:01:00 PM |
| **COUNTY** | DADE |
| **ROAD ID** | OLD CUTLER RD |
| **UNITS** | US FEET |
| **NORTHING** | 459201.17 |
| **EASTING** | 880705.063 |

| | |
|---|---|
| **LATITUDE** | 25 35 43.280481 N |
| **LONGITUDE** | 80 19 7.310390 W |
| **CONVERGENCE** | 0 17 39.634 |
| **SCALE FACTOR** | 1.00000241 |
| **ELEVATION DETERMINATION:** | GPS DERIVED |
| **VERT. DATUM** | NAVD1988 |
| **ELL. HEIGHT** | -71.238 |
| **ELEV** | 12.013 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF EUREKA DR AND OLD CUTLER RD, HEAD SOUTH 0.33 MILES, PID IS ON TIP OF LEFT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF TURN ARROW

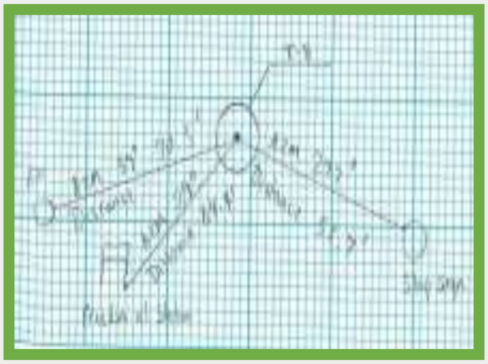
| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| EDGE PAVED SURFACE | 17.5' | 303° |
| TELEPHONE MAN HOLE | 95' | 51° |
| WATER METER | 32.2' | 118° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 33 38.405315 N |
| **POINT ID** | T-8 | **LONGITUDE** | 80 23 13.069324 W |
| **DATE** | 4/26/2018 7:14:19 AM | **CONVERGENCE** | 0 15 52.247 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99999144 |
| **ROAD ID** | S DIXIE HWY | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 446484.27 | **ELL. HEIGHT** | -71.472 |
| **EASTING** | 858264.035 | **ELEV** | 11.139 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF S DIXIE HWY AND SW 224TH ST, HEAD NORTH 0.17 MILES, PID ON NORTHBOUND SIDE OF ROAD ON TIP OF CHEVRON

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF CHEVRON

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| EDGE PAVED SURFACE | 70.3' | 39° |
| "FREEDOM OIL STATION" SIGN | 84.4' | 29° |
| "STOP" SIGN | 31.7' | 299° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

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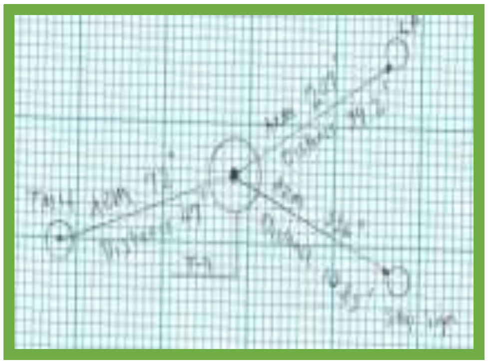
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 40 21.942315 N |
| **POINT ID** | T-9 | **LONGITUDE** | 80 22 22.543143 W |
| **DATE** | 4/26/2018 4:05:09 PM | **CONVERGENCE** | 0 16 18.032 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99999365 |
| **ROAD ID** | SW 103RD ST | | |

**ELEVATION DETERMINATION:** GPS DERIVED

| | | | |
|---|---|---|---|
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 487246.312 | **ELL. HEIGHT** | -74.23 |
| **EASTING** | 862698.248 | **ELEV** | 7.978 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF SW 109TH TERRACE AND KILLIAN DR, HEAD NORTH 0.17 MILES AND TURN LEFT, PID IS ON TIP OF TURN/STRAIGHT ARROW OF EASTBOUND LANE

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF TURN/STRAIGHT ARROW

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| TELEPHONE MAN HOLE | 47' | 72° |
| "STOP" SIGN | 10.85' | 336° |
| LIGHT POLE | 39.2' | 207° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

**GPI** LiDAR | Photogrammetry | Asset Management

**PROJ. No.** 2013083.02
**POINT ID** O-1
**DATE** 5/16/2018 3:07 PM
**COUNTY** COLLIER
**ROAD ID** TRAINING AND TRANSITION

**UNITS** US FEET
**NORTHING** 557829.047
**EASTING** 686577.634

**LATITUDE** 25 52 5.825092 N
**LONGITUDE** 80 54 27.049109 W
**CONVERGENCE** 0 02 25.268
**SCALE FACTOR** 0.99994557

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -69.652
**ELEV** 10.161

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
HEADING WEST ON TAMIAMI TRAIL E TURN RIGHT ONTO TRAINING AND TRANSITION, FOLLOW THIS ROAD FOR 2.49 MILES, PID IS IN THE CENTER OF AN EXISTING CROSS AERIAL TARGET IN ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET IN CENTER OF PAINTED CROSS AERIAL TARGET

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| TELIPHONE PEDISTOOL | 45.7' | 120° |
| LARGER CROSS AERIAL TARGET | 42.1' | 285° |
| FENCE POST | 59' | 345° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

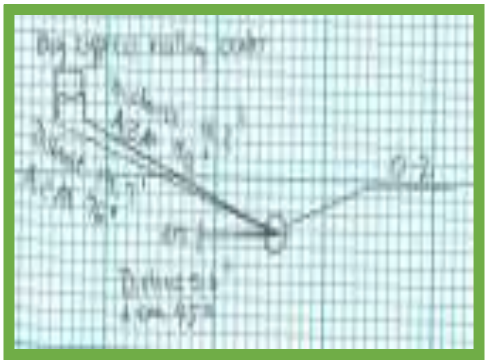
**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | |
|---|---|
| **PROJ. No.** | 2013083.02 |
| **POINT ID** | O-2 |
| **DATE** | 4/24/2018 3:07:48 PM |
| **COUNTY** | COLLIER |
| **ROAD ID** | TAMIAMI TRAIL E |
| **UNITS** | US FEET |
| **NORTHING** | 535090.9 |
| **EASTING** | 697777.054 |

| | |
|---|---|
| **LATITUDE** | 25 48 20.508420 N |
| **LONGITUDE** | 80 52 24.673290 W |
| **CONVERGENCE** | 0 03 18.213 |
| **SCALE FACTOR** | 0.99994653 |
| **ELEVATION DETERMINATION:** | GPS DERIVED |
| **VERT. DATUM** | NAVD1988 |
| **ELL. HEIGHT** | -70.357 |
| **ELEV** | 9.079 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF TAMIAMI TRAIL E AND LOOP RD HEAD WEST 4.18 MILES, PID IS ON THE EASTBOUND SIDE OF THE ROAD IN THE CENTER OF AN EXISTING PAINTED TARGET

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET IN THE CENTER OF EXISTING PAINTED TARGET

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| "BIG CYPRESS VISITING CENTER" SIGN | 19.7' | 76° |
| "BIG CYPRESS VISITING CENTER" SIGN | 16.2' | 70° |
| EDGE PAVED SURFACE | 0.6' | 45° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

GPI

LiDAR | Photogrammetry | Asset Management

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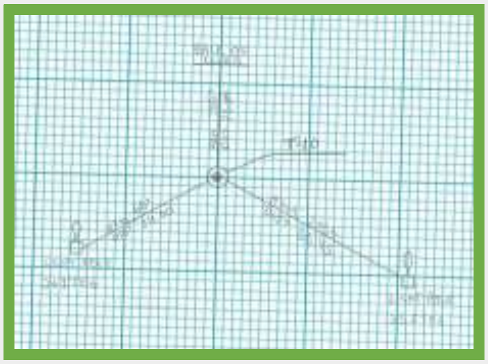
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 45 38.244859 N |
| **POINT ID** | T-10 | **LONGITUDE** | 80 25 57.278773 W |
| **DATE** | 4/27/2018 8:46:14 AM | **CONVERGENCE** | 0 14 47.816 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99998468 |
| **ROAD ID** | BB&T PARKING LOT | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 519091.19 | **ELL. HEIGHT** | -73.323 |
| **EASTING** | 842914.727 | **ELEV** | 8.121 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF SW 8TH ST AND SW 147TH AVE, HEAD SOUTH 0.09 MILES AND TURN LEFT INTO PLAZA. IN 0.04 MILES TAKE A LEFT INTO THE PARKING LOT. HEAD NORTH INTO BB&T PARKING LOT, PID IS ON TIP OF PAINTED ARROW POINTED WEST

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF ARROW FACING WEST

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| BACK OF CURB | 25.8' | 165° |
| LIGHT POLE "36IT06" | 34.6' | 65° |
| LIGHT POLE "35IT06" | 55.95" | 295° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

**GPI** LiDAR | Photogrammetry | Asset Management

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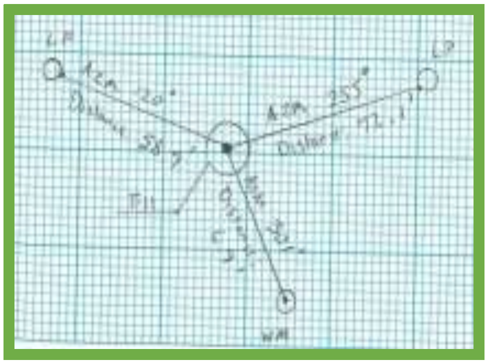
|---|---|
| **PROJ. No.** | 2013083.02 |
| **POINT ID** | T-11 |
| **DATE** | 4/25/2018 6:18:06 PM |
| **COUNTY** | DADE |
| **ROAD ID** | W FLAGLER ST |
| **UNITS** | US FEET |
| **NORTHING** | 522362.936 |
| **EASTING** | 870724.236 |

| | |
|---|---|
| **LATITUDE** | 25 46 9.376340 N |
| **LONGITUDE** | 80 20 52.925439 W |
| **CONVERGENCE** | 0 17 00.423 |
| **SCALE FACTOR** | 0.99999766 |
| **ELEVATION DETERMINATION:** | GPS DERIVED |
| **VERT. DATUM** | NAVD1988 |
| **ELL. HEIGHT** | -77.201 |
| **ELEV** | 4.905 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF W FLAGLER ST AND SW 92ND AVE, HEAD WEST 0.23 MILES, PID ON CORNER OF CHEVRON ON RIGHT SIDE OF ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON CORNER OF CHEVRON

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| LIGHT POLE | 58.9' | 120° |
| WATER METER | 6.9' | 301° |
| LIGHT POLE | 72.1' | 255° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

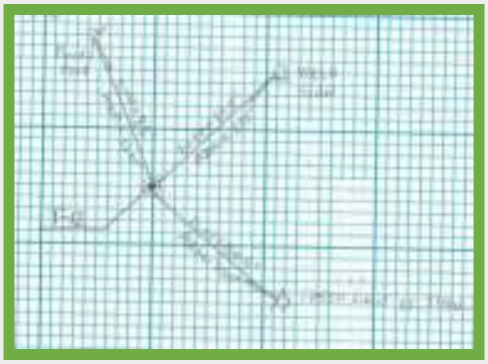
**PROJ. No.** 2013083.02
**POINT ID** T-12
**DATE** 4/26/2018 2:24:02 PM
**COUNTY** DADE
**ROAD ID** MATHESON PARK

**UNITS** US FEET
**NORTHING** 490235.66
**EASTING** 898780.139

**LATITUDE** 25 40 49.707857 N
**LONGITUDE** 80 15 47.998384 W
**CONVERGENCE** 0 19 09.302
**SCALE FACTOR** 1.00001257

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -81.225
**ELEV** 2.134

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF OLD CUTLER RD AND MATHESON PARK, HEAD EAST 0.53 MILES AND TURN RIGHT AT THE FORK IN THE ROAD, CONTINUE EAST 0.1 MILES, PID IS ON TIP OF CHEVRON AT FORK IN ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK ON TIP OF CHEVRON

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| POWER POLE | 83' | 160° |
| "YIELD" SIGN | 24.5' | 255° |
| "SPEED LIMIT 15" SIGN | 125.9' | 350° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

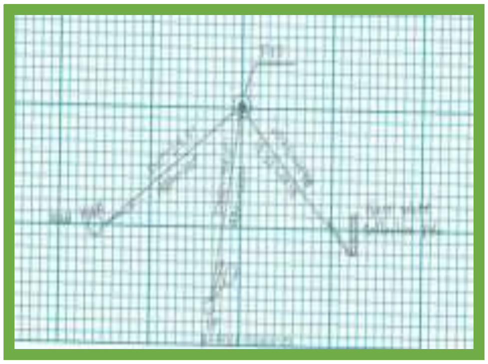
**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 44 57.654090 N |
| **POINT ID** | T-13 | **LONGITUDE** | 80 12 11.987858 W |
| **DATE** | 4/25/2018 6:10:20 PM | **CONVERGENCE** | 0 20 46.031 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00002339 |
| **ROAD ID** | RICKENBACKER CAUSEWAY | | |

**ELEVATION DETERMINATION:** GPS DERIVED

| | | | |
|---|---|---|---|
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 515383.418 | **ELL. HEIGHT** | -70.202 |
| **EASTING** | 918391.197 | **ELEV** | 13.466 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF S MIAMI AVE AND FEDERAL HWY, HEAD WEST 0.15 MILES THEN TURN RIGHT ONTO RICKENBACKER CAUSEWAY, HEAD SOUTHEAST 0.08 MILES, PID IS ON TIP OF CHEVRON RIGHT BEFORE WHITE REFLECTIVE MARKERS START

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF CHEVRON

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| MAN HOLE | 24.5' | 110° |
| LIGHT POLE "B-7253-2001-0" | 43.5' | 65° |
| FIRST WHITE REFLECTIVE POLE | 11.3' | 330° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

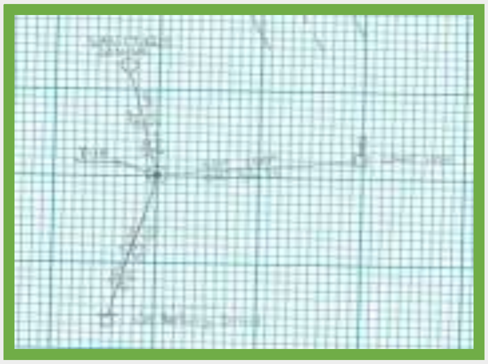
**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 46 11.468171 N |
| **POINT ID** | T-14 | **LONGITUDE** | 80 8 15.014012 W |
| **DATE** | 4/25/2018 5:11:03 PM | **CONVERGENCE** | 0 22 29.999 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00003751 |
| **ROAD ID** | 1ST STREET | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 522972.264 | **ELL. HEIGHT** | -82.437 |
| **EASTING** | 940010.124 | **ELEV** | 1.963 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF WASHINGTON AVE AND 1ST ST, HEAD WEST 0.14 MILES, PID IS ON NORTHWEST CORNER OF CROSSWALK BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHWEST CORNER OF CROSSWALK BAR

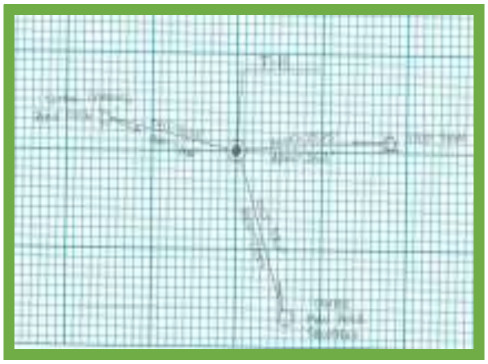
| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| SANITARY SEWER | 34.4' | 150° |
| "NO PARKING" SIGN | 67.4' | 345° |
| LIGHT POLE | 56.35' | 250° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 51 25.005956 N |
| **POINT ID** | T-15 | **LONGITUDE** | 80 7 23.835087 W |
| **DATE** | 4/25/2018 3:46:20 PM | **CONVERGENCE** | 0 22 56.573 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00004039 |
| **ROAD ID** | BYRON AVE | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 554659.378 | **ELL. HEIGHT** | -81.272 |
| **EASTING** | 944477.952 | **ELEV** | 3.072 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NORMANDY DR AND BYRON AVE, HEAD NORTH 0.06 MILES, PID IS ON NORTHWEST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHWEST CORNER OF STOP BAR

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| "SCHOOL LOADING ZONE" SIGN | 50.2' | 106° |
| "STOP" SIGN | 25.75' | 262° |
| SANITARY MAN HOLE | 38.1' | 335° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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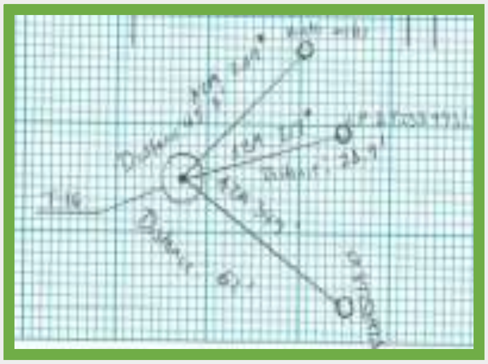
**PROJ. No.** 2013083.02
**POINT ID** T-16
**DATE** 4/25/2018 3:43:12 PM
**COUNTY** DADE
**ROAD ID** NE 2ND AVE

**UNITS** US FEET
**NORTHING** 541888.82
**EASTING** 922063.197

**LATITUDE** 25 49 19.948390 N
**LONGITUDE** 80 11 30.050407 W
**CONVERGENCE** 0 21 07.585
**SCALE FACTOR** 1.00002547

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -67.275
**ELEV** 16.245

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NE 50TH ST AND NE 2ND AVE, HEAD NORTH 0.07 MILES, PID IS ON CORNER OF GORE ON RIGHT SIDE OF ROAD

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON CORNER OF GORE NORTHBOUND LANE

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| WATER METER | 45.4' | 207° |
| LIGHT POLE "872589732" | 28.7' | 217° |
| LIGHT POLE "872589728" | 62' | 349° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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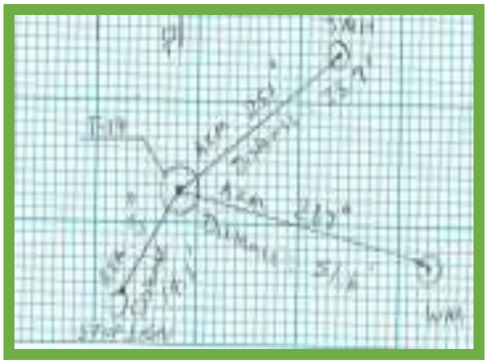
**PROJ. No.** 2013083.02
**POINT ID** T-17
**DATE** 4/25/2018 5:10:18 PM
**COUNTY** DADE
**ROAD ID** LA BARON DR

**UNITS** US FEET
**NORTHING** 537935.069
**EASTING** 894470.545

**LATITUDE** 25 48 42.381282 N
**LONGITUDE** 80 16 32.240009 W
**CONVERGENCE** 0 18 55.510
**SCALE FACTOR** 1.00001002

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -77.8
**ELEV** 4.861

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF LA VILLA DR AND LA BARON DR, HEAD EAST 0.06 MILES, PID IS ON NORTHEAST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| SANITARY MAN HOLE | 23.7' | 251° |
| "STOP" SIGN | 14.1' | 3° |
| WATER METER | 51.6' | 289° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

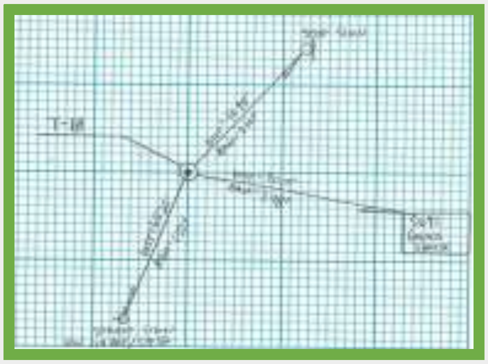
**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

**GPI** LiDAR | Photogrammetry | Asset Management

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 49 30.283000 N |
| **POINT ID** | T-18 | **LONGITUDE** | 80 22 54.415563 W |
| **DATE** | 5/16/2018 11:20 AM | **CONVERGENCE** | 0 16 09.551 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99999224 |
| **ROAD ID** | NW 57TH ST | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 542593.097 | **ELL. HEIGHT** | -75.975 |
| **EASTING** | 859522.703 | **ELEV** | 5.829 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NW 57TH ST AND NW 114TH AVE, PID IS ON TIP OF RIGHT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF RIGHT TURN ARROW

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| "STOP" SIGN | 16.75' | 210° |
| GUARD SHACK "5691" | 90.15' | 278° |
| STREET SIGN "NW114 AVE/57TH ST" | 65.25 | 150° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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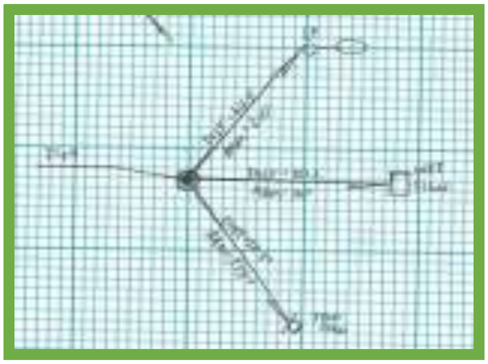
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 53 34.614138 N |
| **POINT ID** | T-19 | **LONGITUDE** | 80 22 45.337320 W |
| **DATE** | 5/16/2018 10:30 AM | **CONVERGENCE** | 0 16 15.889 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.9999926 |
| **ROAD ID** | NW 11TH AVENUE RD | | |

**ELEVATION DETERMINATION:** GPS DERIVED

| | | | |
|---|---|---|---|
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 567265.069 | **ELL. HEIGHT** | -76.593 |
| **EASTING** | 860235.652 | **ELEV** | 5.257 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF US HWY 27 AND NW 138TH ST, HEAD SOUTH 0.17 MILES, TURN LEFT ONTO NW 113TH AVENUE RD AND GO SOUTH 0.13 MILES, PID IS ON TIP OF RIGHT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF RIGHT TURN ARROW

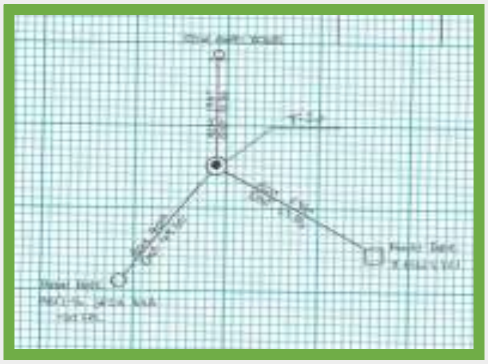
| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| LIGHT POLE | 67.7' | 210° |
| "WRT WORLD ENTERPRISES" SIGN | 121.2' | 310° |
| "STOP" SIGN | 22.5' | 335° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 51 44.956112 N |
| **POINT ID** | T-20 | **LONGITUDE** | 80 18 26.587408 W |
| **DATE** | 5/16/2018 12:40 PM | **CONVERGENCE** | 0 18 07.702 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00000438 |
| **ROAD ID** | W 44TH PL | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 556311.962 | **ELL. HEIGHT** | -77.636 |
| **EASTING** | 883923.741 | **ELEV** | 4.700 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF W 16TH AVE AND 2 44TH PL, HEAD EAST 0.46 MILES, PID IS ON TIP OF SECOND CHEVRON

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF CHEVRON

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| "TOW AWAY ZONE" SIGN | 51.75 | 195° |
| POWER POLE "865614721" | 47.85' | 295° |
| POWER POLE "MB12-16" | 49.5' | 70° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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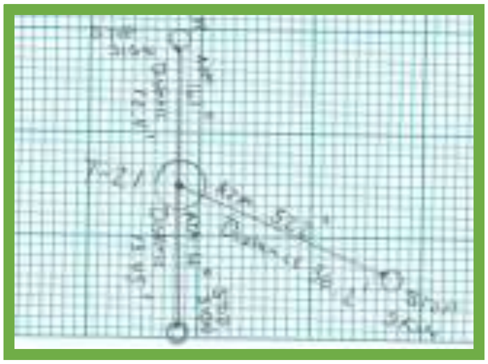
|---|---|
| **PROJ. No.** | 2013083.02 |
| **POINT ID** | T-21 |
| **DATE** | 4/25/2018 2:45:20 PM |
| **COUNTY** | DADE |
| **ROAD ID** | NW 99TH ST |
| **UNITS** | US FEET |
| **NORTHING** | 557394.266 |
| **EASTING** | 911979.083 |

| | |
|---|---|
| **LATITUDE** | 25 51 54.119912 N |
| **LONGITUDE** | 80 13 19.397513 W |
| **CONVERGENCE** | 0 20 21.832 |
| **SCALE FACTOR** | 1.00001996 |
| **ELEVATION DETERMINATION:** | GPS DERIVED |
| **VERT. DATUM** | NAVD1988 |
| **ELL. HEIGHT** | -78.118 |
| **ELEV** | 4.992 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERECTION OF LITTLE RIVER DR AND NW 99TH ST, HEAD EAST 0.19 MILES, PID IS ON NORTHEAST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| "STOP" SIGN | 12.4' | 161° |
| "STOP" SIGN | 36.2' | 322° |
| "STOP" SIGN | 13.45' | 4° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

**GPI** LiDAR | Photogrammetry | Asset Management

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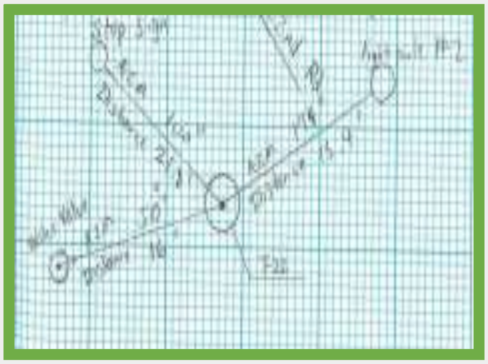
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 53 18.840066 N |
| **POINT ID** | T-22 | **LONGITUDE** | 80 9 23.038519 W |
| **DATE** | 4/25/2018 12:15:56 PM | **CONVERGENCE** | 0 22 06.084 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00003325 |
| **ROAD ID** | NE 122ND ST | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 566081.327 | **ELL. HEIGHT** | -80.757 |
| **EASTING** | 933514.533 | **ELEV** | 3.098 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NE 123RD ST AND N BAYSHORE DR, HEAD SOUTH 0.06 MILES, TURN RIGHT ONTO NE 122NS ST, HEAD WEST 0.26 MILES, PID IS ON CORNER OF GORE AND PARKING STRIPE

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON CORNER OF GORE AND PARKING STRIPE

