
# Geodetic Control Survey Report

## 11103U South Area

Project Number: 2011-103U
Project: Fema Virginia
Client: Dewberry & Davis LLC

Prepared by: Adrian Camungol
Date: 25 May 2011

Control Source: National Geodetic Survey
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: Meters
Geoid: Geoid09

Published Control Station:

**HV5411**

**Latitude:** N38 02 33.30691
**Longitude: W**77 04 10.63718
**Ellipsoid Height:** 16.170m
**Orthometric Height:** 49.51m

GV1969

**Latitude:** N 37 11 59.24638
**Longitude:** W 77 27 47.44394
**Ellipsoid Height:** 21.192m
**Orthometric Height**: 54.772m

New Control Stations:

1110305
**Latitude:** N 37 42 26.58275
**Longitude:** W 77 26 13.13327
**Ellipsoid Height:** 28.5836 m
**Orthometric Height:** 61.4241m

1110306
**Latitude:** N 37 30 06.65193
**Longitude:** W 77 07 33.81068
**Ellipsoid Height:** -0.1037m
**Orthometric Height:** 33.4957m

Table of Contents:

· *Project Information*
· *Requirements for LiDAR Control Points*
· *Final Coordinates (Geodetic and Grid)*
· *Map of Fully Constrained Control Network*
· *Fully Constrained GPS Network*
*(Final results used to produce coordinates for new points)*
· *Minimally Constrained GPS Network*
*(Validate fit and reliability of published control points)*
· New Control Station Descriptions
· *Published Control Station Descriptions and coordinates*

## *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.
    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 +/- 1/3rd 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).

Note: Even if all control stations are published, they must still be tied in order to validate the coordinates.

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

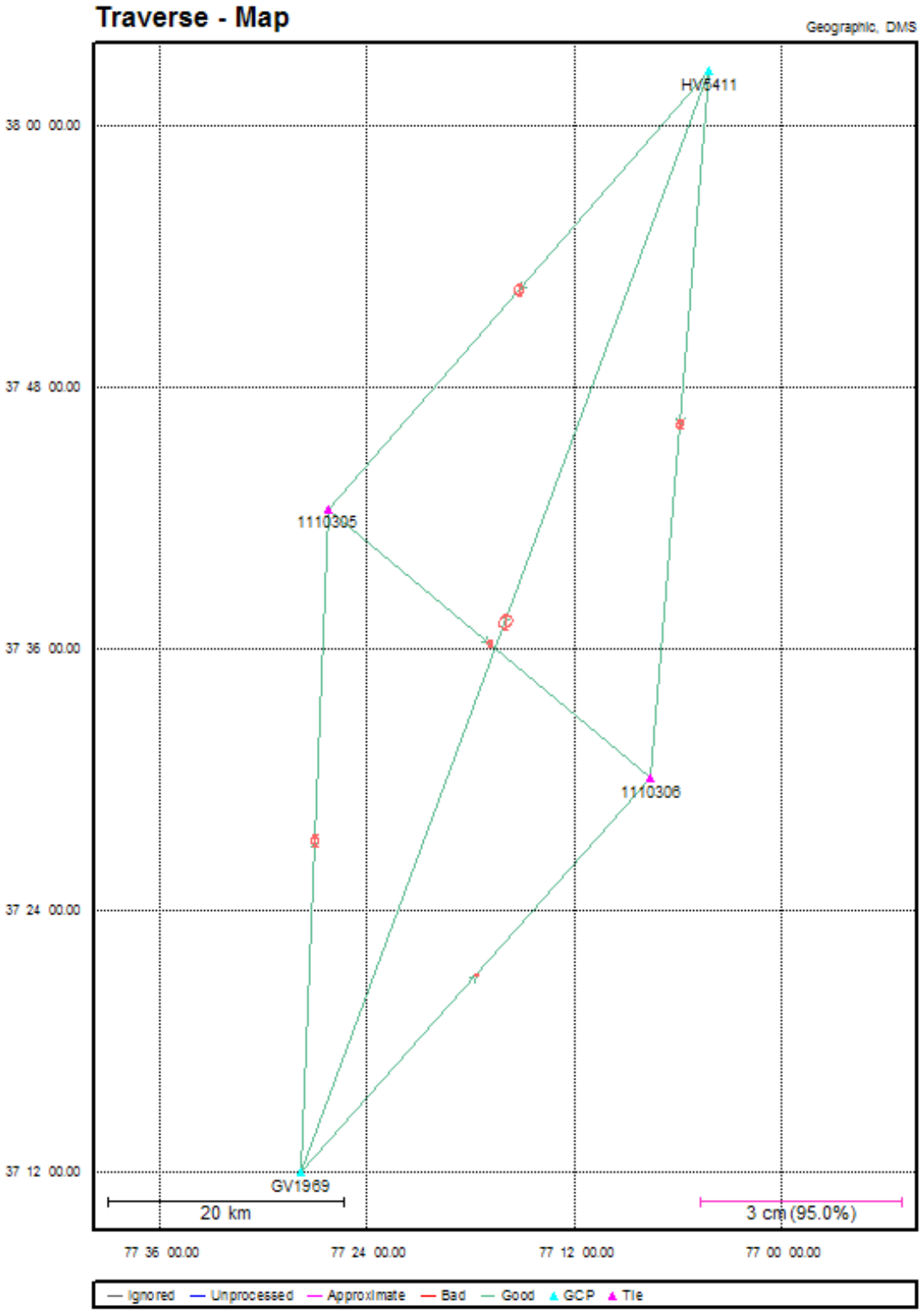
the collection requirements cannot be met and/or obstructions are present.

## CORS for GPS Control Network Observations

COR Stations may be used to supplement ground-based control but shall not be used exclusively. CORS shall not be relied upon to provide flight control (even if they do log at 1 second) since there is no guarantee that the station(s) are operational.

# Map of Control Network

Project: 11103U_South_Area_fully_constrained GrafNet v7.80.2517



```
            ************************************************
            * NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT    *
            *                                              *
            * (c) Copyright NovAtel Inc., (2007)           *
            *                                              *
            * Version: 7.80.2517                           *
            *                                              *
            *FILE:C:\DocumentsandSettings\adrian.camungol\Desktop\2011_103U\2_Op
erations\4_Control\GrafnetProject\11103U_South_Area_fully_constrained.net
            ************************************************

DATE(m/d/y): Tue.  5/10/11  TIME: 16:50:29



*****************************************************************

  DATUM:           'NAD83'
  GRID:           UTM, Zone 18
  SCALE_FACTOR:   21.1370
  CONFIDENCE LEVEL: 95.00 %  (Scale factor is 2.4479)


*****************************************************************
    INPUTCONTROL/CHECKPOINTS
*****************************************************************

STA_ID    TYPE    -- LATITUDE --  -- LONGITUDE --  ELLHGT -   HZ-SD   V-SD
GV1969    GCP-3D  37 11 59.24638  -77 27 47.44394    21.192 0.01000 0.01000
HV5411    GCP-3D  38 02 33.30691  -77 04 10.63718    16.170 0.01000 0.01000


*****************************************************************
    INPUTVECTORS
*****************************************************************

SESSION NAME        VECTOR(m)   ------ Covariance (m) [unscaled] ------
                       DX/DY/DZ       standard deviations in brackets
1110305 to 1110306 (1) 29841.1141 1.4682e-007 (0.0004)
                       -7511.9690-1.1530e-0075.7097e-007(0.0008)
                       -18090.34539.6798e-008-3.4518e-0073.8775e-007(0.0006)

GV1969 to 1110305 (1) -5180.2927 3.6507e-007 (0.0006)
                       33938.2985-2.8995e-0071.6500e-006(0.0013)
                       44726.50682.6048e-007-9.9935e-0071.0980e-006(0.0010)

GV1969 to 1110306 (1) 24660.8211 6.5985e-008 (0.0003)
                       26426.3243-4.4650e-0082.1819e-007(0.0005)
                       26636.16253.3437e-008-1.1407e-0071.4269e-007(0.0004)

HV5411 to 1110305 (2) -26482.2040 5.2580e-007 (0.0007)
                       -29419.7195-3.4711e-0072.0904e-006(0.0014)
                       -29360.56082.7337e-007-1.1610e-0061.1882e-006(0.0011)

HV5411 to 1110306 (1)  3358.9177 4.6295e-007 (0.0007)
                       -36931.7054-4.7238e-0071.1293e-006(0.0011)
                       -47450.89242.1677e-007-5.1519e-0075.8496e-007(0.0008)

HV5411 to 1110306 (2)  3358.9186 3.6755e-007 (0.0006)
                       -36931.7041-3.8590e-0079.3998e-007(0.0010)
                       -47450.89331.8507e-007-4.4514e-0074.9824e-007(0.0007)

HV5411 to GV1969 (1)  -21301.9086 1.4456e-006 (0.0012)
```

```
                    -63358.0059-1.5766e-0063.5761e-006(0.0019)
                    -74087.07278.8348e-007-1.6943e-0061.8663e-006(0.0014)
```

