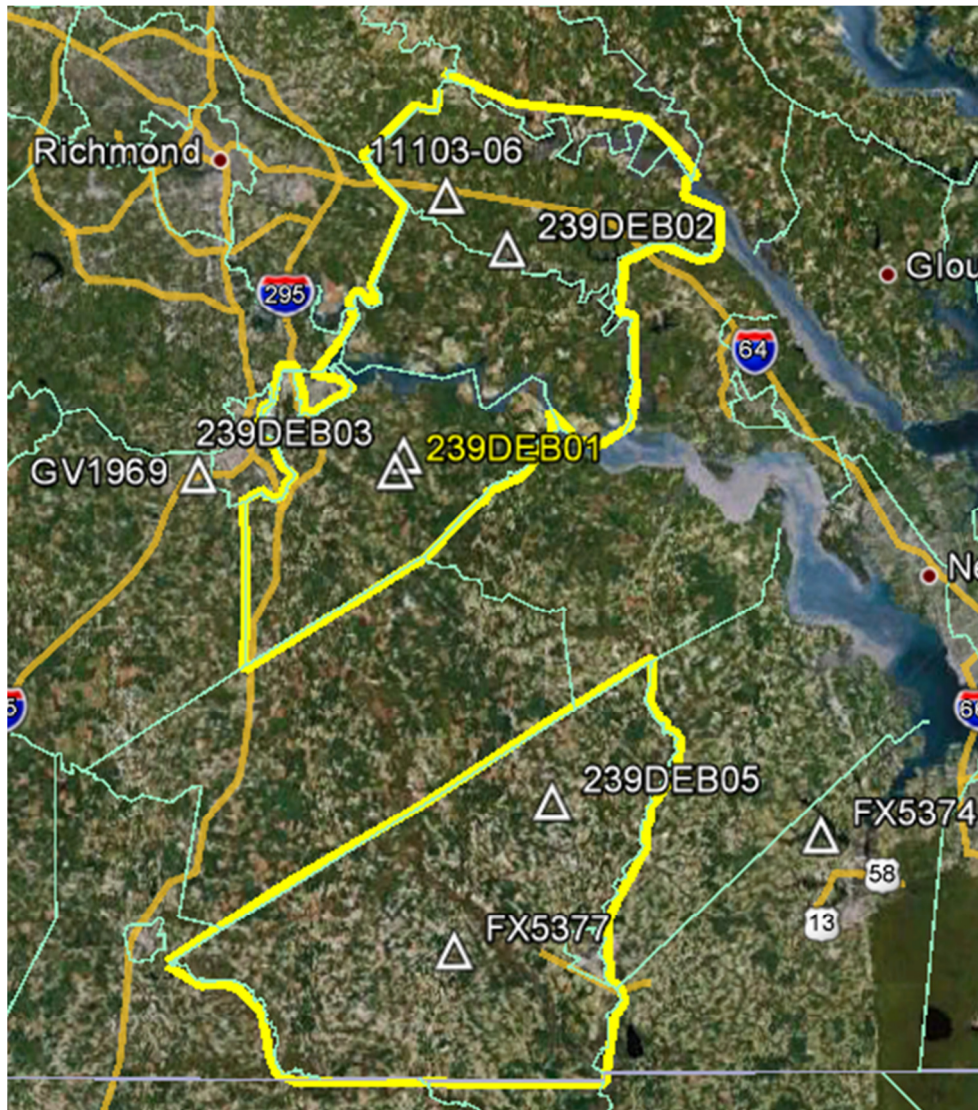


Geodetic Control Report
Southampton and Middle Counties Virginia
239DEB11



239DEB11 Southampton and Middle Counties May2012

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Appendix B

NGS Datasheets, Set Point Station Descriptions Photos

Introduction

This report describes the GPS network adjustments performed to refine the positioning of airborne acquisition data (LiDAR) by GeoDigital International. The project is "Southampton and Middle Counties" which comprised; New Kent, Charles, Prince George and Southampton Counties in the State of Virginia.

The survey was conducted throughout the aerial acquisition during the months of December 2011, Jan, February and March 2012. This report will present the steps followed to establish the GPS Network and adjustments performed.

GPS Network Survey – Personnel

GeoDigital Acquisition Crew	
Manager of Aerial Operations:	Craig Robertson
Ground Surveyor(s):	William Kowalsky, Adam Eversole, Richard Collin, Matt Schroeder

GPS Network Survey - Equipment and Configuration

Receiver Model(s):	Sokkia GSR 2600, Novatel DL4
Number of GPS Receivers Used:	8
Antenna Model(s):	Sokkia SK600, Novatel GPS702
Survey Method:	Static Occupation (Long Term, >~4h)
Source of GPS Control:	NGS – National Geodetic survey
Horizontal Datum:	NAD83
Vertical Datum:	NAVD88
Geoid/Ellipsoid:	Geoid 09
Units:	Meters
NGS Monuments Used:	GV1969, DL3187, FX5377, FX5374
Established Points:	239DEB-01, 239DEB-02, 239DEB-03, PTB-AO, 239DEB-05
GPS Control Network Software:	GrafNet (by Waypoint)

Requirements for LIDAR Control Points

Final control used for flight data processing should:

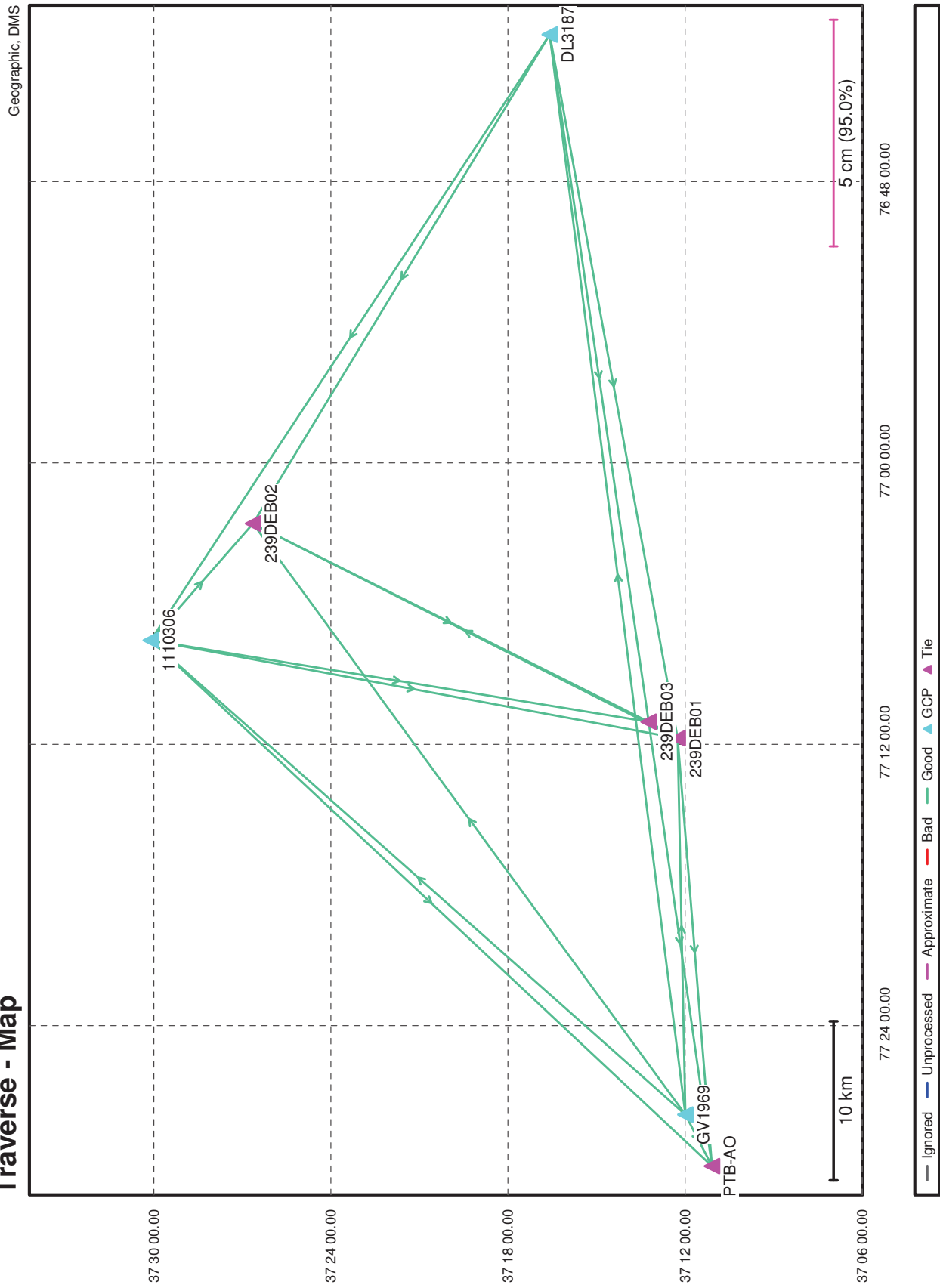
1. Be tied to geodetic control stations.
 - a. Geodetic control stations should be first order or better (unless otherwise specified by client). Preference shall be given to nationally maintained control points before provincial/state level better (unless otherwise specified by client).
 - b. All final flight & ground truthing control (published and/or new) should be tied to these geodetic points by two or more occupations (prove or disprove HI errors).
 - c. All new points used in final flight & ground truthing control require a tie to two AGREEING 3-D geodetic control stations (alternatively any combination of horizontal and vertical control such that both are represented twice). If disagreement is found (i.e. exceeding the tolerance required to meet project specifications), sufficient additional control points must be included in the survey to clearly identify the erroneous monument.
 - d. Final adjusted coordinates of published geodetic control stations should agree to $\pm 1/3^{\text{rd}}$ the required RMSE of the project or better. In cases where this is not achieved, additional control will be required to establish the error in the geodetic control point(s). When insufficient control can be found to agree to this standard, the issue must be taken to Operations Manager and the client.
2. Geodetic control stations may be used as final control for data processing if they meet the standards described in point 1d. In this case, the published coordinates shall be used unless special circumstances dictate otherwise.
3. Where projects use multiple control points for flight data processing, in addition to meeting the requirements of point 1, the flight control points must also be shown to tie to each other within the same specification (1d).

Typical collection parameters are defined as 6 satellites, PDOP of less than 4 and low geomagnetic activity. Under these conditions, the formula of 20 minutes plus 3 minutes per baseline kilometre shall be set as the minimum for each observation. Additional time shall be observed where the collection requirements cannot be met and/or obstructions are present.

Appendix A

Fully Constrained Network Middle
Min-Constrained Network Middle
Fully Constrained Network Southampton
Min-Constrained Network Southampton

Traverse - Map



```

*****
* NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT *
* *
* (c) Copyright NovAtel Inc., (2007) *
* *
* Version: 7.80.2517 *
* *

```

```

* FILE: C:\Projects\239 DEB11-1 Virginia Dewberry\2_Operations\4_Control\G
rafnet Project\239DEB FEMA Virginia Fully Constrained.net
*****

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DATE(m/d/y): Mon. 5/28/12 TIME: 15:22:28

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DATUM: 'NAD83'
GRID: UTM, Zone 18
SCALE_FACTOR: 680.0000
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

```

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	-- LATITUDE --	-- LONGITUDE --	ELLHGT -	HZ-SD	V-SD
1110306	GCP-3D	37 30 06.65193	-77 07 33.81068	-0.104	0.00500	0.00500
DL3187	GCP-3D	37 16 35.03104	-76 41 43.82021	2.293	0.00500	0.00500
GV1969	GCP-3D	37 11 59.24638	-77 27 47.44394	21.192	0.01000	0.01000

INPUT VECTORS

SESSION NAME	VECTOR(m)	----- Covariance (m) [unscaled] -----
	DX/DY/DZ	standard deviations in brackets
1110306 to 239DEB01 (1)	-1552.0680 -20921.1430 -26262.3071	3.5476e-007 (0.0006) -2.2575e-007 1.3588e-006 (0.0012) 1.4523e-007 -6.8490e-007 1.0694e-006 (0.0010)
1110306 to 239DEB01 (2)	-1552.0616 -20921.1457 -26262.3005	3.6068e-007 (0.0006) -2.0367e-007 1.4155e-006 (0.0012) 1.2750e-007 -7.7987e-007 1.2700e-006 (0.0011)
1110306 to 239DEB02 (1)	8014.8305 -2146.0539 -5105.7558	2.7676e-007 (0.0005) 5.4121e-008 1.7220e-006 (0.0013) -2.7770e-007 -1.2889e-006 1.8935e-006 (0.0014)
1110306 to 239DEB03 (1)	-789.0215 -19609.6589 -24810.4564	3.3368e-007 (0.0006) -2.3414e-007 1.2535e-006 (0.0011) 1.5492e-007 -6.0524e-007 9.3496e-007 (0.0010)
1110306 to PTB-AO (1)	-27616.3497 -28119.1819 -27963.4440	3.3461e-006 (0.0018) -1.3397e-006 2.9006e-006 (0.0017) 4.8425e-007 -1.1353e-006 1.2456e-006 (0.0011)
239DEB01 to PTB-AO (1)	-26064.2498 -7198.0288 -1701.1418	2.3903e-007 (0.0005) -1.3857e-007 9.8333e-007 (0.0010) 7.8936e-008 -4.9888e-007 7.2341e-007 (0.0009)

239DEB01 to 239DEB02 (1) 9566.8647 1.3603e-006 (0.0012)
18775.0948 3.8833e-007 4.2316e-006 (0.0021)
21156.5511 -8.5653e-007 -4.2889e-006 9.2298e-006 (0.0030)

239DEB01 to 239DEB02 (2) 9566.8952 2.3990e-007 (0.0005)
18775.0932 -1.4324e-007 1.0191e-006 (0.0010)
21156.5450 8.2309e-008 -4.9536e-007 6.8821e-007 (0.0008)

