GROUND CONTROL SURVEY REPORT

GROUND TRUTH SURVEY
FOR LIDAR CONTROL

Professional Management
and LiDAR Data Collection
and Processing Services

Block 3

PROJECT TITLE:	Professional Management and LiDAR Data Collection and Processing Services
WORK ORDER NAME:	Task Order A
WORK ORDER NUMBER:	2007058492720
CONSULTANT NAME:	3001, Inc., CH2M Hill, Inc.
PROJECT MANAGERS:	Jeremy Conner, 3001 Project Manager JoLee Gardner, CH2M Hill Project Manager

Services provided by:

3001, INC. THE GEOSPATIAL COMPANY
501 Robert Blvd. 2nd Floor
Slidell, Louisiana 70458

November 2008

Florida Division of Emergency Management
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

Re: Professional Management and LiDAR Data Collection and Processing Services, Block 2

This photogrammetric mapping ground control survey is certified as meeting or exceeding, in quality and precision, the standards applicable for this work as set forth in Chapter 61G17-6, Florida Adminstrative Code.

Dean T. Epling, PSM
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CONTENTS

ABSTRACT

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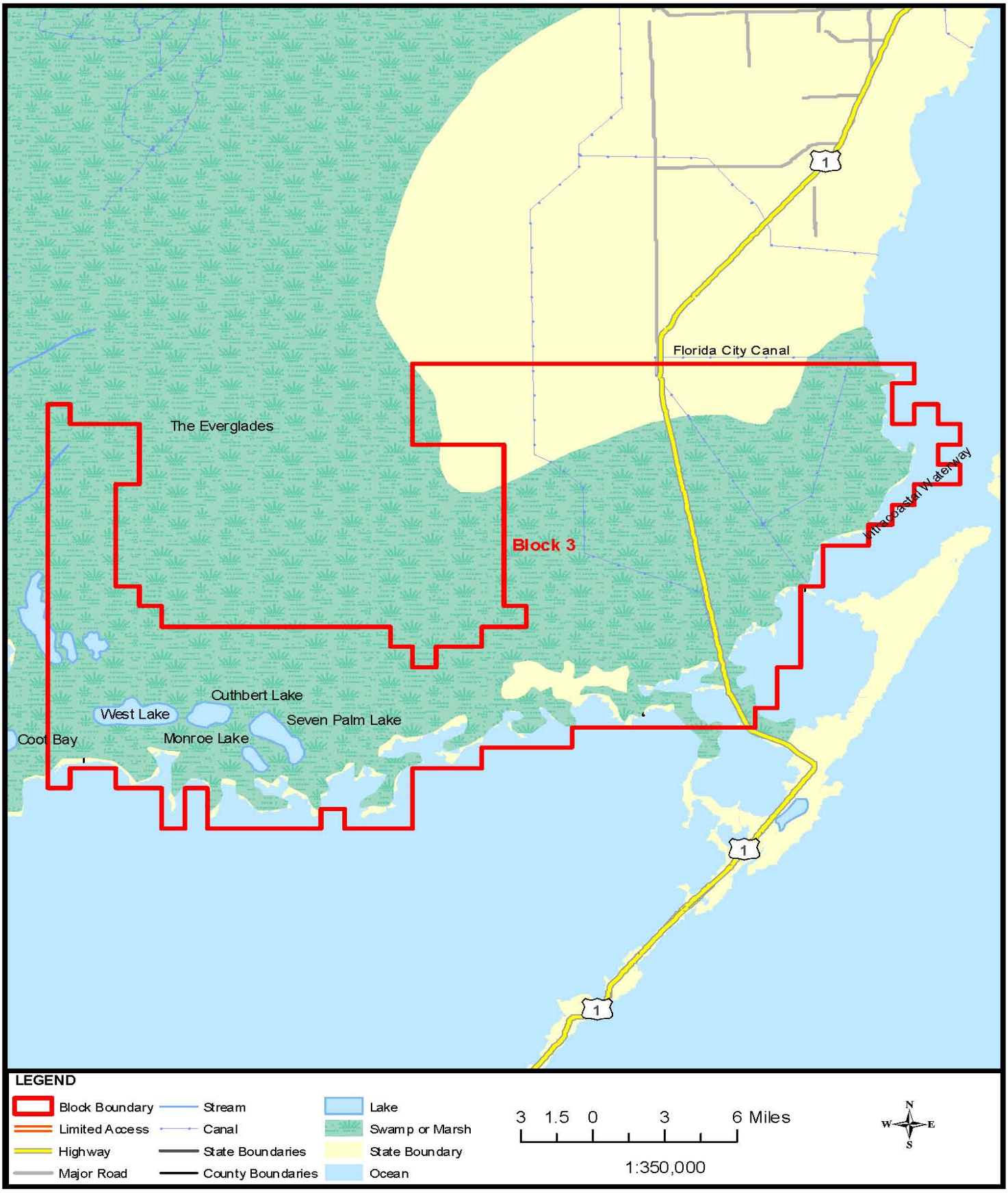
This report documents the GPS ground surveys conducted in support of LIDAR data collection for the Professional Management and LiDAR Data Collection and Processing Services project, Block 3. The data was collected between July 3 and July 8, 2007. Additional survey data was collected on December 9, 2007. The ground control stations were established utilizing six Trimble 4000 series receivers, two Trimble 4700 GPS receivers, six Trimble Compact L1/L2 antennas with ground plane, one Trimble microcentered L1/L2 antenna with ground plane, and one Trimble microcentered L1/L2 antenna without ground plane. There were no problems encountered during this survey.

Following the control network surveys, surveys were conducted at 8 sites utilizing the base stations established in the static network. These surveys established "Ground Truth" data at each site on different surface types, including bare-earth / low grass, brush lands / low trees, forested areas fully covered by trees, and urban areas.

BLOCK 3 SITE MAP



SURVEY METHODOLOGY

SURVEY METHODOLOGY

Prior to beginning the survey collection, a reconnaissance was done of the existing control in the project area, and surrounding areas. Based on the results of the findings, the controls to be included in the network were selected based on their locations, horizontal and vertical orders, and their accessibility. In addition to the survey control, several Continuously Operating Reference Stations (CORS) were included into the GPS network. All control monuments and CORS can be found in the Fully-Constrained Adjustment table, found in Section 4-B, and can also be seen on the GPS Network Map shown in Section 4-A.

The GPS network was then planned to coincide with the following set of standards:

- FGCC, GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES, VERSION 5.0, AUGUST 1989
- FGDC, GEOSPATIAL POSITIONING ACCURACY STANDARDS, NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (NSSDA)
- NGS-58, GUIDELINES FOR ESTABLISHING GPS-DERIVED ELLIPSOID HEIGHTS (2CM AND 5CM)
- NGS-59, GUIDELINES FOR ESTABLISHING GPS-DERIVED ORTHOMETRIC HEIGHTS (2CM AND 5CM)
- FGCC STANDARDS AND SPECIFICATIONS FOR GEODETIC CONTROL NETWORKS, 1984
- FEMA FLOOD HAZARD MAPPING PROGRAM, GUIDELINES AND SPECIFICATIONS FOR FLOOD HAZARD MAPPING PARTNERS, APPENDIX A

Control monuments were tied together with four hour occupations. These monuments were then tied to newly established monuments, or secondary control monuments, with multiple one hour occupations.

After the static GPS network was completed, the ground truth data points were collected using a total station and data collector. This data was collected from base stations tied into the static GPS network, and additional “check-in” points were collected and compared to positions established in the static network. The ground truth data was then processed and used to verify the LIDAR positions.

The horizontal and vertical datums used for this project are listed below:

Coordinate System: US State Plane
Zone: Florida East 0901
Horizontal Datum: NAD83 (1999) / HARN Adjustment
Vertical Datum: NAVD88
Geoid Model: Geoid03
Units: US Survey Feet

MAIN REPORT

STATIC GPS SUMMARY

The Standard Operating Procedure for the data collection includes a geodetic control network plan designed to maximize the use of the highest order control points in the area of interest, and to optimize the spatial distribution of geodetic control across the network. Also included is the simultaneous occupation of points designed to provide redundant vectors and loop closures, as well as a collection of a superfluity of points to compare observed values against published values of geodetic control points.

In addition, the static GPS network was established to verify the compatibility and correlation of existing published NGS controls in the project area. Horizontal and vertical constraints were selected based on the order of accuracy and correlation of the controls selected.

PRELIMINARY ANALYSIS

The baselines were processed using Trimble Geomatics Offices's baseline processing module, WAVE (*Weighted Ambiguity Vector Estimator*). Ionosphere-free fixed solutions were found to provide the best results. Preliminary blunder detections were undertaken using "Redundant Vectors" and Global Network Closures and any extremely large errors were eliminated.

MINIMALLY CONSTRAINED ADJUSTMENT

The data are then processed using a minimally constrained geodetic control network to test the network internally, without external constraints, and produce a statistical summary. The statistics from this process are required to be within the tolerance outlined in the Geometric Geodetic Accuracy Standards and Specifications for using GPS Relative Positioning Techniques, published by the FGCC. These tolerances are represented as ellipsoids showing the margin of error value on a graph of the theoretical points, covariance values that indicate the degree of error of the vectors relative to the other vectors in the network, and a chi-squared test that compares the predicted variance determined through a least-squares analysis to the observed variance. The summary is evaluated to eliminate vectors that are outside of the error tolerances to be replaced with redundant vectors that are within the tolerances until all tolerances are met.

FULLY CONSTRAINED ADJUSTMENT

The quality of the existing horizontal controls is assessed before undertaking the constrained adjustment. Geodetic inverses between the published NAD83 (1999) coordinates of existing stations were compared with the geodetic inverses derived from the minimally constrained least square adjustment results. This distance analysis is especially useful, since it provides a datum invariant means of comparison.

Once the minimally constrained network satisfies the requirements of the above tests, the highest order control points in the control network are selected with an optimum spatial relationship to fully constrain the network to known control points, and have their published values entered as the position for those points and the network re-adjusted. The fully constrained positions are given in Section 4-B. The same statistical tests are rerun on the adjusted network, as well as visually comparing adjusted values of geodetic control points to published values of control points not used as constraints. Again, the summary is evaluated to identify vectors outside of the tolerances and constraining points reselected to obtain the best fit to the geoid where all vectors are within the prescribed tolerances.

ERROR ELLIPSES

The adjustment results show that the a posteriori variance factor of the network was close to 1.0, as should be desired, and passed the χ^2 test. None of the residual components in the network were flagged for possible rejection under the τ-max test at the 0.05 level of significance. The relative confidence ellipses reveal that the horizontal positional accuracy between all directly connected pairs of stations in the network were better than (1:100,000) at the 95% level of confidence. The horizontal and vertical Error ellipses are included in this report in Section 4-D.

GROUND TRUTH SUMMARY

Surveys were conducted to establish ground truth data at representative sites throughout the project area. These sites were selected on the basis of the various types of ground surfaces and vegetation covers that would be encountered by the LIDAR surveys. As a quality control measure, a number of “check-in” points consisted of published horizontal and vertical control points within the area. The base stations used to collect survey data were included in the static GPS network, and were selected on the basis of their having an unobstructed view of the sky, as well as being in a location considered favorable for collecting ground truth data. The vertical and horizontal accuracy of each base station was determined by the statistical tests performed in the least squares adjustment process.

SAMPLE POINTS / TEST POINTS

The test points were distributed and categorized into sites as shown in the Map of Ground Truth Locations attached in this report (Section 5-A). These sites were selected on the basis of various types of ground surfaces and vegetation covers. At the time of LIDAR data acquisition, checkpoints were collected on surfaces with bare-earth / low grass, brush lands / low trees, forested areas fully covered by trees, and urban areas.

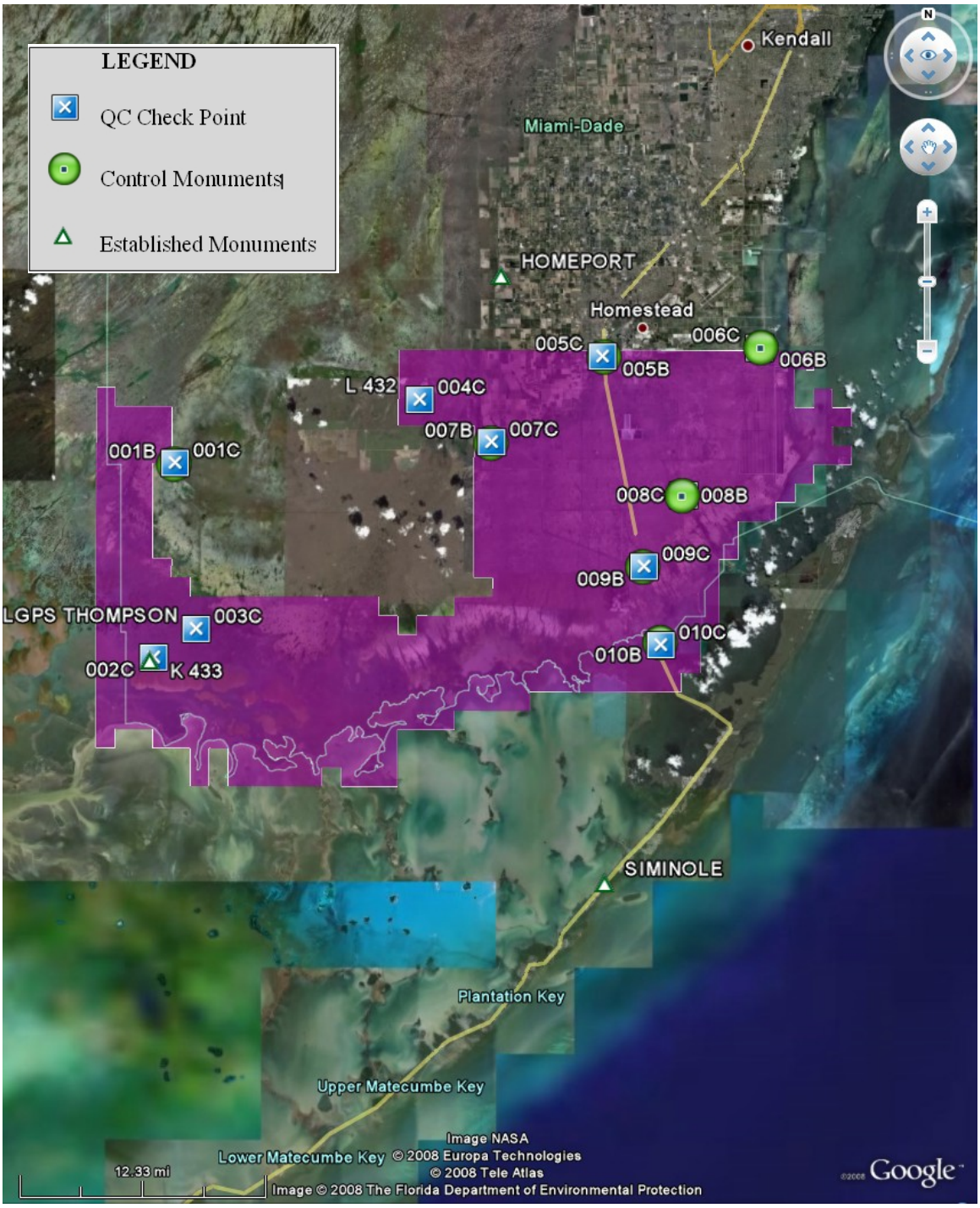
GPS NETWORK

A. GPS Network Map

GPS Network Map

This map shows the GPS baselines processed for this network. The CORS and control monuments can be distinguished from the newly established monuments (see the legend above).

