PROJECT REPORT

FOR

US GEOLOGICAL SURVEY
NGTOC III
ROLLA, MO

INDIANA FLOOD LIDAR (ARRA)

July 15, 2010

AERO-METRIC PROJECT NO. 1-100118

Airborne GPS Survey Report

For

US GEOLOGICAL SURVEY
NGTOC III

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USGS – NRCS – INDIANA LIDAR TASK ORDER

AERO-METRIC Project No. 1-090118

1 INTRODUCTION

This report contains a summary of the LiDAR data acquisition and processing for the **INDIANA FLOOD LIDAR (ARRA) TASK ORDER**.

1.1 Contact Info

Questions regarding the technical aspects of this report should be addressed to:

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1.2 Purpose

AERO-METRIC, INC. acquired highly accurate Light Detection and Ranging (LiDAR) data for eight areas that comprise approximately 297 square miles for the United State Geological Survey. Using AERO-METRIC's Optech Gemini LiDAR system, data was collected at multiple altitudes to support each project area's requirement.

1.3 Project Location

The entire project area is approximately 297 square miles and is split up into eight areas located Indiana. The first area is the Tippecanoe River and contiguous flood plain within Tippecanoe, White, and Carroll Counties. The second area is the East Fork White River, Flatrock River, and Driftwood Rivers and contiguous flood plains in and within 5 miles of the community of Columbus, Bartholomew County. The third area is the Wabash River and contiguous flood plain within the community of Terre Haute, Vigo County. The fourth area is the White River and contiguous flood plain within the community of Spencer, Owen County. The fifth area is the White River and contiguous flood plain within the community of Seymour, Jackson County. The sixth area is the White River and contiguous flood plain within the community of Newberry, Greene County. The seventh area is the Iroquois River and contiguous flood plain within the community of Rensselaer, Jasper County, and the eighth area is the Elkhart River and contiguous flood plain within the communities of Goshen and Elkhart, Elkhart County. Each area was defined and supplied by USGS on January 15, 2010.

1.4 Time Period

LiDAR data acquisition was completed between April 4th, 2010 and April 14th, 2010. A total of 8 flight missions were required to cover the project areas. See Section 6 of the report for each flight and sensor log. QC surveys and control were completed between March 9th and May 13th, 2010.

1.5 Project Scope

AERO-METRIC, INC. acquired highly accurate Light Detection and Ranging (LiDAR) data for an area that encompasses nine project areas of approximately 296 square miles in Indiana. Using AERO-METRIC's Optech Gemini LiDAR system, data was collected at multiple altitudes to support each project area's requirements.

As documented in our proposal dated January 21, 2010 we were to achieve a TIN accuracy of 15cm. The accuracy as tested and published in this report in Section 8 has easily met both vertical accuracy requirements.

1.6 Conditions Affecting Progress

- None.

2 GEODETIC CONTROL

2.1 Network Scope

Base horizontal control for the check point surveys of the eight areas consisted of two NGS Order A stations: **B 120** and **G 129**; four NGS Order B stations: **B 70**, **H 271**, **K 268**, and **N 13**; one NGS First Order station: **J 160**; and six NGS CORS stations: **INBD**, **INCL**, **INEL**, **INLN**, **INRN**, and **INWL**.

Horizontal control is referenced to the Universal Transverse Mercator (UTM) Coordinate System – Zone 16, based on the North American Datum of 1983/2007 (NAD83/07). Final coordinates are published in meters.

Base vertical control for the check point surveys of the eight areas consisted of eleven NGS First Order, Class 2 stations: **14403**, **A 353**, **E 10**, **E 13**, **J 160**, **J 354**, **J 9**, **M 360**, **N 13**, **S 280**, and **Z 293**; ten NGS Second Order stations: **GA 168**, **B 120**, **B 70**, **G 129**, **H 271**, **K 268**, **M 107**, **NEW L 5**, **P 157**, and **S 280**; and one NGS Third Order station: **K 81 RESET**. The NGS Second Order station **Q 28** was also observed, but not used as control. The NGS Geoid Model GEOID09 was applied to the derived ellipsoid heights that approximate the North American Vertical Datum of 1988.

Vertical control is based on the North American Vertical Datum of 1988 (NAVD88).

Base horizontal and vertical control for the Airborne GPS surveys consisted of 14 NGS CORS stations: **GINAS**, **INBR**, **INCB**, **INCL**, **INEL**, **INFR**, **INLN**, **INMO**, **INMT**, **INPD**, **INPL**, **INRN**, **INSY**, and **INWR**.

NGS recovery sheets are located in Section 2 of the Control Survey Report.

2.2 Network Computations

GPS measurements were done in two stages. Initial computations were done with LEICA Geo Office (LGO), version 4.0. LGO permits the conversion of raw satellite data collected by the receivers to a meaningful coordinate difference between points (baseline solutions). Once the baseline solutions were determined, they were input into the GeoSurv-GeoLab2 series of programs (Geolab version 2.4d). Adjustments were performed for analysis and quality closure holding one position and one elevation for each of the two areas

Area 1 (Tippecanoe River)

Holding the position and elevation of **G 129** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
B 120	0.002	0.000	0.002	67310.0	1:33600000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
B 120	207.762	207.733	0.029	67310.0	0.099

Area 2 (Columbus area)

Holding the position and elevation of **K 268** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
H 271	0.008	0.016	0.018	10814.9	1: 601000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
H 271	186.417	186.402	0.015	10814.9	0.040
J 9	210.925	210.930	0.005	15659.7	0.048

Area 3 (Terre Haute area)

Holding the position and elevation of **B 70** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
INLN	0.028	0.005	0.028	52190.9	1: 1800000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
INLN	129.392	129.432	0.040	52190.9	0.087*
M 360	179.783	179.778	0.005	25834.2	0.061
Z 293	144.539	144.557	0.018	29577.0	0.065

Area 4 (Spencer area)

Holding the position and elevation of **N 13** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
INCL	0.013	0.015	0.020	28762.9	1: 1400000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
INCL	249.907	249.870	0.037	28762.9	0.064*
A 353	154.823	154.784	0.039	59945.5	0.093
E 13	171.296	171.263	0.033	24964.0	0.060
K 81 RESET	239.601	239.560	0.041	23794.0	0.059

Area 5 (Seymour area)

Holding the position and elevation of **H 271** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
INBD	0.020	0.002	0.020	61051.2	1: 3052000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
INBD	162.296	162.336	0.040	61051.2	0.094*
E 10	163.702	163.669	0.033	36239.9	0.072
Q 60 X	177.354	177.384	0.030	25041.7	0.060

Area 6 (Newberry area)

Holding the position and elevation of **S 280** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
INLN	0.013	0.005	0.014	27171.0	1: 1940000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
INLN	129.431	129.432	0.001	27171.0	0.063*
A 353	154.757	154.784	0.027	14935.6	0.046
J 354	146.012	146.020	0.008	29314.9	0.065

Area 7 (Rensselaer area)

Holding the position of **INRN** and the elevation of **M 107** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
INNL	0.003	0.007	0.008	49341.6	1: 6167000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
INNL	188.002	188.076	0.074	49341.6	0.084*
INRN	177.480	177.504	0.024	8966.9	0.036*
NEW L5	197.668	197.731	0.063	12823.0	0.043
P 157	209.216	209.273	0.057	18235.0	0.051

Area 8 (Elkhart and Goshen areas)

Holding the position and elevation of **J 160** fixed:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
INEL	0.001	0.008	0.008	16872.4	1: 2109000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE
14403	248.528	248.553	0.025	28122.1	0.064
A 168	226.662	226.705	0.043	27199.5	0.063
INEL	219.239	219.226	0.013	16872.4	0.049*

Note: * - The published heights are ellipsoid.

The NGS bench mark **Q 28** was evaluated, but not held in the final constrained adjustments. The rest of the above control were held in the fully constrained scaled least squares base network adjustments to derive the ground control checkpoint values

3 LiDAR ACQUISITION & PROCEDURES

3.1 Acquisition Time Period

LiDAR data acquisition and Airborne GPS control surveys were completed between April 4th, 2010 and April 14th, 2010. A total of 8 flight missions were required to cover the project areas.

3.2 LiDAR Planning

The LiDAR data for this project was collected with Aero-Metric's Optech Gemini Airborne LiDAR system (Serial Number 03SEN145). All flight planning and acquisition was completed using Optech's ALTM-Nav, version 2.1.25b (flight planning and LiDAR control software).

The following are the acquisition settings for all 8 areas:

- Flying Height (Above Ground): 1700 meters
- Laser Pulse Rate: 70 kHz
- Mirror Scan Frequency: 32.5 Hz
- Scan Angle (+/-): 22°
- Side Lap: 50 %
- Ground Speed: 160 kts
- Nominal Point Spacing: 1.2 meters

3.3 LiDAR Acquisition

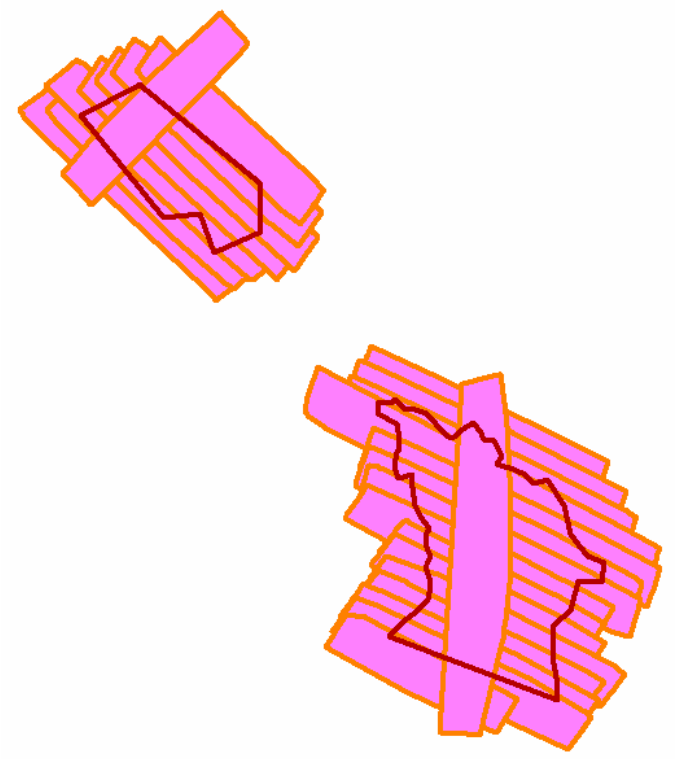
A total of 8 flight missions were required to cover the project area. The missions were flown using the above planned values. See below for a sketch of the acquisition missions and Section 6 of the report for each flight log.

Airborne GPS and IMU trajectories for the LiDAR sensor where also acquired during the time of flight.

Each mission was typically four to five hours long. Before take-off, the LiDAR system and the Airborne GPS and IMU system were initiated for a period of five minutes and then again after landing for another five minutes. The missions acquired data according to the planned flight lines and included a minimum of one (usually two to four) cross flights. The cross flights were flown perpendicular to the planned flight lines and their data used in the in-situ calibration of the sensor.

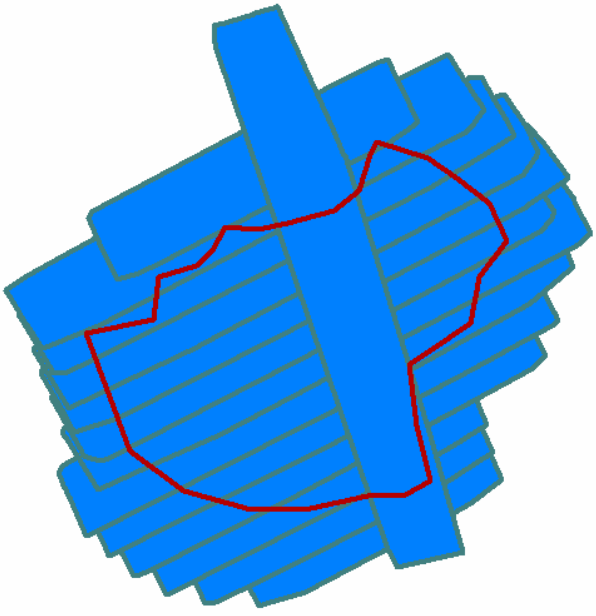
3.3 LiDAR Trajectory Processing

The airborne positioning was based on the following control stations: Elkhart & Goshen INBR-INEL-INSY, Rensselaer INMO-INRN, Tippecanoe INFR-INMO-INPL, Terre Haute INAS-INPD-INPL & INMT, Newberry INAS-INMT, Spencer INAS-INCLINLN, Columbus INCB-INMT-INSY and Seymour INCB-INSY