239DEB01 to 239DEB03 (1) 763.0518 1.4548e-008 (0.0001)
1311.4845 -8.9595e-009 5.2893e-008 (0.0002)
1451.8469 4.5005e-009 -2.6306e-008 3.9684e-008 (0.0002)

239DEB01 to PTB-AO (2) -26064.2794 6.6564e-007 (0.0008)
-7198.0396 -6.9048e-007 5.3559e-006 (0.0023)
-1701.1465 5.7513e-007 -2.6457e-006 3.5971e-006 (0.0019)

239DEB02 to 239DEB03 (1) -8803.8497 2.2556e-007 (0.0005)
-17463.6122 -1.5507e-007 9.6649e-007 (0.0010)
-19704.6951 8.4622e-008 -4.6096e-007 6.3391e-007 (0.0008)

239DEB03 to PTB-AO (1) -26827.3211 5.4207e-007 (0.0007)
-8509.5160 1.4602e-007 3.4755e-006 (0.0019)
-3152.9935 -5.5056e-007 -2.6107e-006 3.7787e-006 (0.0019)

DL3187 to 1110306 (1) -40578.6082 6.3226e-006 (0.0025)
6165.9925 -2.4964e-006 5.5405e-006 (0.0024)
19878.8927 9.0335e-007 -2.1575e-006 2.3733e-006 (0.0015)

DL3187 to 1110306 (2) -40578.5915 7.2048e-006 (0.0027)
6166.0396 -3.1016e-006 5.9466e-006 (0.0024)
19878.9161 1.1833e-006 -2.1397e-006 2.2567e-006 (0.0015)

DL3187 to 239DEB01 (1) -42130.6744 5.9164e-004 (0.0243)
-14755.1003 3.0152e-004 4.2676e-004 (0.0207)
-6383.3967 -3.7822e-005 -9.3339e-005 1.5125e-004 (0.0123)

DL3187 to 239DEB02 (1) -32563.7755 5.3408e-007 (0.0007)
4019.9341 -3.6607e-007 2.1630e-006 (0.0015)
14773.1432 2.0003e-007 -1.0164e-006 1.4404e-006 (0.0012)

DL3187 to 239DEB03 (1) -41367.6206 1.9834e-006 (0.0014)
-13443.6758 -5.3107e-007 1.5104e-006 (0.0012)
-4931.5545 3.1721e-007 -5.7583e-007 5.8327e-007 (0.0008)

GV1969 to 239DEB01 (3) 23108.6975 1.0693e-007 (0.0003)
5505.1880 -5.0731e-008 4.3029e-007 (0.0007)
373.8606 3.1761e-008 -2.2400e-007 3.4472e-007 (0.0006)

GV1969 to 1110306 (1) 24660.8198 3.9070e-006 (0.0020)
26426.3346 -1.6825e-006 3.1905e-006 (0.0018)
26636.1512 6.1341e-007 -1.0705e-006 1.1051e-006 (0.0011)

GV1969 to 239DEB01 (1) 23108.7732 3.2252e-007 (0.0006)
5505.1992 -2.2770e-007 1.5585e-006 (0.0012)
373.8585 9.1526e-008 -7.5223e-007 9.7194e-007 (0.0010)

GV1969 to 239DEB01 (2) 23108.7604 1.2281e-007 (0.0004)
5505.1837 -8.0413e-008 4.5925e-007 (0.0007)
373.8564 4.2708e-008 -2.3611e-007 3.4290e-007 (0.0006)

GV1969 to 239DEB01 (4) 23108.7939 9.3440e-007 (0.0010)
5505.1716 -7.2085e-007 3.1315e-006 (0.0018)
373.8611 1.8510e-007 -2.6228e-006 5.1904e-006 (0.0023)

GV1969 to 239DEB02 (1) 32675.6419 1.3416e-005 (0.0037)
24280.2598 2.3929e-006 2.9423e-006 (0.0017)
21530.4155 3.7974e-008 -9.3770e-007 1.3368e-006 (0.0012)


```

GV1969 to DL3187 (1)  65239.3899  2.8295e-006 (0.0017)
                    20260.3336  -9.1051e-007  2.0229e-006 (0.0014)
                    6757.2798  4.9087e-007  -7.9850e-007  8.0179e-007 (0.0009)

GV1969 to DL3187 (2)  65239.4122  1.9845e-006 (0.0014)
                    20260.2892  -4.0788e-007  1.6889e-006 (0.0013)
                    6757.2373  3.1054e-007  -6.4815e-007  6.7249e-007 (0.0008)

GV1969 to PTB-AO (1)  -2955.5501  3.4960e-008 (0.0002)
                    -1692.8258  -2.3367e-008  1.4552e-007 (0.0004)
                    -1327.2841  1.2607e-008  -6.7879e-008  9.5508e-008 (0.0003)
    
```

 OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)	- PPM -	DIST - (km)	STD - (m)
1110306 to 239DEB01 (1)	-0.0052	0.0021	-0.0141	0.451	33.6	0.0435
1110306 to 239DEB01 (2)	-0.0108	-0.0007	-0.0213	0.712	33.6	0.0455
1110306 to 239DEB02 (1)	-0.0051	-0.0018	-0.0179	1.917	9.7	0.0514
1110306 to 239DEB03 (1)	-0.0004	-0.0019	-0.0160	0.509	31.6	0.0414
1110306 to PTB-AO (1)	0.0011	0.0090	-0.0326	0.701	48.3	0.0714
239DEB01 to PTB-AO (1)	-0.0271	0.0091	-0.0133	1.162	27.1	0.0364
239DEB01 to 239DEB02 (1)	0.0318	-0.0117	0.0067	1.156	29.9	0.1004
239DEB01 to 239DEB02 (2)	0.0024	-0.0018	0.0038	0.162	29.9	0.0364
239DEB01 to 239DEB03 (1)	-0.0005	-0.0005	-0.0002	0.354	2.1	0.0085
239DEB01 to PTB-AO (2)	0.0042	0.0153	-0.0137	0.774	27.1	0.0809
239DEB02 to 239DEB03 (1)	0.0041	0.0000	-0.0074	0.304	27.8	0.0352
239DEB03 to PTB-AO (1)	-0.0069	0.0125	-0.0089	0.593	28.3	0.0728
DL3187 to 1110306 (1)	0.0176	0.0138	0.0400	1.004	45.6	0.0984
DL3187 to 1110306 (2)	-0.0093	-0.0304	0.0592	1.473	45.6	0.1024
DL3187 to 239DEB01 (1)	-0.0006	-0.0275	0.0537	1.338	45.1	0.8918
DL3187 to 239DEB02 (1)	0.0115	0.0100	0.0144	0.581	36.0	0.0530
DL3187 to 239DEB03 (1)	0.0105	0.0114	0.0094	0.415	43.8	0.0527
GV1969 to 239DEB01 (3)	0.0364	-0.0056	0.0062	1.574	23.8	0.0245
GV1969 to 1110306 (1)	-0.0121	0.0106	0.0235	0.635	44.9	0.0747
GV1969 to 239DEB01 (1)	-0.0399	-0.0005	0.0030	1.683	23.8	0.0440
GV1969 to 239DEB01 (2)	-0.0240	0.0087	-0.0056	1.098	23.8	0.0251
GV1969 to 239DEB01 (4)	-0.0540	0.0165	-0.0237	2.577	23.8	0.0793
GV1969 to 239DEB02 (1)	-0.0044	0.0040	-0.0212	0.478	46.1	0.1097
GV1969 to DL3187 (1)	0.0092	-0.0204	-0.0290	0.534	68.6	0.0620
GV1969 to DL3187 (2)	-0.0026	0.0426	-0.0417	0.870	68.6	0.0544
GV1969 to PTB-AO (1)	0.0040	-0.0027	0.0059	2.086	3.7	0.0137

RMS	0.0189	0.0146	0.0243			

\$ - This session is flagged as a 3-sigma outlier

 CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
1110306	-0.0029	-0.0009	-0.0029
DL3187	0.0006	0.0008	0.0022
GV1969	0.0092	0.0002	0.0027

RMS	0.0056	0.0007	0.0026

 OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	--	LATITUDE	--	LONGITUDE	--	ELLHGT	-	ORTHOHGT
1110306	37	30	06.65190	-77	07	33.81080	-0.1067	33.4928
239DEB01	37	12	14.83514	-77	11	44.20102	6.4390	40.2503
239DEB02	37	26	38.58489	-77	02	35.39953	-24.5556	9.4459
239DEB03	37	13	14.10991	-77	11	02.23065	0.7441	34.5521
DL3187	37	16	35.03106	-76	41	43.82018	2.2952	37.5669
GV1969	37	11	59.24638	-77	27	47.44357	21.1947	54.7692
PTB-AO	37	11	05.10615	-77	29	59.30866	24.9998	58.5014

 OUTPUT STATION COORDINATES (GRID)

STA_ID	-	EASTING	-	NORTHING	-	ELLHGT	-	ORTHOHGT
		(m)		(m)		(m)		(m)
1110306	312070.8902	4152669.5588	-0.1067	33.4928				
239DEB01	305153.6468	4119774.5607	6.4390	40.2503				
239DEB02	319259.6157	4146094.0516	-24.5556	9.4459				
239DEB03	306230.5300	4121577.6014	0.7441	34.5521				
DL3187	349682.4914	4126882.0424	2.2952	37.5669				
GV1969	281392.5192	4119878.1903	21.1947	54.7692				
PTB-AO	278097.0765	4118294.5770	24.9998	58.5014				

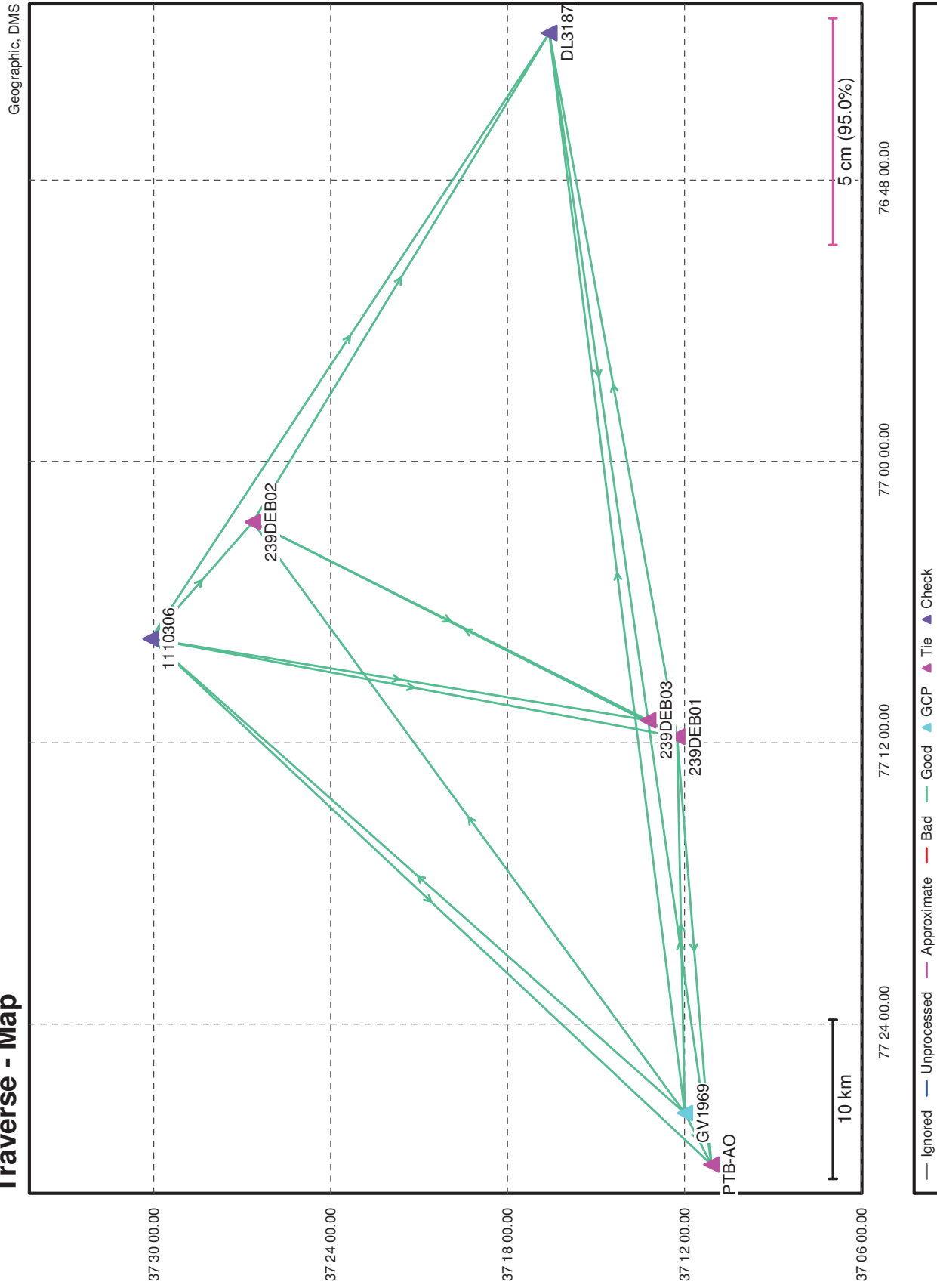
 OUTPUT VARIANCE/COVARIANCE

STA_ID	SE/SN/SUP (95.00 %) (m)	----- CX matrix (m)----- 2 (not scaled by confidence level) (ECEF, XYZ cartesian)							
		1110306	0.0111	2.0677e-005	0.0110	-5.9231e-007	2.2181e-005	0.0118	5.5682e-008
239DEB01	0.0156	4.3515e-005	0.0162	-1.2116e-005	9.5009e-005	0.0273	6.2267e-006	-3.7262e-005	7.0069e-005
239DEB02	0.0193	6.4257e-005	0.0226	-2.1825e-005	2.1706e-004	0.0420	4.4778e-006	-1.0203e-004	1.6064e-004
239DEB03	0.0163	4.7506e-005	0.0170	-1.5057e-005	1.1065e-004	0.0294	7.5300e-006	-4.4562e-005	7.8385e-005
DL3187	0.0115	2.2404e-005	0.0110	-4.9864e-007	2.2574e-005	0.0118	2.0682e-007	-1.4141e-006	2.0629e-005
GV1969	0.0160	4.4093e-005	0.0149	-5.5038e-006	5.9082e-005	0.0202	2.2329e-006	-1.3478e-005	4.4350e-005
PTB-AO	0.0181	5.8133e-005	0.0186	-1.6485e-005	1.2762e-004	0.0311	7.6848e-006	-4.7426e-005	8.7669e-005

VARIANCE FACTOR = 1.0095

Note: Values < 1.0 indicate statistics are pessimistic, while
values > 1.0 indicate optimistic statistics. Entering this
value as the network adjustment scale factor will bring
variance factor to one.