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| "STOP" SIGN | 21.8' | 100° |
| LIGHT POLE "#2" | 13.4' | 174° |
| WATER VALVE | 16' | 50° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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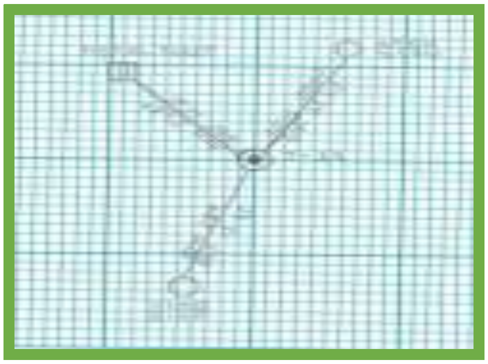
**PROJ. No.** 2013083.02
**POINT ID** T-23
**DATE** 4/25/2018 2:52:21 PM
**COUNTY** DADE
**ROAD ID** COLLINS AVE

**UNITS** US FEET
**NORTHING** 571432.821
**EASTING** 943785.947

**LATITUDE** 25 54 11.174641 N
**LONGITUDE** 80 7 30.185904 W
**CONVERGENCE** 0 22 56.086
**SCALE FACTOR** 1.00003986

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -79.781
**ELEV** 4.503

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF BAYVIEW DR AND COLLINS AVE/A1A, HEAD SOUTH 1.34 MILES, TURN RIGHT INTO PARKING LOT, HEAD WEST 0.04 MILES, PID IS ON NORTHEAST CORNER OF STOP BAR THAT IS ON ROUND ABOUT

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR

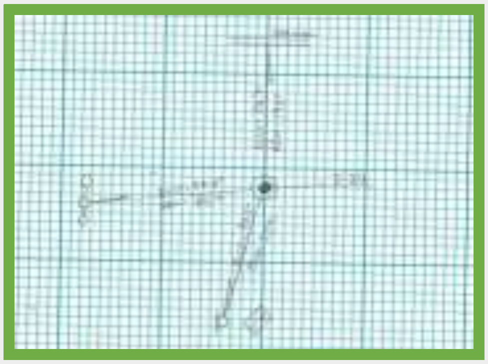
| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| METAL INLET | 32.8' | 345° |
| "STOP" SIGN | 62.4' | 200° |
| "STOP" SIGN | 15.65' | 28° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 58 25.989913 N |
| **POINT ID** | T-24 | **LONGITUDE** | 80 7 41.573266 W |
| **DATE** | 4/25/2018 1:25:19 PM | **CONVERGENCE** | 0 22 54.597 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00003905 |
| **ROAD ID** | NE 37TH AVE | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 597153.648 | **ELL. HEIGHT** | -79.535 |
| **EASTING** | 942574.841 | **ELEV** | 4.717 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NE 37TH AVE AND NE 214TH ST, HEAD WEST 0.09 MILES, PID IS IN TURN LANE ON TIP OF FIRST LEFT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF TURN ARROW

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| SEAWALL | 56.7' | 190° |
| LIGHT POLE | 17.7' | 75° |
| RIGHT ARROW SIGN | 39.5' | 25° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

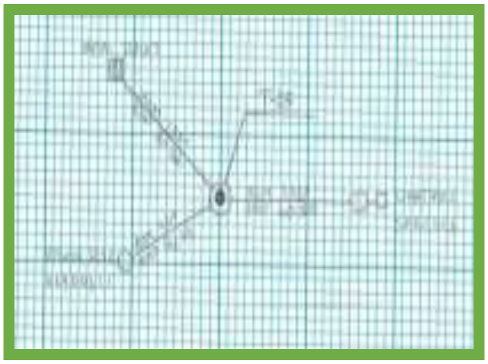
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 56 5.345679 N |
| **POINT ID** | T-25 | **LONGITUDE** | 80 9 15.296535 W |
| **DATE** | 4/25/2018 12:33:13 PM | **CONVERGENCE** | 0 22 11.676 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00003354 |
| **ROAD ID** | NE 23RD AVE | | |

**ELEVATION DETERMINATION:** GPS DERIVED

| | | | |
|---|---|---|---|
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 582897.2 | **ELL. HEIGHT** | -78.822 |
| **EASTING** | 934113.147 | **ELEV** | 5.052 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NE 173RD ST AND NE 23RD AVE, HEAD SOUTH 0.05 MILES, PID IS ON SOUTHEAST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON SOUTHEAST CORNER OF STOP BAR

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| METAL INLET | 33.55' | 155° |
| POWER POLE "469DN311" | 34.45' | 50° |
| LIGHT POLE "SPEC995" | 40.8' | 275° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

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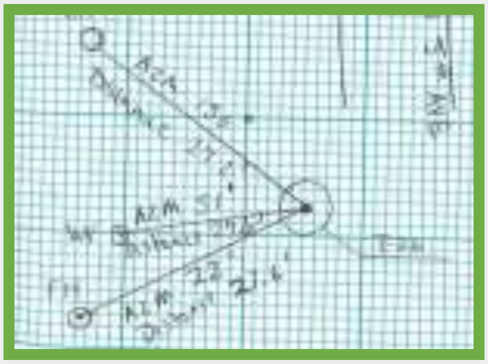
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 54 30.795765 N |
| **POINT ID** | T-26 | **LONGITUDE** | 80 12 26.992341 W |
| **DATE** | 4/25/2018 1:22:11 PM | **CONVERGENCE** | 0 20 46.647 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00002234 |
| **ROAD ID** | NW 146TH ST | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 573241.558 | **ELL. HEIGHT** | -69.829 |
| **EASTING** | 916670.528 | **ELEV** | 13.415 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF NW 146TH ST AND NW 2ND AVE, HEAD WEST 0.25 MILES, PID IS ON SOUTHWEST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON SOUTHWEST CORNER OF STOP BAR

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| EDGE PAVED SURFACE | 27.2' | 156° |
| WATER VALVE | 27.6' | 51° |
| FIRE HYDRANT | 23.6' | 22° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

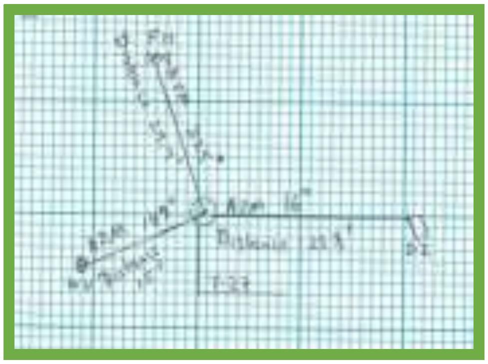
**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 57 32.516665 N |
| **POINT ID** | T-27 | **LONGITUDE** | 80 16 13.403935 W |
| **DATE** | 4/24/2018 12:21:23 PM | **CONVERGENCE** | 0 19 09.787 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00001081 |
| **ROAD ID** | NW 203RD LN | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 591468.84 | **ELL. HEIGHT** | -77.945 |
| **EASTING** | 895894.316 | **ELEV** | 4.755 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NW 39TH CT AND NW 203RD LN, HEAD WEST 0.21 MILES, PID IS ON SOUTHWEST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON SOUTHWEST CORNER OF STOP BAR

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| FIRE HYDRANT | 27.7' | 225° |
| WATER VALVE | 15' | 149° |
| DRAIN INLET | 23.8' | 16° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 57 56.452593 N |
| **POINT ID** | T-28 | **LONGITUDE** | 80 23 1.309006 W |
| **DATE** | 4/24/2018 10:22:53 AM | **CONVERGENCE** | 0 16 11.446 |
| **COUNTY** | BROWARD | **SCALE FACTOR** | 0.99999189 |
| **ROAD ID** | SW 179TH WAY | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 593694.064 | **ELL. HEIGHT** | -77.135 |
| **EASTING** | 858652.741 | **ELEV** | 4.742 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)

**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF SW 184TH AVE AND SW 40TH ST ROUND ABOUT, HEAD EAST 0.48 MILES, TURN RIGHT INTO SUBDIVISION, HEAD SOUTH ON SW 179TH WAY 0.38 MILES, PID IS ON NORTHEAST CORNER OF STOP BAR AT CUL-DE-SAC

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHEAST CORNER OF STOP BAR

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| SANITARY MAN HOLE | 49.3' | 177° |
| WATER VALVE | 11.3' | 99° |
| FIRE HYDRANT | 20.2' | 304° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

LiDAR | Photogrammetry | Asset Management

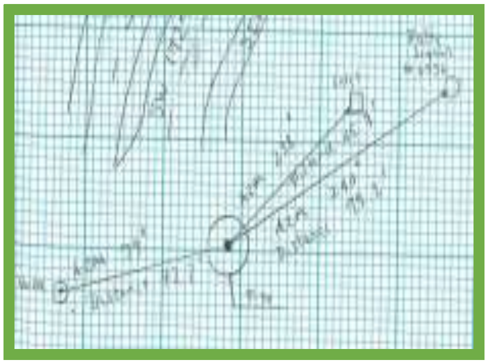
**PROJ. No.** 2013083.02
**POINT ID** T-30
**DATE** 4/27/2018 8:36:28 AM
**COUNTY** DADE
**ROAD ID** SW 172ND AVE

**UNITS** US FEET
**NORTHING** 491995.639
**EASTING** 830011.523

**LATITUDE** 25 41 10.397784 N
**LONGITUDE** 80 28 19.599167 W
**CONVERGENCE** 0 13 43.734
**SCALE FACTOR** 0.99997936

**ELEVATION DETERMINATION:** GPS DERIVED
**VERT. DATUM** NAVD1988
**ELL. HEIGHT** -73.665
**ELEV** 7.555

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF NW 172ND AVE NAD SW 92ND ST, HEAD NORTH 0.45 MILES, PID IS ON TIP OF FIRST RIGHT TURN ARROW

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF RIGHT TURN ARROW

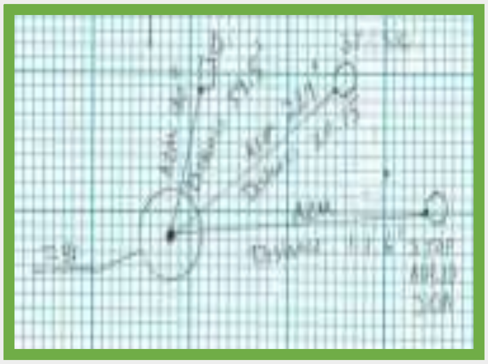
| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| TRAFFIC SIGNAL "6956" | 79.2' | 240° |
| INLET | 45.9' | 238° |
| WATER METER | 42.3' | 79° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 32 46.624677 N |
| **POINT ID** | T-31 | **LONGITUDE** | 80 32 33.977692 W |
| **DATE** | 4/26/2018 10:51:47 AM | **CONVERGENCE** | 0 11 49.843 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99997082 |
| **ROAD ID** | SW 236TH ST | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 441049.719 | **ELL. HEIGHT** | -74.744 |
| **EASTING** | 806916.626 | **ELEV** | 6.185 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**
INTERSECTION OF SW 212TH AVE AND SW 236TH ST, HEAD WEST 0.50 MILES, PID IS ON SOUTHEAST CORNER OF STOP BAR

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON SOUTHEAST CORNER OF STOP BAR

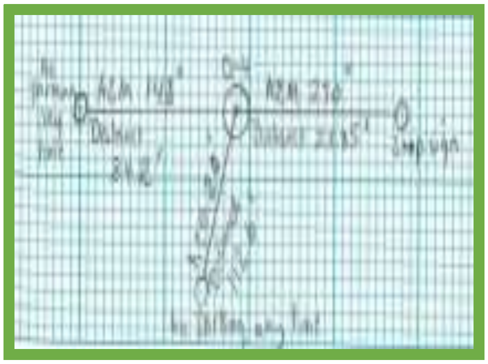
| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| DRAIN INLET | 39.5' | 180° |
| "STOP" SIGN | 20.15' | 227° |
| "STOP SIGN AHEAD" SIGN | 161.6' | 270° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 45 42.385187 N |
| **POINT ID** | O-4 | **LONGITUDE** | 80 45 59.137081 W |
| **DATE** | 4/24/2018 5:14:56 PM | **CONVERGENCE** | 0 06 05.466 |
| **COUNTY** | DADE | **SCALE FACTOR** | 0.99995114 |
| **ROAD ID** | SHARK VALLEY LOOP RD | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 519175.382 | **ELL. HEIGHT** | -66.603 |
| **EASTING** | 733037.983 | **ELEV** | 12.872 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF SW 8TH ST AND SHARK VALLEY LOOP RD, PID IS ON THE CORNER OF STOP BAR OF NORTHBOUND LANE

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON NORTHWEST CORNER OF STOP BAR

| **REFERENCES** | **DIST (ft)** | **AZIMUTH** |
|---|---|---|
| "STOP" SIGN | 23.85' | 250° |
| "NO PARKING ANY TIME" SIGN | 84.2' | 148° |
| "NO PARKING ANY TIME" SIGN | 112.6' | 20° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

**CHECKED BY:** SARAH STILLMAN

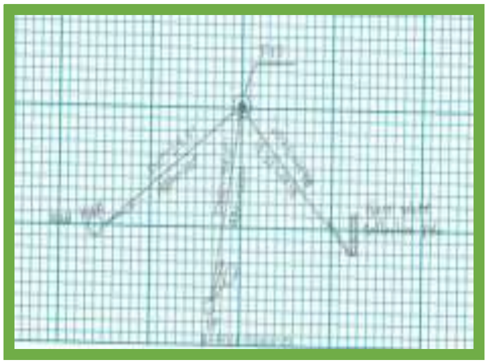
**APRROVED BY:** STEVE KUDA
**DATE APPROVED:** 5/18/2018

GPI

LiDAR | Photogrammetry | Asset Management

| | | | |
|---|---|---|---|
| **PROJ. No.** | 2013083.02 | **LATITUDE** | 25 44 57.654090 N |
| **POINT ID** | T-13 | **LONGITUDE** | 80 12 11.987858 W |
| **DATE** | 4/25/2018 6:10:20 PM | **CONVERGENCE** | 0 20 46.031 |
| **COUNTY** | DADE | **SCALE FACTOR** | 1.00002339 |
| **ROAD ID** | RICKENBACKER CAUSEWAY | | |
| | | **ELEVATION DETERMINATION:** | GPS DERIVED |
| **UNITS** | US FEET | **VERT. DATUM** | NAVD1988 |
| **NORTHING** | 515383.418 | **ELL. HEIGHT** | -70.202 |
| **EASTING** | 918391.197 | **ELEV** | 13.19 |

**HORZ. DATUM** FL EAST STATE PLANE NAD83(11)



**TO REACH THIS STATION FROM THE INTERSECTION OF:**

INTERSECTION OF S MIAMI AVE AND FEDERAL HWY, HEAD WEST 0.15 MILES THEN TURN RIGHT ONTO RICKENBACKER CAUSEWAY, HEAD SOUTHEAST 0.08 MILES, PID IS ON TIP OF CHEVRON RIGHT BEFORE WHITE REFLECTIVE MARKERS START

**MONUMENT DESCRIPTION:**

PK NAIL AND DISK SET ON TIP OF CHEVRON

| REFERENCES | DIST (ft) | AZIMUTH |
|---|---|---|
| MAN HOLE | 24.5' | 110° |
| LIGHT POLE "B-7253-2001-0" | 43.5' | 65° |
| FIRST WHITE REFLECTIVE POLE | 11.3' | 330° |
| N/A | N/A | N/A |
| N/A | N/A | N/A |

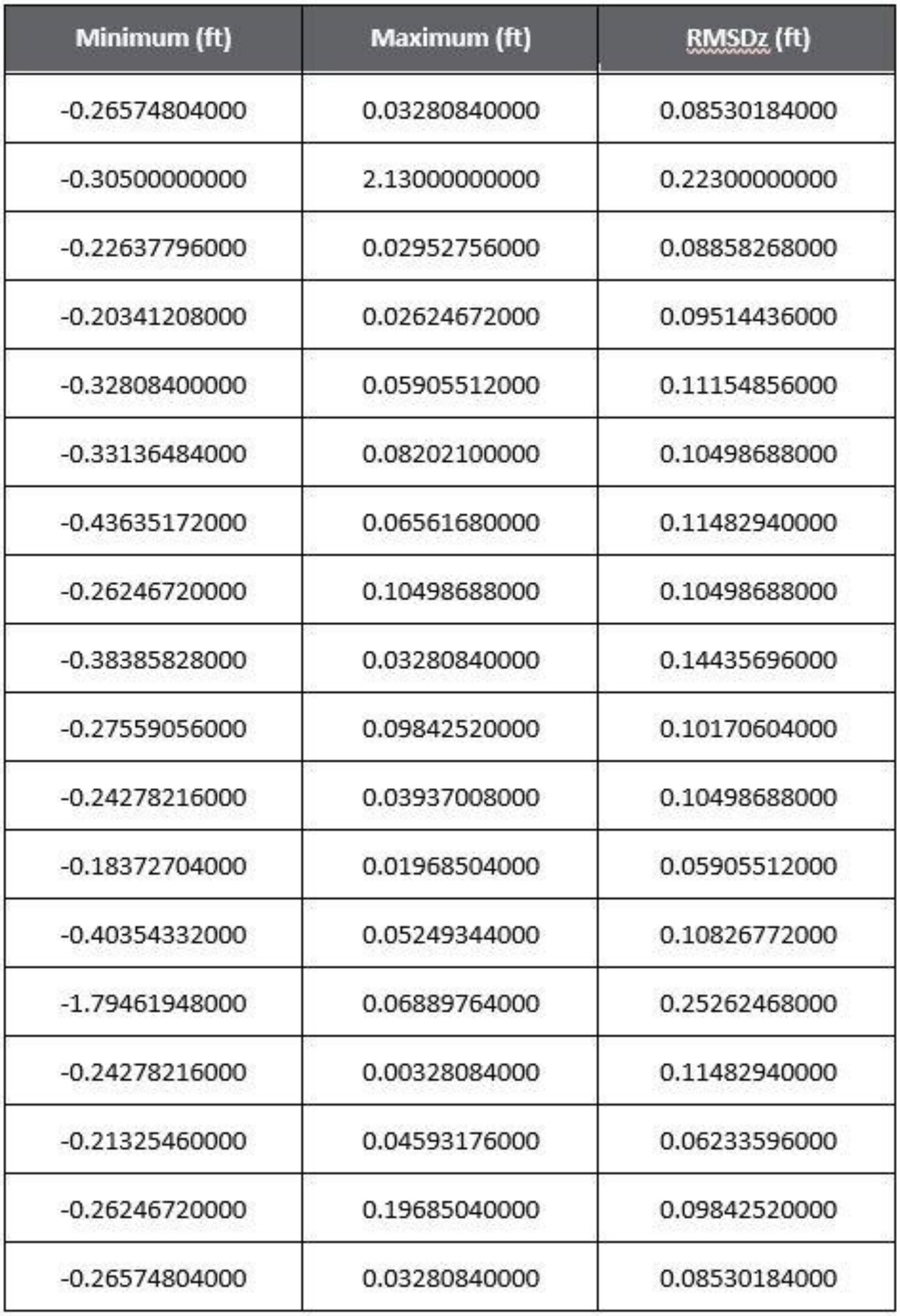
**CHECKED BY:** SARAH STILLMAN

**APRROVED BY:** STEVE KUDA

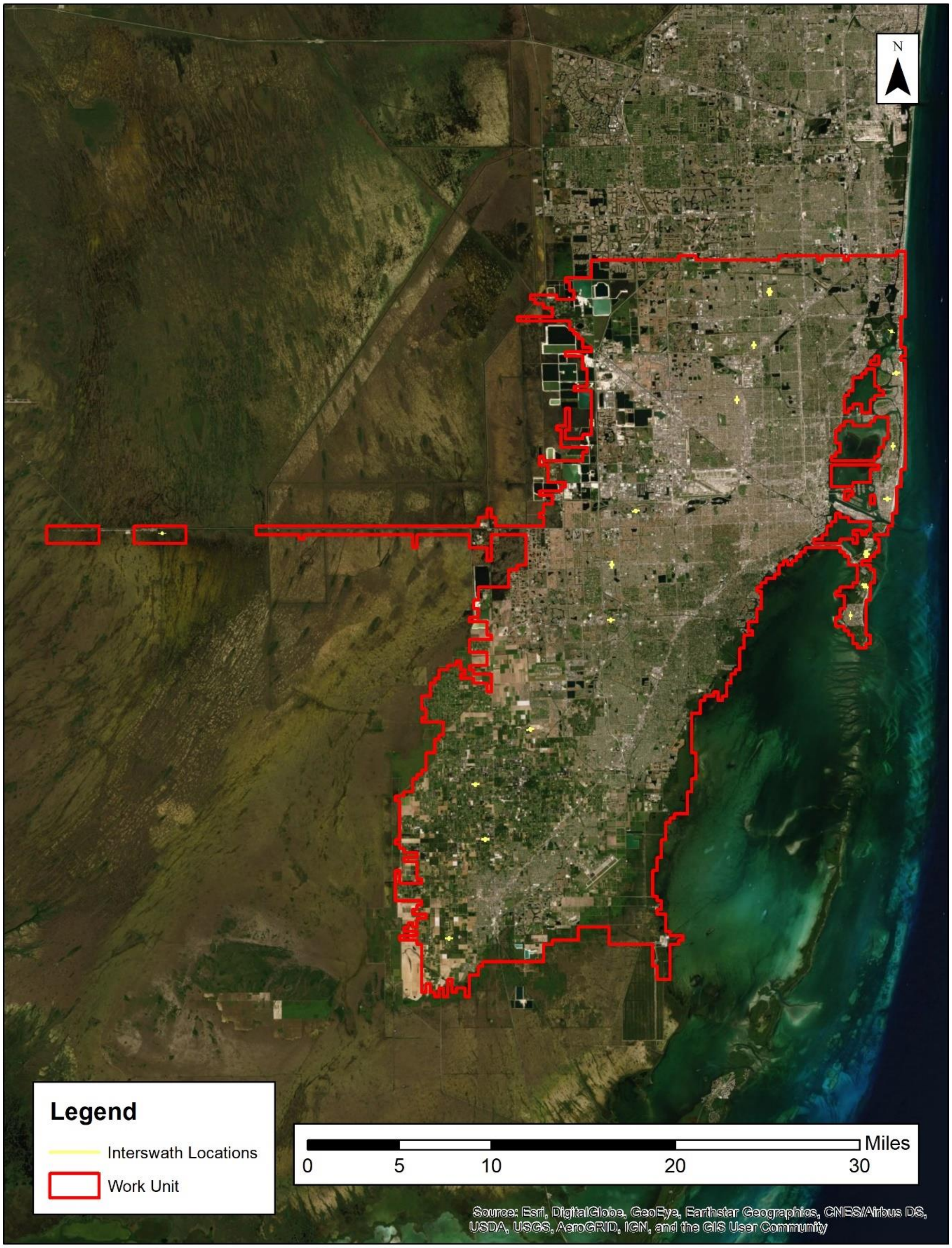
**DATE APPROVED:** 5/18/2018

# Appendix F

## Interswath Results



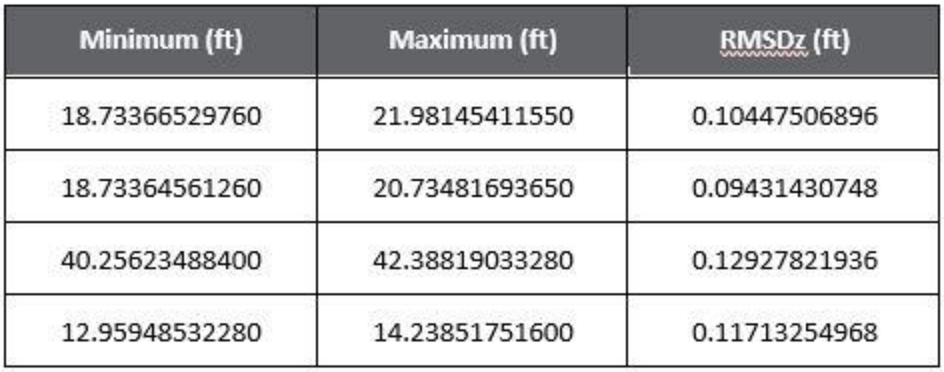
| Minimum (ft) | Maximum (ft) | RMSDz (ft) |
|---|---|---|
| -0.26574804000 | 0.03280840000 | 0.08530184000 |
| -0.30500000000 | 2.13000000000 | 0.22300000000 |
| -0.22637796000 | 0.02952756000 | 0.08858268000 |
| -0.20341208000 | 0.02624672000 | 0.09514436000 |
| -0.32808400000 | 0.05905512000 | 0.11154856000 |
| -0.33136484000 | 0.08202100000 | 0.10498688000 |
| -0.43635172000 | 0.06561680000 | 0.11482940000 |
| -0.26246720000 | 0.10498688000 | 0.10498688000 |
| -0.38385828000 | 0.03280840000 | 0.14435696000 |
| -0.27559056000 | 0.09842520000 | 0.10170604000 |
| -0.24278216000 | 0.03937008000 | 0.10498688000 |
| -0.18372704000 | 0.01968504000 | 0.05905512000 |
| -0.40354332000 | 0.05249344000 | 0.10826772000 |
| -1.79461948000 | 0.06889764000 | 0.25262468000 |
| -0.24278216000 | 0.00328084000 | 0.11482940000 |
| -0.21325460000 | 0.04593176000 | 0.06233596000 |
| -0.26246720000 | 0.19685040000 | 0.09842520000 |
| -0.26574804000 | 0.03280840000 | 0.08530184000 |



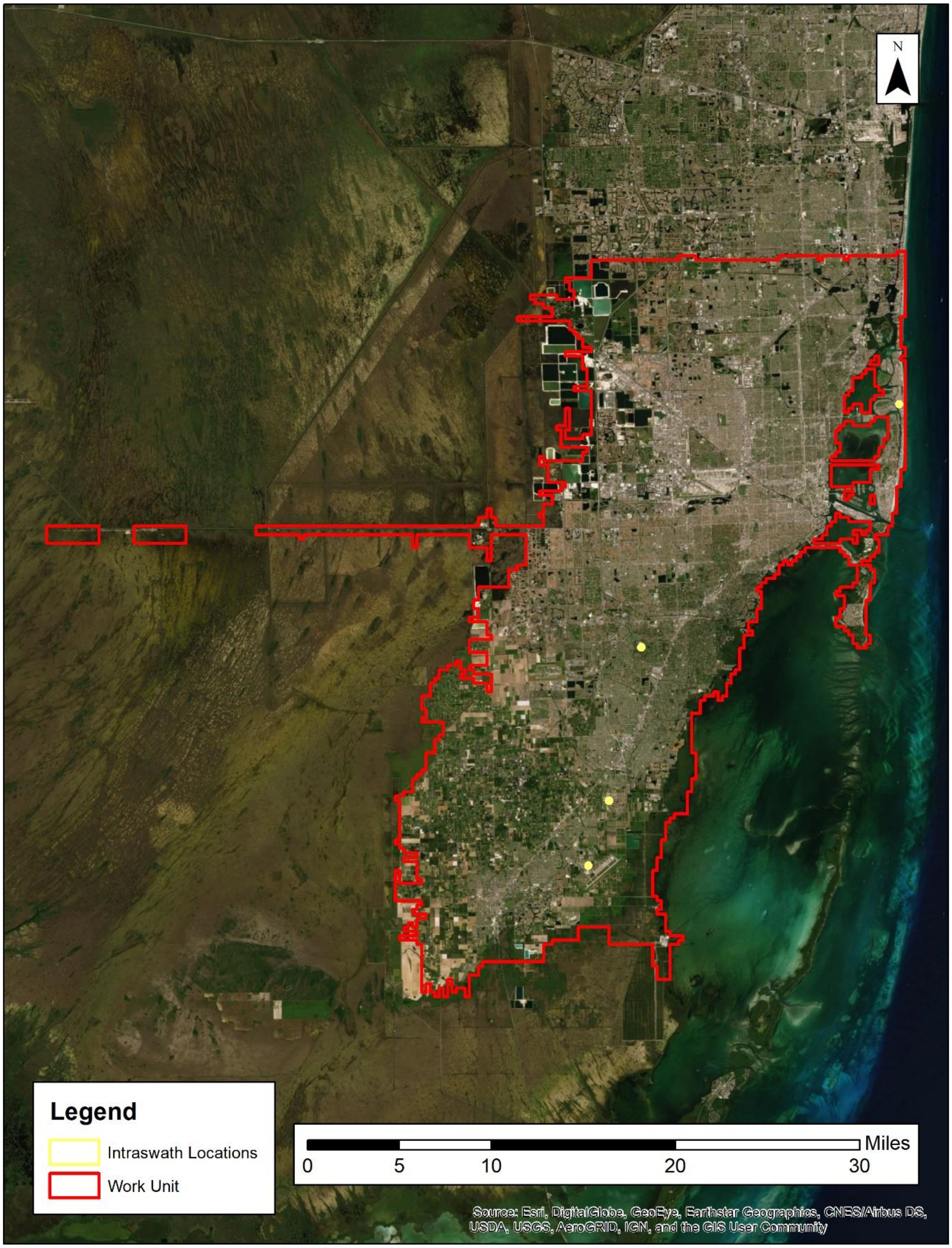
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

# Appendix G

## Intraswath Results



| Minimum (ft) | Maximum (ft) | RMSDz (ft) |
|---|---|---|
| 18.73366529760 | 21.98145411550 | 0.10447506896 |
| 18.73364561260 | 20.73481693650 | 0.09431430748 |
| 40.25623488400 | 42.38819033280 | 0.12927821936 |
| 12.95948532280 | 14.23851751600 | 0.11713254968 |


N
Legend
Intraswath Locations
Work Unit
Miles
0
5
10
20
30
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

# Appendix H

## LiDAR Vertical Accuracy Assessment

### LAS Swath Non-Vegetated Vertical Accuracy (NVA)

LAS Swath Non-Vegetated Vertical Accuracy (NVA) Tested 0.31 Feet Non-vegetated vertical accuracy at a 95 percent confidence level, derived according to NSSDA, in open terrain using 0.157 Feet (RMSEz) x 1.96000 as defined by the National Standards for Spatial Data Accuracy (NSSDA); assessed and reported using National Digital Elevation Program (NDEP)/ASPRS Guidelines and tested against the TIN using LiDAR ground points against 76 NVA points.

