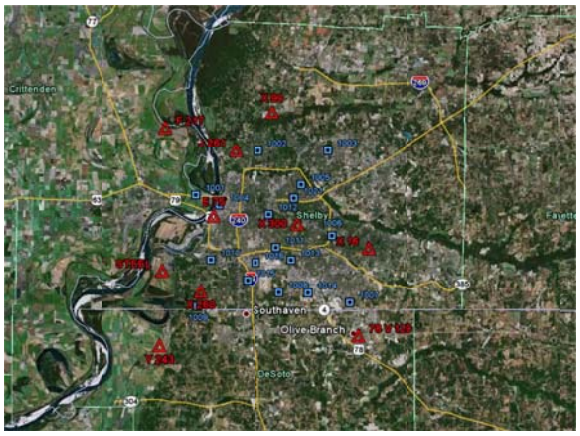
LiDAR GROUND CONTROL SURVEY REPORT



MEMPHIS, TN 1m NPS LiDAR & FEATURE EXTRACTION

Memphis, Tennessee

U.S.GEOLOGICAL SURVEY—DENVER, CO

February 2012

WOOLPERT

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LIDAR GROUND CONTROL SURVEY REPORT

MEMPHIS, TN 1m NPD LiDAR & FEATURE EXTRACTION
Memphis, Tn

U.S. Geological Survey

February, 2012

Prepared by Woolpert, Inc.
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NOTICE OF PROPRIETARY INFORMATION

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SECTION 1: SURVEY REPORT

INTRODUCTION

Report Date:	February 27, 2012
Task Name:	Memphis 1m NPS LiDAR & Feature Extraction Task Order
Client POC Information:	USGS/NGTOC Attn. Pat Emmett, MS 666 1400 Independence Rd. Rolla, MO 65401 Phone: 573.308.3587 Fax: 573.308.3810 pemmett@usgs.gov
Contract Number:	G10PC00057
Task Order Number:	G11PD00768
Date of Contract:	July 21, 2011
Delivery Date:	April 30, 2012

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Woolpert Project Number:	071511

This report contains a comprehensive outline of the LiDAR Ground Control Survey that supported the Memphis 1m NPS LiDAR & Feature Extraction Task Order. All surveys were performed in such a way as to achieve ground control accuracies that meet or exceed the National Mapping Accuracy Standards necessary to support 1 point per 0.3 meter ground sample distance (GSD).

PROJECT AREA

The project area consists of approximately 233 square miles surrounding the urban area of Memphis, TN, including a 100 meter buffer zone.

PURPOSE

The purpose of this survey was to establish three-dimensional coordinates for a minimum of 60 ground control points (GCPs) and a minimum of 20 quality control (QC) points in each of the land cover classifications in the Memphis, TN, project area.

The GCPs were located on open, bare earth surfaces with a level slope to enable effective assessment of swath-to-swath reproducibility and absolute accuracy. The QC points were collected uniformly dispersed over the project area in the appropriate land cover categories to verify fundamental, supplemental, and consolidated vertical accuracies throughout the project.

DATE OF SURVEY

Ground control field operations took place between January 4, 2012, and January 06, 2012.

MONUMENTATION

Prior to aerial imagery acquisition, Woolpert field crews performed a field reconnaissance to verify the existence and suitability of pre-selected existing National Geodetic Survey (NGS) control stations. These existing control stations were utilized to ensure that quality *x, y,* and *z* coordinate values were computed for each of the newly established photogrammetric control stations. Recovery information sheets for the existing NGS control stations can be found in Section 4 of this report. A control diagram showing the ground control stations used to support this LiDAR mapping project can be found in Section 5 of this report.

ACCURACY STANDARDS

The data collected under this task order shall meet the National Standard for spatial Database Accuracy (NSSDA) standards. The NSSDA standards specify that vertical accuracy be reported at the 95 percent confidence level for data tested by an independent source of higher accuracy.

The Fundamental Vertical Accuracy (FVA) of the TIN: 24.5 cm at a 95% confidence level, derived according to NSSDA, i.e., based on RMSEZ of 12.5 cm in the "open terrain" land cover category.

Consolidated Vertical Accuracy (CVA): 36.3 cm at a 95% confidence level, derived according to ASPRS Guidelines, Vertical Accuracy Reporting for LiDAR Data, i.e., based on the 95% error in all land cover categories combined.

Supplemental Vertical Accuracy (SVA): shall be reported based on the 95th percentile error, in each of the reportable land cover categories.

The overall accuracy of the ground control survey is expressed in terms of standard deviation, at a 95% confidence level, based on the published NGS control monuments that were used throughout the task order AOI. The standard deviation of the ground control survey is 0.010m horizontally and 0.023m vertically at the 95% confidence level.

GPS EQUIPMENT

Woolpert utilized a Trimble Navigation R8 Model 2 GNSS dual-frequency GPS receiver with an Air Link Communications Raven CDMA cellular modem with a service plan provided by Verizon as a base station. Woolpert also utilized a Trimble Navigation an R8 Model 2 and an R8 model 3 GNSS dual-frequency GPS receiver with Air Link Communications Raven CDMA cellular modems and two TSC2 data collector as rovers for this project.

METHODOLOGY

REAL-TIME KINEMATIC (RTK) GPS

The field crew utilized Real-Time Kinematic (RTK) GPS surveying throughout the ground control data collection process. Using RTK GPS techniques, observations were performed on 17 LiDAR control points and 83 ground control quality check points. The survey was conducted using a 1-second epoch rate, in a fixed solution RTK mode, with each observation lasting between 60 to 180 seconds. Each station was occupied twice to insure the necessary horizontal and vertical accuracies were being met for this photogrammetric project.

GPS DATA ANALYSIS AND PROCESSING

The field crew chief processed all baselines each day using *Trimble Navigation's* Trimble Business Center (TBC) Version 2.60. Daily processing ensured the integrity of the network as it was constructed, and allowed the field crews to immediately reschedule observations of poor baselines. Unacceptable GPS vectors were removed and field blunders, if any, were detected and eliminated. Once this process was completed, both unconstrained and constrained adjustments were conducted in order to effectively incorporate the observed data.

The GPS control base stations consisted of the following:

Dimension	New and Existing Control Stations
3-D	X 300, 78 V 129, J 261, X 90, X 260, Y 243
2-D	E 75, STEEL
VERTICAL	F 217, X 16,

DATUM REFERENCE AND FINAL COORDINATES

New horizontal GPS control within the Memphis, TN area was based on the UTM Coordinate System Zone 16 North, referenced to North American Datum 1983, national re-adjustment of 2007 (NAD83/2007), expressed in meters. All vertical control was based on the North

American Vertical Datum of 1988 (NAVD88), also expressed in meters. These coordinates for the photogrammetric control survey can be found in Section 2 of this report.

QUALITY ASSURANCE

Existing NGS published control stations were surveyed to assure that there were no discrepancies in the field observation data. Close examinations of the residuals showed no distortions in orientation or scale.

The ground control data meets positional accuracies necessary to support 1.0 point per 0.3 meters squared (1' GSD) data at 95% confidence level as outlined in the *Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy (NSSDA),* published by the Federal Geographic Data Committee (FGDC-STD-007.3-1998).

SECTION 2: GROUND/GEODETIC CONTROL COORDINATE LISTINGS

COORDINATE SYSTEM: GRID

HORIZONTAL DATUM: NAD83
VERTICAL DATUM: NAVD88
ZONE: UTM 16 North
GEOID MODEL: GEOID 09
UNITS: Meters

LiDAR GROUND CONTROL

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
1001	3894744.943	217914.821	66.353	GRAVEL
1002	3901355.198	227836.767	84.598	GRASS
1003	3901076.428	238666.629	90.879	PID STRIPE ONASPHALT
1004	3893116.794	221488.603	74.935	PID CORNER CONCRETE
1005	3895854.825	234370.537	76.568	ASPHALT
1006	3887785.014	238880.004	101.699	GRASS
1007	3877348.867	241341.451	112.067	ASPHALT
1008	3879237.820	230443.697	109.790	GRASS
1009	3877490.515	217679.141	71.933	ASPHALT
1010	3884596.872	219946.035	76.619	PID STRIPE ONASPHALT
1011	3886215.710	230173.928	76.870	ASPHALT
1012	3891386.112	229226.944	92.791	ASPHALT
1013	3884195.800	232464.907	79.920	ASPHALT
1014	3879052.340	234937.427	95.889	ASPHALT
1015	3881233.805	225526.629	92.686	ASPHALT
1016	3883949.990	226886.934	73.955	ASPHALT
1021	3893782.374	233198.342	82.754	GRASS

QUALITY CONTROL POINTS

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
2001	3892953.373	218126.204	65.132	TALL GRASS WEEDS
2002	3902190.787	227292.872	92.400	TALL GRASS
2003	3900992.340	239435.550	89.479	TALL GRASS
2004	3895872.628	241562.486	81.522	TALL GRASS
2005	3895199.332	235368.132	76.282	TALL GRASS
2006	3896282.563	223108.964	75.398	TALL GRASS
2007	3888266.873	219075.098	73.266	TALL GRASS
2008	3893047.034	227027.949	90.594	TALL GRASS
2009	3889584.381	233500.181	90.620	TALL GRASS

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
2010	3891795.736	239147.406	77.397	TALL GRASS
2011	3885793.985	224080.660	71.565	TALL GRASS
2012	3886230.188	230103.396	76.687	TALL GRASS
2013	3884536.870	240304.283	85.929	TALL GRASS
2014	3883640.134	218391.537	70.941	TALL GRASS
2015	3881966.055	222313.276	93.931	TALL GRASS
2016	3882147.490	236500.131	86.857	TALL GRASS
2017	3878472.828	240275.865	108.890	TALL GRASS
2018	3878005.657	230408.386	116.492	TALL GRASS
2019	3879011.563	222733.046	89.271	TALL GRASS
2020	3878087.040	218911.129	80.216	TALL GRASS
2021	3898939.435	222192.434	65.216	TALL GRASS
2022	3901765.022	233030.276	100.426	TALL GRASS
2023	3897686.469	228950.694	74.192	TALL GRASS
2031	3884687.037	222956.331	70.589	TALL GRASS
3001	3898277.024	226204.606	66.005	WOODS
3002	3898266.136	226260.458	64.900	WOODS
3003	3898287.992	226285.279	65.166	WOODS
3004	3898254.760	226304.235	65.218	WOODS
3005	3898206.345	226309.390	65.379	WOODS
3006	3898166.235	226256.443	65.584	WOODS
3007	3889877.903	241898.199	77.042	WOODS
3008	3889909.094	241908.479	77.096	WOODS
3009	3889916.321	241871.787	76.965	WOODS
3010	3889948.874	241871.110	77.122	WOODS
3011	3889957.462	241828.309	77.213	WOODS
3012	3885143.743	236482.507	81.723	WOODS
3013	3889920.391	241804.938	76.826	WOODS
3014	3883661.382	217824.615	67.946	WOODS
3015	3879711.146	219648.426	83.096	WOODS
3016	3879064.386	224907.293	82.850	WOODS
3017	3877558.489	230309.996	116.962	WOODS
3018	3881656.817	241845.543	95.443	WOODS
3019	3877525.349	236816.333	109.456	WOODS
3020	3888933.152	233428.717	88.442	WOODS
3021	3885859.634	220666.859	72.459	WOODS
3022	3887958.498	219261.511	85.374	WOODS
3023	3886091.799	230154.423	76.366	WOODS
3024	3882063.226	222337.273	91.930	WOODS
3031	3884555.735	222985.884	69.392	WOODS
3032	3884548.220	222936.565	69.278	WOODS
3033	3884704.172	222915.677	69.482	WOODS
3034	3884760.776	222926.468	69.723	WOODS

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
3035	3884792.568	222929.824	69.481	WOODS
3036	3884630.809	222886.292	68.105	WOODS
3037	3877975.716	230303.917	112.627	WOODS
3038	3877957.438	230249.303	112.079	WOODS
3039	3877953.124	230218.340	112.173	WOODS
3040	3877895.819	230226.542	108.853	WOODS
3041	3877904.548	230265.706	110.132	WOODS
3042	3877914.282	230311.521	113.328	WOODS
3043	3877890.295	230315.803	114.280	WOODS
4001	3880085.171	218266.780	81.538	URBAN
4002	3879297.673	231953.854	110.397	URBAN
4003	3886844.619	229811.992	83.636	URBAN
4004	3878959.475	241130.183	102.282	URBAN
4005	3889996.587	241002.628	78.789	URBAN CONCRETE
4006	3895834.313	239924.603	76.298	URBAN ASPHALT
4007	3889808.924	232341.110	88.705	URBAN
4008	3885893.740	227896.023	88.961	URBAN
4009	3884211.262	218993.438	83.710	URBAN
4010	3887446.768	219917.817	78.139	URBAN
4011	3892520.118	217816.665	71.338	URBAN ASPHALT
4012	3894684.905	222406.858	69.407	URBAN CONCRETE
4013	3900956.836	224070.977	78.585	URBAN CONCRETE
4014	3892644.421	229157.054	85.352	URBAN ASPHALT
4015	3901889.288	229122.343	93.481	URBAN ASPHALT
4016	3900645.774	234841.049	85.134	URBAN ASPHALT
4017	3899421.729	238540.062	84.948	URBAN ASPHALT
4018	3897224.431	236319.399	76.767	URBAN ASPHALT
4019	3896366.122	229477.745	74.103	URBAN ASPHALT
4020	3888693.436	225457.013	79.633	URBAN
4021	3887478.234	239018.250	95.399	URBAN
4022	3882442.550	236589.576	87.167	URBAN
8001	3889615.681	233703.601	89.728	BARE EARTH
8002	3877371.000	242057.837	111.630	BARE EARTH
8003	3877460.151	236930.212	113.087	BARE EARTH
8004	3879692.791	219955.607	85.224	BARE EARTH
8005	3883674.370	217599.882	74.471	BARE EARTH
8006	3880494.188	229936.522	104.744	BARE EARTH
8007	3880609.036	239989.356	100.545	BARE EARTH
8008	3885041.903	239903.321	85.431	BARE EARTH
8009	3884112.944	237817.852	86.961	BARE EARTH
8010	3882191.874	222646.199	90.812	BARE EARTH
8011	3886923.431	221675.980	72.876	BARE EARTH
8012	3889163.198	228086.489	93.785	BARE EARTH

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
8014	3892718.746	241787.275	102.313	BARE EARTH
8015	3892507.981	223764.528	80.050	BARE EARTH
8016	3891682.368	222904.681	78.576	BARE EARTH
8017	3896382.945	222790.298	70.789	BARE EARTH
8019	3894452.299	239031.934	78.762	BARE EARTH
8020	3898855.812	238781.021	79.085	BARE EARTH
8022	3901203.845	227710.166	79.503	BARE EARTH
8023	3886104.993	226866.819	86.839	BARE EARTH
8024	3900050.907	222962.891	82.425	BARE EARTH
8025	3901695.222	226664.235	84.458	BARE EARTH
8028	3879611.061	225810.921	84.708	BARE EARTH
8029	3891532.804	220607.337	83.565	BARE EARTH

CONTROL BASE STATIONS

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
X 300	3889723.991	233544.284	89.501	FE2200

NGS CONTROL BASE STATION CHECK POINTS

Station Name	Northing (M)	Easting (M)	Elevation (M)	Description
78 V 129 RTK	3872106.762	242451.222	121.030	EG1209
E 75 RTK	3891344.328	220494.023	86.563	FF0482
F 217 RTK	3905227.399	213495.129	74.655	FF0977
J 261 RTK	3901462.71	224239.306	76.759	FF0322
STEEL RTK	3883046.685	212364.072	63.940	AJ2678
X 16 RTK	3885604.243	244467.469	117.700	FE1126
X 90 RTK	3907143.572	230183.456	73.177	FE1410
X 260 RTK	3879693.901	218174.796	84.969	FE0392
Y 243 RTK	3871512.692	211611.822	64.414	EH0143

COORDINATE SYSTEM: GEODETIC

HORIZONTAL DATUM: NAD83
VERTICAL DATUM: NAVD88
ZONE: WGS 84
GEOID MODEL: GEOID 09
UNITS: Meters

LiDAR GROUND CONTROL

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
1001	N35°09'21.92442"	W90°05'48.00947"	39.039	GRAVEL
1002	N35°13'06.05546"	W89°59'24.23138"	57.259	GRASS
1003	N35°13'07.38342"	W89°52'16.07361"	63.484	PID STRIPE ONASPHALT
1004	N35°08'32.73278"	W90°03'24.97777"	47.602	PID CORNER CONCRETE
1005	N35°10'14.03991"	W89°54'59.73775"	49.159	ASPHALT
1006	N35°05'56.65994"	W89°51'52.51302"	74.202	GRASS
1007	N35°00'20.57793"	W89°50'03.70156"	84.526	ASPHALT
1008	N35°01'11.57079"	W89°57'15.30865"	82.325	GRASS
1009	N35°00'02.38687"	W90°05'36.16053"	44.584	ASPHALT
1010	N35°03'55.01445"	W90°04'15.47926"	49.270	PID STRIPE ONASPHALT
1011	N35°04'57.52871"	W89°57'34.10439"	49.432	ASPHALT
1012	N35°07'44.23141"	W89°58'17.53882"	65.391	ASPHALT
1013	N35°03'54.24142"	W89°56'01.40476"	52.451	ASPHALT
1014	N35°01'09.83606"	W89°54'18.00041"	68.389	ASPHALT
1015	N35°02'11.51231"	W90°00'31.44845"	65.273	ASPHALT
1016	N35°03'40.89318"	W89°59'41.04893"	46.540	ASPHALT
1021	N35°09'05.73461"	W89°55'43.60744"	55.338	GRASS

QUALITY CONTROL POINTS

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
2001	N35°08'24.06487"	W90°05'37.46625"	37.816	TALL GRASS WEEDS
2002	N35°13'32.61116"	W89°59'46.71309"	65.064	TALL GRASS
2003	N35°13'05.37717"	W89°51'45.59981"	62.078	TALL GRASS
2004	N35°10'21.36740"	W89°50'15.79078"	54.068	TALL GRASS
2005	N35°09'53.73616"	W89°54'19.59371"	48.861	TALL GRASS
2006	N35°10'16.96475"	W90°02'24.85280"	48.064	TALL GRASS
2007	N35°05'53.10704"	W90°04'54.29374"	45.935	TALL GRASS
2008	N35°08'35.93647"	W89°59'46.28444"	63.221	TALL GRASS
2009	N35°06'49.92516"	W89°55'26.82208"	63.172	TALL GRASS
2010	N35°08'06.94302"	W89°51'46.51584"	49.923	TALL GRASS
2011	N35°04'37.92196"	W90°01'33.89731"	44.184	TALL GRASS

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
2012	N35°04'57.93012"	W89°57'36.90303"	49.250	TALL GRASS
2013	N35°04'12.67325"	W89°50'52.66132"	58.408	TALL GRASS
2014	N35°03'22.44418"	W90°05'15.59720"	43.604	TALL GRASS
2015	N35°02'32.08773"	W90°02'38.97900"	66.552	TALL GRASS
2016	N35°02'51.65570"	W89°53'19.94763"	59.351	TALL GRASS
2017	N35°00'56.03636"	W89°50'46.95482"	81.356	TALL GRASS
2018	N35°00'31.59087"	W89°57'15.26237"	89.025	TALL GRASS
2019	N35°00'56.72762"	W90°02'18.88508"	61.877	TALL GRASS
2020	N35°00'22.95891"	W90°04'48.35256"	52.857	TALL GRASS
2021	N35°11'42.17855"	W90°03'04.25692"	37.890	TALL GRASS
2022	N35°13'24.36485"	W89°55'59.54520"	73.068	TALL GRASS
2023	N35°11'08.20903"	W89°58'35.88366"	46.832	TALL GRASS
2031	N35°04'00.92890"	W90°02'16.90172"	43.213	TALL GRASS
3001	N35°11'24.67215"	W90°00'25.02322"	38.662	WOODS
3002	N35°11'24.37401"	W90°00'22.80471"	37.556	WOODS
3003	N35°11'25.10688"	W90°00'21.85070"	37.823	WOODS
3004	N35°11'24.04820"	W90°00'21.06242"	37.875	WOODS
3005	N35°11'22.48376"	W90°00'20.80101"	38.035	WOODS
3006	N35°11'21.13159"	W90°00'22.84386"	38.240	WOODS
3007	N35°07'07.31574"	W89°49'55.79372"	49.539	WOODS
3008	N35°07'08.33652"	W89°49'55.42308"	49.594	WOODS
3009	N35°07'08.53697"	W89°49'56.87906"	49.463	WOODS
3010	N35°07'09.59179"	W89°49'56.94232"	49.620	WOODS
3011	N35°07'09.83075"	W89°49'58.64094"	49.711	WOODS
3012	N35°07'08.60724"	W89°49'59.52151"	49.324	WOODS
3012	N35°07'08.60724"	W89°49'59.52151"	49.324	WOODS
3013	N35°02'35.26141"	W90°02'38.15009"	64.552	WOODS
3014	N35°03'22.56298"	W90°05'37.97168"	40.614	WOODS
3015	N35°01'16.34259"	W90°04'21.27570"	55.736	WOODS
3016	N35°01'00.57850"	W90°00'53.27433"	55.436	WOODS
3017	N35°00'16.99945"	W89°57'18.61742"	89.495	WOODS
3018	N35°02'40.71817"	W89°49'48.65406"	67.904	WOODS
3019	N35°00'22.09640"	W89°53'02.21274"	81.940	WOODS
3020	N35°06'28.74440"	W89°55'28.88664"	60.990	WOODS
3021	N35°04'36.66731"	W90°03'48.59101"	45.108	WOODS
3022	N35°05'43.29801"	W90°04'46.56514"	58.040	WOODS
3023	N35°04'53.49285"	W89°57'34.72844"	48.928	WOODS
3024	N35°04'28.78085"	W89°53'24.06806"	54.228	WOODS
3031	N35°03'56.70176"	W90°02'15.57868"	42.015	WOODS
3032	N35°03'56.40939"	W90°02'17.51417"	41.901	WOODS
3033	N35°04'01.44419"	W90°02'18.52522"	42.106	WOODS
3034	N35°04'03.28978"	W90°02'18.16780"	42.348	WOODS
3035	N35°04'04.32366"	W90°02'18.07372"	42.106	WOODS