QC Check Points



The QC check points can be seen in the above map. The QC procedures are described in Section 3, in the Ground Truth Summary. The individual check sites can be seen in detail in Section 5-B.

B. Fully Constrained

GPS Control Network
Fully-Constrained Adjustment

Coordinate System: US State Plane
Zone: Florida East 0901
Horizontal Datum: NAD83 (1999)
HARN Adjustment
Vertical Datum: NAVD88
Geoid Model: Geoid03
Units: US Survey Feet

Name	Latitude	Longitude	Northing	Easting	Elev	Ellip Height	North error	East error	Ellip error	Fixed
kyw1	24 34 56.16457	81 39 10.90470	90972.24	439167.31	31.52	-39.84				LLh
mia3	25 43 58.09808	80 09 36.60080	509458.62	932637.26	36.49	-47.71				LLh
MTNT	25 51 56.76081	80 54 25.18701	556914.06	686748.36	17.53	-62.15				LLh
NAPL	26 08 55.10356	81 46 34.62742	660475.38	401512.49	19.92	-57.21				LLh
RMND	25 36 49.58921	80 23 02.14117	465790.41	859175.16	35.96	-46.22				LLh
HOME	25 30 06.12740	80 33 23.75799	424831.23	802411.50	4.91	-75.78	0.01	0.01	0.03	
K433	25 13 24.53171	80 50 15.95963	323507.81	709797.74	2.04	-74.41	0.01	0.01	0.07	
L432	25 24 43.13378	80 37 31.57505	392154.05	779798.35	4.53	-75.22	0.00	0.00	0.00	LLh
SIMI	25 03 44.30649	80 28 28.23301	265240.75	830112.92	8.97	-70.10	0.00	0.00	0.05	LLh
THOM	25 14 45.07522	80 48 04.34413	331654.88	721871.69	2.69	-74.27	0.00	0.00	0.00	LLh
001B	25 21 51.93769	80 49 10.71133	374738.30	715720.46	2.60	-74.97	0.03	0.03	0.08	
005B	25 26 29.92569	80 28 30.95424	403102.12	829324.07	6.35	-75.11	0.01	0.01	0.03	
006B	25 26 53.51709	80 20 58.60106	405666.50	870777.95	5.54	-77.35	0.01	0.01	0.03	
007B	25 22 45.98477	80 33 57.27206	380386.96	799485.58	3.96	-76.16	0.02	0.02	0.05	
008B	25 20 28.18044	80 24 46.72732	366667.86	850038.47	2.81	-78.55	0.02	0.02	0.05	
009B	25 17 23.22958	80 26 40.81005	347951.78	839649.68	3.12	-77.48	0.03	0.03	0.08	
010B	25 14 05.91725	80 25 51.43623	328051.53	844265.67	1.07	-79.28	0.03	0.03	0.08	
001C	25 21 54.94224	80 49 09.08992	375041.81	715868.77	2.51	-75.07	0.04	0.04	0.10	
002C	25 13 28.16153	80 50 10.01344	323874.90	710343.32	2.63	-73.84	0.05	0.04	0.11	
003C	25 14 42.62377	80 48 07.79617	331406.94	721555.12	2.27	-74.67	0.02	0.03	0.05	
004C	25 24 39.07274	80 37 23.80920	391746.08	780511.53	4.85	-74.92	0.03	0.03	0.05	
005C	25 26 31.08031	80 28 37.03615	403216.49	828766.11	4.90	-76.54	0.03	0.03	0.07	
006C	25 26 52.99747	80 21 03.93641	405611.66	870289.16	3.98	-78.90	0.04	0.04	0.09	
007C	25 22 48.56773	80 33 56.96307	380647.81	799513.07	4.10	-76.03	0.06	0.05	0.13	
008C	25 20 29.47729	80 24 44.11081	366799.84	850277.94	4.64	-76.73	0.04	0.03	0.06	
009C	25 17 23.84426	80 26 38.78121	348014.60	839835.63	3.74	-76.86	0.04	0.04	0.09	
010C	25 13 59.54822	80 25 51.04257	327408.71	844304.54	1.32	-79.02	0.07	0.06	0.18	

ERRORS ARE REPORTED AT THE 95% CONFIDENCE LEVEL.

C. NGS Published Positions vs GPS Derived Positions

NGS Positions vs GPS Derived Positions

Coordinate System: US State Plane
Zone: Florida East 0901
Horizontal Datum: NAD83 (1999)
Vertical Datum: NAVD88
Geoid Model: Geoid03
Units: US Survey Feet

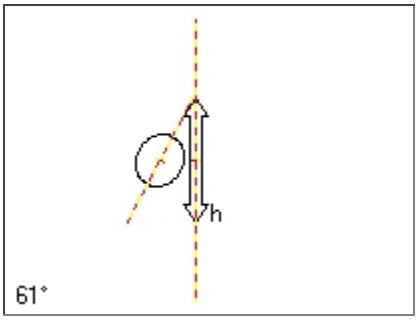
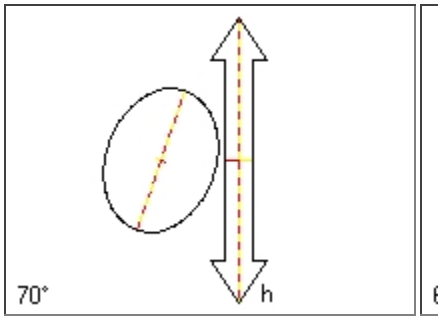
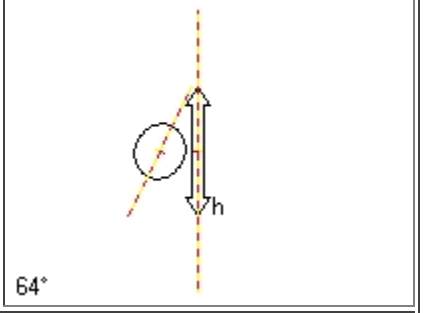
Name	Northing	Easting	Elev	Ellip Ht	Horiz Order	Vert Order	Ellip Order
kyw1	90972.24	439167.31		-39.84	CORS	CORS	CORS
mia3	509458.61	932637.26		-47.71	CORS	CORS	CORS
mtnt	556914.05	686748.36		-62.15	CORS	CORS	CORS
napl	660475.38	401512.49	20.0	-57.21	CORS	CORS	CORS
rmnd	465790.41	859175.16		-46.22	CORS	CORS	CORS
HOMEPORT	424831.30	802411.50	4.97	-75.76	A	1	4
L 432	392154.05	779798.35	4.53	-75.26	1	1	4
FLGPS THOMPSON	331654.88	721871.69	2.69	-74.27	A	1	4
K 433	323507.84	709797.73	2.05	-74.41	1	1	4
SIMINOLE	265240.75	830112.92	8.9	-70.24	1	-	4

Northing	Easting	Elev	Ellip Ht
90972.24	439167.31	31.52	-39.84
509458.62	932637.26	36.49	-47.71
556914.06	686748.36	17.53	-62.15
660475.38	401512.49	19.92	-57.21
465790.41	859175.16	35.96	-46.22
424831.23	802411.50	4.91	-75.78
392154.05	779798.35	4.53	-75.22
331654.88	721871.69	2.69	-74.27
323507.81	709797.74	2.04	-74.41
265240.75	830112.92	8.97	-70.10

delta North	delta East	delta Elev	delta Ellip
0.00	0.00		0.00
-0.01	0.00		0.00
-0.01	0.00		0.00
0.00	0.00	0.08	0.00
0.00	0.00		0.00
0.07	0.00	0.06	0.02
0.00	0.00	0.00	-0.04
0.00	0.00	0.00	0.00
0.03	-0.01	0.01	0.00
0.00	0.00	-0.07	-0.14

D. Error Ellipses

Point Error Ellipses

010B	010C	009B
		
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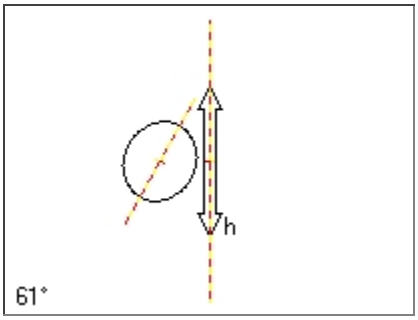	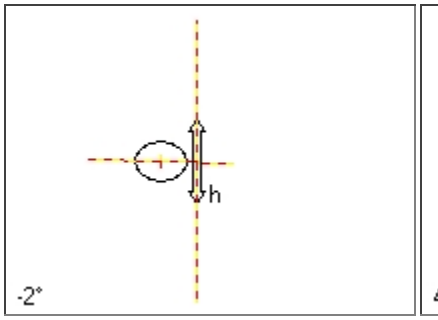	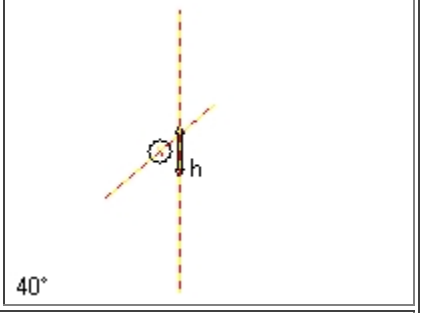
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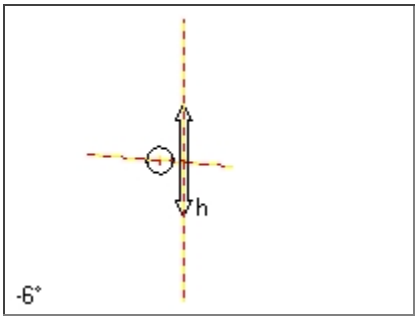
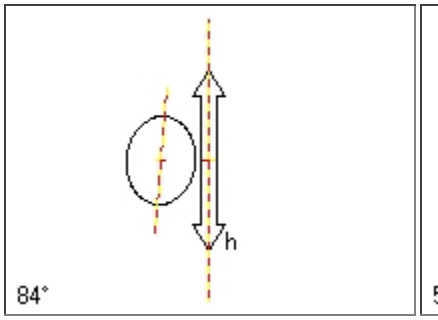
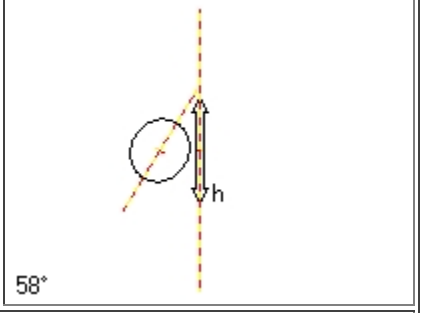
K433	**002C**	**005C**
		
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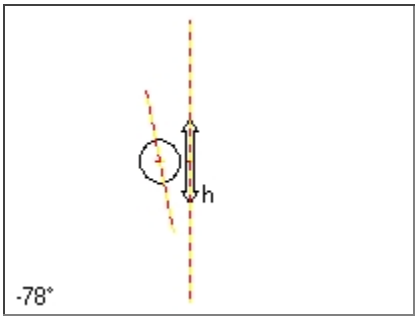
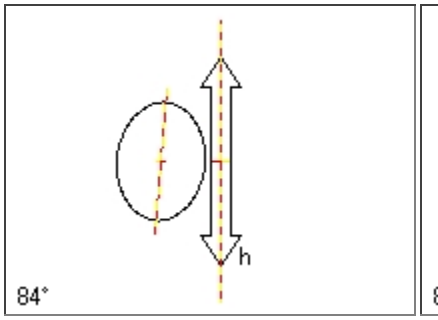
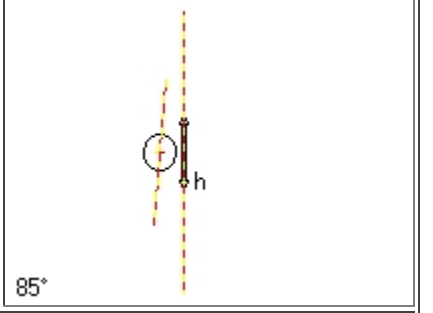
007B	**007C**	**008B**
		
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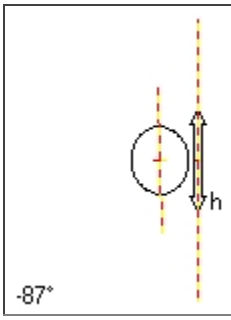
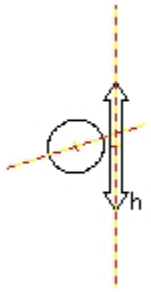
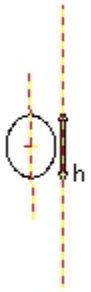
008C	001B	004C
		
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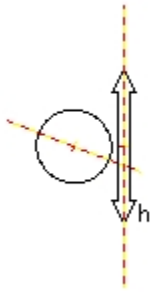
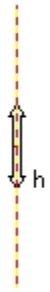
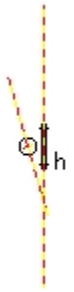
001C	**SIMI**	**006B**
		
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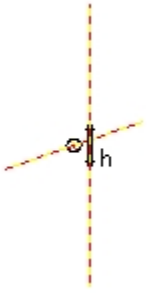
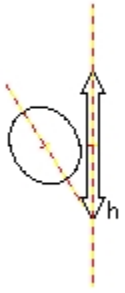
HOME	**006C**	
		