### LAS Swath Vegetated Vertical Accuracy (VVA)

Vegetated Vertical Accuracy (VVA) Tested 0.191 Feet at the 95th percentile reported using National Digital Elevation Program (NDEP)/ASPRS Guidelines and tested against the TIN using LiDAR ground points against 35 VVA points.

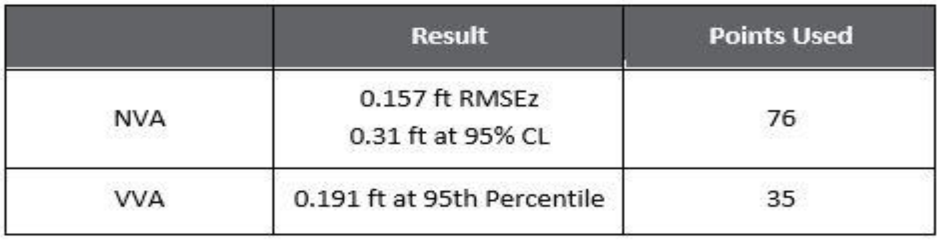
### Bare-Earth DEM Non-Vegetated Vertical Accuracy (NVA)

Bare-Earth DEM Non-Vegetated Vertical Accuracy (NVA) Tested 0.3136 Feet Non-Vegetated vertical accuracy at a 95 percent confidence level, derived according to NSSDA, in open terrain using 0.16 Feet (RMSEz) x 1.96000 as defined by the National Standards for Spatial Data Accuracy (NSSDA); assessed and reported using National Digital Elevation Program (NDEP)/ASPRS Guidelines and tested against the DEM against 73 NVA points.

### Vegetated Vertical Accuracy (VVA)

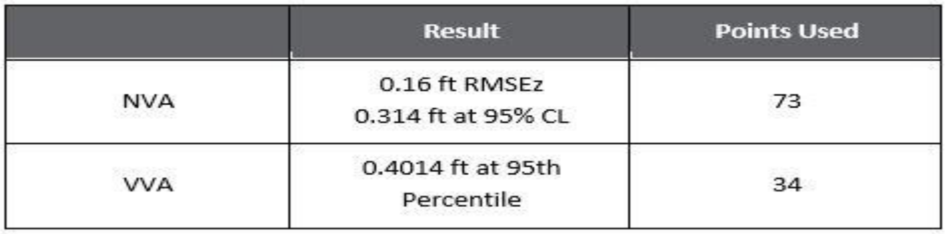
Vegetated Vertical Accuracy (VVA) Tested 0.4014 Feet at the 95th percentile reported using National Digital Elevation Program (NDEP)/ASPRS Guidelines and tested against the DEM against 34 VVA points.

Classified Point Cloud Vertical Accuracy



| | Result | Points Used |
|---|---|---|
| NVA | 0.157 ft RMSEz<br>0.31 ft at 95% CL | 76 |
| VVA | 0.191 ft at 95th Percentile | 35 |

DEM Accuracy



| | Result | Points Used |
|---|---|---|
| NVA | 0.16 ft RMSEz<br>0.314 ft at 95% CL | 73 |
| VVA | 0.4014 ft at 95th Percentile | 34 |

# Appendix I

**GPI**

FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LiDAR | 04/07/21 | 1 | VQ-1560ii + P150 | N948IT | C206 | T BEACHY | G ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4200 | 16:18 | 16:23 | 3600K 100% | | STATIC: KOPF |
| 1 | 1 | / | W | 68 | | 1645 | 1653 | | Y | |
| 2 | 2 | / | E | | | 1655 | 1703 | | Y | |
| 3 | 3 | / | W | | | 1704 | 1713 | | Y | |
| 4 | 4 | / | E | | | 1718 | 1727 | | Y | |
| 5 | 5 | / | W | | | 1728 | 1738 | | Y | |
| 6 | 6 | / | E | | | 1739 | 1749 | | Y | |
| 7 | 7 | / | W | | | 1750 | 1801 | | Y | |
| 8 | 8 | / | E | | | 1803 | 1812 | | Y | |
| CROSS | 9 | / | S | | | 1822 | 1825 | | Y | |
| 69 | 10 | / | W | | | 1846 | 1847 | | Y | |
| 68 | 11 | / | E | | | 1850 | 1856 | | Y | |
| 67 | 12 | / | W | | | 1857 | 1903 | | Y | |
| 66 | 13 | / | E | | | 1905 | 1912 | | Y | |
| 65 | 14 | / | W | | | 1914 | | | Y | |

**GPI**

FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LiDAR | 04/07/21 | 1 | VQ·1560ii+P150 | N9481T | C206 | T. BEACHY | G. ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 15 | / | E | 56 | 4200 | 1922 | 1929 | 3600K 100% | Y | |
| 63 | 16 | / | W | | | 1931 | 1939 | | Y | |
| 62 | 17 | / | E | | | 1940 | 1948 | | Y | |
| 61 | 18 | / | W | | | 1949 | 1957 | | Y | |
| 60 | 19 | / | E | | | 1958 | 2005 | | Y | |
| 59 | 20 | / | W | | | 2008 | 2014 | | Y | |
| 58 | 21 | / | E | | | 2016 | 2023 | | Y | |
| 57 | 22 | / | W | | | 2024 | 2031 | | Y | CLOUD IN LiDAR |
| 56 | 23 | / | E | | | 2033 | 2040 | | Y | |
| 5[illegible]7 | 24 | / | W | | | 2042 | 2048 | | Y | |
| 54 | 25 | / | E | | | 2050 | 2059 | | Y | |
| 55 | 26 | / | W | | | 2100 | 2108 | | Y | |
| CROSS | 27 | / | S | | | 2111 | 2116 | | Y | |
| | | | | | | 2126 | 2131 | | | STATIC X51 |
| | | | | | | | | | | |

GPI

## FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LiDAR | 04/07/21 | 2 | VQ-1560ii +P150 | N948IT | C206 | T. BEACHY | G. ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4200 | 2217 | 2222 | 3600K 100% | | STATIC X51 |
| 53 | 28 | / | W | 13 | | 2237 | 2244 | | N | |
| 52 | 29 | / | E | | | 2245 | 2253 | | N | |
| 51 | 30 | / | W | | | 2255 | 2302 | | N | |
| 50 | 31 | / | E | | | 2303 | 2311 | | N | |
| 49 | 32 | / | W | | | 2313 | 2320 | | N | |
| 48 | 33 | / | E | | | 2321 | 2329 | | N | |
| 47 | 34 | / | W | | | 2330 | 2337 | | N | |
| 46 | 35 | / | E | | | 2338 | 2345 | | N | |
| 45 | 36 | / | W | | | 2353 | 00:00 | | N | |
| 44 | 37 | / | E | | | 00:03 | 0010 | | N | |
| 43 | 38 | / | W | | | 0011 | 0019 | | N | |
| 42 | 39 | / | E | | | | 0029 | | N | |
| 41 | 40 | / | W | | | 0030 | 0038 | | N | |
| 40 | 41 | / | E | | | 0040 | 0047 | | N | |

FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LiDAR | 04/07/21 | 2 | VQ-1560ii +P150 | N948IT | C206 | T. BEACHY | G. ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 39 | 42 | / | W |  | 4200 | 0049 | 0057 | 3600K 100% | N |  |
| 38 | 43 | / | E |  |  | 0058 | 0106 |  | N |  |
| 37 | 44 | / | W |  |  | 0110 | 0120 |  | N |  |
| 36 | 45 | / | E |  |  | 0122 | 0133 |  | N |  |
| 35 | 46 | / | W |  |  | 0134 | 0144 |  | N |  |
| 34 | 47 | / | E |  |  | 0146 | 0156 |  | N |  |
| 33 | 48 | / | W |  |  | 0157 | 0208 |  | N |  |
| 32 | 49 | / | E |  |  | 0209 | 0218 |  | N |  |
| 31 | 50 | / | W |  |  | 0220 | 0231 |  | N |  |
| CROSS | 51 | / | S |  |  | 0234 | 0241 |  | N |  |
|  |  |  |  |  |  | 0304 | 0309 |  |  | STATIC: KOPF |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

**GPI**

## FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LiDAR | 04/08/21 | 1 | VQ-1560ic | N948IT | C206 | T. BEACHY | G. ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4200 | 0242 | 0247 | 3600K 100% | | STATIC: KOPF |
| 9 | 52 | – | W | – | | 0303 | 0312 | | N | |
| 10 | 53 | – | E | | | 0313 | 0322 | | N | |
| 11 | 54 | – | W | | | 0323 | 0332 | | N | |
| 12 | 55 | – | E | | | 0333 | 0342 | | N | |
| 13 | 56 | – | W | | | 0343 | 0351 | | N | |
| 14 | 57 | – | E | | | 0352 | 0402 | | N | |
| 15 | 58 | – | W | | | 0403 | 0412 | | N | |
| 16 | 59 | – | E | | | 0413 | 0422 | | N | |
| 17 | 60 | – | W | | | 0423 | 0432 | | N | |
| 18 | 61 | – | E | | | 0433 | 0443 | | N | |
| 19 | 62 | – | W | | | 0444 | 0453 | | N | |
| 20 | 63 | – | E | | | 0453 | 0504 | | N | |
| 21 | 64 | – | W | | | 0505 | 0514 | | N | |
| 22 | 65 | – | E | | | 0516 | 0525 | | N | POSSIBLE CLOUD E. END OF LINE |

# GPI

## FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LIDAR | 04/08/21 | 1 | VQ-1560ii | N9481T | C206 | T. BEACHY | G. ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| – | 66 | – | – |  | 4200 | – | – | 3600K 100% | N | LIDAR FIRED AFTER LINE ABORT |
| 29 | 67 | – | W | – |  | 0532 | 0542 |  | N | POSSIBLE CLOUD E. END OF LINE |
| 30 | 68 | – | E |  |  | 0544 | 0554 |  | N | POSSIBLE CLOUD E. END OF LINE |
| CROSS | 69 | – | N |  |  | 0605 | 0612 |  | N | CROSS LINE |
|  |  |  |  |  |  | 06:25 | 06:30 |  |  | STATIC: KOPF |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
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**GPI**

## FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 2020572 | MIAMI DADE LiDAR | 04/09/21 | 1 | VQ-1560ii | N9481T | C206 | T. BEACHY | G. ADAMS |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | – | 4200 | 02:25 | 02:30 | 3600K 100% | | STATIC: KOPF |
| 27 | 70 | – | W | | | 0250 | 0310 | | N | POSSIBLE CLOUD |
| 26 | 71 | – | E | | | 0313 | 0333 | | N | CLOUD |
| 29 | 72 | – | W | | | 0335 | 0345 | | N | CLOUD |
| 30 | 73 | – | E | | | 0348 | 0357 | | N | CLOUD |
| 73 | 74 | – | SW | | | 0402 | 0411 | | N | |
| 72 | 75 | – | NE | | | 0413 | 0423 | | N | |
| 71 | 76 | – | SW | | | 0425 | 0435 | | N | |
| 70 | 77 | – | NE | | | 0439 | 0443 | | N | |
| CROSS | 78 | – | SE | | | 0447 | 0449 | | N | |
| 23 | 79 | – | W | | | 0456 | 0505 | | N | CLOUD |
| 24 | 80 | – | E | | | 0509 | 0520 | | N | CLOUD |
| 25 | 81 | – | W | | | 0521 | 0532 | | N | CLOUD |
| 28 | 82 | – | E | | | 0535 | 0546 | | N | CLOUD |
| CROSS | 83 | – | N | | | 0552 | 055 | | N | |

0609 0614 STATIC: KOPF

# GPI

## FLIGHT ACQUISITION FORM

| Job # | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|
| 20572 | ITD Miami | 4/16 | 1 | 1560ii | 9487 | C206 | SS | AB |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note ouds/s ndows,e ..) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 0219 | 0224 | | | Static KOPF |
| 74 | 84 | | S | | 4200 | 239 | 248 | 120 100<br>42003600 | NO | |
| 75 | 85 | | N | | 250 | 250 | 259 | | | |
| 76 | 86 | | S | | | 302 | 311 | | | |
| 77 | 87 | | N | | | 313 | 321 | | | |
| 78 | 88 | | S | | | 323 | 330 | | | |
| 79 | 89 | | N | | | 333 | 347 | | | |
| 80 | 90 | | S | | | 343 | 350 | | | |
| 82 | 91 | | S | | | 355 | 357 | | | |
| 81 | 92 | | N | | | 359 | 404 | | | |
| | | | | | | 422 | 427 | | | Static KOPF |
| | | | | | | | | | | |
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GPI

## FLIGHT ACQUISITION FORM

| Job # | | Job Name | Date | Lift | Sensor | Aircraft | Type | Pilot | Operator |
|---|---|---|---|---|---|---|---|---|---|
| 20572 | | ITD | 6/10 | 1 | 1560:: | 548/T | C206 | SS | AB |

| Flight Line# | Record# | Images/Image# | Direction | Sun Angle | Altitude | Start UTC | Stop UTC | Sensor Settings | Turbulence | Weather Conditions-Comments (note clouds/shadows,etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 1 | 10 | S | | 2500 | 1315 | 1315 | $\overset{100}{4000}$ $\overset{120}{2500}$ | NO | |
| [illegible] | [illegible] | | [illegible] | | | 1538 | 1343 | | | Static |
| [illegible] | | | | | | 1458 | 1503 | | | Static |
| 13 | 2 | 10 | N | | | 1517 | 1518 | | NO | Clear below |
| 12 | 3 | 10 | S | | | 1519 | 1520 | | | |
| 11 | 4 | 10 | N | | | 1522 | 1523 | | | |
| 10 | 5 | 8 | S | | | 1525 | 1526 | | | |
| 9 | 6 | 8 | N | | | 1527 | 1527 | | | |
| 8 | 7 | 8 | S | | | 1529 | 1530 | | | |
| 7 | 8 | 8 | N | | | 1531 | 1532 | | | |
| 6 | 9 | 8 | S | | | 1533 | 1534 | | | |
| 5 | 10 | 8 | N | | | 1536 | 1536 | | | |
| 4 | 11 | 7 | S | | | 1543 | 1544 | | | |
| 3 | 12 | 7 | N | | | 1545 | 1545 | | | |
| 2 | 13 | 7 | S | | | 1547 | 1547 | | | |
| 1 | 14 | | N | | | 1549 | 1549 | | | |
| | | | | | | 1714 | 1719 | | | Static KORL |

# Appendix J

Title: **System Calibration *RIEGL* VQ-1560II S2224887**

Author: Markus Nowotny, DI Peter Rieger

Customer: RIEGL USA
Doc. No.: Na
Date: 06.07.2020
Pages: 20
Issue: 01
Distribution:

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# Contents

# 1 Introduction

The system calibration has been performed using the associated software tools for airborne - laser scanning developed by *RIEGL* LMS GmbH:

**SDCImport, version V.3.1**

**RiWORLD, version V.6.1**

**RiPROCESS, version V.1.8.7**

Calibration parameter values are derived from a process called “scan data adjustment”. Chapter 2 describes the essential parameters given in the protocol associated with scan data adjustment.

The process of system calibration is highly automated; the final “RiPROCESS Scan Data Adjustment Protocol” given in chapter 3 “RiPROCESS Scan Data Adjustment Protocol” includes the automatically generated summary of relevant parameters and results provided by the iterative calculation performed by RiPROCESS.

A visual verification of the quality of the system calibration has been performed by plotting the height difference of two overlapping scan stripes.

The results of the calibration and a calibration protocol confirming the systems specified accuracy are included in this document.

# 2 Explanations to the protocol

## Calculation parameters

Information regarding the configuration and the status of the scan data adjustment algorithm are given in this category.

### *Calculation mode*

In case „least square fitting“ is chosen the sum of the squares of the residues is minimized (least squares method).

The „robust fitting“-method minimizes the absolute values of the residues.

### *Calculation time*

States the actual computation time of the algorithm.

### *Min. change of error [m]*

The iterative calculation ends when the minimum changes of the residual error are smaller than the chosen value.

### *Search radius [m]*

Asks for the maximum distance of the centre of gravity of a terrestrially surveyed control surface (a so called “tie object”) to the centre of gravity of a corresponding surface found in the scan data (point cloud).

### *Angle tolerance [deg]*

The terrestrially surveyed tie objects and the surface in the scan data is found to be correspondent if the normal vectors of both surfaces include an angle smaller than *Angle tolerance*.

### *Max. normal dist. [m]*

The terrestrially surveyed tie objects and the surface in the scan data is found to be correspondent if the mean distance of both surfaces is smaller than *Max. normal distance.*

## Calculation results

### *Number of free parameters*

States the amount of parameters to be optimized by the scan data adjustment algorithm.

### *Number of observations*

States the amount of actually used observations by the scan data adjustment algorithm.

### *Error (Std. deviation) [m]*

States the resulting standard deviation of the residual errors.

## Laser Data

The table gives the optimized angular differences [deg] and translations [m] with respect to the system calibration.

## Laser devices

The exact boresight angles of the laser scanner's coordinate system with respect to the IMU-sensors coordinate system is a result of the scan data adjustment. The boresight calibration and also the optimized angular differences and translations between scan stripes are taken into account with the data processing of all scan stripes separately.

## Navigation Devices

The global shifts with respect to the directions east and north as also to the local normal vector to the ellipsoid in meters are given in this category.

Additionally the parameter "Time" is taken into account when combining the scan data and the trajectory.

## Observations

The spreadsheets give the absolute residual errors of single observations. The best and the worst 15 observations are listed separately with their residual error which is the mean normal distance [m]. The coordinates of each single observation enables a fast search.

A statement regarding the quality of the attitude and position of single scan stripes is given in the tables „best 15 Scans" and "worst 15 Scans". The standard deviation of all observations within a single scan stripe with respect to all other overlapping stripes is stated.

## Histogram of residues

The histogram shows the distribution of the observations according to their residual error. Generally it is a nearly Gaussian distribution with a mean value of 0.

## Orientation chart

The orienation of the observations has an influence on the results of the scan data adjustment algorithm. If the observations are oriented in various directions the result can be expected to be stable and accurate. In case all the corresponding surfaces are aligned similar, e.g. north-south, or in case that only horizontally oriented surfaces are available the algorithm may diverge and a stable result is unlikely, at the same time the residual errors will be low.

The orientation chart shows the distribution of all surfaces with respect to all directions of the compass.

# 3 RiPROCESS Scan Data Adjustment Protocol

| | |
|---|---|
| **Project:** | 200630_VQ-1560II_S2224887 |
| **Protocol date:** | 2020-07-03 12:50 |
| **Operator:** | MN |
| **Comments:** | VQ-1560II S2224887 |
| **Program version:** | RiPROCESS v1.8.9.1056 (2020-05-06) |
| **Computer:** | ROCKET |
| **Physical units:** | m, deg, s |

## 3.1 *Calculation parameters*

| | |
|---|---|
| **Calculation mode:** | Analyze |
| **Calculation time:** | 9 mins, 16 secs |
| **Calculation mode:** | Least Square Fit |
| **Tolerance:** | 0.000100 |
| **Use Manual Tie Objects:** | True |
| **Search corresp. planes:** | False |
| **Search radius [m]:** | 1.000 |
| **Angular tolerance [deg]:** | 5.000 |
| **Max. normal dist. [m]:** | 1.000 |
| **Observations active:** | True |
| **Observations count:** | 177775 |

## 3.2 *Calculation results*

| | |
|---|---|
| **Number of free parameters:** | 0 |
| **Number of observations:** | 177772 |
| **Error (Std. deviation) [m]:** | 0.0142 |

## 3.3 *Laser data*

| Name | Roll [deg] | Pitch [deg] | Yaw [deg] | East [m] | North [m] | Height [m] | Time [s] |
|---|---|---|---|---|---|---|---|
| **200630_083407_Channel_1** | -0.002 | 0.000 | -0.002 | 0.046 | -0.016 | 0.242 | 0.0000 |
| **200630_083407_Channel_2** | -0.002 | 0.000 | -0.002 | 0.046 | -0.016 | 0.242 | 0.0000 |
| **200630_083811_Channel_1** | 0.002 | 0.000 | 0.001 | -0.002 | 0.018 | 0.187 | 0.0000 |
| **200630_083811_Channel_2** | 0.002 | 0.000 | 0.001 | -0.002 | 0.018 | 0.187 | 0.0000 |
| **200630_084209_Channel_1** | 0.000 | 0.001 | 0.000 | -0.022 | 0.006 | 0.178 | 0.0000 |
| **200630_084209_Channel_2** | 0.000 | 0.001 | 0.000 | -0.022 | 0.006 | 0.178 | 0.0000 |
| **200630_084627_Channel_1** | 0.001 | -0.002 | 0.003 | 0.020 | 0.049 | 0.214 | 0.0000 |
| **200630_084627_Channel_2** | 0.001 | -0.002 | 0.003 | 0.020 | 0.049 | 0.214 | 0.0000 |
| **200630_085659_Channel_1** | -0.002 | -0.001 | 0.001 | 0.000 | 0.004 | 0.033 | 0.0000 |
| **200630_085659_Channel_2** | -0.002 | -0.001 | 0.001 | 0.000 | 0.004 | 0.033 | 0.0000 |
| **200630_090022_Channel_1** | 0.001 | 0.002 | 0.000 | 0.006 | 0.026 | 0.040 | 0.0000 |
| **200630_090022_Channel_2** | 0.001 | 0.002 | 0.000 | 0.006 | 0.026 | 0.040 | 0.0000 |
| **200630_090403_Channel_1** | -0.001 | 0.000 | 0.002 | 0.004 | 0.007 | 0.010 | 0.0000 |
| **200630_090403_Channel_2** | -0.001 | 0.000 | 0.002 | 0.004 | 0.007 | 0.010 | 0.0000 |
| **200630_090805_Channel_1** | 0.001 | 0.001 | 0.003 | 0.005 | 0.027 | 0.035 | 0.0000 |
| **200630_090805_Channel_2** | 0.001 | 0.001 | 0.003 | 0.005 | 0.027 | 0.035 | 0.0000 |
| **200630_091125_Channel_1** | -0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.0000 |
| **200630_091125_Channel_2** | -0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.0000 |
| **200630_091447_Channel_1** | 0.002 | 0.001 | 0.002 | 0.010 | 0.035 | 0.062 | 0.0000 |
| **200630_091447_Channel_2** | 0.002 | 0.001 | 0.002 | 0.010 | 0.035 | 0.062 | 0.0000 |
| **200630_091831_Channel_1** | 0.000 | 0.002 | 0.000 | -0.017 | 0.001 | 0.055 | 0.0000 |
| **200630_091831_Channel_2** | 0.000 | 0.002 | 0.000 | -0.017 | 0.001 | 0.055 | 0.0000 |
| **200630_092137_Channel_1** | 0.000 | 0.000 | 0.002 | 0.022 | 0.010 | 0.074 | 0.0000 |
| **200630_092138_Channel_2** | 0.000 | 0.000 | 0.002 | 0.022 | 0.010 | 0.074 | 0.0000 |
| **200630_092458_Channel_1** | -0.001 | 0.002 | 0.003 | -0.014 | 0.004 | 0.076 | 0.0000 |
| **200630_092458_Channel_2** | -0.001 | 0.002 | 0.003 | -0.014 | 0.004 | 0.076 | 0.0000 |

## 3.4 *Laser devices*

| Name | Roll [deg] | Pitch [deg] | Yaw [deg] | X [m] | Y [m] | Z [m] |
|---|---|---|---|---|---|---|
| **Channel 1 (VQ-1560II, S2224887)** | -0.02548 | -0.12611 | -0.01758 | 0.000 | 0.000 | 0.174 |
| **Channel 2 (VQ-1560II, S2224887)** | 0.00000 | 0.00000 | 0.00000 | 0.000 | 0.000 | 0.000 |