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

| SESSION NAME | -- RE -- (m) | -- RN -- (m) | -- RH -- (m) | - PPM - | DIST (km) | STD (m) |
|---|---|---|---|---|---|---|
| 1110305 to 1110306 (1) | 0.0002 | -0.0003 | 0.0040 | 0.114 | 35.7 | 0.0048 |
| GV1969 to 1110305 (1) | -0.0017 | -0.0016 | 0.0026 | 0.062 | 56.4 | 0.0081 |
| GV1969 to 1110306 (1) | -0.0000 | 0.0004 | 0.0021 | 0.047 | 44.9 | 0.0030 |
| HV5411 to 1110305 (2) | 0.0029 | 0.0003 | 0.0102 | 0.215 | 49.3 | 0.0090 |
| HV5411 to 1110306 (1) | -0.0005 | 0.0003 | -0.0086 | 0.143 | 60.2 | 0.0068 |
| HV5411 to 1110306 (2) | -0.0017 | 0.0003 | -0.0071 | 0.122 | 60.2 | 0.0062 |
| HV5411 to GV1969 (1) | -0.0007 | -0.0008 | 0.0195 | 0.196 | 99.8 | 0.0121 |
| RMS | 0.0015 | 0.0007 | 0.0095 | | | |

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

**********
CONTROL POINT RESIDUALS (ADJUSTMENT MADE)
**********

| STA. NAME | -- RE -- (m) | -- RN -- (m) | -- RH -- (m) |
|---|---|---|---|
| GV1969 | 0.0010 | 0.0088 | 0.0121 |
| HV5411 | -0.0009 | -0.0086 | -0.0122 |
| RMS | 0.0009 | 0.0087 | 0.0122 |

**********
OUTPUT STATION COORDINATES (LAT/LONG/HT)
**********

| STA_ID | -- LATITUDE -- | -- LONGITUDE -- | - ELLHGT - | ORTHOHGT |
|---|---|---|---|---|
| 1110305 | 37 42 26.58275 | -77 26 13.13327 | 28.5836 | 61.4241 |
| 1110306 | 37 30 06.65193 | -77 07 33.81068 | -0.1037 | 33.4957 |
| GV1969 | 37 11 59.24666 | -77 27 47.44390 | 21.2040 | 54.7785 |
| HV5411 | 38 02 33.30663 | -77 04 10.63722 | 16.1577 | 49.4970 |

**********
OUTPUT STATION COORDINATES (GRID)
**********

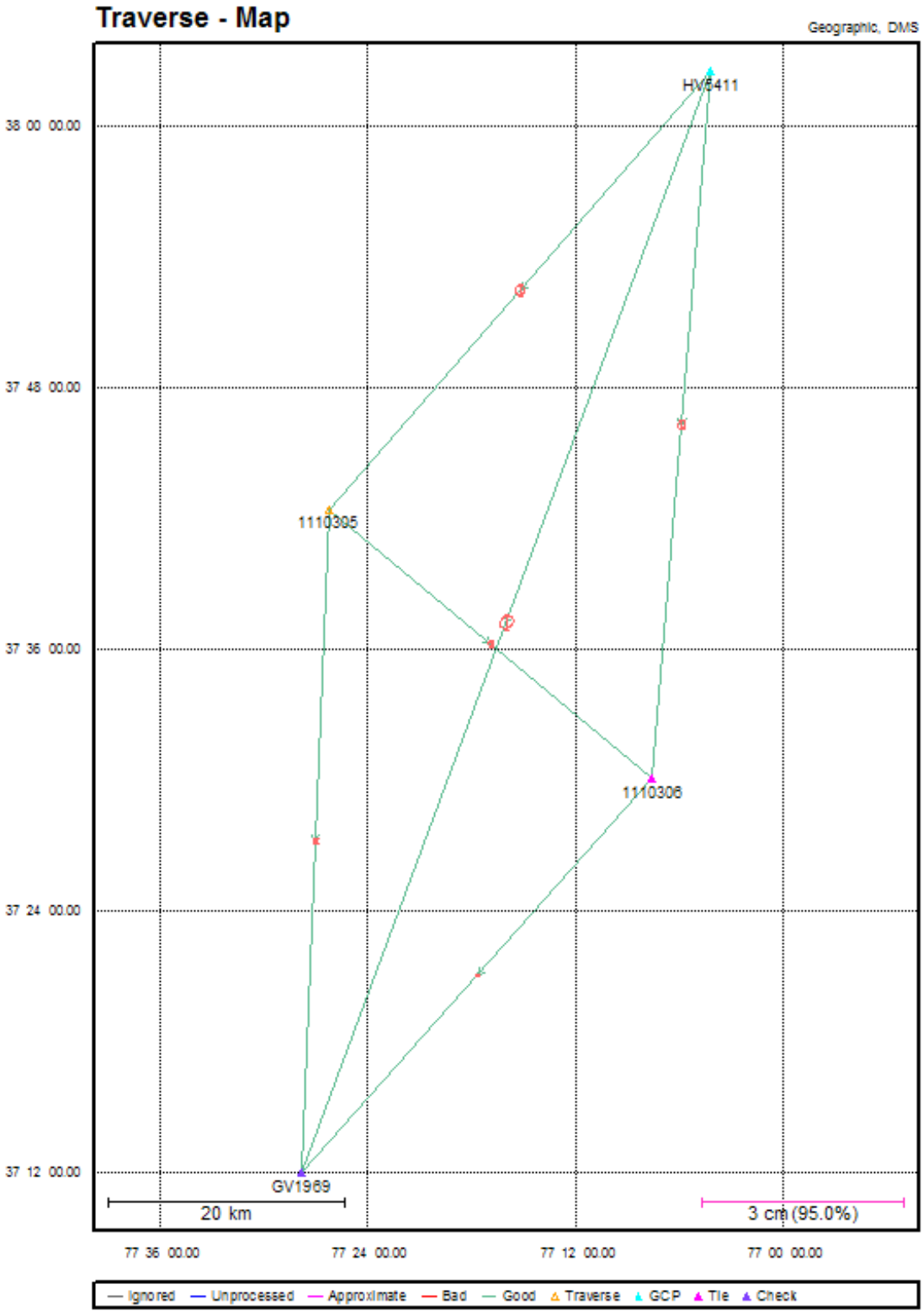
| STA_ID | - EASTING - (m) | - NORTHING - (m) | - ELLHGT - (m) | ORTHOHGT (m) |
|---|---|---|---|---|
| 1110305 | 285175.7060 | 4176144.7306 | 28.5836 | 61.4241 |
| 1110306 | 312070.8931 | 4152669.5598 | -0.1037 | 33.4957 |
| GV1969 | 281392.5112 | 4119878.1991 | 21.2040 | 54.7785 |
| HV5411 | 318388.2995 | 4212561.7760 | 16.1577 | 49.4970 |

