

Designer \_\_\_\_\_ Date \_\_\_\_\_ Checker \_\_\_\_\_ Date \_\_\_\_\_  
 Title \_\_\_\_\_ Job No. \_\_\_\_\_  
 Subject \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

JM

OT-21 →  $H = 0.041$   
 $V = 0.06$   
 $RMS = 0.005m$   
 $RDP = 1.955$   
 $RDP = 2.970$   
 OT-21 CK →  $H = 0.021$   
 $V = 0.031$   
 $RMS = 0.003m$   
 $RDP = 1.955$   
 Min. Sols = 8  
 $GTS = 180$   
 Pos.

Point OT-21 reset day after

VRS.

Area got regraded  
 Point unstable.  
 Dig.  
~~Threat.~~  
~~LOSS~~  
~~or~~  
 use  
 CK.

GS

OT-51 → Opus.

coords differs from  
 Hz ~~Opus~~  
 Opus

GS

GWC-6 → Opus

nicah

FO-5 → DONT HAVE  
 Opus TO LOOK  
 @.

LOOKS GOOD but too many untagables on the field to verify. Suggest to toss.

GS/CNT

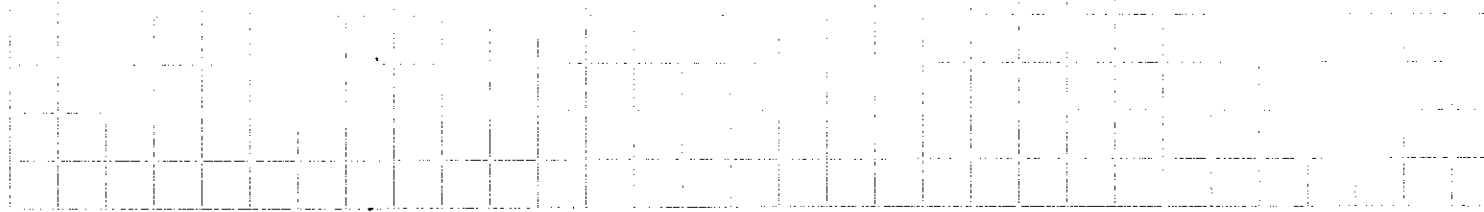
FO-40 → Opus

GS/CNT

FO-61 → Opus

JM

FO-13 → VRS





GROUND CONTROL POINT DOCUMENTATION REPORT

DATE: 12-18-17 TIME: 8:00 AM/PM EMPLOYEE NAME: Chris Davidson

JOB NAME: TENNESSEE LIDAR ADD ON POINT NUMBER: FO-5

STATE: TENNESSEE LATITUDE: 35.87818 +/- LONGITUDE: 88.49212 +/-

ADDRESS and/or INTERSECTION: Water Tower RD
\* Could Not Find Flat Ground in Deciduous woods.

OBSERVATION METHOD:

[ ] VRS GPS RMS: H: V: DURATION: 1

[ ] OPUS GPS (20 MIN) START TIME: AM/PM END: AM/PM

VRS CONVENTIONAL PT. No. FO-5A RMS: 4.6 H: 0.024 V: 0.042 DURATION: 4' 10"
PT. No. FO-5B RMS: 27.9 H: 0.015 V: 0.025 DURATION: 3' 42"

(20 MIN) PT. No. START TIME: AM/PM END: AM/PM

PT. No. START TIME: AM/PM END: AM/PM

OCCUPIED #/HT: FO-5B / 1.624m BS #/HT FO-5A / 1.624 FS #/HT FO-5 / 76.2ft

B/S SLOPE DISTANCE: 26.921, 88.32 B/S VERT. ANGLE 88° 59' 39" ANGLE: 00° 00' 00"

F/S ANGLE: 340° 44' 24" VERT. ANG: 86° 35' 30' SLOPE DIST.: 39.553 HORZ. DIST.: 37.183

TYPE OF LAND COVER:

- [ ] CL 1-OPEN TERRAIN (OT)
[ ] CL 2-HIGH GRASS/WEEDS/CROPS(GWC)
[ ] CL 3-BRUSHLANDS/LOW TREES (BLT)
[X] CL 4-FORESTED (FO)
[ ] CL 5-URBAN AREAS (UT)
[ ] AERIAL PANEL (AP), NGS MARK (NGS)

PICTURES:

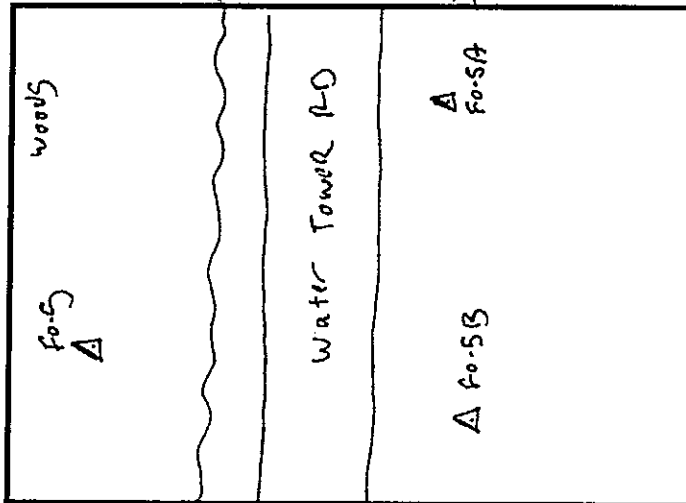
[X] PICTURE(S) OF AREA & SETUP

54, 55, 56

POINT RE-CHECK:

DATE: TIME: AM/PM

RE-CHECK PT. NUMBER:



SKETCH AREA (NTS)

DESCRIPTION OF POINT:

Nail set in woods

# Office

## Project

10 September 2012

### INPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters

### OUTPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

---

### FO-5A

1/2

<b>Northing/Y:</b> 3971448.572	<b>Northing/Y:</b> 571678.073
<b>Easting/X:</b> 365303.590	<b>Easting/X:</b> 1230273.285
<b>Elevation/Z:</b> 155.960	<b>Elevation/Z:</b> 511.679
<b>Convergence:</b> -0 52 28.66561	<b>Convergence:</b> -1 27 32.43381
<b>Scale Factor:</b> 0.999823564	<b>Scale Factor:</b> 0.999948695
<b>Combined Factor:</b> 0.999803531	<b>Combined Factor:</b> 0.999928659
<b>Grid Shift (U.S. ft.): X/Easting = 31773.1, Y/Northing = -12457982.8</b>	