## 3.5 *Navigation devices*

| Name | Roll [deg] | Pitch [deg] | Yaw [deg] | East [m] | North [m] | Height [m] | Time [s] |
|---|---|---|---|---|---|---|---|
| **INS-GPS 1 (Applanix POS AV/LV/MV, 11438)** | 0.00000 | 0.00000 | 0.00000 | 0.000 | 0.000 | 0.000 | -0.0007 |

## 3.6 *Observations*

### *Best 15 observations*

| # | Object 1 | Object 2 | Deviation [m] | Description |
|---|---|---|---|---|
| **1** | Record016_Line6 - 200630_092138_Channel_2 | Record017_Line7 - 200630_092458_Channel_1 | 0.000 | |
| **2** | Record005_Line3 - 200630_083811_Channel_1 | Record014_Line3 - 200630_091447_Channel_1 | 0.000 | |
| **3** | Record004_Line1 - 200630_083407_Channel_1 | Record005_Line3 - 200630_083811_Channel_1 | 0.000 | |
| **4** | Record006_Line5 - 200630_084209_Channel_2 | Record007_Line7 - 200630_084627_Channel_2 | 0.000 | |

| # | Object 1 | Object 2 | Deviation [m] | Description |
|---|---|---|---|---|
| 5 | Record004_Line1 - 200630_083407_Channel_2 | Record011_Line10 - 200630_090403_Channel_1 | 0.000 | |
| 6 | Record010_Line8 - 200630_090022_Channel_2 | Record014_Line3 - 200630_091447_Channel_2 | 0.000 | |
| 7 | Record015_Line5 - 200630_091831_Channel_2 | Record016_Line6 - 200630_092138_Channel_2 | 0.000 | |
| 8 | Record013_Line2 - 200630_091125_Channel_2 | Record014_Line3 - 200630_091447_Channel_2 | 0.000 | |
| 9 | Record016_Line6 - 200630_092137_Channel_1 | Record017_Line7 - 200630_092458_Channel_2 | 0.000 | |
| 10 | Record010_Line8 - 200630_090022_Channel_1 | Record012_Line1 - 200630_090805_Channel_1 | 0.000 | |
| 11 | Record010_Line8 - 200630_090022_Channel_2 | Record017_Line7 - 200630_092458_Channel_2 | 0.000 | |
| 12 | Record012_Line1 - 200630_090805_Channel_1 | Record013_Line2 - 200630_091125_Channel_2 | 0.000 | |
| 13 | Record006_Line5 - 200630_084209_Channel_2 | Record007_Line7 - 200630_084627_Channel_2 | 0.000 | |
| 14 | Record005_Line3 - 200630_083811_Channel_1 | Record011_Line10 - 200630_090403_Channel_2 | 0.000 | |
| 15 | Record006_Line5 - 200630_084209_Channel_2 | Record007_Line7 - 200630_084627_Channel_1 | 0.000 | |

## Worst 15 observations

| # | Object 1 | Object 2 | Deviation [m] | Description |
|---|---|---|---|---|
| 1 | Record009_Line9 - 200630_085659_Channel_1 | Record011_Line10 - 200630_090403_Channel_1 | 0.199 | |
| 2 | Record010_Line8 - 200630_090022_Channel_2 | Record011_Line10 - 200630_090403_Channel_2 | -0.194 | |
| 3 | Record014_Line3 - 200630_091447_Channel_1 | Record017_Line7 - 200630_092458_Channel_2 | 0.193 | |
| 4 | Record015_Line5 - 200630_091831_Channel_2 | Record016_Line6 - 200630_092137_Channel_1 | -0.193 | |
| 5 | Record015_Line5 - 200630_091831_Channel_2 | Record017_Line7 - 200630_092458_Channel_2 | -0.192 | |
| 6 | Record009_Line9 - 200630_085659_Channel_1 | Record013_Line2 - 200630_091125_Channel_1 | 0.191 | |
| 7 | Record006_Line5 - 200630_084209_Channel_2 | Record011_Line10 - 200630_090403_Channel_2 | 0.189 | |
| 8 | Record010_Line8 - 200630_090022_Channel_2 | Record011_Line10 - 200630_090403_Channel_1 | -0.189 | |
| 9 | Record006_Line5 - 200630_084209_Channel_2 | Record017_Line7 - 200630_092458_Channel_1 | -0.185 | |
| 10 | Record013_Line2 - 200630_091125_Channel_2 | Record014_Line3 - 200630_091447_Channel_2 | 0.183 | |
| 11 | Record015_Line5 - 200630_091831_Channel_1 | Record017_Line7 - 200630_092458_Channel_1 | -0.179 | |
| 12 | Record009_Line9 - 200630_085659_Channel_1 | Record010_Line8 - 200630_090022_Channel_1 | -0.179 | |
| 13 | Record005_Line3 - 200630_083811_Channel_2 | Record009_Line9 - 200630_085659_Channel_2 | 0.175 | |
| 14 | Record014_Line3 - 200630_091447_Channel_1 | Record017_Line7 - 200630_092458_Channel_1 | 0.173 | |
| 15 | Record006_Line5 - 200630_084209_Channel_2 | Record015_Line5 - 200630_091831_Channel_2 | 0.173 | |

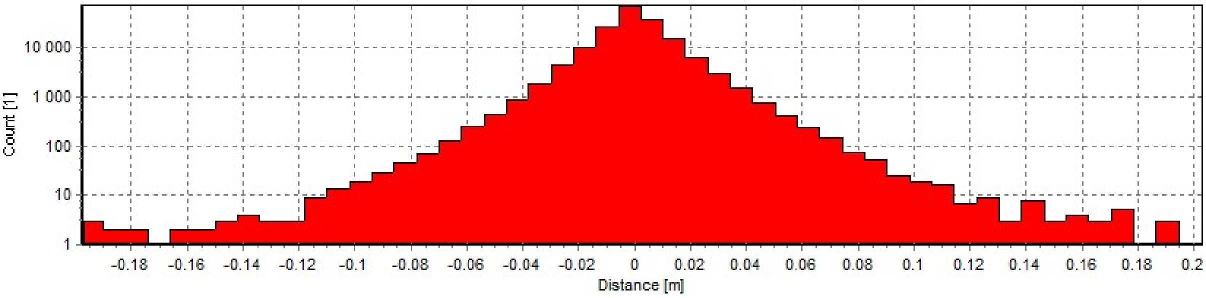
## Best 15 scans

| Name | Objects | Std. dev. [m] |
|---|---|---|
| 200630_090022_Channel_2 | 17405 | 0.012 |
| 200630_090022_Channel_1 | 17430 | 0.012 |
| 200630_090805_Channel_1 | 11083 | 0.012 |
| 200630_085659_Channel_2 | 13711 | 0.012 |
| 200630_090805_Channel_2 | 11208 | 0.012 |
| 200630_090403_Channel_2 | 14332 | 0.013 |
| 200630_091125_Channel_2 | 14857 | 0.013 |
| 200630_091125_Channel_1 | 14737 | 0.013 |
| 200630_091831_Channel_2 | 8922 | 0.013 |
| 200630_091447_Channel_2 | 11162 | 0.013 |
| 200630_091831_Channel_1 | 8889 | 0.013 |
| 200630_085659_Channel_1 | 13641 | 0.013 |
| 200630_092458_Channel_2 | 7929 | 0.014 |
| 200630_091447_Channel_1 | 11087 | 0.014 |
| 200630_090403_Channel_1 | 14326 | 0.014 |

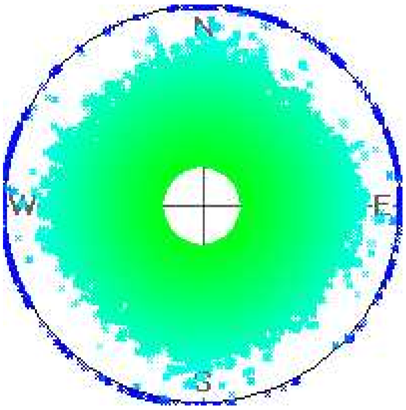
## Worst 15 scans

| Name | Objects | Std. dev. [m] |
|---|---|---|
| 200630_084627_Channel_1 | 9195 | 0.018 |
| 200630_084627_Channel_2 | 9781 | 0.017 |
| 200630_083811_Channel_1 | 20164 | 0.016 |
| 200630_083811_Channel_2 | 20224 | 0.016 |
| 200630_084209_Channel_2 | 19684 | 0.016 |
| 200630_084209_Channel_1 | 19694 | 0.016 |
| 200630_092137_Channel_1 | 9317 | 0.015 |
| 200630_083407_Channel_2 | 19651 | 0.015 |
| 200630_083407_Channel_1 | 19806 | 0.015 |
| 200630_092138_Channel_2 | 9422 | 0.015 |
| 200630_092458_Channel_1 | 7887 | 0.014 |
| 200630_090403_Channel_1 | 14326 | 0.014 |
| 200630_091447_Channel_1 | 11087 | 0.014 |
| 200630_092458_Channel_2 | 7929 | 0.014 |
| 200630_085659_Channel_1 | 13641 | 0.013 |

## 3.7 Histogram of residuals



## 3.8 Orientation chart

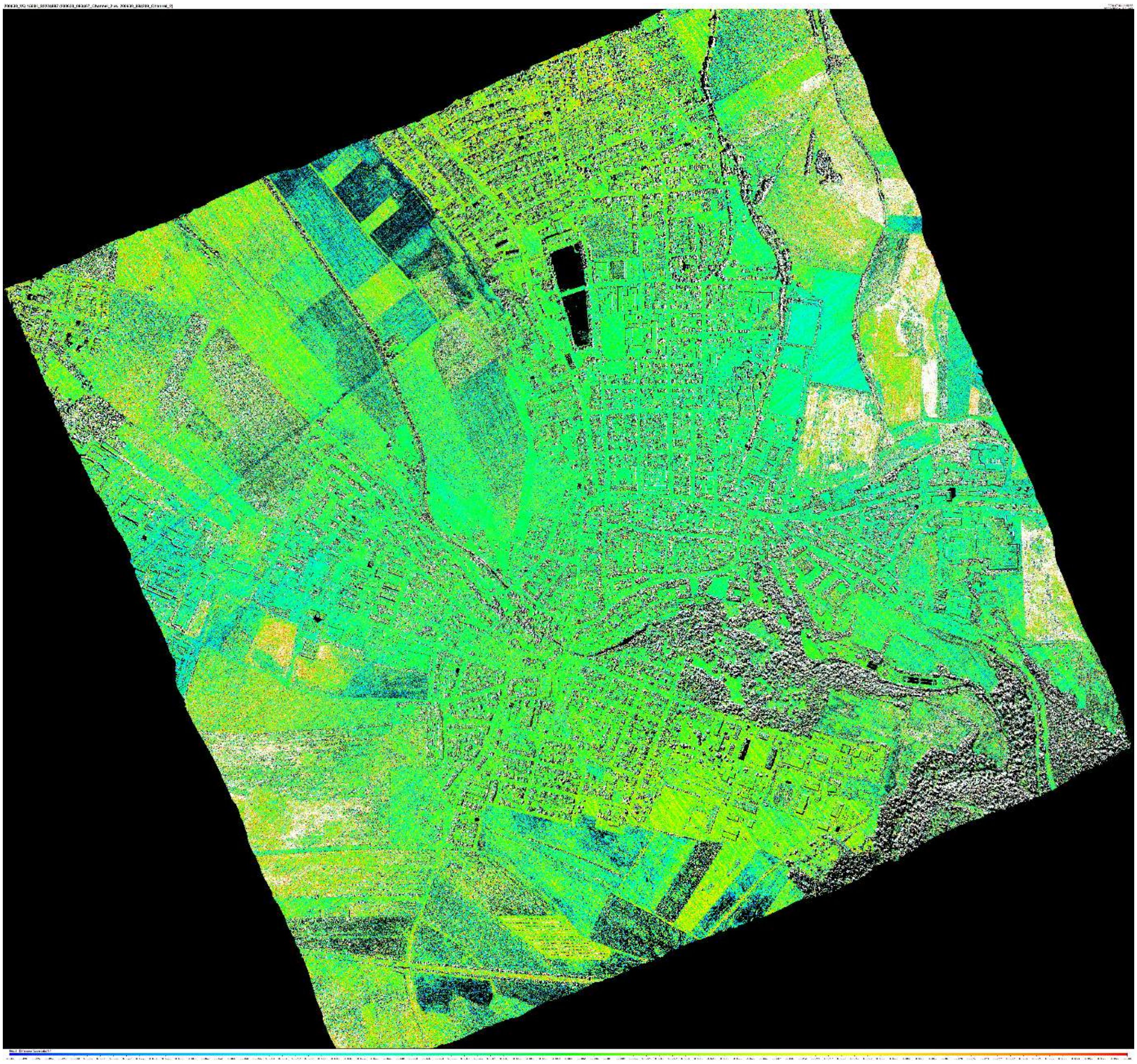


# 4 Visual accuracy assessment

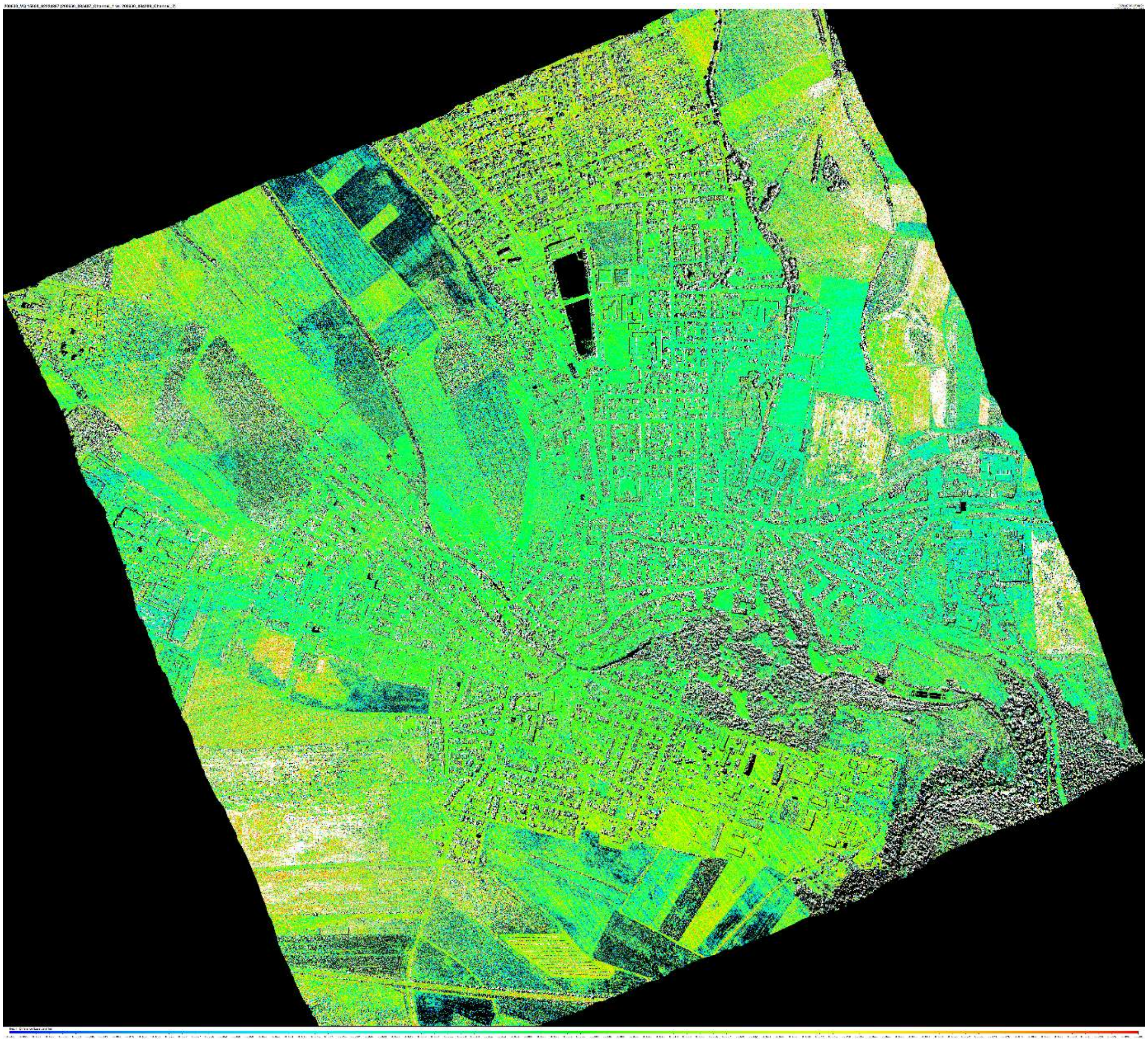
For the visual assessment of the data quality achieved by applying the results of the scan data adjustment algorithm, a few plots chosen at random, showing the height difference of two overlapping scan lines in each case, are given. The height difference is calculated by already determined surfaces in the overlap of two scan stripes. The distance of the centre of gravity of two corresponding surfaces is colour coded according to the colours of the rainbow with a range of +/- 10 cm. If no surfaces have been determined because of e.g. vegetation and trees or missing data like for example lakes and rivers, no valuable information is available which is indicated by black or white coloured pixels.

### 4.1 Height difference plots

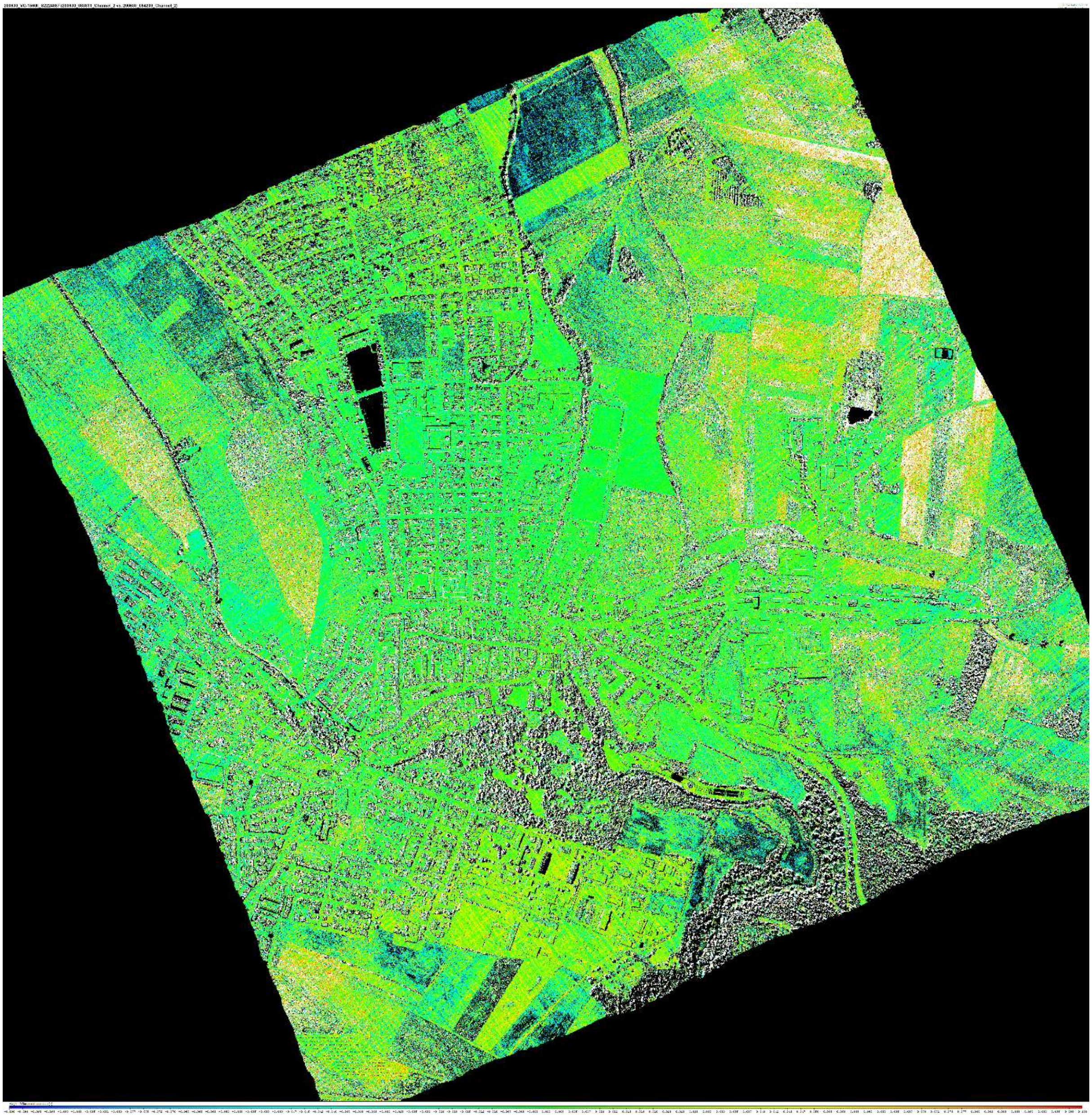
## Scan 200630_083407_2 vs. 200630_084209_2



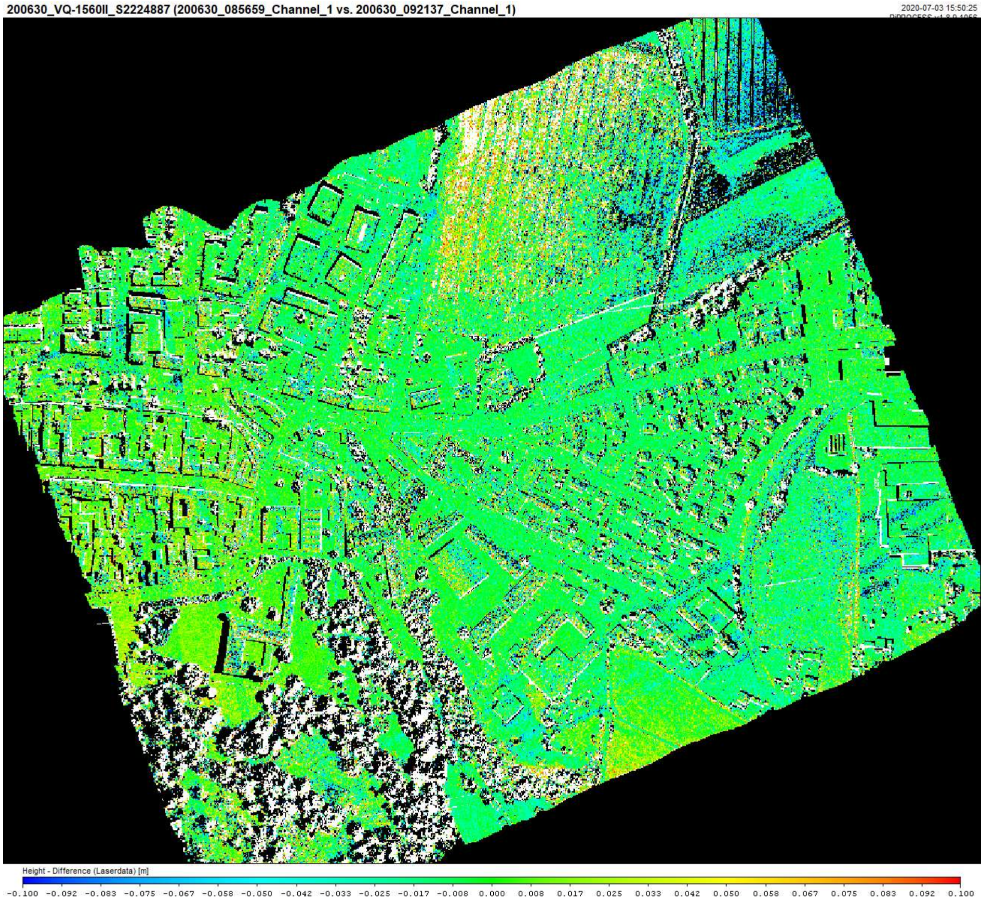
# Scan 200630_083407_1 vs. 200630_084209_2



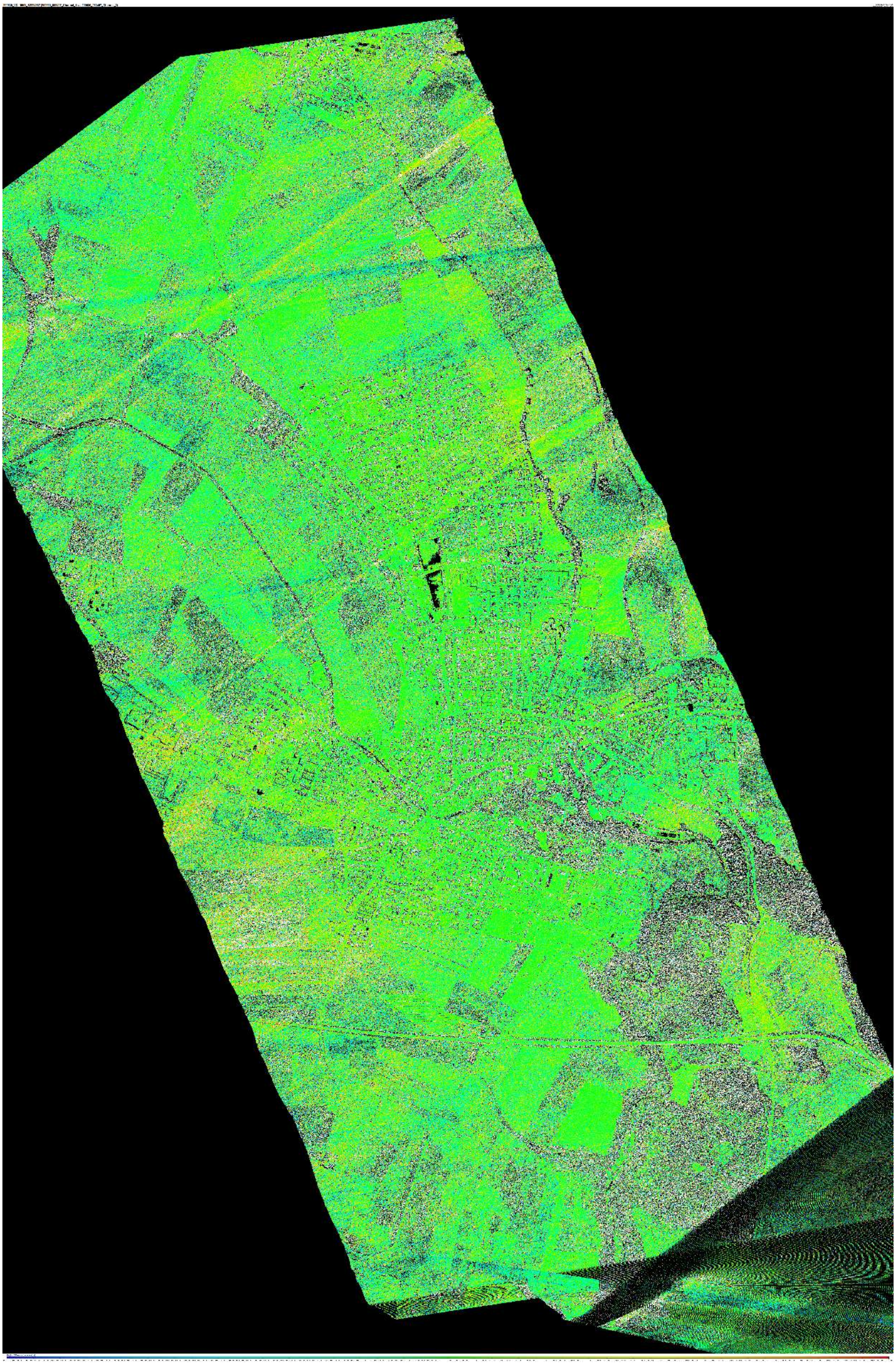
## Scan 200630_083811_2 vs. 200630_084627_2