**********
OUTPUT VARIANCE/COVARIANCE
**********

```
                                                  2
STA_ID    SE/SN/SUP ---------- CX matrix (m )-----------
           (95.00 %)  (not scaled by confidence level)
              (m)          (ECEF, XYZ cartesian)
1110305      0.0176  5.2278e-005
              0.0176 -1.7926e-006 5.8709e-005
              0.0194 1.3932e-006 -5.0390e-006 5.5548e-005

1110306      0.0174  5.1114e-005
              0.0175 -9.9502e-007 5.3204e-005
              0.0181 5.7132e-007 -1.6151e-006 5.1903e-005

GV1969       0.0174  5.0898e-005
              0.0174 -8.0582e-007 5.2461e-005
              0.0179 4.5854e-007 -1.2088e-006 5.1445e-005

HV5411       0.0174  5.0898e-005
              0.0174 -8.0582e-007 5.2461e-005
              0.0179 4.5854e-007 -1.2088e-006 5.1445e-005



*********************************************************************
    VARIANCE FACTOR = 1.0003

    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.
*********************************************************************
```

```
************************************************
* GrafNet - GRAPHIC GPS NETWORK PROCESSING     *
*           SOFTWARE PACKAGE                   *
*                                              *
* TRAVERSE SOLUTION:                           *
*                                              *
* Copyright NovAtel Inc. (2007)                *
*                                              *
* Version: 7.80.2517                           *
*                                              *
*PROJECT:11103U_South_Area_fully_constrained*
************************************************

DATE:  5/25/2011 (m/d/y)
TIME:  13:09:15

DATUM: NAD83
GRID:  UTM, Zone 18
UNITS: metres (see preferences to change)
GEOID:C:\Documents and Settings\adrian.camungol\Desktop\Operations_DVD\Software\Geo
ids\USA\Geoid09\Geoid09_CONUS.wpg


*********************************
  STATIONS (STATUS):
*********************************

Station  Type      HgtStatus     Result  Coordinates derrived from...
1110305  Loop Tie   OK            Good    GV1969
1110306  Loop Tie   OK            Good    GV1969
GV1969   Control-3D OK           Pub(3D) (-)
HV5411   Control-3D OK           Pub(3D) (-)


*********************************
  STATIONS (COORDINATES):
*********************************

Station        Latitude       Longitude      Grid-E      Grid-N    EllHgt  OrthoH
gt
                 (D M S)         (D M S)         (m)         (m)       (m)       (
m)
1110305   37 42 26.58252  -77 26 13.13324  285175.707  4176144.724   28.569   61.4
09
1110306   37 30 06.65164  -77 07 33.81072  312070.892  4152669.551   -0.118   33.4
81
GV1969    37 11 59.24638  -77 27 47.44394  281392.510  4119878.190   21.192   54.7
67
HV5411    38 02 33.30691  -77 04 10.63718  318388.301  4212561.785   16.170   49.5
09


*********************************
LOOP, CHECK & DUPLICATE TIES:
*********************************

Name/Session            Type      Result    DEast   DNorth  DHeight
                                              (m)      (m)      (m)
HV5411 to 1110305       LoopTie   Good     0.0027  -0.0155  -0.0168
HV5411 to 1110306 (1)   Duplicate Good    -0.0023  -0.0177  -0.0350
HV5411 to 1110306       LoopTie   Good    -0.0035  -0.0176  -0.0335
1110305 to 1110306      LoopTie   Good    -0.0014  -0.0023   0.0046
                                          ------------------------
RMS (tie points)                           0.0026   0.0147   0.0257
RMS (check points)
                                          ========================
```

Minimally Constrained GPS Network



```
            ************************************************
            * NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT    *
            *                                              *
            * (c) Copyright NovAtel Inc., (2007)           *
            *                                              *
            * Version: 7.80.2517                           *
            *                                              *
            *FILE:C:\DocumentsandSettings\adrian.camungol\Desktop\2011_103U\2_Op
erations\4_Control\GrafnetProject\11103U_South_Area_minimally_constrained.net
            ************************************************

DATE(m/d/y): Tue.  5/10/11  TIME: 16:42:08



*****************************************************************

  DATUM:           'NAD83'
  GRID:            UTM, Zone 18
  SCALE_FACTOR:    32.7650
  CONFIDENCE LEVEL: 95.00 %  (Scale factor is 2.4479)


*****************************************************************
    INPUTCONTROL/CHECKPOINTS
*****************************************************************

STA_ID    TYPE    -- LATITUDE --  -- LONGITUDE --  ELLHGT -  HZ-SD  V-SD
GV1969    CHK-3D  37 11 59.24638  -77 27 47.44394    21.192
HV5411    GCP-3D  38 02 33.30691  -77 04 10.63718    16.170 0.00500 0.00500


*****************************************************************
    INPUTVECTORS
*****************************************************************

SESSION NAME        VECTOR(m)   ------ Covariance (m) [unscaled] ------
                       DX/DY/DZ       standard deviations in brackets
1110305 to 1110306 (1) 29841.1141 1.4682e-007 (0.0004)
                      -7511.9690-1.1530e-0075.7097e-007(0.0008)
                      -18090.34539.6798e-008-3.4518e-0073.8775e-007(0.0006)

1110305 to GV1969 (1)  5180.2956 9.6957e-008 (0.0003)
                      -33938.3108-5.4631e-0083.6393e-007(0.0006)
                      -44726.49644.8301e-008-1.9853e-0072.4985e-007(0.0005)

1110306 to GV1969 (1) -24660.8205 6.6069e-008 (0.0003)
                      -26426.3272-4.4724e-0082.1800e-007(0.0005)
                      -26636.16033.3581e-008-1.1414e-0071.4286e-007(0.0004)

HV5411 to 1110305 (2) -26482.2040 5.2580e-007 (0.0007)
                      -29419.7195-3.4711e-0072.0904e-006(0.0014)
                      -29360.56082.7337e-007-1.1610e-0061.1882e-006(0.0011)

HV5411 to 1110306 (1)  3358.9177 4.6295e-007 (0.0007)
                      -36931.7054-4.7238e-0071.1293e-006(0.0011)
                      -47450.89242.1677e-007-5.1519e-0075.8496e-007(0.0008)

HV5411 to GV1969 (1)  -21301.9086 1.4456e-006 (0.0012)
                      -63358.0059-1.5766e-0063.5761e-006(0.0019)
                      -74087.07278.8348e-007-1.6943e-0061.8663e-006(0.0014)
```

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

| SESSION NAME | -- RE -- (m) | -- RN -- (m) | -- RH -- (m) | - PPM - | DIST (km) | - STD - (m) |
|---|---|---|---|---|---|---|
| 1110305 to 1110306 (1) | -0.0003 | -0.0006 | 0.0101 | 0.284 | 35.7 | 0.0060 |
| 1110305 to GV1969 (1) | 0.0010 | 0.0006 | -0.0058 | 0.106 | 56.4 | 0.0048 |
| 1110306 to GV1969 (1) | -0.0000 | -0.0004 | 0.0013 | 0.030 | 44.9 | 0.0037 |
| HV5411 to 1110305 (2) | 0.0029 | 0.0006 | 0.0020 | 0.073 | 49.3 | 0.0112 |
| HV5411 to 1110306 (1) | -0.0010 | 0.0003 | -0.0107 | 0.178 | 60.2 | 0.0084 |
| HV5411 to GV1969 (1) | -0.0013 | -0.0010 | 0.0245 | 0.246 | 99.8 | 0.0150 |
| RMS | 0.0014 | 0.0006 | 0.0119 | | | |

$ - 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) |
|---|---|---|---|
| GV1969 | 0.0014 | 0.0175 | 0.0292 |
| RMS | 0.0014 | 0.0175 | 0.0292 |