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
3036	N35°03'59.03695"	W90°02'19.59560"	40.729	WOODS
3037	N35°00'30.51990"	W89°57'19.34380"	85.160	WOODS
3038	N35°00'29.87488"	W89°57'21.47439"	84.614	WOODS
3039	N35°00'29.70527"	W89°57'22.68940"	84.708	WOODS
3040	N35°00'27.85538"	W89°57'22.29931"	81.388	WOODS
3041	N35°00'28.17598"	W89°57'20.76637"	82.666	WOODS
3042	N35°00'28.53553"	W89°57'18.97250"	85.862	WOODS
3043	N35°00'27.76200"	W89°57'18.77576"	86.814	WOODS
4001	N35°01'27.08371"	W90°05'16.17470"	54.191	URBAN
4002	N35°01'14.95710"	W89°56'15.86483"	82.919	URBAN
4003	N35°05'17.56830"	W89°57'49.11661"	56.205	URBAN
4004	N35°01'12.60373"	W89°50'13.83139"	74.743	URBAN
4005	N35°07'10.33594"	W89°50'31.26654"	51.292	URBAN CONCRETE
4006	N35°10'18.60409"	W89°51'20.41993"	48.853	URBAN ASPHALT
4007	N35°06'56.09827"	W89°56'12.81380"	61.268	URBAN
4008	N35°04'44.88747"	W89°59'03.55920"	61.543	URBAN
4009	N35°03'41.56140"	W90°04'52.56580"	56.369	URBAN
4010	N35°05'27.36732"	W90°04'20.05750"	50.800	URBAN
4011	N35°08'09.70884"	W90°05'49.14855"	44.023	URBAN ASPHALT
4012	N35°09'24.47809"	W90°02'50.63668"	42.073	URBAN CONCRETE
4013	N35°12'49.43943"	W90°01'52.50596"	51.256	URBAN CONCRETE
4014	N35°08'24.95591"	W89°58'21.78061"	57.960	URBAN ASPHALT
4015	N35°13'24.62186"	W89°58'34.07987"	66.139	URBAN ASPHALT
4016	N35°12'49.80836"	W89°54'46.70815"	57.759	URBAN ASPHALT
4017	N35°12'13.61811"	W89°52'19.18288"	57.540	URBAN ASPHALT
4018	N35°11'00.29032"	W89°53'44.36728"	49.356	URBAN ASPHALT
4019	N35°10'25.91740"	W89°58'13.51305"	46.731	URBAN ASPHALT
4020	N35°06'13.26657"	W90°00'43.08125"	52.251	URBAN
4021	N35°05'46.84255"	W89°51'46.71129"	67.899	URBAN
4022	N35°03'01.30593"	W89°53'16.75838"	59.662	URBAN
8001	N35°06'51.13360"	W89°55'18.83248"	62.279	BARE EARTH
8002	N35°00'21.95432"	W89°49'35.49650"	84.086	BARE EARTH
8003	N35°00'20.08925"	W89°52'57.65122"	85.57	BARE EARTH
8004	N35°01'16.05417"	W90°04'09.14907"	57.86	BARE EARTH
8005	N35°03'22.75772"	W90°05'46.84670"	47.141	BARE EARTH
8006	N35°01'51.81385"	W89°57'36.76497"	77.287	BARE EARTH
8007	N35°02'05.03214"	W89°51'00.65170"	73.014	BARE EARTH
8008	N35°04'28.67557"	W89°51'09.04391"	57.914	BARE EARTH
8009	N35°03'56.61367"	W89°52'30.23270"	59.454	BARE EARTH
8010	N35°02'39.73738"	W90°02'26.12801"	63.43	BARE EARTH
8011	N35°05'12.15578"	W90°03'10.08523"	45.521	BARE EARTH
8012	N35°06'31.06229"	W89°58'59.91122"	66.382	BARE EARTH
8014	N35°08'39.31995"	W89°50'03.36446"	74.831	BARE EARTH

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
8015	N35°08'15.25587"	W90°01'54.42787"	52.7	BARE EARTH
8016	N35°07'47.64164"	W90°02'27.36299"	51.23	BARE EARTH
8017	N35°10'19.90251"	W90°02'37.55450"	43.457	BARE EARTH
8019	N35°09'32.96452"	W89°51'54.09384"	51.31	BARE EARTH
8020	N35°11'55.49641"	W89°52'09.01923"	51.671	BARE EARTH
8022	N35°13'01.02535"	W89°59'29.05228"	52.164	BARE EARTH
8023	N35°04'50.73431"	W89°59'44.39683"	59.432	BARE EARTH
8024	N35°12'18.97405"	W90°02'35.17707"	55.097	BARE EARTH
8025	N35°13'15.93052"	W90°00'10.95559"	57.122	BARE EARTH
8028	N35°01'19.18437"	W90°00'18.31595"	57.286	BARE EARTH
8029	N35°07'40.50750"	W90°03'57.82846"	56.233	BARE EARTH

NGS CONTROL BASE STATIONS

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
X 300	N35°06'54.49328"	W89°55'25.24386"	62.055	FE2200

NGS CONTROL BASE STATION CHECK POINTS

Station Name	Latitude	Longitude	Ellips. Hgt. (M)	Description
78 V 129	N34°57'31.63095"	W89°49'14.13505"	93.452	EG1209
E 75	N35°07'34.28502"	W90°04'02.07056"	59.198	FF0482
F 217	N/A	N/A	N/A	FF0977
J 261	N35°13'06.00448"	W90°01'46.46697"	49.429	FF0322
STEEL	N35°02'57.09032"	W90°09'12.45513"	36.706	AJ2678
X 16	N/A	N/A	N/A	FE1126
X 90	N35°16'15.98397"	W89°57'58.36766"	45.837	FE1410
X 260	N35°01'14.30779"	W90°05'19.32201"	57.662	FE0392
Y 243	N34°56'42.46278"	W90°09'27.72098"	37.099	EH0143

SECTION 3: GROUND/GEODETIC CONTROL LOGS AND PHOTOS

This section contains the station recovery information sheets and photographs for the ground control, geodetic control and checkpoint stations established for the project. The stations appear as they are ordered in the final coordinate listing of Section 2.

The data is assimilated on the following pages.

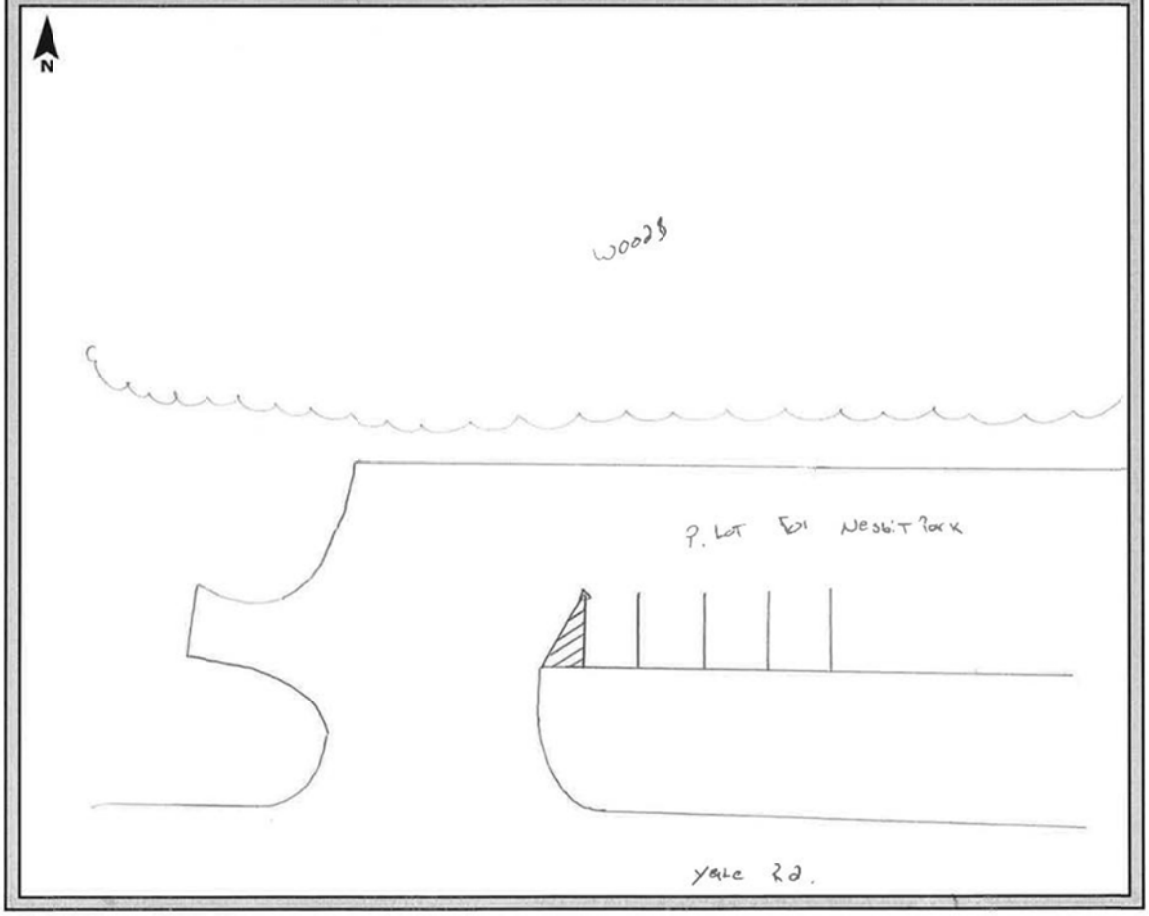
71665, 1001, GROUND

71665, 1002, GROUND

GPS Observation Log Sheet

WOOLPERT

Project Name:	memphis Lidar	**Project Number:** 71665	**Survey Date:** 1-5-12
Station Name:	1003	**Operator Name:**	Brett Harmon
Latitude:	35-13-07.38	**Julian Day:** 5	**Session No.** N/A
Longitude:	89-52-16.07	**Start Time:** N/A	**End Time:** N/A
Ellip. Height:	208.312	**Data File Name:**	memphis Lidar
Type of Mark:	PID	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	N/A	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	Sunny 55°	**Antenna Height:**	2.000m to bottom of antenna mount



71665, 1003, 2

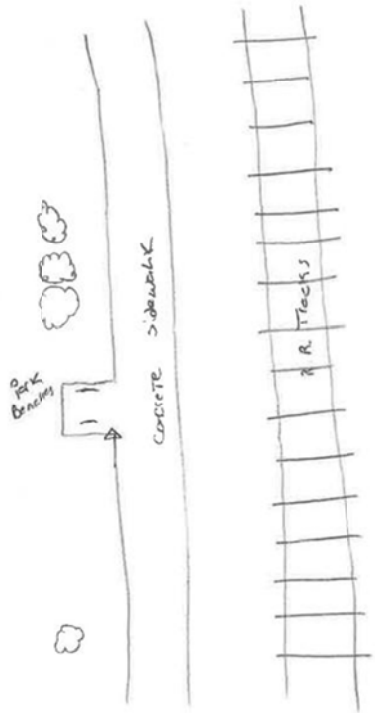
GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis lidar	**Project Number:** 71665	**Survey Date:** 1-4-12
Station Name:	1004	**Operator Name:**	Brett Harmon
Latitude:	35-08-32.73	**Julian Day:** 4	**Session No.** N/A
Longitude:	90-03-24.97	**Start Time:** N/A	**End Time:** N/A
Ellip. Height:	156.146	**Data File Name:**	Memphis Lidar
Type of Mark:	PID	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	N/A	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	Breezy 45° Sunny	**Antenna Height:** 2.000m	to bottom of antenna mount

N

moved point because truck was parked over point picked by Photogrammetry



71665, 1004, 2, GROUND

71665, 1004, 3S,GROUND

71665, 1004, 3W,GROUND

71665, 1005 GROUND

71665-1006 Ground Looking North

71665-1007 Ground Looking North

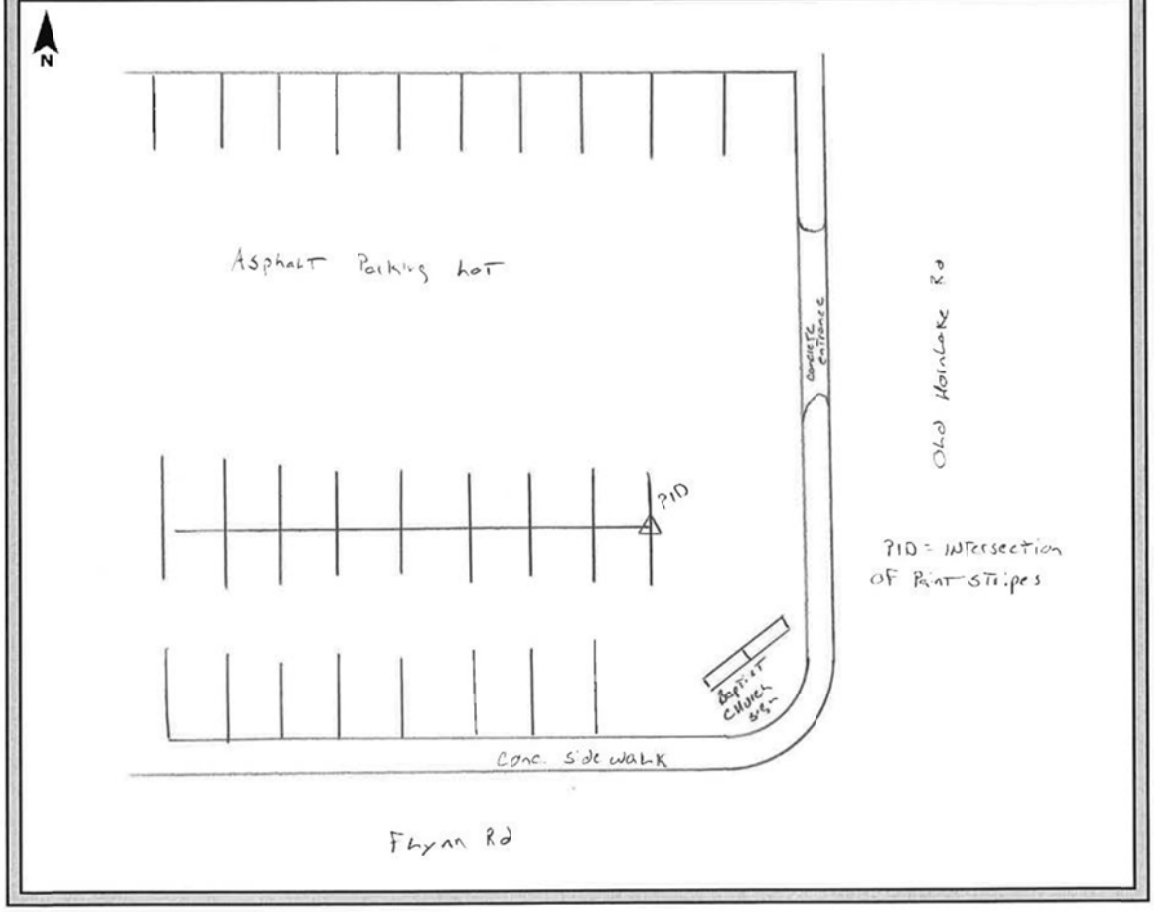
71665-1008 Ground Looking North

71665-1009 Ground Looking Norht

GPS Observation Log Sheet

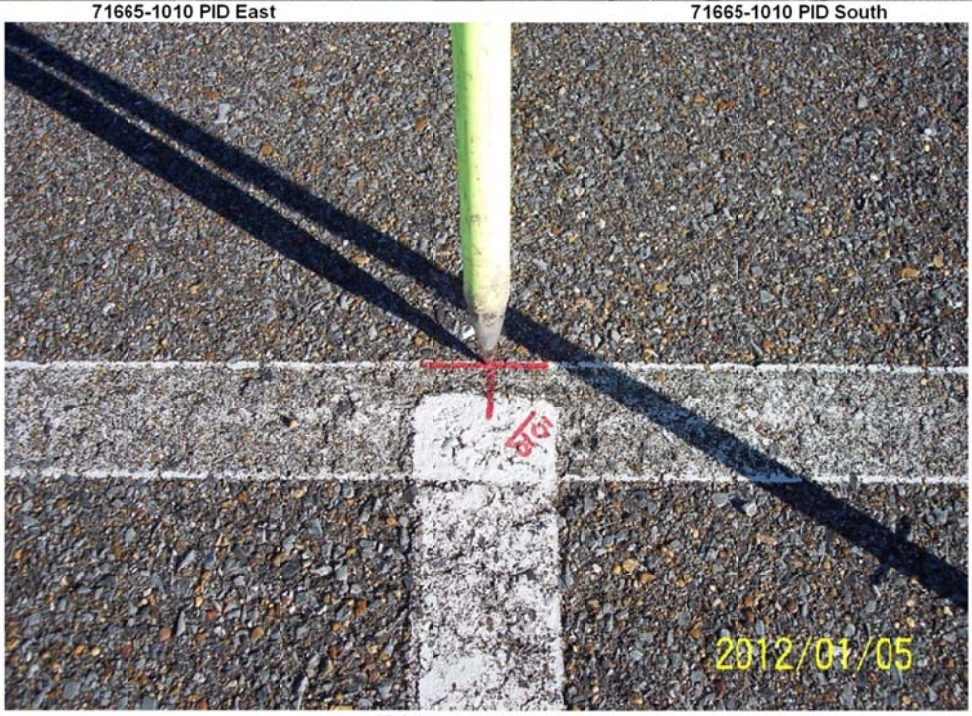
WOOLPERT

Project Name:	Memphis USGS Lidar	Project Number:	71665
Survey Date:	1-5-2012		
Station Name:	1010	Operator Name:	John Owens
Latitude:	35°03'55.01	Julian Day:	5
Session No.	N/A		
Longitude:	90-04-15.47	Start Time:	N/A
End Time:	N/A		
Ellip. Height:	49.270	Data File Name:	Memphis JDO
Type of Mark:	PID	Type of Reciever:	R8-3
Stamping on Mark:	N/A	Type of Antenna:	R8-3
Weather Condition:	Sunny 60°	Antenna Height:	2.0 to bottom of antenna mount