Traverse - Map



```
*****
* NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT *
* *
* (c) Copyright NovAtel Inc., (2007) *
* *
* Version: 7.80.2517 *
* *
* FILE: C:\Projects\239 DEB11-1 Virginia Dewberry\2_Operations\4_Control\G
rafnet Project\239DEB FEMA Virginia MinConstrained.net
*****
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rafnet Project\239DEB FEMA Virginia MinConstrained.net

DATE(m/d/y): Mon. 5/28/12 TIME: 15:30:02

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DATUM: 'NAD83'
GRID: UTM, Zone 18
SCALE_FACTOR: 550.0950
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)
```

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	-- LATITUDE --	-- LONGITUDE --	ELLHGT -	HZ-SD	V-SD
1110306	CHK-3D	37 30 06.65193	-77 07 33.81068	-0.104		
DL3187	CHK-3D	37 16 35.03104	-76 41 43.82021	2.293		
GV1969	GCP-3D	37 11 59.24638	-77 27 47.44394	21.192	0.01000	0.01000

INPUT VECTORS

SESSION NAME	VECTOR(m) DX/DY/DZ	----- Covariance (m) [unscaled] ----- standard deviations in brackets
1110306 to 239DEB01 (1)	-1552.0680 -20921.1430 -26262.3071	3.5476e-007 (0.0006) -2.2575e-007 1.3588e-006 (0.0012) 1.4523e-007 -6.8490e-007 1.0694e-006 (0.0010)
1110306 to 239DEB01 (2)	-1552.0616 -20921.1457 -26262.3005	3.6068e-007 (0.0006) -2.0367e-007 1.4155e-006 (0.0012) 1.2750e-007 -7.7987e-007 1.2700e-006 (0.0011)
1110306 to 239DEB02 (1)	8014.8305 -2146.0539 -5105.7558	2.7676e-007 (0.0005) 5.4121e-008 1.7220e-006 (0.0013) -2.7770e-007 -1.2889e-006 1.8935e-006 (0.0014)
1110306 to 239DEB03 (1)	-789.0215 -19609.6589 -24810.4564	3.3368e-007 (0.0006) -2.3414e-007 1.2535e-006 (0.0011) 1.5492e-007 -6.0524e-007 9.3496e-007 (0.0010)
1110306 to DL3187 (1)	40578.6082 -6165.9926 -19878.8929	6.3125e-006 (0.0025) -2.4934e-006 5.5441e-006 (0.0024) 9.0607e-007 -2.1615e-006 2.3764e-006 (0.0015)
1110306 to DL3187 (2)	40578.5915 -6166.0396 -19878.9163	7.1936e-006 (0.0027) -3.0995e-006 5.9535e-006 (0.0024) 1.1879e-006 -2.1454e-006 2.2602e-006 (0.0015)

1110306 to PTB-AO (1) -27616.3497 3.3461e-006 (0.0018)
-28119.1819 -1.3397e-006 2.9006e-006 (0.0017)
-27963.4440 4.8425e-007 -1.1353e-006 1.2456e-006 (0.0011)

239DEB01 to DL3187 (1) 42130.6742 5.9318e-004 (0.0244)
14755.1005 3.0177e-004 4.2565e-004 (0.0206)
6383.3962 -3.7335e-005 -9.2803e-005 1.5096e-004 (0.0123)

239DEB01 to 239DEB02 (1) 9566.8647 1.3603e-006 (0.0012)
18775.0948 3.8833e-007 4.2316e-006 (0.0021)
21156.5511 -8.5653e-007 -4.2889e-006 9.2298e-006 (0.0030)

239DEB01 to 239DEB02 (2) 9566.8952 2.3990e-007 (0.0005)
18775.0932 -1.4324e-007 1.0191e-006 (0.0010)
21156.5450 8.2309e-008 -4.9536e-007 6.8821e-007 (0.0008)

239DEB01 to 239DEB03 (1) 763.0518 1.4548e-008 (0.0001)
1311.4845 -8.9595e-009 5.2893e-008 (0.0002)
1451.8469 4.5005e-009 -2.6306e-008 3.9684e-008 (0.0002)

239DEB01 to DL3187 (2) 42130.6969 2.0414e-006 (0.0014)
14755.1451 -4.2445e-007 1.7785e-006 (0.0013)
6383.4184 4.4727e-007 -7.6123e-007 8.6850e-007 (0.0009)

239DEB01 to DL3187 (3) 42130.6680 2.1139e-006 (0.0015)
14755.1580 -5.4403e-007 1.7119e-006 (0.0013)
6383.4013 4.7478e-007 -7.1741e-007 8.2110e-007 (0.0009)

239DEB01 to PTB-AO (1) -26064.2498 2.3903e-007 (0.0005)
-7198.0288 -1.3857e-007 9.8333e-007 (0.0010)
-1701.1418 7.8936e-008 -4.9888e-007 7.2341e-007 (0.0009)

239DEB01 to PTB-AO (2) -26064.2794 6.6564e-007 (0.0008)
-7198.0396 -6.9048e-007 5.3559e-006 (0.0023)
-1701.1465 5.7513e-007 -2.6457e-006 3.5971e-006 (0.0019)

239DEB02 to 239DEB03 (1) -8803.8497 2.2556e-007 (0.0005)
-17463.6122 -1.5507e-007 9.6649e-007 (0.0010)
-19704.6951 8.4622e-008 -4.6096e-007 6.3391e-007 (0.0008)

239DEB02 to DL3187 (1) 32563.7757 5.3378e-007 (0.0007)
-4019.9354 -3.6501e-007 2.1629e-006 (0.0015)
-14773.1422 1.9920e-007 -1.0169e-006 1.4409e-006 (0.0012)

DL3187 to 239DEB03 (1) -41367.6206 1.9834e-006 (0.0014)
-13443.6758 -5.3107e-007 1.5104e-006 (0.0012)
-4931.5545 3.1721e-007 -5.7583e-007 5.8327e-007 (0.0008)

GV1969 to 239DEB01 (1) 23108.7732 3.2252e-007 (0.0006)
5505.1992 -2.2770e-007 1.5585e-006 (0.0012)
373.8585 9.1526e-008 -7.5223e-007 9.7194e-007 (0.0010)

GV1969 to 1110306 (1) 24660.8198 3.9070e-006 (0.0020)
26426.3346 -1.6825e-006 3.1905e-006 (0.0018)
26636.1512 6.1341e-007 -1.0705e-006 1.1051e-006 (0.0011)

GV1969 to 239DEB01 (2) 23108.7604 1.2281e-007 (0.0004)
5505.1837 -8.0413e-008 4.5925e-007 (0.0007)
373.8564 4.2708e-008 -2.3611e-007 3.4290e-007 (0.0006)

GV1969 to 239DEB01 (3) 23108.6975 1.0693e-007 (0.0003)
5505.1880 -5.0731e-008 4.3029e-007 (0.0007)
373.8606 3.1761e-008 -2.2400e-007 3.4472e-007 (0.0006)

GV1969 to 239DEB01 (4) 23108.7939 9.3440e-007 (0.0010)
5505.1716 -7.2085e-007 3.1315e-006 (0.0018)
373.8611 1.8510e-007 -2.6228e-006 5.1904e-006 (0.0023)

```

GV1969 to 239DEB02 (1) 32675.6419 1.3416e-005 (0.0037)
                        24280.2598 2.3929e-006 2.9423e-006 (0.0017)
                        21530.4155 3.7974e-008 -9.3770e-007 1.3368e-006 (0.0012)

GV1969 to DL3187 (1) 65239.3899 2.8295e-006 (0.0017)
                    20260.3336 -9.1051e-007 2.0229e-006 (0.0014)
                    6757.2798 4.9087e-007 -7.9850e-007 8.0179e-007 (0.0009)

GV1969 to DL3187 (2) 65239.4122 1.9845e-006 (0.0014)
                    20260.2892 -4.0788e-007 1.6889e-006 (0.0013)
                    6757.2373 3.1054e-007 -6.4815e-007 6.7249e-007 (0.0008)

GV1969 to PTB-AO (1) -2955.5501 3.4960e-008 (0.0002)
                    -1692.8258 -2.3367e-008 1.4552e-007 (0.0004)
                    -1327.2841 1.2607e-008 -6.7879e-008 9.5508e-008 (0.0003)

PTB-AO to 239DEB03 (1) 26827.3216 5.4316e-007 (0.0007)
                       8509.5141 1.4936e-007 3.4764e-006 (0.0019)
                       3152.9949 -5.5440e-007 -2.6103e-006 3.7778e-006 (0.0019)
    
```

 OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)	- PPM -	DIST - (km)	STD - (m)
1110306 to 239DEB01 (1)	-0.0008	0.0009	0.0072	0.217	33.6	0.0391
1110306 to 239DEB01 (2)	-0.0064	-0.0019	-0.0000	0.199	33.6	0.0409
1110306 to 239DEB02 (1)	-0.0017	-0.0023	0.0020	0.355	9.7	0.0463
1110306 to 239DEB03 (1)	0.0038	-0.0027	0.0057	0.232	31.6	0.0372
1110306 to DL3187 (1)	-0.0044	-0.0128	0.0062	0.327	45.6	0.0885
1110306 to DL3187 (2)	0.0225	0.0313	-0.0129	0.891	45.6	0.0921
1110306 to PTB-AO (1)	0.0069	0.0083	-0.0090	0.292	48.3	0.0642
239DEB01 to DL3187 (1)	0.0096	0.0298	-0.0284	0.936	45.1	0.8022
239DEB01 to 239DEB02 (1)	0.0308	-0.0110	0.0053	1.109	29.9	0.0903
239DEB01 to 239DEB02 (2)	0.0014	-0.0011	0.0024	0.099	29.9	0.0327
239DEB01 to 239DEB03 (1)	-0.0006	-0.0001	0.0001	0.317	2.1	0.0077
239DEB01 to DL3187 (2)	-0.0226	-0.0111	-0.0113	0.612	45.1	0.0508
239DEB01 to DL3187 (3)	0.0027	-0.0090	0.0143	0.379	45.1	0.0506
239DEB01 to PTB-AO (1)	-0.0256	0.0096	-0.0110	1.088	27.1	0.0327
239DEB01 to PTB-AO (2)	0.0056	0.0158	-0.0114	0.747	27.1	0.0727
239DEB02 to 239DEB03 (1)	0.0049	-0.0002	-0.0056	0.268	27.8	0.0317
239DEB02 to DL3187 (1)	-0.0015	-0.0087	0.0103	0.377	36.0	0.0477
DL3187 to 239DEB03 (1)	0.0015	0.0098	-0.0151	0.412	43.8	0.0474
GV1969 to 239DEB01 (1)	-0.0417	-0.0012	-0.0015	1.758	23.8	0.0396
GV1969 to 1110306 (1)	-0.0184	0.0110	-0.0022	0.481	44.9	0.0672
GV1969 to 239DEB01 (2)	-0.0258	0.0079	-0.0100	1.213	23.8	0.0226
GV1969 to 239DEB01 (3)	0.0346	-0.0063	0.0018	1.482	23.8	0.0220
GV1969 to 239DEB01 (4)	-0.0559	0.0158	-0.0281	2.715	23.8	0.0714
GV1969 to 239DEB02 (1)	-0.0073	0.0040	-0.0271	0.615	46.1	0.0987
GV1969 to DL3187 (1)	0.0163	-0.0191	-0.0086	0.386	68.6	0.0558
GV1969 to DL3187 (2)	0.0044	0.0440	-0.0213	0.715	68.6	0.0489
GV1969 to PTB-AO (1)	0.0035	-0.0030	0.0038	1.635	3.7	0.0123
PTB-AO to 239DEB03 (1)	0.0053	-0.0124	0.0045	0.502	28.3	0.0655

RMS	0.0192	0.0145	0.0125			

\$ - This session is flagged as a 3-sigma outlier

 CHECK POINT RESIDUALS (East, North, Height - Local Level)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
1110306	-0.0184	-0.0005	-0.0314
DL3187	-0.0016	0.0020	0.0198

RMS	0.0130	0.0014	0.0263

 CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
GV1969	0.0000	0.0000	0.0000

RMS	0.0000	0.0000	0.0000

 OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	-- LATITUDE --	-- LONGITUDE --	- ELLHGT -	ORTHOHGT
1110306	37 30 06.65191	-77 07 33.81143	-0.1352	33.4643
239DEB01	37 12 14.83511	-77 11 44.20146	6.4318	40.2431
239DEB02	37 26 38.58489	-77 02 35.40002	-24.5643	9.4373
239DEB03	37 13 14.10989	-77 11 02.23111	0.7373	34.5453
DL3187	37 16 35.03110	-76 41 43.82027	2.3128	37.5845
GV1969	37 11 59.24638	-77 27 47.44394	21.1919	54.7665
PTB-AO	37 11 05.10613	-77 29 59.30905	24.9950	58.4966