---

### FO-5B

2/2

<b>Northing/Y:</b> 3971442.427	<b>Northing/Y:</b> 571658.789
<b>Easting/X:</b> 365277.337	<b>Easting/X:</b> 1230186.942
<b>Elevation/Z:</b> 156.021	<b>Elevation/Z:</b> 511.879
<b>Convergence:</b> -0 52 29.27262	<b>Convergence:</b> -1 27 33.04438
<b>Scale Factor:</b> 0.999823651	<b>Scale Factor:</b> 0.999948694
<b>Combined Factor:</b> 0.999803608	<b>Combined Factor:</b> 0.999928649
<b>Grid Shift (U.S. ft.): X/Easting = 31772.9, Y/Northing = -12457981.9</b>	

---

Remark:

# Office

## Project

10 September 2012

### INPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

### OUTPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters

---

### FO-5

1/1

<b>Northing/Y:</b> 571781.5055	<b>Northing/Y:</b> 3971479.695
<b>Easting/X:</b> 1230145.4607	<b>Easting/X:</b> 365264.314
<b>Elevation/Z:</b> 519.5888	<b>Elevation/Z:</b> 158.371
<b>Convergence:</b> -1 27 33.36162	<b>Convergence:</b> -0 52 29.61573
<b>Scale Factor:</b> 0.999948698	<b>Scale Factor:</b> 0.999823694
<b>Combined Factor:</b> 0.999928284	<b>Combined Factor:</b> 0.999803283
Grid Shift (m.): X/Easting = -9684.8, Y/Northing = 3797200.3	

---

Remark:

**Dewberry**

**GROUND CONTROL POINT DOCUMENTATION REPORT**

DATE: 2-2-10 TIME: 11:20 (AM) EMPLOYEE NAME: Jacob McCarthy  
 JOB NAME: Western Tennessee LiDAR POINT NUMBER: FO-13  
 STATE: Tennessee LATITUDE: 36° 16' 39.3" +/- LONGITUDE: 88° 58' 48.3" +/-  
 ADDRESS AND/OR INTERSECTION: 2624 SIMMONS RD RIVES, TN 38253

**OBSERVATION METHOD:**

VRS GPS  
 602 RMS: 15.8 H: 0.026 V: 0.043 DURATION: 3 min 9 sec  
 603 14.7 0.022 0.037 4 min 58 sec  
 OPUS GPS (18 MIN) START TIME: \_\_\_\_\_ AM/PM END: \_\_\_\_\_ AM/PM  
 RTK GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_

CONVENTIONAL

1 SHEET EA. GPS PT. (TOTAL 3 SHEETS)  FIELD BOOK NOTES  GPS FIXED HEIGHT TRIPOD 2M  2 GPS LOCATIONS  
 OCCUPIED #/HT: 602 / 5.08  BBS #/HT: 603 / 6.00  FS #/HT: FO-13 / 4.95  
 BACK SITE DISTANCE: 114.96  ANGLE: 81° - 39' - 33"  FS DISTANCE: 81.88  
 DATA COLLECTOR MODEL: Trimble TSC2 RECEIVER MODEL: Trimble R-8

**TYPE OF LAND COVER:**

- CL 1-OPEN TERRAIN (OT-#)
- CL 2-HIGH GRASS/WEEDS/CROPS(GWC-#)
- CL 3-BRUSHLANDS/LOW TREES (BLT-#)
- CL 4-FORESTED (FOR-#)
- CL 5-URBAN AREAS (UT-#)

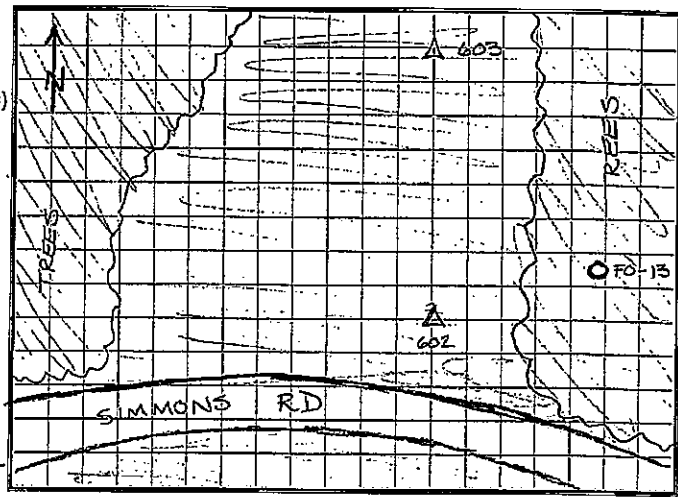
**PICTURES:**

PICTURE(S) OF AREA & SETUP

**POINT RE-CHECK:**

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ AM/PM

RE-CHECK POINT NUMBER: \_\_\_\_\_



SKETCH AREA (NTS)

**DESCRIPTION OF POINT:**

FOREST SHOT- NAIL SET ~ 35' INTO WOODS NORTH OF SIMMONS RD



# Point Details

Project: Tennessee Lidar JM

<b>User name</b>	cnieves	<b>Date &amp; Time</b>	2:45:30 PM 9/10/2012
<b>Coordinate System</b>	US State Plane 1983	<b>Zone</b>	10003 Dreywood Lane, Suite 204 Tennessee 4100
<b>Project Datum</b>	NAD 1983 (Conus)	<b>Geoid Model</b>	Lanham, MD 20706-4804 301.731.5551
<b>Vertical Datum</b>			301.731.0188 fax
<b>Coordinate Units</b>	US survey feet		www.dewberry.com
<b>Distance Units</b>	US survey feet		
<b>Height Units</b>	US survey feet		

✓ Name	Northing	Easting	Elevation	Feature Code	Hz Prec	Vc Prec	Ant Ht	Antenna Type	Start Time	RMS
✓ 602	721209.926	1090038.209	289.847	fo-13 trv	0.026	0.043	6.562	R8 GNSS/SPS88x Internal	12:27:04	0.003
✓ 603	721318.295	1089999.974	291.207	fo-13 trv	0.022	0.037	6.562	R8 GNSS/SPS88x Internal	12:31:23	0.003

[Back to top](#)

Designer \_\_\_\_\_ Date \_\_\_\_\_ Checker \_\_\_\_\_ Date \_\_\_\_\_  
Title \_\_\_\_\_ Job No. \_\_\_\_\_  
Subject \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

π @ 602  
603

0-00-00

114.96

UP  
5.08  
6.00

FO-13

HA  
VA

81-39-33

72-14-302

HD 81.875

VD 0.885

SD 81.880

ROD = 4.95



Office

Project

10 September 2012

INPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

OUTPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters  
Dewberry & Davis LLC  
10003 Derekwood Lane, Suite 204  
Lanham, MD 20706-4804  
301.731.5551  
301.731.0188 fax  
www.dewberry.com