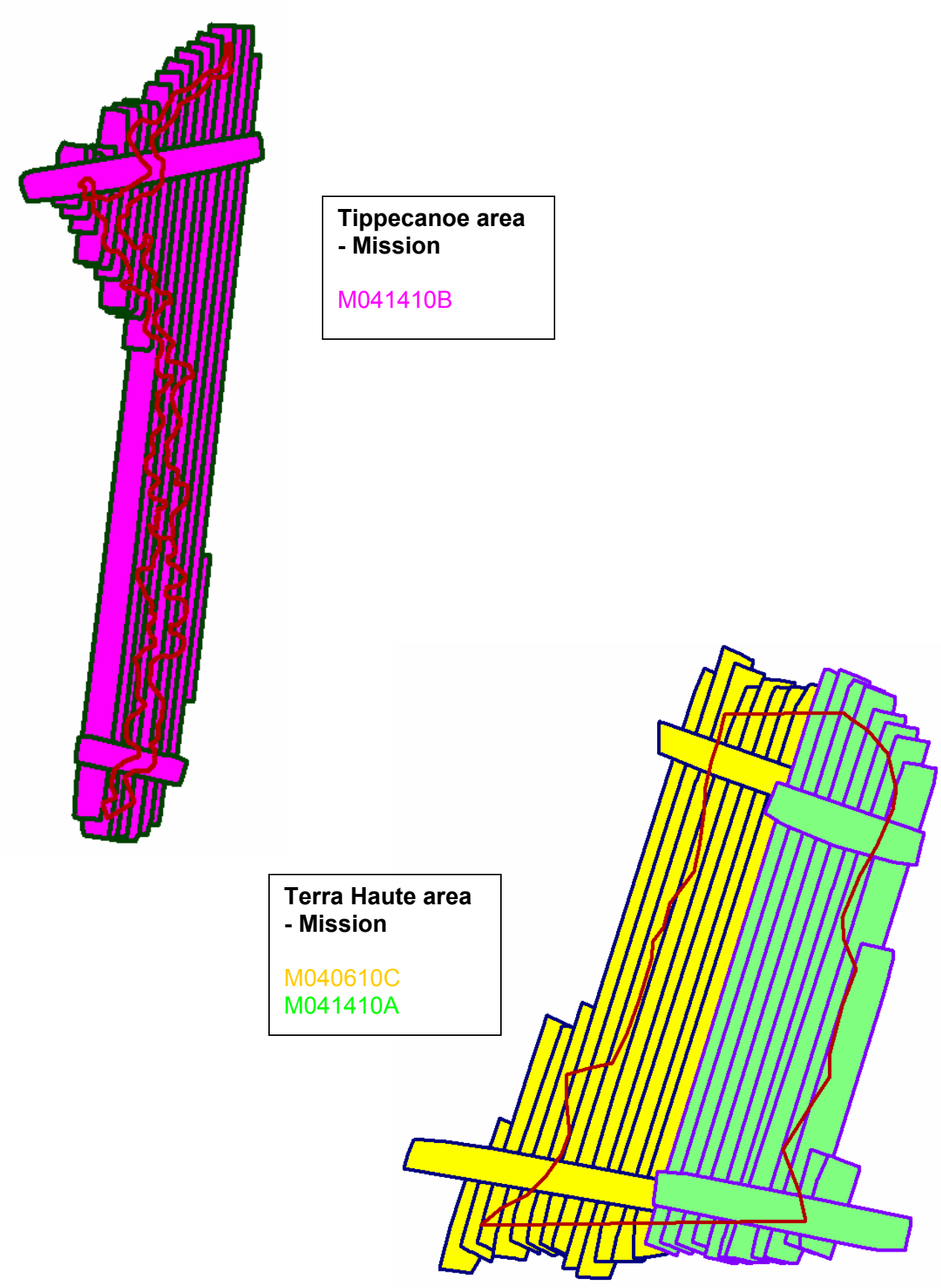
Elkhart & Goshen area - Mission

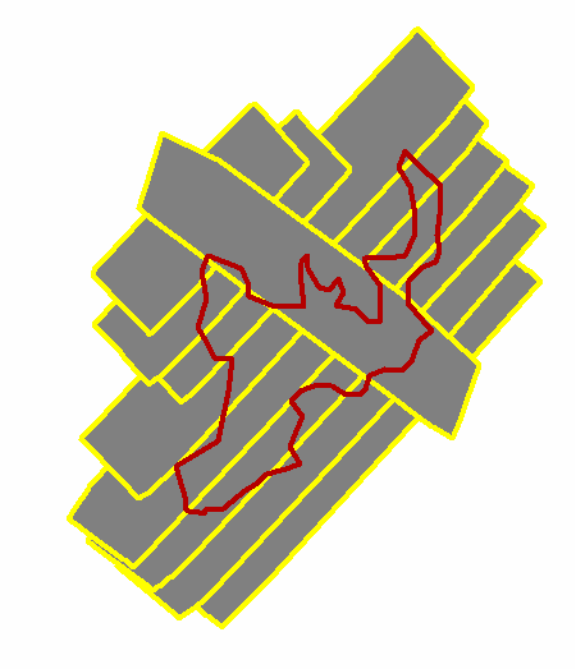
M040510A



Rensselaer area - Mission

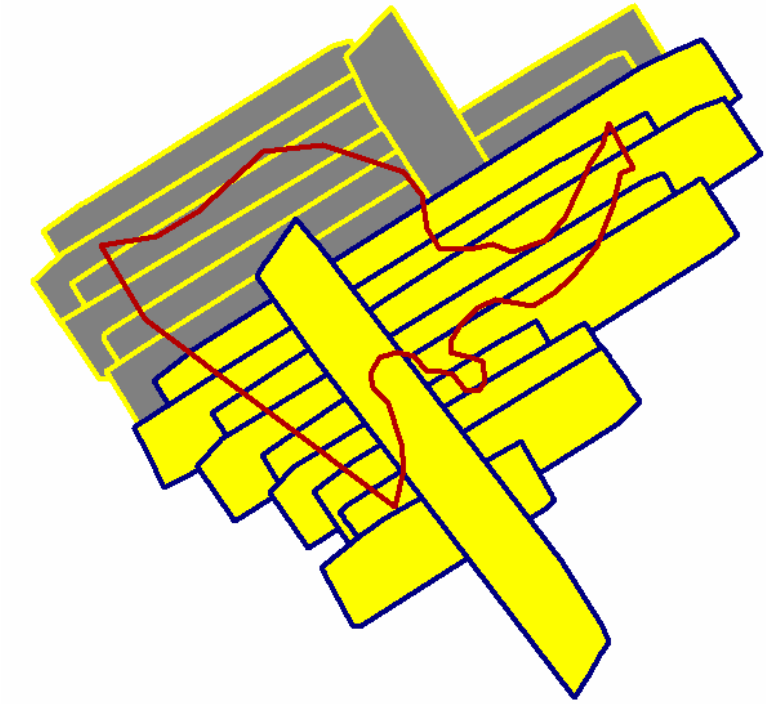
M041410C


Tippecanoe area
- Mission
M041410B
Terra Haute area
- Mission
M040610C
M041410A



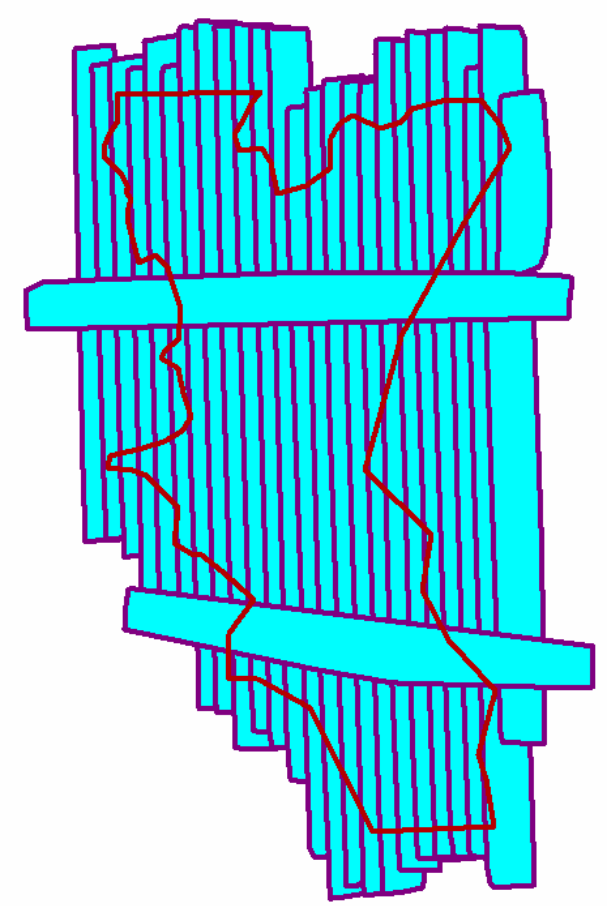
Spencer area - Mission

M040610B



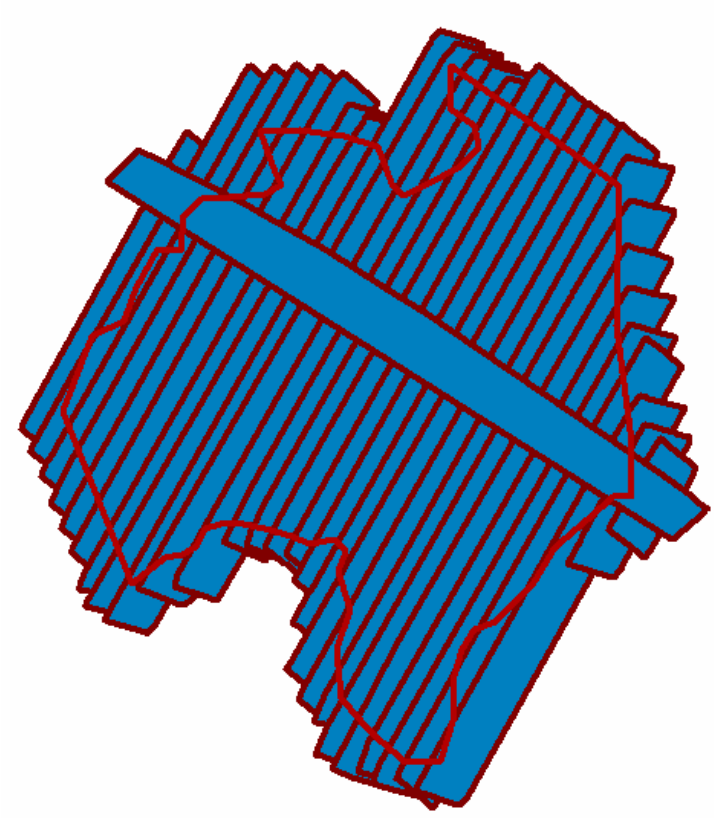
Newberry area - Mission

M040610B
M041410C



Columbus area - Mission

M040410A



Seymour area - Mission

M040610A

4 QC SURVEYS

The check point survey was performed completed between March 9th and May 13th, 2010 using Rapid Static GPS techniques. A total of 51 check points were surveyed across the project area. These points were collected in open terrain to assess Fundamental Vertical Accuracy.

The control stations mentioned above to support the Airborne GPS acquisition were also used to complete the QC surveys.

See Section 5 of the control report for a complete listing.

5 FINAL LiDAR PROCESSING

5.1 ABGPS and IMU Processing

Airborne GPS

Applanix - POSGPS
Utilizing carrier phase ambiguity resolution on the fly (i.e., without initialization). The solution to sub-decimeter kinematic positioning without the operational constraint of static initialization as used in semi-kinematic or stop-and-go positioning was utilized for the airborne GPS post-processing.

The processing technique used by Applanix, Inc. for achieving the desired accuracy is Kinematic Ambiguity Resolution (KAR). KAR searches for ambiguities and uses a special method to evaluate the relative quality of each intersection (RMS). The quality indicator is used to evaluate the accuracy of the solution for each processing computation. In addition to the quality indicator, the software will compute separation plots between any two solutions, which will ultimately determine the acceptance of the airborne GPS post processing.

Inertial Data

The post-processing of inertial and aiding sensor data (i.e. airborne GPS post processed data) is to compute an optimally blended navigation solution. The Kalman filter-based aided inertial navigation algorithm generates an accurate (in the sense of least-square error) navigation solution that will retain the best characteristics of the processed input data. An example of inertial/GPS sensor blending is the following: inertial data is smooth in the short term. However, a free-inertial navigation solution has errors that grow without bound with time. A GPS navigation solution exhibits short-term noise but has errors that are bounded. This optimally blended navigation solution will retain the best features of both, i.e. the blended navigation solution has errors that are smooth and bounded.
The resultant processing generates the following data:

- Position: Latitude, Longitude, Altitude
- Velocity: North, East, and Down components
- 3-axis attitude: roll, pitch, true heading
- Acceleration: x, y, z components
- Angular rates: x, y, z components

The Applanix software, version 4.4, was used to determine both the ABGPS trajectory and the blending of inertial data.

The airborne GPS and blending of inertial and GPS post-processing were completed in multiple steps.

1. The collected data was transferred the field data collectors to the main computer. Data was saved under the project number and separated between LiDAR mission dates. Inside each mission date, a sub-directory was created with the aircraft's tail number and an A or B suffix was attached for the time of when the data was collected. Inside the tail number sub-directory, five sub-directories were also created EO, GPS, IMU, PROC, and RAW.

2. The aircraft raw data (IMU and GPS data combined) was run through a data extractor program. This separated the IMU and GPS data. In addition to the extracting of data, it provided the analyst the first statistics on the overall flight. The program was POSPac (POS post-processing PACkage).