71665-1010 PID East

71665-1010 PID South



71665-1010 PID

71665-1011 Ground North

71665, 1012, GROUND

71665-1013_Ground North

71665-1014_Ground North

71665-1015_Ground North

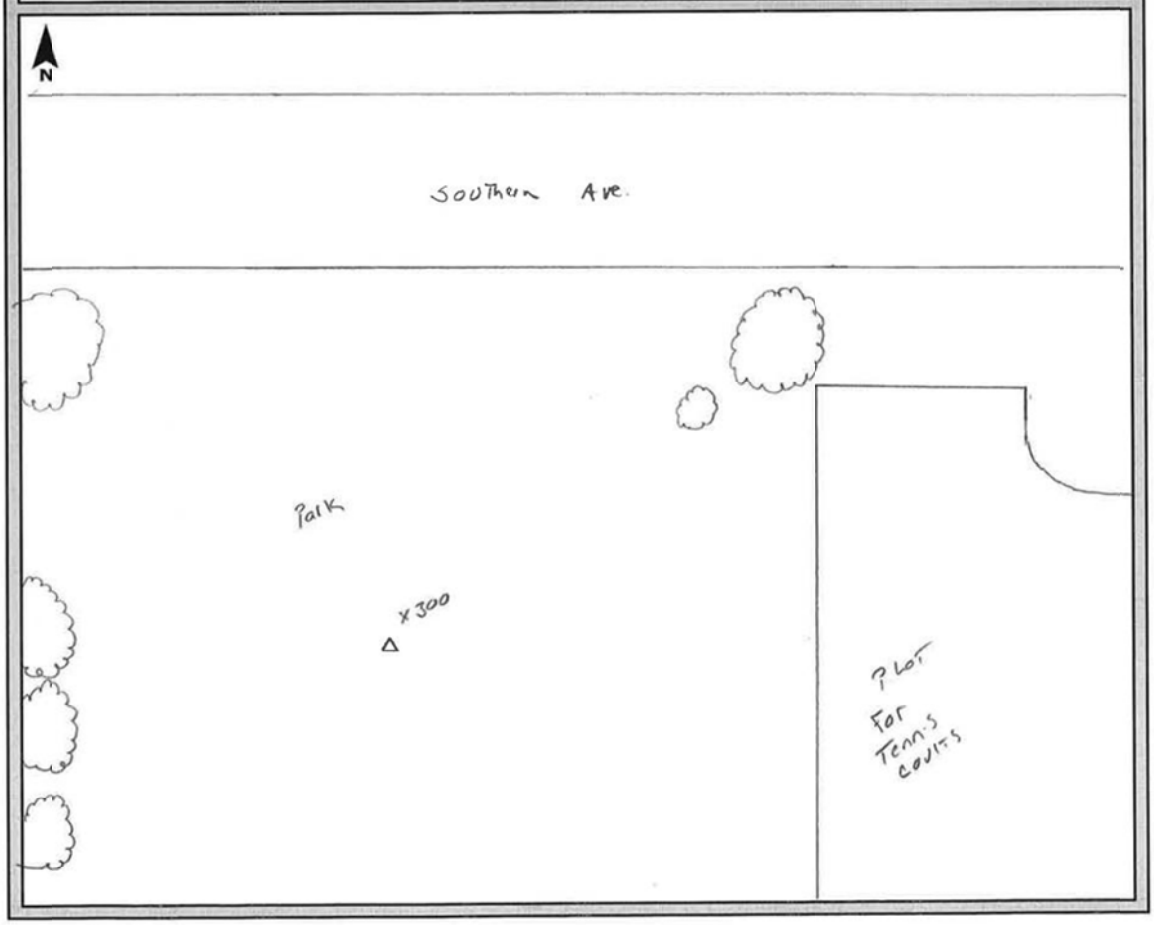
71665-1016_Ground North

71665, 1021, GROUND

GPS Observation Log Sheet

WOOLPERT

Project Name:	71665 Memphis Lidar	**Project Number:**	71665
Survey Date:	1-4-12		
Station Name:	X 300	**Operator Name:**	Brett Harmon
Latitude:	35-06-54.493	**Julian Day:**	4
Session No.	30sec		
Longitude:	89-55-25.243	**Start Time:**	N/A
End Time:	N/A		
Ellip. Height:	62.055	**Data File Name:**	Memphis Lidar
Type of Mark:	Deep Rod	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	X 300	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	Cloudy 40°	**Antenna Height:**	2.000m to bottom of antenna mount

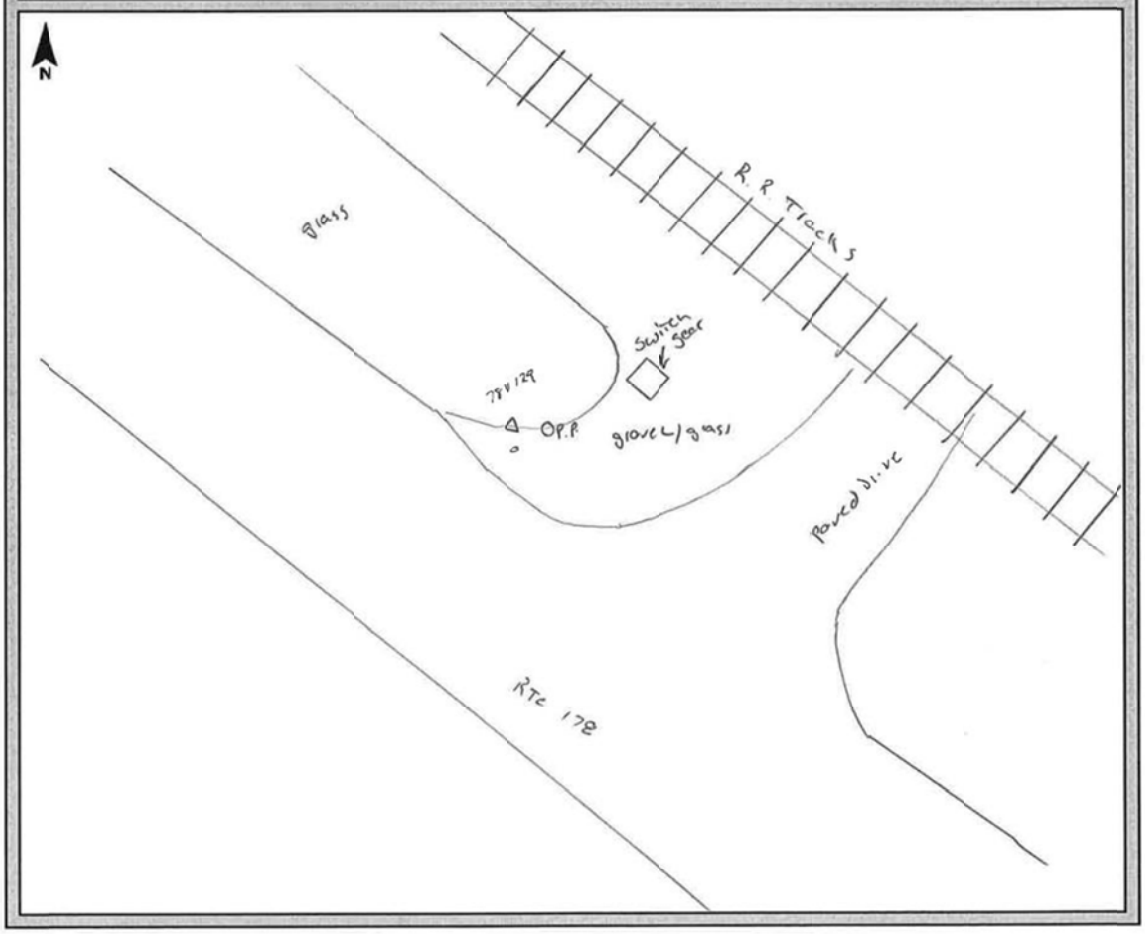


71665, X 300, 1

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis Lidar USGS	**Project Number:** 71665	**Survey Date:** 1-4-12
Station Name:	78 V 129	**Operator Name:**	Brett Harmon
Latitude:	34-57-31.63	**Julian Day:** 4	**Session No.** N/A
Longitude:	89-49-14.13	**Start Time:** N/A	**End Time:** N/A
Ellip. Height:	93.483 m	**Data File Name:**	Memphis JD0
Type of Mark:	Conc. nail	**Type of Reciever:**	Trimble R8-2 Internal
Stamping on Mark:	78 V 129	**Type of Antenna:**	Trimble R8-2 Internal
Weather Condition:	Sunny 50°	**Antenna Height:** 2.000m	to bottom of antenna mount



71665-78 V 129_1

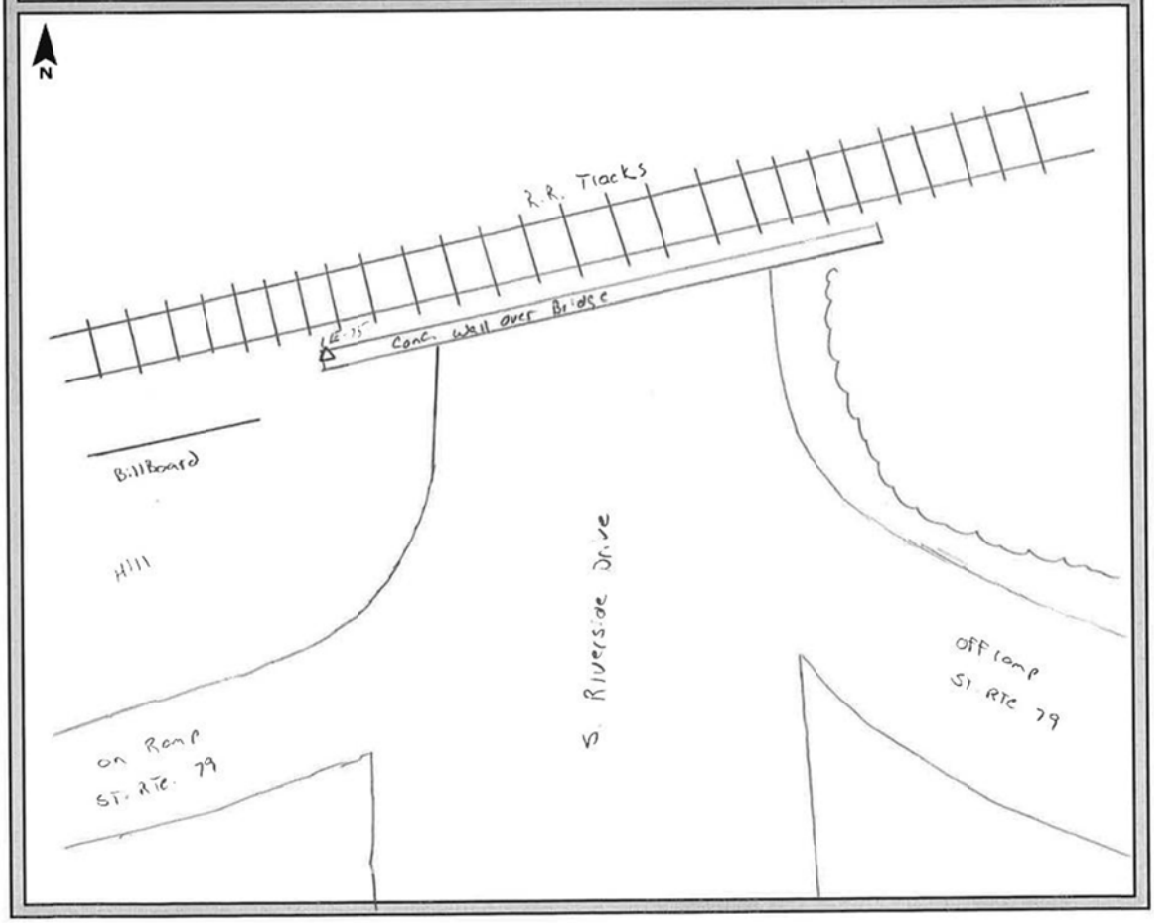
71665-78 V 129_2

71665-78 V 129_E

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis Lidar USGS	Project Number:	71665
Station Name:	E 75	Survey Date:	1-4-2012
Latitude:	35-07-31.28	Operator Name:	Brett Harmon
Longitude:	90-04-02.07	Julian Day:	4
Ellip. Height:	59.232 m	Session No.	N/A
Type of Mark:	Bench Mark	Start Time:	N/A
Stamping on Mark:	E 75 1954	End Time:	N/A
Weather Condition:	Sunny 55°C	Data File Name:	Memphis Lidar
		Type of Reciever:	Trimble R8 Internal
		Type of Antenna:	Trimble R8 Internal
		Antenna Height:	2.000m to bottom of antenna mount



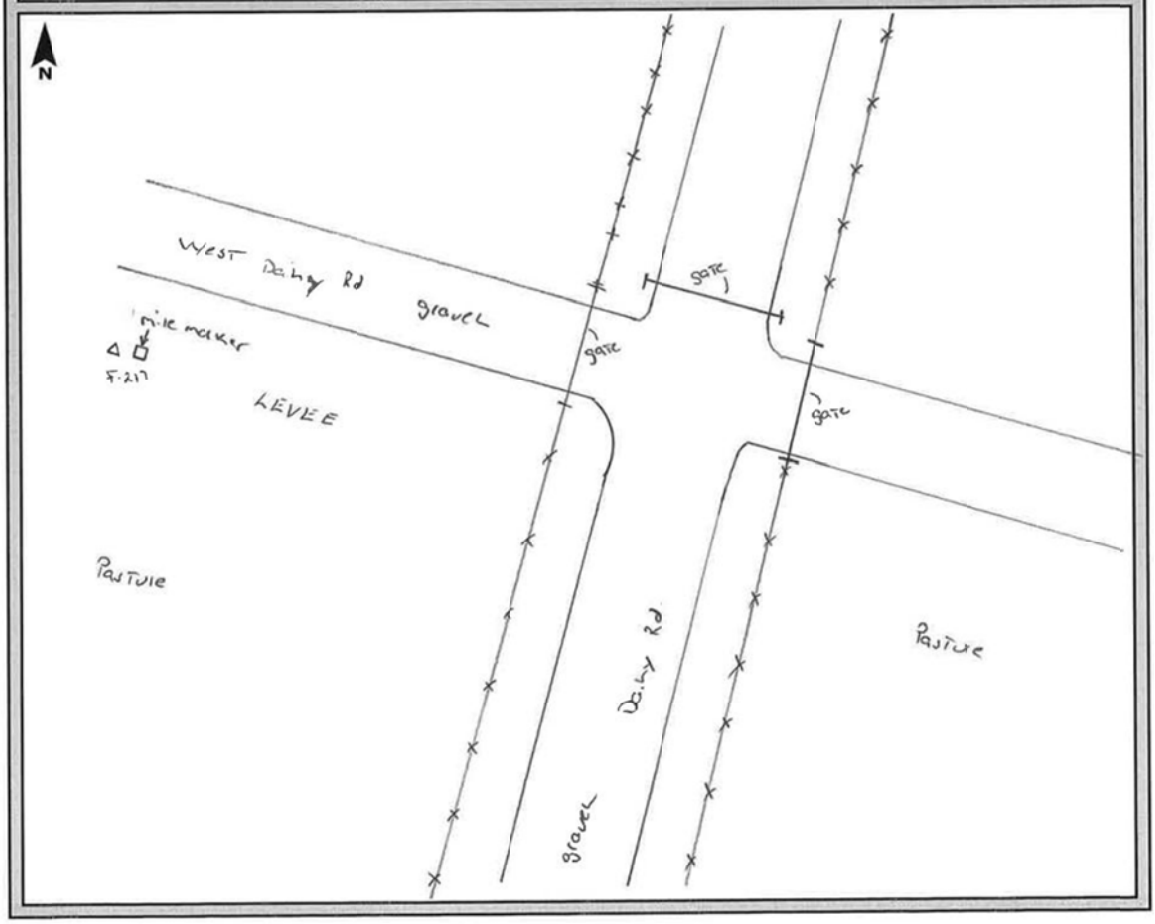
71665, E 75, 3E

71665, E 75, 3S

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis USGS	**Project Number:**	71665
Station Name:	F. 217	**Survey Date:**	1-4-2012
Latitude:	35-14-57.19	**Operator Name:**	Brett Harmon
Longitude:	90-08-55.56	**Julian Day:**	4
Ellip. Height:	47.328 m	**Session No.**	N/A
Type of Mark:	Conc. monument	**Start Time:**	N/A
Stamping on Mark:	F-217 1976	**End Time:**	N/A
Weather Condition:	Sunny 55°	**Data File Name:**	Memphis Lidar
		Type of Reciever:	Trimble R8 Internal
		Type of Antenna:	Trimble R8 Internal
		Antenna Height:	2.000m to bottom of antenna mount



71665, F 217,1

71665, F 217, 2

71665, F 217, 3E

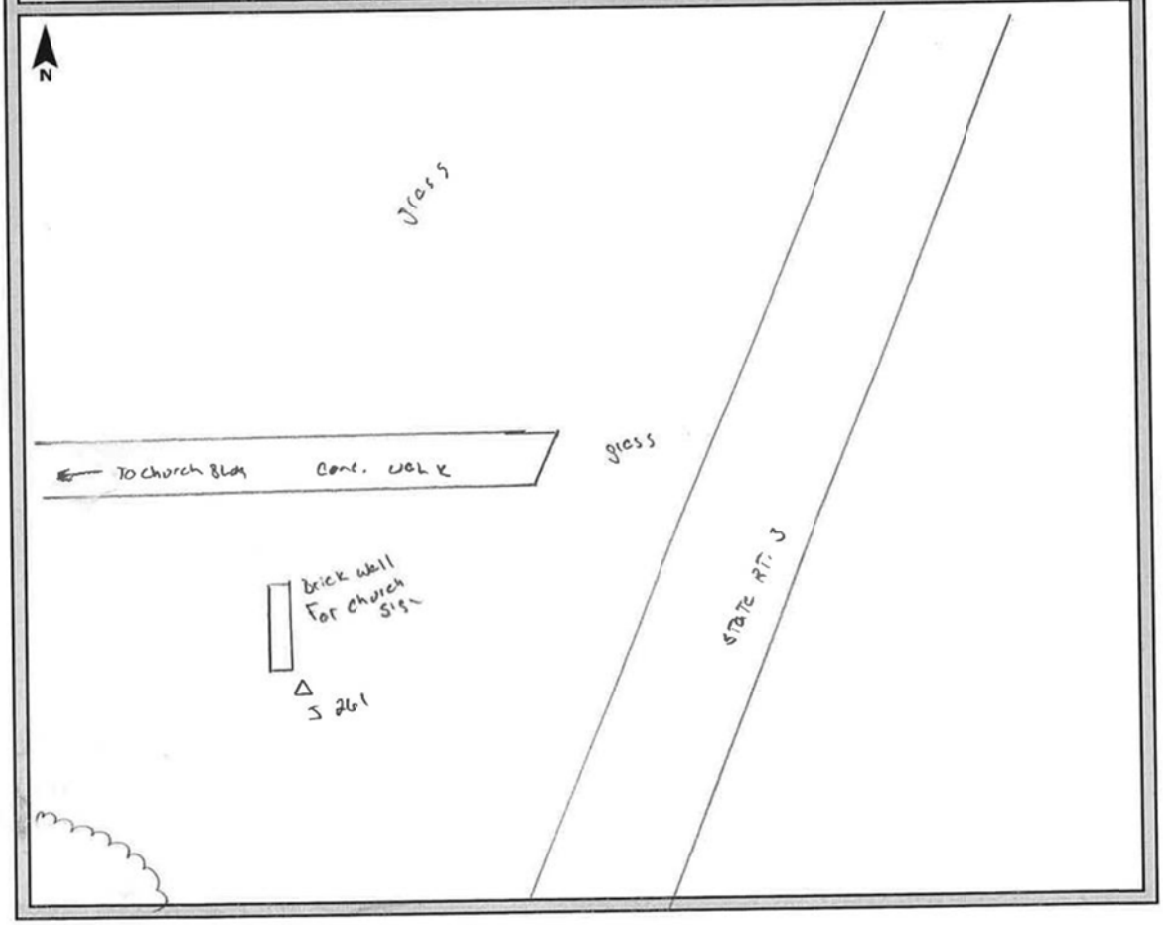
71665, F 217, 3S

GPS Observation Log Sheet

WOOLPERT

Project Name: Memphis Lidar
Station Name: J 261
Latitude: 35° 13' 06.004"
Longitude: 90° 01' 46.47"
Ellip. Height: 251.89s
Type of Mark: Brass Disc
Stamping on Mark: J 261
Weather Condition: Sunny 50°

Project Number: 71665 Survey Date: 1-4-12
Operator Name: Brett Harmon
Julian Day: 4 Session No. N/A
Start Time: N/A End Time: N/A
Data File Name: Memphis Lidar
Type of Reciever: Trimble R8 Internal
Type of Antenna: Trimble R8 Internal
Antenna Height: 2.000m to bottom of antenna mount