FO-13

1/1

Northing/Y: 721248.0529  
Easting/X: 1090110.6002  
Elevation/Z: 286.7854  
Convergence: -1 44 41.51578  
Scale Factor: 0.999978340  
Combined Factor: 0.999969047

Northing/Y: 4016600.984  
Easting/X: 322125.842  
Elevation/Z: 87.412  
Convergence: -1 10 19.69687  
Scale Factor: 0.999989841  
Combined Factor: 0.999980548

Grid Shift (m.): X/Easting = -10140.5, Y/Northing = 3796764.1

Remark:



226 → 06730350  
 227 → 13680351

FO-40



**GROUND CONTROL POINT DOCUMENTATION REPORT**

DATE: 2/4/11 TIME: 11:30  AM  PM EMPLOYEE NAME: Christian Nieves  
 JOB NAME: Western Tennessee LIDAR POINT NUMBER: FO-40  
 STATE: Tennessee LATITUDE: 35°-40' - 31.8" N +1- LONGITUDE: 88°-55' - 51.0" W +1-  
 ADDRESS AND/OR INTERSECTION: 6342 Belle Hwy. Jackson TN 38305

**OBSERVATION METHOD:**

VRS GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_  
 OPUS GPS (18 MIN) My cell START TIME: 11:35  AM  PM END: 11:56  AM  PM  
 RTK GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_  
 CONVENTIONAL

1 SHEET EA. GPS PT. (TOTAL 3 SHEETS)  FIELD BOOK NOTES  GPS FIXED HEIGHT TRIPOD 2M  2 GPS LOCATIONS  
 OCCUPIED #/HT: 226 / 4.60'  BS #/HT: 227 / 15.02'  FS #/HT: FO-40 / 5.02'  
 BACK SITE DISTANCE: 59.126.4'  ANGLE: 0°-00'00"  FS DISTANCE: 283.510'  
 DATA COLLECTOR MODEL: Trimble TSC2 RECEIVER MODEL: Trimble R-8

TYPE OF LAND COVER: 226 & 227 - 27-48"  
 CL 1-OPEN TERRAIN (OT-#)  
 CL 2-HIGH GRASS/WEEDS/CROPS(GWC-#)  
 CL 3-BRUSHLANDS/LOW TREES (BLT-#)  
 CL 4-FORESTED (FOR-#)  
 CL 5-URBAN AREAS (UT-#)

**PICTURES:**

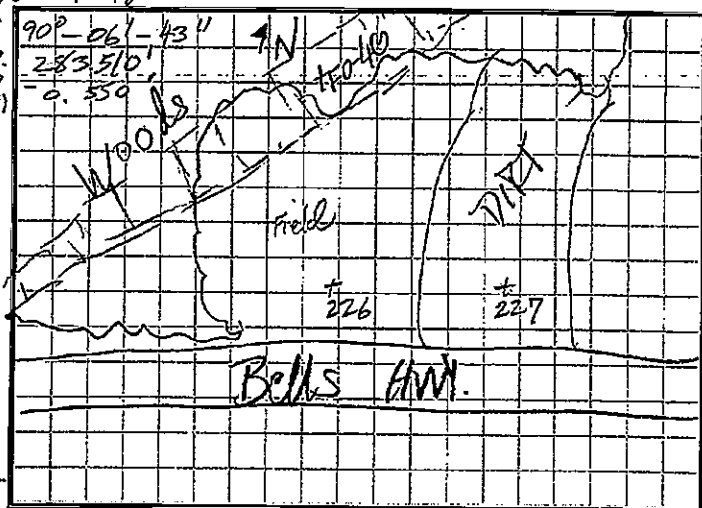
PICTURE(S) OF AREA & SETUP

**POINT RE-CHECK:**

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ AM/PM

RE-CHECK POINT NUMBER: \_\_\_\_\_

DESCRIPTION OF POINT: \_\_\_\_\_



SKETCH AREA (NTS)

226

Nieves, Christian

From: opus [opus@NGS.NOAA.GOV]
Sent: Monday, February 07, 2011 12:09 PM
To: Nieves, Christian
Subject: OPUS-RS solution : 13680351.11o 000206133

FILE: 13680351.11o 000206133

NGS OPUS-RS SOLUTION REPORT

=====

USER: cnieves@dewberry.com DATE: February 07, 2011
RINEX FILE: 1368035r.11o TIME: 17:09:02 UTC

SOFTWARE: rsgps 1.35.1 RS40.prl 1.66 START: 2011/02/04 17:33:45
EPHEMERIS: igr16215.eph [rapid] STOP: 2011/02/04 17:54:30
NAV FILE: brdc0350.11n OBS USED: 1728 / -1791 : 96%
ANT NAME: TRM\_R8\_GNSS QUALITY IND. 21.89/ 25.90
ARP HEIGHT: 2.00 NORMALIZED RMS: 0.327

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000) ITRF00 (EPOCH:2011.09518)

X: 96827.226(m) 0.006(m) 96826.487(m) 0.006(m)
Y: -5186250.830(m) 0.024(m) -5186249.400(m) 0.024(m)
Z: 3699076.861(m) 0.018(m) 3699076.701(m) 0.018(m)

LAT: 35 40 32.32362 0.005(m) 35 40 32.34672 0.005(m)
E LON: 271 4 10.51352 0.006(m) 271 4 10.48520 0.006(m)
W LON: 88 55 49.48648 0.006(m) 88 55 49.51480 0.006(m)
EL HGT: 104.056(m) 0.030(m) 102.790(m) 0.030(m)

ORTHO HGT: 132.268(m) 0.035(m) [NAVD88 (Computed using GEOID09)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 16) SPC (4100 TN )

Northing (Y) [meters] 3949690.531 152899.477
Easting (X) [meters] 325296.160 334757.783
Convergence [degrees] -1.12609395 -1.71558013
Point Scale 0.99997612 0.99995220
Combined Factor 0.99995979 0.99993587

US NATIONAL GRID DESIGNATOR: 16SCE2529649690(NAD 83)

BASE STATIONS USED

Table with columns: PID, DESIGNATION, LATITUDE, LONGITUDE, DISTANCE(m). Lists base stations like DJ9570, DL6195, etc.