# Scan 200630_085659_1 vs. 200630_092137_1

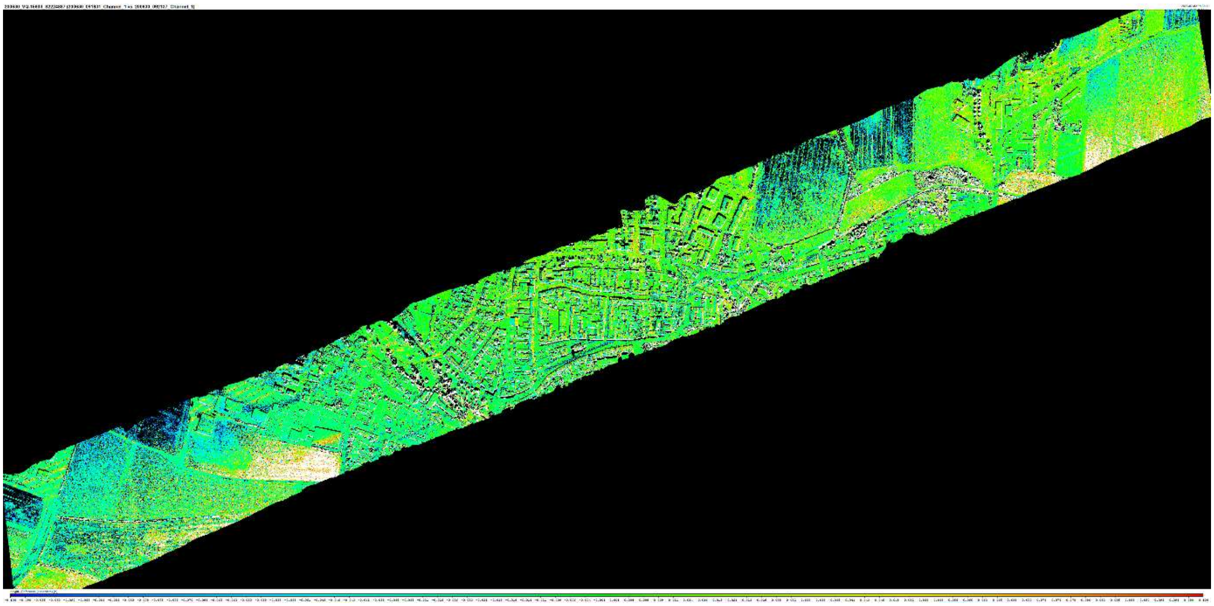


# Scan 200630_083407_1 vs. 200630_083407_2

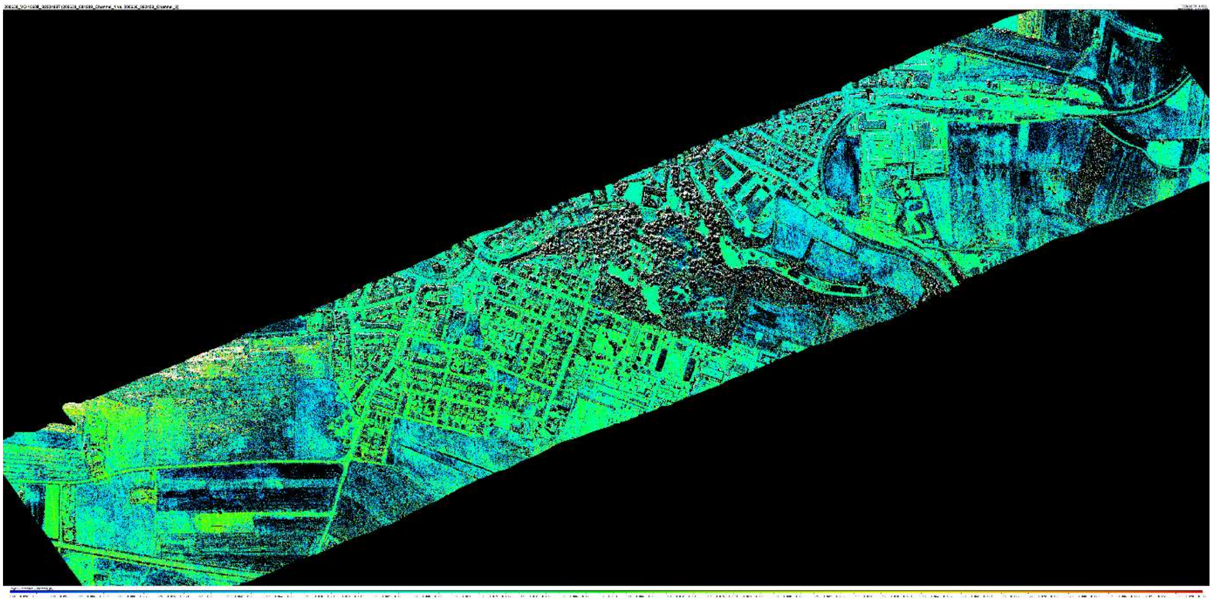


# Scan 200630_083407_2 vs. 200630_085659_2

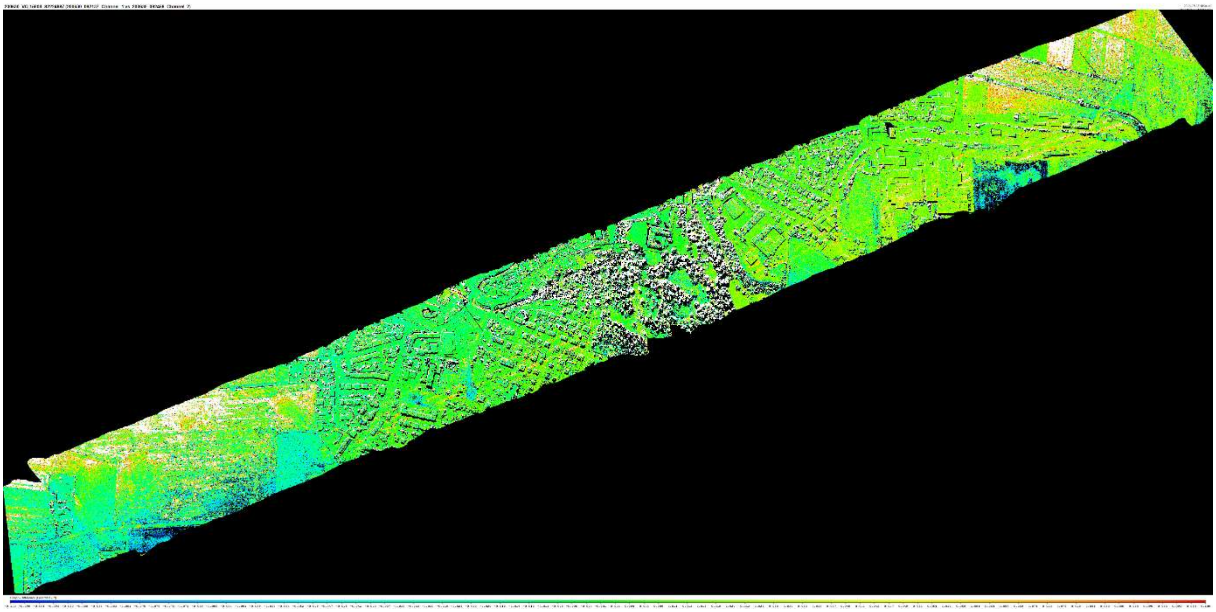
## Scan 200630_091831_1 vs. 200630_092137_1



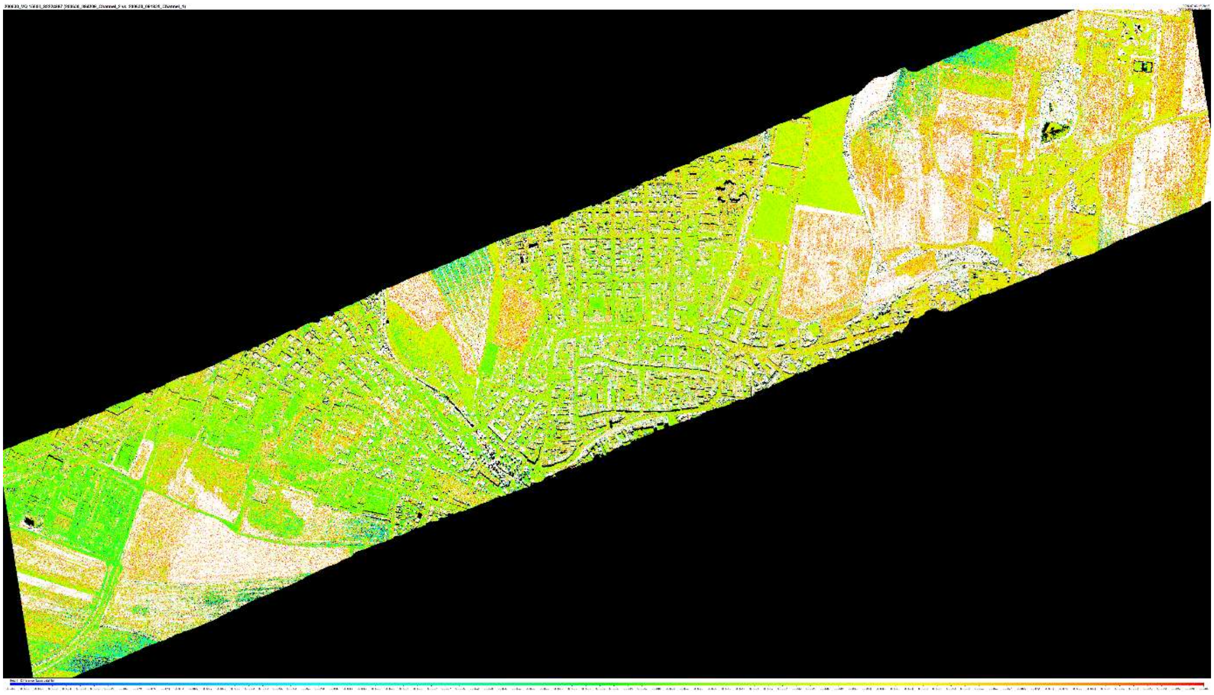
## Scan 200630_084209_1 vs. 200630_092458_2



## Scan 200630_092137_1 vs. 200630_092458_2



## Scan 200630_094209_1 vs. 200630_091831_2



# 5 Calibration Result

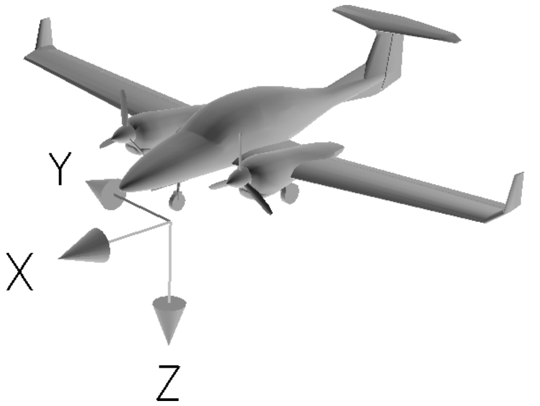
In the following the boresight angles for laser scanner are specified. The results are an output of the iterative scan data adjustment algorithm and are also given in chapter 3 “RiPROCESS Scan Data Adjustment Protocol”.

Applying the automated scan data adjustment algorithm the following values of boresighting angles Scanner-IMU, according to the axis and their chirality of the aircraft defined in the ARINC 705 aviation standard (see chapter 5.2 “Excerpt of the ARINC 705 aviation standard:”), have been determined to be:

## *5.1 Boresight angles Scanner S2224887 - IMU*

| Axis | notation | angle [deg] |
|---|---|---|
| x - Roll | $\nu_c$ | -0.02548 |
| y - Pitch | $\rho_c$ | -0.12611 |
| z - Yaw | $\kappa_c$ | -0.01758 |

## *5.2 Excerpt of the ARINC 705 aviation standard:*



**Definition of the axis of the aircraft-own coordinate system**

Positive values of roll angles mean a right handed rotation of the aircraft around the roll-axis (x) with respect to the local horizon

Positive values of pitch angles mean a right-handed rotation around the pitch-axis (y) with respect to the local horizon.

Positive values of yaw angles mean a right-handed rotation around the yaw-axis (z) with respect to Heading North.

**The ARINC 705 Standard – definition of roll-, pitch- and yaw angles with respect to the aircraft own coordinate system.**

## *5.3 Residues after System Calibration*

The standard deviation of all residual errors determined by taking 177772 observations into account calculates to 0.0142 Meters (1.42 cm).

RIEGL® LASER MEASUREMENT SYSTEMS

# Calibration Protocol

## CAL-0720-S2224887

| | | | |
|---|---|---|---|
| **Customer:** | RIEGL USA | | |
| **System:** | | | |
| **Laser Scanner:** | RIEGL VQ-1560II | **Serial No:** | S2224887 |
| **IMU/GPS-System:** | APPLANIX AV610 | **Serial No:** | 11557 |
| **IMU-Sensor** | APPLANIX IMU57-Ri | **Serial No:** | 19567 |

## *Calibration Results Scanner S2224887:*

**Boresight Misalignment (System Installation):**

| | optimum alignment angles [deg] | |
|---|---|---|
| **Roll** | -0.02548 | |
| **Pitch** | -0.12611 | |
| **Yaw** | -0.01758 | |

| | | |
|---|---|---|
| **Time offset** | -0.0007 [s] | |

**Standard deviation of residuals derived from 177772 observations = 0.0142 m**

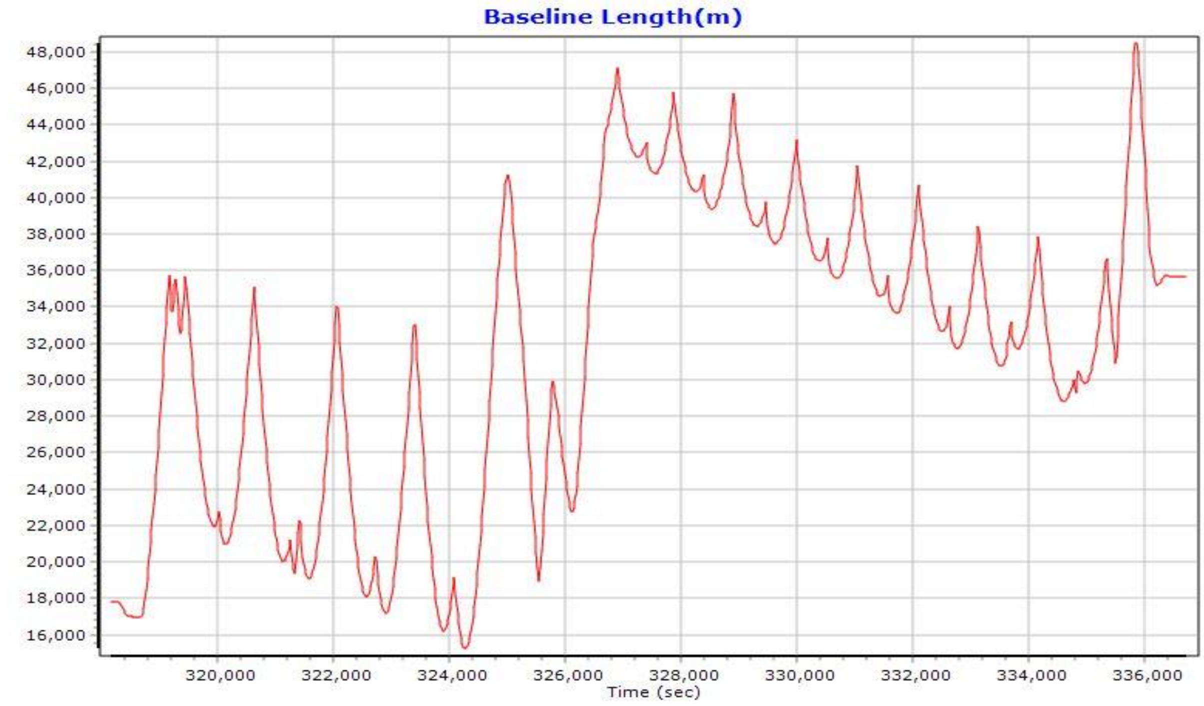
Calibration performed: 06.07.2020,
Date, Sign

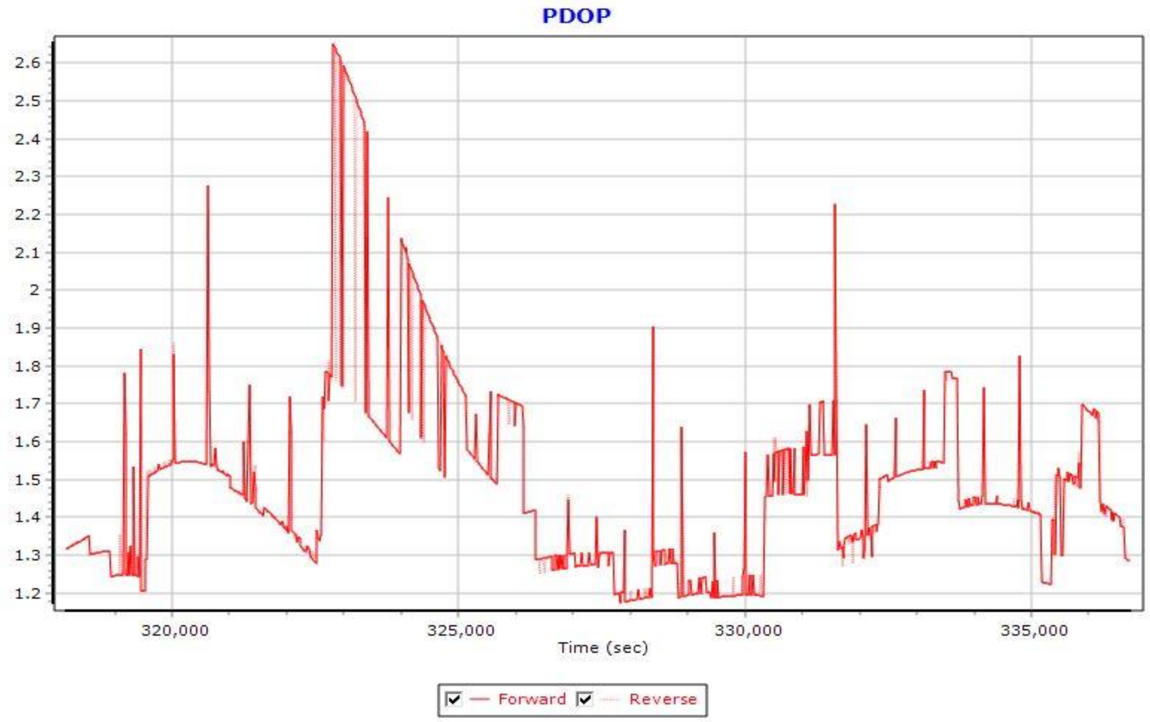
Supervising engineer: 06.07.2020,
Date, Sign

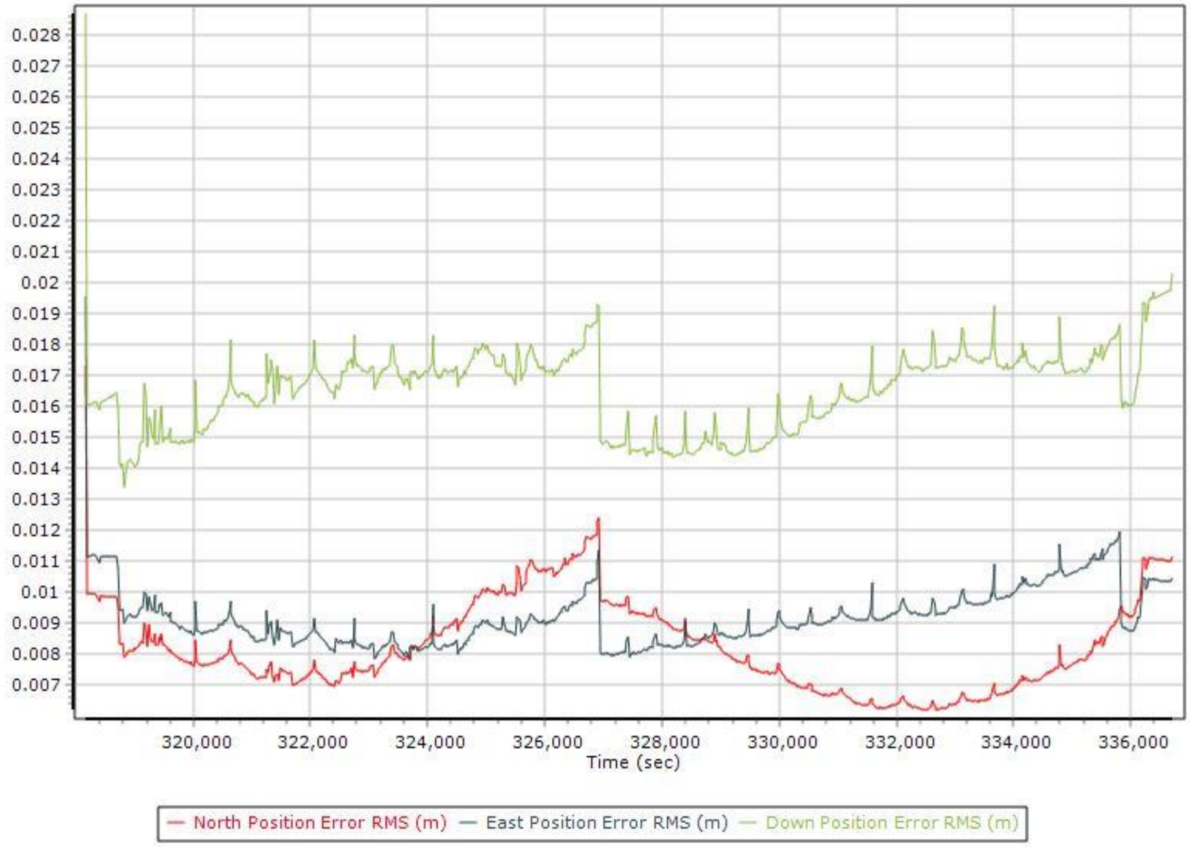
Approved: 06.07.2020
Date, Sign

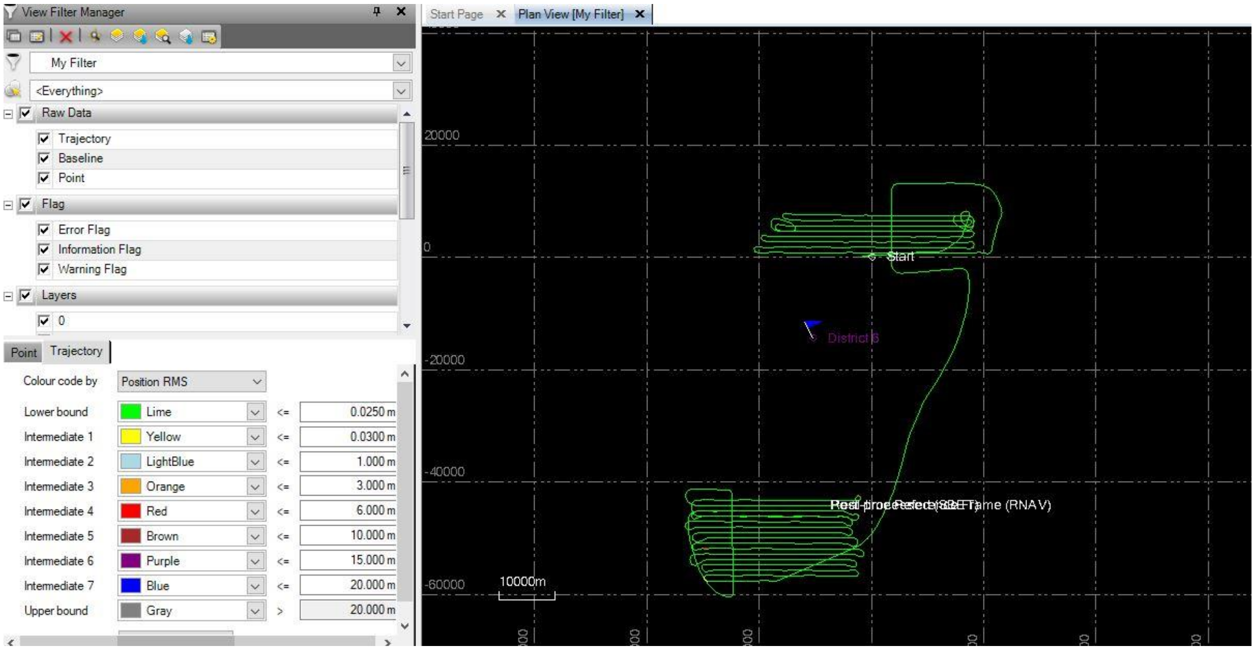
# Appendix K

## Mission 04/07/2021 Lift 1




PDOP
2.6
2.5
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
320,000
325,000
330,000
335,000
Time (sec)
☑ Forward ☑ Reverse


0.028
0.027
0.026
0.025
0.024
0.023
0.022
0.021
0.02
0.019
0.018
0.017
0.016
0.015
0.014
0.013
0.012
0.011
0.01
0.009
0.008
0.007
320,000
322,000
324,000
326,000
328,000
330,000
332,000
334,000
336,000
Time (sec)
North Position Error RMS (m)
East Position Error RMS (m)
Down Position Error RMS (m)