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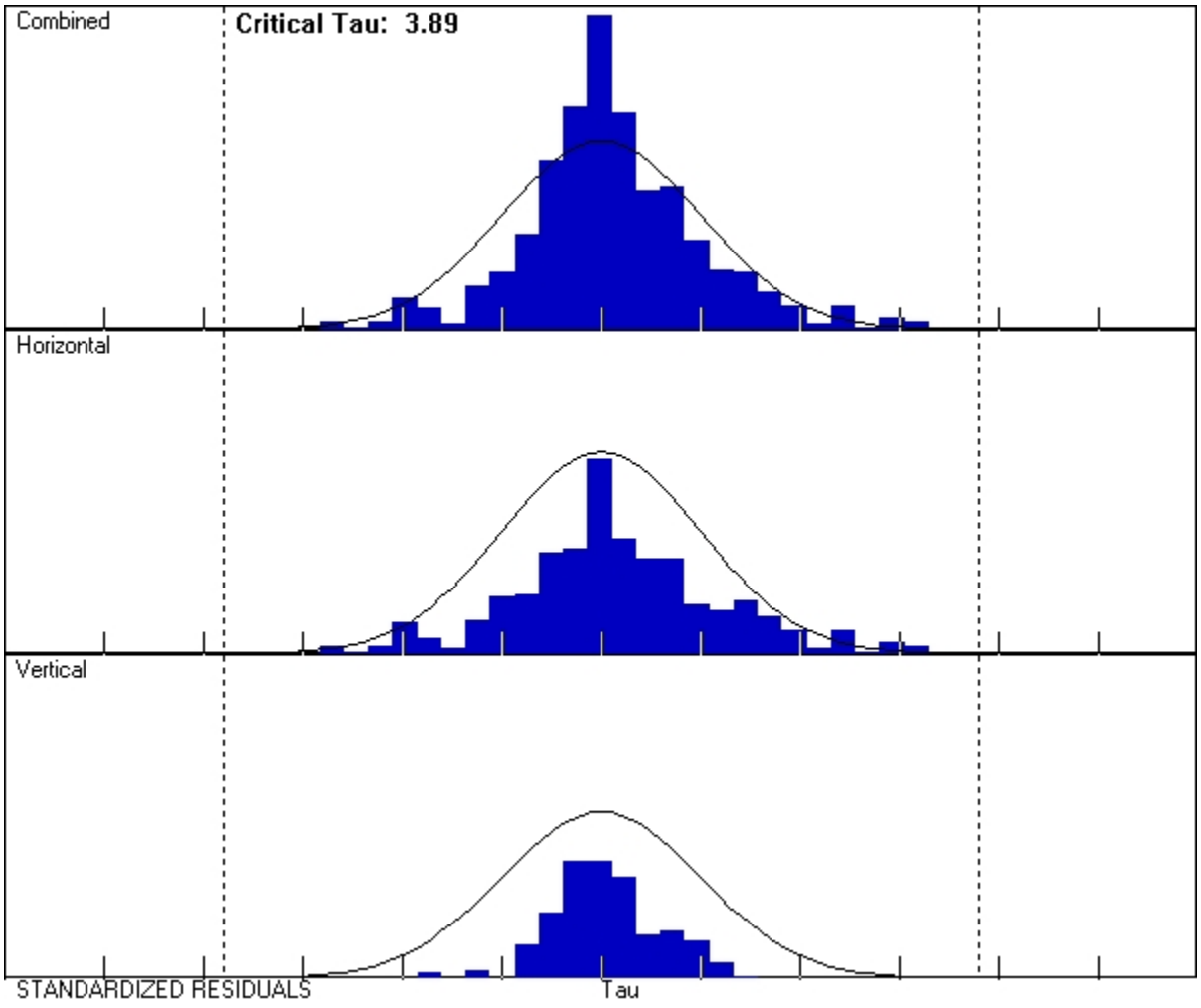
E. Histograms of Standardized Residuals

Histograms of Standardized Residuals



GROUND TRUTH SURVEY

A. Map of Ground Truth Locations

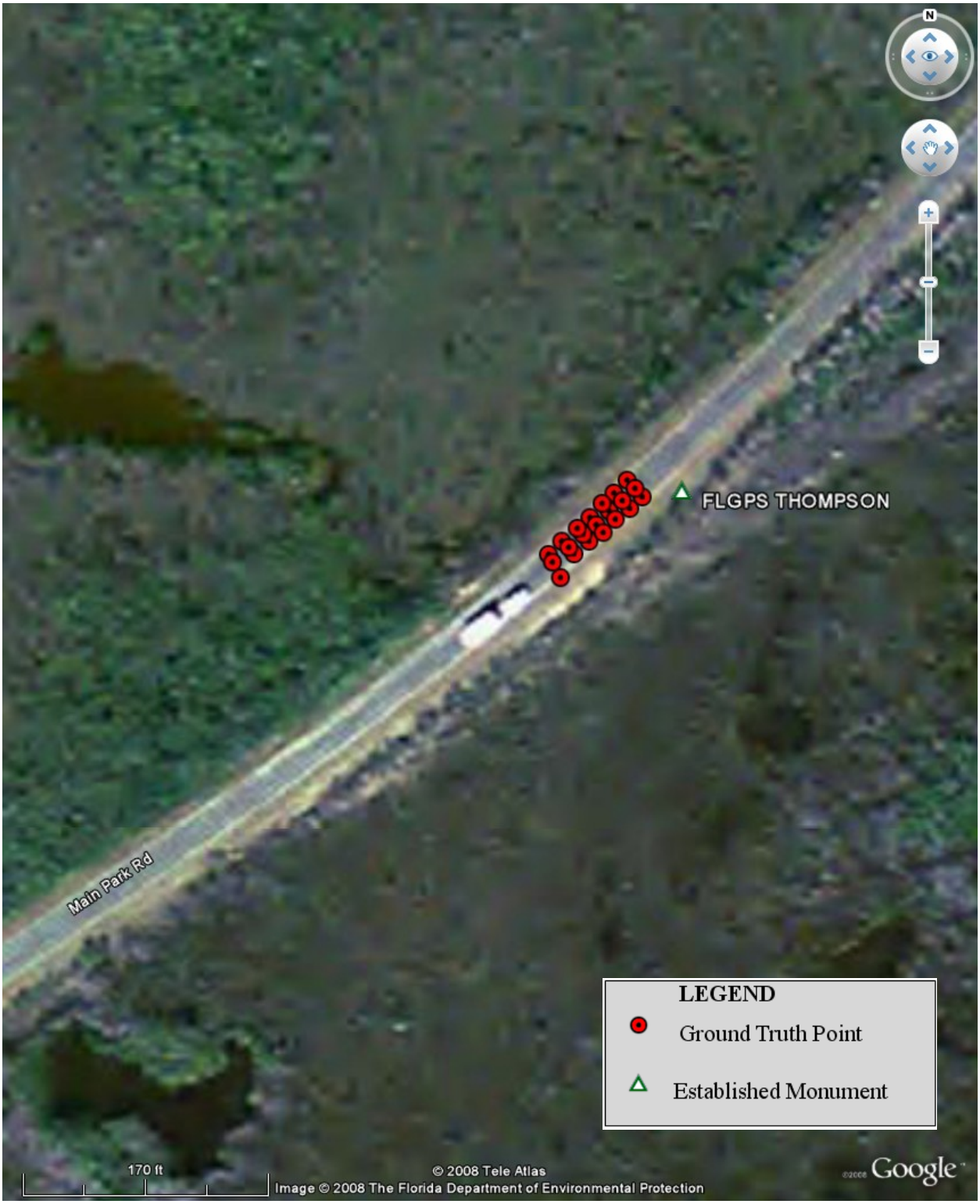
Ground Control Areas

The individual check sites can be seen in detail on the following pages.