DJ9572	TN45	TDOT DISTRICT 45	CORS ARP	N351757.372	W0893934.600	78245.0
DL6197	TN48	TDOT DISTRICT 48	CORS ARP	N361745.755	W0881747.681	89476.0

NEAREST NGS PUBLISHED CONTROL POINT

FE2380	PIPKIN			N354047.678	W0885337.105	3358.9
--------	--------	--	--	-------------	--------------	--------

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

227

Nieves, Christian

From: opus [opus@NGS.NOAA.GOV]
Sent: Tuesday, February 08, 2011 9:36 AM
To: Nieves, Christian
Subject: OPUS-RS solution : 0673035C.11o 000206779

FILE: 0673035C.11o 000206779

NGS OPUS-RS SOLUTION REPORT

=====

USER: cnieves@dewberry.com DATE: February 08, 2011
RINEX FILE: 0673035r.11o TIME: 14:35:29 UTC

SOFTWARE: rsgps 1.35.1 RS11.pr1 1.66
EPHEMERIS: igr16215.eph [rapid]
NAV FILE: brdc0350.11n
ANT NAME: TRM\_R8\_GNSS
ARP HEIGHT: 2.00
START: 2011/02/04 17:35:45
STOP: 2011/02/04 17:56:00
OBS USED: 1845 / 1872 : 99%
QUALITY IND. 23.77/ 27.42
NORMALIZED RMS: 0.326

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000) ITRF00 (EPOCH:2011.09518)

X: 96865.754(m) 0.006(m) 96865.015(m) 0.006(m)
Y: -5186252.377(m) 0.034(m) -5186250.947(m) 0.034(m)
Z: 3699075.456(m) 0.025(m) 3699075.296(m) 0.025(m)

LAT: 35 40 32.24371 0.005(m) 35 40 32.26681 0.005(m)
E LON: 271 4 12.04416 0.006(m) 271 4 12.01584 0.006(m)
W LON: 88 55 47.95584 0.006(m) 88 55 47.98416 0.006(m)
EL HGT: 105.078(m) 0.042(m) 103.812(m) 0.042(m)

ORTHO HGT: 133.290(m) 0.045(m) [NAVD88 (Computed using GEOID09)]

UTM COORDINATES

STATE PLANE COORDINATES

UTM (Zone 16) SPC (4100 TN )
Northing (Y) [meters] 3949687.312 152895.863
Easting (X) [meters] 325334.595 334796.182
Convergence [degrees] -1.12584520 -1.71533122
Point Scale 0.99997595 0.99995221
Combined Factor 0.99995946 0.99993571

US NATIONAL GRID DESIGNATOR: 16SCE2533449687(NAD 83)

BASE STATIONS USED

Table with 7 columns: PID, DESIGNATION, LATITUDE, LONGITUDE, DISTANCE(m). Lists base stations like DJ9570, DL6195, etc.

DJ9572	TN45	TDOT	DISTRICT 45	CORS	ARP	N351757.372	W0893934.600	78276.3
DL6197	TN48	TDOT	DISTRICT 48	CORS	ARP	N361745.755	W0881747.681	89453.4

NEAREST NGS PUBLISHED CONTROL POINT

FE2380	PIPKIN					N354047.678	W0885337.105	3321.2
--------	--------	--	--	--	--	-------------	--------------	--------

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

# Office

## Project

10 September 2012

### INPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters

### OUTPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

---

**227**

1/2

<b>Northing/Y:</b> 3949687.312	<b>Northing/Y:</b> 501625.845
<b>Easting/X:</b> 325334.595	<b>Easting/X:</b> 1098410.474
<b>Elevation/Z:</b> 133.290	<b>Elevation/Z:</b> 437.302
<b>Convergence:</b> -1 07 33.04271	<b>Convergence:</b> -1 42 55.19238
<b>Scale Factor:</b> 0.999975953	<b>Scale Factor:</b> 0.999952205
<b>Combined Factor:</b> 0.999959460	<b>Combined Factor:</b> 0.999935713
Grid Shift (U.S. ft.): X/Easting = 31041.9, Y/Northing = -12456639.9	

---

**226**

2/2

<b>Northing/Y:</b> 3949690.531	<b>Northing/Y:</b> 501637.702
<b>Easting/X:</b> 325296.160	<b>Easting/X:</b> 1098284.494
<b>Elevation/Z:</b> 132.268	<b>Elevation/Z:</b> 433.949
<b>Convergence:</b> -1 07 33.93823	<b>Convergence:</b> -1 42 56.08847
<b>Scale Factor:</b> 0.999976118	<b>Scale Factor:</b> 0.999952204
<b>Combined Factor:</b> 0.999959786	<b>Combined Factor:</b> 0.999935872
Grid Shift (U.S. ft.): X/Easting = 31042.0, Y/Northing = -12456638.6	

---

Remark:

# Office

## Project

10 September 2012

### INPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

### OUTPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters

---

### FO-40

1/1

<b>Northing/Y:</b> 501914.4984	<b>Northing/Y:</b> 3949774.704
<b>Easting/X:</b> 1098223.1638	<b>Easting/X:</b> 325276.599
<b>Elevation/Z:</b> 432.9751	<b>Elevation/Z:</b> 131.971
<b>Convergence:</b> -1 42 56.58229	<b>Convergence:</b> -1 07 34.50493
<b>Scale Factor:</b> 0.999952168	<b>Scale Factor:</b> 0.999976202
<b>Combined Factor:</b> 0.999935882	<b>Combined Factor:</b> 0.999959916
Grid Shift (m.): X/Easting = -9462.5, Y/Northing = 3796790.9	

---

Remark:

FO-61

410 → 15:14 ↗ 06730341  
411 → 15:37 ↗ 06730342

# Dewberry

## GROUND CONTROL POINT DOCUMENTATION REPORT

DATE: 2-3-11 TIME: 9:14 AM/PM EMPLOYEE NAME: Gary Simpson  
JOB NAME: Western Tennessee LIDAR POINT NUMBER: FO-61  
STATE: Tennessee LATITUDE: 35-23-16.9 +/- LONGITUDE: 88-49-04.8 +/-  
ADDRESS AND/OR INTERSECTION: \_\_\_\_\_

OBSERVATION METHOD: 410- 9:14/9:34 411- 9:37/9:57

- VRS GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_
- OPUS GPS (18 MIN) START TIME: 9:14 AM/PM END: 9:34 AM/PM
- RTK GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_
- CONVENTIONAL