My Filter

<Everything>

☑ Raw Data
- ☑ Trajectory
- ☑ Baseline
- ☑ Point

☑ Flag
- ☑ Error Flag
- ☑ Information Flag
- ☑ Warning Flag

☑ Layers
- ☑ 0

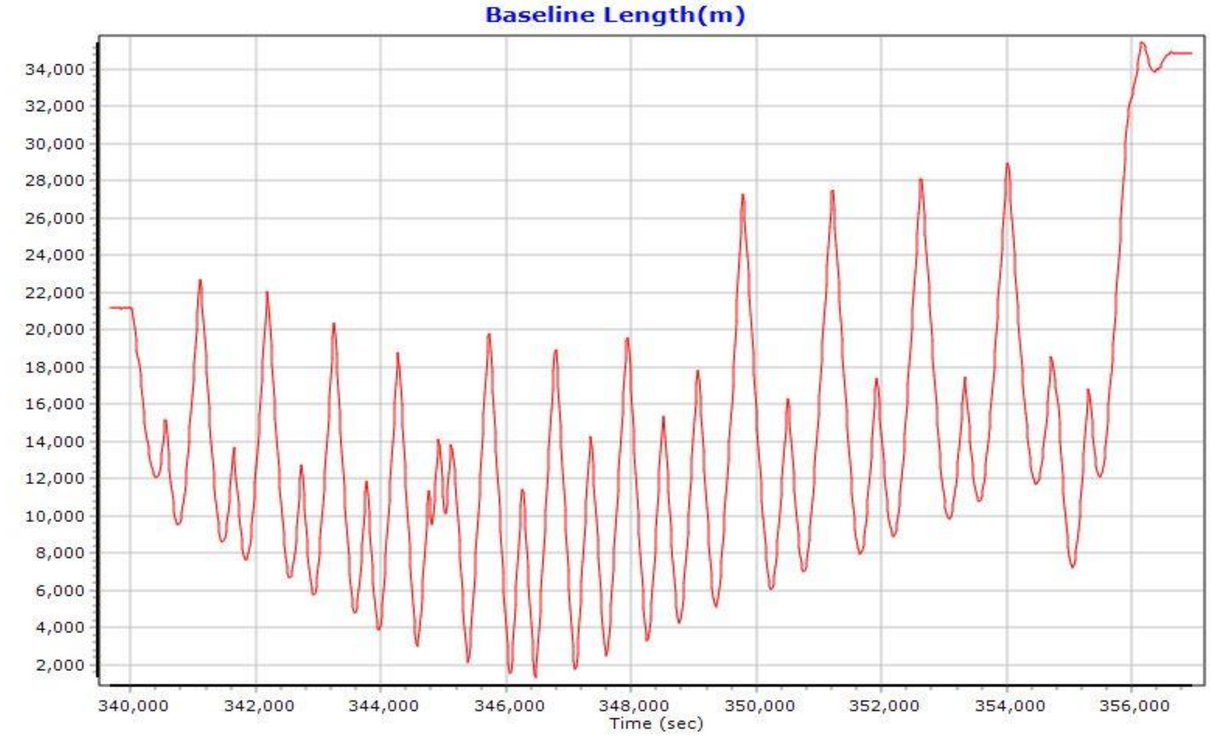
Point | Trajectory

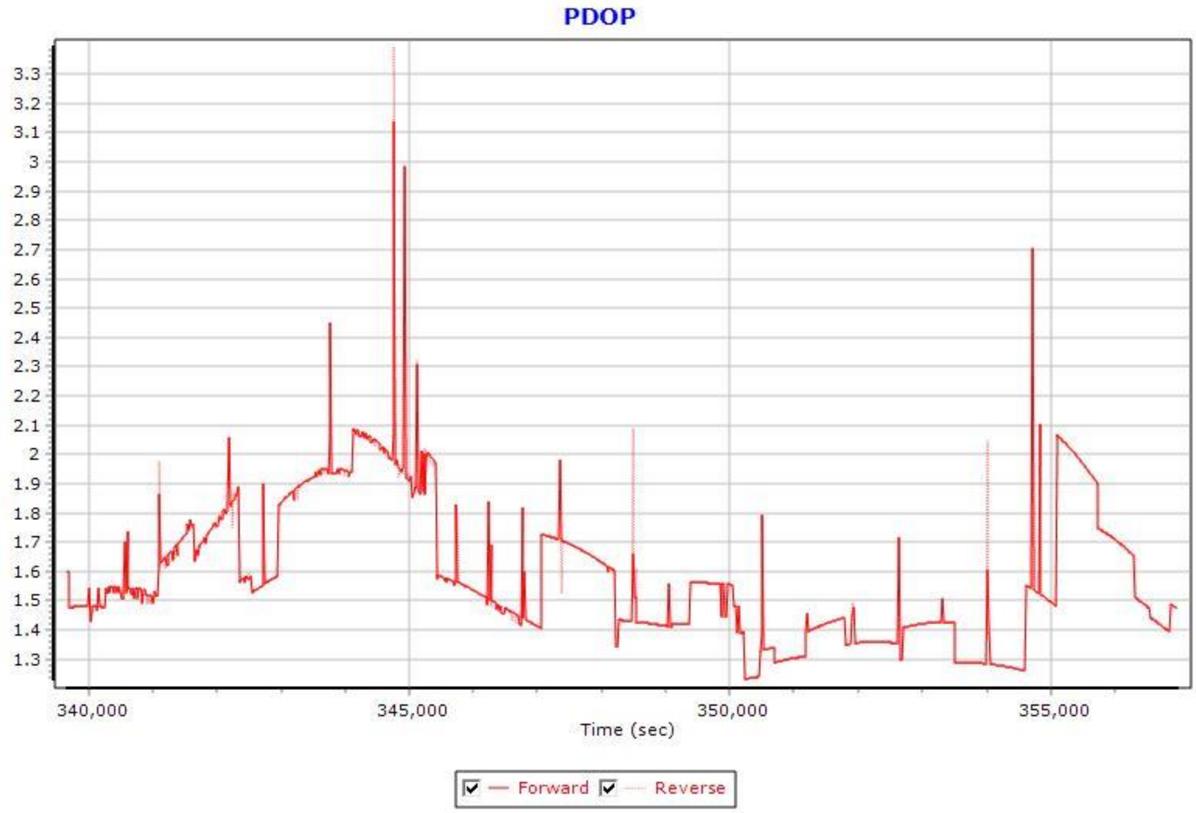
Colour code by: Position RMS

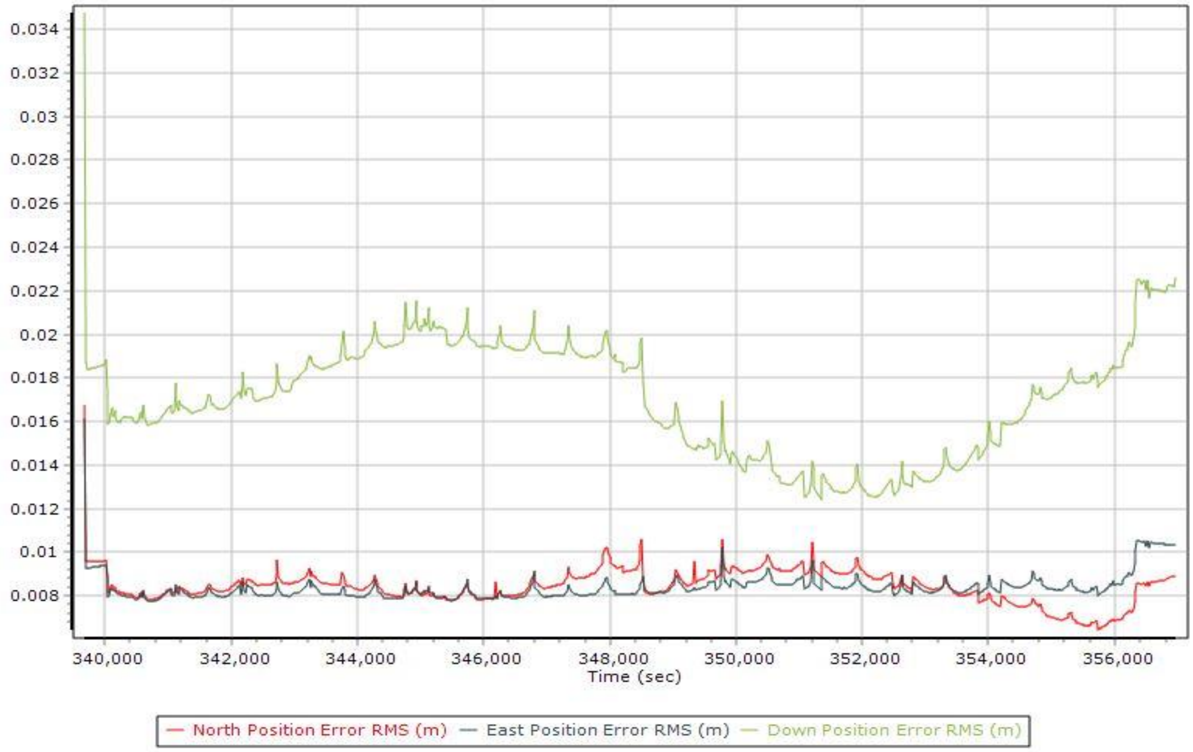
| | | | |
|---|---|---|---|
| Lower bound | 🟩 Lime | <= | 0.0250 m |
| Intermediate 1 | 🟨 Yellow | <= | 0.0300 m |
| Intermediate 2 | 🟦 LightBlue | <= | 1.000 m |
| Intermediate 3 | 🟧 Orange | <= | 3.000 m |
| Intermediate 4 | 🟥 Red | <= | 6.000 m |
| Intermediate 5 | 🟫 Brown | <= | 10.000 m |
| Intermediate 6 | 🟪 Purple | <= | 15.000 m |
| Intermediate 7 | 🟦 Blue | <= | 20.000 m |
| Upper bound | ⬜ Gray | > | 20.000 m |

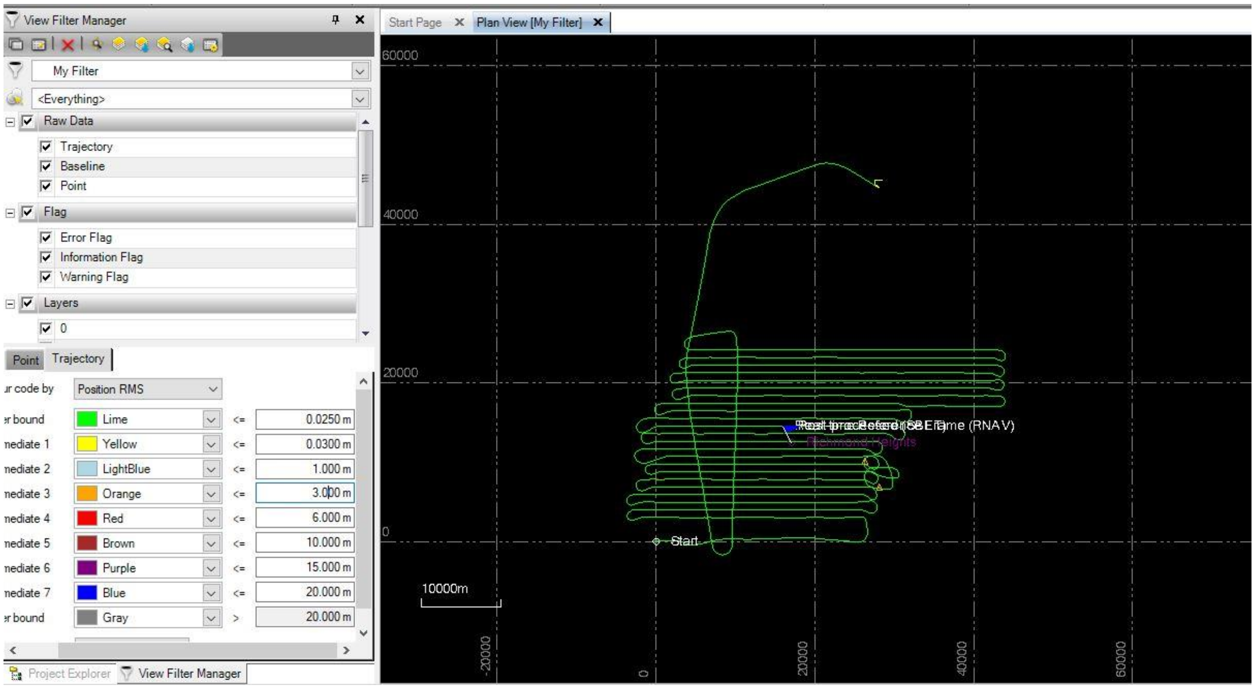
## Trajectory RMS

## Mission 04/07/2021 Lift 2




PDOP
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
340,000
345,000
350,000
355,000
Time (sec)
☑ Forward
☑ Reverse


0.034
0.032
0.03
0.028
0.026
0.024
0.022
0.02
0.018
0.016
0.014
0.012
0.01
0.008
340,000
342,000
344,000
346,000
348,000
350,000
352,000
354,000
356,000
Time (sec)
North Position Error RMS (m)
East Position Error RMS (m)
Down Position Error RMS (m)



My Filter

<Everything>

☑ Raw Data
- ☑ Trajectory
- ☑ Baseline
- ☑ Point

☑ Flag
- ☑ Error Flag
- ☑ Information Flag
- ☑ Warning Flag

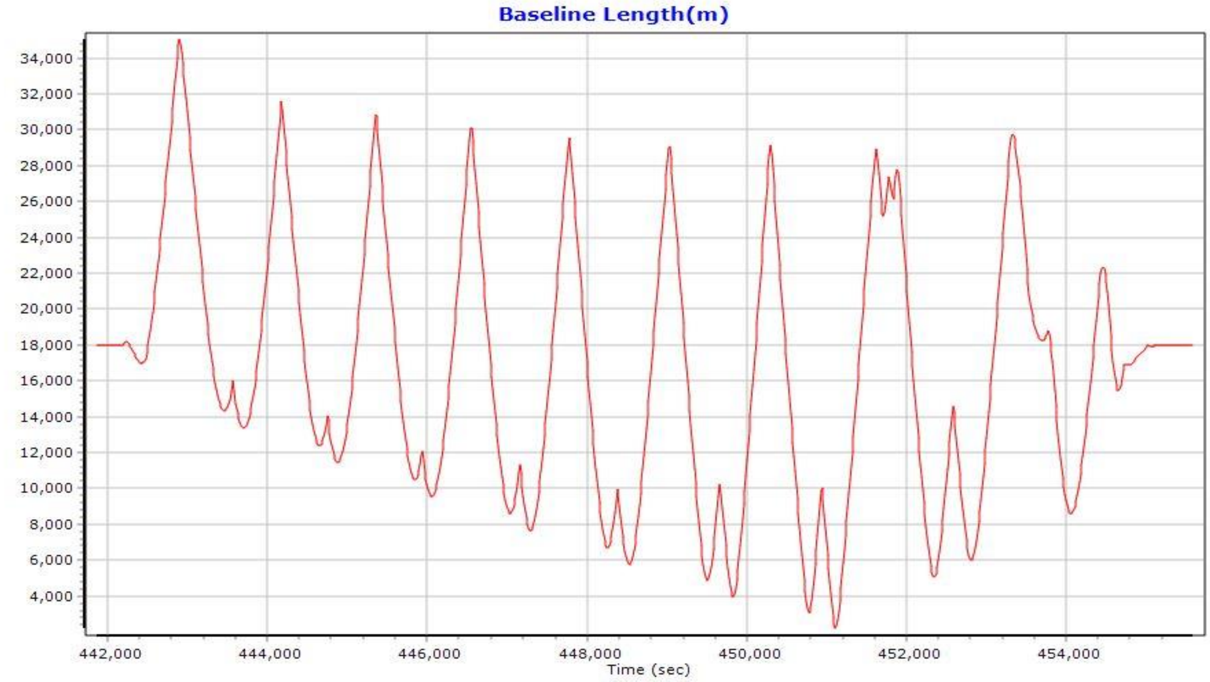
☑ Layers
- ☑ 0

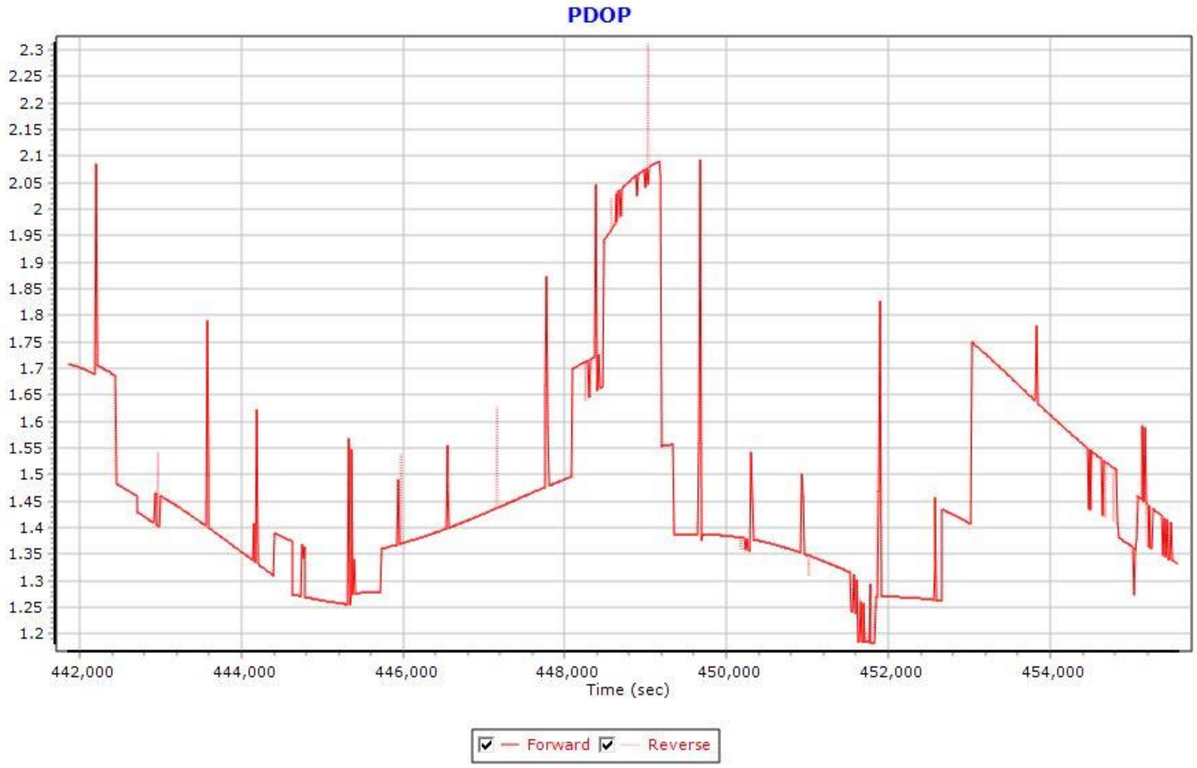
Point | Trajectory

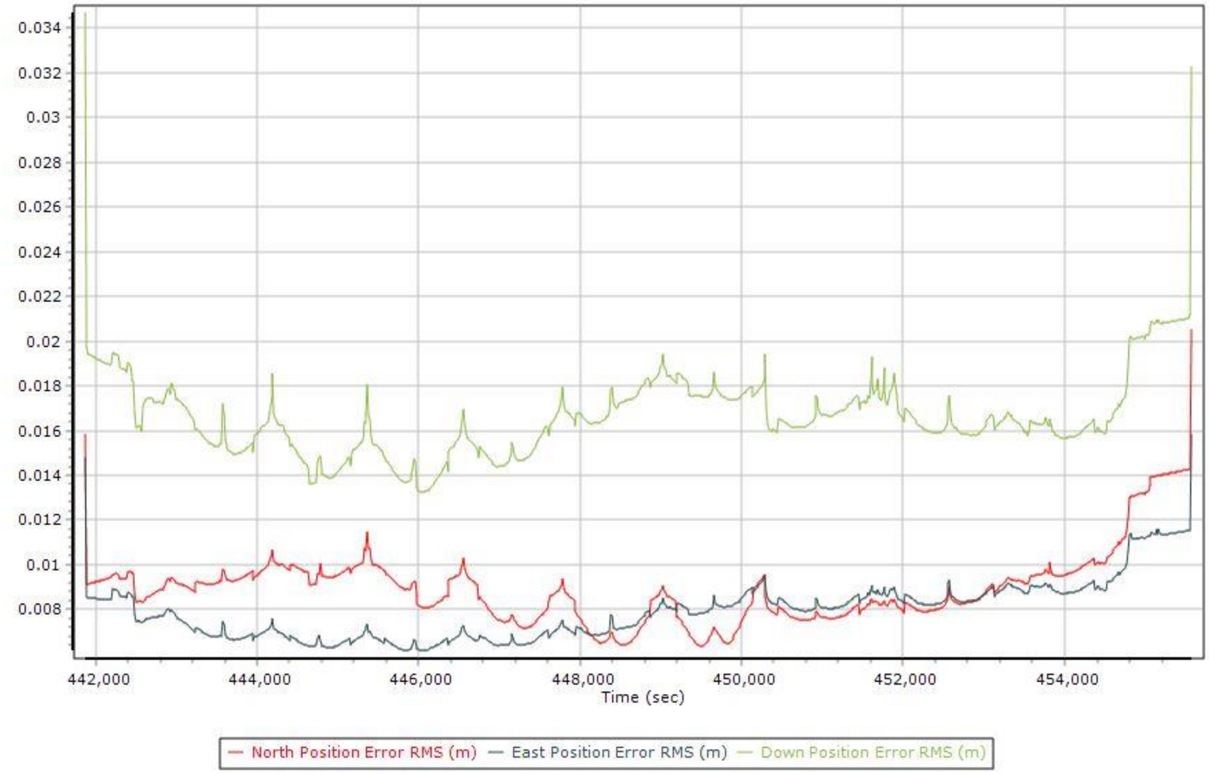
|  |  |  |  |
|---|---|---|---|
| ır code by | Position RMS |  |  |
| ɜr bound | 🟩 Lime | <= | 0.0250 m |
| nediate 1 | 🟨 Yellow | <= | 0.0300 m |
| nediate 2 | 🟦 LightBlue | <= | 1.000 m |
| nediate 3 | 🟧 Orange | <= | 3.000 m |
| nediate 4 | 🟥 Red | <= | 6.000 m |
| nediate 5 | 🟫 Brown | <= | 10.000 m |
| nediate 6 | 🟪 Purple | <= | 15.000 m |
| nediate 7 | 🟦 Blue | <= | 20.000 m |
| ɜr bound | ⬜ Gray | > | 20.000 m |

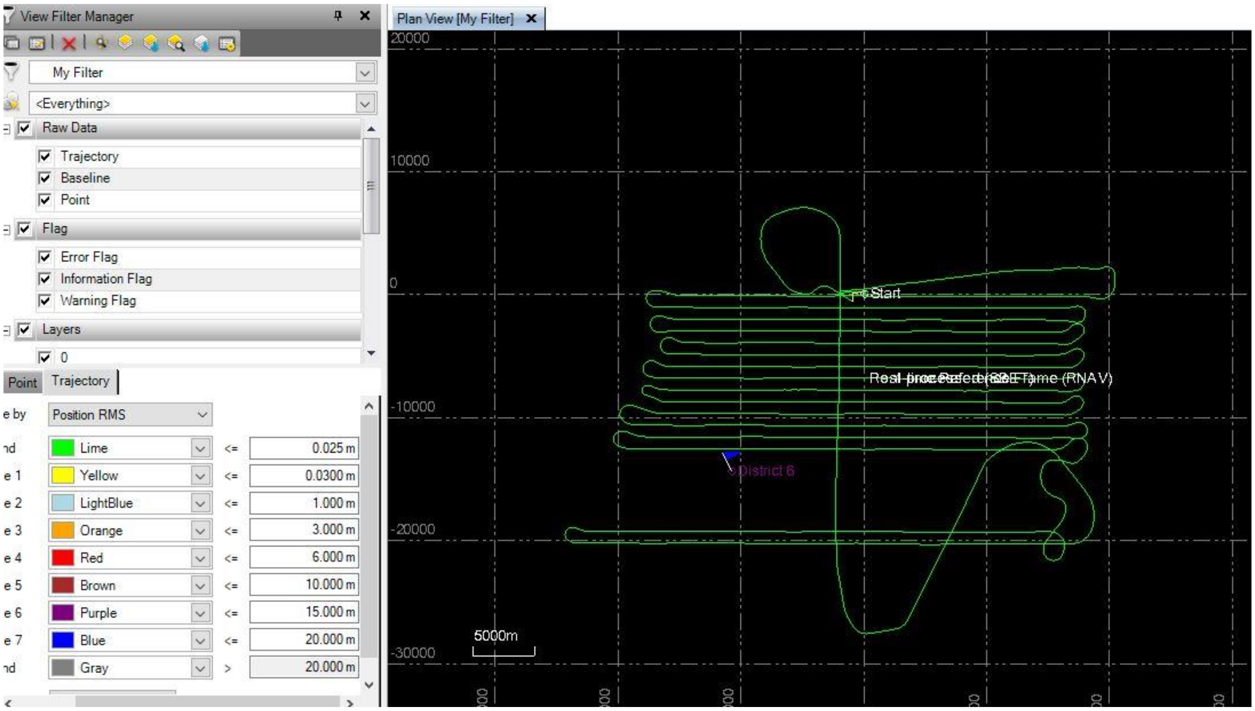
## Trajectory RMS

## Mission 04/08/2021




PDOP
2.3
2.25
2.2
2.15
2.1
2.05
2
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
1.55
1.5
1.45
1.4
1.35
1.3
1.25
1.2
442,000
444,000
446,000
448,000
450,000
452,000
454,000
Time (sec)
☑ Forward ☑ Reverse


0.034
0.032
0.03
0.028
0.026
0.024
0.022
0.02
0.018
0.016
0.014
0.012
0.01
0.008
442,000
444,000
446,000
448,000
450,000
452,000
454,000
Time (sec)
North Position Error RMS (m)
East Position Error RMS (m)
Down Position Error RMS (m)



View Filter Manager

My Filter

<Everything>

- ☑ Raw Data
  - ☑ Trajectory
  - ☑ Baseline
  - ☑ Point
- ☑ Flag
  - ☑ Error Flag
  - ☑ Information Flag
  - ☑ Warning Flag
- ☑ Layers
  - ☑ 0