**********
OUTPUTSTATIONCOORDINATES(LAT/LONG/HT)
**********

| STA_ID | -- LATITUDE -- | -- LONGITUDE -- | - ELLHGT - | ORTHOHGT |
|---|---|---|---|---|
| 1110305 | 37 42 26.58304 | -77 26 13.13323 | 28.5876 | 61.4281 |
| 1110306 | 37 30 06.65222 | -77 07 33.81067 | -0.0937 | 33.5057 |
| GV1969 | 37 11 59.24695 | -77 27 47.44388 | 21.2211 | 54.7956 |
| HV5411 | 38 02 33.30691 | -77 04 10.63718 | 16.1699 | 49.5092 |

**********
OUTPUTSTATIONCOORDINATES(GRID)
**********

| STA_ID | - EASTING - (m) | - NORTHING - (m) | - ELLHGT - (m) | ORTHOHGT (m) |
|---|---|---|---|---|
| 1110305 | 285175.7072 | 4176144.7396 | 28.5876 | 61.4281 |
| 1110306 | 312070.8937 | 4152669.5686 | -0.0937 | 33.5057 |
| GV1969 | 281392.5118 | 4119878.2079 | 21.2211 | 54.7956 |
| HV5411 | 318388.3006 | 4212561.7846 | 16.1699 | 49.5092 |

**********
OUTPUTVARIANCE/COVARIANCE
**********

| STA_ID | SE/SN/SUP (95.00 %) (m) | CX matrix ($m^2$) (not scaled by confidence level) (ECEF, XYZ cartesian) |
|---|---|---|
| 1110305 | 0.0135 | 3.2464e-005 |
| | 0.0135 | -6.6558e-006 4.7534e-005 |

```
              0.0185 4.0489e-006-1.1697e-0053.8026e-005

1110306       0.0134  3.2227e-005
              0.0134 -6.9132e-0064.4800e-005
              0.0179 3.8405e-006-9.8441e-0063.6157e-005

GV1969        0.0135  3.2636e-005
              0.0135 -7.1043e-0064.6506e-005
              0.0183 4.1207e-006-1.0769e-0053.7321e-005

HV5411        0.0122  2.5000e-005
              0.0122 -9.0949e-0212.5000e-005
              0.0122 6.8212e-021-1.8637e-0352.5000e-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.
**********************************************************************
```

```
*************************************************
* GrafNet - GRAPHIC GPS NETWORK PROCESSING      *
*           SOFTWARE PACKAGE                    *
*                                               *
* TRAVERSE SOLUTION:                            *
*                                               *
* Copyright NovAtel Inc. (2007)                 *
*                                               *
* Version: 7.80.2517                            *
*                                               *
*PROJECT:11103U_South_Area_minimally_constrained*
*************************************************


DATE:  5/24/2011 (m/d/y)
TIME:  14:40:13

DATUM: NAD83
GRID:  UTM, Zone 18
UNITS: metres (see preferences to change)
GEOID: C:\Documents and Settings\adrian.camungol\Desktop\Operations_DVD\Software\Geo
ids\USA\Geoid09\Geoid09_CONUS.wpg


*********************************
  STATIONS (STATUS):
*********************************

Station  Type      HgtStatus     Result  Coordinates derrived from...
1110305  Traverse   OK           Good    HV5411
1110306  Loop Tie   OK           Good    HV5411
GV1969   Check-3D   OK           Good    HV5411
HV5411   Control-3D OK           Pub(3D) (-)


*********************************
  STATIONS (COORDINATES):
*********************************

Station        Latitude       Longitude      Grid-E      Grid-N    EllHgt  OrthoH
gt
                 (D M S)         (D M S)         (m)         (m)       (m)       (
m)
1110305   37 42 26.58302  -77 26 13.13335  285175.704  4176144.739   28.586   61.4
26
1110306   37 30 06.65221  -77 07 33.81063  312070.895  4152669.568   -0.083   33.5
16
GV1969    37 11 59.24697  -77 27 47.44384  281392.513  4119878.209   21.197   54.7
71
HV5411    38 02 33.30691  -77 04 10.63718  318388.301  4212561.785   16.170   49.5
09


*********************************
LOOP, CHECK & DUPLICATE TIES:
*********************************

Name/Session           Type      Result    DEast   DNorth  DHeight
                                             (m)     (m)       (m)
1110305 to 1110306     LoopTie   Good    0.0036 -0.0002   0.0228
POINT GV1969           CheckPnt  Good    0.0026  0.0183   0.0046
1110305 to GV1969      LoopTie   Good    0.0051  0.0020  -0.0283
1110306 to GV1969      LoopTie   Good    0.0002  0.0005  -0.0339
                                        ------------------------
RMS (tie points)                        0.0036  0.0012   0.0287
RMS (check points)                      0.0026  0.0183   0.0046
                                        ========================
```

## Station Description and Photos:

1110305
**Latitude:** N 37 42 26.58275
**Longitude:** W 77 26 13.13327
**Ellipsoid Height:** 28.5836 m
**Orthometric Height:** 61.4241m

Final STATION COORDINATES (GRID)
**Easting:** 285175.7060
**Northing:** 4176144.7306
**Ellipsoid Height:** 28.5836 m
**Orthometric Height:** 61.4241m

Terrapoint

## STATION DESCRIPTION FORM

PROJECT No.: 1110305
PROJECT NAME: Fimo VA.
LOCATION: Hanover

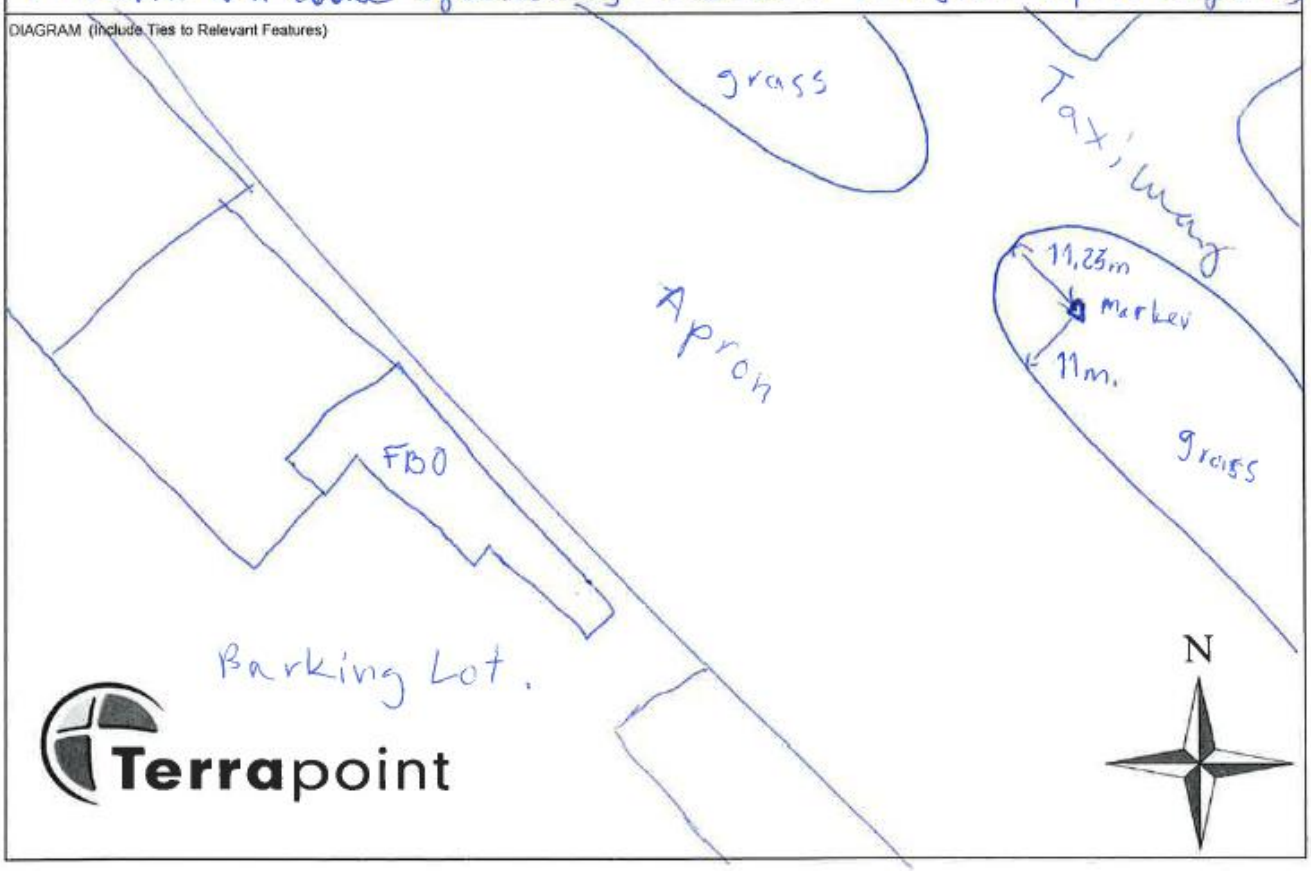
PHOTOS TAKEN:

| STATION NAME: | MARKER TYPE: | DATE: |
|---|---|---|
| 1110305 | Rebar. | 9 may 2011 |
| **STATION NUMBER:** | **STATION LOCALITY:** | **LEGAL DESCRIPTION:** |
| 1110305 | Hanover | |
| **DATUM:** | **CENTRAL MERIDIAN:** | **UTM ZONE:** |
| NAD83 | | 18 |
| **LATITUDE:** | **LONGITUDE:** | **ELLIPSOID HEIGHT metres (h):** |
| 37 42 26.58275 | 77 26 13.13327 | 28.5836 m |
| **UTM NORTHING metres:** | **UTM EASITNG metres:** | **GEOID HEIGHT metres (MSL):** |
| 285175.7060 | 4176144.7306 | 61.4241m |

MONUMENT IS: ☒ FLUSH WITH GROUND ☐ ABOVE GROUND _____ cm ☐ BELOW GROUND _____ cm

MARKER LOCATION: In Hanover Airport, on the grass across the Arpron 11.25 m NW corne of taxiway entrance & 11m from Apron Edge(SW)

DIAGRAM (Include Ties to Relevant Features)




Terrapoint

1110306
**Latitude:** N 37 30 06.65193
**Longitude:** W 77 07 33.81068
**Ellipsoid Height:** -0.1037m
**Orthometric Height:** 33.4957m

Final STATION COORDINATES (GRID)
**Easting:** 312070.8931
**Northing:** 4152669.5598
**Ellipsoid Height:** -0.1037m
**Orthometric Height:** 33.4957m

## STATION DESCRIPTION FORM

PROJECT No.: 1110306
PROJECT NAME: Fema VA
LOCATION: Kent County

Terrapoint

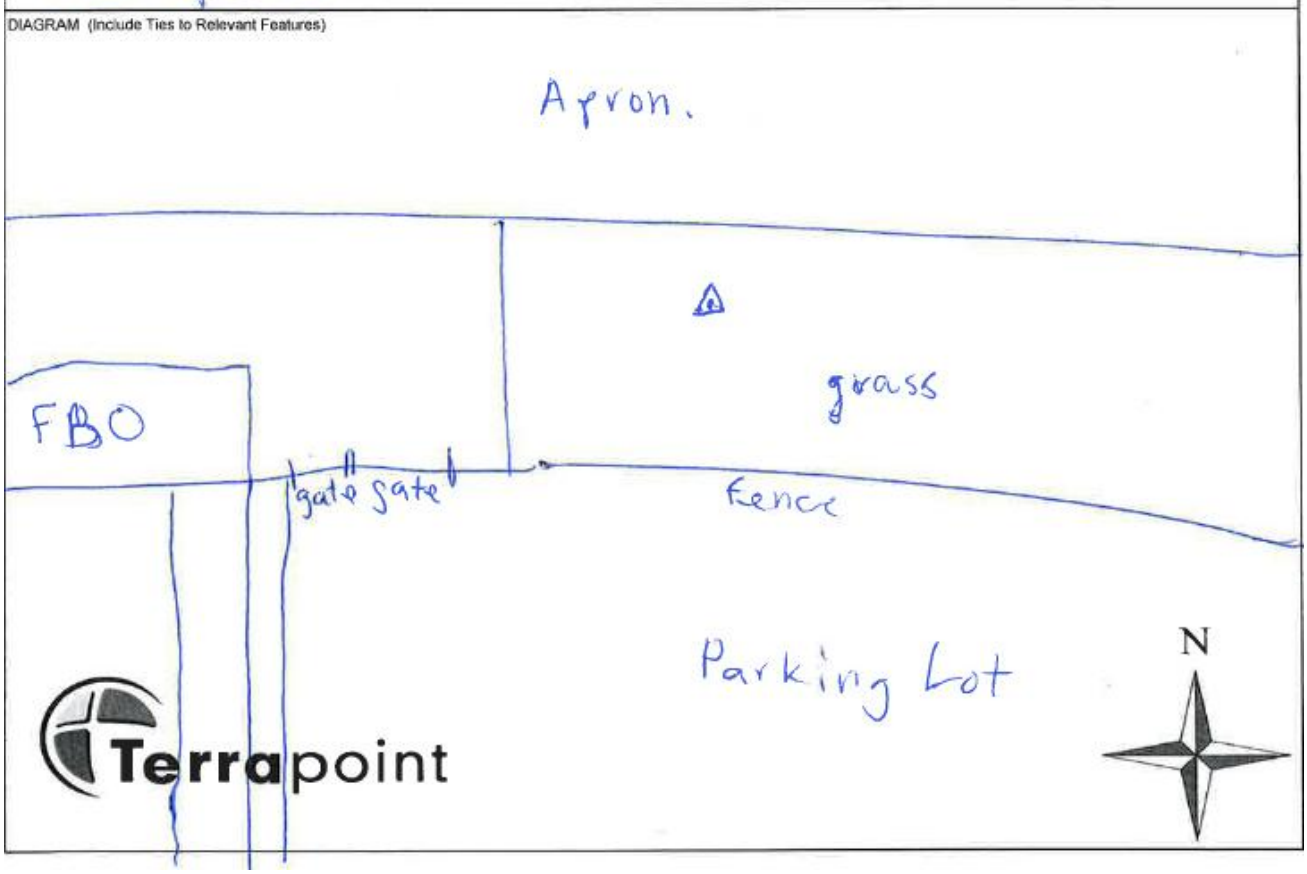
PHOTOS TAKEN:

| STATION NAME: | MARKER TYPE: | DATE: |
|---|---|---|
| 1110306 | Rebar. | 9 May 2011 |
| **STATION NUMBER:** | **STATION LOCALITY:** | **LEGAL DESCRIPTION:** |
| 1110306 | Kent County Airport | |
| **DATUM:** | **CENTRAL MERIDIAN:** | **UTM ZONE:** |
| NAD83 | | 18 |
| **LATITUDE:** | **LONGITUDE:** | **ELLIPSOID HEIGHT metres (h):** |
| 37 30 06.65193 | 77 07 33.81068 | -0.1037m |
| **UTM NORTHING metres:** | **UTM EASITNG metres:** | **GEOID HEIGHT metres (MSL):** |
| 4152669.5598 | 312070.8931 | 33.4957m |

MONUMENT IS: ☒ FLUSH WITH GROUND ☐ ABOVE GROUND _____ cm ☐ BELOW GROUND _____ cm

MARKER LOCATION: At Kent County Airport on the grass west to the Apron.