 OUTPUT STATION COORDINATES (GRID)

STA_ID	- EASTING - (m)	- NORTHING - (m)	- ELLHGT - (m)	ORTHOHGT (m)
1110306	312070.8748	4152669.5595	-0.1352	33.4643
239DEB01	305153.6357	4119774.5600	6.4318	40.2431
239DEB02	319259.6036	4146094.0517	-24.5643	9.4373
239DEB03	306230.5187	4121577.6012	0.7373	34.5453
DL3187	349682.4892	4126882.0436	2.3128	37.5845
GV1969	281392.5100	4119878.1904	21.1919	54.7665
PTB-AO	278097.0669	4118294.5767	24.9950	58.4966

 OUTPUT VARIANCE/COVARIANCE

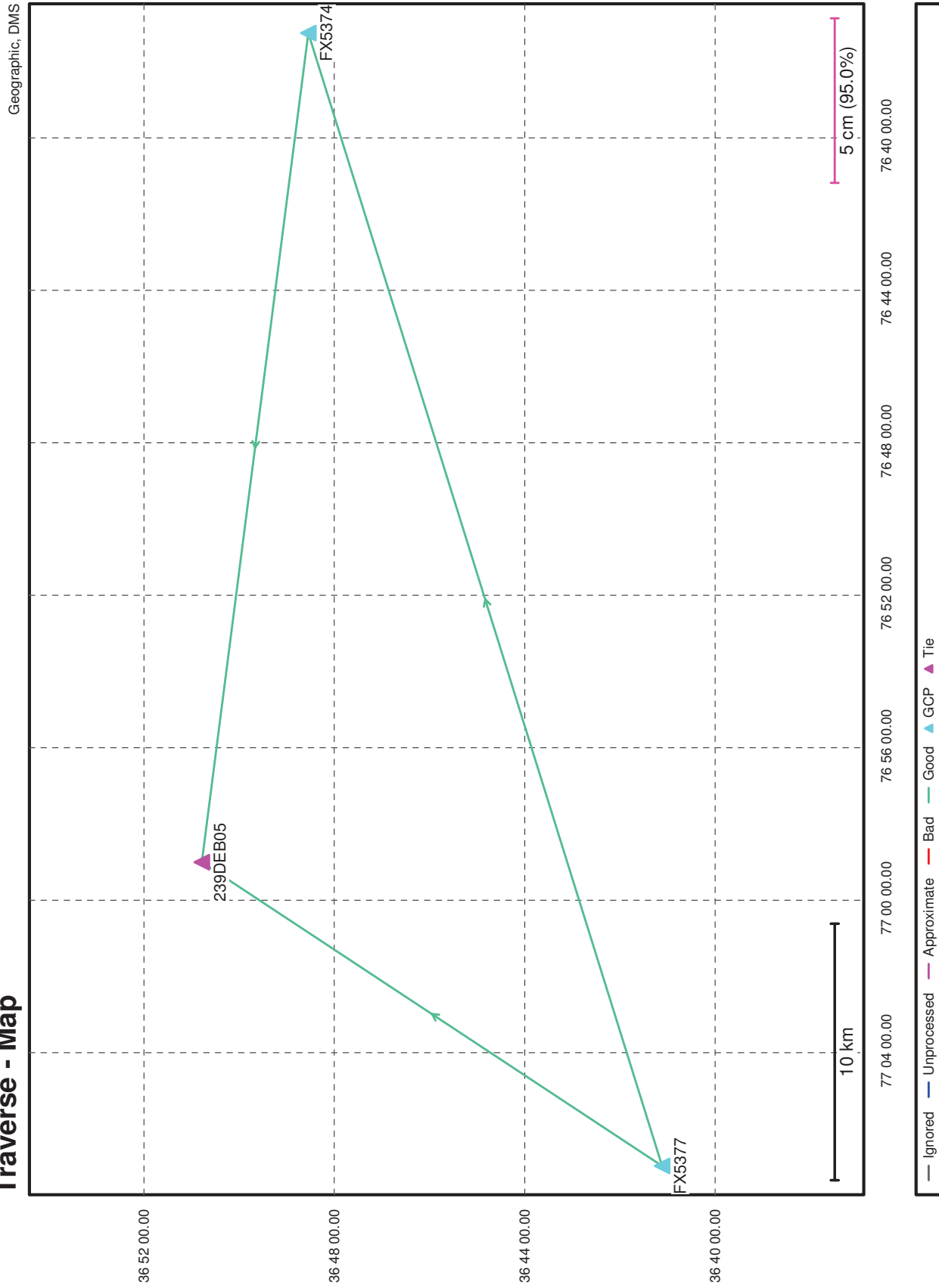
STA_ID	SE/SN/SUP (95.00 %) (m)	----- CX matrix (m)----- (not scaled by confidence level) (ECEF, XYZ cartesian)			
1110306	0.0303	1.6059e-004			
	0.0311	-3.0154e-005	2.7966e-004		
	0.0450	1.2423e-005	-8.0418e-005	2.1137e-004	
239DEB01	0.0264	1.1866e-004			
	0.0271	-9.9987e-006	1.6570e-004		

	0.0338	5.0026e-006	-3.2059e-005	1.4556e-004
239DEB02	0.0303	1.5707e-004		
	0.0316	-2.3927e-005	2.9287e-004	
	0.0467	9.6258e-006	-9.3628e-005	2.3385e-004
239DEB03	0.0270	1.2475e-004		
	0.0279	-1.3242e-005	1.8619e-004	
	0.0362	6.2585e-006	-4.1576e-005	1.5916e-004
DL3187	0.0364	2.3917e-004		
	0.0300	-4.4397e-005	2.7900e-004	
	0.0445	2.7162e-005	-7.3196e-005	1.8380e-004
GV1969	0.0245	1.0000e-004		
	0.0245	1.1828e-019	1.0000e-004	
	0.0245	-4.5805e-021	4.8691e-020	1.0000e-004
PTB-AO	0.0261	1.1580e-004		
	0.0270	-1.0173e-005	1.6549e-004	
	0.0336	5.3009e-006	-3.0788e-005	1.4319e-004

VARIANCE FACTOR = 1.0000

Note: Values < 1.0 indicate statistics are pessimistic, while
values > 1.0 indicate optimistic statistics. Entering this
value as the network adjustment scale factor will bring
variance factor to one.

Traverse - Map



```

*****
* NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT *
* *
* (c) Copyright NovAtel Inc., (2007) *
* *
* Version: 7.80.2517 *
* *
* FILE: C:\Projects\239 DEB11-1 Virginia Dewberry\2_Operations\4_Control\G
rafnet Project\239DEB FEMA Virginia Southampton FullyConstrained.net
*****

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DATE(m/d/y): Sun. 1/01/12 TIME: 9:42:59

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DATUM:          'NAD83'
GRID:           UTM, Zone 17
SCALE_FACTOR:   264.0000
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

```

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	--	LATITUDE	--	LONGITUDE	--	ELLHGT	-	HZ-SD	V-SD
FX5374	GCP-3D	36	48	32.84247	-76	37	15.00901	-28.477	0.01500	0.01500
FX5377	GCP-3D	36	41	06.67076	-77	06	58.40294	-7.237	0.01500	0.01500

INPUT VECTORS

SESSION NAME	VECTOR(m)	----- Covariance (m) [unscaled] -----
	DX/DY/DZ	standard deviations in brackets
FX5374 to 239DEB05 (1)	-32054.4544	3.5590e-007 (0.0006)
	-4979.3270	-3.1104e-007 1.5966e-006 (0.0013)
	3322.5001	1.4362e-007 -6.9345e-007 9.5624e-007 (0.0010)
FX5374 to 239DEB05 (2)	-32054.4541	3.5782e-007 (0.0006)
	-4979.3226	-3.1865e-007 1.5993e-006 (0.0013)
	3322.4987	1.3784e-007 -6.9882e-007 9.5393e-007 (0.0010)
FX5377 to 239DEB05 (1)	9156.0165	5.8688e-008 (0.0002)
	13101.4154	-4.2359e-008 2.7664e-007 (0.0005)
	14330.2584	2.2003e-008 -1.2918e-007 1.6662e-007 (0.0004)
FX5377 to 239DEB05 (2)	9155.9994	1.3956e-007 (0.0004)
	13101.4014	-1.0781e-007 6.6574e-007 (0.0008)
	14330.2515	6.2595e-008 -3.0890e-007 4.0480e-007 (0.0006)
FX5377 to FX5374 (1)	41210.4607	2.8685e-006 (0.0017)
	18080.7519	-9.1068e-007 2.6003e-006 (0.0016)
	11007.7519	3.4725e-007 -9.8411e-007 1.1489e-006 (0.0011)
FX5377 to FX5374 (2)	41210.4455	2.7217e-006 (0.0016)
	18080.7312	-6.9490e-007 2.5608e-006 (0.0016)
	11007.7461	3.5852e-007 -1.0466e-006 1.2509e-006 (0.0011)

 OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)	- PPM -	DIST - (km)	STD - (m)
FX5374 to 239DEB05 (1)	0.0034	0.0005	-0.0057	0.205	32.6	0.0277
FX5374 to 239DEB05 (2)	0.0021	-0.0009	-0.0015	0.085	32.6	0.0277
FX5377 to 239DEB05 (1)	-0.0066	-0.0031	0.0025	0.361	21.5	0.0115
FX5377 to 239DEB05 (2)	0.0132	0.0083	-0.0012	0.728	21.5	0.0179
FX5377 to FX5374 (1)	-0.0023	-0.0055	0.0213	0.477	46.3	0.0418
FX5377 to FX5374 (2)	0.0172	0.0092	0.0114	0.489	46.3	0.0415

RMS	0.0095	0.0057	0.0102			

\$ - This session is flagged as a 3-sigma outlier

 CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
FX5374	0.0128	-0.0127	-0.0122
FX5377	-0.0127	0.0126	0.0123

RMS	0.0128	0.0127	0.0123

 OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	-- LATITUDE --	-- LONGITUDE --	- ELLHGT -	ORTHOHGT
239DEB05	36 50 47.15799	-76 59 00.22918	-14.6087	20.3903
FX5374	36 48 32.84206	-76 37 15.00850	-28.4893	7.6452
FX5377	36 41 06.67117	-77 06 58.40345	-7.2248	27.6380

 OUTPUT STATION COORDINATES (GRID)

STA_ID	- EASTING -	- NORTHING -	- ELLHGT -	ORTHOHGT
	(m)	(m)	(m)	(m)
239DEB05	858181.9931	4085372.7494	-14.6087	20.3903
FX5374	890720.7119	4082654.3756	-28.4893	7.6452
FX5377	847059.2675	4066983.4344	-7.2248	27.6380

 OUTPUT VARIANCE/COVARIANCE

STA_ID	SE/SN/SUP (95.00 %)	----- CX matrix (m)----- (not scaled by confidence level) (m) (ECEF, XYZ cartesian)			
239DEB05	0.0272	1.2543e-004			
	0.0278	-9.2413e-006	1.6372e-004		
	0.0328	4.3206e-006	-2.2380e-005	1.4315e-004	

```
FX5374      0.0270  1.2312e-004
             0.0271  -4.9193e-006  1.3894e-004
             0.0295  1.9873e-006  -9.8598e-006  1.2800e-004

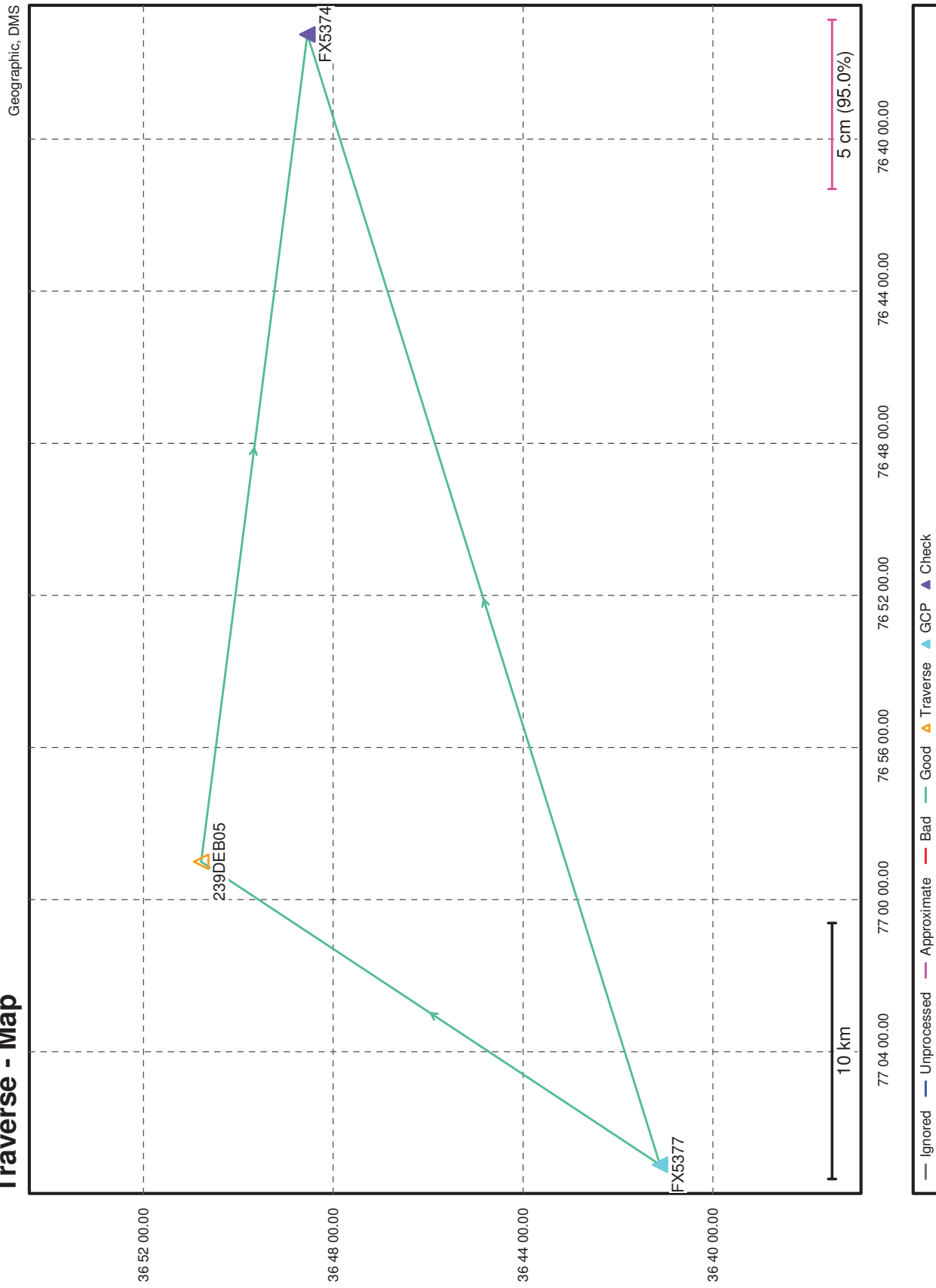
FX5377      0.0270  1.2312e-004
             0.0271  -4.9193e-006  1.3894e-004
             0.0295  1.9873e-006  -9.8598e-006  1.2800e-004
```

```
*****
VARIANCE FACTOR = 1.0597
```