71665, J 261, 1

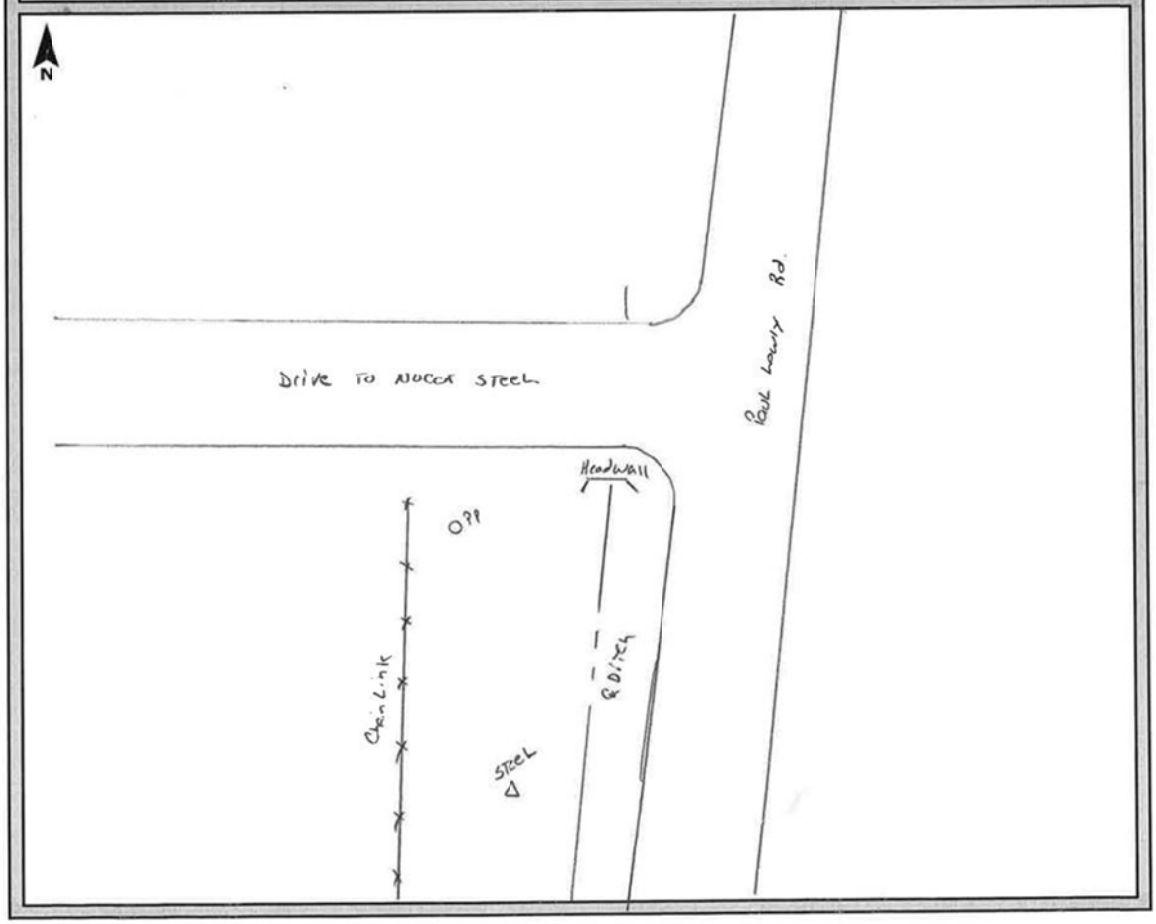
71665, J 261, 3S

71665, J 261, 3W

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis USGS LiDar	**Project Number:**	71665
Survey Date:	1-6-12		
Station Name:	STEEL	**Operator Name:**	Brett Harmon
Latitude:	35-02-51.09	**Julian Day:**	6
Session No.	N/A		
Longitude:	90-09-12.45	**Start Time:**	N/A
End Time:	N/A		
Ellip. Height:	36.650	**Data File Name:**	
Type of Mark:	Conc mon	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	STEEL	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	Sunny 50°	**Antenna Height:**	2.000m to bottom of antenna mount



71665, STEEL, 1

71665, STEEL 2

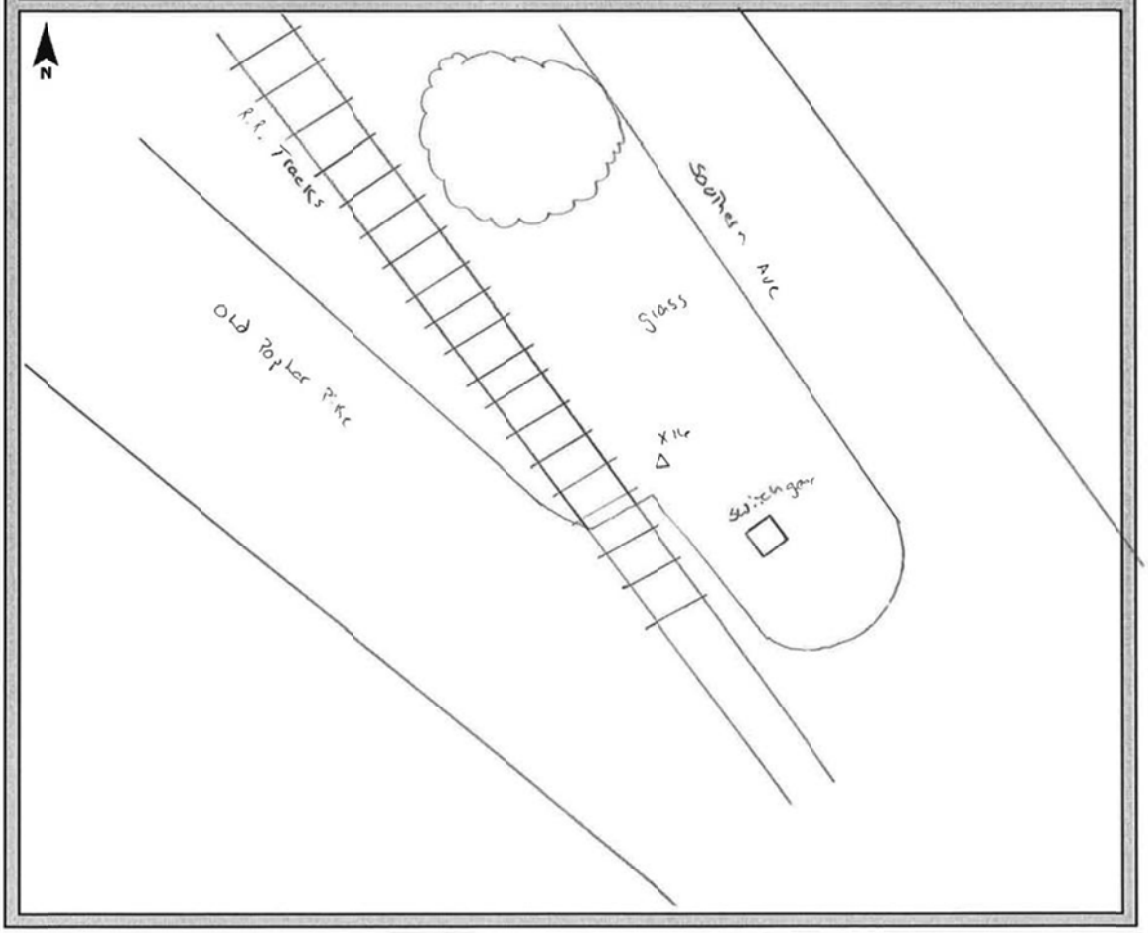
71665, STEEL, 3S

71665, STEEL, 3W

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis USGS RTK	**Project Number:**	71665 **Survey Date:** 1-4-2012
Station Name:	X 16	**Operator Name:**	Brett Harmon
Latitude:	35-04-51.10	**Julian Day:**	4 **Session No.** N/A
Longitude:	89-48-09.66	**Start Time:**	N/A **End Time:** N/A
Ellip. Height:	90.159	**Data File Name:**	Memphis 004
Type of Mark:	Conc. mon B.M.	**Type of Reciever:**	Trimble R8-2 Internal
Stamping on Mark:	X-16	**Type of Antenna:**	Trimble R8-2 Internal
Weather Condition:	Sunny 55°	**Antenna Height:**	2.000m to bottom of antenna mount



71665-X16_1

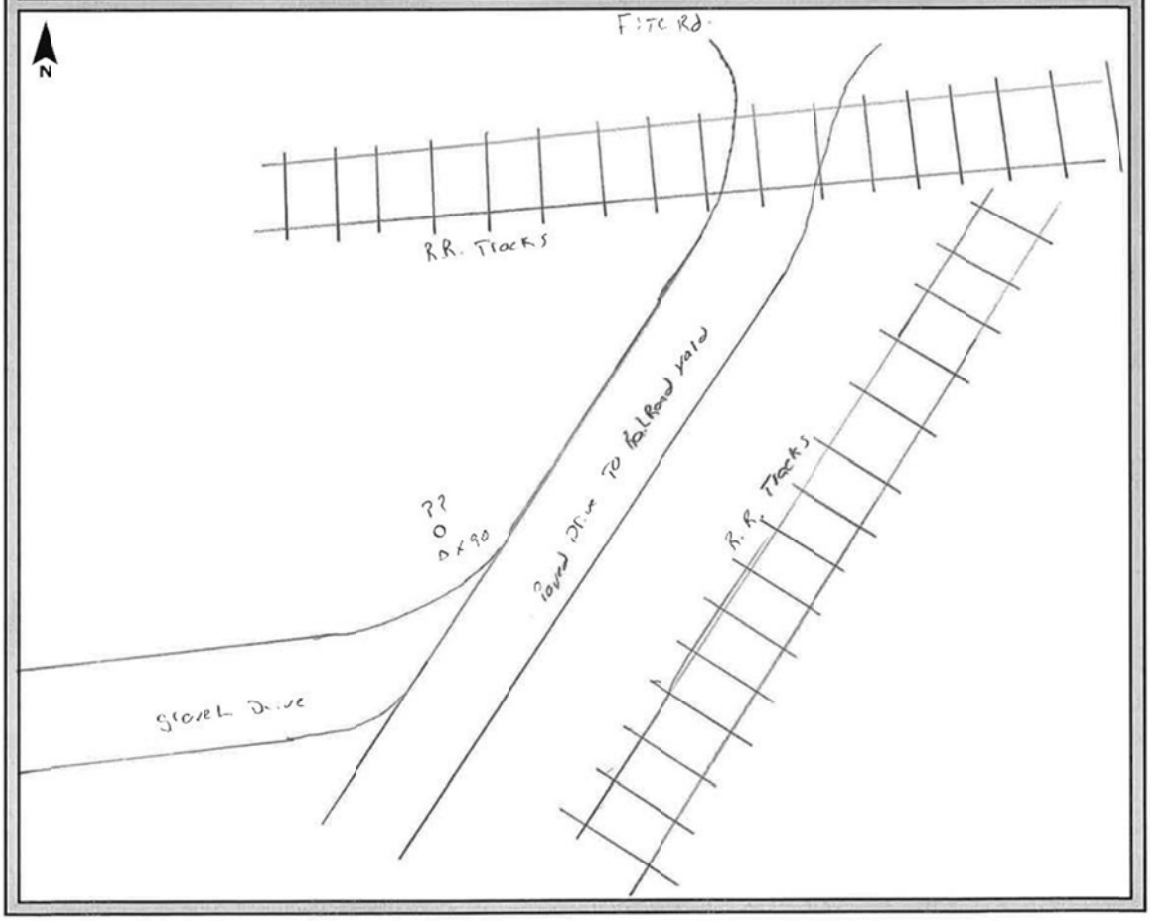
71665-X16_E

71665-X16_S

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis Lidar	Project Number:	71665
Survey Date:	1-5-12		
Station Name:	X90	Operator Name:	Brett Harmon
Latitude:	35-10-15.98	Julian Day:	5
Session No.	N/A		
Longitude:	89-57-58.36	Start Time:	N/A
End Time:	N/A		
Ellip. Height:	150.387	Data File Name:	Memphis Lidar
Type of Mark:	Brass Disk BM	Type of Reciever:	Trimble R8 Internal
Stamping on Mark:	X 90	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Sunny 60°	Antenna Height:	2.000m to bottom of antenna mount



71665, X 90, 1

71665, X 90, 2

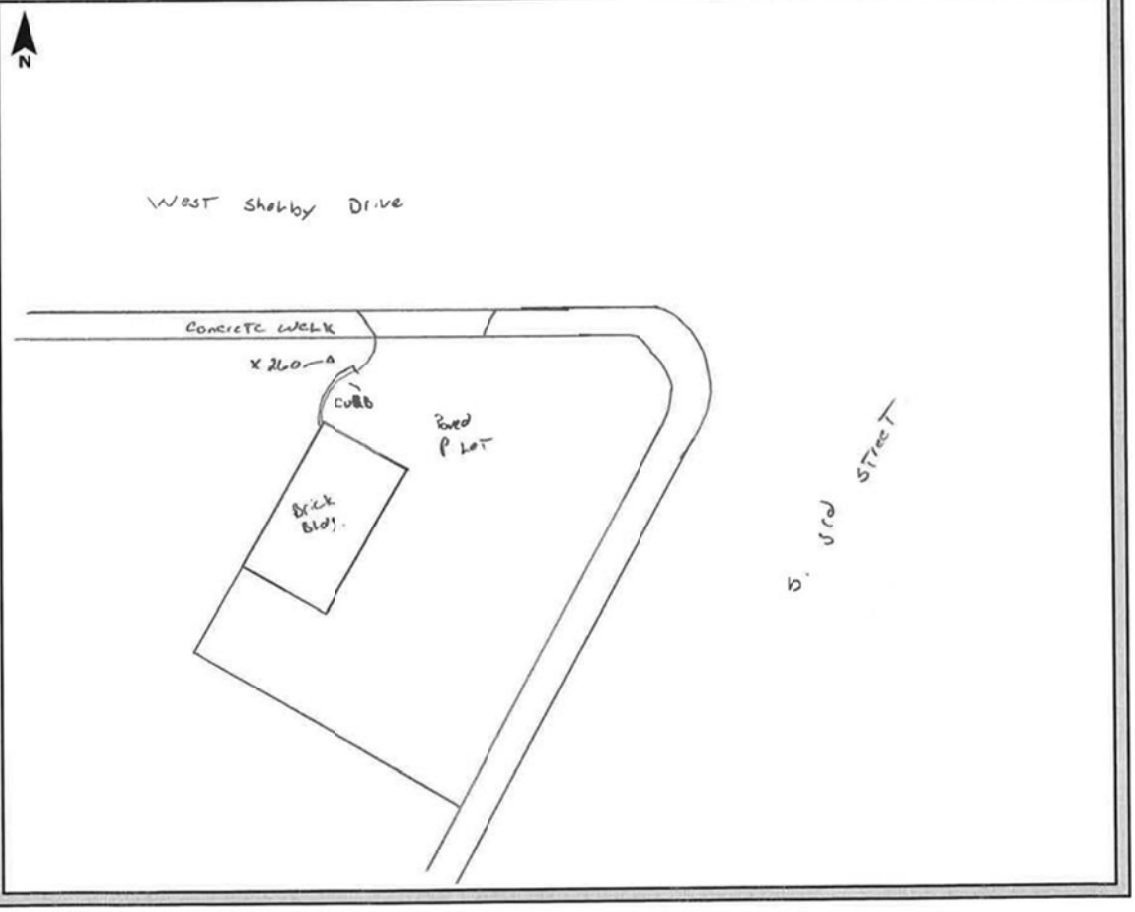
71665, X 90, 3S

71665, X 90, 3W

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis USGS	**Project Number:**	71665 **Survey Date:** 1-5-2012
Station Name:	X 260	**Operator Name:**	Brett Harmon
Latitude:	35-01-14.30	**Julian Day:**	5 **Session No.** N/A
Longitude:	90 05 - 19.32	**Start Time:**	N/A **End Time:** N/A
Ellip. Height:	-57.623	**Data File Name:**	Memphis 5Do
Type of Mark:	Conc. monument	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	X 260	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	Sunny 50°	**Antenna Height:**	2.000m to bottom of antenna mount



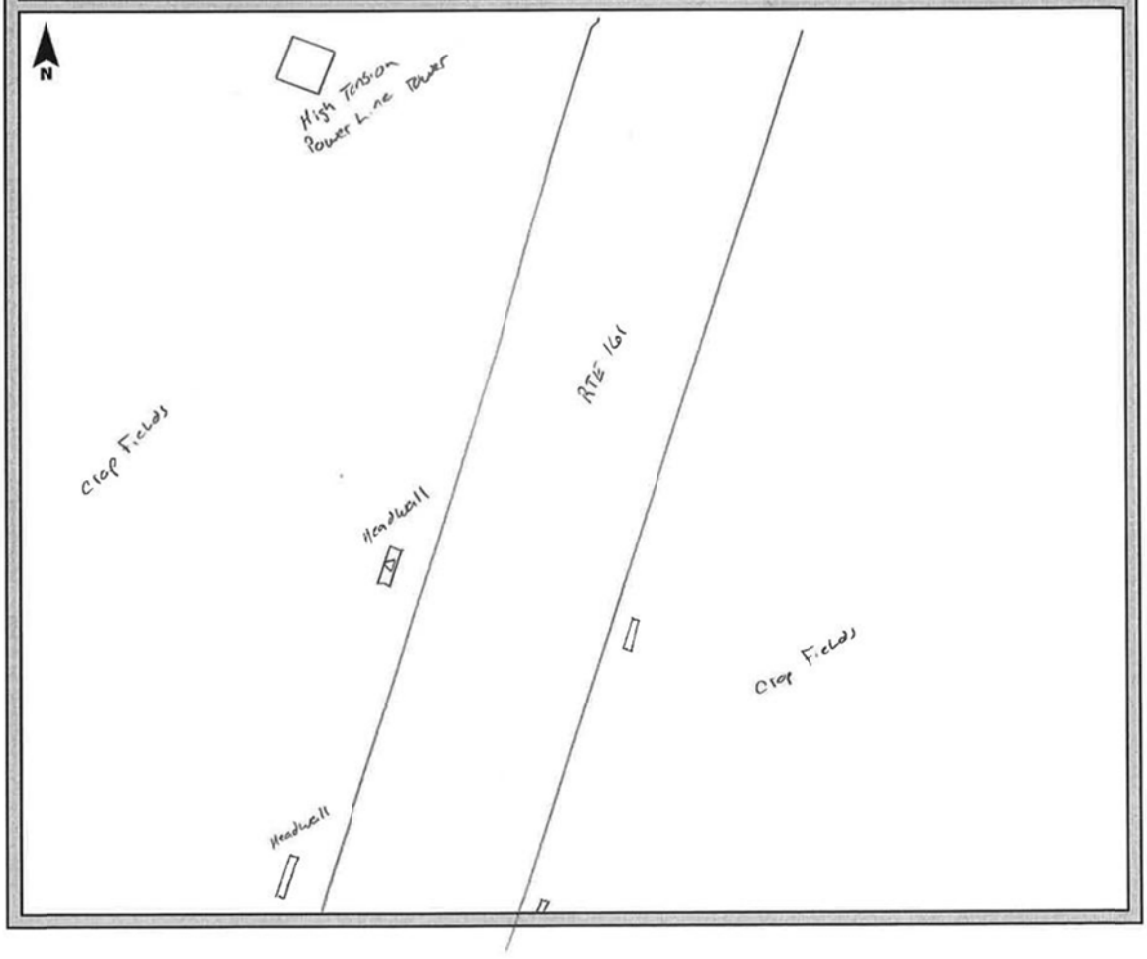
71665-X 260_E

71665-X 260_N

GPS Observation Log Sheet

WOOLPERT

Project Name:	Memphis USGS LiDar	Project Number:	71665- Survey Date: 1-6-12
Station Name:	Y 243	Operator Name:	Brett Harmon
Latitude:	34-56-42.96	Julian Day:	6 Session No. N/A
Longitude:	90-09-27.72	Start Time:	N/A End Time: N/A
Ellip. Height:	37.102 m	Data File Name:	Memphis JDO
Type of Mark:	DM in Headwall	Type of Reciever:	Trimble R8-2 Internal
Stamping on Mark:	Y 243	Type of Antenna:	Trimble R8-2 Internal
Weather Condition:	Sunny 50°	Antenna Height:	2.000m to bottom of antenna mount