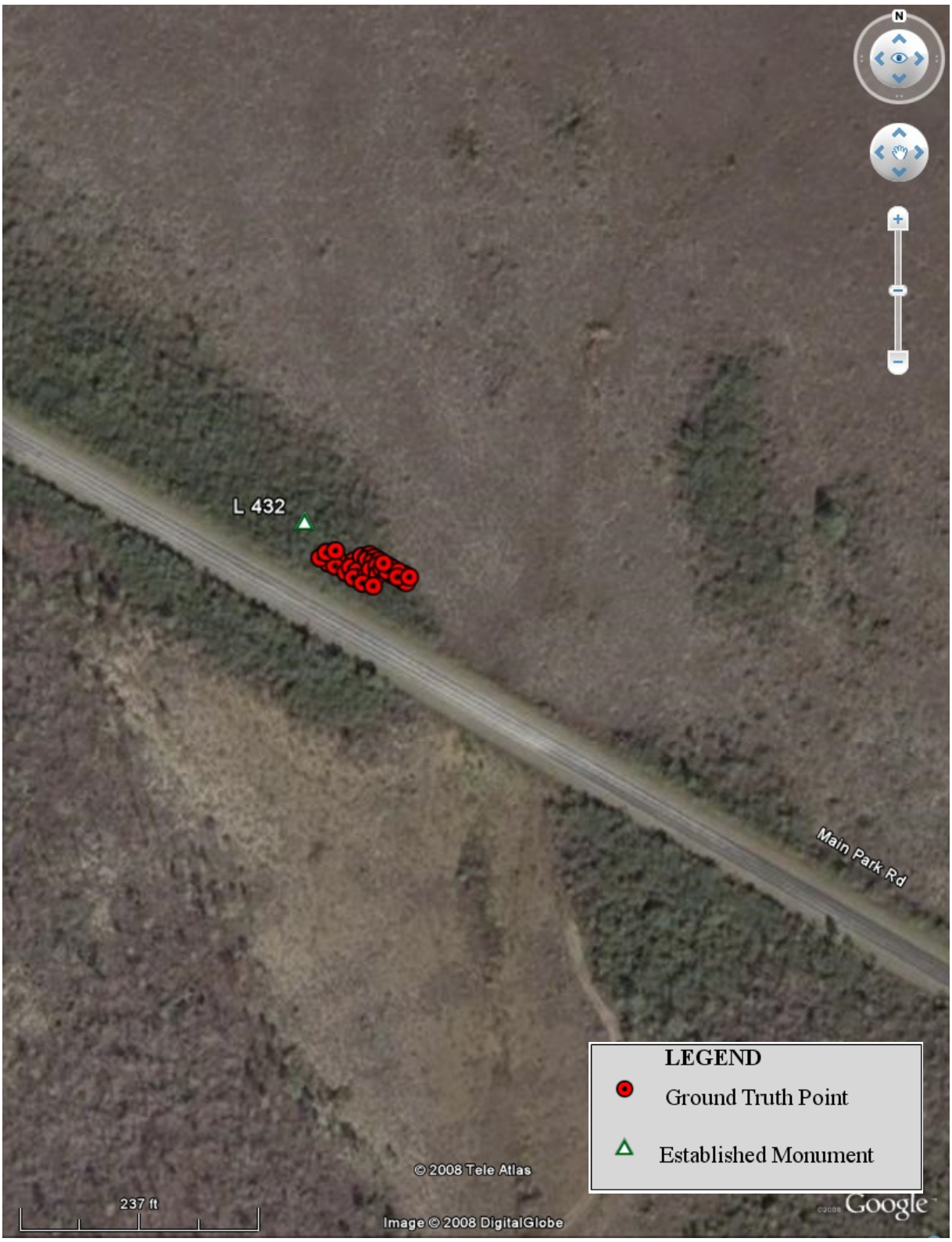
B. Ground Truth Site Maps

SITE 1 - Ground Truth Points

SITE 2 - Ground Truth Points

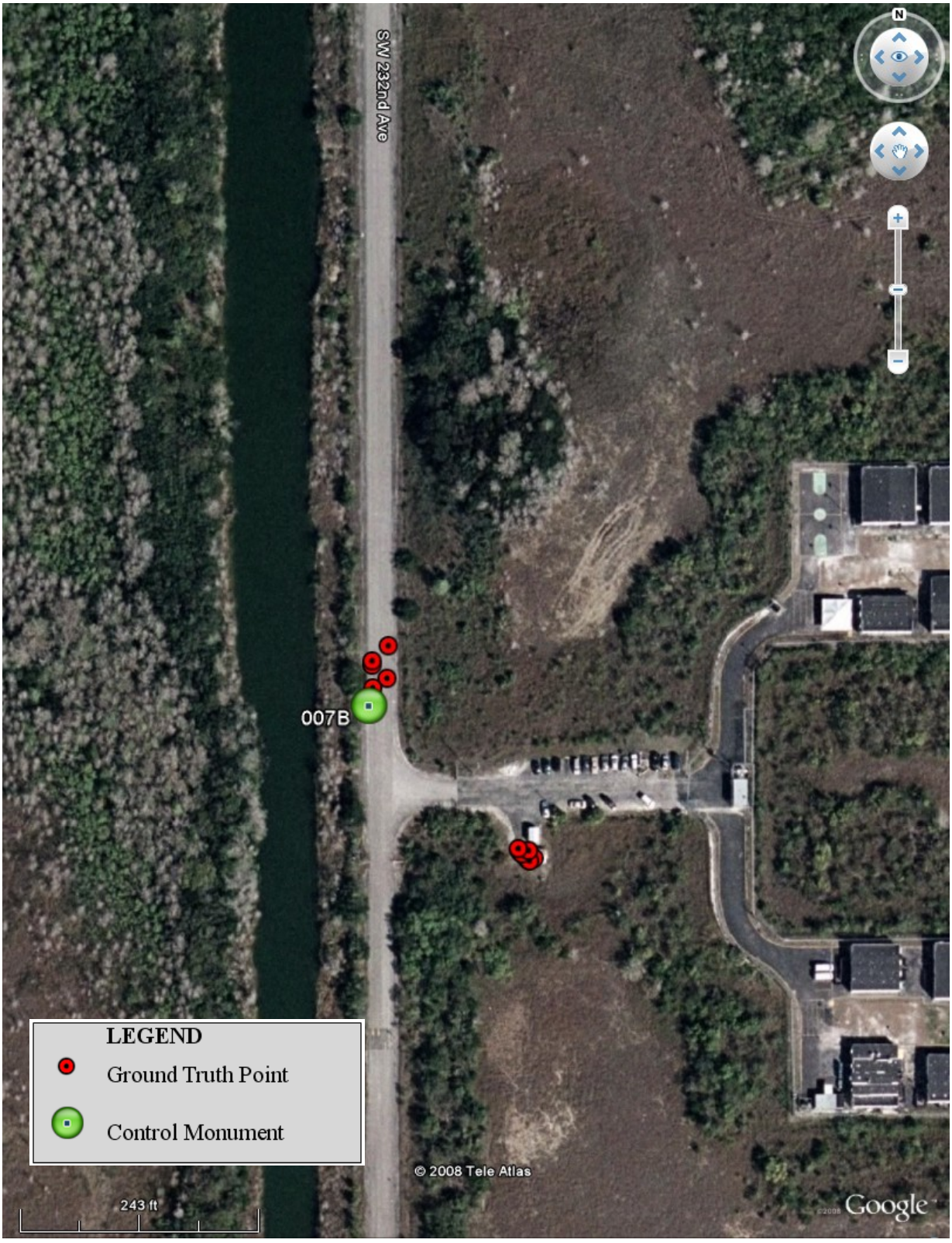


SITE 3 - Ground Truth Points

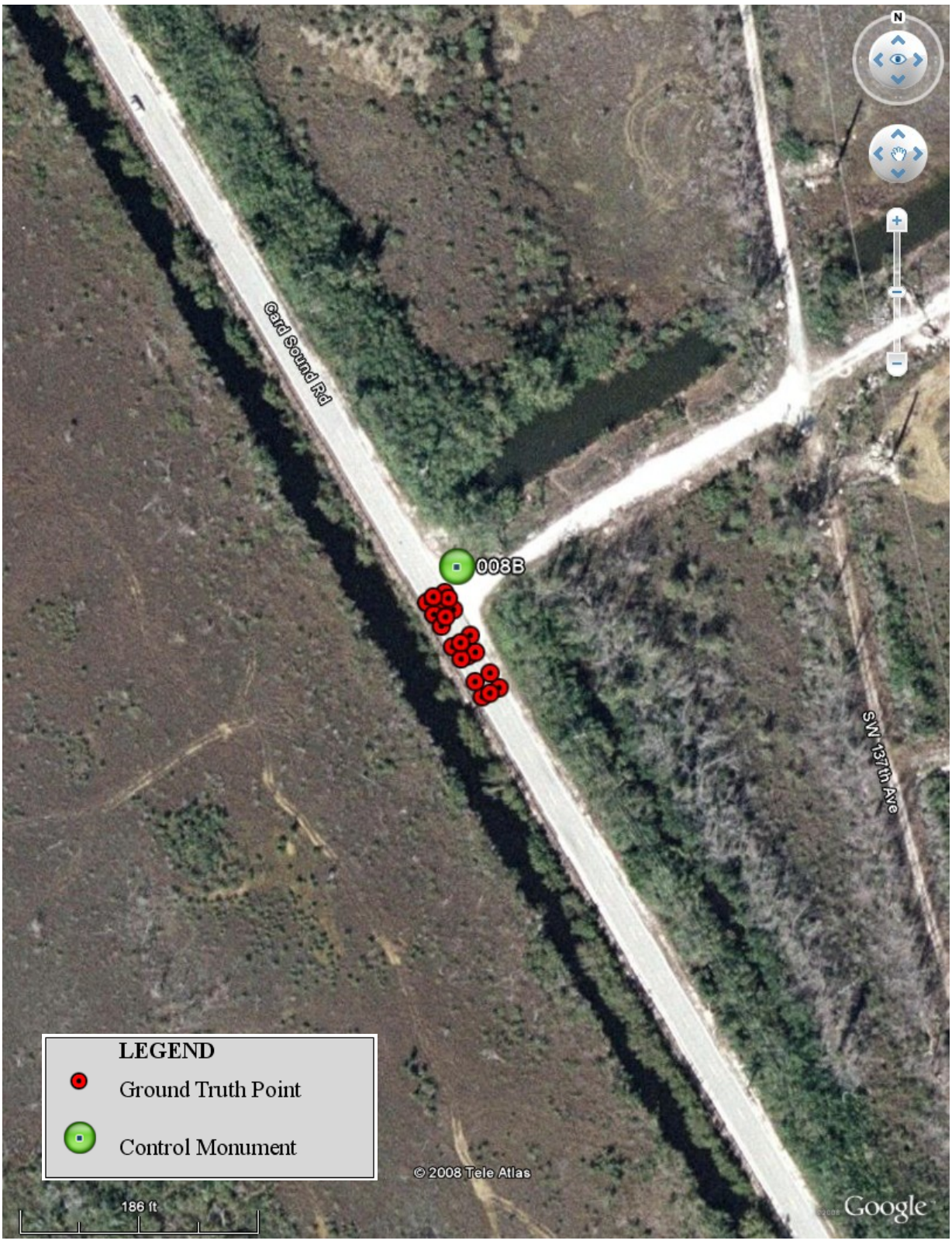


SITE 4 - Ground Truth Points

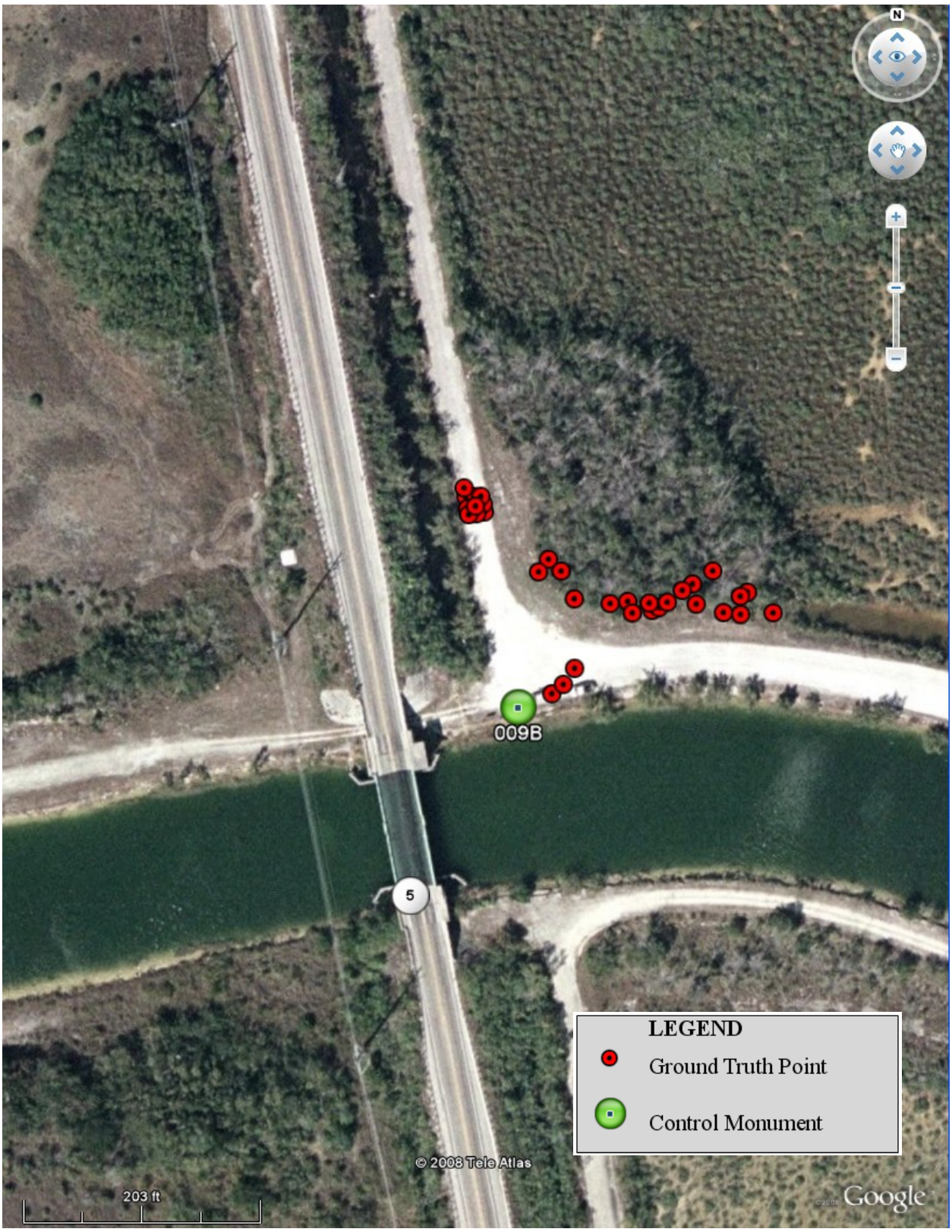
SITE 5 - Ground Truth Points



SITE 6 - Ground Truth Points



SITE 7 - Ground Truth Points



SITE 8 - Ground Truth Points

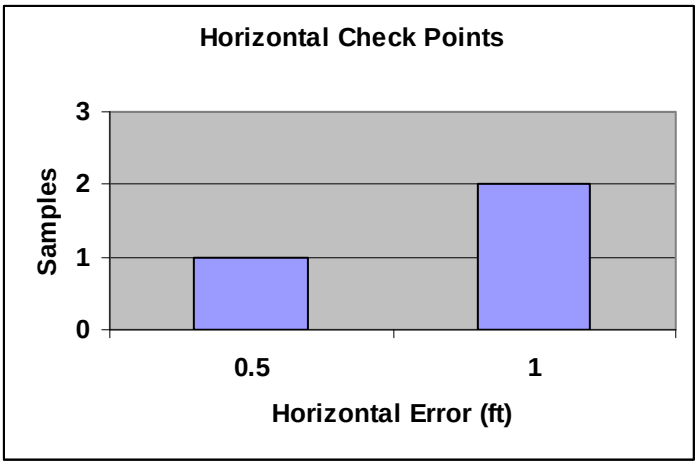
C. Horizontal Accuracy Assessment

HORIZONTAL ACCURACY CHECK POINTS

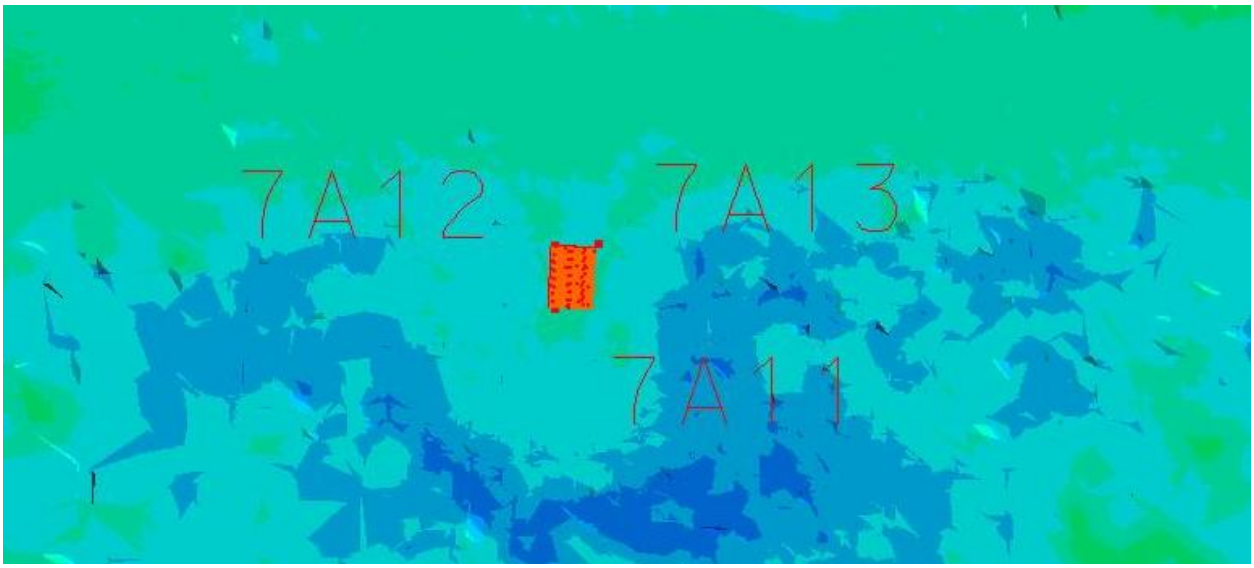
Horizontal check points were collected at several sites within the project area, in order to verify the horizontal accuracy of the LiDAR data. These check points are collected in the same locations as the vertical ground truth data, from base stations that were established in the static GPS network. The horizontal check points were collected with a total station and data collector.

After the LiDAR data has been processed these horizontal check points are plotted and compared to the approximate positions from the LiDAR data set. For this purpose building corners are most often used, because they can be identified from the LiDAR data and the corners can be estimated. Distances are measured from the estimated LiDAR positions to the surveyed positions. The statistics are shown below, and screen captures of the LiDAR derived features are shown on the following pages.

Horizontal Check Points (ft)	
RMSEr	1.06
Mean	1.03
Standard Error	0.18
Median	1.21
Standard Deviation	0.31
Sample Variance	0.10
Skewness	-1.73
Range	0.55
Minimum	0.67
Maximum	1.22



Site 7 – Horizontal Check Point



CONTROL MARK DATA SHEETS

```
AH3723 ****************************************************************************
AH3723  CORS       -  This is a GPS Continuously Operating Reference Station.
AH3723  DESIGNATION -  MIAMI 3 CORS ARP
AH3723  CORS_ID    -  MIA3
AH3723  PID        -  AH3723
AH3723  STATE/COUNTY-  FL/MIAMI-DADE
AH3723  USGS QUAD   -  KEY BISCAYNE (1994)
AH3723
AH3723                    *CURRENT SURVEY CONTROL
AH3723 ______________________________________________________________________________
AH3723* NAD 83(CORS)-  25 43 58.09808(N)    080 09 36.60080(W)     ADJUSTED
AH3723* NAVD 88     -
AH3723 ______________________________________________________________________________
AH3723  EPOCH DATE  -        2002.00
AH3723  X           -     982,510.903 (meters)                 COMP
AH3723  Y           -  -5,664,648.798 (meters)                 COMP
AH3723  Z           -   2,752,419.865 (meters)                 COMP
AH3723  ELLIP HEIGHT-         -14.542 (meters)          (03/??/02) GPS OBS
AH3723  GEOID HEIGHT-         -25.66  (meters)                 GEOID03
AH3723
AH3723  HORZ ORDER  -  SPECIAL (CORS)
AH3723  ELLP ORDER  -  SPECIAL (CORS)
AH3723
AH3723.ITRF positions are available for this station.
AH3723.The coordinates were established by GPS observations
AH3723.and adjusted by the National Geodetic Survey in March 2002.
AH3723.The coordinates are valid at the epoch date displayed above.
AH3723.The epoch date for horizontal control is a decimal equivalence
AH3723.of Year/Month/Day.
AH3723
AH3723
AH3723.The PID for the CORS L1 Phase Center is AJ7937.
AH3723
AH3723.The XYZ, and position/ellipsoidal ht. are equivalent.
AH3723
AH3723.The ellipsoidal height was determined by GPS observations
AH3723.and is referenced to NAD 83.
AH3723
AH3723.The geoid height was determined by GEOID03.
AH3723
AH3723;                North         East     Units Scale Factor Converg.
AH3723;SPC FL E     -  155,283.296   284,268.404   MT  1.00002883   +0 21 52.8
AH3723;SPC FL E     -  509,458.61    932,637.26   sFT  1.00002883   +0 21 52.8
AH3723
AH3723!           - Elev Factor  x  Scale Factor =   Combined Factor
AH3723!SPC FL E     -  1.00000228  x   1.00002883  =   1.00003111
AH3723
AH3723                      SUPERSEDED SURVEY CONTROL
AH3723
AH3723  NAD 83(CORS)-  25 43 58.09790(N)    080 09 36.60095(W) AD(1997.00) c
AH3723  ELLIP H (08/??/98)  -14.538  (m)                    GP(1997.00) c c
AH3723
AH3723.Superseded values are not recommended for survey control.
AH3723.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AH3723.See file dsdata.txt to determine how the superseded data were derived.
AH3723
```