Note: Values < 1.0 indicate statistics are pessimistic, while values > 1.0 indicate optimistic statistics. Entering this value as the network adjustment scale factor will bring variance factor to one.

```
*****
```

Traverse - Map



```

*****
* NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT *
* *
* (c) Copyright NovAtel Inc., (2007) *
* *
* Version: 7.80.2517 *
* *
* FILE: C:\Projects\239 DEB11-1 Virginia Dewberry\2_Operations\4_Control\G
rafnet Project\239DEB FEMA Virginia Southampton MinConstrained.net
*****

```

DATE(m/d/y): Sun. 1/01/12 TIME: 9:34:16

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DATUM:          'NAD83'
GRID:           UTM, Zone 17
SCALE_FACTOR:   252.2580
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

```

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	--	LATITUDE	--	LONGITUDE	--	ELLHGT	-	HZ-SD	V-SD
FX5374	CHK-3D	36	48	32.84247	-76	37	15.00901	-28.477		
FX5377	GCP-3D	36	41	06.67076	-77	06	58.40294	-7.237	0.00500	0.00500

INPUT VECTORS

SESSION NAME	VECTOR(m)	-----	Covariance (m)	[unscaled]	-----
	DX/DY/DZ		standard deviations in brackets		
239DEB05 to FX5374 (1)	32054.4550	3.5552e-007	(0.0006)		
	4979.3246	-3.1020e-007	1.5968e-006	(0.0013)	
	-3322.4983	1.4289e-007	-6.9339e-007	9.5617e-007	(0.0010)
239DEB05 to FX5374 (2)	32054.4547	3.5744e-007	(0.0006)		
	4979.3202	-3.1778e-007	1.5993e-006	(0.0013)	
	-3322.4969	1.3711e-007	-6.9876e-007	9.5391e-007	(0.0010)
FX5377 to 239DEB05 (1)	9156.0165	5.8688e-008	(0.0002)		
	13101.4154	-4.2359e-008	2.7664e-007	(0.0005)	
	14330.2584	2.2003e-008	-1.2918e-007	1.6662e-007	(0.0004)
FX5377 to 239DEB05 (2)	9155.9994	1.3956e-007	(0.0004)		
	13101.4014	-1.0781e-007	6.6574e-007	(0.0008)	
	14330.2515	6.2595e-008	-3.0890e-007	4.0480e-007	(0.0006)
FX5377 to FX5374 (1)	41210.4395	1.0005e-006	(0.0010)		
	18080.7350	-2.6927e-007	8.6779e-007	(0.0009)	
	11007.7442	1.3424e-007	-3.3166e-007	4.1471e-007	(0.0006)
FX5377 to FX5374 (2)	41210.4455	2.7217e-006	(0.0016)		
	18080.7312	-6.9490e-007	2.5608e-006	(0.0016)	
	11007.7461	3.5852e-007	-1.0466e-006	1.2509e-006	(0.0011)

 OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)

SESSION NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)	- PPM -	DIST - (km)	STD - (m)
239DEB05 to FX5374 (1)	-0.0048	-0.0060	-0.0027	0.249	32.6	0.0271
239DEB05 to FX5374 (2)	-0.0035	-0.0046	-0.0069	0.275	32.6	0.0271
FX5377 to 239DEB05 (1)	-0.0070	-0.0044	0.0004	0.385	21.5	0.0113
FX5377 to 239DEB05 (2)	0.0129	0.0070	-0.0033	0.699	21.5	0.0175
FX5377 to FX5374 (1)	0.0205	0.0009	0.0092	0.486	46.3	0.0240
FX5377 to FX5374 (2)	0.0156	0.0024	0.0040	0.351	46.3	0.0406

RMS	0.0123	0.0047	0.0053			

\$ - This session is flagged as a 3-sigma outlier

 CHECK POINT RESIDUALS (East, North, Height - Local Level)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
FX5374	0.0239	-0.0322	-0.0319

RMS	0.0239	0.0322	0.0319

 CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
FX5377	0.0000	-0.0000	-0.0000

RMS	0.0000	0.0000	0.0000

 OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	-- LATITUDE --	-- LONGITUDE --	- ELLHGT -	ORTHOHGT
239DEB05	36 50 47.15754	-76 59 00.22868	-14.6231	20.3759
FX5374	36 48 32.84142	-76 37 15.00805	-28.5089	7.6256
FX5377	36 41 06.67076	-77 06 58.40294	-7.2371	27.6257

 OUTPUT STATION COORDINATES (GRID)

STA_ID	- EASTING - (m)	- NORTHING - (m)	- ELLHGT - (m)	ORTHOHGT (m)
239DEB05	858182.0061	4085372.7360	-14.6231	20.3759
FX5374	890720.7239	4082654.3566	-28.5089	7.6256
FX5377	847059.2807	4066983.4223	-7.2371	27.6257


```

*****
OUTPUT VARIANCE/COVARIANCE
*****
                                2
STA_ID      SE/SN/SUP  ----- CX matrix (m )-----
              (95.00 %) (not scaled by confidence level)
              (m)      (ECEF, XYZ cartesian)
239DEB05     0.0142   3.4930e-005
              0.0151  -6.9056e-006  6.8327e-005
              0.0222  3.6683e-006 -1.9915e-005  5.0872e-005

FX5374       0.0189   6.5919e-005
              0.0183  -2.0877e-005  1.2318e-004
              0.0299  9.4981e-006 -3.9814e-005  7.6236e-005

FX5377       0.0122   2.5000e-005
              0.0122  2.2737e-021  2.5000e-005
              0.0122  3.5527e-022  3.4106e-021  2.5000e-005

```

```

*****
VARIANCE FACTOR = 1.0000

```

Note: Values < 1.0 indicate statistics are pessimistic, while values > 1.0 indicate optimistic statistics. Entering this value as the network adjustment scale factor will bring variance factor to one.