71665-Y 243

71665-Y 243 East

71665-Y 243 South

SECTION 4: EXISTING NGS DATA SHEETS

This section contains the published National Geodetic Survey (NGS) Data Sheets used in the final control network for this project.

```
**********************************************************************
 FE2200  CBN          -  This is a Cooperative Base Network Control Station.
 FE2200  DESIGNATION  -  X 300
 FE2200  PID          -  FE2200
 FE2200  STATE/COUNTY-  TN/SHELBY
 FE2200  USGS QUAD    -  SOUTHEAST MEMPHIS (1993)
 FE2200
 FE2200                        *CURRENT SURVEY CONTROL
 FE2200  ______________________________________________________________________
 FE2200* NAD 83(2007)-  35 06 54.49329(N)    089 55 25.24383(W)     ADJUSTED
 FE2200* NAVD 88      -        89.501  (meters)     293.64   (feet)  ADJUSTED
 FE2200  ______________________________________________________________________
 FE2200  EPOCH DATE   -        2002.00
 FE2200  X            -       6,957.511 (meters)                     COMP
 FE2200  Y            -  -5,223,135.836 (meters)                     COMP
 FE2200  Z            -   3,648,358.630 (meters)                     COMP
 FE2200  LAPLACE CORR-          -1.14  (seconds)                     DEFLEC09
 FE2200  ELLIP HEIGHT-          61.993 (meters)          (10/16/11) ADJUSTED
 FE2200  GEOID HEIGHT-         -27.45  (meters)                     GEOID09
 FE2200  DYNAMIC HT   -          89.419 (meters)     293.37  (feet)  COMP
 FE2200  MODELED GRAV-     979,716.6   (mgal)                       NAVD 88
 FE2200
 FE2200  HORZ ORDER   -  A
 FE2200  VERT ORDER   -  FIRST     CLASS II
 FE2200  ELLP ORDER   -  THIRD     CLASS II
 FE2200
 FE2200.The horizontal coordinates were established by GPS observations
 FE2200.and adjusted by the National Geodetic Survey in October 2011.
 FE2200
 FE2200.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 FE2200.See National Readjustment for more information.
 FE2200
 FE2200.The horizontal coordinates are valid at the epoch date displayed above
 FE2200.which is a decimal equivalence of Year/Month/Day.
 FE2200
 FE2200.The orthometric height was determined by differential leveling and
 FE2200.adjusted in June 1991.
 FE2200
 FE2200.WARNING-GPS observations at this control monument resulted in a GPS
 FE2200.derived orthometric height which differed from the leveled height by
 FE2200.more than one decimeter (0.1 meter).
 FE2200
 FE2200.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 FE2200
 FE2200.The Laplace correction was computed from DEFLEC09 derived deflections.
 FE2200
 FE2200.The ellipsoidal height was determined by GPS observations
 FE2200.and is referenced to NAD 83.
 FE2200
 FE2200.The geoid height was determined by GEOID09.
 FE2200
 FE2200.The dynamic height is computed by dividing the NAVD 88
 FE2200.geopotential number by the normal gravity value computed on the
 FE2200.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 FE2200.degrees latitude (g = 980.6199 gals.).
 FE2200
 FE2200.The modeled gravity was interpolated from observed gravity values.
 FE2200
 FE2200;                    North         East     Units Scale Factor Converg.
 FE2200;SPC TN       -    93,911.391   242,403.314   MT  1.00002654   -2 17 49.5
 FE2200;SPC TN       -   308,107.62    795,284.87   sFT  1.00002654   -2 17 49.5
 FE2200;UTM  16      - 3,889,723.991   233,544.284   MT  1.00047510   -1 40 57.9
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FE2200;UTM  15      - 3,890,143.502   780,371.542   MT  1.00056891   +1 46 14.6
FE2200
FE2200!             -  Elev Factor  x  Scale Factor =   Combined Factor
FE2200!SPC TN       -   0.99999027  x   1.00002654  =   1.00001681
FE2200!UTM  16      -   0.99999027  x   1.00047510  =   1.00046536
FE2200!UTM  15      -   0.99999027  x   1.00056891  =   1.00055917
FE2200
FE2200                          SUPERSEDED SURVEY CONTROL
FE2200
FE2200  NAD 83(2007)-  35 06 54.49351(N)    089 55 25.24440(W) AD(       ) 0
FE2200  ELLIP H (02/10/07)   61.997  (m)                       GP(       )
FE2200  NAD 83(1995)-  35 06 54.49324(N)    089 55 25.24442(W) AD(       ) A
FE2200  ELLIP H (08/03/04)   61.976  (m)                       GP(       ) 4 1
FE2200  NAVD 88 (02/01/05)   89.4    (m)          293.     (f) GPS OBS
FE2200  NAVD 88 (08/03/04)   89.50   (m)          293.6    (f) LEVELING    3
FE2200
FE2200.Superseded values are not recommended for survey control.
FE2200.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FE2200.See file dsdata.txt to determine how the superseded data were derived.
FE2200
FE2200_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SBD3354489723(NAD 83)
FE2200
FE2200_MARKER: I = METAL ROD
FE2200_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
FE2200_SP_SET: STAINLESS STEEL ROD
FE2200_STAMPING: X 300 1983
FE2200_MARK LOGO: NGS
FE2200_PROJECTION: FLUSH
FE2200_MAGNETIC: N = NO MAGNETIC MATERIAL
FE2200_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
FE2200_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FE2200+SATELLITE: SATELLITE OBSERVATIONS - October 10, 2003
FE2200_ROD/PIPE-DEPTH: 8.92 meters
FE2200
FE2200  HISTORY     - Date     Condition        Report By
FE2200  HISTORY     - 1983     MONUMENTED       NGS
FE2200  HISTORY     - 20020708 GOOD             TN1620
FE2200  HISTORY     - 20031010 GOOD             TNDT
FE2200
FE2200                          STATION DESCRIPTION
FE2200
FE2200'DESCRIBED BY NATIONAL GEODETIC SURVEY 1983
FE2200'IN MEMPHIS.
FE2200'IN MEMPHIS, 4.5 KM (2.8 MI) WEST ALONG PARK AVENUE FROM THE WHITE
FE2200'STATION POST OFFICE TO THE JUNCTION OF CHERRY ROAD, THENCE 1.0 KM
FE2200'(0.6 MI) NORTH ALONG CHERRY ROAD TO THE JUNCTION OF SOUTHERN ROAD,
FE2200'THENCE 0.5 KM (0.3 MI) WEST ALONG SOUTHERN ROAD TO THE MARK ON THE
FE2200'LEFT AT A TENNIS AND BASEBALL COMPLEX, 60.38 METERS (198.1 FT) SOUTH
FE2200'OF THE CENTERLINE OF THE ROAD, 53.04 METERS (174.0 FT) NORTHWEST OF
FE2200'THE NORTHWEST CORNER OF THE OFFICE BUILDING OF THE TENNIS COURTS,
FE2200'46.79 METERS (153.5 FT) NORTHWEST OF A POWERLINE POLE WITH 2
FE2200'TRANSFORMERS, 9.14 METERS (30.0 FT) SOUTHWEST OF A GUY WIRE ANCHOR FOR
FE2200'A LIGHTPOLE FOR THE BASEBALL FIELD, 0.88 METER (2.9 FT) EAST OF A
FE2200'LIGHTPOLE FOR THE BASEBALL DIAMOND, AND 0.30 METER (1.0 FT) NORTH OF
FE2200'A CHAIN LINK FENCE AROUND THE BASEBALL FIELD.
FE2200'THE MARK IS 0.61 METERS  E FROM A WITNESS POST.
FE2200'THE MARK IS 0.61 M ABOVE ROAD.
FE2200
FE2200                          STATION RECOVERY (2002)
FE2200
FE2200'RECOVERY NOTE BY CITY OF MEMPHIS TENNESSEE 2002 (SB)
FE2200'RECOVERED IN GOOD CONDITION.
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 FE2200
 FE2200                          STATION RECOVERY (2003)
 FE2200
 FE2200'RECOVERY NOTE BY TN DEPT OF TRANSP 2003
 FE2200'RECOVERED AS DESCRIBED.
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 EG1209  DESIGNATION -  78 V 129
 EG1209  PID         -  EG1209
 EG1209  STATE/COUNTY-  MS/DE SOTO
 EG1209  USGS QUAD   -  OLIVE BRANCH (1982)
 EG1209
 EG1209                        *CURRENT SURVEY CONTROL
 EG1209  ______________________________________________________________________
 EG1209* NAD 83(2007)-  34 57 31.63095(N)    089 49 14.13505(W)     NO CHECK
 EG1209* NAVD 88     -       121.000  (meters)     396.98   (feet)  ADJUSTED
 EG1209  ______________________________________________________________________
 EG1209  EPOCH DATE  -        2002.00
 EG1209  X           -      16,386.151 (meters)                     COMP
 EG1209  Y           -  -5,233,098.993 (meters)                     COMP
 EG1209  Z           -   3,634,174.169 (meters)                     COMP
 EG1209  LAPLACE CORR-          -0.57  (seconds)                    DEFLEC09
 EG1209  ELLIP HEIGHT-          93.490 (meters)          (02/10/07) NO CHECK
 EG1209  GEOID HEIGHT-         -27.55  (meters)                     GEOID09
 EG1209  DYNAMIC HT  -         120.887 (meters)     396.61  (feet)  COMP
 EG1209
 EG1209  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 EG1209  Type    PID    Designation                      North   East  Ellip
 EG1209  ----------------------------------------------------------------
 EG1209  NETWORK EG1209 78 V 129                           1.84   1.92   7.53
 EG1209  ----------------------------------------------------------------
 EG1209  MODELED GRAV-     979,692.8   (mgal)                      NAVD 88
 EG1209
 EG1209  VERT ORDER  -  SECOND    CLASS 0
 EG1209
 EG1209.The horizontal coordinates were established by GPS observations
 EG1209.and adjusted by the National Geodetic Survey in February 2007.
 EG1209
 EG1209.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 EG1209.See National Readjustment for more information.
 EG1209.No horizontal observational check was made to the station.
 EG1209.The horizontal coordinates are valid at the epoch date displayed above.
 EG1209.The epoch date for horizontal control is a decimal equivalence
 EG1209.of Year/Month/Day.
 EG1209
 EG1209.The orthometric height was determined by differential leveling and
 EG1209.adjusted in June 1991.
 EG1209
 EG1209.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 EG1209
 EG1209.The Laplace correction was computed from DEFLEC09 derived deflections.
 EG1209
 EG1209.The ellipsoidal height was determined by GPS observations
 EG1209.and is referenced to NAD 83.
 EG1209
 EG1209.The geoid height was determined by GEOID09.
 EG1209
 EG1209.The dynamic height is computed by dividing the NAVD 88
 EG1209.geopotential number by the normal gravity value computed on the
 EG1209.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 EG1209.degrees latitude (g = 980.6199 gals.).
 EG1209
 EG1209.The modeled gravity was interpolated from observed gravity values.
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EG1209
EG1209;                    North         East      Units Scale Factor Converg.
EG1209;SPC MS W     -   605,421.173   746,828.452   MT  0.99997702   +0 17 37.7
EG1209;SPC MS W     - 1,986,285.97  2,450,219.68   sFT  0.99997702   +0 17 37.7
EG1209;SPC TN       -    76,206.378   251,116.514   MT  1.00006415   -2 14 12.2
EG1209;SPC TN       -   250,020.43    823,871.43   sFT  1.00006415   -2 14 12.2
EG1209;UTM  16      - 3,872,106.768   242,451.220   MT  1.00041759   -1 37 01.4
EG1209
EG1209!             -  Elev Factor  x  Scale Factor =   Combined Factor
EG1209!SPC MS W     -   0.99998533  x   0.99997702  =   0.99996235
EG1209!SPC TN       -   0.99998533  x   1.00006415  =   1.00004947
EG1209!UTM  16      -   0.99998533  x   1.00041759  =   1.00040291
EG1209
EG1209                          SUPERSEDED SURVEY CONTROL
EG1209
EG1209  ELLIP H (04/15/02)   93.549  (m)                       GP(       ) 4 2
EG1209  NAD 83(1993)-  34 57 31.63045(N)    089 49 14.13394(W) AD(       ) 1
EG1209  ELLIP H (02/15/02)   93.534  (m)                       GP(       ) 4 1
EG1209  NAD 83(1993)-  34 57 31.62710(N)    089 49 14.13067(W) AD(       ) 3
EG1209  ELLIP H (05/13/94)   93.653  (m)                       GP(       ) 4 1
EG1209  NAD 83(1990)-  34 57 31.62534(N)    089 49 14.12828(W) AD(       ) 3
EG1209  NAD 83(1986)-  34 57 31.63466(N)    089 49 14.13162(W) AD(       ) 3
EG1209  NAD 27      -  34 57 31.29893(N)    089 49 13.81326(W) AD(       ) 3
EG1209  NAVD 88 (02/15/02)  121.00   (m)          397.0    (f) LEVELING    3
EG1209  NGVD 29 (??/??/92)  120.957  (m)          396.84   (f) ADJ UNCH    2 0
EG1209
EG1209.Superseded values are not recommended for survey control.
EG1209.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
EG1209.See file dsdata.txt to determine how the superseded data were derived.
EG1209
EG1209_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SBD4245172106(NAD 83)
EG1209_MARKER: DB = BENCH MARK DISK
EG1209_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
EG1209_SP_SET: SET IN TOP OF CONCRETE MONUMENT
EG1209_STAMPING: 78V-129 1965
EG1209_MARK LOGO: MSHD
EG1209_PROJECTION: FLUSH
EG1209_MAGNETIC: N = NO MAGNETIC MATERIAL
EG1209_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
EG1209+STABILITY: SURFACE MOTION
EG1209_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
EG1209+SATELLITE: SATELLITE OBSERVATIONS - October 31, 2010
EG1209
EG1209  HISTORY     - Date     Condition        Report By
EG1209  HISTORY     - 1965     MONUMENTED       MSHD
EG1209  HISTORY     - 1966     GOOD             MSHD
EG1209  HISTORY     - 19880129 GOOD
EG1209  HISTORY     - 20001010 GOOD             MSHD
EG1209  HISTORY     - 20031001 GOOD             USACE
EG1209  HISTORY     - 20031104 GOOD             INDIV
EG1209  HISTORY     - 20060208 GOOD             TVA
EG1209  HISTORY     - 20080417 GOOD             MSDOT
EG1209  HISTORY     - 20081028 GOOD             MSDOT
EG1209  HISTORY     - 20101031 GOOD             MSSU
EG1209
EG1209                          STATION DESCRIPTION
EG1209
EG1209'DESCRIBED BY MISSISSIPPI STATE HIGHWAY DEPARTMENT 1965 (AJL)
EG1209'THE STATION IS LOCATED ABOUT 0.6 KM (0.4 MI)
EG1209'SOUTHEAST OF THE CENTER OF OLIVE BRANCH, IN THE GRASS STRIP BETWEEN
EG1209'OLD U.S. HIGHWAY 78 AND THE BURLINGTON NORTHERN RAILROAD.
EG1209'OWNERSHIP--STATE HIGHWAY RIGHT-OF-WAY.
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EG1209'
EG1209'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 78 AND STATE
EG1209'HIGHWAY 305, ABOUT 1.6 KM (1.0 MI) SOUTH OF OLIVE BRANCH, GO
EG1209'NORTH FOR 1.9 KM (1.2 MI) ON HIGHWAY 304 TO A PAVED CROSSROADS
EG1209'(STATE HIGHWAY 302 GOES LEFT AND HIGHWAY 305 GOES RIGHT).
EG1209'TURN RIGHT AND GO EAST FOR 0.5 KM (0.3 MI) ON GOODMAN AVENUE
EG1209'THROUGH TOWN TO THE INTERSECTION OF OLD U.S. HIGHWAY 78.
EG1209'TURN RIGHT AND GO SOUTHEAST FOR 0.6 KM (0.35 MI) ON OLD U.S.
EG1209'HIGHWAY 78 TO THE STATION ON THE LEFT, JUST BEFORE REACHING A PAVED
EG1209'ROAD LEADING EAST ACROSS THE RAILROAD TRACKS.
EG1209'
EG1209'THE STATION IS A STANDARD MSHD DISK
EG1209'STAMPED---78 V 129 1965---,
EG1209'SET INTO THE TOP OF A ROUND CONCRETE MONUMENT
EG1209'28 CM IN DIAMETER RECESSED 4 CM BELOW GROUND.  LOCATED
EG1209'38.3 METERS (125.8 FT) SOUTH-SOUTHEAST FROM THE RAILROAD SIGNAL
EG1209'NO. 5020,
EG1209'21.6 METERS (71.0 FT) NORTHWEST FROM THE CENTER OF THE PAVED ROAD
EG1209'CROSSING THE TRACKS,
EG1209'14.3 METERS (47.0 FT) SOUTHWEST FROM THE SOUTHWEST RAIL OF THE
EG1209'RAILROAD TRACKS,
EG1209'7.6 METERS (25.0 FT) NORTHEAST FROM THE CENTER OF OLD HIGHWAY 78,
EG1209'1.5 METERS (5.0 FT) WEST FROM A JUNCTION POWER POLE,
EG1209'0.9 METERS (3.0 FT) NORTH-NORTHWEST FROM A GAS PIPELINE WARNING
EG1209'SIGN, AND
EG1209'0.5 METERS (1.5 FT) NORTH-NORTHWEST FROM A METAL WITNESS POST.
EG1209'
EG1209'DESCRIBED BY C.L. SMITH, TYPED BY R.L. ZURFLUH.
EG1209
EG1209                          STATION RECOVERY (1966)
EG1209
EG1209'RECOVERY NOTE BY MISSISSIPPI STATE HIGHWAY DEPARTMENT 1966
EG1209'0.40 MI SE FROM OLIVE BRANCH.
EG1209'TO REACH FROM THE INTERSECTION OF HIGHWAYS 78 AND 305 IN OLIVE BRANCH
EG1209'GO SOUTHEAST ON HIGHWAY 78 FOR 0.40 MILE TO A DRIVEWAY LEADING TO THE
EG1209'POLAR KRAFT MANUFACTURING COMPANY AND THE MARK ON THE LEFT.  THE MARK
EG1209'IS A DISK SET IN THE TOP OF A 12 INCH ROUND CONCRETE POST, 71.0 FEET
EG1209'NORTHWEST OF A DRIVEWAY, 47.0 FEET SOUTHWEST OF THE SOUTHWEST RAIL OF
EG1209'THE SAN FRANCISCO RAILROAD, 24.8 FEET NORTHEAST OF THE CENTERLINE OF
EG1209'HIGHWAY 78, 5.8 FEET NORTHWEST OF A POWER POLE, 4.7 FEET SOUTHEAST OF
EG1209'A POWER POLE, 1 FOOT NORTHWEST OF A METAL WITNESS POST, ABOUT LEVEL
EG1209'WITH HIGHWAY 78, AND PROJECTS 2 INCHES.
EG1209
EG1209                          STATION RECOVERY (1988)
EG1209
EG1209'RECOVERED 1988
EG1209'RECOVERED IN GOOD CONDITION.
EG1209
EG1209                          STATION RECOVERY (2000)
EG1209
EG1209'RECOVERY NOTE BY MISSISSIPPI STATE HIGHWAY DEPARTMENT 2000
EG1209'RECOVERED AS DESCRIBED.
EG1209
EG1209                          STATION RECOVERY (2003)
EG1209
EG1209'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2003 (DLB)
EG1209'RECOVERED IN GOOD CONDITION.
EG1209
EG1209                          STATION RECOVERY (2003)
EG1209
EG1209'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2003 (RPB)
EG1209'RECOVERED IN GOOD CONDITION.
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 EG1209
 EG1209                          STATION RECOVERY (2006)
 EG1209
 EG1209'RECOVERY NOTE BY TENNESSEE VALLEY AUTHORITY 2006 (CDM)
 EG1209'RECOVERED IN GOOD CONDITION.
 EG1209
 EG1209                          STATION RECOVERY (2008)
 EG1209
 EG1209'RECOVERY NOTE BY MS DEPT TRANS 2008 (HDB)
 EG1209'RECOVERED IN GOOD CONDITION.
 EG1209
 EG1209                          STATION RECOVERY (2008)
 EG1209
 EG1209'RECOVERY NOTE BY MS DEPT TRANS 2008 (LKK)
 EG1209'RECOVERED AS DESCRIBED.
 EG1209
 EG1209                          STATION RECOVERY (2010)
 EG1209
 EG1209'RECOVERY NOTE BY MISSISSIPPI STATE UNIVERSITY 2010 (DAL)
 EG1209'THE MARK IS A DISK EMBEDDED ON TOP OF A CONCRETE BLOCK, ABOUT 10
 EG1209'INCHES BELOW THE LEVEL OF HIGHWAY 178 (OLD HWY 78), AND ABOUT 5 INCHES
 EG1209'BELOW THE GROUND LEVEL. THE DISK IS LOCATED IN THE GRASS STRIP BETWEEN