DIAGRAM (Include Ties to Relevant Features)



**HV5411**

**Latitude:** N38 02 33.30691
**Longitude: W**77 04 10.63718
**Ellipsoid Height:** 16.170m
**Orthometric Height:** 49.51m

Terrapoint

## STATION DESCRIPTION FORM

PROJECT No.: 11103V

PROJECT NAME: Fenn VA.

LOCATION: Essex County

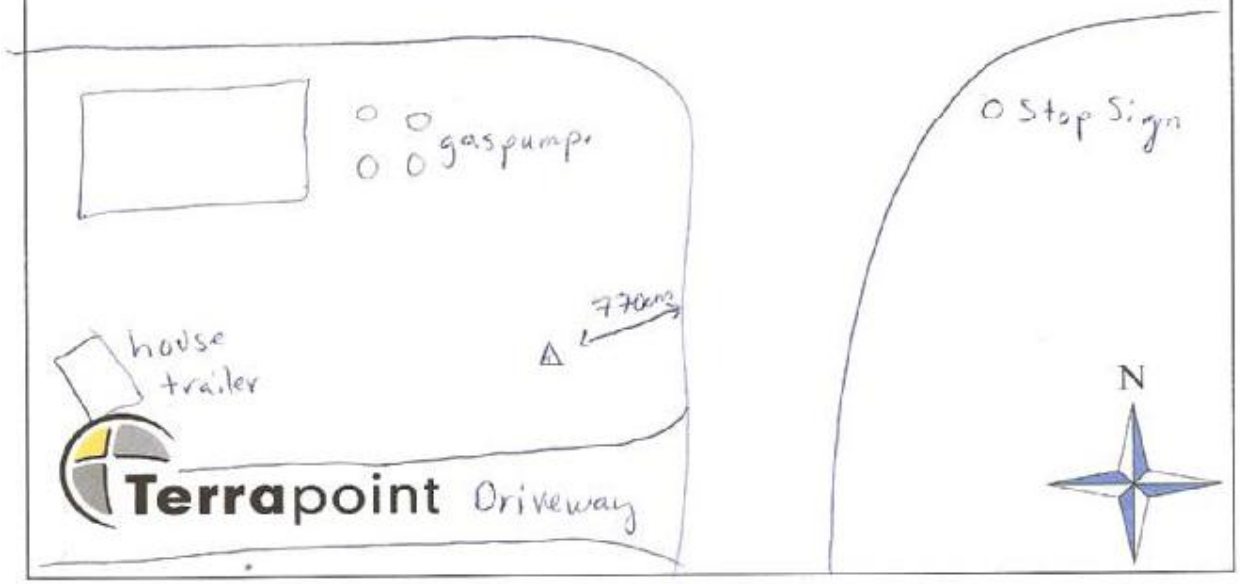
PHOTOS TAKEN:

| STATION NAME: | MARKER TYPE: | DATE: |
|---|---|---|
| HV 5411 | Bronze Marker | 25/9/2011 |
| **STATION NUMBER:** | **STATION LOCALITY:** | **LEGAL DESCRIPTION:** |
| HV 5411 | Hustle Post Off in Essex County | |
| **DATUM:** | **CENTRAL MERIDIAN:** | **UTM ZONE:** |
| NAD83 | | 18 |
| **LATITUDE:** | **LONGITUDE:** | **ELLIPSOID HEIGHT metres (h):** |
| N38 02 33.30691 | W77 04 10.63718 | 16.170m |
| **UTM NORTHING metres:** | **UTM EASTNG metres:** | **GEOID HEIGHT metres (MSL):** |
| 4212561.7555 | 318388.2985 | 49.51m |

MONUMENT IS: ☒ FLUSH WITH GROUND ☐ ABOVE GROUND _____ cm ☐ BELOW GROUND _____ cm

MARKER LOCATION: 10.9m East of SE corner of abandoned store

DIAGRAM (Include Ties to Relevant Features)