```

*****

```

Appendix B

NGS Datasheets, Set Point Station Descriptions and Photos

DL3187 CORS - This is a GPS Continuously Operating Reference Station.
DL3187 DESIGNATION - LOYOLA X CORS L1 PHASE CENTER
DL3187 CORS_ID - LOYX
DL3187 PID - DL3187
DL3187 STATE/COUNTY- VA/C OF WILLIAMSBURG
DL3187 USGS QUAD - WILLIAMSBURG (1984)

DL3187

DL3187 *CURRENT SURVEY CONTROL

DL3187

DL3187*	NAD 83(CORS)-	37 16 35.03104(N)	076 41 43.82021(W)	ADJUSTED
DL3187*	NAVD 88	-	** (meters) ** (feet)	

DL3187

DL3187	EPOCH DATE	-	2002.00	
DL3187	X	-	1,169,379.998 (meters)	COMP
DL3187	Y	-	-4,945,092.840 (meters)	COMP
DL3187	Z	-	3,841,847.800 (meters)	COMP
DL3187	ELLIP HEIGHT-		2.293 (meters)	(06/??/09) ADJUSTED
DL3187	GEOID HEIGHT-		-35.27 (meters)	GEOID09
DL3187	HORZ ORDER	-	SPECIAL (CORS)	
DL3187	ELLP ORDER	-	SPECIAL (CORS)	

DL3187

DL3187. [ITRF positions](#) are available for this station.

DL3187. The coordinates were established by GPS observations

DL3187. and adjusted by the National Geodetic Survey in June 2009.

DL3187. The coordinates are valid at the epoch date displayed above.

DL3187. The epoch date for horizontal control is a decimal equivalence

DL3187. of Year/Month/Day.

DL3187

DL3187

DL3187. The PID for the CORS ARP is DL3186.

DL3187

DL3187. The XYZ, and position/ellipsoidal ht. are equivalent.

DL3187

DL3187. The ellipsoidal height was determined by GPS observations

DL3187. and is referenced to NAD 83.

DL3187

DL3187. The geoid height was determined by GEOID09.

DL3187

DL3187;		North	East	Units	Scale	Factor	Converg.
DL3187;SPC VA S	-	1,106,185.476	3,660,019.521	MT	0.99994666	+1 05	42.7
DL3187;SPC VA S	-	3,629,210.18	12,007,914.05	sFT	0.99994666	+1 05	42.7

DL3187

DL3187! - Elev Factor x Scale Factor = Combined Factor

DL3187! SPC VA S - 0.99999964 x 0.99994666 = 0.99994630

DL3187

DL3187 SUPERSEDED SURVEY CONTROL

DL3187

DL3187. No superseded survey control is available for this station.

DL3187

DL3187_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SUG4968226882(NAD 83)

DL3187_MARKER: STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA

DL3187

DL3187 STATION DESCRIPTION

DL3187

DL3187'DESCRIBED BY NATIONAL GEODETIC SURVEY

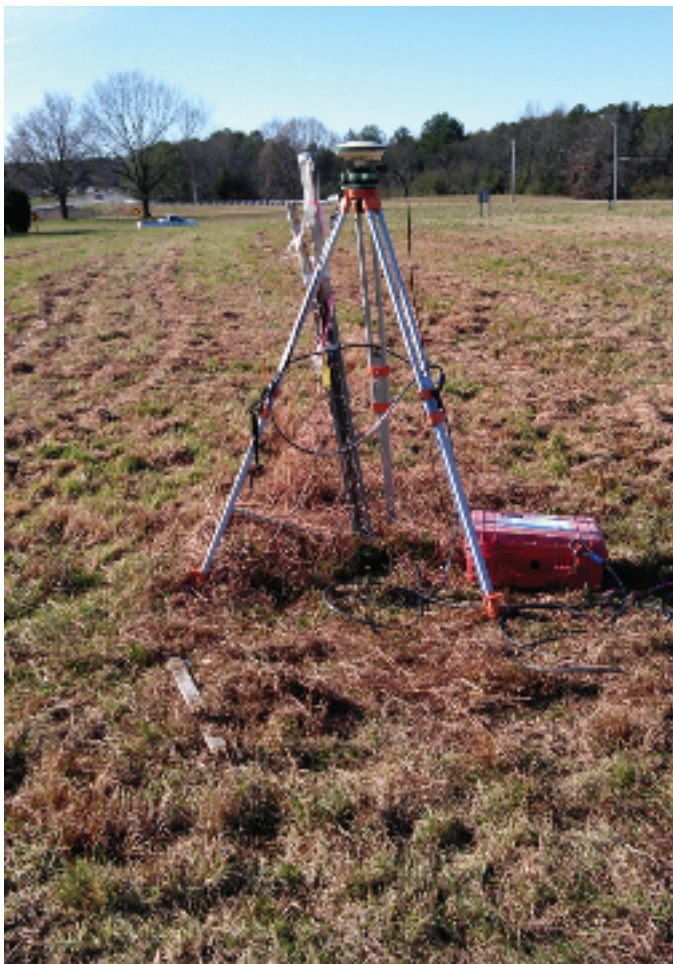
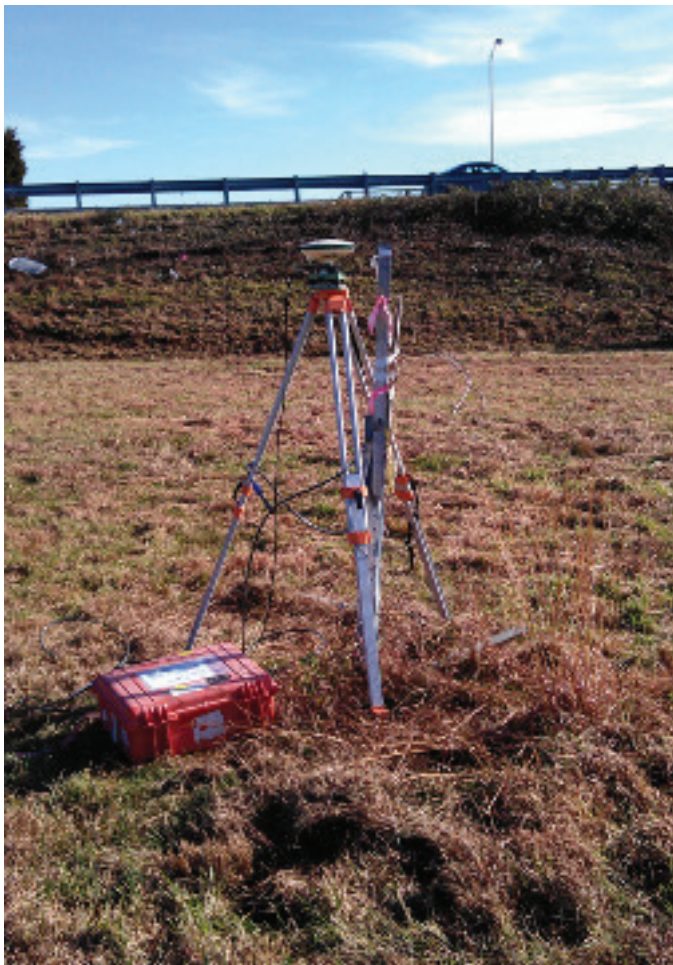
DL3187'STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND

DL3187'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE

DL3187'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.

DL3187' ftp cors.ngs.noaa.gov: cors/coord and cors/station_log

DL3187' http://geodesy.noaa.gov/CORS



GV1969 CBN - This is a Cooperative Base Network Control Station.
 GV1969 DESIGNATION - ADDISON 2
 GV1969 PID - GV1969
 GV1969 STATE/COUNTY- VA/DINWIDDIE
 GV1969 USGS QUAD - PETERSBURG (1994)
 GV1969
 GV1969 *CURRENT SURVEY CONTROL
 GV1969
 GV1969* NAD 83(2007)- 37 11 59.24638(N) 077 27 47.44394(W) ADJUSTED
 GV1969* NAVD 88 - 54.8 (meters) 180. (feet) GPS OBS
 GV1969
 GV1969 EPOCH DATE - 2002.00
 GV1969 X - 1,104,140.593 (meters) COMP
 GV1969 Y - -4,965,353.187 (meters) COMP
 GV1969 Z - 3,835,090.554 (meters) COMP
 GV1969 LAPLACE CORR- -4.09 (seconds) DEFLEC09
 GV1969 ELLIP HEIGHT- 21.192 (meters) (02/10/07) ADJUSTED
 GV1969 GEOID HEIGHT- -33.58 (meters) GEOID09
 GV1969
 GV1969 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
 GV1969 Type PID Designation North East Ellip
 GV1969 -----
 GV1969 NETWORK GV1969 ADDISON 2 0.35 0.29 0.69
 GV1969 -----
 GV1969
 GV1969.The horizontal coordinates were established by GPS observations
 GV1969.and adjusted by the National Geodetic Survey in February 2007.
 GV1969
 GV1969.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 GV1969.See [National Readjustment](#) for more information.
 GV1969.The horizontal coordinates are valid at the epoch date displayed above.
 GV1969.The epoch date for horizontal control is a decimal equivalence
 GV1969.of Year/Month/Day.
 GV1969
 GV1969.The orthometric height was determined by GPS observations and a
 GV1969.high-resolution geoid model.
 GV1969
 GV1969.[Photographs](#) are available for this station.
 GV1969
 GV1969.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 GV1969
 GV1969.The Laplace correction was computed from DEFLEC09 derived deflections.
 GV1969
 GV1969.The ellipsoidal height was determined by GPS observations
 GV1969.and is referenced to NAD 83.
 GV1969
 GV1969.The geoid height was determined by GEOID09.
 GV1969
 GV1969;

	North	East	Units	Scale	Factor	Converg.
GV1969;SPC VA S	- 1,096,659.958	3,592,040.670	MT	0.99994966		+0 37 45.4
GV1969;SPC VA S	- 3,597,958.55	11,784,886.76	sFT	0.99994966		+0 37 45.4
GV1969;UTM 18	- 4,119,878.190	281,392.510	MT	1.00018873		-1 29 23.3

 GV1969
 GV1969!

GV1969!SPC VA S	-	0.99999667	x	0.99994966	=	0.99994633
GV1969!UTM 18	-	0.99999667	x	1.00018873	=	1.00018540

 GV1969
 GV1969:

GV1969:SPC VA S	-	Primary Azimuth Mark		Grid Az
		ADDISON 2 AZ MK		211 45 31.0

GV1969:UTM 18 - ADDISON 2 AZ MK 213 52 39.7

GV1969

PID	Reference Object	Distance	Geod. Az
			dddmmss.s
GV1971	ADDISON 2 RM 4	20.071 METERS	00914
GV5413	PETERSBURG CEN ST HOSP STK	APPROX. 1.5 KM	0555845.9
GV1968	ADDISON	59.380 METERS	11947
GV1973	ADDISON 2 AZ MK		2122316.4
GV1972	ADDISON AZ MK		2210320.7
GV1970	ADDISON 2 RM 3	23.551 METERS	27813

GV1969

GV1969 SUPERSEDED SURVEY CONTROL

GV1969

GV1969	ELLIP H (07/14/04)	21.204 (m)		GP()	3 2
GV1969	ELLIP H (08/14/01)	21.215 (m)		GP()	4 1
GV1969	NAD 83(1993)- 37 11	59.24763(N)	077 27 47.44382(W)	AD()	B
GV1969	ELLIP H (06/29/94)	21.210 (m)		GP()	4 1
GV1969	NAD 83(1993)- 37 11	59.24765(N)	077 27 47.44382(W)	AD()	B
GV1969	ELLIP H (04/04/94)	21.209 (m)		GP()	4 1
GV1969	NAD 83(1986)- 37 11	59.25490(N)	077 27 47.46560(W)	AD()	2
GV1969	NAD 27 - 37 11	58.71980(N)	077 27 48.52210(W)	AD()	2
GV1969	NAVD 88 (08/14/01)	54.8 (m)	180. (f)	GPS OBS	
GV1969	NAVD 88 (04/04/94)	54.8 (m)	180. (f)	GPS OBS	
GV1969	NGVD 29 (??/??/??)	55.05 (m)	180.6 (f)	RESET	3

GV1969

GV1969.Superseded values are not recommended for survey control.

GV1969.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

GV1969.[See file dsdata.txt](#) to determine how the superseded data were derived.

GV1969

GV1969_U.S. NATIONAL GRID SPATIAL ADDRESS: 18STG8139219878(NAD 83)

GV1969_MARKER: DS = TRIANGULATION STATION DISK

GV1969_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

GV1969_SP_SET: CONCRETE POST

GV1969_STAMPING: ADDISON 2 1966 BM RESET

GV1969_MARK LOGO: CGS

GV1969_MAGNETIC: N = NO MAGNETIC MATERIAL

GV1969_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

GV1969_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

GV1969+SATELLITE: SATELLITE OBSERVATIONS - June 11, 2008

GV1969

HISTORY	- Date	Condition	Report By
GV1969	HISTORY - 1966	MONUMENTED	CGS
GV1969	HISTORY - 1966	GOOD	CGS
GV1969	HISTORY - 1973	GOOD	LOCENG
GV1969	HISTORY - 1989	GOOD	USPSQD
GV1969	HISTORY - 19900301	GOOD	NOS
GV1969	HISTORY - 19930512	GOOD	NGS
GV1969	HISTORY - 19940523	GOOD	NOS
GV1969	HISTORY - 19980623	GOOD	VADHT
GV1969	HISTORY - 20000228	GOOD	VADOT
GV1969	HISTORY - 20010331	GOOD	NGS
GV1969	HISTORY - 20011105	GOOD	USE
GV1969	HISTORY - 20040209	GOOD	JCLS
GV1969	HISTORY - 20051119	GOOD	USPSQD
GV1969	HISTORY - 20080611	GOOD	GEOMET

GV1969

GV1969 STATION DESCRIPTION

GV1969

GV1969'DESCRIBED BY COAST AND GEODETIC SURVEY 1966 (JCB)

GV1969'STATION IS LOCATED ABOUT 4 MILES SOUTHWEST OF PETERSBURG AT

GV1969'THE INTERSECTION OF U.S. HIGHWAY 1 AND THE RICHMOND-PETERSBURG

GV1969'TURNPIKE (INTERSTATE 85). STATION IS 59 FEET WEST OF THE
GV1969'CENTERLINE OF THE PRESENT U.S. HIGHWAY 1 (SOUTHBOUND), 30.5
GV1969'FEET NORTHWEST OF A UTILITY POLE AND THE HIGHWAY RIGHT OF WAY
GV1969'LINE AND 1.0 FOOT NORTH OF A STEEL WITNESS POST. THE MARK
GV1969'IS ABOUT 10 INCHES IN DIAMETER, FLUSH WITH THE GROUND AND
GV1969'THE DISK IS STAMPED ADDISON 2 1966 BM RESET.

GV1969'

GV1969'REFERENCE MARK NO. 3 IS A STANDARD DISK SET FLUSH IN THE TOP
GV1969'OF A CONCRETE MONUMENT ABOUT 10 INCHES IN DIAMETER, FLUSH
GV1969'WITH THE GROUND, AND THE DISK IS STAMPED ADDISON 2 NO 3 1966
GV1969'BM RESET.

GV1969'

GV1969'REFERENCE MARK NO. 4 IS 3.5 FEET SOUTHWEST OF POINT B, A
GV1969'REFERENCED POINT OF THE HIGHWAY DEPARTMENT. THE MARK IS A
GV1969'STANDARD DISK SET FLUSH IN A CONCRETE MONUMENT ABOUT 10 INCHES
GV1969'IN DIAMETER, PROJECTS ABOUT 2 INCHES AND THE DISK IS STAMPED
GV1969'ADDISON 2 NO 4 1966 BM RESET.

GV1969'

GV1969'AZIMUTH MARK IS 12 FEET NORTH OF THE NORTHWEST CORNER OF A
GV1969'TWO STORY WHITE HOUSE, 7 FEET NORTHEAST OF A UTILITY POLE
GV1969'AND 1.0 FOOT SOUTHWEST OF A STEEL WITNESS POST. THE MARK
GV1969'IS A STANDARD DISK SET FLUSH IN A CONCRETE MONUMENT ABOUT 10
GV1969'INCHES IN DIAMETER, PROJECTS ABOUT 4 INCHES AND THE DISK IS
GV1969'STAMPED ADDISON 2 1966 BM RESET.

GV1969'

GV1969'TO REACH AZIMUTH MARK FROM STATION GO SOUTH ON U.S. HIGHWAY
GV1969'1 FOR 0.15 MILE TO DRIVEWAY ON LEFT. TURN LEFT AND GO 0.1
GV1969'MILE TO TOP OF GRADE AND MARK ON THE RIGHT AS DESCRIBED.

GV1969

STATION RECOVERY (1966)

GV1969

GV1969'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1966
GV1969'4 MI SW FROM PETERSBURG.

GV1969'ABOUT 4.0 MILES SOUTHWEST OF PETERSBURG AT THE JUNCTION OF U.S.
GV1969'HIGHWAY 1 AND THE RICHMOND-PETERSBURG TURNPIKE (INTERSTATE 85),
GV1969'59 FEET WEST OF THE CENTERLINE OF SOUTHBOUND LANE OF U.S. HIGHWAY