3. Executing POSGPS program to derive accurate GPS positions for all flights:
   Applanix POSGPS
   The software utilized for the data collected was PosGPS, a kinematic on-the-fly (OTF) processing software package. Post processing of the data is computed from each base station (Note: only base stations within the flying area were used) in both a forward and backward direction. This provides the analyst the ability to Quality Check (QC) the post processing, since different ambiguities are determined from different base stations and also with the same data from different directions.

   The trajectory separation program is designed to display the time of week that the airborne or roving antenna traveled, and compute the differences found between processing runs. Processed data can be compared between a forward/reverse solution from one base station, a reverse solution from one base station and a forward solution from the second base station, etc. For the Applanix POSGPS processing, this is considered the final QC check for the given mission. If wrong ambiguities were found with one or both runs, the analyst would see disagreements from the trajectory plot, and re-processing would continue until an agreement was determined.

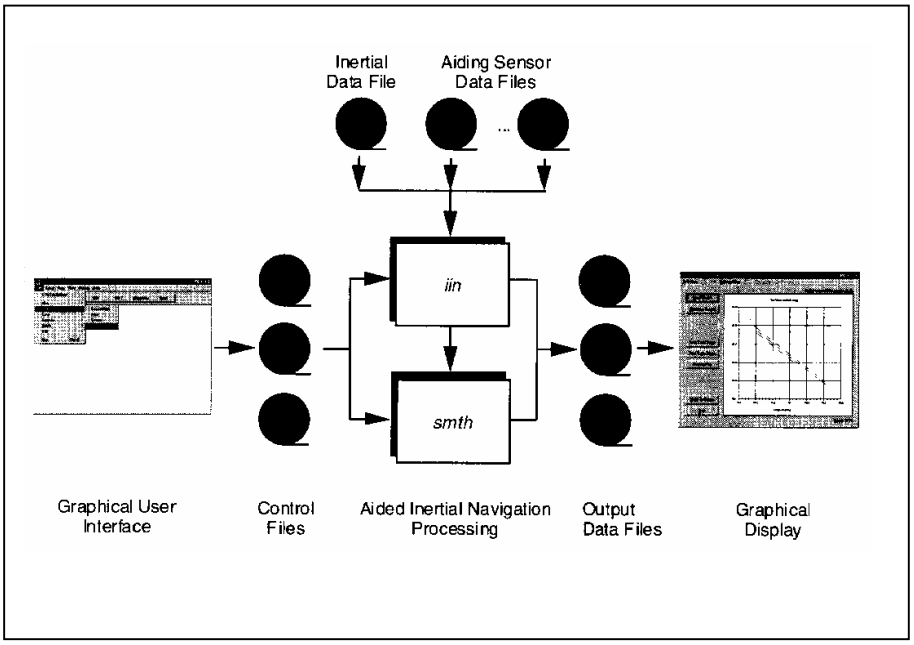
   Once the analyst accepts a forward and reverse processing solution, the trajectory plot is analyzed and the combined solution is stored in a file format acceptable for the IMU post processor.

   Please see Section 7 of the control report for the final accepted trajectory plots.

4. When the processed trajectory (either through POSGPS) data was accepted after quality control analysis, the combined solution is stored in a file format acceptable for the IMU post processor (i.e. POSProc).

5. Execute POSProc.
   POSProc comprises a set of individual processing interface tools that execute and provide the following functions:

   Diagram 3 shows the organization of these tools, and is a function of the



   POSProc processing components.

   - Integrated Inertial Navigation (*iin*) Module.
     The name *iin* is a contraction of Integrated Inertial Navigation. *iin* reads inertial data and aiding data from data files specified in a processing environment file and computes the aided inertial navigation solution. The inertial data comes from a strapdown IMU. *iin* outputs the navigation data between start and end times at a data rate as specified in the environment file. *iin* also outputs Kalman filter data for analysis of estimation error statistics and smoother data that the smoothing program *smth* uses to improve the navigation solution accuracy.[3]
     iin implements a full strapdown inertial navigator that solves Newton's equation of motion on the earth using inertial data from a strapdown IMU. The inertial navigator implements coning and sculling compensation to handle potential problems caused by vibration of the IMU. [3]

- Smoother Module (*smth*).
  smth is a companion processing module to *iin*. *smth* is comprised of two individual functions that run in sequence. *smth* first runs the *smoother function* and then runs the *navigation correction function*. [3]

  The *smth* smoother function performs backwards-in-time processing of the forwards-in-time blended navigation solution and Kalman filter data generated by *iin* to compute smoothed error estimates. *smth* implements a modified Bryson-Frazier smoothing algorithm specifically designed for use with the *iin* Kalman filter. The resulting smoothed strapdown navigator error estimates at a given time point are the optimal estimates based on all input data before and after the given time point. In this sense, *smth* makes use of all available information in the input data. *smth* writes the smoothed error estimates and their RMS estimation errors to output data files. [3]

  The *smth* navigation correction function implements a feedforward error correction mechanism similar to that in the *iin* strapdown navigation solution using the smoothed strapdown navigation errors. s*mth* reads in the smoothed error estimates and with these, corrects the strapdown navigation data. The resulting navigation solution is called a Best Estimate of Trajectory (BET), and is the best obtainable estimate of vehicle trajectory with the available inertial and aiding sensor data. [3]

The above-mentioned modules provide the analyst the following statistics to ensure that the most optimal solution was achieved: a log of the *iin* processing, the Kalman filter Measurement Residuals, Smoothed RMS Estimation Errors, and Smoothed Sensor Errors and RMS.

5.2 LiDAR "Point Cloud" Processing

The ABGPS/IMU post processed data along with the LiDAR raw measurements were processed using Optech Incorporated's ASDA software. This software was used to match the raw LiDAR measurements with the computed ABGPS/IMU positions and attitudes of the LiDAR sensor. The result was a "point cloud" of LiDAR measured points referenced to the ground control system.

5.3 LIDAR CALIBRATION

Introduction

The purpose of the LiDAR system calibration is to refine the system parameters in order for the post-processing software to produce a "point cloud" that best fits the actual ground.

The following report outlines the calibration techniques employed for this project.

Calibration Procedures

AERO-METRIC routinely performs two types of calibrations on its Optech Gemini LiDAR system. The first calibration, system calibration, is performed whenever the LiDAR system is installed in the aircraft. This calibration is performed to define the system parameters affected by the physical misalignment of the system versus aircraft. The second calibration, in-situ calibration, is performed for each mission using that missions data. This calibration is performed to refine the system parameters that are affected by the on site conditions as needed.

System Calibration and Correction Software

Optech has developed proprietary calibration software in December of 2009 that performs system calibration. The results from this new software achieved excellent results and an accuracy that meets the project requirements.

This new calibration tool incorporates Optech's proprietary optical sensor models to compute laser point positions and provide laser point calibration improvements on a per flightline basis for the entire project area. It furthermore calculates planar surfaces at different angles from each flight line and then uses a robust least squares solution to compute the orientation parameters at the optical level instead of the traditional methods relating to the ground points. Determining and correcting at the optical level is critical when correcting the data especially when working in terrain and aggressive design parameters as found in this project. Each flight line was computed individually and output in LAS 1.2 format.

In-situ Calibration

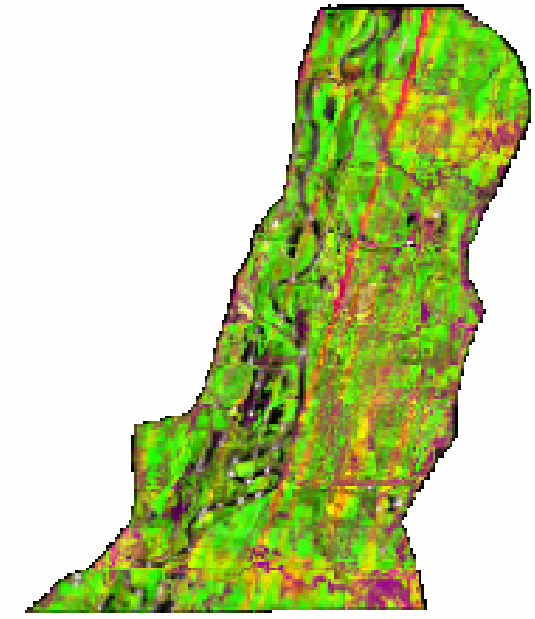
The in-situ calibration is performed, as needed using the mission's data. This calibration is performed to refine the system parameters that are affected by the on site conditions.

For each mission, LiDAR data for at least one cross flight is acquired over the mission's acquisition site. The processed data of the cross flight is compared to the perpendicular flight lines using either the Optech proprietary software or TerraSolid's TerraMatch software to determine if any systematic errors are present. In this calibration, the data of individual flight lines are compared against each other and their systematic errors are corrected in the final processed data.

5.4 LiDAR Processing

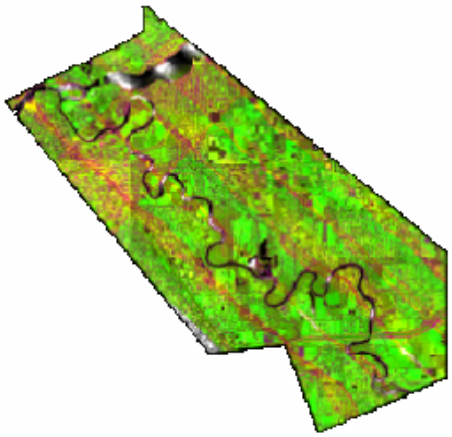
The LAS files were then imported, verified, and parsed into manageable, tiled grids using GeoCue version 6.1.21.0. GeoCue allows for ease of data management and process tracking.

The first step after the data has been processed and calibrated is to perform a relative accuracy assessment on the flightline to flightline comparisons and also a data density test prior any further processing. To determine a proper accuracy assessment between flightlines, Aero-Metric uses GeoCue to create Orthos by elevation differences. The generated orthos have assigned elevation ranges that allow the technician to evaluate if the data passes the accuracy assessment and also determine if additional calibration efforts are needed based on the bias trends. Below are screen captures of the elevation orthos with green indicates a flightline comparison of less than 0.05 meters; yellow is 0.056 – 0.100 meters; red 0.101 – 0.150 meters; and magenta 0.151 – 0.200 meters. The red and magenta areas in the screen captures below were reevaluated. They were determined to be overlap and placed in the non-ground class. The final products were not effected by the overlap points.