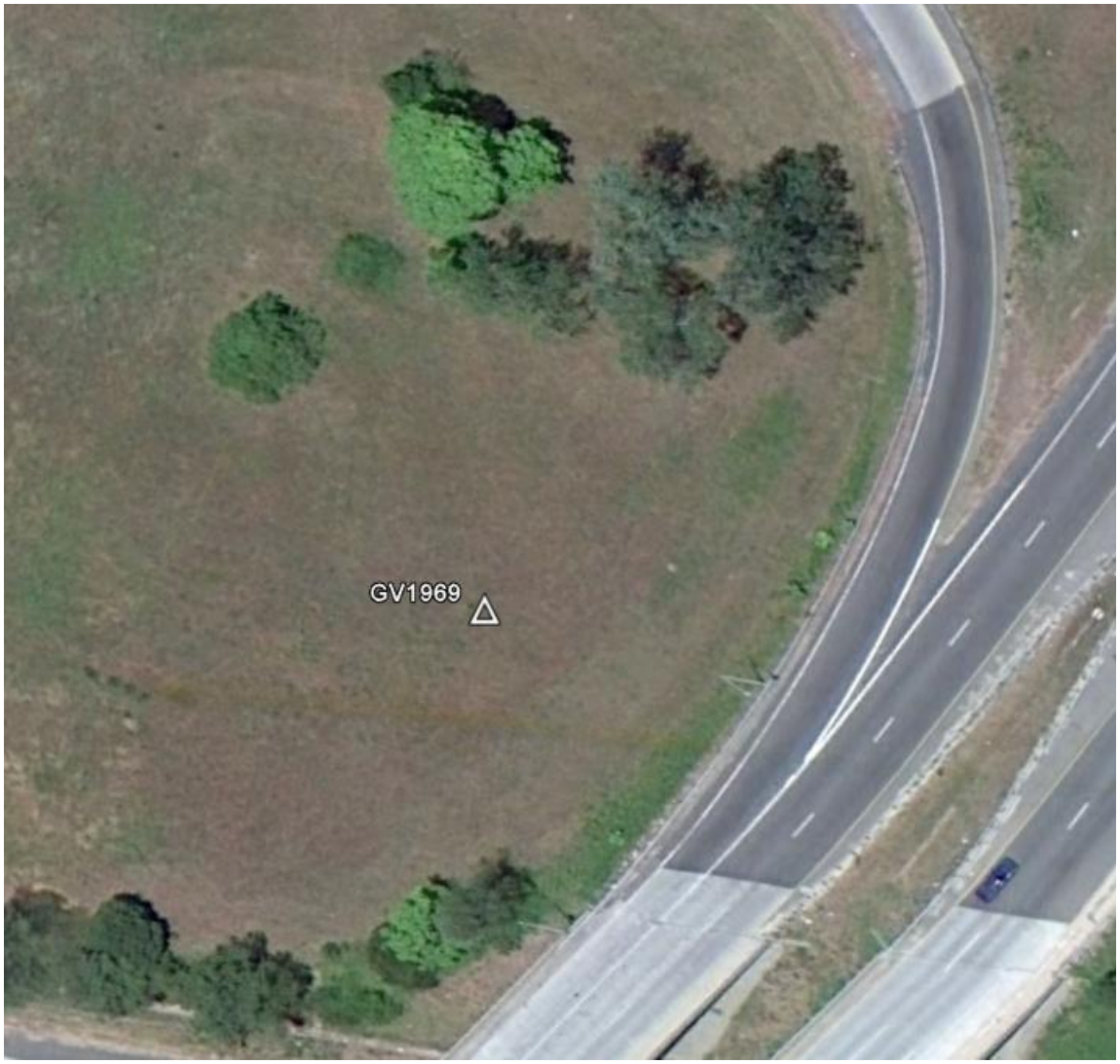
```
HV5411  CBN         -  This is a Cooperative Base Network Control Station.
HV5411  DESIGNATION -  HUSTLE RESET
HV5411  PID         -  HV5411
HV5411  STATE/COUNTY-  VA/ESSEX
HV5411  USGS QUAD   -  LORETTO (1978)
HV5411
HV5411                        *CURRENT SURVEY CONTROL
HV5411  ______________________________________________________________________
HV5411* NAD 83(2007)-  38 02 33.30691(N)    077 04 10.63718(W)     ADJUSTED
HV5411* NAVD 88     -        49.5    (meters)     162.     (feet)  GPS OBS
HV5411  ______________________________________________________________________
HV5411  EPOCH DATE  -        2002.00
HV5411  X           -   1,125,442.503 (meters)                     COMP
HV5411  Y           -  -4,901,995.173 (meters)                     COMP
HV5411  Z           -   3,909,177.644 (meters)                     COMP
HV5411  LAPLACE CORR-          -3.36  (seconds)                    DEFLEC09
HV5411  ELLIP HEIGHT-          16.170 (meters)          (02/10/07) ADJUSTED
HV5411  GEOID HEIGHT-         -33.34  (meters)                     GEOID09
HV5411
HV5411  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
HV5411  Type    PID    Designation                        North   East  Ellip
HV5411  ----------------------------------------------------------------------
HV5411  NETWORK HV5411 HUSTLE RESET                        0.53   0.47   1.67
HV5411  ----------------------------------------------------------------------
HV5411
HV5411.The horizontal coordinates were established by GPS observations
HV5411.and adjusted by the National Geodetic Survey in February 2007.
HV5411
HV5411.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
HV5411.See National Readjustment for more information.
HV5411.The horizontal coordinates are valid at the epoch date displayed above.
HV5411.The epoch date for horizontal control is a decimal equivalence
HV5411.of Year/Month/Day.
HV5411
HV5411.The orthometric height was determined by GPS observations and a
HV5411.high-resolution geoid model.
HV5411
HV5411.The X, Y, and Z were computed from the position and the ellipsoidal ht.
HV5411
HV5411.The Laplace correction was computed from DEFLEC09 derived deflections.
HV5411
HV5411.The ellipsoidal height was determined by GPS observations
HV5411.and is referenced to NAD 83.
HV5411
HV5411.The geoid height was determined by GEOID09.
HV5411
HV5411;                    North         East     Units Scale Factor Converg.
HV5411;SPC VA S     - 1,190,643.602 3,625,558.030   MT  1.00001474 +0 52 05.3
HV5411;SPC VA S     - 3,906,303.22 11,894,851.64   sFT  1.00001474 +0 52 05.3
HV5411;SPC VA N     - 2,042,704.356 3,625,555.700   MT  0.99999838 +0 53 33.8
HV5411;SPC VA N     - 6,701,772.54 11,894,843.99   sFT  0.99999838 +0 53 33.8
HV5411;UTM  18      - 4,212,561.784   318,388.301   MT  1.00000624 -1 16 32.7
HV5411
HV5411!             -  Elev Factor  x  Scale Factor =   Combined Factor
HV5411!SPC VA S     -   0.99999746  x   1.00001474  =   1.00001220
HV5411!SPC VA N     -   0.99999746  x   0.99999838  =   0.99999584
HV5411!UTM  18      -   0.99999746  x   1.00000624  =   1.00000370
HV5411
HV5411:                Primary Azimuth Mark                    Grid Az
HV5411:SPC VA S     -  HUSTLE RM 2 AZIMUTH                    270 46 55.6
HV5411:SPC VA N     -  HUSTLE RM 2 AZIMUTH                    270 45 27.1
HV5411:UTM  18      -  HUSTLE RM 2 AZIMUTH                    272 55 33.6
```

```
HV5411
HV5411|---------------------------------------------------------------------|
HV5411| PID    Reference Object                    Distance      Geod. Az   |
HV5411|                                                          dddmmss.s |
HV5411| DC6015 HUSTLE RM 1                         35.140 METERS 02806     |
HV5411| DC6018 HUSTLE RM 4                         30.700 METERS 17657     |
HV5411| DC6016 HUSTLE RM 2 AZIMUTH                               2713900.9 |
HV5411| DC6017 HUSTLE RM 3                         32.559 METERS 31356     |
HV5411|---------------------------------------------------------------------|
HV5411
HV5411                          SUPERSEDED SURVEY CONTROL
HV5411
HV5411  NAD 83(1993)-  38 02 33.30721(N)    077 04 10.63693(W) AD(       ) A
HV5411  ELLIP H (07/14/04)   16.173  (m)                       GP(       ) 3 2
HV5411  NAD 83(1993)-  38 02 33.30728(N)    077 04 10.63714(W) AD(       ) A
HV5411  ELLIP H (08/14/01)   16.110  (m)                       GP(       ) 4 1
HV5411  ELLIP H (09/08/95)   16.742  (m)                       GP(       ) 4 2
HV5411  NAD 83(1993)-  38 02 33.30867(N)    077 04 10.63420(W) AD(       ) 1
HV5411  ELLIP H (11/14/94)   16.276  (m)                       GP(       ) 4 2
HV5411  NAD 83(1991)-  38 02 33.30821(N)    077 04 10.65046(W) AD(       ) 1
HV5411  NAD 83(1986)-  38 02 33.30876(N)    077 04 10.65284(W) AD(       ) 1
HV5411  NAD 27      -  38 02 32.82500(N)    077 04 11.74600(W) AD(       ) 1
HV5411
HV5411.Superseded values are not recommended for survey control.
HV5411.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
HV5411.See file dsdata.txt to determine how the superseded data were derived.
HV5411
HV5411_U.S. NATIONAL GRID SPATIAL ADDRESS: 18SUH1838812561(NAD 83)
HV5411_MARKER: DD = SURVEY DISK
HV5411_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
HV5411_SP_SET: CONCRETE POST
HV5411_STAMPING: HUSTLE 1934 1963
HV5411_MARK LOGO: CGS
HV5411_MAGNETIC: N = NO MAGNETIC MATERIAL
HV5411_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
HV5411+STABILITY: POSITION/ELEVATION WELL
HV5411_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
HV5411+SATELLITE: SATELLITE OBSERVATIONS - April 09, 2009
HV5411
HV5411  HISTORY     - Date     Condition        Report By
HV5411  HISTORY     - 1963     MONUMENTED       CGS
HV5411  HISTORY     - 19920414 GOOD             NOS
HV5411  HISTORY     - 19990609 GOOD             USPSQD
HV5411  HISTORY     - 20000308 GOOD             VADOT
HV5411  HISTORY     - 20020328 GOOD             GEOMET
HV5411  HISTORY     - 20040313 GOOD             USPSQD
HV5411  HISTORY     - 20090409 GOOD             GEOCAC
HV5411
HV5411                          STATION DESCRIPTION
HV5411
HV5411'DESCRIBED BY NATIONAL OCEAN SERVICE 1992
HV5411'THE STATION IS LOCATED AT THE HUSTLE POST OFFICE IN ESSEX COUNTY
HV5411'VA.
HV5411'TO REACH THE STATION FROM THE LORETTO POST OFFICE, PROCEED
HV5411'NORTHWEST ALONG HIGHWAY 17 FOR 0.05 MI (0.08 KM) , TURN LEFT ON STATE
HV5411'ROUTE 635 AND PROCEED 3.25 MI (5.23 KM) TO THE HUSTLE POST
HV5411'OFFICE.
HV5411'THE STATION IS A STANDARD USC AND GS DISK SET IN TOP OF A 1
HV5411'FT (0.30 M) DIAMETER ROUND CONCRETE MONUMENT PROJECTING 4 IN ABOVE
HV5411'GROUND, IT IS 23.8 M (78.08 FT) EAST-SOUTHEAST OF THE SOUTHEAST CORNER
HV5411'OF THE POST OFFICE, 91 FT (27.74 M) SOUTH OF THE T-INTERSECTION
HV5411'IN A GRAVEL PARKING LOT NEXT TO AN ABANDONED STORE.
HV5411
```

```
HV5411                          STATION RECOVERY (1999)
HV5411
HV5411'RECOVERY NOTE BY US POWER SQUADRON 1999
HV5411'RECOVERED IN GOOD CONDITION.
HV5411
HV5411                          STATION RECOVERY (2000)
HV5411
HV5411'RECOVERY NOTE BY VIRGINIA DEPARTMENT OF TRANSPORTATION 2000 (MB)
HV5411'RECOVERED WITH CHANGES NOTED.  DISK IS LOCATED 10.9M EAST SOUTHEAST OF
HV5411'THE SOUTHEAST CORNER OF AN ABANDONED STORE.  POST OFFICE IS IN A NEW
HV5411'LOCATION, NORTH OF T-INTERSECTION.
HV5411
HV5411                          STATION RECOVERY (2002)
HV5411
HV5411'RECOVERY NOTE BY GEOMETRICS GPS INCORPORATED 2002 (MAJ)
HV5411'RECOVERED IN GOOD CONDITION.
HV5411
HV5411                          STATION RECOVERY (2004)
HV5411
HV5411'RECOVERY NOTE BY US POWER SQUADRON 2004
HV5411'MARK IS IN MIDDLE OF DRIVEWAY NEXT TO ABANDONED STORE.  RM1 IS 10 FT
HV5411'FROM SE CORNER OF HUSTLE POST OFFICE NEXT TO PARKING AREA
HV5411
HV5411                          STATION RECOVERY (2009)
HV5411
HV5411'RECOVERY NOTE BY GEOCACHING 2009 (WD)
HV5411'THE STATION IS LOCATED NEAR THE NORTHWEST EDGE OF A GRAVEL DRIVEWAY,
HV5411'ABOUT 110 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF THE POST OFFICE,
HV5411'ABOUT 91 FEET SOUTH OF THE CENTERLINE OF EAST-WEST HUSTLE ROAD, ABOUT
HV5411'39 FEET SOUTH-SOUTHWEST OF THE SOUTHEAST CORNER OF A WHITE CINDER
HV5411'BLOCK BUILDING, AND ABOUT 33 FEET WEST OF THE CENTERLINE OF PILKINGTON
HV5411'ROAD LEADING SOUTH.  REFERENCE MARK NO. 1 IS ABOUT 18 FEET NORTH OF
HV5411'THE CENTERLINE OF HUSTLE ROAD, ABOUT 10 FEET SOUTHEAST OF THE
HV5411'SOUTHEAST CORNER OF THE POST OFFICE, AND ABOUT 2.5 FEET SOUTHEAST
HV5411'OF A FLAG POLE.  REFERENCE MARK NOS. 3 AND 4 WERE NOT FOUND AFTER A 20
```