GV1969'1, 30.5 FEET NORTHWEST OF UTILITY POLE, 1.0 FOOT NORTH OF STEEL
GV1969'WITNESS POST AND ON STATE HIGHWAY PROPERTY. MARK IS A STANDARD
GV1969'DISK SET FLUSH IN A CONCRETE MONUMENT ABOUT 10 INCHES IN DIAMETER
GV1969'AND FLUSH WITH THE GROUND.

GV1969

GV1969

STATION RECOVERY (1973)

GV1969

GV1969'RECOVERY NOTE BY LOCAL ENGINEER (INDIVIDUAL OR FIRM) 1973 (HJW)
GV1969'ADDISON NO. 2 1966 BM RESET CONDITION GOOD.
GV1969'AZ MARK-ADDISON NO. 2 1966 BM RESET CONDITION GOOD.

GV1969'

GV1969'DESCRIPTION ADEQUATE EXCEPT WHITE HOUSE AT AZ MARK HAS BEEN RAZED.
GV1969'FOUNDATION REMAINS. RM NO. 3 AND NO. 4 NOT SEARCHED FOR.

GV1969'

GV1969'DISTANCE AND DIRECTION FROM NEAREST TOWN-4 MILES S. W. OF
GV1969'PETERSBURG.

GV1969

GV1969

STATION RECOVERY (1989)

GV1969

GV1969'RECOVERY NOTE BY US POWER SQUADRON 1989 (GES)
GV1969'RECOVERED IN GOOD CONDITION.

GV1969

GV1969

STATION RECOVERY (1990)

GV1969

GV1969'RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1990
GV1969'THE STATION IS LOCATED ABOUT 4 MILES SW OF PETERSBURG AT THE
GV1969'INTERSECTION OF U.S. HIGHWAY 1 (SOUTHBOUND) AND THE

GV1969' RICHMOND-PETERSBURG TURNPIKE (I-85). IT IS IN THE NW QUADRANT OF THE
GV1969' INTERSECTION IN THE EXACT CENTER OF THE EXIT OFF-RAMP.
GV1969' THE STATION IS APPROXIMATELY 10 INCHES IN DIAMETER, FLUSH WITH THE
GV1969' GROUND AND IS STAMPED ---ADDISON 2 1966 BM RESET---.
GV1969' A SEARCH WAS NOT CONDUCTED FOR THE REFERENCE MARKS AND AZIMUTH MARK.
GV1969
GV1969 STATION RECOVERY (1993)
GV1969
GV1969 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993
GV1969' THE STATION IS LOCATED ABOUT 4.0 MI (6.4 KM) SOUTHWEST OF PETERSBURG
GV1969' AT THE INTERSECTION OF U.S. HIGHWAY 1 (SOUTHBOUND) AND INTERSTATE
GV1969' HIGHWAY 85 IN THE NORTHWEST QUADRANT OF THE INTERSECTION IN THE
GV1969' CLOVERLEAF. OWNERSHIP--HIGHWAY RIGHT-OF-WAY.
GV1969' TO REACH THE STATION FROM THE JUNCTION OF INTERSTATE HIGHWAY 85
GV1969' SOUTHBOUND AND SQUIRREL ROAD (EXIT 65), GO SOUTH ON INTERSTATE 85 FOR
GV1969' 2.1 MI (3.4 KM) TO THE OFF RAMP FOR U.S. HIGHWAY 1 SOUTH (EXIT 63A).
GV1969' TAKE THIS OFF RAMP AND GO 0.05 MI (0.08 KM) TO THE STATION ON THE
GV1969' RIGHT IN THE GRASS.
GV1969' LOCATED 18.0 M (59.1 FT) WEST OF THE CENTERLINE OF U.S. HIGHWAY 1
GV1969' SOUTHBOUND, 9.3 M (30.5 FT) NORTHWEST OF A UTILITY POLE AND 0.3 M
GV1969' (1.0 FT) NORTHEAST OF A WITNESS POST.
GV1969
GV1969 STATION RECOVERY (1994)
GV1969
GV1969 RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1994 (CSM)
GV1969' RECOVERED AS DESCRIBED
GV1969
GV1969 STATION RECOVERY (1998)
GV1969
GV1969 RECOVERY NOTE BY VA DEPT HWYS-TRANSP 1998 (JCA)
GV1969' RECOVERED IN GOOD CONDITION.
GV1969
GV1969 STATION RECOVERY (2000)
GV1969
GV1969 RECOVERY NOTE BY VIRGINIA DEPARTMENT OF TRANSPORTATION 2000 (DB)
GV1969' RECOVERED AS DESCRIBED.
GV1969
GV1969 STATION RECOVERY (2001)
GV1969
GV1969 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2001 (DB)
GV1969' THIS REPORT WAS SUBMITTED BY THE US POWER SQUADRONS.
GV1969
GV1969 STATION RECOVERY (2001)
GV1969
GV1969 RECOVERY NOTE BY US ENGINEERS 2001 (RWS)
GV1969' RECOVERED IN GOOD CONDITION.
GV1969
GV1969 STATION RECOVERY (2004)
GV1969
GV1969 RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2004
GV1969' RECOVERED IN GOOD CONDITION.
GV1969
GV1969 STATION RECOVERY (2005)
GV1969
GV1969 RECOVERY NOTE BY US POWER SQUADRON 2005 (CLR)
GV1969' RECOVERED IN GOOD CONDITION.
GV1969
GV1969 STATION RECOVERY (2008)
GV1969
GV1969 RECOVERY NOTE BY GEOMETRICS GPS INCORPORATED 2008 (EMH)
GV1969' RECOVERED IN GOOD CONDITION.


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FX5377 CBN - This is a Cooperative Base Network Control Station.
FX5377 DESIGNATION - VA 02
FX5377 PID - FX5377
FX5377 STATE/COUNTY- VA/SOUTHAMPTON
FX5377 USGS QUAD - COURTLAND (1986)
FX5377
FX5377 *CURRENT SURVEY CONTROL
FX5377
FX5377* NAD 83(2007)- 36 41 06.67076(N) 077 06 58.40294(W) ADJUSTED
FX5377* NAVD 88 - 27.6 (meters) 91. (feet) GPS OBS
FX5377
FX5377 EPOCH DATE - 2002.00
FX5377 X - 1,141,836.087 (meters) COMP
FX5377 Y - -4,992,012.980 (meters) COMP
FX5377 Z - 3,789,429.805 (meters) COMP
FX5377 LAPLACE CORR- -3.43 (seconds) DEFLEC09
FX5377 ELLIP HEIGHT- -7.237 (meters) (02/10/07) ADJUSTED
FX5377 GEOID HEIGHT- -34.86 (meters) GEOID09
FX5377
FX5377 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
FX5377 Type PID Designation North East Ellip
FX5377 -----
FX5377 NETWORK FX5377 VA 02 0.33 0.29 1.06
FX5377 -----
FX5377
FX5377.The horizontal coordinates were established by GPS observations
FX5377.and adjusted by the National Geodetic Survey in February 2007.
FX5377
FX5377.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
FX5377.See National Readjustment for more information.
FX5377.The horizontal coordinates are valid at the epoch date displayed above.
FX5377.The epoch date for horizontal control is a decimal equivalence
FX5377.of Year/Month/Day.
FX5377
FX5377.The orthometric height was determined by GPS observations and a
FX5377.high-resolution geoid model.
FX5377
FX5377.The X, Y, and Z were computed from the position and the ellipsoidal ht.
FX5377
FX5377.The Laplace correction was computed from DEFLEC09 derived deflections.
FX5377
FX5377.The ellipsoidal height was determined by GPS observations
FX5377.and is referenced to NAD 83.
FX5377
FX5377.The geoid height was determined by GEOID09.
FX5377
FX5377; North East Units Scale Factor Converg.
FX5377;SPC VA S - 1,039,953.305 3,623,675.760 MT 1.00001579 +0 50 23.5
FX5377;SPC VA S - 3,411,913.47 11,888,676.22 sFT 1.00001579 +0 50 23.5
FX5377;UTM 18 - 4,062,036.617 310,920.957 MT 1.00004047 -1 15 52.7
FX5377
FX5377! - Elev Factor x Scale Factor = Combined Factor
FX5377!SPC VA S - 1.00000114 x 1.00001579 = 1.00001693
FX5377!UTM 18 - 1.00000114 x 1.00004047 = 1.00004161
FX5377
FX5377 SUPERSEDED SURVEY CONTROL
FX5377
FX5377 ELLIP H (09/24/02) -7.251 (m) GP( ) 4 1
FX5377 ELLIP H (08/14/01) -7.274 (m) GP( ) 4 1

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FX5377 NAD 83(1986)- 36 41 06.67921(N) 077 06 58.41899(W) AD() 1
 FX5377 NAD 83(1993)- 36 41 06.67209(N) 077 06 58.40218(W) AD() B
 FX5377 ELLIP H (06/29/94) -7.219 (m) GP() 4 1
 FX5377 NAD 83(1993)- 36 41 06.67210(N) 077 06 58.40218(W) AD() B
 FX5377 ELLIP H (04/04/94) -7.219 (m) GP() 4 1
 FX5377 NAVD 88 (09/11/96) 27.6 (m) 91. (f) GPS OBS
 FX5377 NAVD 88 (04/04/94) 27.6 (m) 91. (f) GPS OBS

FX5377

FX5377.Superseded values are not recommended for survey control.

FX5377.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

FX5377.[See file dsdata.txt](#) to determine how the superseded data were derived.

FX5377

FX5377_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SUF1092062036(NAD 83)

FX5377_MARKER: I = METAL ROD

FX5377_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)

FX5377_SP_SET: STAINLESS STEEL ROD IN SLEEVE

FX5377_STAMPING: VA02 1993

FX5377_MARK LOGO: NGS

FX5377_PROJECTION: FLUSH

FX5377_MAGNETIC: N = NO MAGNETIC MATERIAL

FX5377_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

FX5377_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

FX5377+SATELLITE: SATELLITE OBSERVATIONS - April 10, 2002

FX5377_ROD/PIPE-DEPTH: 8.2 meters

FX5377_SLEEVE-DEPTH : 1.0 meters

FX5377

FX5377	HISTORY	- Date	Condition	Report By
FX5377	HISTORY	- 1993	MONUMENTED	NGS
FX5377	HISTORY	- 19950823	GOOD	NGS
FX5377	HISTORY	- 20000301	GOOD	VADOT
FX5377	HISTORY	- 20010716	GOOD	VADOT
FX5377	HISTORY	- 20020410	GOOD	RSA

FX5377

FX5377 STATION DESCRIPTION

FX5377

FX5377'DESCRIBED BY NATIONAL GEODETIC SURVEY 1993

FX5377'THE STATION IS LOCATED ABOUT 40 KM (24.85 MI) EAST OF EMPORIA, 17.0 KM

FX5377'(10.55 MI) WEST OF FRANKLIN, 5.0 KM (3.10 MI) SOUTHWEST OF COURTLAND.

FX5377'OWNERSHIP--HIGHWAY RIGHT OF WAY.

FX5377'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 58 AND STATE

FX5377'HIGHWAY 35 JUST SOUTHWEST OF COURTLAND, GO SOUTHWEST ON STATE HIGHWAY

FX5377'35 (MEHERRIN ROAD) FOR 1.4 MI (2.3 KM) TO THE JUNCTION OF SECONDARY

FX5377'STATE HIGHWAY 658 (BLACKHEAD SIGNPOST ROAD) AND THE STATION IN THE

FX5377'SOUTHEAST CORNER OF THE JUNCTION.

FX5377'LOCATED 26.5 M (86.9 FT) SOUTHEAST FROM THE CENTERLINE OF HIGHWAY 35,

FX5377'26.1 M (85.6 FT) NORTHEAST FROM UTILITY POLE NO. 10-164-1, 21.0 M

FX5377'(68.9 FT) WEST FROM THE CENTERLINE OF HIGHWAY 658, 14.8 M (48.6 FT)

FX5377'SOUTH FROM A CABLE BOX WITH ORANGE TOP AND 0.6 M (2.0 FT) NORTH FROM A

FX5377'WITNESS POST.

FX5377

FX5377 STATION RECOVERY (1995)

FX5377

FX5377'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (CLS)

FX5377'THE STATION IS LOCATED ABOUT 40 KM (24.85 MI) EAST OF EMPORIA, 17.0 KM

FX5377'(10.55 MI) WEST OF FRANKLIN, 5.0 KM (3.10 MI) SOUTHWEST OF COURTLAND.

FX5377'OWNERSHIP--HIGHWAY RIGHT OF WAY. TO REACH THE STATION FROM THE

FX5377'JUNCTION OF U.S. HIGHWAY 58 AND STATE HIGHWAY 35 JUST SOUTHWEST OF

FX5377'COURTLAND, GO SOUTHWEST ON STATE HIGHWAY 35 (MEHERRIN ROAD) FOR 1.4 MI

FX5377'(2.3 KM) TO THE JUNCTION OF SECONDARY STATE HIGHWAY 658 (BLACKHEAD

FX5377'SIGNPOST ROAD) ON THE LEFT AND THE STATION IN THE WEST ANGLE OF THE

FX5377'JUNCTION. LOCATED 26.5 M (86.9 FT) SOUTHEAST FROM THE CENTERLINE OF

FX5377'HIGHWAY 35, 26.1 M (85.6 FT) NORTHEAST FROM UTILITY POLE NO. 10-164-1,

FX5377'21.0 M (68.9 FT) WEST FROM THE CENTERLINE OF HIGHWAY 658, 14.8 SOUTH