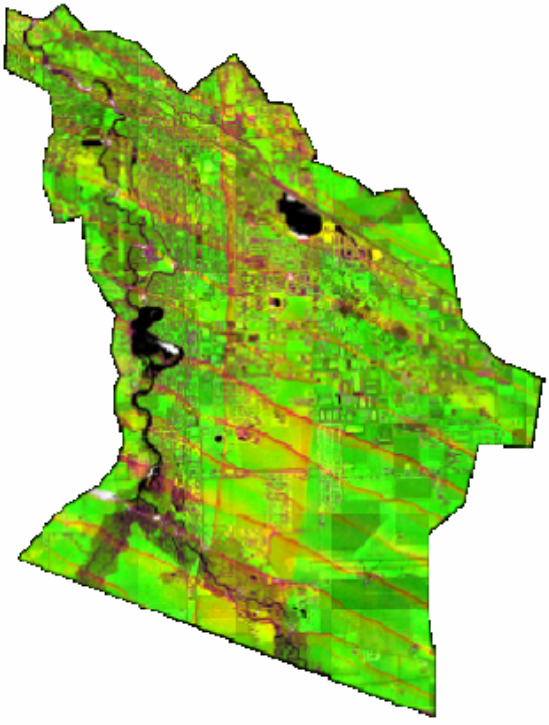


Terre Haute

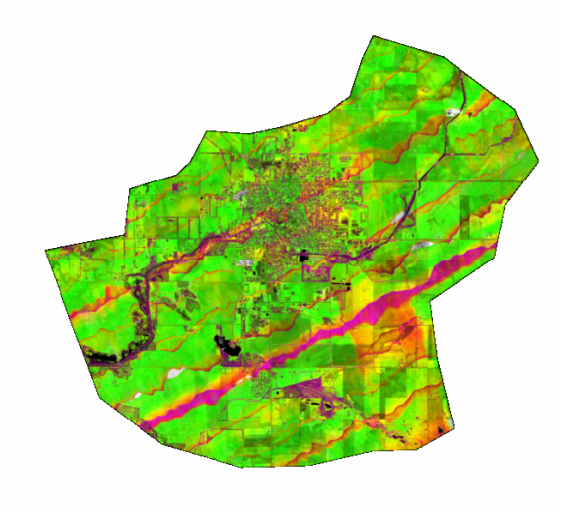
Spencer



Elkhart

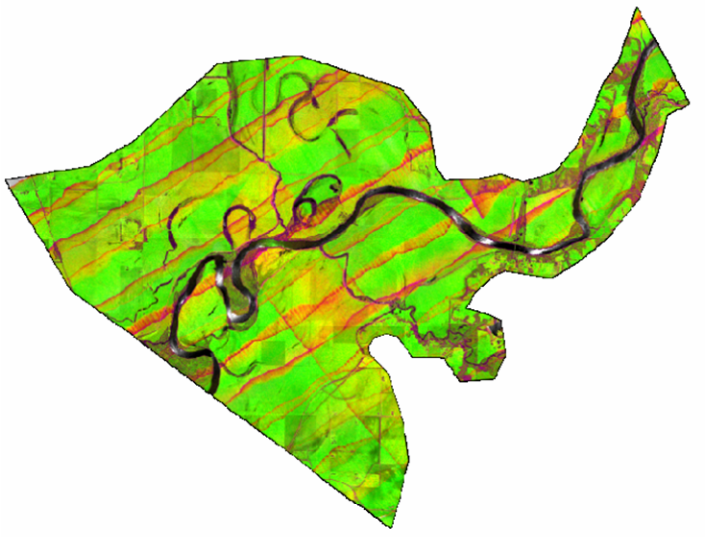


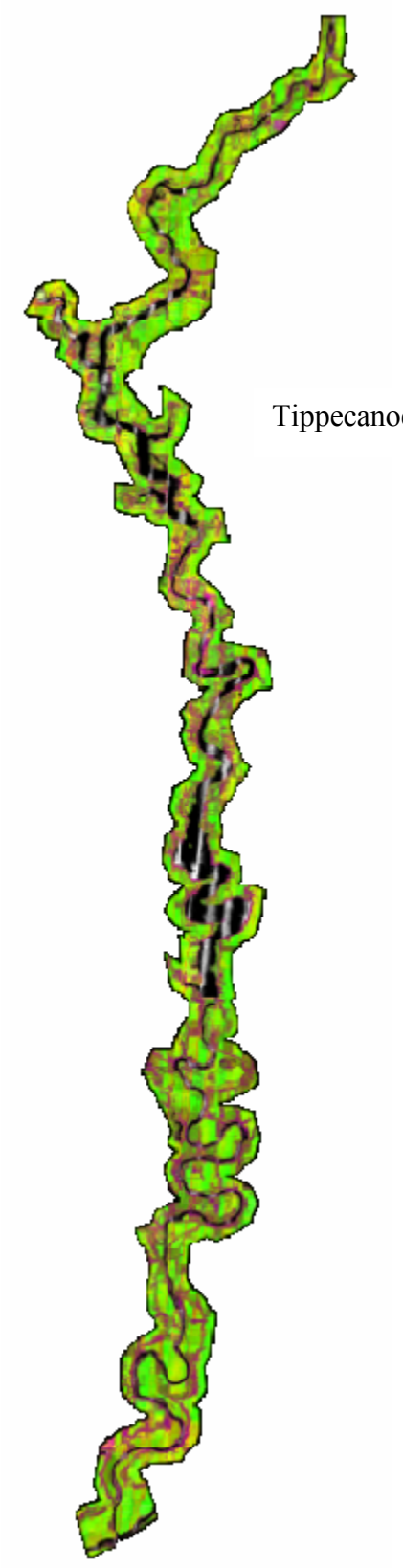
Goshen



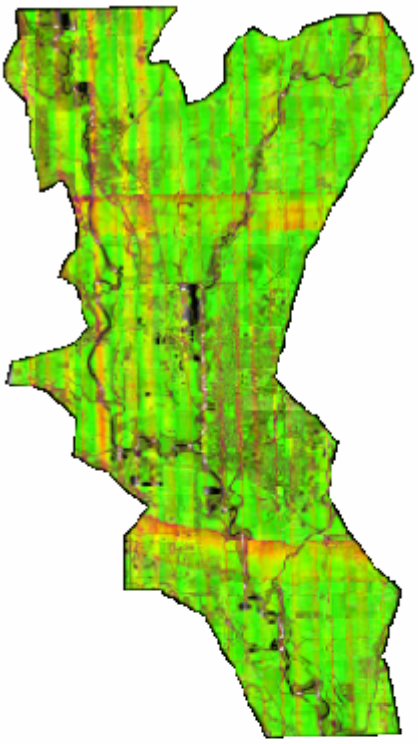
Rensselaer

Newberry

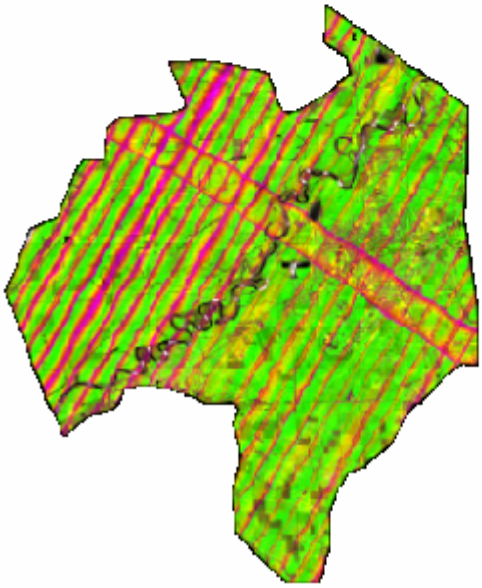




Tippecanoe

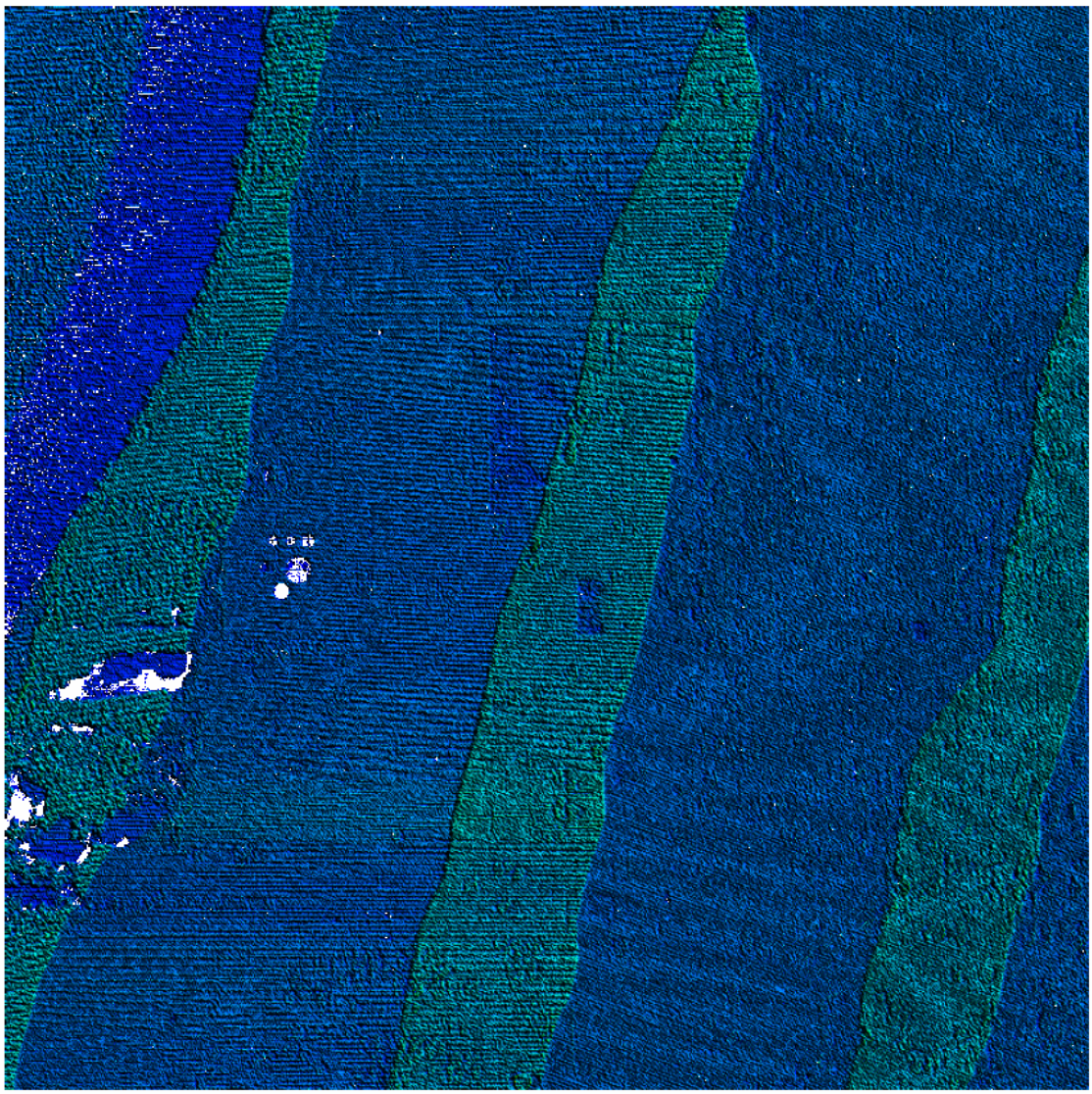


Columbus



Seymour

In addition to the relative accuracy assessment, Aero-Metric also reviews a few tiles to ensure that the desired density has been met. Aero-Metric utilizes in house proprietary software to complete this task. Initially a grid was placed according to the version 12 specifications, which is based on the nominal post spacing. The results indicated that the density of the sampled tiles achieved 98% of the points meeting the specified data density criteria. Below are the statistics and also a screen capture of the results of an inspected tile.



Sampled tiles: Area 1 (6_598546015, 6_486045295, 6_463543660, 6_493543075, 6_591043475, and 6_59253130).

(Version 12 – 0.7m)
Total number of cells: 3375000
Total number of cells with one point: 55408
Percentage of cells with 1 point or more: 98%

Once both the accuracy between swaths and data density is accepted an automated classification algorithm is performed using TerraSolid's TerraScan, version 10.011. This will produce the majority of the bare-earth datasets.

The remainder of the data was classified using manual classification techniques. The majority of the manual edit removed point misclassified as ground (class 2) to unclassified (class 1). Erroneous low points, high points, including clouds are classified to class 7.

5.4 Check Point Validation

The data was then verified using the ground control data collected by Aero-Metric. TerraScan then computes the vertical differences between the surveyed elevation and the LiDAR derived elevation for each point.

A report listing the differences and common statistics was created and can be found in Section 8 of this report.

5.5 LiDAR Data Delivery

Raw point cloud data supplied is in the following format:

- LAS, version 1.2
- GPS times adjusted to GPS Absolute
- Full swaths and delivered as 1 file per swath which did not exceed 2gb.

Classified point cloud data is also being supplied using the following criteria.

- LAS, version 1.2
- GPS times adjusted to GPS Absolute
- Classification schemed:
  - Code 1 – Processed, but unclassified
  - Code 2 – Ground
  - Code 7 – Noise
  - Code 9 - Water
  - Code 10 – Ignored Ground (Breakline proximity)

The 2 meter bare-earth DEMs were created in the following manner. First, ArcGrids in ASCII format were created using TerraModeler version 10.003 (TerraSolid Ltd.). The ASCII grids were then imported into ARC and translated to raster format and placed in a geodatabase DEM feature dataset.

Collected breaklines are first collected in a Microstation environment using the base specifications. Upon acceptance the breaklines, either polygons or lines,

are translated into ARC and imported to the final geodatabase as separate features.

6 CONCLUSION

Because of the rigorous procedures and use of new technology, this project will serve the USDA-NRCS and all users requiring the provided LiDAR derivative products for all project areas in Indiania well into the future. Although this project tested the limits of both the equipment and personnel, the results are extremely accurate and reliable.

InCORS Reference Station Coordinates & RTCM ID #'s January 23, 2010

NAD83 (CORS96) Reference System (Epoch 2002)

Station Name	Latitude (N)			Longitude (W)			Ellipsoid Height (m)	RTCM ID #
	°	'	"	°	'	"		
INAB	40	17	53.68811	85	12	41.20243	267.107	403
INAG	41	37	58.87400	85	1	40.06297	306.578	202
INAS	39	23	22.22958	87	6	39.63006	154.462	310
INAX	40	16	41.71288	85	40	10.54097	241.999	402
INBD	38	51	47.10448	86	31	20.30531	162.336	502
INBF	40	44	29.24192	85	16	34.17057	228.062	209
INBL	39	11	40.96757	86	33	11.84633	220.979	601
INBR	41	27	28.72638	86	11	33.44276	225.152	103
INCB	39	11	50.49565	85	57	42.93240	164.894	602
INCL	39	32	11.11661	86	48	5.53081	249.870	309
INCR	40	4	55.78326	86	54	17.48083	206.859	305
INDA	38	11	42.24602	86	58	25.97812	127.310	508
INEL	41	38	19.61356	85	57	58.10929	219.226	201
INES	38	7	45.92993	87	33	1.85002	112.666	507
INFC	38	20	48.31602	85	44	58.83067	110.565	609
INFL	40	36	45.87996	87	18	54.21428	222.538	301
INFR	40	16	42.15421	86	31	57.71293	236.940	304
INFW	41	7	40.81811	85	10	39.13874	230.419	206
INGG	39	21	35.41601	85	30	53.73824	254.556	603
INGY	41	35	42.65006	87	14	47.66238	159.452	101
INJS	38	24	30.04915	86	56	19.27206	155.642	506
INLB	39	37	54.25310	85	0	44.60554	272.448	408
INLN	39	1	46.98784	87	9	12.11518	129.432	501
INLP	41	35	6.73352	86	41	33.07322	217.361	102
INLW	41	17	24.48432	87	18	57.45957	181.961	104
INMD	38	50	3.07942	85	25	16.18889	232.300	606
INMO	40	43	33.35274	86	45	9.94503	167.213	107
INMT	39	46	16.15760	86	2	34.88863	232.461	405
INNP	39	52	9.11492	87	24	38.90940	169.358	306
INPA	38	33	57.70659	86	29	30.63538	201.353	505
INPD	39	58	23.49396	85	46	10.77336	235.369	404
INPL	39	41	30.68745	86	23	39.85092	193.523	308
INPR	40	47	6.79352	86	7	48.65703	209.233	207
INRN	40	56	46.97723	87	8	22.51382	177.504	106
INSB	39	52	1.86077	84	56	27.05100	292.028	407
INSG	38	41	3.13804	85	47	43.30251	144.193	607
INSY	38	57	36.28050	85	51	42.43287	158.638	605
INTC	38	3	36.15301	86	37	32.84299	213.444	509
INTP	40	16	49.30704	86	3	19.84653	236.720	401
INVI	38	37	38.55597	87	31	50.13641	102.150	503
INVR	39	2	52.70139	85	15	41.77708	268.567	604
INWB	40	49	29.02343	85	48	11.62249	218.494	208
INWL	40	27	28.46841	86	55	34.30893	188.076	302
INWN	41	4	45.83545	86	36	15.44549	189.186	105
INWR	41	16	12.93231	85	53	40.69465	230.523	203