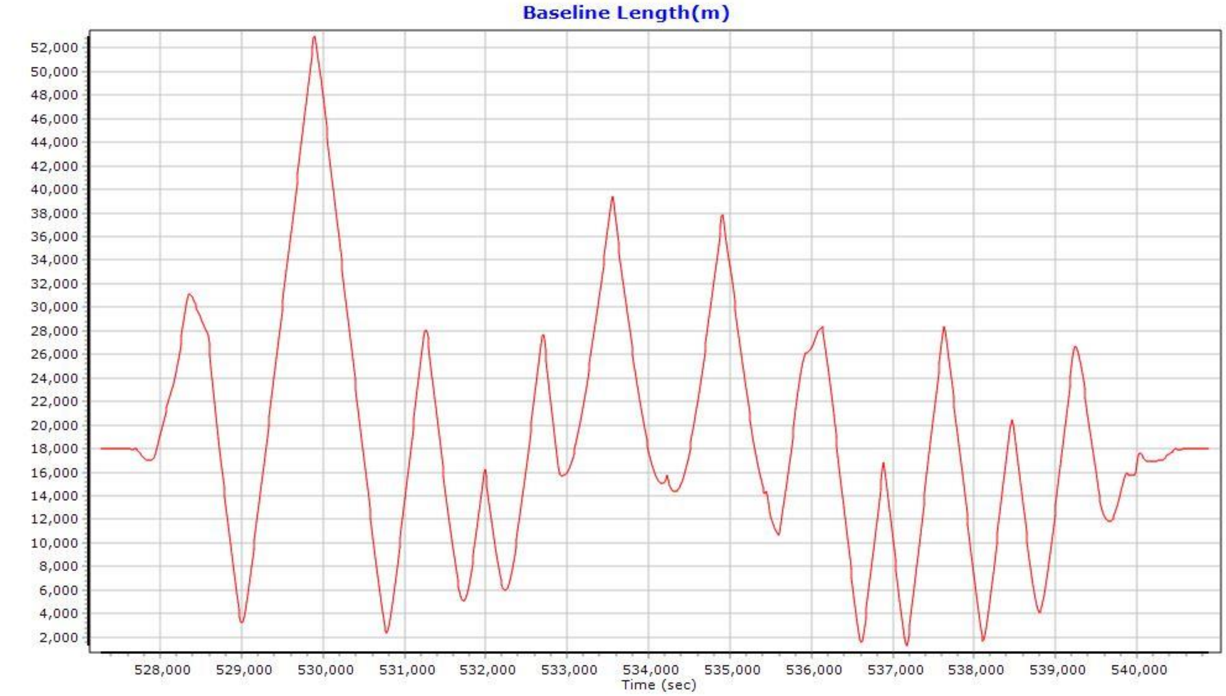
Point | Trajectory

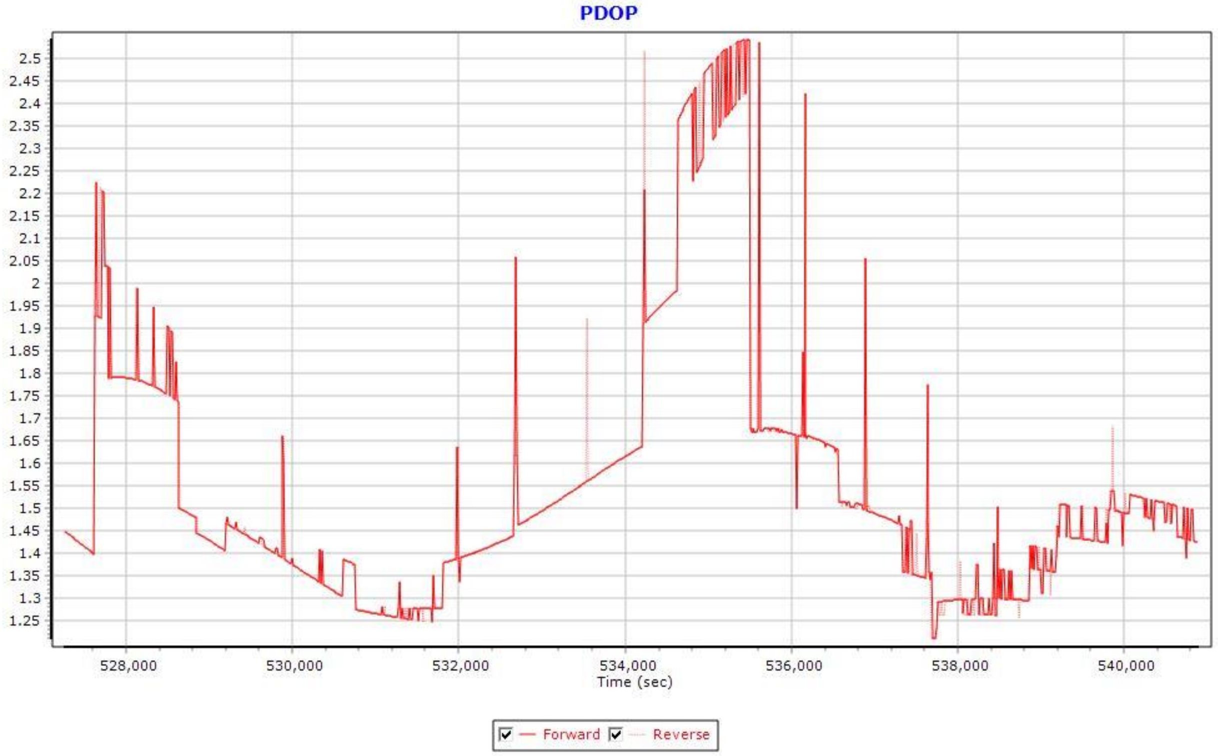
e by: Position RMS

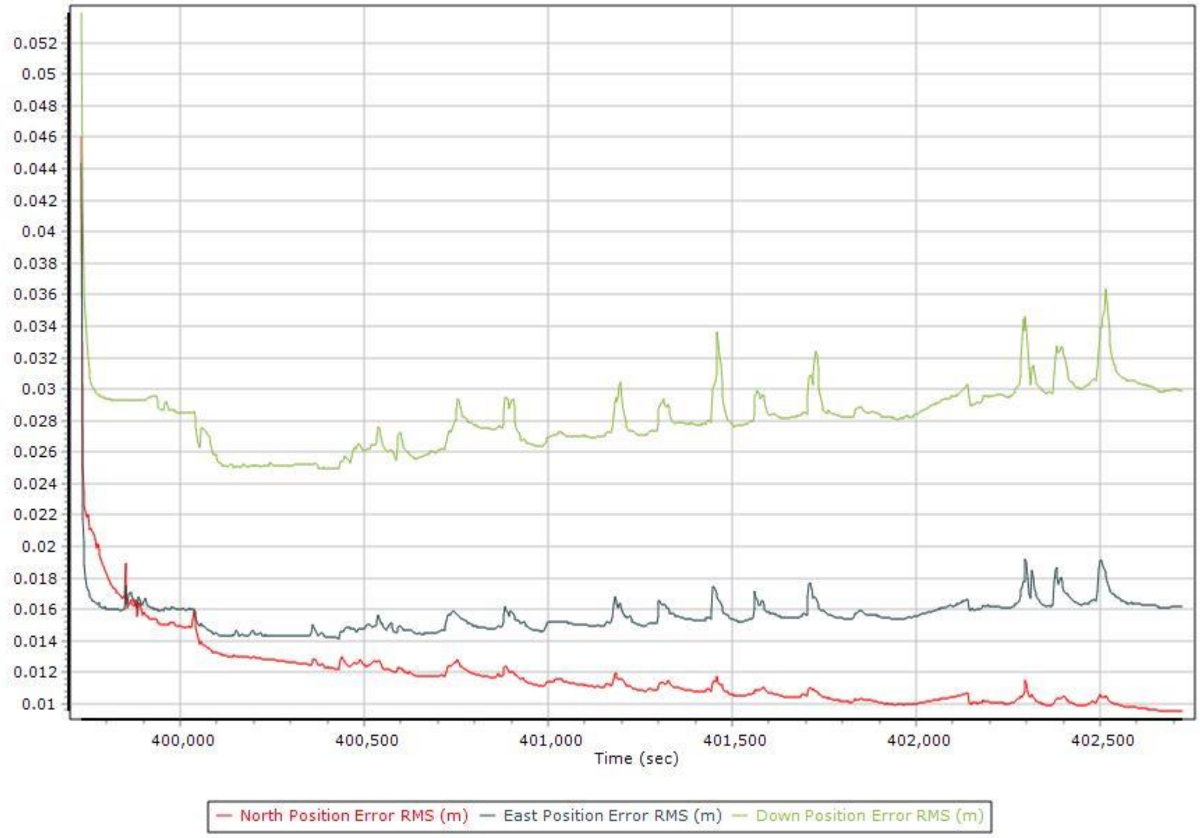
| | | | |
|---|---|---|---|
| nd | 🟩 Lime | <= | 0.025 m |
| e 1 | 🟨 Yellow | <= | 0.0300 m |
| e 2 | 🟦 LightBlue | <= | 1.000 m |
| e 3 | 🟧 Orange | <= | 3.000 m |
| e 4 | 🟥 Red | <= | 6.000 m |
| e 5 | 🟫 Brown | <= | 10.000 m |
| e 6 | 🟪 Purple | <= | 15.000 m |
| e 7 | 🟦 Blue | <= | 20.000 m |
| nd | ⬜ Gray | > | 20.000 m |

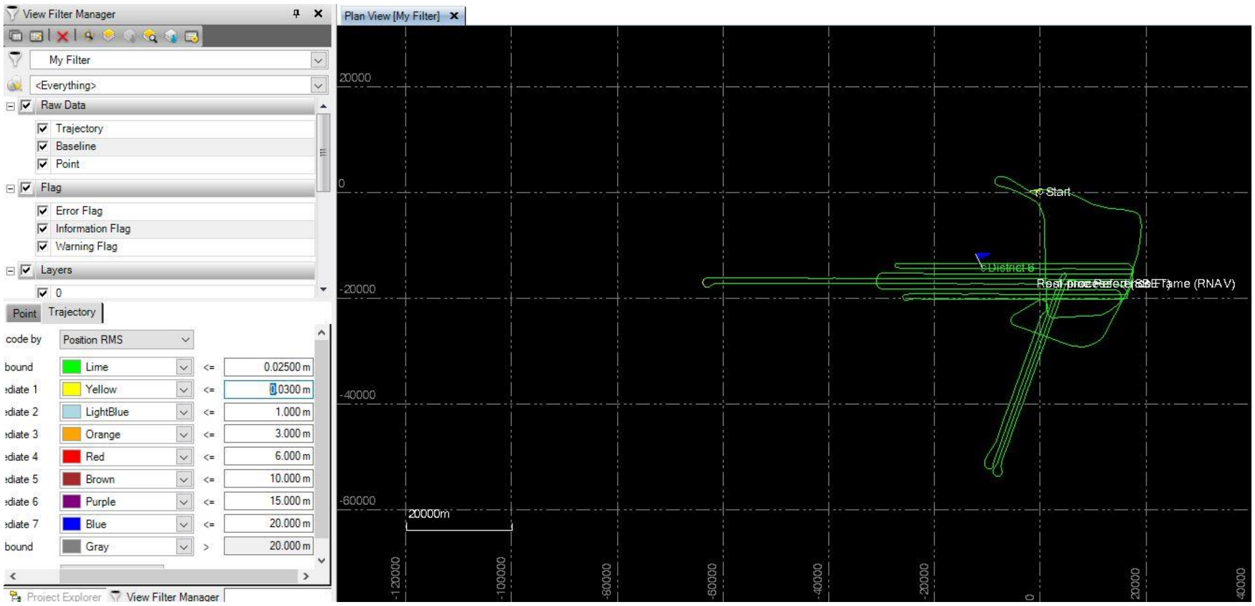
## Trajectory RMS

## Mission 04/09/2021




PDOP
2.5
2.45
2.4
2.35
2.3
2.25
2.2
2.15
2.1
2.05
2
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
1.55
1.5
1.45
1.4
1.35
1.3
1.25
528,000
530,000
532,000
534,000
536,000
538,000
540,000
Time (sec)
☑ Forward ☑ Reverse


0.052
0.05
0.048
0.046
0.044
0.042
0.04
0.038
0.036
0.034
0.032
0.03
0.028
0.026
0.024
0.022
0.02
0.018
0.016
0.014
0.012
0.01
400,000
400,500
401,000
401,500
402,000
402,500
Time (sec)
North Position Error RMS (m)
East Position Error RMS (m)
Down Position Error RMS (m)



My Filter
<Everything>

- ☑ Raw Data
  - ☑ Trajectory
  - ☑ Baseline
  - ☑ Point
- ☑ Flag
  - ☑ Error Flag
  - ☑ Information Flag
  - ☑ Warning Flag
- ☑ Layers
  - ☑ 0

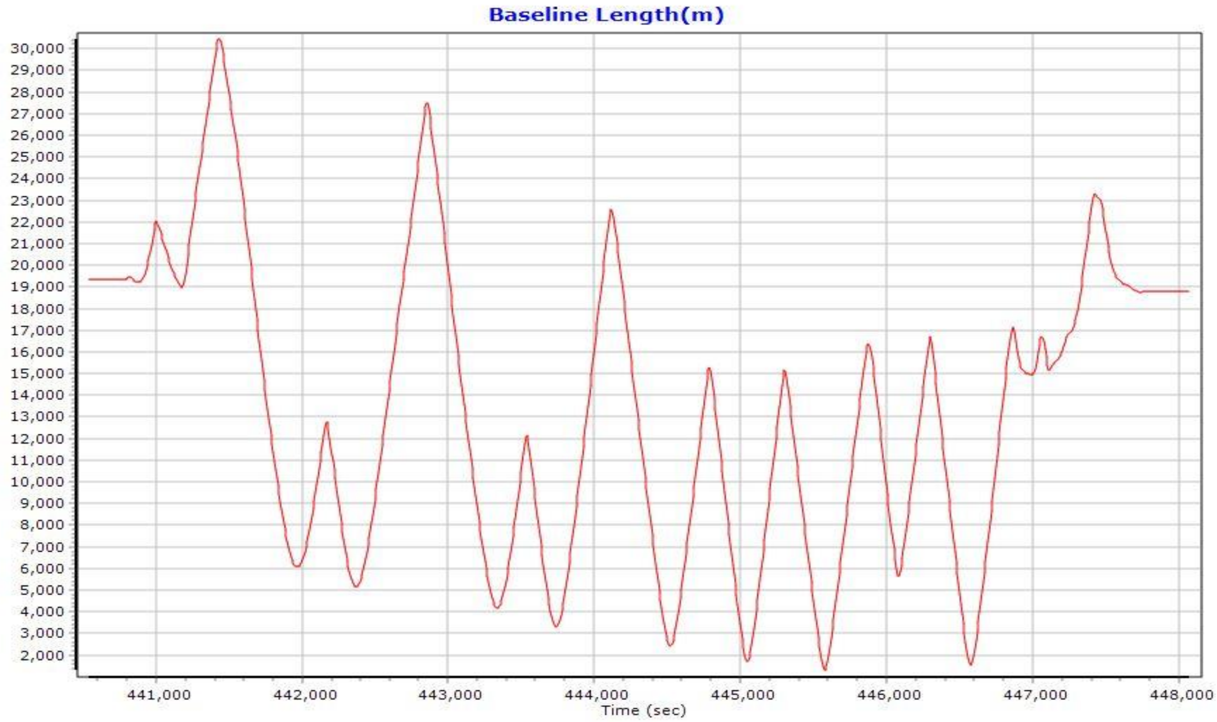
Point | Trajectory

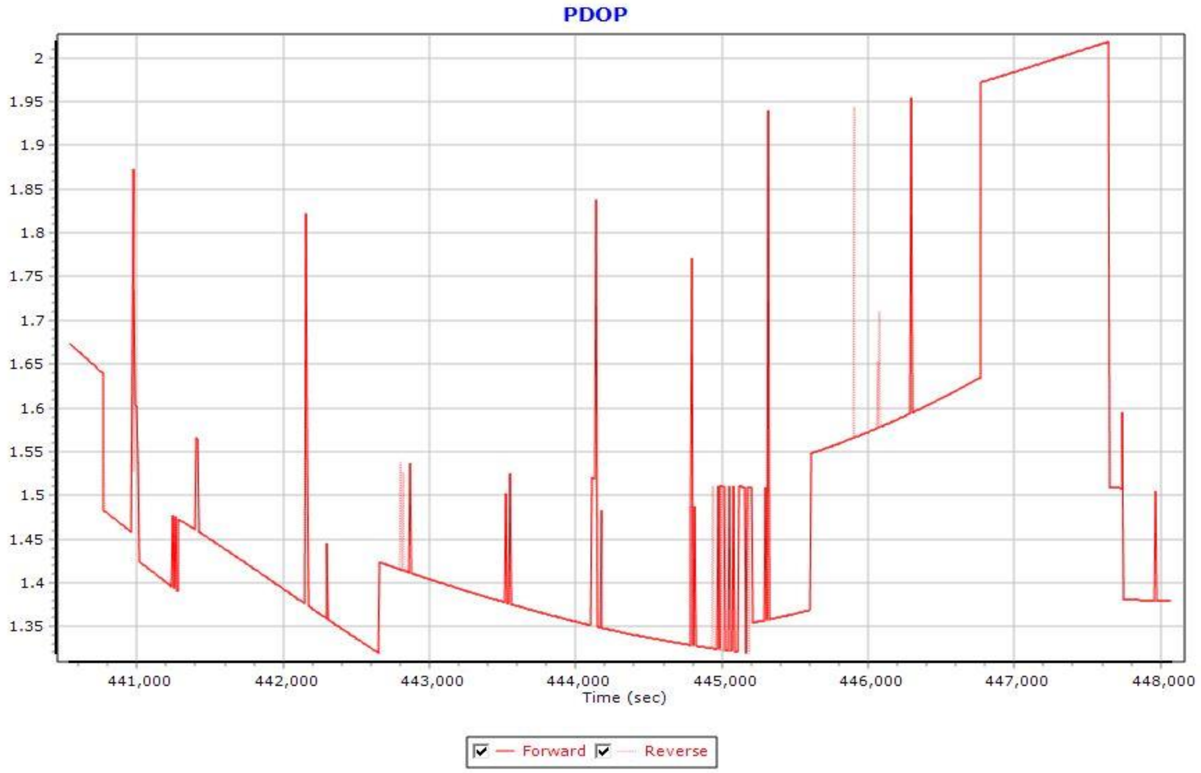
code by: Position RMS

| | | | |
|---|---|---|---|
| bound | 🟩 Lime | <= | 0.02500 m |
| ediate 1 | 🟨 Yellow | <= | 0.0300 m |
| ediate 2 | LightBlue | <= | 1.000 m |
| ediate 3 | 🟧 Orange | <= | 3.000 m |
| ediate 4 | 🟥 Red | <= | 6.000 m |
| ediate 5 | 🟫 Brown | <= | 10.000 m |
| ediate 6 | 🟪 Purple | <= | 15.000 m |
| ediate 7 | 🟦 Blue | <= | 20.000 m |
| bound | ⬛ Gray | > | 20.000 m |

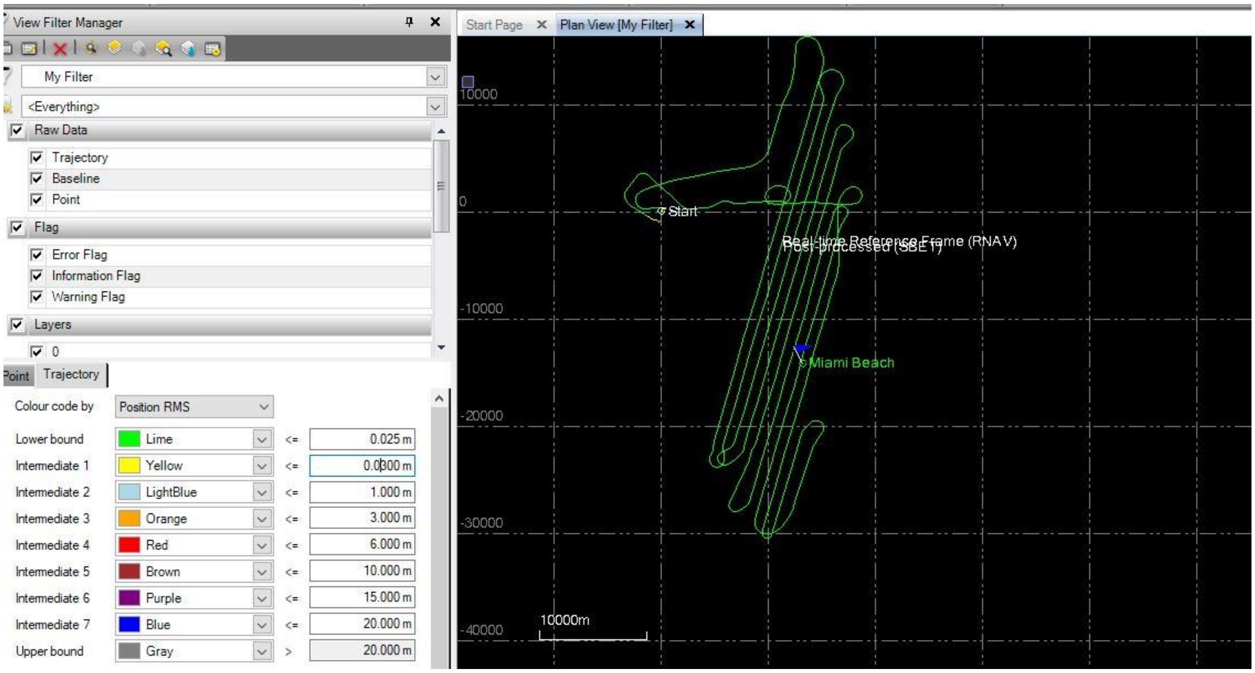
## Trajectory RMS

## Mission 04/16/2021




PDOP
2
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
1.55
1.5
1.45
1.4
1.35
441,000
442,000
443,000
444,000
445,000
446,000
447,000
448,000
Time (sec)
☑ Forward ☑ Reverse


0.04
0.038
0.036
0.034
0.032
0.03
0.028
0.026
0.024
0.022
0.02
0.018
0.016
0.014
0.012
0.01
0.008
441,000
442,000
443,000
444,000
445,000
446,000
447,000
448,000
Time (sec)
North Position Error RMS (m)
East Position Error RMS (m)
Down Position Error RMS (m)



My Filter

<Everything>

☑ Raw Data
  ☑ Trajectory
  ☑ Baseline
  ☑ Point
☑ Flag
  ☑ Error Flag
  ☑ Information Flag
  ☑ Warning Flag
☑ Layers
  ☑ 0