FX5377'FROM A CABLE BOX WITH ORANGE TOP, 18.8 M (61.7 FT) SOUTHWEST OF A
FX5377'ORANGE WARNING POST FOR A BURIED FIBER OPTIC CABLE ON THE WEST SIDE
FX5377'OF SECONDARY STATE HIGHWAY 658.

FX5377

FX5377 STATION RECOVERY (2000)

FX5377

FX5377'RECOVERY NOTE BY VIRGINIA DEPARTMENT OF TRANSPORTATION 2000 (TK)

FX5377'RECOVERED AS DESCRIBED.

FX5377

FX5377 STATION RECOVERY (2001)

FX5377

FX5377'RECOVERY NOTE BY VIRGINIA DEPARTMENT OF TRANSPORTATION 2001 (MZ)

FX5377'RECOVERED AS DESCRIBED. LOCATED 15.0 METERS (49.2 FEET) SOUTH OF A

FX5377'TELEPHONE BOX C-73-1

FX5377'NO ORANGE TOP, 10.28 METERS (33.7 FEET) SOUTH OF A GUY ANCHOR, 48.46

FX5377'METERS (159.00 FEET)

FX5377'NORTHWEST OF A YELLOW UNDERGROUND GAS PIPE MARKER.

FX5377'

FX5377'

FX5377'

FX5377

FX5377 STATION RECOVERY (2002)

FX5377

FX5377'RECOVERY NOTE BY ROUSE-SIRINE ASSOCIATES 2002 (DWS)

FX5377'RECOVERED IN GOOD CONDITION.

*** retrieval complete.

Elapsed Time = 00:00:02



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FX5374 CBN - This is a Cooperative Base Network Control Station.
FX5374 DESIGNATION - LP 2
FX5374 PID - FX5374
FX5374 STATE/COUNTY- VA/C OF SUFFOLK
FX5374 USGS QUAD - CHUCKATUCK (1990)
FX5374
FX5374 *CURRENT SURVEY CONTROL
FX5374
FX5374* NAD 83(2007)- 36 48 32.84247(N) 076 37 15.00901(W) ADJUSTED
FX5374* NAVD 88 - 7.7 (meters) 25. (feet) GPS OBS
FX5374
FX5374 EPOCH DATE - 2002.00
FX5374 X - 1,183,046.526 (meters) COMP
FX5374 Y - -4,973,932.259 (meters) COMP
FX5374 Z - 3,800,437.600 (meters) COMP
FX5374 LAPLACE CORR- -6.66 (seconds) DEFLEC09
FX5374 ELLIP HEIGHT- -28.477 (meters) (02/10/07) ADJUSTED
FX5374 GEOID HEIGHT- -36.13 (meters) GEOID09
FX5374
FX5374 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
FX5374 Type PID Designation North East Ellip
FX5374 -----
FX5374 NETWORK FX5374 LP 2 0.35 0.29 1.16
FX5374 -----
FX5374
FX5374.The horizontal coordinates were established by GPS observations
FX5374.and adjusted by the National Geodetic Survey in February 2007.
FX5374
FX5374.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
FX5374.See National Readjustment for more information.
FX5374.The horizontal coordinates are valid at the epoch date displayed above.
FX5374.The epoch date for horizontal control is a decimal equivalence
FX5374.of Year/Month/Day.
FX5374
FX5374.The orthometric height was determined by GPS observations and a
FX5374.high-resolution geoid model.
FX5374
FX5374.The X, Y, and Z were computed from the position and the ellipsoidal ht.
FX5374
FX5374.The Laplace correction was computed from DEFLEC09 derived deflections.
FX5374
FX5374.The ellipsoidal height was determined by GPS observations
FX5374.and is referenced to NAD 83.
FX5374
FX5374.The geoid height was determined by GEOID09.
FX5374
FX5374; North East Units Scale Factor Converg.
FX5374;SPC VA S - 1,054,469.389 3,667,672.405 MT 0.99999256 +1 08 25.8
FX5374;SPC VA S - 3,459,538.32 12,033,021.88 sFT 0.99999256 +1 08 25.8
FX5374;UTM 18 - 4,074,923.557 355,419.223 MT 0.99985753 -0 58 16.7
FX5374
FX5374! - Elev Factor x Scale Factor = Combined Factor
FX5374!SPC VA S - 1.00000447 x 0.99999256 = 0.99999703
FX5374!UTM 18 - 1.00000447 x 0.99985753 = 0.99986200
FX5374
FX5374 SUPERSEDED SURVEY CONTROL
FX5374
FX5374 ELLIP H (07/14/04) -28.472 (m) GP( ) 3 2
FX5374 ELLIP H (08/14/01) -28.463 (m) GP( ) 4 1

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FX5374 NAD 83(1986)- 36 48 32.85088(N) 076 37 15.02699(W) AD() 1
 FX5374 NAD 83(1993)- 36 48 32.84353(N) 076 37 15.00841(W) AD() B
 FX5374 ELLIP H (06/29/94) -28.465 (m) GP() 4 1
 FX5374 NAD 83(1993)- 36 48 32.84353(N) 076 37 15.00841(W) AD() B
 FX5374 ELLIP H (04/04/94) -28.465 (m) GP() 4 1
 FX5374 NAVD 88 (08/14/01) 7.7 (m) 25. (f) GPS OBS
 FX5374 NAVD 88 (06/02/98) 7.6 (m) 25. (f) GPS OBS
 FX5374 NAVD 88 (09/11/96) 7.6 (m) 25. (f) GPS OBS
 FX5374 NAVD 88 (04/04/94) 7.7 (m) 25. (f) GPS OBS

FX5374

FX5374.Superseded values are not recommended for survey control.

FX5374.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

FX5374.[See file dsdata.txt](#) to determine how the superseded data were derived.

FX5374

FX5374_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SUF5541974923(NAD 83)

FX5374_MARKER: I = METAL ROD

FX5374_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)

FX5374_SP_SET: STAINLESS STEEL ROD

FX5374_STAMPING: LP-2 1992

FX5374_MARK LOGO: RSA

FX5374_MAGNETIC: N = NO MAGNETIC MATERIAL

FX5374_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

FX5374_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

FX5374+SATELLITE: SATELLITE OBSERVATIONS - April 01, 2009

FX5374

FX5374	HISTORY	- Date	Condition	Report By
FX5374	HISTORY	- 1992	MONUMENTED	RSA
FX5374	HISTORY	- 19930505	GOOD	NGS
FX5374	HISTORY	- 19950823	GOOD	NGS
FX5374	HISTORY	- 20000302	GOOD	RSA
FX5374	HISTORY	- 20090401	GOOD	VADOT

FX5374

FX5374 STATION DESCRIPTION

FX5374

FX5374'DESCRIBED BY NATIONAL GEODETIC SURVEY 1993

FX5374'THE STATION IS LOCATED ABOUT 5.0 MI (8.0 KM) NORTHWEST OF SUFFOLK, AT

FX5374'LAKE PRINCE, IN THE GRASS AREA BETWEEN STATE HIGHWAY 605 AND THE

FX5374'CONCRETE SLOPE OF THE DAM. OWNERSHIP--STATE HIGHWAY RIGHT-OF-WAY.

FX5374'TO REACH THE STATION FROM THE JUNCTION U.S. HIGHWAY 58 AND U.S.

FX5374'HIGHWAY 460, JUST NORTHWEST OF SUFFOLK, GO NORTHWEST ON U.S. HIGHWAY

FX5374'460 FOR 2.0 MI (3.2 KM) TO STATE HIGHWAY 604 (LAKE PRINCE ROAD), TURN

FX5374'RIGHT AND GO NORTH 0.35 MI (0.56 KM) ON STATE HIGHWAY 604 TO A FORK

FX5374'IN ROAD, TAKE THE LEFT FORK AND GO 0.4 MI (0.6 KM) TO STATE HIGHWAY

FX5374'605 (GIRL SCOUT ROAD), TURN RIGHT AND GO 1.4 MI (2.3 KM) ON STATE

FX5374'HIGHWAY 605 TO THE STATION ON THE LEFT.

FX5374'ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. LOCATED 15.9

FX5374'M (52.2 FT) EAST FROM UTILITY POLE NO. 65, 7.0 M (23.0 FT) SOUTH FROM

FX5374'THE EGDE OF THE CONCRETE DAM, 3.9 M (12.8 FT) NORTH FROM THE

FX5374'CENTERLINE OF STATE HIGHWAY 605 AND 0.5 M (1.6 FT) SOUTH FROM A

FX5374'WITNESS POST.

FX5374

FX5374 STATION RECOVERY (1995)

FX5374

FX5374'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (CLS)

FX5374'RECOVERED AS DESCRIBED.

FX5374

FX5374 STATION RECOVERY (2000)

FX5374

FX5374'RECOVERY NOTE BY ROUSE-SIRINE ASSOCIATES 2000 (MS)

FX5374'RECOVERED AS DESCRIBED.

FX5374

FX5374 STATION RECOVERY (2009)

FX5374

FX5374'RECOVERY NOTE BY VIRGINIA DEPARTMENT OF TRANSPORTATION 2009 (WDF)
FX5374'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00





STATION DESCRIPTION FORM

PROJECT No.: 239DEB11
PROJECT NAME: Middle Counties
LOCATION: Prince George County VA

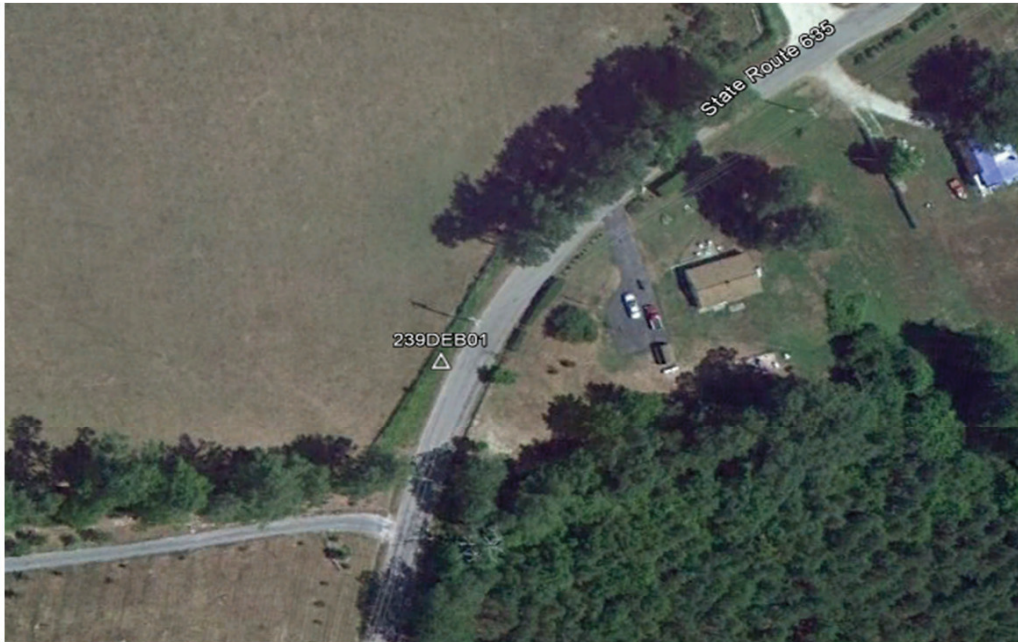
PHOTOS TAKEN:

STATION NAME: 239DEB-01	MARKER TYPE: Carriage bolt and washer	DATE: DEC 2011
STATION NUMBER: 239DEB-01	STATION LOCALITY: Prince George County VA	LEGAL DESCRIPTION:
DATUM: NAD83	CENTRAL MERIDIAN: 75	UTM ZONE: 18
LATITUDE: N 37 12 14.83514	LONGITUDE: W 077 11 44.20102	ELLIPSOID HEIGHT metres (h): -6.4390
UTM NORTHING metres: 4 119 774.561	UTM EASTING metres: 305 153.646	GEOID HEIGHT metres (MSL): 40.250

MONUMENT IS: FLUSH WITH GROUND ABOVE GROUND _____ CM BELOW GROUND _____ CM

MARKER LOCATION:

DIAGRAM (Include Ties to Relevant Features)





STATION DESCRIPTION FORM

PROJECT No.: 239DEB11
PROJECT NAME: Middle Counties
LOCATION: Prince George County VA

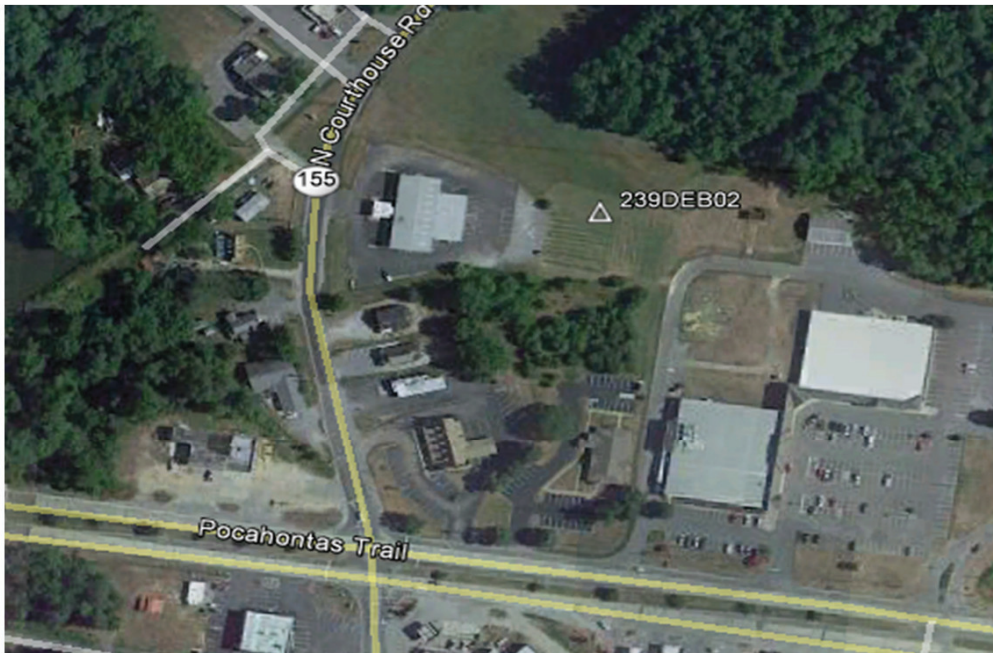
PHOTOS TAKEN:

STATION NAME: 239DEB-02	MARKER TYPE: Carriage bolt and washer	DATE: DEC 2011
STATION NUMBER: 239DEB-02	STATION LOCALITY: New Kent County VA	LEGAL DESCRIPTION:
DATUM: NAD83	CENTRAL MERIDIAN: 75	UTM ZONE: 18
LATITUDE: N 37 26 38.58489	LONGITUDE: W 077 11 44.20102	ELLIPSOID HEIGHT metres (h): -24.555
UTM NORTHING metres: 4 146 094.052	UTM EASTING metres: 319 259.616	GEOID HEIGHT metres (MSL): 9.445

MONUMENT IS: FLUSH WITH GROUND ABOVE GROUND _____ CM BELOW GROUND _____ CM

MARKER LOCATION:

DIAGRAM (Include Ties to Relevant Features)





STATION DESCRIPTION FORM

PROJECT No.: 239DEB11
PROJECT NAME: Middle Counties
LOCATION: Prince George County VA

PHOTOS TAKEN:

STATION NAME: 239DEB-03	MARKER TYPE: Carriage bolt and washer	DATE: DEC 2011
STATION NUMBER: 239DEB-03	STATION LOCALITY: Prince George County VA	LEGAL DESCRIPTION:
DATUM: NAD83	CENTRAL MERIDIAN: 75	UTM ZONE: 18
LATITUDE: N 37 12 14.83514	LONGITUDE: W 077 11 44.20102	ELLIPSOID HEIGHT metres (h): 0.744
UTM NORTHING metres: 4 121 577.601	UTM EASTING metres: 306 230.530	GEOID HEIGHT metres (MSL): 34.552

MONUMENT IS: FLUSH WITH GROUND ABOVE GROUND _____ CM BELOW GROUND _____ CM

MARKER LOCATION:

DIAGRAM (Include Ties to Relevant Features)





STATION DESCRIPTION FORM

PROJECT No.: 239DEB11
PROJECT NAME: Middle Counties
LOCATION: South Hampton County VA

PHOTOS TAKEN:

STATION NAME: 239DEB-05	MARKER TYPE: Carriage bolt and washer	DATE: DEC 2011
STATION NUMBER: 239DEB-05	STATION LOCALITY: Southampton County VA	LEGAL DESCRIPTION:
DATUM: NAD83	CENTRAL MERIDIAN: 75	UTM ZONE: 18
LATITUDE: N 36 50 47.15799	LONGITUDE: W 076 59 00.22918	ELLIPSOID HEIGHT metres (h): -14.609
UTM NORTHING metres: 4 085 372.749	UTM EASTING metres: 858 181.993	GEOID HEIGHT metres (MSL): 20.3903

MONUMENT IS: FLUSH WITH GROUND ABOVE GROUND _____ CM BELOW GROUND _____ CM

MARKER LOCATION:

DIAGRAM (Include Ties to Relevant Features)