**GV1969**

**Latitude:** N 37 11 59.24638
**Longitude:** W 77 27 47.44394
**Ellipsoid Height:** 21.192m
**Orthometric Height**: 54.772m



## STATION DESCRIPTION FORM

PROJECT No.: 110306
PROJECT NAME: Kent VA
LOCATION: Kent County

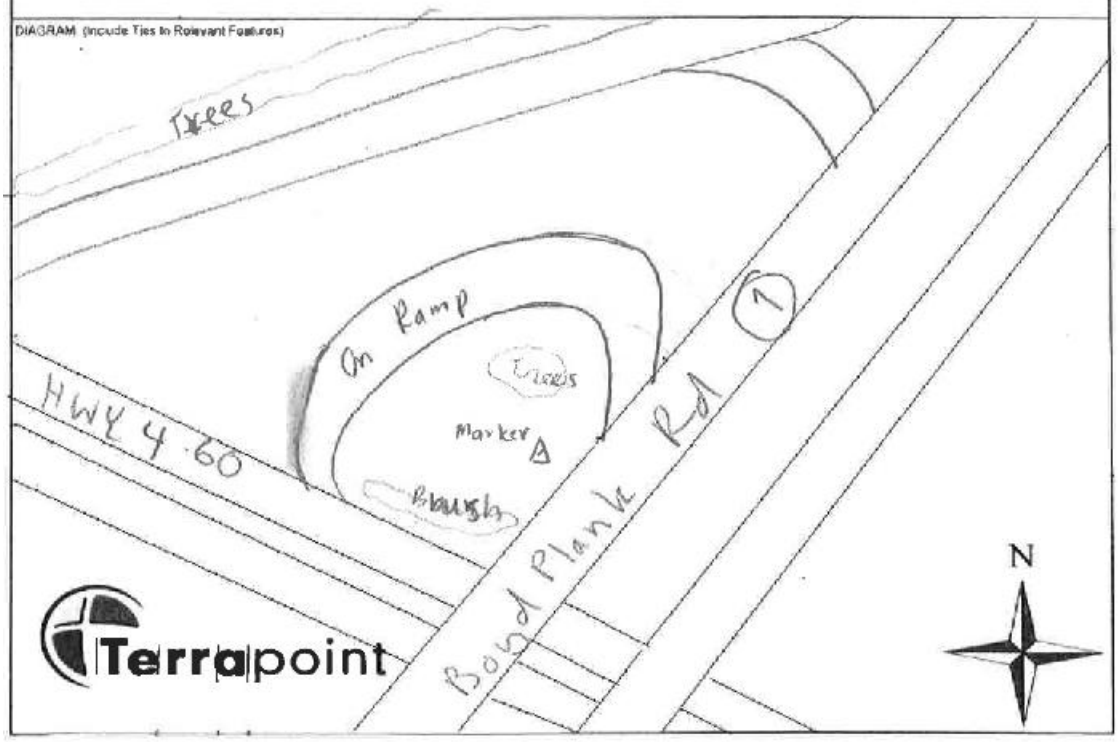
PHOTOS TAKEN:

| | | |
|---|---|---|
| STATION NAME: GV1969 | MARKER TYPE: Rebar | DATE: 9 May 2021 |
| STATION NUMBER: GV1969 | STATION LOCALITY: Petersburg | LEGAL DESCRIPTION: |
| DATUM: NAD 83 | | UTM ZONE: 18 |
| LATITUDE: 37 11 59.24638 | LONGITUDE: 77 27 47.44394 | ELLIPSOID HEIGHT metres (h): 21.192m |
| UTM NORTHING metres: 4119878.1991 | UTM EASTING metres: 281392.5112 | GEOID HEIGHT metres (MSL): 54.772m |

MONUMENT IS: ☒ FLUSH WITH GROUND ☐ ABOVE GROUND _____ cm ☐ BELOW GROUND _____ cm

MARKER LOCATION:

DIAGRAM (Include Ties to Relevant Features)




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!             -  Elev Factor  x  Scale Factor =   Combined Factor
GV1969!SPC VA S     -   0.99999667  x   0.99994966  =   0.99994633
GV1969!UTM  18      -   0.99999667  x   1.00018873  =   1.00018540
GV1969
GV1969:                Primary Azimuth Mark                    Grid Az
GV1969:SPC VA S     -  ADDISON 2 AZ MK                        211 45 31.0
GV1969:UTM  18      -  ADDISON 2 AZ MK                        213 52 39.7
GV1969
GV1969|---------------------------------------------------------------------|
GV1969| PID    Reference Object                    Distance      Geod. Az  |
GV1969|                                                          dddmmss.s |
```

```
GV1969| GV1971 ADDISON 2 RM 4                        20.071 METERS 00914     |
GV1969| GV5413 PETERSBURG CEN ST HOSP STK          APPROX. 1.5 KM 0555845.9 |
GV1969| GV1968 ADDISON                              59.380 METERS 11947     |
GV1969| GV1973 ADDISON 2 AZ MK                                    2122316.4 |
GV1969| GV1972 ADDISON AZ MK                                      2210320.7 |
GV1969| GV1970 ADDISON 2 RM 3                       23.551 METERS 27813     |
GV1969|-------------------------------------------------------------------|
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  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
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                          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 (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
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.