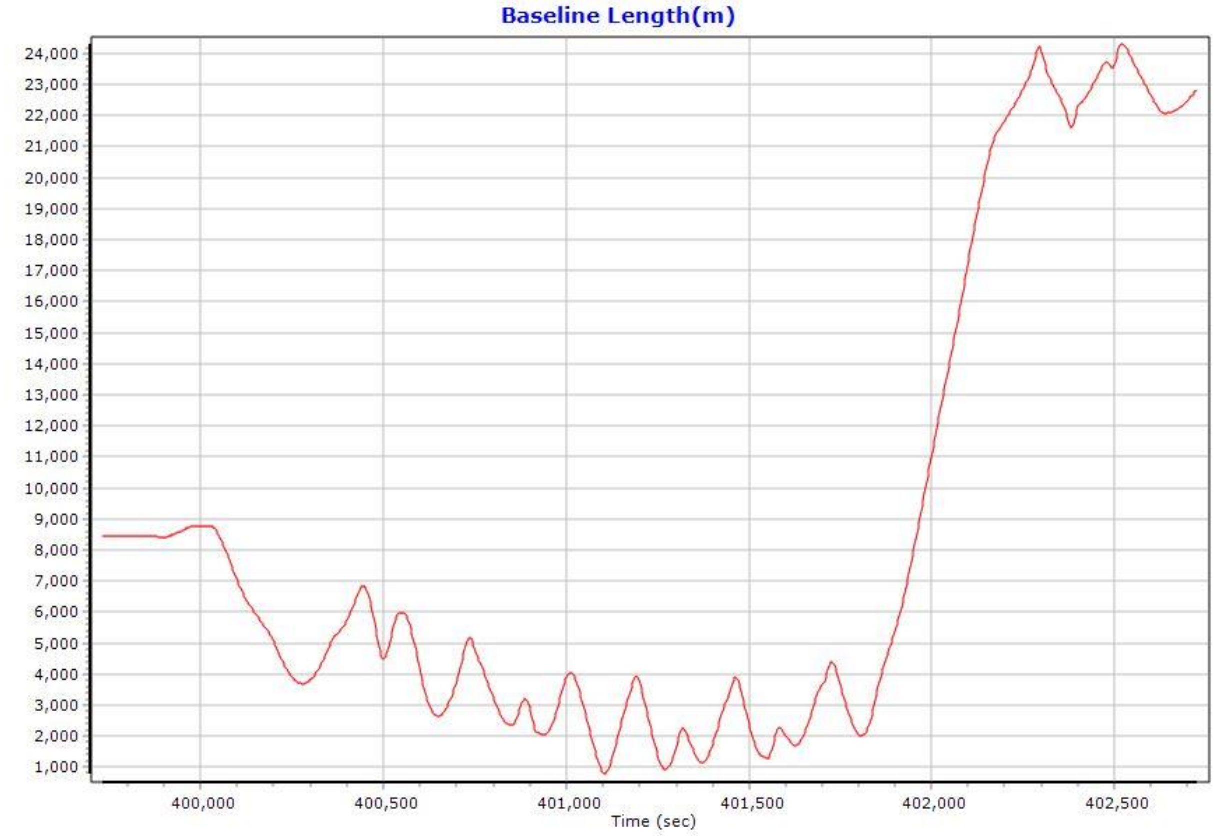
Point | Trajectory

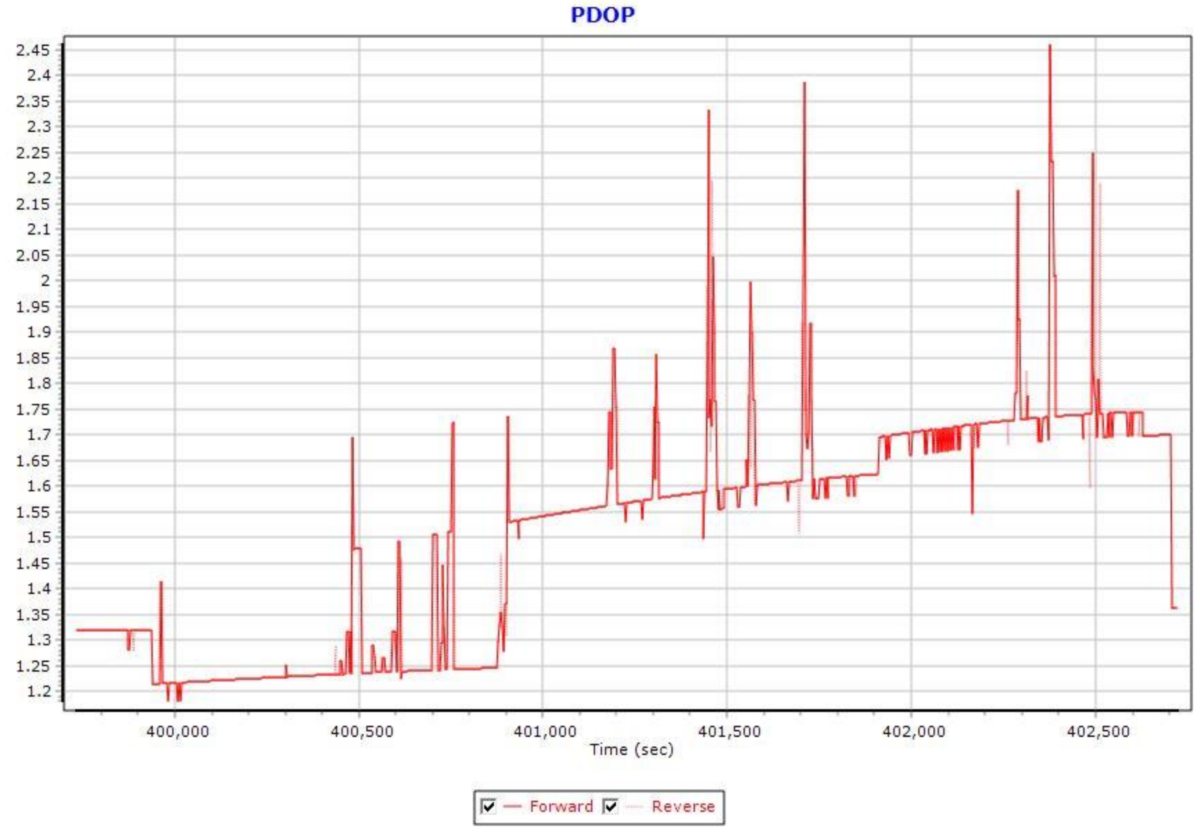
Colour code by: Position RMS

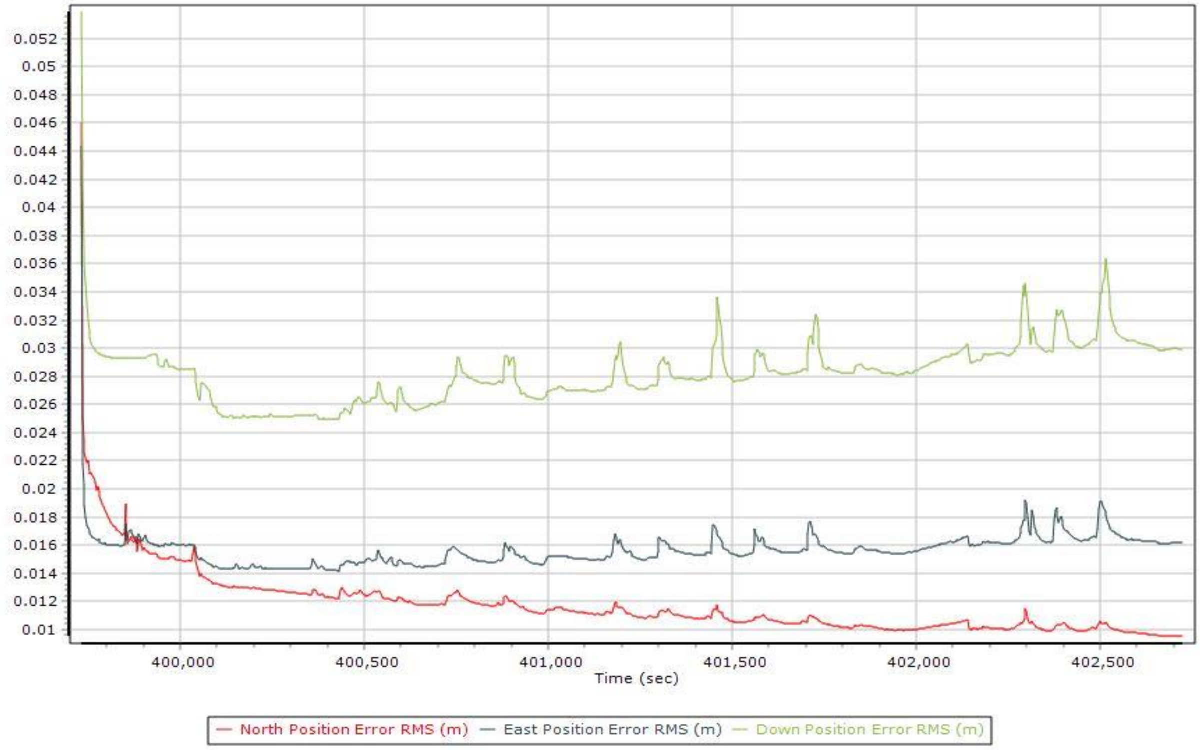
| | | | |
|---|---|---|---|
| Lower bound | 🟩 Lime | <= | 0.025 m |
| Intermediate 1 | 🟨 Yellow | <= | 0.0300 m |
| Intermediate 2 | 🟦 LightBlue | <= | 1.000 m |
| Intermediate 3 | 🟧 Orange | <= | 3.000 m |
| Intermediate 4 | 🟥 Red | <= | 6.000 m |
| Intermediate 5 | 🟫 Brown | <= | 10.000 m |
| Intermediate 6 | 🟪 Purple | <= | 15.000 m |
| Intermediate 7 | 🟦 Blue | <= | 20.000 m |
| Upper bound | ⬜ Gray | > | 20.000 m |

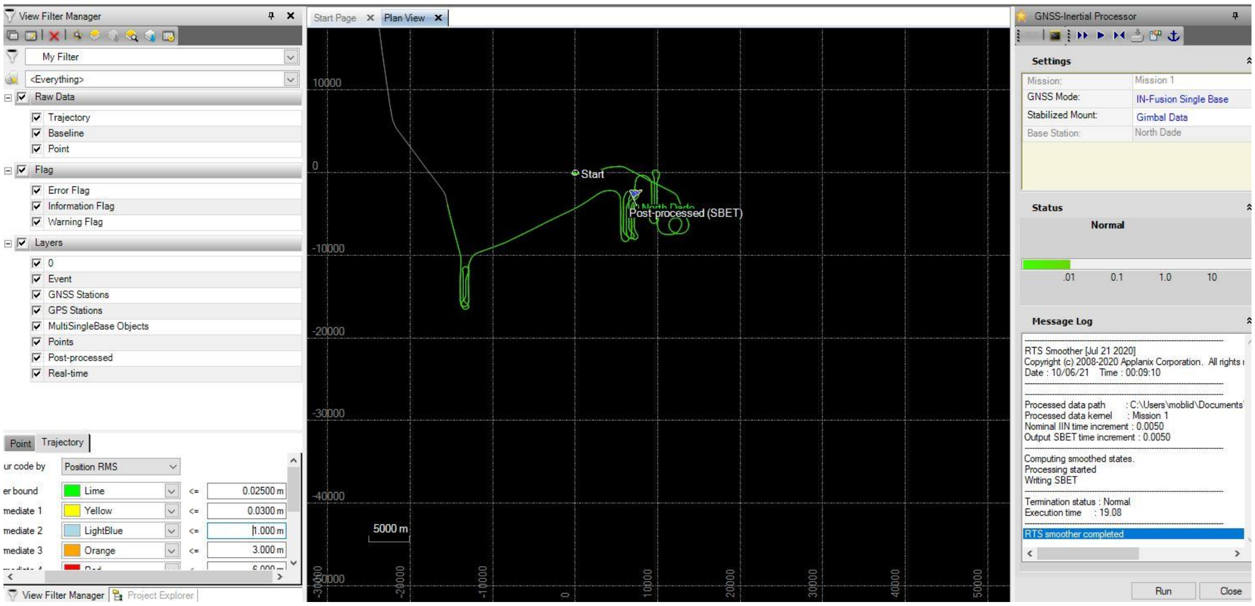
## Trajectory RMS

## Mission 06/10/2021




PDOP
2.45
2.4
2.35
2.3
2.25
2.2
2.15
2.1
2.05
2
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
1.55
1.5
1.45
1.4
1.35
1.3
1.25
1.2
400,000
400,500
401,000
401,500
402,000
402,500
Time (sec)
☑ Forward ☑ Reverse


0.052
0.05
0.048
0.046
0.044
0.042
0.04
0.038
0.036
0.034
0.032
0.03
0.028
0.026
0.024
0.022
0.02
0.018
0.016
0.014
0.012
0.01
400,000
400,500
401,000
401,500
402,000
402,500
Time (sec)
North Position Error RMS (m)
East Position Error RMS (m)
Down Position Error RMS (m)



ur code by: Position RMS

er bound: 🟩 Lime <= 0.02500 m

mediate 1: 🟨 Yellow <= 0.0300 m

mediate 2: LightBlue <= 1.000 m

mediate 3: 🟧 Orange <= 3.000 m

Mission: Mission 1

GNSS Mode: IN-Fusion Single Base

Stabilized Mount: Gimbal Data

Base Station: North Dade

```
------------------------------------------------------------
RTS Smoother [Jul 21 2020]
Copyright (c) 2008-2020 Applanix Corporation.  All rights
Date : 10/06/21    Time : 00:09:10
------------------------------------------------------------
------------------------------------------------------------
Processed data path         : C:\Users\moblid\Documents
Processed data kernel       : Mission 1
Nominal IIN time increment : 0.0050
Output SBET time increment : 0.0050
------------------------------------------------------------
Computing smoothed states.
Processing started
Writing SBET
------------------------------------------------------------
Termination status : Normal
Execution time      : 19.08
------------------------------------------------------------
RTS smoother completed
```

**Trajectory RMS**

# Appendix L

## LiDAR Control Report

| Number | Easting | Northing | Elevation | Lidar Tin | Delta Z |
|---|---|---|---|---|---|
| O-1 | 686577.634 | 557829.047 | 10.162 | outside | * |
| O-2 | 697777.054 | 535090.900 | 9.087 | outside | * |
| O-4 | 733037.983 | 519175.382 | 12.874 | 12.720 | -0.154 |
| O-6 | 727606.961 | 402485.087 | 3.375 | outside | * |
| O-10 | 797204.150 | 387173.310 | 7.814 | outside | * |
| O-13 | 795999.387 | 468771.846 | 7.708 | outside | * |
| O-14 | 760087.325 | 519298.470 | 13.187 | 13.080 | -0.107 |
| O-16 | 842195.626 | 611516.067 | 8.899 | outside | * |
| O-17 | 839483.072 | 348679.757 | 12.328 | outside | * |
| T-1 | 813323.456 | 390772.231 | 6.243 | 6.220 | -0.023 |
| T-2 | 820927.233 | 394651.624 | 4.817 | 4.680 | -0.137 |
| T-3 | 875784.058 | 401576.785 | 4.657 | 4.610 | -0.047 |
| T-4 | 845959.189 | 418498.519 | 6.265 | 6.120 | -0.145 |
| T-5 | 817882.450 | 418538.959 | 8.836 | 8.850 | 0.014 |
| T-6 | 838742.284 | 466530.313 | 8.741 | 8.620 | -0.121 |
| T-7 | 880705.063 | 459201.170 | 11.955 | 11.820 | -0.135 |
| T-8 | 858264.035 | 446484.270 | 11.112 | 11.030 | -0.082 |
| T-9 | 862698.248 | 487246.312 | 7.966 | 7.790 | -0.176 |
| T-10 | 842914.727 | 519091.190 | 8.127 | 8.060 | -0.067 |
| T-11 | 870724.236 | 522362.936 | 4.920 | 4.930 | 0.010 |
| T-12 | 898780.139 | 490235.660 | 2.118 | 2.040 | -0.078 |
| T-13 | 918391.197 | 515383.418 | 13.209 | 13.140 | -0.069 |
| T-14 | 940010.124 | 522972.264 | 1.970 | 2.110 | 0.140 |
| T-15 | 944477.952 | 554659.378 | 3.061 | 2.990 | -0.071 |
| T-16 | 922063.197 | 541888.820 | 16.260 | 16.150 | -0.110 |
| T-17 | 894470.545 | 537935.069 | 4.890 | 4.870 | -0.020 |
| T-18 | 859522.703 | 542593.097 | 5.849 | 5.850 | 0.001 |
| T-19 | 860235.652 | 567265.069 | 5.290 | 5.230 | -0.060 |
| T-20 | 883923.741 | 556311.962 | 4.745 | 4.800 | 0.055 |
| T-21 | 911979.083 | 557394.266 | 5.021 | 4.990 | -0.031 |
| T-22 | 933514.533 | 566081.327 | 3.110 | 3.040 | -0.070 |
| T-23 | 943785.947 | 571432.821 | 4.510 | 4.560 | 0.050 |
| T-24 | 942574.841 | 597153.648 | 4.732 | 4.870 | 0.138 |
| T-25 | 934113.147 | 582897.200 | 5.071 | 5.030 | -0.041 |
| T-26 | 916670.528 | 573241.558 | 13.446 | 13.510 | 0.064 |
| T-27 | 895894.316 | 591468.840 | 4.784 | 4.740 | -0.044 |
| T-28 | 858652.741 | 593694.064 | 4.762 | 4.870 | 0.108 |
| T-31 | 830011.523 | 491995.639 | 7.547 | 7.510 | -0.037 |
| T-30 | 806916.626 | 441049.719 | 6.182 | 6.200 | 0.018 |

| | |
|---|---|
| Average delta z | -0.038 |
| Minimum delta z | -0.176 |
| Maximum delta z | 0.140 |
| Average magnitude | 0.076 |
| Root mean square | 0.089 |
| Std deviation | 0.082 |

### LiDAR Checkpoints Non-Vegetated Accuracy (NVA)

| Number | Easting | Northing | Elevation | Lidar Tin | Delta Z |
|---|---|---|---|---|---|
| 5001_2019_FL | 710317.914 | 597133.200 | 16.612 | outside | * |
| 5002_2019_FL | 680758.479 | 549730.758 | 9.088 | outside | * |
| 5003_2019_FL | 780416.961 | 555895.556 | 16.450 | outside | * |
| 5004_2019_FL | 812604.817 | 603425.435 | 16.978 | outside | * |
| 5005_2019_FL | 839737.872 | 595142.283 | 17.515 | outside | * |
| 5006_2019_FL | 832817.500 | 350058.570 | 2.973 | outside | * |
| 5007_2019_FL | 699999.271 | 316929.297 | 3.736 | outside | * |
| 5008_2019_FL | 766630.134 | 518930.014 | 8.618 | 8.630 | 0.012 |
| 5009_2019_FL | 727591.109 | 402465.466 | 3.069 | outside | * |
| 5010_2019_FL | 813150.757 | 362591.228 | 3.888 | outside | * |
| 6001_2019_FL | 820016.576 | 519163.374 | 9.246 | 9.180 | -0.066 |
| 6002_2019_FL | 815113.725 | 434485.684 | 7.597 | 7.580 | -0.017 |
| 6003_2019_FL | 793600.322 | 386344.567 | 5.053 | outside | * |
| 6004_2019_FL | 717361.248 | 366384.441 | 3.266 | outside | * |
| 6005_2019_FL | 761496.272 | 383916.762 | 4.390 | outside | * |
| 6006_2019_FL | 843467.340 | 328351.519 | 5.303 | outside | * |
| 6007_2019_FL | 889759.847 | 354926.384 | 3.918 | outside | * |
| 6008_2019_FL | 933225.680 | 485512.679 | 7.777 | 7.990 | 0.213 |
| 6009_2019_FL | 945214.608 | 599714.067 | 1.844 | 2.220 | 0.376 |
| 6010_2019_FL | 864759.493 | 598341.804 | 5.949 | 6.010 | 0.061 |
| 6011_2020_FL | 796228.712 | 463588.015 | 6.922 | outside | * |
| 6012_2019_FL | 828967.439 | 413279.708 | 7.071 | 7.020 | -0.051 |
| 6013_2019_FL | 876792.774 | 438302.658 | 4.842 | 4.700 | -0.142 |
| 6014_2019_FL | 838779.146 | 467174.104 | 8.874 | 8.880 | 0.006 |
| 6015_2019_FL | 888121.312 | 521879.300 | 5.850 | 5.750 | -0.100 |
| 6016_2019_FL | 863543.715 | 543091.261 | 7.097 | 6.870 | -0.227 |
| 6017_2019_FL | 905088.028 | 564080.517 | 6.661 | 6.760 | 0.099 |
| 6018_2019_FL | 825576.452 | 563721.852 | 8.616 | outside | * |
| 6019_2019_FL | 944155.675 | 563626.629 | 2.991 | 2.960 | -0.031 |
| 6020_2019_FL | 910600.472 | 596167.294 | 4.625 | 4.640 | 0.015 |
| 8001_2019_FL | 694519.384 | 537797.916 | 10.435 | outside | * |
| 8002_2019_FL | 712986.451 | 519207.954 | 13.254 | 13.400 | 0.146 |

| | | | | | |
|---|---|---|---|---|---|
| 8003_2019_FL | 800684.380 | 518939.059 | 7.469 | 7.420 | -0.049 |
| 8004_2019_FL | 846652.134 | 579766.316 | 6.446 | 6.540 | 0.094 |
| 8005_2019_FL | 851329.554 | 591358.258 | 5.306 | 5.430 | 0.124 |
| 8006_2019_FL | 861647.716 | 590948.017 | 4.290 | 4.450 | 0.160 |
| 8007_2019_FL | 870561.318 | 585680.659 | 5.552 | 5.710 | 0.158 |
| 8008_2019_FL | 876968.681 | 590467.935 | 5.358 | 5.560 | 0.202 |
| 8009_2019_FL | 893450.091 | 579873.437 | 5.453 | 5.780 | 0.327 |
| 8010_2019_FL | 903040.420 | 593305.363 | 4.255 | 4.220 | -0.035 |
| 8011_2019_FL | 911733.191 | 582386.449 | 5.202 | 5.480 | 0.278 |
| 8012_2019_FL | 920501.839 | 590611.075 | 3.982 | 4.130 | 0.148 |
| 8013_2019_FL | 933413.492 | 593760.578 | 4.477 | 4.570 | 0.093 |
| 8014_2019_FL | 859989.989 | 568838.197 | 6.199 | 6.410 | 0.211 |
| 8015_2019_FL | 873858.409 | 564382.817 | 5.023 | 4.870 | -0.153 |
| 8016_2019_FL | 883234.665 | 575680.470 | 6.042 | 5.770 | -0.272 |
| 8017_2019_FL | 904855.388 | 568335.187 | 6.078 | 6.110 | 0.032 |
| 8018_2019_FL | 924295.711 | 566396.200 | 6.806 | 6.900 | 0.094 |
| 8019_2019_FL | 923708.232 | 551338.133 | 3.808 | 4.030 | 0.222 |
| 8020_2019_FL | 897514.500 | 549867.997 | 7.462 | 7.300 | -0.162 |
| 8021_2019_FL | 881778.055 | 547375.154 | 8.024 | 7.680 | -0.344 |
| 8022_2019_FL | 922478.850 | 531897.485 | 8.820 | 8.730 | -0.090 |
| 8023_2019_FL | 887680.592 | 561401.592 | 5.952 | 5.910 | -0.042 |
| 8024_2019_FL | 863397.821 | 528471.270 | 5.964 | 5.940 | -0.024 |
| 8025_2019_FL | 858797.412 | 540736.444 | 6.042 | 5.750 | -0.292 |
| 8026_2019_FL | 880080.010 | 534497.404 | 6.000 | 5.770 | -0.230 |
| 8027_2019_FL | 901388.074 | 538215.362 | 5.787 | 5.470 | -0.317 |
| 8028_2019_FL | 839171.694 | 519137.371 | 7.752 | 7.930 | 0.178 |
| 8029_2019_FL | 869977.924 | 514357.503 | 7.630 | 7.520 | -0.110 |
| 8030_2019_FL | 890650.491 | 516687.281 | 11.613 | 11.570 | -0.043 |
| 8031_2019_FL | 906861.632 | 524815.385 | 11.667 | 11.450 | -0.217 |
| 8032_2019_FL | 919249.916 | 517219.936 | 14.298 | 14.250 | -0.048 |
| 8033_2019_FL | 837974.877 | 506283.047 | 7.470 | 7.480 | 0.010 |
| 8034_2019_FL | 862408.381 | 504906.592 | 6.449 | 6.420 | -0.029 |
| 8035_2019_FL | 873836.235 | 496113.302 | 7.514 | 7.680 | 0.166 |
| 8036_2019_FL | 840043.706 | 490992.601 | 8.359 | 8.400 | 0.041 |
| 8037_2019_FL | 858827.130 | 489831.014 | 8.878 | 8.810 | -0.068 |
| 8038_2019_FL | 888405.006 | 496026.095 | 8.985 | 8.940 | -0.045 |
| 8039_2019_FL | 901846.350 | 511476.978 | 10.886 | 10.740 | -0.146 |
| 8040_2019_FL | 818245.718 | 474259.012 | 6.391 | 6.560 | 0.169 |
| 8041_2019_FL | 848721.304 | 479047.971 | 8.715 | 8.690 | -0.025 |
| 8042_2019_FL | 877554.360 | 476911.071 | 10.315 | 10.210 | -0.105 |
| 8043_2019_FL | 879395.227 | 466251.744 | 8.241 | 8.300 | 0.059 |
| 8044_2019_FL | 859242.979 | 465243.335 | 8.982 | 8.850 | -0.132 |
| 8045_2019_FL | 862521.355 | 482980.619 | 7.888 | 7.710 | -0.178 |

| | | | | | |
|---|---|---|---|---|---|
| 8046_2019_FL | 825361.067 | 463703.917 | 7.284 | 7.340 | 0.056 |
| 8047_2019_FL | 865244.927 | 450748.277 | 6.367 | 6.260 | -0.107 |
| 8048_2019_FL | 844142.557 | 453615.496 | 11.006 | 11.040 | 0.034 |
| 8049_2019_FL | 818840.320 | 442567.039 | 7.604 | 7.430 | -0.174 |
| 8050_2019_FL | 836312.953 | 437546.255 | 10.000 | 9.870 | -0.130 |
| 8051_2019_FL | 807087.029 | 426396.660 | 6.850 | 6.870 | 0.020 |
| 8052_2019_FL | 836562.735 | 424135.771 | 9.306 | 9.200 | -0.106 |
| 8053_2019_FL | 852353.586 | 423658.121 | 5.933 | 5.790 | -0.143 |
| 8054_2019_FL | 827553.397 | 403948.068 | 5.940 | 5.900 | -0.040 |
| 8055_2019_FL | 813204.200 | 412781.878 | 5.885 | 5.580 | -0.305 |
| 8056_2019_FL | 812277.437 | 394586.407 | 4.675 | 4.610 | -0.065 |
| 8057_2019_FL | 844869.285 | 410919.905 | 6.191 | 6.170 | -0.021 |
| 8058_2019_FL | 841209.937 | 339973.048 | 2.918 | outside | * |
| 8059_2019_FL | 802144.208 | 389188.578 | 7.519 | outside | * |
| 8060_2019_FL | 811478.486 | 389212.101 | 7.950 | 7.980 | 0.030 |
| 8061_2019_FL | 822897.631 | 418812.056 | 7.828 | 7.720 | -0.108 |
| 8062_2019_FL | 860261.533 | 441261.518 | 6.108 | 6.060 | -0.048 |
| 8063_2019_FL | 838568.115 | 470102.459 | 6.687 | 6.700 | 0.013 |
| 8064_2019_FL | 851807.906 | 508278.586 | 4.880 | 4.850 | -0.030 |
| 8065_2019_FL | 912100.545 | 555617.010 | 3.060 | 3.140 | 0.080 |

| | |
|---|---|
| Average delta z | -0.015 |
| Minimum delta z | -0.344 |
| Maximum delta z | 0.376 |
| Average magnitude | 0.118 |
| Root mean square | 0.150 |
| Std deviation | 0.150 |

## LiDAR Checkpoints Vegetated Vertical Accuracy (VVA)

| Number | Easting | Northing | Elevation | Lidar Tin | Delta Z |
|---|---|---|---|---|---|
| VVA1 | 882305.969 | 594457.164 | 7.560 | 7.470 | -0.090 |
| VVA10 | 926004.806 | 542396.939 | 3.440 | 3.500 | 0.060 |
| VVA11 | 945270.844 | 558814.332 | 8.390 | 8.280 | -0.110 |
| VVA12 | 826859.139 | 486367.329 | 5.790 | 5.930 | 0.140 |
| VVA13 | 900964.748 | 531462.211 | 3.550 | 3.570 | 0.020 |
| VVA14 | 933975.213 | 498248.601 | 2.890 | 2.870 | -0.020 |
| VVA15 | 837260.428 | 519134.919 | 4.960 | 5.080 | 0.120 |
| VVA16 | 854313.641 | 505172.124 | 6.110 | 6.140 | 0.030 |
| VVA17 | 882868.138 | 496597.519 | 9.980 | 9.840 | -0.140 |
| VVA18 | 712806.783 | 518787.711 | 9.530 | 9.480 | -0.050 |
| VVA19 | 836386.964 | 501761.977 | 7.330 | 7.300 | -0.030 |
| VVA2 | 932050.454 | 584825.432 | 7.140 | 7.160 | 0.020 |

| | | | | | |
|---|---|---|---|---|---|
| VVA20 | 812228.991 | 468964.538 | 5.370 | 5.490 | 0.120 |
| VVA21 | 853373.410 | 470134.189 | 8.620 | 8.550 | -0.070 |
| VVA22 | 841166.039 | 453658.531 | 8.560 | 8.560 | 0.000 |
| VVA23 | 883610.020 | 464847.169 | 12.460 | 12.470 | 0.010 |
| VVA24 | 870186.762 | 440677.264 | 3.010 | 3.010 | 0.000 |
| VVA25R | 871740.898 | 410909.298 | 4.360 | 4.330 | -0.030 |
| VVA26R | 869386.580 | 400725.055 | 2.050 | 2.000 | -0.050 |
| VVA27 | 807316.643 | 389240.459 | 5.700 | 5.550 | -0.150 |
| VVA28 | 829350.215 | 401462.231 | 4.700 | 4.630 | -0.070 |
| VVA29 | 806752.324 | 415760.768 | 5.530 | 5.630 | 0.100 |
| VVA3 | 857254.190 | 570330.309 | 2.420 | 2.540 | 0.120 |
| VVA30 | 805142.356 | 442357.396 | 5.300 | 5.350 | 0.050 |
| VVA31 | 833666.752 | 434021.894 | 4.900 | 4.770 | -0.130 |
| VVA32 | 942217.110 | 524081.322 | 11.130 | 11.460 | 0.330 |
| VVA33 | 864407.317 | 522147.552 | 7.160 | 7.150 | -0.010 |
| VVA34 | 858001.882 | 431219.977 | 5.710 | 5.550 | -0.160 |
| VVA35 | 913236.814 | 512427.805 | 4.540 | 4.670 | 0.130 |
| VVA4 | 859347.578 | 548366.585 | 6.130 | 6.280 | 0.150 |
| VVA5 | 878483.000 | 571859.526 | 6.800 | 6.860 | 0.060 |
| VVA7 | 934555.858 | 576129.955 | 2.840 | 2.730 | -0.110 |
| VVA6 | 898770.976 | 581266.294 | 5.700 | 5.790 | 0.090 |
| VVA8 | 909191.737 | 563946.606 | 10.710 | 10.700 | -0.010 |
| VVA9 | 926296.485 | 560649.470 | 9.990 | 10.050 | 0.060 |

| | |
|---|---|
| Average delta z | 0.011 |
| Minimum delta z | -0.160 |
| Maximum delta z | 0.330 |
| Average magnitude | 0.081 |
| Root mean square | 0.104 |
| Std deviation | 0.105 |

Outside * points outside project limits

All Units in U.S. Survey Feet