AH3723_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ8424046362(NAD 83)
AH3723_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
AH3723
AH3723 STATION DESCRIPTION
AH3723
AH3723'DESCRIBED BY NATIONAL GEODETIC SURVEY 2002
AH3723'STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND
AH3723'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AH3723'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AH3723' FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION_LOG
AH3723' HTTP://WWW.NGS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

```
DF7988 ***********************************************************************
DF7988  CORS        -  This is a GPS Continuously Operating Reference Station.
DF7988  DESIGNATION -  RICHMOND CORS ARP
DF7988  CORS_ID     -  RMND
DF7988  PID         -  DF7988
DF7988  STATE/COUNTY-  FL/MIAMI-DADE
DF7988  USGS QUAD   -  GOULDS (1994)
DF7988
DF7988                    *CURRENT SURVEY CONTROL
DF7988 _______________________________________________________________________
DF7988* NAD 83(CORS)-  25 36 49.58921(N)    080 23 02.14117(W)     ADJUSTED
DF7988* NAVD 88     -
DF7988 _______________________________________________________________________
DF7988  EPOCH DATE  -        2002.00
DF7988  X           -     961,335.300 (meters)                 COMP
DF7988  Y           -  -5,674,075.696 (meters)                 COMP
DF7988  Z           -   2,740,535.349 (meters)                 COMP
DF7988  ELLIP HEIGHT-         -14.088 (meters)          (09/??/03) GPS OBS
DF7988  GEOID HEIGHT-         -25.05  (meters)                 GEOID03
DF7988
DF7988  HORZ ORDER  -  SPECIAL (CORS)
DF7988  ELLP ORDER  -  SPECIAL (CORS)
DF7988
DF7988.ITRF positions are available for this station.
DF7988.The coordinates were established by GPS observations
DF7988.and adjusted by the National Geodetic Survey in September 2003.
DF7988.The coordinates are valid at the epoch date displayed above.
DF7988.The epoch date for horizontal control is a decimal equivalence
DF7988.of Year/Month/Day.
DF7988
DF7988
DF7988.The PID for the CORS L1 Phase Center is DF7989.
DF7988
DF7988.The XYZ, and position/ellipsoidal ht. are equivalent.
DF7988
DF7988.The ellipsoidal height was determined by GPS observations
DF7988.and is referenced to NAD 83.
DF7988
DF7988.The geoid height was determined by GEOID03.
DF7988
DF7988;                North         East      Units Scale Factor Converg.
DF7988;SPC FL E     -  141,973.202   261,877.112   MT  0.99998844   +0 15 58.8
DF7988;SPC FL E     -  465,790.41    859,175.16    sFT  0.99998844   +0 15 58.8
DF7988
DF7988!           -  Elev Factor  x  Scale Factor =   Combined Factor
DF7988!SPC FL E     -  1.00000221  x   0.99998844  =   0.99999065
DF7988
DF7988                    SUPERSEDED SURVEY CONTROL
DF7988
DF7988.No superseded survey control is available for this station.
DF7988
DF7988_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ6185633057(NAD 83)
DF7988_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
DF7988
DF7988                    STATION DESCRIPTION
DF7988
```

DF7988'DESCRIBED BY NATIONAL GEODETIC SURVEY 2003
DF7988'STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND
DF7988'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DF7988'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DF7988'   FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION_LOG
DF7988'   HTTP://WWW.NGS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

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DF7052 ***************************************************************************
DF7052  CORS        -  This is a GPS Continuously Operating Reference Station.
DF7052  DESIGNATION -  NAPLES CORS ARP
DF7052  CORS_ID     -  NAPL
DF7052  PID         -  DF7052
DF7052  STATE/COUNTY-  FL/COLLIER
DF7052  USGS QUAD   -  NAPLES NORTH (1987)
DF7052
DF7052                    *CURRENT SURVEY CONTROL
DF7052 ______________________________________________________________________________
DF7052* NAD 83(CORS)-  26 08 55.10356(N)    081 46 34.62742(W)     ADJUSTED
DF7052* NAVD 88     -        6.1    (meters)      20.     (feet)  GPS OBS
DF7052 ______________________________________________________________________________
DF7052  EPOCH DATE  -        2002.00
DF7052  X           -     819,477.897 (meters)                  COMP
DF7052  Y           -  -5,670,157.335 (meters)                  COMP
DF7052  Z           -   2,793,845.936 (meters)                  COMP
DF7052  ELLIP HEIGHT-         -17.439 (meters)          (08/??/03) GPS OBS
DF7052  GEOID HEIGHT-         -23.51  (meters)                  GEOID03
DF7052
DF7052  HORZ ORDER  -  SPECIAL (CORS)
DF7052  ELLP ORDER  -  SPECIAL (CORS)
DF7052
DF7052.ITRF positions are available for this station.
DF7052.The coordinates were established by GPS observations
DF7052.and adjusted by the National Geodetic Survey in August 2003.
DF7052.The coordinates are valid at the epoch date displayed above.
DF7052.The epoch date for horizontal control is a decimal equivalence
DF7052.of Year/Month/Day.
DF7052
DF7052.The orthometric height was determined by GPS observations and a
DF7052.high-resolution geoid model.
DF7052
DF7052.The PID for the CORS L1 Phase Center is DF7053.
DF7052
DF7052.The XYZ, and position/ellipsoidal ht. are equivalent.
DF7052
DF7052.The ellipsoidal height was determined by GPS observations
DF7052.and is referenced to NAD 83.
DF7052
DF7052.The geoid height was determined by GEOID03.
DF7052
DF7052;                 North         East      Units Scale Factor Converg.
DF7052;SPC FL E     -   201,313.299   122,381.251   MT  1.00001554   -0 20 31.7
DF7052;SPC FL E     -   660,475.38    401,512.49    sFT  1.00001554   -0 20 31.7
DF7052
DF7052!           - Elev Factor  x  Scale Factor =   Combined Factor
DF7052!SPC FL E     -  1.00000274  x   1.00001554  =   1.00001828
DF7052
DF7052                     SUPERSEDED SURVEY CONTROL
DF7052
DF7052.No superseded survey control is available for this station.
DF7052
DF7052_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMJ2240892377(NAD 83)
DF7052_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
DF7052
```

DF7052 STATION DESCRIPTION
DF7052
DF7052'DESCRIBED BY NATIONAL GEODETIC SURVEY 2003
DF7052'STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND
DF7052'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DF7052'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DF7052' FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION_LOG
DF7052' HTTP://WWW.NGS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

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DF7050 ************************************************************************
DF7050  CORS        -  This is a GPS Continuously Operating Reference Station.
DF7050  DESIGNATION -  MIAMI TNT CORS ARP
DF7050  CORS_ID     -  MTNT
DF7050  PID         -  DF7050
DF7050  STATE/COUNTY-  FL/COLLIER
DF7050  USGS QUAD   -  FIFTYMILE BEND (1995)
DF7050
DF7050                    *CURRENT SURVEY CONTROL
DF7050 ______________________________________________________________________
DF7050* NAD 83(CORS)-  25 51 56.76081(N)    080 54 25.18701(W)     ADJUSTED
DF7050* NAVD 88     -
DF7050 ______________________________________________________________________
DF7050  EPOCH DATE  -        2002.00
DF7050  X           -     907,579.127 (meters)                 COMP
DF7050  Y           -  -5,670,639.703 (meters)                 COMP
DF7050  Z           -   2,765,679.841 (meters)                 COMP
DF7050  ELLIP HEIGHT-         -18.942 (meters)          (08/??/03) GPS OBS
DF7050  GEOID HEIGHT-         -24.29  (meters)                 GEOID03
DF7050
DF7050  HORZ ORDER  -  SPECIAL (CORS)
DF7050  ELLP ORDER  -  SPECIAL (CORS)
DF7050
DF7050.ITRF positions are available for this station.
DF7050.The coordinates were established by GPS observations
DF7050.and adjusted by the National Geodetic Survey in August 2003.
DF7050.The coordinates are valid at the epoch date displayed above.
DF7050.The epoch date for horizontal control is a decimal equivalence
DF7050.of Year/Month/Day.
DF7050
DF7050
DF7050.The PID for the CORS L1 Phase Center is DF7051.
DF7050
DF7050.The XYZ, and position/ellipsoidal ht. are equivalent.
DF7050
DF7050.The ellipsoidal height was determined by GPS observations
DF7050.and is referenced to NAD 83.
DF7050
DF7050.The geoid height was determined by GEOID03.
DF7050
DF7050;                North         East      Units Scale Factor Converg.
DF7050;SPC FL E     -  169,747.743   209,321.320   MT  0.99994225   +0 02 26.1
DF7050;SPC FL E     -  556,914.05    686,748.36    sFT  0.99994225   +0 02 26.1
DF7050
DF7050!           -  Elev Factor  x  Scale Factor =   Combined Factor
DF7050!SPC FL E     -  1.00000298  x   0.99994225  =   0.99994523
DF7050
DF7050                    SUPERSEDED SURVEY CONTROL
DF7050
DF7050.No superseded survey control is available for this station.
DF7050
DF7050_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ0931860822(NAD 83)
DF7050_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
DF7050
DF7050                    STATION DESCRIPTION
DF7050
```

DF7050'DESCRIBED BY NATIONAL GEODETIC SURVEY 2003
DF7050'STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND
DF7050'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DF7050'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DF7050'   FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION_LOG
DF7050'   HTTP://WWW.NGS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

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AF9578 ***********************************************************************
AF9578  CORS       -  This is a GPS Continuously Operating Reference Station.
AF9578  DESIGNATION -  KEY WEST 1 CORS ARP
AF9578  CORS_ID    -  KYW1
AF9578  PID        -  AF9578
AF9578  STATE/COUNTY-  FL/MONROE
AF9578  USGS QUAD   -  BOCA CHICA KEY (1971)
AF9578
AF9578                    *CURRENT SURVEY CONTROL
AF9578  ______________________________________________________________________
AF9578* NAD 83(CORS)-  24 34 56.16457(N)    081 39 10.90470(W)     ADJUSTED
AF9578* NAVD 88     -
AF9578  ______________________________________________________________________
AF9578  EPOCH DATE  -        2002.00
AF9578  X           -     842,465.065 (meters)                 COMP
AF9578  Y           -  -5,741,930.642 (meters)                 COMP
AF9578  Z           -   2,637,061.739 (meters)                 COMP
AF9578  ELLIP HEIGHT-         -12.143 (meters)          (03/??/02) GPS OBS
AF9578  GEOID HEIGHT-          -21.75  (meters)                 GEOID03
AF9578
AF9578  HORZ ORDER  -  SPECIAL (CORS)
AF9578  ELLP ORDER  -  SPECIAL (CORS)
AF9578
AF9578.ITRF positions are available for this station.
AF9578.The coordinates were established by GPS observations
AF9578.and adjusted by the National Geodetic Survey in March 2002.
AF9578.The coordinates are valid at the epoch date displayed above.
AF9578.The epoch date for horizontal control is a decimal equivalence
AF9578.of Year/Month/Day.
AF9578
AF9578
AF9578.The PID for the CORS L1 Phase Center is AJ7905.
AF9578
AF9578.The XYZ, and position/ellipsoidal ht. are equivalent.
AF9578
AF9578.The ellipsoidal height was determined by GPS observations
AF9578.and is referenced to NAD 83.
AF9578
AF9578.The geoid height was determined by GEOID03.
AF9578
AF9578;                North         East     Units Scale Factor Converg.
AF9578;SPC FL E     -    27,728.394   133,858.464   MT  0.99999519   -0 16 18.0
AF9578;SPC FL E     -    90,972.24    439,167.31   sFT  0.99999519   -0 16 18.0
AF9578
AF9578!           -  Elev Factor  x  Scale Factor =   Combined Factor
AF9578!SPC FL E     -  1.00000191  x   0.99999519  =   0.99999710
AF9578
AF9578                     SUPERSEDED SURVEY CONTROL
AF9578
AF9578  NAD 83(CORS)-  24 34 56.16457(N)    081 39 10.90497(W) AD(1997.00) c
AF9578  ELLIP H (07/??/98)  -12.165  (m)                    GP(1997.00) c c
AF9578  NAD 83(CORS)-  24 34 56.16450(N)    081 39 10.90475(W) AD(1996.00) c
AF9578  ELLIP H (12/??/96)  -12.108  (m)                    GP(1996.00) c c
AF9578
AF9578.Superseded values are not recommended for survey control.
AF9578.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
```

AF9578.See file dsdata.txt to determine how the superseded data were derived.
AF9578
AF9578_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMH3388118851(NAD 83)
AF9578_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
AF9578
AF9578 STATION DESCRIPTION
AF9578
AF9578'DESCRIBED BY NATIONAL GEODETIC SURVEY 2002
AF9578'STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND
AF9578'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AF9578'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AF9578' FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION_LOG
AF9578' HTTP://WWW.NGS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