 EG1209'HWY 178 AND THE RAILROAD, CLOSER TO THE SIDE OF THE HWY 178, ABOUT 6
 EG1209'FEET FROM A POWER POLE, AND IN BETWEEN TWO METAL WITNESS POSTS (1 FOOT
 EG1209'AWAY FROM EACH WITNESS POST).
*************************************************************************
 FF0482  HT_MOD      -  This is a Height Modernization Survey Station.
 FF0482  DESIGNATION -  E 75
 FF0482  PID         -  FF0482
 FF0482  STATE/COUNTY-  TN/SHELBY
 FF0482  USGS QUAD   -  NORTHWEST MEMPHIS (1997)
 FF0482
 FF0482                        *CURRENT SURVEY CONTROL
 FF0482  ______________________________________________________________________
 FF0482* NAD 83(2007)-  35 07 34.28498(N)    090 04 02.07061(W)     ADJUSTED
 FF0482* NAVD 88     -        86.54   (meters)     283.9    (feet)  GPS OBS
 FF0482  ______________________________________________________________________
 FF0482  EPOCH DATE  -        2002.00
 FF0482  X           -      -6,129.001 (meters)                     COMP
 FF0482  Y           -  -5,222,429.131 (meters)                     COMP
 FF0482  Z           -   3,649,360.077 (meters)                     COMP
 FF0482  LAPLACE CORR-          -0.82  (seconds)                    DEFLEC09
 FF0482  ELLIP HEIGHT-          59.233 (meters)          (02/10/07) ADJUSTED
 FF0482  GEOID HEIGHT-         -27.33  (meters)                     GEOID09
 FF0482
 FF0482  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 FF0482  Type    PID    Designation                      North   East  Ellip
 FF0482  ----------------------------------------------------------------------
 FF0482  NETWORK FF0482 E 75                               0.49   0.41   1.02
 FF0482  ----------------------------------------------------------------------
 FF0482
 FF0482.The horizontal coordinates were established by GPS observations
 FF0482.and adjusted by the National Geodetic Survey in February 2007.
 FF0482
 FF0482.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 FF0482.See National Readjustment for more information.
 FF0482
 FF0482.The horizontal coordinates are valid at the epoch date displayed above
 FF0482.which is a decimal equivalence of Year/Month/Day.
 FF0482
 FF0482.The orthometric height was determined by GPS observations and a
 FF0482.high-resolution geoid model using precise GPS observation and
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FF0482.processing techniques. It supersedes the leveled height previously
FF0482.determined for this station.
FF0482
FF0482.The X, Y, and Z were computed from the position and the ellipsoidal ht.
FF0482
FF0482.The Laplace correction was computed from DEFLEC09 derived deflections.
FF0482
FF0482.The ellipsoidal height was determined by GPS observations
FF0482.and is referenced to NAD 83.
FF0482
FF0482.The geoid height was determined by GEOID09.
FF0482
FF0482;                    North         East     Units Scale Factor Converg.
FF0482;SPC TN       -    95,670.793   229,377.603   MT  1.00002416   -2 22 52.0
FF0482;SPC TN       -   313,879.93    752,549.69   sFT  1.00002416   -2 22 52.0
FF0482;UTM  15      - 3,890,974.680   767,247.281   MT  1.00048031   +1 41 18.4
FF0482;UTM  16      - 3,891,344.336   220,494.011   MT  1.00056293   -1 45 57.5
FF0482
FF0482!             -  Elev Factor  x  Scale Factor =   Combined Factor
FF0482!SPC TN       -   0.99999070  x   1.00002416  =   1.00001486
FF0482!UTM  15      -   0.99999070  x   1.00048031  =   1.00047101
FF0482!UTM  16      -   0.99999070  x   1.00056293  =   1.00055363
FF0482
FF0482                          SUPERSEDED SURVEY CONTROL
FF0482
FF0482  NAD 83(1995)-  35 07 34.28506(N)    090 04 02.07058(W) AD(       ) 1
FF0482  ELLIP H (01/24/03)   59.220  (m)                       GP(       ) 2 2
FF0482  NAVD 88 (01/24/03)   86.54   (m)          283.9    (f) LEVELING    3
FF0482  NAVD 88 (06/15/91)   86.538  (m)          283.92   (f) ADJUSTED    1 1
FF0482  NGVD 29 (??/??/??)   86.519  (m)          283.85   (f) ADJUSTED    1 1
FF0482
FF0482.Superseded values are not recommended for survey control.
FF0482.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FF0482.See file dsdata.txt to determine how the superseded data were derived.
FF0482
FF0482_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SYU6724790974(NAD 83)
FF0482
FF0482_MARKER: DO = NOT SPECIFIED OR SEE DESCRIPTION
FF0482_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
FF0482_SP_SET: SET IN TOP OF CONCRETE MONUMENT
FF0482_STAMPING: E 75 1956
FF0482_MARK LOGO: CGS
FF0482_MAGNETIC: N = NO MAGNETIC MATERIAL
FF0482_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
FF0482+STABILITY: SURFACE MOTION
FF0482_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FF0482+SATELLITE: SATELLITE OBSERVATIONS - August 11, 2009
FF0482
FF0482  HISTORY     - Date     Condition        Report By
FF0482  HISTORY     - 1956     MONUMENTED       CGS
FF0482  HISTORY     - 1974     GOOD             NGS
FF0482  HISTORY     - 1976     GOOD             NGS
FF0482  HISTORY     - 1990     GOOD             USPSQD
FF0482  HISTORY     - 19950620 GOOD             TN1620
FF0482  HISTORY     - 20001128 GOOD             USE
FF0482  HISTORY     - 20011014 GOOD             3001
FF0482  HISTORY     - 20090811 GOOD             USACE
FF0482
FF0482                          STATION DESCRIPTION
FF0482
FF0482'DESCRIBED BY NATIONAL GEODETIC SURVEY 1974
FF0482'AT MEMPHIS.
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 FF0482'AT MEMPHIS, 0.2 MILE NORTH ALONG FLORIDA STREET FROM THE INTERSECTION
 FF0482'WITH CRUMP BOULEVARD, THENCE 0.3 MILE WEST ALONG ST. LOUIS-SAN
 FF0482'FRANCISCO-MISSOURI-PACIFIC RAILROAD, AT THE RIVERSIDE DRIVE UNDERPASS,
 FF0482'6.7 FEET SOUTHEAST OF THE MOST SOUTHEASTERLY RAIL OF TRACKS, SET IN
 FF0482'THE TOP OF WEST CORNER OF THE SOUTHWEST END OF THE SOUTHEAST
 FF0482'CONCRETE FOUNDATION OF THE SOUTHEAST STEEL AND CONCRETE BANNISTER
 FF0482'AND 2 FEET BELOW LEVEL OF THE RAILS.  NOTE-- ALSO, ABOUT 0.4 MILE
 FF0482'EAST OF THE SOUTHEAST END OF THE RAILROAD BRIDGE OVER THE MISSISSIPPI
 FF0482'RIVER.
 FF0482
 FF0482                          STATION RECOVERY (1976)
 FF0482
 FF0482'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1976
 FF0482'RECOVERED IN GOOD CONDITION.
 FF0482
 FF0482                          STATION RECOVERY (1990)
 FF0482
 FF0482'RECOVERY NOTE BY US POWER SQUADRON 1990 (EL)
 FF0482'RECOVERED IN GOOD CONDITION.
 FF0482
 FF0482                          STATION RECOVERY (1995)
 FF0482
 FF0482'RECOVERY NOTE BY CITY OF MEMPHIS TENNESSEE 1995 (DA)
 FF0482'RECOVERED IN GOOD CONDITION.
 FF0482
 FF0482                          STATION RECOVERY (2000)
 FF0482
 FF0482'RECOVERY NOTE BY US ENGINEERS 2000 (JMH)
 FF0482'RECOVERED IN GOOD CONDITION.  DESCRIPTION CHANGE- MARK IS LOCATED ON
 FF0482'NW CORNER OF SW STEEL AND CONCRETE BANNISTER.
 FF0482
 FF0482                          STATION RECOVERY (2001)
 FF0482
 FF0482'RECOVERY NOTE BY 3001, INC 2001 (KWC)
 FF0482'THE STATION IS LOCATED 3.0 MILES SOUTH OF EDMONDSON, AR.  6 MILES
 FF0482'SOUTH OF INTERSTATE 40.
 FF0482'6.2 MILES SOUTHWEST OF WEST MEMPHIS MUNICIPAL AIRPORT.
 FF0482'
 FF0482'TO REACH THE STATION FROM THE INTERSECTION OF INTERSTATE 40 AND HWY
 FF0482'50, GO SOUTH ON
 FF0482'HWY 50 FOR 5.5 MILES TO CR 263 LEVEE ROAD.  TURN LEFT AND SOUTH ON
 FF0482'LEVEE ROAD FOR 0.6
 FF0482'MILES TO A GATE ON RIGHT AND RAMP TO LEVEE.  PROCEED THROUGH GATE UP
 FF0482'RAMP TO TOP OF
 FF0482'LEVEE AND THE STATION IS ON THE LEFT, JUST NORTH OF EAST GATE.
 FF0482'
 FF0482'THE STATION IS AN ALUMINUM COE DISK SET ON A ROD, 12 FEET EAST OF
 FF0482'CENTERLINE OF GRAVEL
 FF0482'ROAD CROSSING LEVEE.  14 FEET NORTH OF CENTERLINE OF LEVEE AT GATE.  3
 FF0482'FEET WEST OF A
 FF0482'FENCE POST.  STATION IS STAMPED SP-17-2000.
 FF0482'
 FF0482'
 FF0482
 FF0482                          STATION RECOVERY (2009)
 FF0482
 FF0482'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2009 (JMH)
 FF0482'RECOVERED IN GOOD CONDITION.
*********************************************************************
FF0977  DESIGNATION -  F 217
 FF0977  PID         -  FF0977
 FF0977  STATE/COUNTY-  AR/CRITTENDEN
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FF0977  USGS QUAD    -  WEST MEMPHIS (1983)
FF0977
FF0977                          *CURRENT SURVEY CONTROL
FF0977  ______________________________________________________________________
FF0977* NAD 83(1986)-  35 14 56.     (N)    090 08 56.     (W)     SCALED
FF0977* NAVD 88      -        74.691  (meters)     245.05   (feet)  ADJUSTED
FF0977  ______________________________________________________________________
FF0977  GEOID HEIGHT-         -27.33  (meters)                     GEOID09
FF0977  DYNAMIC HT   -          74.624 (meters)     244.83  (feet)  COMP
FF0977  MODELED GRAV-     979,741.3   (mgal)                       NAVD 88
FF0977
FF0977  VERT ORDER   -  FIRST     CLASS I
FF0977
FF0977.The horizontal coordinates were scaled from a topographic map and have
FF0977.an estimated accuracy of +/- 6 seconds.
FF0977
FF0977.The orthometric height was determined by differential leveling and
FF0977.adjusted in June 1991.
FF0977
FF0977.The geoid height was determined by GEOID09.
FF0977
FF0977.The dynamic height is computed by dividing the NAVD 88
FF0977.geopotential number by the normal gravity value computed on the
FF0977.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
FF0977.degrees latitude (g = 980.6199 gals.).
FF0977
FF0977.The modeled gravity was interpolated from observed gravity values.
FF0977
FF0977;                    North         East     Units  Estimated Accuracy
FF0977;SPC AR N      -   103,160.      568,450.      MT  (+/- 180 meters Scaled)
FF0977
FF0977                          SUPERSEDED SURVEY CONTROL
FF0977
FF0977  NGVD 29 (??/??/??)   74.675  (m)          245.00   (f) ADJUSTED    1 1
FF0977
FF0977.Superseded values are not recommended for survey control.
FF0977.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FF0977.See file dsdata.txt to determine how the superseded data were derived.
FF0977
FF0977_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SYV594043(NAD 83)
FF0977_MARKER: DB = BENCH MARK DISK
FF0977_SETTING: 16 = (FASTENED TO) A METAL ROD WITH BASE PLATE BURIED/SCREWED
FF0977+WITH SETTING: INTO GROUND
FF0977_SP_SET: METAL ROD WITH BASE PLATE
FF0977_STAMPING: F 217 1976
FF0977_MARK LOGO: NGS
FF0977_MAGNETIC: N = NO MAGNETIC MATERIAL
FF0977_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
FF0977+STABILITY: SURFACE MOTION
FF0977_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FF0977+SATELLITE: SATELLITE OBSERVATIONS - September 21, 2007
FF0977
FF0977  HISTORY     - Date     Condition        Report By
FF0977  HISTORY     - 1976     MONUMENTED       NGS
FF0977  HISTORY     - 20000901 GOOD             USE
FF0977  HISTORY     - 20070921 GOOD             USACE
FF0977
FF0977                           STATION DESCRIPTION
FF0977
FF0977'DESCRIBED BY NATIONAL GEODETIC SURVEY 1976
FF0977'10.3 MI NORTH FROM WEST MEMPHIS.
FF0977'10.3 MILES NORTH ALONG THE LEVEE FROM THE CROSSING OF INTERSTATE
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 FF0977'HIGHWAY 55 AT WEST MEMPHIS, 16 FEET SOUTH OF THE CENTER OF THE
 FF0977'LEVEE AND 2 FEET NORTHWEST OF MILEPOST 140/141.
 FF0977'A DISK ON THE TOP OF A COPPER-COATED STEEL ROD SET TO A DEPTH OF 4
 FF0977'FEET.  2 FEET BELOW THE LEVEE.  1 FEET EAST OF A WITNESS POST.
 FF0977
 FF0977                          STATION RECOVERY (2000)
 FF0977
 FF0977'RECOVERY NOTE BY US ENGINEERS 2000 (JMH)
 FF0977'RECOVERED IN GOOD CONDITION.
 FF0977
 FF0977                          STATION RECOVERY (2007)
 FF0977
 FF0977'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2007 (JMH)
 FF0977'RECOVERED IN GOOD CONDITION.
*********************************************************************
 FF0322  DESIGNATION -  J 261
 FF0322  PID         -  FF0322
 FF0322  STATE/COUNTY-  TN/SHELBY
 FF0322  USGS QUAD   -  NORTHWEST MEMPHIS (1997)
 FF0322
 FF0322                        *CURRENT SURVEY CONTROL
 FF0322  ______________________________________________________________
 FF0322* NAD 83(2007)-  35 13 06.00465(N)    090 01 46.46732(W)     ADJUSTED
 FF0322* NAVD 88     -        76.758  (meters)     251.83   (feet)  ADJUSTED
 FF0322  ______________________________________________________________
 FF0322  EPOCH DATE  -        2002.00
 FF0322  X           -      -2,692.609 (meters)                     COMP
 FF0322  Y           -  -5,216,535.242 (meters)                     COMP
 FF0322  Z           -   3,657,710.894 (meters)                     COMP
 FF0322  LAPLACE CORR-          -0.29  (seconds)                    DEFLEC09
 FF0322  ELLIP HEIGHT-          49.433 (meters)          (02/10/07) ADJUSTED
 FF0322  GEOID HEIGHT-         -27.33  (meters)                     GEOID09
 FF0322  DYNAMIC HT  -          76.689 (meters)     251.60  (feet)  COMP
 FF0322
 FF0322  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 FF0322  Type    PID    Designation                       North   East  Ellip
 FF0322  ----------------------------------------------------------------
 FF0322  NETWORK FF0322 J 261                               1.55   1.27   2.35
 FF0322  ----------------------------------------------------------------
 FF0322  MODELED GRAV-     979,737.8   (mgal)                      NAVD 88
 FF0322
 FF0322  VERT ORDER  -  FIRST     CLASS I
 FF0322
 FF0322.The horizontal coordinates were established by GPS observations
 FF0322.and adjusted by the National Geodetic Survey in February 2007.
 FF0322
 FF0322.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 FF0322.See National Readjustment for more information.
 FF0322.The horizontal coordinates are valid at the epoch date displayed above.
 FF0322.The epoch date for horizontal control is a decimal equivalence
 FF0322.of Year/Month/Day.
 FF0322
 FF0322.The orthometric height was determined by differential leveling and
 FF0322.adjusted in June 1991.
 FF0322
 FF0322.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 FF0322
 FF0322.The Laplace correction was computed from DEFLEC09 derived deflections.
 FF0322
 FF0322.The ellipsoidal height was determined by GPS observations
 FF0322.and is referenced to NAD 83.
 FF0322
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FF0322.The geoid height was determined by GEOID09.
FF0322
FF0322.The dynamic height is computed by dividing the NAVD 88
FF0322.geopotential number by the normal gravity value computed on the
FF0322.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
FF0322.degrees latitude (g = 980.6199 gals.).
FF0322
FF0322.The modeled gravity was interpolated from observed gravity values.
FF0322
FF0322;                    North         East     Units Scale Factor Converg.
FF0322;SPC TN       -   105,743.132   233,228.864   MT  1.00000574   -2 21 32.7
FF0322;SPC TN       -   346,925.59    765,185.03   sFT  1.00000574   -2 21 32.7
FF0322;UTM  15      - 3,901,299.946   770,375.189   MT  1.00050102   +1 42 50.6
FF0322;UTM  16      - 3,901,462.715   224,239.298   MT  1.00053728   -1 44 53.7
FF0322
FF0322!             -  Elev Factor  x  Scale Factor =   Combined Factor
FF0322!SPC TN       -   0.99999224  x   1.00000574  =   0.99999798
FF0322!UTM  15      -   0.99999224  x   1.00050102  =   1.00049326
FF0322!UTM  16      -   0.99999224  x   1.00053728  =   1.00052952
FF0322
FF0322                          SUPERSEDED SURVEY CONTROL
FF0322
FF0322  NAD 83(1995)-  35 13 06.00479(N)    090 01 46.46696(W) AD(       ) 1
FF0322  ELLIP H (05/31/05)   49.447  (m)                        GP(       ) 4 2
FF0322  NAVD 88 (05/31/05)   76.76   (m)          251.8    (f) LEVELING    3
FF0322  NGVD 29 (??/??/??)   76.713  (m)          251.68   (f) ADJUSTED    1 1
FF0322
FF0322.Superseded values are not recommended for survey control.
FF0322.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FF0322.See file dsdata.txt to determine how the superseded data were derived.
FF0322
FF0322_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SYV7037501299(NAD 83)
FF0322_MARKER: DB = BENCH MARK DISK
FF0322_SETTING: 46 = COPPER-CLAD STEEL ROD W/O SLEEVE (10 FT.+)
FF0322_SP_SET: 46 FEET
FF0322_STAMPING: J 261 1974
FF0322_MAGNETIC: N = NO MAGNETIC MATERIAL
FF0322_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
FF0322_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FF0322+SATELLITE: SATELLITE OBSERVATIONS - April 20, 2008
FF0322
FF0322  HISTORY     - Date     Condition        Report By
FF0322  HISTORY     - 1974     MONUMENTED       NGS
FF0322  HISTORY     - 19941212 GOOD             TN1620
FF0322  HISTORY     - 20021022 GOOD             USACE
FF0322  HISTORY     - 20030702 GOOD             EMCINC
FF0322  HISTORY     - 20080420 GOOD             NGS
FF0322
FF0322                          STATION DESCRIPTION
FF0322
FF0322'DESCRIBED BY NATIONAL GEODETIC SURVEY 1974
FF0322'AT FRAYSER.
FF0322'AT FRAYSER, 0.9 MILE NORTHEAST ALONG U.S. HIGHWAY 51 FROM THE
FF0322'OVERPASS OVER ILLINOIS CENTRAL RAILROAD, 47 FEET SOUTHEAST OF THE
FF0322'SOUTHEAST CORNER OF THE FRAYSER BAPTIST CHURCH, 81 FEET