- 1 SHEET EA. GPS PT. (TOTAL 3 SHEETS)  FIELD BOOK NOTES  GPS FIXED HEIGHT TRIPOD 2M  2 GPS LOCATIONS
- OCCUPIED #/HT: 411 15.04'  BS #/HT: 410 5.02'  FS #/HT: FA-61 15.02'
- BACK SITE DISTANCE: 130.505'  ANGLE: 0°-00'-00"  FS DISTANCE: 125.820'
- DATA COLLECTOR MODEL: Trimble TSC2 RECEIVER MODEL: Trimble R-8

**TYPE OF LAND COVER:**

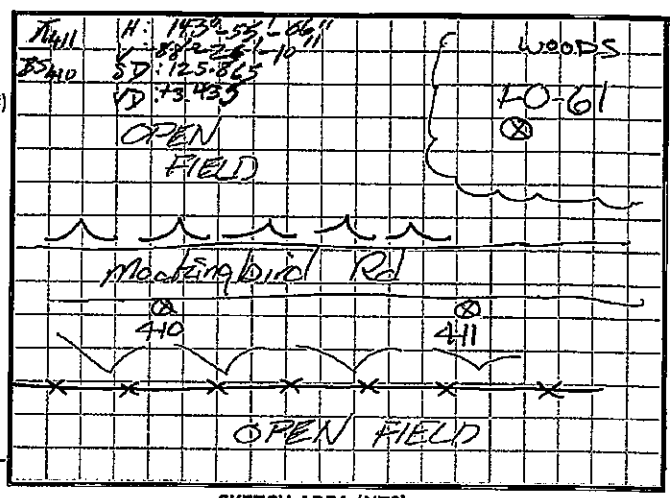
- CL 1-OPEN TERRAIN (OT-#)
- CL 2-HIGH GRASS/WEEDES/CROPS(GWC-#)
- CL 3-BRUSHLANDS/LOW TREES (BLT-#)
- CL 4-FORESTED (FOR-#)
- CL 5-URBAN AREAS (UT-#)

PICTURES:  
 PICTURE(S) OF AREA & SETUP

POINT RE-CHECK:  
DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ AM/PM

RE-CHECK POINT NUMBER: \_\_\_\_\_

DESCRIPTION OF POINT:  
\_\_\_\_\_  
\_\_\_\_\_



SKETCH AREA (NTS)



410

Nieves, Christian

From: opus [opus@NGS.NOAA.GOV]
Sent: Tuesday, February 08, 2011 9:48 AM
To: Nieves, Christian
Subject: OPUS-RS solution : 06730341.11o 000206782

FILE: 06730341.11o 000206782

NGS OPUS-RS SOLUTION REPORT

USER: cnieves@dewberry.com DATE: February 08, 2011
RINEX FILE: 0673034p.11o TIME: 14:48:02 UTC

SOFTWARE: rsgps 1.35.1 RS50.pr1 1.66 START: 2011/02/03 15:14:15
EPHEMERIS: igr16214.eph [rapid] STOP: 2011/02/03 15:35:00
NAV FILE: brdc0340.11n OBS USED: 2268 / 2268 : 100%
ANT NAME: TRM\_R8\_GNSS QUALITY IND: 20.02 / 32.54
ARP HEIGHT: 2.00 NORMALIZED RMS: 0.339

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000) ITRF00 (EPOCH:2011.09217)

X: 107427.945(m) 0.011(m) 107427.208(m) 0.011(m)
Y: -5204644.763(m) 0.033(m) -5204643.329(m) 0.033(m)
Z: 3673046.080(m) 0.028(m) 3673045.917(m) 0.028(m)

LAT: 35 23 14.28445 0.006(m) 35 23 14.30736 0.006(m)
E LON: 271 10 56.86271 0.012(m) 271 10 56.83469 0.012(m)
W LON: 88 49 3.13729 0.012(m) 88 49 3.16531 0.012(m)
EL HGT: 111.829(m) 0.043(m) 110.554(m) 0.043(m)

ORTHO HGT: 139.961(m) 0.046(m) [NAVD88 (Computed using GEOID09)]

UTM COORDINATES STATE PLANE COORDINATES

UTM-(Zone 16) SPC (4100 TN )
Northing (Y) [meters] 3917511.228 120621.994
Easting (X) [meters] 334922.713 344050.746
Convergence [degrees] -1.05277510 -1.64949875
Point Scale 0.99993583 0.99997861
Combined Factor 0.99991828 0.99996106

US NATIONAL GRID DESIGNATOR: 16SCE3492217511(NAD 83)

BASE STATIONS USED

Table with 7 columns: PID, DESIGNATION, LATITUDE, LONGITUDE, DISTANCE(m), and two unlabeled columns. Rows list base stations like DJ9568, DJ9570, DL7339, etc.

DM3531 TN30 TDOT DISTRICT 30 CORS ARP      N353305.845 W0873426.208    114337.0  
DI2224 AL20 ALDOT 2 DIV OFF CORS ARP      N344237.129 W0873945.736    129388.0

NEAREST NGS PUBLISHED CONTROL POINT

FE2278      KING      N352359.548 W0885045.205      2929.0

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

411

Nieves, Christian

From: opus [opus@NGS.NOAA.GOV]
Sent: Wednesday, February 09, 2011 12:42 PM
To: Nieves, Christian
Subject: OPUS-RS solution : 06730342.11o 000207611

FILE: 06730342.11o 000207611

NGS OPUS-RS SOLUTION REPORT

=====

USER: cnieves@dewberry.com DATE: February 09, 2011
RINEX FILE: 0673034p.11o TIME: 17:42:07 UTC

SOFTWARE: rsgps 1.35.1 RS30.pr1 1.66 START: 2011/02/03 15:37:15
EPHEMERIS: igr16214.eph [rapid] STOP: 2011/02/03 15:57:45
NAV FILE: brdc0340.11n OBS USED: 2304 / 2448 : 94%
ANT NAME: TRM\_R8\_GNSS QUALITY IND. 3.62/ 17.78
ARP HEIGHT: 2.00 NORMALIZED RMS: 0.321

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000) ITRF00 (EPOCH:2011.09221)

X: 107428.371(m) 0.012(m) 107427.634(m) 0.012(m)
Y: -5204621.763(m) 0.018(m) -5204620.329(m) 0.018(m)
Z: 3673078.520(m) 0.020(m) 3673078.357(m) 0.020(m)

LAT: 35 23 15.57449 0.008(m) 35 23 15.59741 0.008(m)
E LON: 271 10 56.89840 0.013(m) 271 10 56.87037 0.013(m)
W LON: 88 49 3.10160 0.013(m) 88 49 3.12963 0.013(m)
EL HGT: 111.876(m) 0.025(m) 110.600(m) 0.025(m)

ORTHO HGT: 140.008(m) 0.031(m) [NAVD88 (Computed using GEOID09)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 16) SPC (4100 TN )
Northing (Y) [meters] 3917550.960 120661.709
Easting (X) [meters] 334924.344 344052.791
Convergence [degrees] -1.05277862 -1.64949295
Point Scale 0.99993582 0.99997856
Combined Factor 0.99991826 0.99996100

US NATIONAL GRID DESIGNATOR: 16SCE3492417550(NAD 83)

BASE STATIONS USED

Table with 7 columns: PID, DESIGNATION, LATITUDE, LONGITUDE, DISTANCE(m), and two unlabeled columns. Rows list various base stations like DJ9568, DL7339, etc.