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 DG9160 ***********************************************************************
 DG9160  DESIGNATION -  14403
 DG9160  PID         -  DG9160
 DG9160  STATE/COUNTY-  MI/CASS
 DG9160  USGS QUAD   -  ADAMSVILLE (1981)
 DG9160
 DG9160                         *CURRENT SURVEY CONTROL
 DG9160  ______________________________________________________________________
 DG9160* NAD 83(1986)-  41 46 36.     (N)    085 53 49.     (W)     SCALED
 DG9160* NAVD 88     -       248.553  (meters)     815.46   (feet)  ADJUSTED
 DG9160  ______________________________________________________________________
 DG9160  GEOID HEIGHT-         -33.38  (meters)                     GEOID09
 DG9160  DYNAMIC HT  -         248.461 (meters)     815.16   (feet)  COMP
 DG9160  MODELED GRAV-     980,249.2   (mgal)                       NAVD 88
 DG9160
 DG9160  VERT ORDER  -  FIRST     CLASS II
 DG9160
 DG9160.The horizontal coordinates were scaled from a topographic map and have
 DG9160.an estimated accuracy of +/- 6 seconds.
 DG9160
 DG9160.The orthometric height was determined by differential leveling and
 DG9160.adjusted in March 2005.
 DG9160
 DG9160.The geoid height was determined by GEOID09.
 DG9160
 DG9160.The dynamic height is computed by dividing the NAVD 88
 DG9160.geopotential number by the normal gravity value computed on the
 DG9160.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DG9160.degrees latitude (g = 980.6199 gals.).
 DG9160
 DG9160.The modeled gravity was interpolated from observed gravity values.
 DG9160
 DG9160;                    North         East     Units  Estimated Accuracy
 DG9160;SPC MI S     -    31,890.    3,872,770.      MT  (+/- 180 meters Scaled)
 DG9160
 DG9160                          SUPERSEDED SURVEY CONTROL
 DG9160
 DG9160.No superseded survey control is available for this station.
 DG9160
 DG9160_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TEM916255(NAD 83)
 DG9160_MARKER: DD = SURVEY DISK
 DG9160_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 DG9160_STAMPING: 14403 2001
 DG9160_MARK LOGO: MIDT
 DG9160_PROJECTION: FLUSH
 DG9160_MAGNETIC: N = NO MAGNETIC MATERIAL
 DG9160_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 DG9160+STABILITY: SURFACE MOTION
 DG9160_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DG9160+SATELLITE: SATELLITE OBSERVATIONS - March 09, 2010
 DG9160
 DG9160  HISTORY     - Date     Condition        Report By
 DG9160  HISTORY     - 20010611 MONUMENTED       MIDT
```

DG9160 HISTORY   - 20030512 GOOD   NGS
DG9160 HISTORY   - 20100309 GOOD   AEROME
DG9160
DG9160   STATION DESCRIPTION
DG9160
DG9160'DESCRIBED BY NATIONAL GEODETIC SURVEY 2003 (JDR)
DG9160'STATION IS LOCATED ABOUT 1.6 MILES WEST OF UNION, IN THE NORTHWEST
DG9160'1/4 OF SECTION 13. T-8-S, R-14-W, MASON TOWNSHIP AND ON HIGHWAY
DG9160'RIGHT-OF WAY.
DG9160'
DG9160'TO REACH STATION FROM THE JUNCTION OF UNION RD AND HIGHWAY 12 IN
DG9160'UNION, GO WEST ON HIGHWAY 12 FOR 1.6 MILES TO THE STATION ON THE LEFT
DG9160'IN THE CLEAR VISION AREA, FOR THE INTERSECTION OF HIGHWAY 12 AND
DG9160'KESSINGTON RD BY UTILITY POLE NUMBER C-598-24.
DG9160'
DG9160'THE STATION IS A MICHIGAN DEPARTMENT OF TRANSPORTATION DISK, SET
DG9160'INTO THE TOP OF A 12-INCH CYCLINDRICAL CONCRETE MONUMENT, FLUSH WITH
DG9160'THE GROUND SURFACE. IT IS 98.0 FEET EAST OF KESSINGTON RD, 69.0 FEET
DG9160'EAST-SOUTHEAST OF A UTILITY POLE NUMBER C-598-24, 58.6 FEET NORTH OF
DG9160'THE CENTERLINE OF HIGHWAY 12, 8.6 FEET WEST-NORTHWEST FROM A FENCE
DG9160'CORNER AND UNDERGROUND FIBER OPTIC CABLE MARKER AND 2.0 FEET
DG9160'SOUTH-SOUTHWEST OF A FENCE.
DG9160'
DG9160'DESCRIBED BY RONALD L. RAMSEY, NGS GEODETIC ADVISOR - MICHIGAN.
DG9160
DG9160   STATION RECOVERY (2010)
DG9160
DG9160'RECOVERY NOTE BY AERO METRIC INC 2010
DG9160'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 ME0014 ***********************************************************************
 ME0014  DESIGNATION -  A 168
 ME0014  PID         -  ME0014
 ME0014  STATE/COUNTY-  IN/ST JOSEPH
 ME0014  USGS QUAD   -  OSCEOLA (1994)
 ME0014
 ME0014                         *CURRENT SURVEY CONTROL
 ME0014  ______________________________________________________________________
 ME0014* NAD 83(1986)-  41 38 36.     (N)    086 06 50.     (W)     SCALED
 ME0014* NAVD 88     -       226.705  (meters)     743.78   (feet)  ADJUSTED
 ME0014  ______________________________________________________________________
 ME0014  GEOID HEIGHT-         -33.76  (meters)                     GEOID09
 ME0014  DYNAMIC HT  -         226.615 (meters)     743.49   (feet)  COMP
 ME0014  MODELED GRAV-     980,219.4   (mgal)                       NAVD 88
 ME0014
 ME0014  VERT ORDER  -  SECOND    CLASS 0
 ME0014
 ME0014.The horizontal coordinates were scaled from a topographic map and have
 ME0014.an estimated accuracy of +/- 6 seconds.
 ME0014
 ME0014.The orthometric height was determined by differential leveling and
 ME0014.adjusted in June 1991.
 ME0014
 ME0014.The geoid height was determined by GEOID09.
 ME0014
 ME0014.The dynamic height is computed by dividing the NAVD 88
 ME0014.geopotential number by the normal gravity value computed on the
 ME0014.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 ME0014.degrees latitude (g = 980.6199 gals.).
 ME0014
 ME0014.The modeled gravity was interpolated from observed gravity values.
 ME0014
 ME0014;                    North         East     Units  Estimated Accuracy
 ME0014;SPC IN E     -   710,100.       62,740.      MT  (+/- 180 meters Scaled)
 ME0014
 ME0014                          SUPERSEDED SURVEY CONTROL
 ME0014
 ME0014  NGVD 29 (??/??/92)  226.825  (m)          744.17   (f) ADJ UNCH    2 0
 ME0014
 ME0014.Superseded values are not recommended for survey control.
 ME0014.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 ME0014.See file dsdata.txt to determine how the superseded data were derived.
 ME0014
 ME0014_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TEM737105(NAD 83)
 ME0014_MARKER: DB = BENCH MARK DISK
 ME0014_SETTING: 36 = SET IN A MASSIVE STRUCTURE
 ME0014_SP_SET: BRIDGE
 ME0014_STAMPING: A 168 1946
 ME0014_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 ME0014_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 ME0014+SATELLITE: SATELLITE OBSERVATIONS - May 08, 2008
 ME0014
 ME0014  HISTORY     - Date     Condition        Report By
```

```
ME0014  HISTORY     - 1946     MONUMENTED       CGS
ME0014  HISTORY     - 1984     GOOD             NGS
ME0014  HISTORY     - 19950725 GOOD             USPSQD
ME0014  HISTORY     - 20010930 GOOD             USPSQD
ME0014  HISTORY     - 20041209 GOOD             ABCI
ME0014  HISTORY     - 20060222 GOOD             INDIV
ME0014  HISTORY     - 20080508 GOOD             LFA
ME0014
ME0014                          STATION DESCRIPTION
ME0014
ME0014'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
ME0014'3.7 MI SE FROM MISHAWAKA.
ME0014'ABOUT 2.4 MILES EAST ALONG U.S. HIGHWAY 33 FROM THE HIGH SCHOOL
ME0014'AT MISHAWAKA, THENCE ABOUT 1.3 MILES SOUTH ALONG ELDER STREET
ME0014'AND BLACKBERRY ROAD, 53 FEET NORTH OF THE CENTER OF THE
ME0014'INTERSECTION OF A ROAD LEADING SOUTHEAST ALONG THE SOUTHWEST SIDE
ME0014'OF A DITCH, AT A 20-FOOT CONCRETE BRIDGE OVER THE DITCH, IN THE
ME0014'TOP OF THE EAST END OF THE SOUTHWEST WING WALL, 14.5 FEET WEST
ME0014'OF THE CENTER LINE OF THE ROAD, AND ABOUT LEVEL WITH THE ROAD.
ME0014
ME0014                          STATION RECOVERY (1984)
ME0014
ME0014'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1984
ME0014'RECOVERED IN GOOD CONDITION.
ME0014
ME0014                          STATION RECOVERY (1995)
ME0014
ME0014'RECOVERY NOTE BY US POWER SQUADRON 1995
ME0014'RECOVERED IN GOOD CONDITION.
ME0014
ME0014                          STATION RECOVERY (2001)
ME0014
ME0014'RECOVERY NOTE BY US POWER SQUADRON 2001 (DGS)
ME0014'RECOVERED IN GOOD CONDITION.
ME0014
ME0014                          STATION RECOVERY (2004)
ME0014
ME0014'RECOVERY NOTE BY ABONMARCHE CONSULTANTS INC. 2004 (NWF)
ME0014'RECOVERED IN GOOD CONDITION.
ME0014
ME0014                          STATION RECOVERY (2006)
ME0014
ME0014'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2006 (DAB)
ME0014'RECOVERED IN GOOD CONDITION.
ME0014
ME0014                          STATION RECOVERY (2008)
ME0014
ME0014'RECOVERY NOTE BY LAWSON-FISHER ASSOCIATES PC 2008 (SST)
ME0014'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA1721 ***********************************************************************
 KA1721  DESIGNATION -  A 353
 KA1721  PID         -  KA1721
 KA1721  STATE/COUNTY-  IN/GREENE
 KA1721  USGS QUAD   -  SWITZ CITY (1986)
 KA1721
 KA1721                         *CURRENT SURVEY CONTROL
 KA1721  ______________________________________________________________________
 KA1721* NAD 83(1986)-  39 01 57.      (N)    087 00 40.      (W)     SCALED
 KA1721* NAVD 88     -       154.784   (meters)     507.82    (feet)  ADJUSTED
 KA1721  ______________________________________________________________________
 KA1721  GEOID HEIGHT-         -32.68  (meters)                       GEOID09
 KA1721  DYNAMIC HT  -         154.690 (meters)      507.51   (feet)  COMP
 KA1721  MODELED GRAV-     980,018.3   (mgal)                         NAVD 88
 KA1721
 KA1721  VERT ORDER  -  FIRST     CLASS II
 KA1721
 KA1721.The horizontal coordinates were scaled from a topographic map and have
 KA1721.an estimated accuracy of +/- 6 seconds.
 KA1721
 KA1721.The orthometric height was determined by differential leveling and
 KA1721.adjusted in June 1991.
 KA1721
 KA1721.The geoid height was determined by GEOID09.
 KA1721
 KA1721.The dynamic height is computed by dividing the NAVD 88
 KA1721.geopotential number by the normal gravity value computed on the
 KA1721.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 KA1721.degrees latitude (g = 980.6199 gals.).
 KA1721
 KA1721.The modeled gravity was interpolated from observed gravity values.
 KA1721
 KA1721;                    North         East     Units  Estimated Accuracy
 KA1721;SPC IN W     -   420,110.      906,250.      MT  (+/- 180 meters Scaled)
 KA1721
 KA1721                           SUPERSEDED SURVEY CONTROL
 KA1721
 KA1721.No superseded survey control is available for this station.
 KA1721
 KA1721_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SDJ990203(NAD 83)
 KA1721_MARKER: I = METAL ROD
 KA1721_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
 KA1721_SP_SET: STAINLESS STEEL ROD IN SLEEVE
 KA1721_STAMPING: A 353 1985
 KA1721_MARK LOGO: NGS
 KA1721_PROJECTION: RECESSED 2 CENTIMETERS
 KA1721_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
 KA1721+STABILITY: POSITION/ELEVATION WELL
 KA1721_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 KA1721+SATELLITE: SATELLITE OBSERVATIONS - May 11, 2010
 KA1721_ROD/PIPE-DEPTH: 15.8 meters
 KA1721_SLEEVE-DEPTH  : 3.1 meters
 KA1721
```