```
 AC4651 ************************************************************************
AC4651  CBN        -  This is a Cooperative Base Network Control Station.
AC4651  DESIGNATION -  HOMEPORT
AC4651  PID        -  AC4651
AC4651  STATE/COUNTY-  FL/MIAMI-DADE
AC4651  USGS QUAD   -  GROSSMAN HAMMOCK (1973)
AC4651
AC4651                    *CURRENT SURVEY CONTROL
AC4651  ______________________________________________________________________
AC4651* NAD 83(1999)-  25 30 06.12806(N)    080 33 23.75794(W)     ADJUSTED
AC4651* NAVD 88     -        1.516  (meters)      4.97   (feet)  ADJUSTED
AC4651  ______________________________________________________________________
AC4651  X          -     945,108.586 (meters)                  COMP
AC4651  Y          -  -5,682,222.782 (meters)                  COMP
AC4651  Z          -   2,729,330.809 (meters)                  COMP
AC4651  LAPLACE CORR-          -3.26  (seconds)                DEFLEC99
AC4651  ELLIP HEIGHT-         -23.093 (meters)          (12/09/02) GPS OBS
AC4651  GEOID HEIGHT-         -24.59  (meters)                GEOID03
AC4651  DYNAMIC HT  -          1.513 (meters)       4.96  (feet)  COMP
AC4651  MODELED GRAV-      978,986.3   (mgal)                  NAVD 88
AC4651
AC4651  HORZ ORDER  -  A
AC4651  VERT ORDER  -  FIRST     CLASS II
AC4651  ELLP ORDER  -  FOURTH    CLASS I
AC4651
AC4651.This mark is at Homestead Airport (X51)
AC4651
AC4651.The horizontal coordinates were established by GPS observations
AC4651.and adjusted by the National Geodetic Survey in December 2002.
AC4651
AC4651.The orthometric height was determined by differential leveling
AC4651.and adjusted by the NATIONAL GEODETIC SURVEY in May 1994.
AC4651
AC4651.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4651
AC4651.The Laplace correction was computed from DEFLEC99 derived deflections.
AC4651
AC4651.The ellipsoidal height was determined by GPS observations
AC4651.and is referenced to NAD 83.
AC4651
AC4651.The geoid height was determined by GEOID03.
AC4651
AC4651.The dynamic height is computed by dividing the NAVD 88
AC4651.geopotential number by the normal gravity value computed on the
AC4651.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4651.degrees latitude (g = 980.6199 gals.).
AC4651
AC4651.The modeled gravity was interpolated from observed gravity values.
AC4651
AC4651;                North         East     Units Scale Factor Converg.
AC4651;SPC FL E     -   129,488.839   244,575.516   MT  0.99996570   +0 11 27.3
AC4651;SPC FL E     -   424,831.30    802,411.51    sFT  0.99996570   +0 11 27.3
AC4651;UTM  17      - 2,820,576.640   544,560.307   MT  0.99962452   +0 11 27.3
AC4651
AC4651!           -  Elev Factor  x  Scale Factor =   Combined Factor
AC4651!SPC FL E     -   1.00000363  x   0.99996570  =   0.99996933
```

AC4651!UTM 17 - 1.00000363 x 0.99962452 = 0.99962815
AC4651
AC4651: Primary Azimuth Mark Grid Az
AC4651:SPC FL E - HOMEPORT AZ MK 179 16 42.2
AC4651:UTM 17 - HOMEPORT AZ MK 179 16 42.2
AC4651
AC4651|---|
AC4651| PID Reference Object Distance Geod. Az |
AC4651| dddmmss.s |
AC4651| AC4661 HOMEPORT AZ MK APPROX. 1.1 KM 1792809.5 |
AC4651|---|
AC4651
AC4651 SUPERSEDED SURVEY CONTROL
AC4651
AC4651 NAD 83(1999)- 25 30 06.12806(N) 080 33 23.75794(W) AD( ) B
AC4651 ELLIP H (05/31/01) -23.009 (m) GP( ) 5 1
AC4651 NAD 83(1990)- 25 30 06.12664(N) 080 33 23.75743(W) AD( ) B
AC4651 ELLIP H (09/13/90) -23.030 (m) GP( ) 4 1
AC4651 NAVD 88 (12/09/02) 1.52 (m) 5.0 (f) LEVELING 3
AC4651 NGVD 29 (09/01/92) 1.978 (m) 6.49 (f) ADJUSTED 1 2
AC4651
AC4651.Superseded values are not recommended for survey control.
AC4651.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4651.See file dsdata.txt to determine how the superseded data were derived.
AC4651
AC4651_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ4456020577(NAD 83)
AC4651_MARKER: F = FLANGE-ENCASED ROD
AC4651_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AC4651_SP_SET: STAINLESS STEEL ROD IN SLEEVE
AC4651_STAMPING: HOMEPORT 1989
AC4651_MARK LOGO: NGS
AC4651_PROJECTION: FLUSH
AC4651_MAGNETIC: O = OTHER; SEE DESCRIPTION
AC4651_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4651_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4651+SATELLITE: SATELLITE OBSERVATIONS - August 04, 2005
AC4651_ROD/PIPE-DEPTH: 2.4 meters
AC4651_SLEEVE-DEPTH : 0.91 meters
AC4651
AC4651 HISTORY - Date Condition Report By
AC4651 HISTORY - 1989 MONUMENTED NGS
AC4651 HISTORY - 19910221 GOOD FLDNR
AC4651 HISTORY - 19930518 GOOD NGS
AC4651 HISTORY - 20020219 SEE DESCRIPTION MAPTEC
AC4651 HISTORY - 20050804 GOOD WEIDEN
AC4651
AC4651 STATION DESCRIPTION
AC4651
AC4651'DESCRIBED BY NATIONAL GEODETIC SURVEY 1989
AC4651'THE STATION IS LOCATED IN HOMESTEAD AT THE HOMESTEAD GENERAL AVIATION
AC4651'AIRPORT, IN GRASSY MEDIAN AT THE NORTH END OF RUNWAY 18-36.
AC4651'OWNERSHIP--DADE COUNTY AVIATION DEPARTMENT, P.O. BOX 592075, MIAMI FL
AC4651'33159, AIRPORT MANAGER IS A.J. SILVAROLI, PHONE 305-247-4883, OR
AC4651'CHARLIE CANNON ON SITE CONTACT. NOTE--PERMISSION MUST BE OBTAINED
AC4651'BEFORE ENTERING AIRPORT.
AC4651'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 1 AND AVOCADO

AC4651'DR. (NW 296TH ST.), LOCATED AT THE NORTHEAST CORNER OF HOMESTEAD, GO
AC4651'WEST ALONG AVOCADO DR. FOR 8.7 KM (5.40 MI) TO THE JUNCTION OF 217TH
AC4651'AVE., THEN GO RIGHT, NORTH, ALONG 217TH AVE. FOR 0.88 KM (0.55 MI) TO
AC4651'THE AIRPORT ACCESS ROAD ON THE LEFT, THEN GO LEFT, WEST ALONG THE
AC4651'AIRPORT ACCESS ROAD FOR 0.4 KM (0.25 MI) TO THE DADE COUNTY AVIATION
AC4651'DEPT. SIGN ON THE RIGHT, THEN GO RIGHT, NORTH THEN WEST ALONG AN
AC4651'ASPHALT ROAD FOR 0.16 KM (0.10 MI) TO THE AIRPORT OFFICE ON THE RIGHT,
AC4651'THEN PASS TO THE WEST SIDE OF THE OFFICE AND GO NORTH AND WEST ALONG
AC4651'PAVED TAXIWAY FOR 0.72 KM (0.45 MI) TO THE NORTH END OF RUNWAY 18-36
AC4651'AND THE STATION IN THE GRASSY MEDIAN.
AC4651'THE STATION IS RECESSED 10 CM BELOW GROUND. LOCATED 22.2 M (72.8 FT)
AC4651'WEST OF THE WEST EDGE OF THE TAXIWAY, 20.4 M (66.9 FT) SOUTH OF THE
AC4651'SOUTH EDGE OF TAXI APPROACH, IN LINE WITH TAXI HOLDING BARS, 31.4 M
AC4651'(103.0 FT) EAST OF THE EAST EDGE OF THE RUNWAY AND ABOUT LEVEL WITH
AC4651'THE RUNWAY.
AC4651'DESCRIBED BY G.F. SMITH.
AC4651
AC4651 STATION RECOVERY (1991)
AC4651
AC4651'RECOVERY NOTE BY FL DEPT OF NAT RES 1991
AC4651'RECOVERED IN GOOD CONDITION.
AC4651
AC4651 STATION RECOVERY (1993)
AC4651
AC4651'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993
AC4651'0.1 KM (0.05 MI) WESTERLY ALONG SOUTHWEST 8TH STREET FROM THE POST
AC4651'OFFICE IN HOMESTEAD, THENCE 1.6 KM (1.00 MI) NORTHERLY ALONG KROME
AC4651'AVENUE, THENCE 6.5 KM (4.05 MI) WESTERLY ALONG AVOCADO DRIVE, THENCE
AC4651'1.0 KM (0.60 MI) NORTHERLY ALONG SOUTHWEST 217TH AVENUE, THENCE 1.5
AC4651'KM (0.95 MI) WESTERLY ALONG THE HOMESTEAD GENERAL AVIATION AIRPORT
AC4651'ENTRANCE ROAD, AN APRON ON THE SOUTH SIDE OF A HANGER AND A TAXIWAY,
AC4651'THENCE 0.2 KM (0.10 MI) NORTHERLY ALONG A TAXIWAY, 46.7 M (153.2 FT)
AC4651'EAST OF THE CENTERLINE OF RUNWAY 18-36, 31.7 M (104.0 FT) SOUTH OF
AC4651'THE CENTER OF A TAXIWAY, 29.6 M (97.1 FT) WEST OF AND LEVEL WITH THE
AC4651'CENTERLINE OF A TAXIWAY, AND ON THE EXTENDED LINE OF A HOLD BAR.
AC4651'NOTE--ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP. THE
AC4651'MARK IS ON PROPERTY OWNED BY THE HOMESTEAD GENERAL AVIATION AIRPORT,
AC4651'28700 SOUTHWEST 217TH AVENUE, HOMESTEAD, FLORIDA 33030,
AC4651'CONTACT--MICHAEL J HANDRAHAN--AIRPORT MANAGER, TELEPHONE NUMBER (305)
AC4651'247-4883.
AC4651
AC4651 STATION RECOVERY (2002)
AC4651
AC4651'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (RLT)
AC4651'THE MARK IS ON PROPERTY OWNED BY MIAMI-DADE AVIATION, HOMESTEAD
AC4651'REGIONAL AIRPORT, 29101 SW 123 AVENUE, HOMESTEAD, FL 33039.
AC4651'CONTACT NEIL WATSON, AIRPORT MANAGER, PHONE 305-247-4883.
AC4651'
AC4651'TO REACH THE STATION FROM THE INTERSECTION OF KROME AVENUE
AC4651'(STATE HIGHWAY 997) AND MOWRY DRIVE IN HOMESTEAD, GO WEST ON
AC4651'MOWRY DRIVE FOR 4.0 MI (6.4 KM) TO THE INTERSECTION OF SW 217TH
AC4651'AVENUE. TURN RIGHT AND GO NORTH ON SW 217TH AVENUE FOR 2.1 MI (3.4
AC4651'KM) TO A SIDE ROAD LEFT. TURN LEFT AND GO WEST ON HOMESTEAD
AC4651'REGIONAL AIRPORT ENTRANCE ROAD FOR 0.4 MI (0.6 KM) TO A SIDE ROAD
AC4651'RIGHT. TURN RIGHT AND GO NORTH FOR 0.1 MI (0.15 KM) AND THEN GO
AC4651'WEST FOR 0.1 MI (0.15 KM) TO THE AIRPORT MANAGERS OFFICE. CHECK IN

AC4651'WITH MANAGERS OFFICE TO GET TO SURVEY POINT. FROM ROAD AT WEST
AC4651'SIDE OF MANAGERS OFFICE GO NORTH FOR 50 M (164 FT) TURN LEFT AND GO
AC4651'WEST FOR 50 M (164 FT) TURN RIGHT AND GO NORTH FOR 0.1 MI (0.15 KM)
AC4651'TO
AC4651'AN EAST-WEST TAXIWAY. TURN LEFT AND GO WEST ON TAXIWAY FOR 0.35
AC4651'MI (0.55 KM) TO A NORTH-SOUTH TAXIWAY AND THE STATION IN THE
AC4651'SOUTHWEST QUADRANT OF THE INTERSECTION OF TAXIWAYS.
AC4651'
AC4651'THE STATION IS LOCATED 46.7 M (153.2 FT) EAST OF THE CENTERLINE OF
AC4651'RUNWAY 18-36, 31.7 M (104.0 FT) SOUTH OF A TAXIWAY, 29.6 M (97.1 FT)
AC4651'WEST
AC4651'OF THE CENTERLINE OF A TAXIWAY AND 11.5 M (37.7 FT) SOUTHWEST OF
AC4651'THE SOUTH POST OF RUNWAY INDICATOR B 18.
AC4651'
AC4651'NOTE THE STAMPING PART OF THE LOGO CAP HAS BEEN BROKEN OFF, THE
AC4651'ROD IS IN GOOD CONDITION.
AC4651'
AC4651'
AC4651'
AC4651'
AC4651
AC4651 STATION RECOVERY (2005)
AC4651
AC4651'RECOVERY NOTE BY WEIDENER SURVEYING AND MAPPING 2005
AC4651'NOT SUITABLE FOR RTK-GPS. AIRPORT STAFF WILL NOT ALLOW IT.

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AB2368 ***************************************************************************
AB2368  DESIGNATION -  L 432
AB2368  PID         -  AB2368
AB2368  STATE/COUNTY-  FL/MIAMI-DADE
AB2368  USGS QUAD   -  LONG PINE KEY (1972)
AB2368
AB2368                    *CURRENT SURVEY CONTROL
AB2368 ______________________________________________________________________
AB2368* NAD 83(1999)-  25 24 43.13378(N)    080 37 31.57505(W)     ADJUSTED
AB2368* NAVD 88     -        1.382  (meters)       4.53   (feet)  ADJUSTED
AB2368 ______________________________________________________________________
AB2368  X           -     938,976.900 (meters)                   COMP
AB2368  Y           -  -5,687,569.436 (meters)                   COMP
AB2368  Z           -   2,720,356.687 (meters)                   COMP
AB2368  LAPLACE CORR-          -2.90  (seconds)                  DEFLEC99
AB2368  ELLIP HEIGHT-         -22.940 (meters)          (12/12/02) GPS OBS
AB2368  GEOID HEIGHT-         -24.31  (meters)                   GEOID03
AB2368  DYNAMIC HT  -          1.380 (meters)       4.53  (feet)  COMP
AB2368  MODELED GRAV-     978,982.1   (mgal)                     NAVD 88
AB2368
AB2368  HORZ ORDER  -  FIRST
AB2368  VERT ORDER  -  FIRST     CLASS II
AB2368  ELLP ORDER  -  FOURTH    CLASS I
AB2368
AB2368.The horizontal coordinates were established by GPS observations
AB2368.and adjusted by the National Geodetic Survey in December 2002.
AB2368
AB2368.The orthometric height was determined by differential leveling
AB2368.and adjusted by the NATIONAL GEODETIC SURVEY in April 1996.
AB2368
AB2368.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AB2368
AB2368.The Laplace correction was computed from DEFLEC99 derived deflections.
AB2368
AB2368.The ellipsoidal height was determined by GPS observations
AB2368.and is referenced to NAD 83.
AB2368
AB2368.The geoid height was determined by GEOID03.
AB2368
AB2368.The dynamic height is computed by dividing the NAVD 88
AB2368.geopotential number by the normal gravity value computed on the
AB2368.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AB2368.degrees latitude (g = 980.6199 gals.).
AB2368
AB2368.The modeled gravity was interpolated from observed gravity values.
AB2368
AB2368;                North         East      Units Scale Factor Converg.
AB2368;SPC FL E     -   119,528.793   237,683.012   MT  0.99995871   +0 09 38.6
AB2368;SPC FL E     -   392,154.05    779,798.35    sFT  0.99995871   +0 09 38.6
AB2368;UTM  17      - 2,810,619.992   537,670.155   MT  0.99961752   +0 09 38.6