DM3531 TN30 TDOT DISTRICT 30 CORS ARP	N353305.845 W0873426.208	114329.5
DI2224 AL20 ALDOT 2 DIV OFF CORS ARP	N344237.129 W0873945.736	129410.2

NEAREST NGS PUBLISHED CONTROL POINT

FE2278 KING	N352359.548 W0885045.205	2910.9
-------------	--------------------------	--------

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

# Office

## Project

10 September 2012

### INPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters

### OUTPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

---

**410**

1/2

**Northing/Y:** 3917511.228  
**Easting/X:** 334922.713  
**Elevation/Z:** 139.961  
**Convergence:** -1 03 09.99037  
**Scale Factor:** 0.999935830  
**Combined Factor:** 0.999918278  
Grid Shift (U.S. ft.): X/Easting = 29947.6, Y/Northing = -12456960.8

**Northing/Y:** 395740.661  
**Easting/X:** 1128773.156  
**Elevation/Z:** 459.189  
**Convergence:** -1 38 58.19553  
**Scale Factor:** 0.999978609  
**Combined Factor:** 0.999961057

---

**411**

2/2

**Northing/Y:** 3917550.960  
**Easting/X:** 334924.344  
**Elevation/Z:** 140.008  
**Convergence:** -1 03 10.00305  
**Scale Factor:** 0.999935823  
**Combined Factor:** 0.999918264  
Grid Shift (U.S. ft.): X/Easting = 29948.9, Y/Northing = -12456960.8

**Northing/Y:** 395870.958  
**Easting/X:** 1128779.864  
**Elevation/Z:** 459.343  
**Convergence:** -1 38 58.17463  
**Scale Factor:** 0.999978561  
**Combined Factor:** 0.999961001

---

Remark:

# Office

## Project

10 September 2012

### INPUT

State Plane, NAD83  
4100 - Tennessee, U.S. Feet  
Vertical - NAVD88, U.S. Feet

### OUTPUT

UTM, NAD83  
16 - 90W to 84W, Meters  
Vertical - NAVD88, Meters

---

## FO-61

1/1

<b>Northing/Y:</b> 395976.3167	<b>Northing/Y:</b> 3917582.852
<b>Easting/X:</b> 1128711.0909	<b>Easting/X:</b> 334903.049
<b>Elevation/Z:</b> 462.7981	<b>Elevation/Z:</b> 141.061
<b>Convergence:</b> -1 38 58.68215	<b>Convergence:</b> -1 03 10.53185
<b>Scale Factor:</b> 0.999978522	<b>Scale Factor:</b> 0.999935910
<b>Combined Factor:</b> 0.999960798	<b>Combined Factor:</b> 0.999918186
<b>Grid Shift (m.):</b> X/Easting = -9128.8, Y/Northing = 3796889.0	

---

Remark:

GWC-6

2/3/11  
Eva  
18:23 → 18:43  
0673034A

# Dewberry

## GROUND CONTROL POINT DOCUMENTATION REPORT

DATE: 2-3-11 TIME: 12:23 AM/PM AM EMPLOYEE NAME: Gary Simpson

JOB NAME: Western Tennessee LIDAR POINT NUMBER: GWC-6

STATE: Tennessee LATITUDE: \_\_\_\_\_ +/- LONGITUDE: \_\_\_\_\_ +/-

ADDRESS AND/OR INTERSECTION: \_\_\_\_\_

### OBSERVATION METHOD:

- VRS GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_
- OPUS GPS (18 MIN) START TIME: 12:23 AM/PM AM END: 12:43 AM/PM PM
- RTK GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_
- CONVENTIONAL

1 SHEET EA. GPS PT. (TOTAL 3 SHEETS)  FIELD BOOK NOTES  GPS FIXED HEIGHT TRIPOD 2M  2 GPS LOCATIONS

OCCUPIED #/HT: \_\_\_\_\_ / \_\_\_\_\_  BS #/HT \_\_\_\_\_ / \_\_\_\_\_  FS #/HT \_\_\_\_\_ / \_\_\_\_\_

BACK SITE DISTANCE: \_\_\_\_\_  ANGLE: \_\_\_\_\_  FS DISTANCE \_\_\_\_\_

DATA COLLECTOR MODEL: Trimble TSC2 RECEIVER MODEL: Trimble R-8

### TYPE OF LAND COVER:

- CL 1-OPEN TERRAIN (OT-#)
- CL 2-HIGH GRASS/WEEDS/CROPS(GWC-#)
- CL 3-BRUSHLANDS/LOW TREES (BLT-#)
- CL 4-FORESTED (FOR-#)
- CL 5-URBAN AREAS (UT-#)

### PICTURES:

PICTURE(S) OF AREA & SETUP

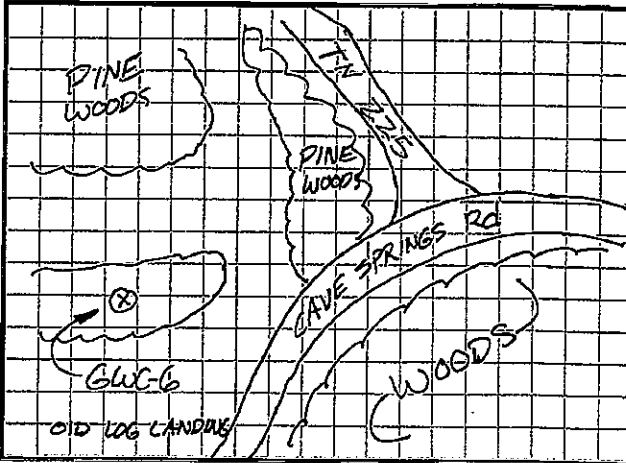
### POINT RE-CHECK:

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ AM/PM

RE-CHECK POINT NUMBER: \_\_\_\_\_

### DESCRIPTION OF POINT:

Nail Set



SKETCH AREA (NTS)