KA1721 HISTORY   - Date   Condition   Report By
KA1721 HISTORY   - 1985   MONUMENTED   NGS
KA1721 HISTORY   - 20070421 GOOD   INDIV
KA1721 HISTORY   - 20100511 GOOD   AEROME
KA1721
KA1721   STATION DESCRIPTION
KA1721
KA1721'DESCRIBED BY NATIONAL GEODETIC SURVEY 1985
KA1721'10.6 KM (6.6 MI) SW FROM WORTHINGTON.
KA1721'5.4 KM (3.35 MI) SOUTHWESTERLY ALONG U.S. HIGHWAY 231 FROM ITS
KA1721'JUNCTION WITH STATE HIGHWAY 157 IN WORTHINGTON, THENCE 5.2 KM (3.25
KA1721'MI) SOUTHERLY ALONG STATE HIGHWAY 57, 0.1 KM (0.05 MI) NORTH OF THE
KA1721'JUNCTION OF STATE HIGHWAY 54, 32.5 M (106.6 FT) SOUTH OF THE CENTER OF
KA1721'A DRIVEWAY, 22.8 M (74.8 FT) EAST OF THE CENTERLINE OF THE HIGHWAY,
KA1721'AND 8.5 M (27.9 FT) EAST-NORTHEAST OF A UTILITY POLE. NOTE--ACCESS TO
KA1721'DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP.
KA1721'THE MARK IS 0.9 METERS E FROM A WITNESS POST AND FENCE
KA1721'THE MARK IS ABOVE LEVEL WITH THE HIGHWAY.
KA1721
KA1721   STATION RECOVERY (2007)
KA1721
KA1721'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2007 (JAB)
KA1721'RECOVERED BY M D WESSLER AND ASSOCIATES
KA1721
KA1721   STATION RECOVERY (2010)
KA1721
KA1721'RECOVERY NOTE BY AERO METRIC INC 2010
KA1721'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA1153 ***********************************************************************
 KA1153  CBN         -  This is a Cooperative Base Network Control Station.
 KA1153  DESIGNATION -  B 70
 KA1153  PID         -  KA1153
 KA1153  STATE/COUNTY-  IN/CLAY
 KA1153  USGS QUAD   -  STAUNTON (1986)
 KA1153
 KA1153                        *CURRENT SURVEY CONTROL
 KA1153  ______________________________________________________________________
 KA1153* NAD 83(2007)-  39 29 59.19999(N)    087 09 37.58224(W)     ADJUSTED
 KA1153* NAVD 88     -       205.387  (meters)     673.84   (feet)  ADJUSTED
 KA1153  ______________________________________________________________________
 KA1153  EPOCH DATE  -        2002.00
 KA1153  X           -     244,147.705 (meters)                      COMP
 KA1153  Y           -  -4,922,303.467 (meters)                      COMP
 KA1153  Z           -   4,035,394.167 (meters)                      COMP
 KA1153  LAPLACE CORR-          -0.90  (seconds)                     DEFLEC09
 KA1153  ELLIP HEIGHT-         172.441 (meters)          (02/10/07) ADJUSTED
 KA1153  GEOID HEIGHT-         -32.94  (meters)                     GEOID09
 KA1153  DYNAMIC HT  -         205.270 (meters)     673.46  (feet)  COMP
 KA1153
 KA1153  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KA1153  Type    PID    Designation                      North   East  Ellip
 KA1153  ----------------------------------------------------------------------
 KA1153  NETWORK KA1153 B 70                              0.82   0.53   1.94
 KA1153  ----------------------------------------------------------------------
 KA1153  MODELED GRAV-     980,050.4   (mgal)                       NAVD 88
 KA1153
 KA1153  VERT ORDER  -  SECOND    CLASS 0
 KA1153
 KA1153.The horizontal coordinates were established by GPS observations
 KA1153.and adjusted by the National Geodetic Survey in February 2007.
 KA1153
 KA1153.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KA1153.See National Readjustment for more information.
 KA1153.The horizontal coordinates are valid at the epoch date displayed above.
 KA1153.The epoch date for horizontal control is a decimal equivalence
 KA1153.of Year/Month/Day.
 KA1153
 KA1153.The orthometric height was determined by differential leveling and
 KA1153.adjusted in June 1991.
 KA1153
 KA1153.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KA1153
 KA1153.The Laplace correction was computed from DEFLEC09 derived deflections.
 KA1153
 KA1153.The ellipsoidal height was determined by GPS observations
 KA1153.and is referenced to NAD 83.
 KA1153
 KA1153.The geoid height was determined by GEOID09.
 KA1153
 KA1153.The dynamic height is computed by dividing the NAVD 88
 KA1153.geopotential number by the normal gravity value computed on the
```

KA1153.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
KA1153.degrees latitude (g = 980.6199 gals.).
KA1153
KA1153.The modeled gravity was interpolated from observed gravity values.
KA1153
KA1153;   North   East   Units Scale Factor Converg.
KA1153;SPC IN W   -   471,982.737   893,368.034   MT 0.99996721   -0 02 56.6
KA1153;SPC IN W   - 1,548,496.70 2,930,991.62   sFT 0.99996721   -0 02 56.6
KA1153;UTM 16   - 4,372,252.130   486,205.522   MT 0.99960234   -0 06 07.4
KA1153
KA1153!   - Elev Factor x Scale Factor =   Combined Factor
KA1153!SPC IN W   -   0.99997295 x   0.99996721 =   0.99994016
KA1153!UTM 16   -   0.99997295 x   0.99960234 =   0.99957530
KA1153
KA1153   SUPERSEDED SURVEY CONTROL
KA1153
KA1153 NAD 83(1997)- 39 29 59.20001(N)   087 09 37.58237(W) AD(   ) B
KA1153 ELLIP H (04/10/98) 172.446 (m)   GP(   ) 4 1
KA1153 NAVD 88 (04/10/98) 205.39   (m)   673.9   (f) LEVELING   3
KA1153 NGVD 29 (??/??/92) 205.485 (m)   674.16   (f) ADJ UNCH   2 0
KA1153
KA1153.Superseded values are not recommended for survey control.
KA1153.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KA1153.See file dsdata.txt to determine how the superseded data were derived.
KA1153
KA1153_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SDJ8620572252(NAD 83)
KA1153_MARKER: DB = BENCH MARK DISK
KA1153_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KA1153_SP_SET: SET IN TOP OF CONCRETE MONUMENT
KA1153_STAMPING: B 70 1946
KA1153_MARK LOGO: CGS
KA1153_MAGNETIC: N = NO MAGNETIC MATERIAL
KA1153_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KA1153+STABILITY: SURFACE MOTION
KA1153_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KA1153+SATELLITE: SATELLITE OBSERVATIONS - August 15, 1997
KA1153
KA1153 HISTORY   - Date   Condition   Report By
KA1153 HISTORY   - 1946   MONUMENTED   CGS
KA1153 HISTORY   - 19970815 GOOD   SEC
KA1153
KA1153   STATION DESCRIPTION
KA1153
KA1153'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
KA1153'AT TURNER.
KA1153'AT TURNER, AT A PENNSYLVANIA RAILROAD SPUR LINE CROSSING, 44
KA1153'FEET NORTH OF AND ACROSS THE TRACK FROM A CABLE LINE TELEPHONE
KA1153'POLE NO. 2128, 36 FEET SOUTHEAST OF THE EAST CORNER OF THE
KA1153'HOFFMAN GROCERY STORE, 24 FEET SOUTHWEST OF AND ABOUT LEVEL WITH
KA1153'THE CENTER LINE OF THE ROAD, 16.5 FEET NORTHWEST OF THE CENTER
KA1153'LINE OF THE TRACK, AND 2 FEET NORTH OF A WHITE WOODEN WITNESS
KA1153'POST. A STANDARD DISK, STAMPED B 70 1946 AND SET IN THE TOP
KA1153'OF A CONCRETE POST PROJECTING 4 INCHES ABOVE GROUND.
KA1153
KA1153   STATION RECOVERY (1997)
KA1153
KA1153'RECOVERY NOTE BY SCHNEIDER ENGINEERING CORPORATION 1997 (RGR)
KA1153'THE STATION IS 2 MILES (3.2 KM) SOUTHWEST OF BRAZIL, 1 MILE (1.6 KM)
KA1153'NORTH OF I-70, IN NORTH EDGE OF TURNER. FROM THE JUNCTION OF STATE
KA1153'HIGHWAY 59 AND U.S. HIGHWAY 40, GO WEST ON HIGHWAY 40 FOR 2.20 MILES
KA1153'(3.54 KM) TO A ROAD LEFT. TURN LEFT AND GO SOUTH FOR 0.80 MILES (1.29
KA1153'KM) TO AN ABANDONED RAILROAD CROSSING AND THE STATION ON THE RIGHT,
KA1153'NEAR THE EAST PROPERTY CORNER OF MR. DOYLE, BOX 7779, ROAD 300 WEST.
KA1153'THE STATION IS A SQUARE CONCRETE POST PROJECTING 5 CM ABOVE GROUND.
KA1153'LOCATED AZIMUTH 270 DEGREES 8.40 METERS (27.56 FT) OF CENTERLINE OF
KA1153'ROAD, AZIMUTH 247 DEGREES 8.100 METERS (26.575 FT) EAST CORNER OF A

KA1153'GARAGE, AZIMUTH 340 DEGREES 12.252 METERS (40.197 FT) TO POWER POLE 2,
KA1153'AZIMUTH 47 DEGREES 2.931 METERS (9.616 FT) OF A RAILROAD CROSSING
KA1153'SIGN.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 LB0781 ***********************************************************************
 LB0781  CBN         -  This is a Cooperative Base Network Control Station.
 LB0781  DESIGNATION -  B 120
 LB0781  PID         -  LB0781
 LB0781  STATE/COUNTY-  IN/TIPPECANOE
 LB0781  USGS QUAD   -  LAFAYETTE EAST (1986)
 LB0781
 LB0781                        *CURRENT SURVEY CONTROL
 LB0781  ______________________________________________________________________
 LB0781* NAD 83(2007)-  40 23 06.26402(N)    086 45 06.07485(W)     ADJUSTED
 LB0781* NAVD 88     -       207.733  (meters)     681.54   (feet)  ADJUSTED
 LB0781  ______________________________________________________________________
 LB0781  EPOCH DATE  -        2002.00
 LB0781  X           -     275,681.297 (meters)                     COMP
 LB0781  Y           -  -4,857,429.172 (meters)                     COMP
 LB0781  Z           -   4,110,760.111 (meters)                     COMP
 LB0781  LAPLACE CORR-          -1.79  (seconds)                    DEFLEC09
 LB0781  ELLIP HEIGHT-         173.926 (meters)          (02/10/07) ADJUSTED
 LB0781  GEOID HEIGHT-         -33.82  (meters)                     GEOID09
 LB0781  DYNAMIC HT  -         207.628 (meters)     681.19  (feet)  COMP
 LB0781
 LB0781  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 LB0781  Type    PID    Designation                      North   East  Ellip
 LB0781  ----------------------------------------------------------------------
 LB0781  NETWORK LB0781 B 120                             0.88   0.74   1.90
 LB0781  ----------------------------------------------------------------------
 LB0781  MODELED GRAV-     980,115.5   (mgal)                       NAVD 88
 LB0781
 LB0781  VERT ORDER  -  SECOND    CLASS 0
 LB0781
 LB0781.The horizontal coordinates were established by GPS observations
 LB0781.and adjusted by the National Geodetic Survey in February 2007.
 LB0781
 LB0781.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 LB0781.See National Readjustment for more information.
 LB0781.The horizontal coordinates are valid at the epoch date displayed above.
 LB0781.The epoch date for horizontal control is a decimal equivalence
 LB0781.of Year/Month/Day.
 LB0781
 LB0781.The orthometric height was determined by differential leveling and
 LB0781.adjusted in June 1991.
 LB0781
 LB0781.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 LB0781
 LB0781.The Laplace correction was computed from DEFLEC09 derived deflections.
 LB0781
 LB0781.The ellipsoidal height was determined by GPS observations
 LB0781.and is referenced to NAD 83.
 LB0781
 LB0781.The geoid height was determined by GEOID09.
 LB0781
 LB0781.The dynamic height is computed by dividing the NAVD 88
 LB0781.geopotential number by the normal gravity value computed on the
```