AB2368
AB2368!            -  Elev Factor  x  Scale Factor =   Combined Factor
AB2368!SPC FL E     -   1.00000360  x   0.99995871  =   0.99996231
AB2368!UTM  17      -   1.00000360  x   0.99961752  =   0.99962112
AB2368
AB2368                     SUPERSEDED SURVEY CONTROL
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AB2368
AB2368 NAVD 88 (12/12/02)   1.38   (m)   4.5   (f) LEVELING   3
AB2368
AB2368.Superseded values are not recommended for survey control.
AB2368.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AB2368.See file dsdata.txt to determine how the superseded data were derived.
AB2368
AB2368_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ3767010620(NAD 83)
AB2368_MARKER: F = FLANGE-ENCASED ROD
AB2368_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AB2368_STAMPING: L 432 1994
AB2368_MARK LOGO: NGS
AB2368_PROJECTION: FLUSH
AB2368_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AB2368_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AB2368_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AB2368+SATELLITE: SATELLITE OBSERVATIONS - May 23, 2002
AB2368_ROD/PIPE-DEPTH: 2.8 meters
AB2368
AB2368 HISTORY   - Date   Condition   Report By
AB2368 HISTORY   - 1994   MONUMENTED   FLDEP
AB2368 HISTORY   - 20020523 GOOD   MAPTEC
AB2368
AB2368   STATION DESCRIPTION
AB2368
AB2368'DESCRIBED BY FL DEPT OF ENV PRO 1994 (LGB)
AB2368'THE MARK IS ABOUT 9.35 MI (15.05 KM) SOUTHWEST OF FLORIDA CITY IN THE
AB2368'EVERGLADES NATIONAL PARK. TO REACH THE MARK FROM THE INTERSECTION OF
AB2368'U.S. HIGHWAY 1 AND PALM DRIVE (SW. 3 STREET) IN FLORIDA CITY, GO
AB2368'WEST ON PALM DRIVE (STATE ROAD 27, SW. 3 STREET) FOR 1.7 MI (2.7 KM)
AB2368'TO THE INTERSECTION OF TOWER ROAD (SW. 192 AVENUE) , TURN LEFT ON
AB2368'TOWER ROAD (STATE ROAD 27, SW 192 AVENUE) AND GO SOUTH FOR 2.1 MI (3.4
AB2368'KM) TO THE JUNCTION OF SW. 376 STREET (STATE ROAD 27) ON THE RIGHT,
AB2368'TURN RIGHT ON SW. 376 STREET (STATE ROAD 27, PARK ROAD) AND GO WEST
AB2368'FOR 5.4 MI (8.7 KM) TO THE EVERGLADES NATIONAL PARK ENTRANCE BUILDING,
AB2368'CONTINUE WEST-NORTHWEST ON PARK ROAD (STATE ROAD 27) FOR 2.35 MI (3.78
AB2368'KM) TO THE TURNOFF FOR ROYAL PALM HAMMOCK, CONTINUE WEST-NORTHWEST ON
AB2368'PARK ROAD (STATE ROAD 27) FOR 0.9 MI (1.4 KM) TO THE MARK ON THE
AB2368'RIGHT, A STAINLESS STEEL ROD DRIVEN TO REFUSAL AT A DEPTH OF 9.2 FT
AB2368'(2.8 M) RECESSED 0.4 FT (12.2 CM) BELOW THE GROUND, WITH A LOGO CAP
AB2368'FLUSH WITH THE GROUND AND 0.5 FT (15.2 CM) BELOW THE LEVEL OF PARK
AB2368'ROAD (STATE ROAD 27) . LOCATED 17.6 FT (5.4 M) NORTH OF THE
AB2368'APPROXIMATE CENTERLINE OF PARK ROAD (STATE ROAD 27) , 7.4 FT (2.3 M)
AB2368'SOUTH OF THE EDGE OF THE BRUSHLINE AND 6.8 FT (2.1 M) NORTH OF THE
AB2368'NORTH PAVEMENT EDGE OF PARK ROAD (STATE ROAD 27) . NOTE ACCESS TO
AB2368'DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP.
AB2368
AB2368   STATION RECOVERY (2002)
AB2368
AB2368'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)
AB2368'RECOVERED AS DESCRIBED.
AB2368'

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AC4648 ****************************************************************************
AC4648  CBN        -  This is a Cooperative Base Network Control Station.
AC4648  DESIGNATION -  FLGPS THOMPSON
AC4648  PID        -  AC4648
AC4648  STATE/COUNTY-  FL/MIAMI-DADE
AC4648  USGS QUAD   -  WEST LAKE (1972)
AC4648
AC4648                    *CURRENT SURVEY CONTROL
AC4648 ______________________________________________________________________________
AC4648* NAD 83(1999)-  25 14 45.07522(N)    080 48 04.34413(W)     ADJUSTED
AC4648* NAVD 88     -        0.819  (meters)      2.69   (feet)  ADJUSTED
AC4648 ______________________________________________________________________________
AC4648  X          -     922,783.107 (meters)                  COMP
AC4648  Y          -  -5,698,195.362 (meters)                  COMP
AC4648  Z          -   2,703,722.817 (meters)                  COMP
AC4648  LAPLACE CORR-          -3.00  (seconds)                DEFLEC99
AC4648  ELLIP HEIGHT-         -22.639 (meters)          (04/12/01) GPS OBS
AC4648  GEOID HEIGHT-         -23.45  (meters)                GEOID03
AC4648  DYNAMIC HT  -          0.818 (meters)       2.68  (feet)  COMP
AC4648  MODELED GRAV-     978,987.1   (mgal)                   NAVD 88
AC4648
AC4648  HORZ ORDER  -  A
AC4648  VERT ORDER  -  FIRST     CLASS II
AC4648  ELLP ORDER  -  FOURTH    CLASS I
AC4648
AC4648.The horizontal coordinates were established by GPS observations
AC4648.and adjusted by the National Geodetic Survey in April 2001.
AC4648
AC4648.The orthometric height was determined by differential leveling
AC4648.and adjusted by the NATIONAL GEODETIC SURVEY in April 1996.
AC4648
AC4648.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4648
AC4648.The Laplace correction was computed from DEFLEC99 derived deflections.
AC4648
AC4648.The ellipsoidal height was determined by GPS observations
AC4648.and is referenced to NAD 83.
AC4648
AC4648.The geoid height was determined by GEOID03.
AC4648
AC4648.The dynamic height is computed by dividing the NAVD 88
AC4648.geopotential number by the normal gravity value computed on the
AC4648.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4648.degrees latitude (g = 980.6199 gals.).
AC4648
AC4648.The modeled gravity was interpolated from observed gravity values.
AC4648
AC4648;                North         East     Units Scale Factor Converg.
AC4648;SPC FL E     -   101,088.609   220,026.931   MT  0.99994613   +0 05 05.2
AC4648;SPC FL E     -   331,654.88    721,871.69    sFT  0.99994613   +0 05 05.2
AC4648;UTM  17      - 2,792,186.100   520,020.098   MT  0.99960495   +0 05 05.2
AC4648
AC4648!            -  Elev Factor  x  Scale Factor =   Combined Factor
AC4648!SPC FL E     -   1.00000356  x   0.99994613  =   0.99994969
AC4648!UTM  17      -   1.00000356  x   0.99960495  =   0.99960851
AC4648
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AC4648: Primary Azimuth Mark Grid Az
AC4648:SPC FL E - FLGPS THOMPSON AZ MK 235 08 11.8
AC4648:UTM 17 - FLGPS THOMPSON AZ MK 235 08 11.8
AC4648
AC4648|---|
AC4648| PID Reference Object Distance Geod. Az |
AC4648| dddmmss.s |
AC4648| AC4659 FLGPS THOMPSON AZ MK APPROX. 0.6 KM 2351317.0 |
AC4648|---|
AC4648
AC4648 SUPERSEDED SURVEY CONTROL
AC4648
AC4648 NAD 83(1990)- 25 14 45.07359(N) 080 48 04.34378(W) AD( ) B
AC4648 ELLIP H (09/13/90) -22.638 (m) GP( ) 4 1
AC4648 NAVD 88 (04/12/01) 0.82 (m) 2.7 (f) LEVELING 3
AC4648 NGVD 29 (09/10/92) 1.0 (m) 3. (f) GPS OBS
AC4648
AC4648.Superseded values are not recommended for survey control.
AC4648.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4648.See file dsdata.txt to determine how the superseded data were derived.
AC4648
AC4648_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNH2002092186(NAD 83)
AC4648_MARKER: F = FLANGE-ENCASED ROD
AC4648_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AC4648_SP_SET: STAINLESS STEEL ROD IN SLEEVE
AC4648_STAMPING: FLGPS THOMPSON 1989
AC4648_MARK LOGO: NGS
AC4648_PROJECTION: FLUSH
AC4648_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AC4648_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4648_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4648+SATELLITE: SATELLITE OBSERVATIONS - September 30, 2003
AC4648_ROD/PIPE-DEPTH: 4 meters
AC4648_SLEEVE-DEPTH : .91 meters
AC4648
AC4648 HISTORY - Date Condition Report By
AC4648 HISTORY - 1989 MONUMENTED NGS
AC4648 HISTORY - 19911126 GOOD NOS
AC4648 HISTORY - 19930303 GOOD NGS
AC4648 HISTORY - 19941017 GOOD FLDEP
AC4648 HISTORY - 19990405 GOOD FLDT
AC4648 HISTORY - 20020301 GOOD MAPTEC
AC4648 HISTORY - 20020524 GOOD MAPTEC
AC4648 HISTORY - 20030930 GOOD WEIDEN
AC4648
AC4648 STATION DESCRIPTION
AC4648
AC4648'DESCRIBED BY NATIONAL GEODETIC SURVEY 1989
AC4648'THE STATION IS LOCATED 40 KM (24.85 MI) SOUTHWEST OF FLORIDA CITY,
AC4648'17.70 KM (11.00 MI) NORTHEAST OF FLAMINGO, IN THE EVERGLADES NATIONAL
AC4648'PARK, WITHIN THE RIGHT-OF-WAY OF THE MAIN PARK ROAD.
AC4648'OWNERSHIP--NATIONAL PARK SERVICE, KEITH WHISENET, PHONE 305-247-6211.
AC4648'TO REACH THE STATION FROM THE TOLL STATION AT THE ENTRANCE TO THE
AC4648'EVERGLADES NATIONAL PARK (WHERE STATE ROAD 9336 ENDS AND MAIN PARK
AC4648'ROAD STARTS), GO SOUTH FOR 19.47 KM (12.10 MI) ON THE PARK ROAD TO THE
AC4648'ENTRANCE TO THE PA-HAY-OKEE OVERLOOK. CONTINUE SOUTH FOR 21.16 KM

AC4648'(13.15 MI) ON THE PARK ROAD TO THE ENTRANCE TO NINE MILE POND.
AC4648'CONTINUE SOUTH FOR 1.05 KM (0.65 MI) ON THE PARK ROAD TO THE STATION
AC4648'ON LEFT.
AC4648'THE STATION IS RECESSED 10 CM BELOW GROUND. LOCATED 27.28 M
AC4648'(89.5 FT) SOUTHWEST FROM THE SOUTHWEST END OF THE SOUTHEAST HEADWALL
AC4648'OF A CONCRETE CULVERT UNDER THE PARK ROAD, 27.07 M (88.8 FT) SOUTHWEST
AC4648'FROM A REFLECTOR POST AT THE EDGE OF A HEADWALL WITH STATION DISK
AC4648'PINKS NO 1, 7.07 M (23.2 FT) SOUTHEAST FROM THE APPROXIMATE CENTER OF
AC4648'THE PARK ROAD, 1.22 M (4.0 FT) NORTHWEST FROM THE EDGE OF MARSH AND
AC4648'1.98 M (6.5 FT) NORTHWEST FROM A CARSONITE WITNESS POST. NOTE--ACCESS
AC4648'TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP.
AC4648'DESCRIBED BY R.L. MALLOY.
AC4648
AC4648 STATION RECOVERY (1991)
AC4648
AC4648'RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1991
AC4648'THE STATION IS LOCATED 24.85 MI (39.99 KM) SOUTHWEST OF FLORIDA CITY,
AC4648'11.0 MI (17.70 KM) NORTHEAST OF FLAMINGO, IN THE EVERGLADES NATIONAL
AC4648'PARK, WITHIN THE RIGHT OF WAY OF THE MAIN PARK ROAD.
AC4648'TO REACH THE
AC4648'STATION FROM THE TOLL STATION AT THE ENTRANCE TO THE EVERGLADES
AC4648'NATIONAL PARK, GO SOUTH FOR 12.1 MI (19.47 KM) ON THE PARK ROAD TO THE
AC4648'ENTRANCE TO THE PA-HAY-OKEE OVERLOOK. CONTINUE SOUTH FOR 13.5 MI
AC4648'(21.73 KM) ON THE PARK ROAD TO THE ENTRANCE TO NINE MILE POND.
AC4648'CONTINUE SOUTH FOR 0.65 MI (1.05 KM) ON THE PARK ROAD TO THE STATION
AC4648'ON THE LEFT.
AC4648'THE STATION IS RECESSED 10 CM BELOW GROUND. LOCATED 89.5
AC4648'FT (27.28 M) SOUTHWEST FROM THE SOUTHWEST END OF THE SOUTHEAST
AC4648'HEADWALL OF A CONCRETE CULVERT UNDER THE PARK ROAD, 88.8 FT (27.07 M)
AC4648'SOUTHWEST FROM A REFLECTOR POST AT THE EDGE OF A HEADWALL WITH STATION
AC4648'DISK PINKS NO 1, 23.2 FT (7.07 M) SOUTHEAST FROM THE APPROXIMATE
AC4648'CENTER OF THE PARK ROAD AND 6.5 FT (1.98 M) NORTHWEST OF A WITNESS
AC4648'POST. THE DATUM POINT IS A STAINLESS STEEL ROD AND IS HAD THROUGH A 5
AC4648'INCH LOGO CAP.
AC4648
AC4648 STATION RECOVERY (1993)
AC4648
AC4648'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993
AC4648'THE STATION IS LOCATED 40 KM (24.85 MI) SOUTHWEST OF FLORIDA CITY,
AC4648'17.70 KM (11.00 MI) NORTHEAST OF FLAMINGO, IN THE EVERGLADES NATIONAL
AC4648'PARK, WITHIN THE RIGHT-OF-WAY OF THE MAIN PARK ROAD.
AC4648'OWNERSHIP--NATIONAL PARK SERVICE, KEITH WHISENET, PHONE 305-247-6211.
AC4648'TO REACH THE STATION FROM THE TOLL STATION AT THE ENTRANCE TO THE
AC4648'EVERGLADES NATIONAL PARK (WHERE STATE ROAD 9336 ENDS AND MAIN PARK
AC4648'ROAD STARTS), GO SOUTH FOR 19.8 KM (12.30 MI) ON THE PARK ROAD TO THE
AC4648'ENTRANCE TO THE PA-HAY-OKEE OVERLOOK. CONTINUE SOUTH FOR 21.97 KM
AC4648'(13.65 MI) ON THE PARK ROAD TO THE ENTRANCE TO NINE MILE POND.
AC4648'CONTINUE SOUTH FOR 1.05 KM (0.65 MI) ON THE PARK ROAD TO THE STATION
AC4648'ON LEFT.
AC4648'THE STATION IS RECESSED 10 CM BELOW GROUND. LOCATED 27.28 M
AC4648'(89.50 FT) SOUTHWEST FROM THE SOUTHWEST END OF THE SOUTHEAST HEADWALL
AC4648'OF A CONCRETE CULVERT UNDER THE PART ROAD, 27.07 M (88.81 FT)
AC4648'SOUTHWEST FROM A REFLECTOR POST AT THE EDGE OF A HEADWALL WITH STATION
AC4648'DISK PINKS NO 1, 7.01 M (23.00 FT) SOUTHEAST FROM THE APPROXIMATE
AC4648'CENTER OF THE PARK ROAD, 1.22 M (4.00 FT) NORTHWEST FROM THE EDGE OF
AC4648'MARSH AND 2.1 M (6.9 FT) NORTHWEST FROM A CARSONITE WITNESS POST.

AC4648'NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP.
AC4648
AC4648 STATION RECOVERY (1994)
AC4648
AC4648'RECOVERY NOTE BY FL DEPT OF ENV PRO 1994 (LGB)
AC4648'RECOVERED AS DESCRIBED.