Nieves, Christian

GWC-6

From: opus [opus@NGS.NOAA.GOV]
Sent: Tuesday, February 08, 2011 9:44 AM
To: Nieves, Christian
Subject: OPUS-RS solution : 0673034A.11o 000206776

FILE: 0673034A.11o 000206776

NGS OPUS-RS SOLUTION REPORT

=====

USER: cnieves@dewberry.com DATE: February 08, 2011
RINEX FILE: 0673034s.11o TIME: 14:43:40 UTC

SOFTWARE: rsgps 1.35.1 RS10.pr1 1.66 START: 2011/02/03 18:24:15
EPHEMERIS: igr16214.eph [rapid] STOP: 2011/02/03 18:43:45
NAV FILE: brdc0340.11n OBS USED: 1899 / 1899 : 100%
ANT NAME: TRM\_R8\_GNSS QUALITY IND. 4.24/ 11.47
ARP HEIGHT: 2.00 NORMALIZED RMS: 0.340

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000) ITRF00 (EPOCH:2011.09253)

X: 117213.820(m) 0.012(m) 117213.083(m) 0.012(m)
Y: -5209102.729(m) 0.028(m) -5209101.294(m) 0.028(m)
Z: 3666562.011(m) 0.025(m) 3666561.848(m) 0.025(m)

LAT: 35 18 55.05167 0.007(m) 35 18 55.07458 0.007(m)
E LON: 271 17 20.53175 0.013(m) 271 17 20.50386 0.013(m)
W LON: 88 42 39.46825 0.013(m) 88 42 39.49614 0.013(m)
EL HGT: 167.518(m) 0.036(m) 166.240(m) 0.036(m)

ORTHO HGT: 195.540(m) 0.040(m) [NAVD88 (Computed using GEOID09)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 16) SPC (4100 TN )

Northing (Y) [meters] 3909351.365 112362.544
Easting (X) [meters] 344465.270 353508.354
Convergence [degrees] -0.98926433 -1.58710567
Point Scale 0.99989813 0.99998912
Combined Factor 0.99987184 0.99996283

US NATIONAL GRID DESIGNATOR: 16SCE4446509351(NAD 83)

BASE STATIONS USED

Table with 7 columns: PID, DESIGNATION, LATITUDE, LONGITUDE, DISTANCE(m). Lists base stations like DJ9568, DL6193, etc.



DL6197 TN48 TDOT DISTRICT 48 CORS ARP      N361745.755 W0881747.681    115085.4  
DL7695 HCES HILLCREST ELEMENT CORS ARP    N361957.353 W0891018.334    120311.4

NEAREST NGS PUBLISHED CONTROL POINT

FE2266      CROWN                                    N352212.565 W0884329.312    6235.6

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



**GROUND CONTROL POINT DOCUMENTATION REPORT**

DATE: 2-4-11 TIME: 12:45 AM/PM EMPLOYEE NAME: Jacob McCarthy

JOB NAME: Western Tennessee LiDAR POINT NUMBER: OT-21

STATE: Tennessee LATITUDE: 36° 06' 20.4" +/- LONGITUDE: 88° 50' 29.6" +/-

ADDRESS AND/OR INTERSECTION: 59 WILDCAT LN BRADFORD, TN 38316

**OBSERVATION METHOD:**

- VRS GPS RMS: 25.8 H: 0.041 V: 0.059 DURATION: 3 min 23 sec
- OPUS GPS (18 MIN) START TIME: \_\_\_\_\_ AM/PM END: \_\_\_\_\_ AM/PM
- RTK GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_
- CONVENTIONAL

1 SHEET EA. GPS PT. (TOTAL 3 SHEETS)  FIELD BOOK NOTES  GPS FIXED HEIGHT TRIPOD 2M  2 GPS LOCATIONS

OCCUPIED #/HT: \_\_\_\_\_ / \_\_\_\_\_  BS #/HT \_\_\_\_\_ / \_\_\_\_\_  FS #/HT \_\_\_\_\_ / \_\_\_\_\_

BACK SITE DISTANCE: \_\_\_\_\_  ANGLE: \_\_\_\_\_  FS DISTANCE \_\_\_\_\_

DATA COLLECTOR MODEL: Trimble TSC2 RECEIVER MODEL: Trimble R-8

**TYPE OF LAND COVER:**

- CL 1-OPEN TERRAIN (OT-#)
- CL 2-HIGH GRASS/WEEDS/CROPS(GWC-#)
- CL 3-BRUSHLANDS/LOW TREES (BLT-#)
- CL 4-FORESTED (FOR-#)
- CL 5-URBAN AREAS (UT-#)

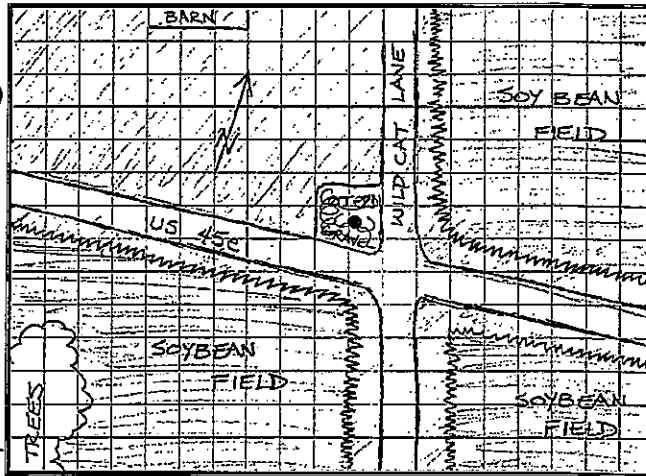
**PICTURES:**

(PICTURE(S) OF AREA & SETUP

**POINT RE-CHECK:**

DATE: 2-5-11 TIME: 5:15 AM/PM

RE-CHECK POINT NUMBER: OT-21 CK



SKETCH AREA (NTS)

**DESCRIPTION OF POINT:**

OPEN SHOT - NAIL SET IN GRAVEL PATCH IN NORTH WEST CORNER OF THE INTERSECTION BETWEEN WILD CAT LANE & US 45E

*Nail disturbed*

## Point Details

Project : Tennessee Lidar JM

User name	cnieves	Date & Time	2:33:54 PM 9/10/2012
Coordinate System	US State Plane 1983	Zone	Tennessee 4100
Project Datum	NAD 1983 (Conus)	Geoid Model	GEOID09 (Conus)
Vertical Datum			
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