LB0781.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
LB0781.degrees latitude (g = 980.6199 gals.).
LB0781
LB0781.The modeled gravity was interpolated from observed gravity values.
LB0781
LB0781;   North   East   Units Scale Factor Converg.
LB0781;SPC IN W   -   570,326.920   928,159.884   MT 0.99997642   +0 12 53.6
LB0781;SPC IN W   - 1,871,147.57 3,045,137.89   sFT 0.99997642   +0 12 53.6
LB0781;UTM 16   - 4,470,527.610   521,076.353   MT 0.99960547   +0 09 39.2
LB0781
LB0781!   - Elev Factor x Scale Factor =   Combined Factor
LB0781!SPC IN W   -   0.99997272 x   0.99997642 =   0.99994914
LB0781!UTM 16   -   0.99997272 x   0.99960547 =   0.99957820
LB0781
LB0781   SUPERSEDED SURVEY CONTROL
LB0781
LB0781 NAD 83(1997)- 40 23 06.26399(N)   086 45 06.07478(W) AD(   ) A
LB0781 ELLIP H (01/19/05) 173.930 (m)   GP(   ) 4 1
LB0781 NAVD 88 (01/19/05) 207.73   (m)   681.5   (f) LEVELING   3
LB0781 NGVD 29 (??/??/92) 207.839 (m)   681.89   (f) ADJ UNCH   2 0
LB0781
LB0781.Superseded values are not recommended for survey control.
LB0781.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
LB0781.See file dsdata.txt to determine how the superseded data were derived.
LB0781
LB0781_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TEK2107670527(NAD 83)
LB0781_MARKER: DB = BENCH MARK DISK
LB0781_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
LB0781_SP_SET: SET IN TOP OF CONCRETE MONUMENT
LB0781_STAMPING: B 120 1946
LB0781_MARK LOGO: CGS
LB0781_PROJECTION: PROJECTING 8 CENTIMETERS
LB0781_MAGNETIC: O = OTHER; SEE DESCRIPTION
LB0781_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
LB0781+STABILITY: SURFACE MOTION
LB0781_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
LB0781+SATELLITE: SATELLITE OBSERVATIONS - July 28, 2009
LB0781
LB0781 HISTORY   - Date   Condition   Report By
LB0781 HISTORY   - 1946   MONUMENTED   CGS
LB0781 HISTORY   - 1965   GOOD   NGS
LB0781 HISTORY   - 20020520 MARK NOT FOUND   INDIV
LB0781 HISTORY   - 20030520 GOOD   INDIV
LB0781 HISTORY   - 20030624 GOOD   PURDUE
LB0781 HISTORY   - 20090728 GOOD   LDACE
LB0781
LB0781   STATION DESCRIPTION
LB0781
LB0781'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
LB0781'1.6 MI NE FROM DAYTON.
LB0781'ABOUT 0.9 MILE EAST ALONG STATE HIGHWAY 38 FROM THE POST OFFICE
LB0781'AT DAYTON, THENCE 0.7 MILE NORTH ALONG THE BUCK CREEK-DAYTON
LB0781'ROAD, 0.2 MILE SOUTH OF AN EAST-WEST CROSS ROAD, 22 FEET EAST
LB0781'OF THE CENTER LINE OF THE ROAD, 20.5 FEET NORTH OF THE CENTER
LB0781'LINE OF A DRIVEWAY TO THE WALLACE PATTON FARM HOUSE, 11 FEET
LB0781'NORTH OF A FENCE CORNER, 1 1/2 FEET WEST OF A FENCE LINE
LB0781'AND ABOUT 1 FOOT HIGHER THAN ROAD LEVEL. A STANDARD DISK, STAMPED
LB0781'B 120 1946 AND SET IN THE TOP OF A CONCRETE POST PROJECTING
LB0781'5 INCHES ABOVE GROUND.
LB0781
LB0781   STATION RECOVERY (1965)
LB0781
LB0781'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1965
LB0781'RECOVERED IN GOOD CONDITION.
LB0781
LB0781   STATION RECOVERY (2002)