AC4648
AC4648 STATION RECOVERY (1999)
AC4648
AC4648'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 1999
AC4648'RECOVERED AS DESCRIBED.
AC4648
AC4648 STATION RECOVERY (2002)
AC4648
AC4648'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (RLT)
AC4648'RECOVERED AS DESCRIBED
AC4648'
AC4648'
AC4648
AC4648 STATION RECOVERY (2002)
AC4648
AC4648'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)
AC4648'RECOVERED AS DESCRIBED.
AC4648'
AC4648
AC4648 STATION RECOVERY (2003)
AC4648
AC4648'RECOVERY NOTE BY WEIDENER SURVEYING AND MAPPING 2003 (MM)
AC4648'RECOVERED AS DESCRIBED

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AB2391 ********************************************************************
AB2391  DESIGNATION -  K 433
AB2391  PID         -  AB2391
AB2391  STATE/COUNTY-  FL/MIAMI-DADE
AB2391  USGS QUAD   -  WEST LAKE (1972)
AB2391
AB2391                    *CURRENT SURVEY CONTROL
AB2391 ______________________________________________________________________
AB2391* NAD 83(1999)-  25 13 24.53201(N)    080 50 15.95975(W)     ADJUSTED
AB2391* NAVD 88     -        0.625  (meters)       2.05   (feet)  ADJUSTED
AB2391 ______________________________________________________________________
AB2391  X           -     919,315.193 (meters)                   COMP
AB2391  Y           -  -5,699,826.114 (meters)                   COMP
AB2391  Z           -   2,701,480.911 (meters)                   COMP
AB2391  LAPLACE CORR-          -2.94  (seconds)                  DEFLEC99
AB2391  ELLIP HEIGHT-         -22.679 (meters)          (12/12/02) GPS OBS
AB2391  GEOID HEIGHT-         -23.30  (meters)                   GEOID03
AB2391  DYNAMIC HT  -          0.624 (meters)        2.05  (feet)  COMP
AB2391  MODELED GRAV-      978,988.2   (mgal)                     NAVD 88
AB2391
AB2391  HORZ ORDER  -  FIRST
AB2391  VERT ORDER  -  FIRST     CLASS II
AB2391  ELLP ORDER  -  FOURTH    CLASS I
AB2391
AB2391.The horizontal coordinates were established by GPS observations
AB2391.and adjusted by the National Geodetic Survey in December 2002.
AB2391
AB2391.The orthometric height was determined by differential leveling
AB2391.and adjusted by the NATIONAL GEODETIC SURVEY in April 1996.
AB2391
AB2391.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AB2391
AB2391.The Laplace correction was computed from DEFLEC99 derived deflections.
AB2391
AB2391.The ellipsoidal height was determined by GPS observations
AB2391.and is referenced to NAD 83.
AB2391
AB2391.The geoid height was determined by GEOID03.
AB2391
AB2391.The dynamic height is computed by dividing the NAVD 88
AB2391.geopotential number by the normal gravity value computed on the
AB2391.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AB2391.degrees latitude (g = 980.6199 gals.).
AB2391
AB2391.The modeled gravity was interpolated from observed gravity values.
AB2391
AB2391;                North         East      Units Scale Factor Converg.
AB2391;SPC FL E     -    98,605.387   216,346.781   MT  0.99994448   +0 04 08.9
AB2391;SPC FL E     -   323,507.84    709,797.73    sFT  0.99994448   +0 04 08.9
AB2391;UTM  17      - 2,789,703.725   516,341.204   MT  0.99960330   +0 04 08.9
AB2391
AB2391!           -  Elev Factor  x  Scale Factor =   Combined Factor
AB2391!SPC FL E     -  1.00000356  x   0.99994448  =   0.99994804
AB2391!UTM  17      -  1.00000356  x   0.99960330  =   0.99960686
AB2391
AB2391                     SUPERSEDED SURVEY CONTROL
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AB2391
AB2391 NAVD 88 (12/12/02)   0.62   (m)   2.0   (f) LEVELING   3
AB2391
AB2391.Superseded values are not recommended for survey control.
AB2391.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AB2391.See file dsdata.txt to determine how the superseded data were derived.
AB2391
AB2391_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNH1634189704(NAD 83)
AB2391_MARKER: F = FLANGE-ENCASED ROD
AB2391_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AB2391_STAMPING: K 433 1994
AB2391_MARK LOGO: NGS
AB2391_PROJECTION: FLUSH
AB2391_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AB2391_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AB2391_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AB2391+SATELLITE: SATELLITE OBSERVATIONS - May 24, 2002
AB2391_ROD/PIPE-DEPTH: 4.4 meters
AB2391
AB2391 HISTORY   - Date   Condition   Report By
AB2391 HISTORY   - 1994   MONUMENTED   FLDEP
AB2391 HISTORY   - 20020524 GOOD   MAPTEC
AB2391
AB2391   STATION DESCRIPTION
AB2391
AB2391'DESCRIBED BY FL DEPT OF ENV PRO 1994 (LGB)
AB2391'THE MARK IS ABOUT 25.6 MI (41.2 KM) SOUTHWEST OF FLORIDA CITY IN THE
AB2391'EVERGLADES NATIONAL PARK. TO REACH THE MARK FROM THE INTERSECTION OF
AB2391'U.S. HIGHWAY 1 AND PALM DRIVE (SW. 3 STREET) IN FLORIDA CITY, GO
AB2391'WEST ON PALM DRIVE (STATE ROAD 27, SW. 3 STREET) FOR 1.7 MI (2.7 KM)
AB2391'TO THE INTERSECTION OF TOWER ROAD (SW. 192 AVENUE) , TURN LEFT ON
AB2391'TOWER ROAD (STATE ROAD 27, SW 192 AVENUE) AND GO SOUTH FOR 2.1 MI (3.4
AB2391'KM) TO THE JUNCTION OF SW. 376 STREET (STATE ROAD 27) ON THE RIGHT,
AB2391'TURN RIGHT ON SW. 376 STREET (STATE ROAD 27, PARK ROAD) AND GO WEST
AB2391'FOR 5.4 MI (8.7 KM) TO THE EVERGLADES NATIONAL PARK ENTRANCE BUILDING,
AB2391'CONTINUE WEST-NORTHWEST ON PARK ROAD (STATE ROAD 27) FOR 4.75 MI (7.64
AB2391'KM) TO THE TURNOFF FOR LONG PINE KEY, CONTINUE WEST-NORTHWEST ON PARK
AB2391'ROAD (STATE ROAD 27) FOR 8.45 MI (13.60 KM) TO THE JUNCTION OF THE
AB2391'ROAD TO PA-HAY-OKEE LOOKOUT TOWER ON THE RIGHT, CONTINUE SOUTHWEST ON
AB2391'PARK ROAD (STATE ROAD 27) FOR 7.15 MI (11.51 KM) TO THE JUNCTION OF A
AB2391'ROAD ON THE RIGHT TO MAHOGANY HAMMOCK, CONTINUE SOUTH ON PARK ROAD
AB2391'(STATE ROAD 27) FOR 4.5 MI (7.2 KM) TO THE JUNCTION OF A ROAD TO
AB2391'POURATIS POND ON THE RIGHT, CONTINUE SOUTH ON PARK ROAD (STATE ROAD
AB2391'27) FOR 5.4 MI (8.7 KM) TO THE MARK ON THE LEFT, A STAINLESS STEEL ROD
AB2391'DRIVEN TO REFUSAL AT A DEPTH OF 14.4 FT (4.4 M) RECESSED 0.1 FT (3.0
AB2391'CM) BELOW THE LEVEL OF THE GROUND, WITH A LOGO CAP FLUSH WITH THE
AB2391'GROUND AND ABOUT 0.5 FT (15.2 CM) BELOW THE LEVEL OF PARK ROAD (STATE
AB2391'ROAD 27), 17.2 FT (5.2 M) SOUTHEAST OF THE APPROXIMATE CENTERLINE OF
AB2391'PARK ROAD (STATE ROAD 27) , 7.6 FT (2.3 M) NORTHWEST OF THE EDGE OF
AB2391'THE BRUSHLINE AND 6.2 FT (1.9 M) SOUTHEAST OF THE SOUTHEAST EDGE OF
AB2391'THE PAVEMENT OF PARK ROAD (STATE ROAD 27) . NOTE ACCESS TO DATUM POINT
AB2391'IS HAD THROUGH A 5-INCH LOGO CAP.
AB2391
AB2391   STATION RECOVERY (2002)
AB2391
AB2391'RECOVERY NOTE BY MAPTECH INCORPORATED 2002 (CDP)

AB2391'RECOVERED AS DESCRIBED.
AB2391'

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AC4851 *********************************************************************
AC4851  DESIGNATION -  SIMINOLE
AC4851  PID         -  AC4851
AC4851  STATE/COUNTY-  FL/MONROE
AC4851  USGS QUAD   -  ROCK HARBOR (1990)
AC4851
AC4851                    *CURRENT SURVEY CONTROL
AC4851 _____________________________________________________________________
AC4851* NAD 83(1999)-  25 03 44.30649(N)    080 28 28.23301(W)     ADJUSTED
AC4851* NAVD 88     -        2.7    (meters)       9.     (feet)  GPS OBS
AC4851 _____________________________________________________________________
AC4851  X           -     956,689.117 (meters)                   COMP
AC4851  Y           -  -5,701,365.388 (meters)                   COMP
AC4851  Z           -   2,685,319.138 (meters)                   COMP
AC4851  LAPLACE CORR-          -2.78  (seconds)                  DEFLEC99
AC4851  ELLIP HEIGHT-         -21.409 (meters)          (06/19/01) GPS OBS
AC4851  GEOID HEIGHT-         -24.10  (meters)                   GEOID03
AC4851
AC4851  HORZ ORDER  -  FIRST
AC4851  ELLP ORDER  -  FOURTH    CLASS I
AC4851
AC4851.The horizontal coordinates were established by GPS observations
AC4851.and adjusted by the National Geodetic Survey in June 2001.
AC4851
AC4851.The orthometric height was determined by GPS observations and a
AC4851.high-resolution geoid model.
AC4851
AC4851.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4851
AC4851.The Laplace correction was computed from DEFLEC99 derived deflections.
AC4851
AC4851.The ellipsoidal height was determined by GPS observations
AC4851.and is referenced to NAD 83.
AC4851
AC4851.The geoid height was determined by GEOID03.
AC4851
AC4851;                North         East     Units Scale Factor Converg.
AC4851;SPC FL E     -    80,845.543   253,018.924   MT  0.99997588   +0 13 21.4
AC4851;SPC FL E     -   265,240.75    830,112.92    sFT  0.99997588   +0 13 21.4
AC4851;UTM  17      - 2,771,949.940   553,000.834   MT  0.99963469   +0 13 21.4
AC4851
AC4851!           -  Elev Factor  x  Scale Factor =   Combined Factor
AC4851!SPC FL E     -   1.00000336  x   0.99997588  =   0.99997924
AC4851!UTM  17      -   1.00000336  x   0.99963469  =   0.99963805
AC4851
AC4851                     SUPERSEDED SURVEY CONTROL
AC4851
AC4851  NAD 83(1990)-  25 03 44.30543(N)    080 28 28.23216(W) AD(       ) 1
AC4851  ELLIP H (12/14/93)  -21.405  (m)                     GP(       ) 4 1
AC4851
AC4851.Superseded values are not recommended for survey control.
AC4851.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4851.See file dsdata.txt to determine how the superseded data were derived.
AC4851
AC4851_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNH5300171950(NAD 83)
AC4851_MARKER: DD = SURVEY DISK
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AC4851_SETTING: 34 = SET IN THE FOOTINGS OF SMALL/MEDIUM STRUCTURES
AC4851_SP_SET: CONCRETE BASE FOR MANHOLE
AC4851_STAMPING: SIMINOLE 1993
AC4851_MARK LOGO: FLDNR
AC4851_MAGNETIC: O = OTHER; SEE DESCRIPTION
AC4851_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AC4851+STABILITY: SURFACE MOTION
AC4851_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4851+SATELLITE: SATELLITE OBSERVATIONS - June 02, 2003
AC4851
AC4851 HISTORY - Date Condition Report By
AC4851 HISTORY - 1993 MONUMENTED KEISCH
AC4851 HISTORY - 20030602 GOOD BAH
AC4851
AC4851 STATION DESCRIPTION
AC4851
AC4851'DESCRIBED BY KEITH AND SCHNARS - LAKELAND 1993
AC4851'THE STATION IS LOCATED ON KEY LARGO, 3.5 MI (5.6 KM) SOUTHWEST OF THE
AC4851'KEY LARGO POST OFFICE IN A BIKE PATH IN THE MEDIAN OF U.S. 1.
AC4851'TO REACH THE STATION FROM THE POST OFFICE IN THE CITY OF KEY LARGO, GO
AC4851'SOUTHWEST ON U.S. 1 FOR 3.5 MI (5.6 KM) TO THE STATION IN THE MEDIAN.
AC4851'THE STATION LIES 0.45 MI (0.72 KM) SOUTHWEST OF MILE MARKER 97, 30.6
AC4851'FT (9.3 M) SOUTH OF THE SOUTH EDGE OF PAVEMENT OF THE SOUTHBOUND
AC4851'LANE, 18.7 FT (5.7 M) NORTH OF THE NORTH EDGE OF PAVEMENT OF THE
AC4851'NORTHBOUND, AND 21.2 FT (6.5 M) NORTHWEST OF A CARSONITE WITNESS
AC4851'POST.
AC4851'THE STATION IS A FLORIDA DEPARTMENT OF NATURAL RESOURCES SURVEY AND
AC4851'MAPPING SURVEY MARKER SET IN A 7 FOOT BY 9 FOOT CONCRETE STRUCTURE
AC4851'WITH A MANHOLE COVER STAMPED SIMINOLE 1993.
AC4851'REFERENCES--
AC4851'FOUND ALUMINUM DISC SET IN CONCRETE STAMPED F. H. HILDERBRANDT INC
AC4851'PLS 2749, MAGNETIC AZIMUTH OF 197 DEGREES AT 12.75 FT (3.89 M).
AC4851'KEITH AND SCHNARS NAIL AND DISC, SET AT THE EDGE OF PAVEMENT, MAGNETC
AC4851'AZIMUTH OF 322 DEGREES AT 31.95 FT (9.74 M).
AC4851'X-CUT, SET IN A CONCRETE SLAB, MAGNETIC AZIMUTH OF 03 DEGREES AT 9.22
AC4851'FT (2.81 M).
AC4851'X-CUT, SET IN A CONCRETE SLAB, MAGNETIC AZIMUTH OF 46 DEGREES AT 7.23
AC4851'FT (2.20 M).
AC4851'SET CARSONITE WITNESS POST, MAGENTIC AZIMUTH OF 87 DEGREES AT 21.2 FT
AC4851'(6.5 M).
AC4851
AC4851 STATION RECOVERY (2003)
AC4851
AC4851'RECOVERY NOTE BY BERRYMAN & HENIGAR 2003 (KAW)
AC4851'RECOVERED IN GOOD CONDITION.

SURVEY INFORMATION

A. Field Personnel

The following field personnel worked on this GPS network, and related survey collection:

Field Supervisor: J. Purpera
Party Chief: M. Havard
Instrument Man: V. McNeal
Instrument Man: C. LaPrarie

The point of contact for survey related questions is:

Josh Hardy
Operations Supervisor
(985) 661-3001

B. GPS Logsheets