FF0322'WEST-NORTHWEST OF THE WEST-NORTHWEST LANE OF U.S. HIGHWAY 51,
FF0322'51 FEET WEST OF TELEPHONE POLE 104222, 12 FEET SOUTH OF THE SOUTH
FF0322'EDGE OF A CONCRETE SIDEWALK, 1 FOOT EAST OF THE SOUTH END OF A LOW
FF0322'BRICK FOUNDATION SUPPORTING WROUGHT IRON SIGN FRAYSER BAPTIST
FF0322'CHURCH, ABOUT LEVEL WITH THE HIGHWAY AND ON TOP OF A COPPER COATED
FF0322'STEEL ROD, 1-INCH BELOW GROUND AND PROTECTED BY A 4-INCH PLASTIC
FF0322'PIPE FLUSH WITH THE GROUND.  THE ROD WAS DRIVEN TO REFUSAL DEPTH
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 FF0322'OF 46 FEET.
 FF0322
 FF0322                          STATION RECOVERY (1994)
 FF0322
 FF0322'RECOVERY NOTE BY CITY OF MEMPHIS TENNESSEE 1994 (KG)
 FF0322'RECOVERED IN GOOD CONDITION.
 FF0322
 FF0322                          STATION RECOVERY (2002)
 FF0322
 FF0322'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2002 (JMH)
 FF0322'RECOVERED IN GOOD CONDITION.
 FF0322
 FF0322                          STATION RECOVERY (2003)
 FF0322
 FF0322'RECOVERY NOTE BY EMC INCORPORATED 2003 (MG)
 FF0322'RECOVERED AS DESCRIBED.
 FF0322
 FF0322                          STATION RECOVERY (2008)
 FF0322
 FF0322'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2008 (SH)
 FF0322'RECOVERED IN GOOD CONDITION.
*****************************************************************
 AJ2678  DESIGNATION -  STEEL
 AJ2678  PID         -  AJ2678
 AJ2678  STATE/COUNTY-  TN/SHELBY
 AJ2678  USGS QUAD   -  FLETCHER LAKE (1993)
 AJ2678
 AJ2678                        *CURRENT SURVEY CONTROL
 AJ2678  ______________________________________________________________
 AJ2678* NAD 83(2007)-  35 02 57.09032(N)    090 09 12.45513(W)     ADJUSTED
 AJ2678* NAVD 88     -        64.01   (meters)     210.0    (feet)  LEVELING
 AJ2678  ______________________________________________________________
 AJ2678  EPOCH DATE  -        2002.00
 AJ2678  X           -     -14,000.735 (meters)                     COMP
 AJ2678  Y           -  -5,227,305.995 (meters)                     COMP
 AJ2678  Z           -   3,642,357.072 (meters)                     COMP
 AJ2678  LAPLACE CORR-          -1.12  (seconds)                    DEFLEC09
 AJ2678  ELLIP HEIGHT-          36.706 (meters)          (02/10/07) ADJUSTED
 AJ2678  GEOID HEIGHT-         -27.29  (meters)                     GEOID09
 AJ2678
 AJ2678  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 AJ2678  Type    PID    Designation                       North   East  Ellip
 AJ2678  ----------------------------------------------------------------
 AJ2678  NETWORK AJ2678 STEEL                              0.76   0.57   1.71
 AJ2678  ----------------------------------------------------------------
 AJ2678  VERT ORDER  -  THIRD ?
 AJ2678
 AJ2678.The horizontal coordinates were established by GPS observations
 AJ2678.and adjusted by the National Geodetic Survey in February 2007.
 AJ2678
 AJ2678.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 AJ2678.See National Readjustment for more information.
 AJ2678.The horizontal coordinates are valid at the epoch date displayed above.
 AJ2678.The epoch date for horizontal control is a decimal equivalence
 AJ2678.of Year/Month/Day.
 AJ2678
 AJ2678.The orthometric height was determined by differential leveling.
 AJ2678.The vertical network tie was performed by a horz. field party for horz.
 AJ2678.obs reductions. Reset procedures were used to establish the elevation.
 AJ2678
 AJ2678.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AJ2678
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AJ2678.The Laplace correction was computed from DEFLEC09 derived deflections.
AJ2678
AJ2678.The ellipsoidal height was determined by GPS observations
AJ2678.and is referenced to NAD 83.
AJ2678
AJ2678.The geoid height was determined by GEOID09.
AJ2678
AJ2678;                    North         East      Units Scale Factor Converg.
AJ2678;SPC TN       -    87,465.785   221,163.332   MT  1.00004150   -2 25 53.8
AJ2678;SPC TN       -   286,960.66    725,600.03    sFT  1.00004150   -2 25 53.8
AJ2678;UTM  15      - 3,882,203.863   759,632.613   MT  1.00043086   +1 38 08.2
AJ2678
AJ2678!             -  Elev Factor  x  Scale Factor =   Combined Factor
AJ2678!SPC TN       -   0.99999424  x   1.00004150  =   1.00003574
AJ2678!UTM  15      -   0.99999424  x   1.00043086  =   1.00042510
AJ2678
AJ2678                          SUPERSEDED SURVEY CONTROL
AJ2678
AJ2678  NAD 83(1995)-  35 02 57.08987(N)    090 09 12.45507(W) AD(       ) 1
AJ2678  ELLIP H (04/26/01)   36.771  (m)                       GP(       ) 4 1
AJ2678  NAVD 88 (04/26/01)   64.0    (m)          210.     (f) GPS OBS
AJ2678
AJ2678.Superseded values are not recommended for survey control.
AJ2678.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ2678.See file dsdata.txt to determine how the superseded data were derived.
AJ2678
AJ2678_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SYU5963282203(NAD 83)
AJ2678_MARKER: DD = SURVEY DISK
AJ2678_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AJ2678_MARK LOGO: TN1620
AJ2678_MAGNETIC: O = OTHER; SEE DESCRIPTION
AJ2678_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AJ2678+STABILITY: SURFACE MOTION
AJ2678_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ2678+SATELLITE: SATELLITE OBSERVATIONS - January 28, 2008
AJ2678
AJ2678  HISTORY     - Date     Condition        Report By
AJ2678  HISTORY     - 1999     MONUMENTED       TN1620
AJ2678  HISTORY     - 20030407 GOOD             TN1620
AJ2678  HISTORY     - 20080128 GOOD             TN1620
AJ2678
AJ2678                           STATION DESCRIPTION
AJ2678
AJ2678'DESCRIBED BY CITY OF MEMPHIS TENNESSEE 1999 (KG)
AJ2678'THE STATION IS LOCATED IN SOUTHWEST SHELBY COUNTY APPROXIMATELY 2.00
AJ2678'MILES (3.22 KM) SOUTH OF ALLEN STEAM PLANT IN THE PIDGEON INDUSTRIAL
AJ2678'PARK.
AJ2678'TO REACH THE STATION FROM THE INTERSECTION OF WEST PLANT ROAD AND
AJ2678'RIVERPORT ROAD PROCEED WEST ON RIVERPORT ROAD APPROXIMATELY 0.75 MILE
AJ2678'(1.21 KM) TO WHERE RIVERPORT ROAD TURNS SOUTH AND BECOMES PAUL R.
AJ2678'LOWERY ROAD, CONTINUE SOUTH ON PAUL R.  LOWERY APPROXIMATELY 1.30 MILE
AJ2678'(2.09 KM) TO DRIVE ENTRANCE TO STEEL PLANT.  THE STATION IS ON THE
AJ2678'RIGHT.
AJ2678'THE STATION IS A CAST ALUMINUM CAP WITH A CROSS MARK SET ON A 1/2 INCH
AJ2678'REBAR ENCASED IN A 6 INCH ROUND, 36 INCH LONG CONCRETE MONUMENT SET IN
AJ2678'THE GROUND.  THE STATION IS LOCATED 143.00 FEET (43.59 M) SOUTH OF THE
AJ2678'ASPHALT DRIVEWAY TO STEEL PLANT, 67.00 FEET (20.42 M) WEST OF THE
AJ2678'CENTERLINE OF PAUL R.  LOWERY ROAD, 74.20 FEET (22.62 M) NORTH OF A
AJ2678'SEWER MANHOLE, 56.20 FEET (17.13 M) SOUTHEAST OF A WOOD POWER POLE NO.
AJ2678'265635.  THE CAP AND CONCRETE ARE SET FLUSH WITH THE GROUND.
AJ2678
AJ2678                          STATION RECOVERY (2003)
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 AJ2678
 AJ2678'RECOVERY NOTE BY CITY OF MEMPHIS TENNESSEE 2003 (DA)
 AJ2678'RECOVERED IN GOOD CONDITION.
 AJ2678
 AJ2678                          STATION RECOVERY (2008)
 AJ2678
 AJ2678'RECOVERY NOTE BY CITY OF MEMPHIS TENNESSEE 2008 (KG)
 AJ2678'RECOVERED IN GOOD CONDITION.
*********************************************************************
 FE1126  DESIGNATION -  X 16
 FE1126  PID         -  FE1126
 FE1126  STATE/COUNTY-  TN/SHELBY
 FE1126  USGS QUAD   -  GERMANTOWN (1997)
 FE1126
 FE1126                        *CURRENT SURVEY CONTROL
 FE1126  ______________________________________________________________
 FE1126* NAD 83(1986)-  35 04 52.     (N)    089 48 08.     (W)     SCALED
 FE1126* NAVD 88     -       117.664  (meters)     386.04   (feet)  ADJUSTED
 FE1126  ______________________________________________________________
 FE1126  GEOID HEIGHT-         -27.54  (meters)                     GEOID09
 FE1126  DYNAMIC HT  -         117.555 (meters)     385.68  (feet)  COMP
 FE1126  MODELED GRAV-     979,707.6   (mgal)                       NAVD 88
 FE1126
 FE1126  VERT ORDER  -  FIRST     CLASS II
 FE1126
 FE1126.The horizontal coordinates were scaled from a topographic map and have
 FE1126.an estimated accuracy of +/- 6 seconds.
 FE1126.
 FE1126.The orthometric height was determined by differential leveling and
 FE1126.adjusted in June 1991.
 FE1126
 FE1126.The geoid height was determined by GEOID09.
 FE1126
 FE1126.The dynamic height is computed by dividing the NAVD 88
 FE1126.geopotential number by the normal gravity value computed on the
 FE1126.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 FE1126.degrees latitude (g = 980.6199 gals.).
 FE1126
 FE1126.The modeled gravity was interpolated from observed gravity values.
 FE1126
 FE1126;                    North         East     Units  Estimated Accuracy
 FE1126;SPC TN       -    89,700.      253,320.      MT  (+/- 180 meters Scaled)
 FE1126
 FE1126                         SUPERSEDED SURVEY CONTROL
 FE1126
 FE1126  NGVD 29 (??/??/??)  117.633  (m)          385.93   (f) ADJUSTED    1 2
 FE1126
 FE1126.Superseded values are not recommended for survey control.
 FE1126.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 FE1126.See file dsdata.txt to determine how the superseded data were derived.
 FE1126
 FE1126_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SBD445856(NAD 83)
 FE1126
 FE1126_MARKER: DB = BENCH MARK DISK
 FE1126_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 FE1126_SP_SET: SET IN TOP OF CONCRETE MONUMENT
 FE1126_STAMPING: X 16 1934
 FE1126_MARK LOGO: CGS
 FE1126_PROJECTION: FLUSH
 FE1126_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 FE1126+STABILITY: SURFACE MOTION
 FE1126_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
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FE1126+SATELLITE: SATELLITE OBSERVATIONS - October 09, 2002
FE1126
FE1126  HISTORY     - Date     Condition        Report By
FE1126  HISTORY     - 1934     MONUMENTED       CGS
FE1126  HISTORY     - 1983     GOOD             NGS
FE1126  HISTORY     - 20021009 GOOD             USACE
FE1126  HISTORY     - 20050301 POOR             GEOCAC
FE1126
FE1126                          STATION DESCRIPTION
FE1126
FE1126'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
FE1126'8.8 MI NW FROM COLLIERVILLE.
FE1126'8.8 MILES NORTHWEST ALONG THE SOUTHERN RAILWAY FROM THE
FE1126'COLLIERVILLE HERALD PRINTING OFFICE AT COLLIERVILLE, SHELBY
FE1126'COUNTY, 300 FEET SOUTHEAST OF THE CITY-LIMIT AT GERMANTOWN, 54
FE1126'FEET EAST OF BLOCK SIGNAL 5365 A, AND 30 FEET NORTHEAST OF THE
FE1126'CENTERLINE OF THE TRACK.  A STANDARD DISK, STAMPED X 16 1934
FE1126'AND SET IN THE TOP OF A CONCRETE POST.
FE1126
FE1126                          STATION RECOVERY (1983)
FE1126
FE1126'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1983
FE1126'RECOVERED IN GOOD CONDITION.  NOTE, 4.6 METERS (15.0 FT) NORTHWEST OF
FE1126'THE NORTHWEST FACE OF A RAILROAD SWITCH BOX, AND 0.30 METER (1.0 FT)
FE1126'SOUTHEAST OF A WITNESS POST.  NOTE, THE X IN THE STAMPING IS NOT
FE1126'LEGIBLE.
FE1126'THE MARK IS 0.61 M BELOW RAILROAD.
FE1126
FE1126                          STATION RECOVERY (2002)
FE1126
FE1126'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2002 (JMH)
FE1126'RECOVERED IN GOOD CONDITION.
FE1126
FE1126                          STATION RECOVERY (2005)
FE1126
FE1126'RECOVERY NOTE BY GEOCACHING 2005 (MFL)
FE1126'STAMPING ON MARK IS NOT LEGIBLE.
**********************************************************************
FE1410  DESIGNATION -  X 90
FE1410  PID         -  FE1410
FE1410  STATE/COUNTY-  TN/SHELBY
FE1410  USGS QUAD   -  MILLINGTON (1997)
FE1410
FE1410                          *CURRENT SURVEY CONTROL
FE1410  ______________________________________________________________________
FE1410* NAD 83(2007)-  35 16 15.98396(N)    089 57 58.36767(W)     ADJUSTED
FE1410* NAVD 88     -        73.173  (meters)     240.07   (feet)  ADJUSTED
FE1410  ______________________________________________________________________
FE1410  EPOCH DATE  -        2002.00
FE1410  X           -       3,074.146 (meters)                     COMP
FE1410  Y           -  -5,213,153.451 (meters)                     COMP
FE1410  Z           -   3,662,490.442 (meters)                     COMP
FE1410  LAPLACE CORR-          -0.14  (seconds)                    DEFLEC09
FE1410  ELLIP HEIGHT-          45.848 (meters)          (02/10/07) ADJUSTED
FE1410  GEOID HEIGHT-         -27.34  (meters)                     GEOID09
FE1410  DYNAMIC HT  -          73.108 (meters)     239.86  (feet)  COMP
FE1410
FE1410  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
FE1410  Type    PID    Designation                       North   East  Ellip
FE1410  ----------------------------------------------------------------------
FE1410  NETWORK FE1410 X 90                                0.76   0.63   1.98
FE1410  ----------------------------------------------------------------------
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FE1410  MODELED GRAV-     979,747.7   (mgal)                      NAVD 88
FE1410
FE1410  VERT ORDER  -  FIRST     CLASS II
FE1410
FE1410.The horizontal coordinates were established by GPS observations
FE1410.and adjusted by the National Geodetic Survey in February 2007.
FE1410
FE1410.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
FE1410.See National Readjustment for more information.
FE1410
FE1410.The horizontal coordinates are valid at the epoch date displayed above
FE1410.which is a decimal equivalence of Year/Month/Day.
FE1410
FE1410.The orthometric height was determined by differential leveling and
FE1410.adjusted in August 1995.
FE1410
FE1410.Photographs are available for this station.
FE1410
FE1410.The X, Y, and Z were computed from the position and the ellipsoidal ht.
FE1410
FE1410.The Laplace correction was computed from DEFLEC09 derived deflections.
FE1410
FE1410.The ellipsoidal height was determined by GPS observations
FE1410.and is referenced to NAD 83.
FE1410
FE1410.The geoid height was determined by GEOID09.
FE1410
FE1410.The dynamic height is computed by dividing the NAVD 88
FE1410.geopotential number by the normal gravity value computed on the
FE1410.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
FE1410.degrees latitude (g = 980.6199 gals.).
FE1410
FE1410.The modeled gravity was interpolated from observed gravity values.
FE1410
FE1410;                    North         East     Units Scale Factor Converg.
FE1410;SPC TN       -   111,357.540   239,229.997   MT  0.99999634   -2 19 19.1
FE1410;SPC TN       -   365,345.53    784,873.75   sFT  0.99999634   -2 19 19.1
FE1410;UTM  16      - 3,907,143.571   230,183.438   MT  1.00049729   -1 42 49.9
FE1410;UTM  15      - 3,907,329.646   775,965.179   MT  1.00053866   +1 45 10.6
FE1410
FE1410!             -  Elev Factor  x  Scale Factor =   Combined Factor
FE1410!SPC TN       -   0.99999280  x   0.99999634  =   0.99998914
FE1410!UTM  16      -   0.99999280  x   1.00049729  =   1.00049009
FE1410!UTM  15      -   0.99999280  x   1.00053866  =   1.00053146
FE1410
FE1410                          SUPERSEDED SURVEY CONTROL
FE1410
FE1410  NAD 83(1995)-  35 16 15.98378(N)    089 57 58.36742(W) AD(       ) 1
FE1410  ELLIP H (02/20/01)   45.884  (m)                        GP(       ) 2 1
FE1410  NAVD 88 (02/20/01)   73.17   (m)          240.1    (f) LEVELING    3
FE1410  NAVD 88 (06/15/91)   73.202  (m)          240.16   (f) UNKNOWN     1 2
FE1410  NGVD 29 (??/??/??)   73.155  (m)          240.01   (f) ADJUSTED    1 2
FE1410
FE1410.Superseded values are not recommended for survey control.
FE1410.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FE1410.See file dsdata.txt to determine how the superseded data were derived.
FE1410
FE1410_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SBE3018307143(NAD 83)
FE1410
FE1410_MARKER: DB = BENCH MARK DISK
FE1410_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
FE1410_SP_SET: CONCRETE POST
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FE1410_STAMPING: X 90 1957
FE1410_MARK LOGO: NGS
FE1410_PROJECTION: FLUSH
FE1410_MAGNETIC: N = NO MAGNETIC MATERIAL
FE1410_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
FE1410+STABILITY: SURFACE MOTION
FE1410_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FE1410+SATELLITE: SATELLITE OBSERVATIONS - April 19, 2008
FE1410
FE1410  HISTORY     - Date     Condition        Report By
FE1410  HISTORY     - 1957     MONUMENTED       CGS
FE1410  HISTORY     - 1974     GOOD             NGS
FE1410  HISTORY     - 19920116 GOOD             NGS
FE1410  HISTORY     - 1999     GOOD             LOWE
FE1410  HISTORY     - 20021007 GOOD             USACE
FE1410  HISTORY     - 20030702 GOOD             EMCINC
FE1410  HISTORY     - 20080419 GOOD             MAEC
FE1410
FE1410                          STATION DESCRIPTION
FE1410
FE1410'DESCRIBED BY NATIONAL GEODETIC SURVEY 1974
FE1410'4.8 MI NE FROM FRAYSER.
FE1410'ABOUT 3.8 MILES NORTHEAST ALONG U.S. HIGHWAY 51 FROM OUR LADY OF
FE1410'SORROWS CHURCH AND SCHOOL AT FRAYSER, THENCE 1.05 MILES EAST
FE1410'ALONG FITE ROAD (PAVED) TO THE ILLINOIS CENTRAL RAILROAD, 0.1
FE1410'MILE SOUTHWEST OF THE CROSSING OF FITE ROAD, 13 RAILS NORTHEAST