---

Name	Northing	Easting	Elevation	Feature Code	Ht Prec	Vt Prec	Ant Ht	Antenna Type	Start Time	RMS
ot-21ck	657300.033	1129237.548	351.580	open gravel check	0.023	0.034	6.562 R8	GNSS/SPS88x Internal	18:13:58	0.003
ot-21	657299.119	1129236.305	355.419	open gravel	0.041	0.059	6.562 R8	GNSS/SPS88x Internal	13:57:43	0.005

[Back to top](#)

OT-21

OT-51

Std. (TN)

06/30/11

2 3 11 16:34

16:54

(2nd) Greenwich

22:34 to 22:54



**GROUND CONTROL POINT DOCUMENTATION REPORT**

DATE: 2-3-11 TIME: 4:34 AM/PM (PM) EMPLOYEE NAME: Gary Simpson

JOB NAME: Western Tennessee LIDAR POINT NUMBER: 07-51

STATE: Tennessee LATITUDE: \_\_\_\_\_ +/- LONGITUDE: \_\_\_\_\_ +/-

ADDRESS AND/OR INTERSECTION: \_\_\_\_\_

**OBSERVATION METHOD:**

VRS GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_

OPUS GPS (18 MIN) START TIME: 4:34 AM/PM (PM) END: 4:54 AM/PM (PM)

RTK GPS RMS: \_\_\_\_\_ H: \_\_\_\_\_ V: \_\_\_\_\_ DURATION: \_\_\_\_\_

CONVENTIONAL

1 SHEET EA. GPS PT. (TOTAL 3 SHEETS)  FIELD BOOK NOTES  GPS FIXED HEIGHT TRIPOD 2M  2 GPS LOCATIONS

OCCUPIED #/HT: \_\_\_\_\_ / \_\_\_\_\_  BS #/HT \_\_\_\_\_ / \_\_\_\_\_  FS #/HT \_\_\_\_\_ / \_\_\_\_\_

BACK SITE DISTANCE: \_\_\_\_\_  ANGLE: \_\_\_\_\_  FS DISTANCE \_\_\_\_\_

DATA COLLECTOR MODEL: Trimble TSC2 RECEIVER MODEL: Trimble R-8

**TYPE OF LAND COVER:**

- CL 1-OPEN TERRAIN (OT-#)
- CL 2-HIGH GRASS/WEEDS/CROPS(GWC-#)
- CL 3-BRUSHLANDS/LOW TREES (BLT-#)
- CL 4-FORESTED (FOR-#)
- CL 5-URBAN AREAS (UT-#)

**PICTURES:**

PICTURE(S) OF AREA & SETUP

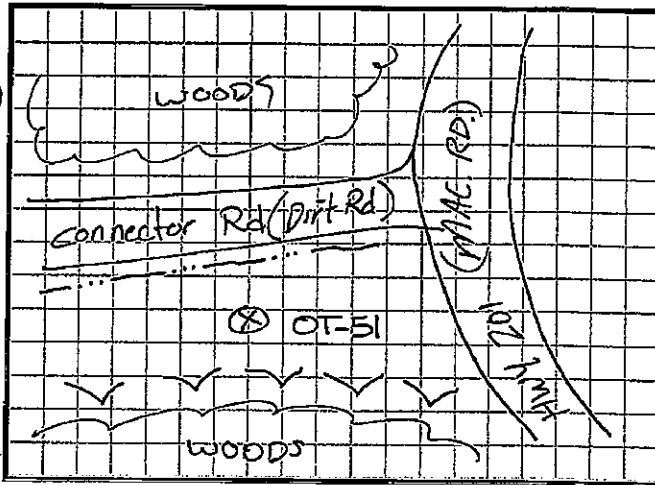
**POINT RE-CHECK:**

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ AM/PM

RE-CHECK POINT NUMBER: \_\_\_\_\_

**DESCRIPTION OF POINT:**

Nail Set



SKETCH AREA (NTS)

OT-51

Nieves, Christian

From: opus [opus@NGS.NOAA.GOV]
Sent: Wednesday, February 09, 2011 11:34 AM
To: Nieves, Christian
Subject: OPUS-RS solution : 0673034J.11o 000207543

FILE: 0673034J.11o 000207543

NGS OPUS-RS SOLUTION REPORT

USER: cnieves@dewberry.com
RINEX FILE: 0673034w.11o

DATE: February 09, 2011
TIME: 16:33:30 UTC

SOFTWARE: rsgps 1.35.1 RS23.prl 1.66
EPHEMERIS: igr16214.eph [rapid]
NAV FILE: brdc0340.11n
ANT NAME: TRM\_R8\_GNSS
ARP HEIGHT: 2.00

START: 2011/02/03 22:34:45
STOP: 2011/02/03 22:54:15
OBS USED: 1854 / 2016 : 92%
QUALITY IND. 23.97 / 23.39
NORMALIZED RMS: 0.328

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000)

ITRF00 (EPOCH:2011.09301)

X: 147751.405(m) 0.007(m) 147750.667(m) 0.007(m)
Y: -5198811.616(m) 0.034(m) -5198810.181(m) 0.034(m)
Z: 3679908.202(m) 0.020(m) 3679908.040(m) 0.020(m)

LAT: 35 27 46.79642 0.007(m) 35 27 46.81954 0.007(m)
E LON: 271 37 40.51504 0.007(m) 271 37 40.48740 0.007(m)
W LON: 88 22 19.48496 0.007(m) 88 22 19.51260 0.007(m)
EL HGT: 143.287(m) 0.039(m) 142.007(m) 0.039(m)

ORTHO HGT: 171.200(m) 0.043(m) [NAVD88 (Computed using GEOID09)]

UTM COORDINATES

STATE PLANE COORDINATES

UTM (Zone 16)

SPC (4100 TN )

Northing (Y) [meters] 3925254.831
Easting (X) [meters] 375500.925
Convergence [degrees] -0.79615121
Point Scale 0.99979101
Combined Factor 0.99976853

127944.937
384711.753
-1.38870937
0.99996925
0.99994676

US NATIONAL GRID DESIGNATOR: 16SCE7550025254(NAD 83)

BASE STATIONS USED

Table with columns: PID, DESIGNATION, LATITUDE, LONGITUDE, DISTANCE(m). Lists base stations like DL7339 TN40, DL6193 TN46, etc.

DI2224	AL20	ALDOT 2 DIV OFF	CORS ARP	N344237.129	W0873945.736	105630.3
DJ9566	TN42	TDOT DISTRICT 42	CORS ARP	N360812.548	W0891453.313	108905.2

NEAREST NGS PUBLISHED CONTROL POINT

FE0198	W 21			N352222.	W0882159.	10056.6
--------	------	--	--	----------	-----------	---------

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