FE1410'OF A TOOL AND CAR SHED BETWEEN TRACKS AT WOODSTOCK, WHICH IS A
FE1410'SIDING, 140 FEET SOUTH OF THE CENTER LINE OF FITE ROAD (BEFORE
FE1410'MARKING CURVE), 82 FEET NORTHWEST OF THE NORTHWEST RAIL OF MAIN
FE1410'TRACK, 42 FEET NORTHWEST OF THE NORTHWEST RAIL OF A SIDE TRACK,
FE1410'27 FEET NORTHWEST OF THE CENTER LINE OF A GRAVEL ROAD, 10 FEET
FE1410'SOUTHWEST OF POWER POLE NO. 17410, 1.5 FEET SOUTHEAST OF A
FE1410'FENCE, 2 FEET SOUTH OF A 4 FT BY 4 FT WOODEN WITNESS POST, 2 1/2
FE1410'FEET BELOW LEVEL OF THE RAILS AND IN THE TOP OF A CONCRETE
FE1410'POST PROJECTING 1-INCH.
FE1410
FE1410                          STATION RECOVERY (1992)
FE1410
FE1410'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992
FE1410'10.1 KM (6.25 MI) SOUTHWESTERLY ALONG U.S. HIGHWAY 51 FROM THE
FE1410'JUNCTION OF COUNTY ROAD 205 (NAVY ROAD) IN MILLINGTON, THENCE 1.5 KM
FE1410'(0.95 MI) EASTERLY ALONG FITE ROAD, 42.7 M (140.1 FT) SOUTH OF THE
FE1410'CENTER OF THE ROAD, 9.9 M (32.5 FT) SOUTHEAST OF THE NEAR RAIL OF A
FE1410'SPUR TRACK OF THE ILLINOIS CENTRAL RAILROAD, 8.3 M (27.2 FT)
FE1410'NORTHWEST OF THE CENTER OF A GRAVELED ROAD, 2.9 M (9.5 FT) SOUTHWEST
FE1410'OF UTILITY POLE NUMBER 17410, 0.3 M (1.0 FT) BELOW THE LEVEL OF THE
FE1410'TRACK, 0.3 M (1.0 FT) NORTHEAST OF A WITNESS POST, AND THE MONUMENT
FE1410'IS FLUSH WITH THE GROUND SURFACE.
FE1410
FE1410                          STATION RECOVERY (1999)
FE1410
FE1410'RECOVERY NOTE BY LOWE ENGINEERS 1999
FE1410'RECOVERED 1999
FE1410'RECOVERED IN GOOD CONDITION.
FE1410'
FE1410'
FE1410
FE1410                          STATION RECOVERY (2002)
FE1410
FE1410'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2002 (JMH)
FE1410'RECOVERED IN GOOD CONDITION.
FE1410
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 FE1410                          STATION RECOVERY (2003)
 FE1410
 FE1410'RECOVERY NOTE BY EMC INCORPORATED 2003 (MG)
 FE1410'RECOVERED AS DESCRIBED
 FE1410
 FE1410                          STATION RECOVERY (2008)
 FE1410
 FE1410'RECOVERY NOTE BY MA ENGINEERING CONSULT INC 2008 (SH)
 FE1410'RECOVERED IN GOOD CONDITION.
*********************************************************************
 FF0392  DESIGNATION -  X 260
 FF0392  PID         -  FF0392
 FF0392  STATE/COUNTY-  TN/SHELBY
 FF0392  USGS QUAD   -  SOUTHWEST MEMPHIS (1993)
 FF0392
 FF0392                        *CURRENT SURVEY CONTROL
 FF0392  ______________________________________________________________
 FF0392* NAD 83(2007)-  35 01 14.30782(N)    090 05 19.32196(W)     ADJUSTED
 FF0392* NAVD 88     -        85.008  (meters)     278.90   (feet)  ADJUSTED
 FF0392  ______________________________________________________________
 FF0392  EPOCH DATE  -        2002.00
 FF0392  X           -      -8,095.346 (meters)                     COMP
 FF0392  Y           -  -5,229,154.011 (meters)                     COMP
 FF0392  Z           -   3,639,775.572 (meters)                     COMP
 FF0392  LAPLACE CORR-          -1.33  (seconds)                    DEFLEC09
 FF0392  ELLIP HEIGHT-          57.669 (meters)          (02/10/07) ADJUSTED
 FF0392  GEOID HEIGHT-         -27.35  (meters)                     GEOID09
 FF0392  DYNAMIC HT  -          84.929 (meters)     278.64  (feet)  COMP
 FF0392
 FF0392  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 FF0392  Type    PID    Designation                       North   East  Ellip
 FF0392  ----------------------------------------------------------------------
 FF0392  NETWORK FF0392 X 260                               1.31   1.06   1.96
 FF0392  ----------------------------------------------------------------------
 FF0392  MODELED GRAV-     979,711.7   (mgal)                      NAVD 88
 FF0392
 FF0392  VERT ORDER  -  FIRST     CLASS I
 FF0392
 FF0392.The horizontal coordinates were established by GPS observations
 FF0392.and adjusted by the National Geodetic Survey in February 2007.
 FF0392
 FF0392.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 FF0392.See National Readjustment for more information.
 FF0392
 FF0392.The horizontal coordinates are valid at the epoch date displayed above
 FF0392.which is a decimal equivalence of Year/Month/Day.
 FF0392
 FF0392.The orthometric height was determined by differential leveling and
 FF0392.adjusted in June 1991.
 FF0392
 FF0392.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 FF0392
 FF0392.The Laplace correction was computed from DEFLEC09 derived deflections.
 FF0392
 FF0392.The ellipsoidal height was determined by GPS observations
 FF0392.and is referenced to NAD 83.
 FF0392
 FF0392.The geoid height was determined by GEOID09.
 FF0392
 FF0392.The dynamic height is computed by dividing the NAVD 88
 FF0392.geopotential number by the normal gravity value computed on the
 FF0392.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
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FF0392.degrees latitude (g = 980.6199 gals.).
FF0392
FF0392.The modeled gravity was interpolated from observed gravity values.
FF0392
FF0392;                    North         East     Units Scale Factor Converg.
FF0392;SPC TN       -    84,052.235   226,934.254   MT  1.00004839   -2 23 37.3
FF0392;SPC TN       -   275,761.37    744,533.46   sFT  1.00004839   -2 23 37.3
FF0392;UTM  15      - 3,879,206.913   765,633.495   MT  1.00046973   +1 40 18.1
FF0392
FF0392!             -  Elev Factor  x  Scale Factor =   Combined Factor
FF0392!SPC TN       -   0.99999095  x   1.00004839  =   1.00003934
FF0392!UTM  15      -   0.99999095  x   1.00046973  =   1.00046067
FF0392
FF0392                          SUPERSEDED SURVEY CONTROL
FF0392
FF0392  NAD 83(1995)-  35 01 14.30783(N)    090 05 19.32173(W) AD(       ) 1
FF0392  ELLIP H (05/31/05)   57.661  (m)                       GP(       ) 4 2
FF0392  NAVD 88 (05/31/05)   85.01   (m)          278.9    (f) LEVELING    3
FF0392  NGVD 29 (??/??/??)   84.985  (m)          278.82   (f) ADJUSTED    1 1
FF0392
FF0392.Superseded values are not recommended for survey control.
FF0392.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
FF0392.See file dsdata.txt to determine how the superseded data were derived.
FF0392
FF0392_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SYU6563379206(NAD 83)
FF0392
FF0392_MARKER: DV = VERTICAL CONTROL DISK
FF0392_SETTING: 16 = (FASTENED TO) A METAL ROD WITH BASE PLATE BURIED/SCREWED
FF0392+WITH SETTING: INTO GROUND
FF0392_SP_SET: METAL ROD WITH BASE PLATE
FF0392_STAMPING: X 260 1974
FF0392_MARK LOGO: NGS
FF0392_MAGNETIC: N = NO MAGNETIC MATERIAL
FF0392_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
FF0392_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
FF0392+SATELLITE: SATELLITE OBSERVATIONS - July 01, 2003
FF0392
FF0392  HISTORY     - Date     Condition        Report By
FF0392  HISTORY     - 1974     MONUMENTED       NGS
FF0392  HISTORY     - 1976     GOOD             NGS
FF0392  HISTORY     - 1983     GOOD             NGS
FF0392  HISTORY     - 19920116 GOOD             NGS
FF0392  HISTORY     - 20021028 GOOD             USACE
FF0392  HISTORY     - 20030701 GOOD             EMCINC
FF0392
FF0392                          STATION DESCRIPTION
FF0392
FF0392'DESCRIBED BY NATIONAL GEODETIC SURVEY 1974
FF0392'4.8 MI SW FROM MEMPHIS.
FF0392'ABOUT 4.8 MILES SOUTHWEST ALONG U.S. HIGHWAY 61 (SOUTH THIRD
FF0392'STREET) FROM THE INTERSTATE 55 UNDERPASS AT MEMPHIS, AT THE
FF0392'INTERSECTION OF SHELBY DRIVE AND SOUTH THIRD STREET, 136 FEET
FF0392'NORTHWEST OF THE NORTHWEST CURBLINE OF U.S. HIGHWAY 61, 39 FEET
FF0392'SOUTH OF THE CENTER LINE OF SHELBY DRIVE, 22 FEET NORTHWEST OF
FF0392'THE NORTHWEST CORNER OF THE EXXON SERVICE STATION, 46 FEET EAST
FF0392'OF A LONE 36-INCH OAK TREE, 2.8 FEET WEST OF A PIPE CORNER POST
FF0392'IN CHAIN LINK FENCE, 1 FOOT NORTH OF A FENCE, 1 FOOT NORTHEAST
FF0392'OF A METAL WINNESS POST, 2 FEET BELOW LEVEL OF SHELBY DRIVE AND
FF0392'ON THE TOP OF A 4-FOOT COPPER COATED STEEL ROD THAT IS ATTACHED
FF0392'TO A METAL BASE PLATE.  THE DISK IS 2-INCHES BELOW LEVEL OF THE
FF0392'GROUND AND PROTECTED BY A 4-INCH IRON PIPE 1-INCH BELOW LEVEL
FF0392'OF THE GROUND.
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 FF0392
 FF0392                          STATION RECOVERY (1976)
 FF0392
 FF0392'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1976
 FF0392'RECOVERED IN GOOD CONDITION.
 FF0392
 FF0392                          STATION RECOVERY (1983)
 FF0392
 FF0392'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1983
 FF0392'RECOVERED IN GOOD CONDITION.
 FF0392
 FF0392                          STATION RECOVERY (1992)
 FF0392
 FF0392'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992
 FF0392'7.4 KM (4.60 MI) SOUTHERLY ALONG U.S. HIGHWAY 61 FROM THE JUNCTION OF
 FF0392'INTERSTATE HIGHWAY 55 IN MEMPHIS, 48.1 M (157.8 FT) NORTHWEST OF THE
 FF0392'HIGHWAY CENTERLINE, 8.7 M (28.5 FT) SOUTH OF AND LEVEL WITH THE
 FF0392'CENTERLINE OF SHELBY DRIVE, 4.7 M (15.4 FT) SOUTHWEST OF A UTILITY
 FF0392'LIGHT POLE, 0.9 M (3.0 FT) WEST OF THE NORTH END OF A CHAIN-LINK
 FF0392'FENCE, AND 0.4 M (1.3 FT) NORTHEAST OF A WITNESS POST.  NOTE--THE
 FF0392'DISK IS ENCASED IN A 4-INCH METAL PIPE RECESSED 0.3 M (1.0 FT) BELOW
 FF0392'THE GROUND SURFACE.
 FF0392
 FF0392                          STATION RECOVERY (2002)
 FF0392
 FF0392'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2002 (JMH)
 FF0392'MARK IS ALSO 10.0 FT SW OF A POWER POLE AND CARSONITE WITNESS POST.
 FF0392
 FF0392                          STATION RECOVERY (2003)
 FF0392
 FF0392'RECOVERY NOTE BY EMC INCORPORATED 2003 (MG)
 FF0392'RECOVERED AS DESCRIBED
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 EH0143  DESIGNATION -  Y 243
 EH0143  PID         -  EH0143
 EH0143  STATE/COUNTY-  MS/DE SOTO
 EH0143  USGS QUAD   -  LAKE CORMORANT (1982)
 EH0143
 EH0143                      *CURRENT SURVEY CONTROL
 EH0143  ______________________________________________________________________
 EH0143* NAD 83(2007)-  34 56 42.46278(N)    090 09 27.72098(W)     NO CHECK
 EH0143* NAVD 88     -        64.411  (meters)     211.32   (feet)  ADJUSTED
 EH0143  ______________________________________________________________________
 EH0143  EPOCH DATE  -        2002.00
 EH0143  X           -     -14,405.838 (meters)                     COMP
 EH0143  Y           -  -5,233,926.658 (meters)                     COMP
 EH0143  Z           -   3,632,899.952 (meters)                     COMP
 EH0143  LAPLACE CORR-          -1.33  (seconds)                    DEFLEC09
 EH0143  ELLIP HEIGHT-          37.108 (meters)          (02/10/07) NO CHECK
 EH0143  GEOID HEIGHT-         -27.31  (meters)                     GEOID09
 EH0143  DYNAMIC HT  -          64.351 (meters)     211.12  (feet)  COMP
 EH0143
 EH0143  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 EH0143  Type    PID    Designation                      North   East  Ellip
 EH0143  ----------------------------------------------------------------
 EH0143  NETWORK EH0143 Y 243                             0.49   0.31   1.06
 EH0143  ----------------------------------------------------------------
 EH0143  MODELED GRAV-     979,703.5   (mgal)                     NAVD 88
 EH0143
 EH0143  VERT ORDER  -  FIRST     CLASS I
 EH0143
 EH0143.The horizontal coordinates were established by GPS observations
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EH0143.and adjusted by the National Geodetic Survey in February 2007.
EH0143
EH0143.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
EH0143.See National Readjustment for more information.
EH0143.No horizontal observational check was made to the station.
EH0143.The horizontal coordinates are valid at the epoch date displayed above.
EH0143.The epoch date for horizontal control is a decimal equivalence
EH0143.of Year/Month/Day.
EH0143
EH0143.The orthometric height was determined by differential leveling and
EH0143.adjusted in July 1994.
EH0143
EH0143.Photographs are available for this station.
EH0143
EH0143.The X, Y, and Z were computed from the position and the ellipsoidal ht.
EH0143
EH0143.The Laplace correction was computed from DEFLEC09 derived deflections.
EH0143
EH0143.The ellipsoidal height was determined by GPS observations
EH0143.and is referenced to NAD 83.
EH0143
EH0143.The geoid height was determined by GEOID09.
EH0143
EH0143.The dynamic height is computed by dividing the NAVD 88
EH0143.geopotential number by the normal gravity value computed on the
EH0143.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
EH0143.degrees latitude (g = 980.6199 gals.).
EH0143
EH0143.The modeled gravity was interpolated from observed gravity values.
EH0143
EH0143;                    North         East     Units Scale Factor Converg.
EH0143;SPC MS W     -   603,800.077   716,043.123   MT  0.99995317   +0 06 02.2
EH0143;SPC MS W     - 1,980,967.42  2,349,218.15   sFT  0.99995317   +0 06 02.2
EH0143;UTM  15      - 3,870,647.719   759,574.477   MT  1.00043051   +1 37 44.2
EH0143
EH0143!             -  Elev Factor  x  Scale Factor =   Combined Factor
EH0143!SPC MS W     -   0.99999418  x   0.99995317  =   0.99994735
EH0143!UTM  15      -   0.99999418  x   1.00043051  =   1.00042468
EH0143
EH0143                          SUPERSEDED SURVEY CONTROL
EH0143
EH0143  NAD 83(1993)-  34 56 42.46241(N)    090 09 27.72054(W) AD(       ) 1
EH0143  ELLIP H (12/02/99)   37.132  (m)                       GP(       ) 1 1
EH0143  NAVD 88 (12/02/99)   64.41   (m)          211.3    (f) LEVELING    3
EH0143  NAVD 88 (06/15/91)   64.406  (m)          211.31   (f) UNKNOWN     1 1
EH0143  NGVD 29 (??/??/??)   64.404  (m)          211.30   (f) ADJUSTED    1 1
EH0143
EH0143.Superseded values are not recommended for survey control.
EH0143.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
EH0143.See file dsdata.txt to determine how the superseded data were derived.
EH0143
EH0143_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SYU5957470647(NAD 83)
EH0143_MARKER: DV = VERTICAL CONTROL DISK
EH0143_SETTING: 32 = SET IN A RETAINING WALL OR CONCRETE LEDGE
EH0143_SP_SET: 4X11-FT. DOUBLE CULVERT HEADWALL
EH0143_STAMPING: Y 243 1974
EH0143_MARK LOGO: NGS
EH0143_MAGNETIC: N = NO MAGNETIC MATERIAL
EH0143_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
EH0143+STABILITY: SURFACE MOTION
EH0143_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
EH0143+SATELLITE: SATELLITE OBSERVATIONS - October 24, 2009
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EH0143
EH0143  HISTORY     - Date     Condition        Report By
EH0143  HISTORY     - 1974     MONUMENTED       NGS
EH0143  HISTORY     - 19911112 GOOD             NGS
EH0143  HISTORY     - 19990302 GOOD             NGS
EH0143  HISTORY     - 20030409 GOOD             USACE
EH0143  HISTORY     - 20070814 GOOD             JCLS
EH0143  HISTORY     - 20070814 GOOD             JCLS
EH0143  HISTORY     - 20091024 GOOD             JCLS
EH0143
EH0143                          STATION DESCRIPTION
EH0143
EH0143'DESCRIBED BY NATIONAL GEODETIC SURVEY 1974
EH0143'0.85 MI SW FROM WALLS.
EH0143'ABOUT 0.85 MILE SOUTHWEST ALONG U.S. HIGHWAY 61 FROM THE POST OFFICE
EH0143'AT WALLS, 76 FEET NORTHWEST OF AND ACROSS THE HIGHWAY FROM POWER POLE
EH0143'134 WHICH IS BRACED BY A GUY WIRE, 20.5 FEET NORTHWEST OF THE CENTER
EH0143'LINE OF THE HIGHWAY, 1 FOOT BELOW LEVEL OF THE HIGHWAY AND SET IN TOP
EH0143'AND CENTER OF THE NORTHWEST HEADWALL OF A 11 FT. BY 4 FT. DOUBLE
EH0143'CHANNEL BOX CULVERT. SECTION 4, T 1S, R 9W.
EH0143
EH0143                          STATION RECOVERY (1991)
EH0143
EH0143'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1991
EH0143'1.0 KM (0.60 MI) SOUTHERLY ALONG U.S. HIGHWAY 61 FROM THE POST OFFICE
EH0143'IN WALLS, IN TOP OF AND 1.9 M (6.2 FT) SOUTHWEST OF THE NORTHEAST END
EH0143'OF THE NORTHWEST CONCRETE HEADWALL OF A CULVERT, 6.1 M (20.0 FT)
EH0143'NORTHWEST OF THE HIGHWAY CENTERLINE, AND 0.1 M (0.3 FT) BELOW THE
EH0143'LEVEL OF THE HIGHWAY.
EH0143
EH0143                          STATION RECOVERY (1999)
EH0143
EH0143'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (AJL)
EH0143'RECOVERED AS DESCRIBED 03/02/99.  R.G.  HAYES
EH0143
EH0143                          STATION RECOVERY (2003)
EH0143
EH0143'RECOVERY NOTE BY US ARMY CORPS OF ENGINEERS 2003 (JMH)
EH0143'RECOVERED IN GOOD CONDITION.
EH0143
EH0143                          STATION RECOVERY (2007)
EH0143
EH0143'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2007 (MRY)
EH0143'RECOVERED IN GOOD CONDITION.
EH0143
EH0143                          STATION RECOVERY (2007)
EH0143
EH0143'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2007
EH0143'RECOVERED IN GOOD CONDITION.
EH0143
EH0143                          STATION RECOVERY (2009)
EH0143
EH0143'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2009
EH0143'RECOVERED IN GOOD CONDITION.
```
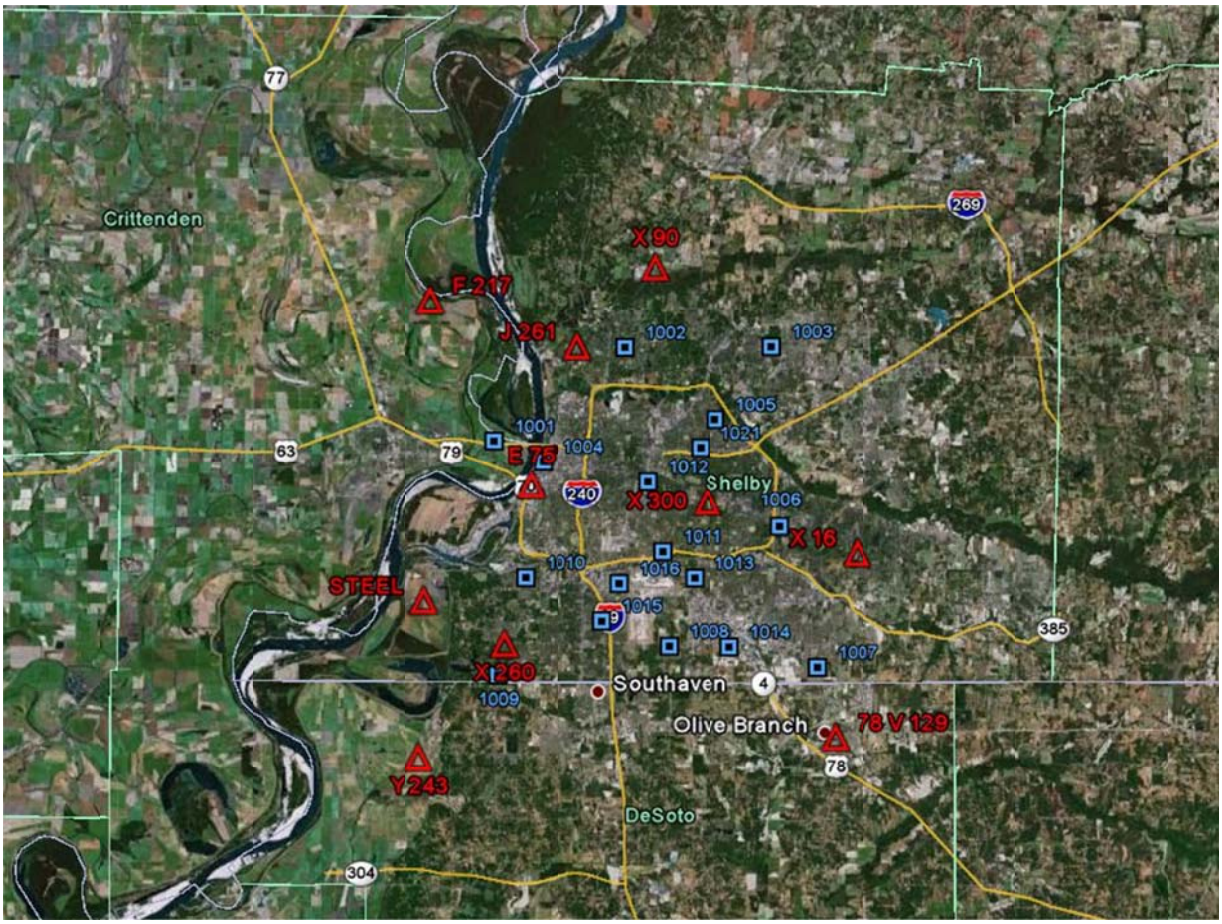

SECTION 5: GPS CONTROL DIAGRAM

This section contains a graphical representation of the new and existing control stations used for the project.



N

Memphis, TN 1m NPS LiDAR & Feature Extraction

Not to Scale