LB0781
LB0781'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2002
LB0781'MARK NOT FOUND, DUE TO THE ROAD IS NOT BEING THERE.
LB0781
LB0781 STATION RECOVERY (2003)
LB0781
LB0781'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2003 (BLY)
LB0781'RECOVERED IN GOOD CONDITION.
LB0781
LB0781 STATION RECOVERY (2003)
LB0781
LB0781'RECOVERY NOTE BY PURDUE UNIVERSITY 2003 (BHV)
LB0781'THE STATION IS LOCATED IN SHEFFIELD TOWNSHIP, ABOUT 1.6 MI NORTHEAST
LB0781'OF DAYTON. OWNERSHIP--WALLACE PATTON FARM HOUSE, JOHN B. SPITZNAGLE,
LB0781'JOHN DEERE ROAD, 2233 CR S 800 E, LAFAYETTE, IN 47905.
LB0781'
LB0781'TO REACH THE STATION FROM THE INTERSECTION OF INTERSTATE HIGHWAY 65
LB0781'AND US HIGHWAY 38 GO EAST ON HIGHWAY 38 FOR 1.75 MI PASSING THROUGH
LB0781'DAYTON TO COUNTY ROAD 800 E ON THE LEFT. TURN LEFT AND GO NORTH ON
LB0781'ROAD 800 E FOR 0.8 MI TO THE STATION ON THE RIGHT.
LB0781'
LB0781'THE STATION IS 40.6 FT WEST-NORTHWEST OF A UTILITY POLE, 24.3 FT EAST
LB0781'OF THE CENTER OF ROAD 800 E, 22.5 FT NORTH OF THE CENTER OF JOHN
LB0781'DEERE ROAD AND 11.3 FT NORTHWEST OF THE LAST POST OF AN EAST-WEST
LB0781'FENCE LINE.
LB0781
LB0781 STATION RECOVERY (2009)
LB0781
LB0781'RECOVERY NOTE BY LOUISVILLE DISTRICT USE 2009 (DLS)
LB0781'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 JA0009 ***********************************************************************
 JA0009  DESIGNATION -  E 10
 JA0009  PID         -  JA0009
 JA0009  STATE/COUNTY-  IN/JACKSON
 JA0009  USGS QUAD   -  VALLONIA (1994)
 JA0009
 JA0009                         *CURRENT SURVEY CONTROL
 JA0009  ______________________________________________________________________
 JA0009* NAD 83(1986)-  38 51 12.      (N)    086 05 50.      (W)      SCALED
 JA0009* NAVD 88     -       163.669   (meters)     536.97    (feet)   ADJUSTED
 JA0009  ______________________________________________________________________
 JA0009  GEOID HEIGHT-          -33.55  (meters)                        GEOID09
 JA0009  DYNAMIC HT  -          163.564 (meters)      536.63   (feet)   COMP
 JA0009  MODELED GRAV-      979,983.2   (mgal)                          NAVD 88
 JA0009
 JA0009  VERT ORDER  -  FIRST     CLASS II
 JA0009
 JA0009.The horizontal coordinates were scaled from a topographic map and have
 JA0009.an estimated accuracy of +/- 6 seconds.
 JA0009
 JA0009.The orthometric height was determined by differential leveling and
 JA0009.adjusted in June 1991.
 JA0009
 JA0009.The geoid height was determined by GEOID09.
 JA0009
 JA0009.The dynamic height is computed by dividing the NAVD 88
 JA0009.geopotential number by the normal gravity value computed on the
 JA0009.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 JA0009.degrees latitude (g = 980.6199 gals.).
 JA0009
 JA0009.The modeled gravity was interpolated from observed gravity values.
 JA0009
 JA0009;                    North         East     Units  Estimated Accuracy
 JA0009;SPC IN E     -   400,300.       62,630.      MT  (+/- 180 meters Scaled)
 JA0009
 JA0009                          SUPERSEDED SURVEY CONTROL
 JA0009
 JA0009  NGVD 29 (??/??/92)  163.792  (m)          537.37   (f) ADJ UNCH    1 2
 JA0009
 JA0009.Superseded values are not recommended for survey control.
 JA0009.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 JA0009.See file dsdata.txt to determine how the superseded data were derived.
 JA0009
 JA0009_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ783008(NAD 83)
 JA0009_MARKER: DB = BENCH MARK DISK
 JA0009_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 JA0009_SP_SET: SET IN TOP OF CONCRETE MONUMENT
 JA0009_STAMPING: 537.374 E 10 1930
 JA0009_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 JA0009+STABILITY: SURFACE MOTION
 JA0009_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 JA0009+SATELLITE: SATELLITE OBSERVATIONS - March 16, 2010
 JA0009
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JA0009  HISTORY     - Date     Condition        Report By
JA0009  HISTORY     - 1930     MONUMENTED       CGS
JA0009  HISTORY     - 1967     GOOD             NGS
JA0009  HISTORY     - 20100316 GOOD             AEROME
JA0009
JA0009                          STATION DESCRIPTION
JA0009
JA0009'DESCRIBED BY NATIONAL GEODETIC SURVEY 1967
JA0009'AT VALLONIA.
JA0009'AT VALLONIA, JACKSON COUNTY, ON THE BALTIMORE AND OHIO RAILROAD,
JA0009'94 FEET WEST OF THE STATION, 77 FEET EAST OF MILEPOST C 101,
JA0009'AND 19.6 FEET SOUTH OF THE SOUTH RAIL OF THE MAIN-LINE TRACK.  A
JA0009'STANDARD DISK, STAMPED 537.374 E 10 1930 AND SET IN THE TOP OF
JA0009'A CONCRETE POST PROJECTING 8 INCHES ABOVE GROUND.
JA0009
JA0009                          STATION RECOVERY (2010)
JA0009
JA0009'RECOVERY NOTE BY AERO METRIC INC 2010
JA0009'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA0380 ***********************************************************************
 KA0380  DESIGNATION -  E 13
 KA0380  PID         -  KA0380
 KA0380  STATE/COUNTY-  IN/OWEN
 KA0380  USGS QUAD   -  SPENCER (1983)
 KA0380
 KA0380                         *CURRENT SURVEY CONTROL
 KA0380  ______________________________________________________________________
 KA0380* NAD 83(1986)-  39 17 09.      (N)    086 45 19.      (W)     SCALED
 KA0380* NAVD 88     -       171.263   (meters)     561.89    (feet)  ADJUSTED
 KA0380  ______________________________________________________________________
 KA0380  GEOID HEIGHT-          -32.96  (meters)                       GEOID09
 KA0380  DYNAMIC HT  -          171.161 (meters)      561.55   (feet)  COMP
 KA0380  MODELED GRAV-      980,031.0   (mgal)                         NAVD 88
 KA0380
 KA0380  VERT ORDER  -  FIRST     CLASS II
 KA0380
 KA0380.The horizontal coordinates were scaled from a topographic map and have
 KA0380.an estimated accuracy of +/- 6 seconds.
 KA0380
 KA0380.The orthometric height was determined by differential leveling and
 KA0380.adjusted in June 1991.
 KA0380
 KA0380.The geoid height was determined by GEOID09.
 KA0380
 KA0380.The dynamic height is computed by dividing the NAVD 88
 KA0380.geopotential number by the normal gravity value computed on the
 KA0380.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 KA0380.degrees latitude (g = 980.6199 gals.).
 KA0380
 KA0380.The modeled gravity was interpolated from observed gravity values.
 KA0380
 KA0380;                    North         East     Units  Estimated Accuracy
 KA0380;SPC IN W     -   448,280.      928,300.      MT   (+/- 180 meters Scaled)
 KA0380
 KA0380                          SUPERSEDED SURVEY CONTROL
 KA0380
 KA0380  NGVD 29 (??/??/92)  171.390  (m)          562.30    (f) ADJ UNCH    1 2
 KA0380
 KA0380.Superseded values are not recommended for survey control.
 KA0380.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 KA0380.See file dsdata.txt to determine how the superseded data were derived.
 KA0380
 KA0380_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ211485(NAD 83)
 KA0380_MARKER: DB = BENCH MARK DISK
 KA0380_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 KA0380_SP_SET: SET IN TOP OF CONCRETE MONUMENT
 KA0380_STAMPING: 562.302 E 13 1930
 KA0380_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 KA0380+STABILITY: SURFACE MOTION
 KA0380_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 KA0380+SATELLITE: SATELLITE OBSERVATIONS - May 12, 2010
 KA0380
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KA0380  HISTORY     - Date     Condition        Report By
KA0380  HISTORY     - 1930     MONUMENTED       CGS
KA0380  HISTORY     - 1946     GOOD             NGS
KA0380  HISTORY     - 20080625 GOOD             INDNR
KA0380  HISTORY     - 20100512 GOOD             AEROME
KA0380
KA0380                          STATION DESCRIPTION
KA0380
KA0380'DESCRIBED BY NATIONAL GEODETIC SURVEY 1946
KA0380'AT SPENCER.
KA0380'AT SPENCER, OWEN COUNTY, 0.3 MILE EAST ALONG THE PENNSYLVANIA
KA0380'RAILROAD FROM THE COURTHOUSE, 215 FEET EAST OF THE CROSSING
KA0380'OF A ROAD LEADING TO THE MELNICK HOTHOUSES, 27 FEET NORTHEAST
KA0380'OF POLE 2462, 9 FEET WEST OF MILEAGE POLE 53/10, 8.8 FEET
KA0380'SOUTH OF THE SOUTH RAIL, 5 FEET NORTH OF A WOVEN-WIRE FENCE, AND
KA0380'2 FEET EAST OF A WHITE WOODEN WITNESS POST.  A STANDARD DISK,
KA0380'STAMPED 562.302 E 13 1930 AND SET IN THE TOP OF A CONCRETE POST
KA0380'PROJECTING 4 INCHES ABOVE GROUND.
KA0380
KA0380                          STATION RECOVERY (2008)
KA0380
KA0380'RECOVERY NOTE BY IN DEPT OF NAT RES 2008 (RWW)
KA0380'RECOVERED IN GOOD CONDITION.
KA0380
KA0380                          STATION RECOVERY (2010)
KA0380
KA0380'RECOVERY NOTE BY AERO METRIC INC 2010
KA0380'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 LB1139 ***********************************************************************
 LB1139  CBN         -  This is a Cooperative Base Network Control Station.
 LB1139  DESIGNATION -  G 129
 LB1139  PID         -  LB1139
 LB1139  STATE/COUNTY-  IN/PULASKI
 LB1139  USGS QUAD   -  MONON NE (1962)
 LB1139
 LB1139                        *CURRENT SURVEY CONTROL
 LB1139  ______________________________________________________________________
 LB1139* NAD 83(2007)-  40 59 04.84804(N)    086 52 05.22931(W)     ADJUSTED
 LB1139* NAVD 88     -       204.987  (meters)     672.53   (feet)  ADJUSTED
 LB1139  ______________________________________________________________________
 LB1139  EPOCH DATE  -        2002.00
 LB1139  X           -     263,438.205 (meters)                     COMP
 LB1139  Y           -  -4,814,634.572 (meters)                     COMP
 LB1139  Z           -   4,161,251.388 (meters)                     COMP
 LB1139  LAPLACE CORR-          -0.55  (seconds)                    DEFLEC09
 LB1139  ELLIP HEIGHT-         171.312 (meters)          (02/10/07) ADJUSTED
 LB1139  GEOID HEIGHT-         -33.67  (meters)                     GEOID09
 LB1139  DYNAMIC HT  -         204.896 (meters)     672.23  (feet)  COMP
 LB1139
 LB1139  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 LB1139  Type    PID    Designation                      North   East  Ellip
 LB1139  ----------------------------------------------------------------------
 LB1139  NETWORK LB1139 G 129                             0.82   0.61   1.67
 LB1139  ----------------------------------------------------------------------
 LB1139  MODELED GRAV-     980,178.2   (mgal)                       NAVD 88
 LB1139
 LB1139  VERT ORDER  -  SECOND    CLASS 0
 LB1139
 LB1139.The horizontal coordinates were established by GPS observations
 LB1139.and adjusted by the National Geodetic Survey in February 2007.
 LB1139
 LB1139.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 LB1139.See National Readjustment for more information.
 LB1139.The horizontal coordinates are valid at the epoch date displayed above.
 LB1139.The epoch date for horizontal control is a decimal equivalence
 LB1139.of Year/Month/Day.
 LB1139
 LB1139.The orthometric height was determined by differential leveling and
 LB1139.adjusted in June 1991.
 LB1139
 LB1139.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 LB1139
 LB1139.The Laplace correction was computed from DEFLEC09 derived deflections.
 LB1139
 LB1139.The ellipsoidal height was determined by GPS observations
 LB1139.and is referenced to NAD 83.
 LB1139
 LB1139.The geoid height was determined by GEOID09.
 LB1139
 LB1139.The dynamic height is computed by dividing the NAVD 88
 LB1139.geopotential number by the normal gravity value computed on the
```

LB1139.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
LB1139.degrees latitude (g = 980.6199 gals.).
LB1139
LB1139.The modeled gravity was interpolated from observed gravity values.
LB1139
LB1139;   North   East   Units Scale Factor Converg.
LB1139;SPC IN W   -   636,879.219   918,110.671   MT 0.99997070   +0 08 28.1
LB1139;SPC IN W   - 2,089,494.57 3,012,168.09   sFT 0.99997070   +0 08 28.1
LB1139;UTM 16   - 4,537,064.774   511,093.942   MT 0.99960151   +0 05 11.4
LB1139
LB1139!   - Elev Factor x Scale Factor =   Combined Factor
LB1139!SPC IN W   -   0.99997313 x   0.99997070 =   0.99994383
LB1139!UTM 16   -   0.99997313 x   0.99960151 =   0.99957465
LB1139
LB1139   SUPERSEDED SURVEY CONTROL
LB1139
LB1139 NAD 83(1997)- 40 59 04.84797(N)   086 52 05.22929(W) AD(   ) A
LB1139 ELLIP H (01/19/05) 171.312 (m)   GP(   ) 4 1
LB1139 NAVD 88 (01/19/05) 204.99   (m)   672.5   (f) LEVELING   3
LB1139 NGVD 29 (??/??/92) 205.085 (m)   672.85   (f) ADJ UNCH   2 0
LB1139
LB1139.Superseded values are not recommended for survey control.
LB1139.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
LB1139.See file dsdata.txt to determine how the superseded data were derived.
LB1139
LB1139_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TEL1109337064(NAD 83)
LB1139_MARKER: DB = BENCH MARK DISK
LB1139_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
LB1139_SP_SET: SET IN TOP OF CONCRETE MONUMENT
LB1139_STAMPING: G 129 1946
LB1139_MARK LOGO: CGS
LB1139_PROJECTION: PROJECTING 15 CENTIMETERS
LB1139_MAGNETIC: O = OTHER; SEE DESCRIPTION
LB1139_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
LB1139+STABILITY: SURFACE MOTION
LB1139_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
LB1139+SATELLITE: SATELLITE OBSERVATIONS - March 18, 2010
LB1139
LB1139 HISTORY   - Date   Condition   Report By
LB1139 HISTORY   - 1946   MONUMENTED   CGS
LB1139 HISTORY   - 1989   GOOD   USPSQD
LB1139 HISTORY   - 20030612 GOOD   ABSHER
LB1139 HISTORY   - 20100318 GOOD   AEROME
LB1139
LB1139   STATION DESCRIPTION
LB1139
LB1139'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
LB1139'0.8 MI E FROM FRANCESVILLE.
LB1139'ABOUT 0.75 MILE EAST ALONG A PAVED ROAD FROM THE POST OFFICE AT
LB1139'FRANCESVILLE, ABOUT 0.3 MILE WEST OF A STEEL BRIDGE OVER BIG
LB1139'MONON CREEK, 94 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A HOUSE,
LB1139'58 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A GARAGE, 27 FEET
LB1139'NORTH OF THE CENTER LINE OF THE ROAD, 43 FEET WEST OF THE CENTER
LB1139'LINE OF A DRIVEWAY, 1 FOOT NORTH OF THE NORTH RIGHT-OF-WAY FENCE
LB1139'LINE, ABOUT LEVEL WITH THE CENTER LINE OF THE ROAD AND SET IN
LB1139'THE TOP OF A CONCRETE POST PROJECTING ABOUT 6 INCHES.
LB1139
LB1139   STATION RECOVERY (1989)
LB1139
LB1139'RECOVERY NOTE BY US POWER SQUADRON 1989 (TCR)
LB1139'RECOVERED IN GOOD CONDITION.
LB1139
LB1139   STATION RECOVERY (2003)
LB1139
LB1139'RECOVERY NOTE BY ABSHER SURVEYING 2003 (DA)
LB1139'RECOVERED AS DESCRIBED WITH THE FOLLOWING ADDITION.

LB1139'
LB1139'THE STATION IS 16 FT NORTH OF THE NORTH EDGE OF BITUMINOUS SURFACE OF
LB1139'COUNTY ROAD 500 SOUTH.
LB1139
LB1139   STATION RECOVERY (2010)
LB1139
LB1139'RECOVERY NOTE BY AERO METRIC INC 2010
LB1139'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 JZ2219 ***********************************************************************
 JZ2219  CBN         -  This is a Cooperative Base Network Control Station.
 JZ2219  DESIGNATION -  H 271
 JZ2219  PID         -  JZ2219
 JZ2219  STATE/COUNTY-  IN/BARTHOLOMEW
 JZ2219  USGS QUAD   -  COLUMBUS (1993)
 JZ2219
 JZ2219                        *CURRENT SURVEY CONTROL
 JZ2219  ______________________________________________________________________
 JZ2219* NAD 83(2007)-  39 08 57.12407(N)    085 55 13.44609(W)     ADJUSTED
 JZ2219* NAVD 88     -       186.402  (meters)     611.55   (feet)  ADJUSTED
 JZ2219  ______________________________________________________________________
 JZ2219  EPOCH DATE  -        2002.00
 JZ2219  X           -     352,368.038 (meters)                     COMP
 JZ2219  Y           -  -4,940,454.936 (meters)                     COMP
 JZ2219  Z           -   4,005,272.308 (meters)                     COMP
 JZ2219  LAPLACE CORR-          -2.68  (seconds)                    DEFLEC09
 JZ2219  ELLIP HEIGHT-         152.603 (meters)          (02/10/07) ADJUSTED
 JZ2219  GEOID HEIGHT-         -33.80  (meters)                     GEOID09
 JZ2219  DYNAMIC HT  -         186.287 (meters)     611.18  (feet)  COMP
 JZ2219
 JZ2219  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 JZ2219  Type    PID    Designation                      North   East  Ellip
 JZ2219  ----------------------------------------------------------------------
 JZ2219  NETWORK JZ2219 H 271                             0.63   0.47   1.55
 JZ2219  ----------------------------------------------------------------------
 JZ2219  MODELED GRAV-     980,008.4   (mgal)                       NAVD 88
 JZ2219
 JZ2219  VERT ORDER  -  SECOND    CLASS 0
 JZ2219
 JZ2219.The horizontal coordinates were established by GPS observations
 JZ2219.and adjusted by the National Geodetic Survey in February 2007.
 JZ2219
 JZ2219.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 JZ2219.See National Readjustment for more information.
 JZ2219.The horizontal coordinates are valid at the epoch date displayed above.
 JZ2219.The epoch date for horizontal control is a decimal equivalence
 JZ2219.of Year/Month/Day.
 JZ2219
 JZ2219.The orthometric height was determined by differential leveling and
 JZ2219.adjusted in June 1991.
 JZ2219
 JZ2219.Photographs are available for this station.
 JZ2219
 JZ2219.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 JZ2219
 JZ2219.The Laplace correction was computed from DEFLEC09 derived deflections.
 JZ2219
 JZ2219.The ellipsoidal height was determined by GPS observations
 JZ2219.and is referenced to NAD 83.
 JZ2219
 JZ2219.The geoid height was determined by GEOID09.
 JZ2219
```

JZ2219.The dynamic height is computed by dividing the NAVD 88
JZ2219.geopotential number by the normal gravity value computed on the
JZ2219.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
JZ2219.degrees latitude (g = 980.6199 gals.).
JZ2219
JZ2219.The modeled gravity was interpolated from observed gravity values.
JZ2219
JZ2219;   North   East   Units Scale Factor Converg.
JZ2219;SPC IN E   -   433,090.249   78,066.800   MT 0.99997259   -0 09 36.7
JZ2219;SPC IN E   - 1,420,896.93   256,124.16   sFT 0.99997259   -0 09 36.7
JZ2219;UTM 16   - 4,333,888.728   593,288.792   MT 0.99970716   +0 40 53.9
JZ2219
JZ2219!   - Elev Factor x Scale Factor =   Combined Factor
JZ2219!SPC IN E   -   0.99997606 x   0.99997259 =   0.99994865
JZ2219!UTM 16   -   0.99997606 x   0.99970716 =   0.99968323
JZ2219
JZ2219   SUPERSEDED SURVEY CONTROL
JZ2219
JZ2219 NAD 83(1997)- 39 08 57.12423(N)   085 55 13.44599(W) AD(   ) B
JZ2219 ELLIP H (04/10/98) 152.624 (m)   GP(   ) 4 1
JZ2219 NAVD 88 (04/10/98) 186.40   (m)   611.5   (f) LEVELING   3
JZ2219 NGVD 29 (??/??/92) 186.524 (m)   611.95   (f) ADJ UNCH   2 0
JZ2219
JZ2219.Superseded values are not recommended for survey control.
JZ2219.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
JZ2219.See file dsdata.txt to determine how the superseded data were derived.
JZ2219
JZ2219_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ9328833888(NAD 83)
JZ2219_MARKER: DB = BENCH MARK DISK
JZ2219_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
JZ2219_SP_SET: SET IN TOP OF CONCRETE MONUMENT
JZ2219_STAMPING: H 271 1947
JZ2219_MARK LOGO: CGS
JZ2219_PROJECTION: FLUSH
JZ2219_MAGNETIC: N = NO MAGNETIC MATERIAL
JZ2219_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
JZ2219+STABILITY: SURFACE MOTION
JZ2219_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
JZ2219+SATELLITE: SATELLITE OBSERVATIONS - March 16, 2010
JZ2219
JZ2219 HISTORY   - Date   Condition   Report By
JZ2219 HISTORY   - 1947   MONUMENTED   CGS
JZ2219 HISTORY   - 19970819 GOOD   SEC
JZ2219 HISTORY   - 20010529 GOOD   WOOLPT
JZ2219 HISTORY   - 20100316 GOOD   AEROME
JZ2219
JZ2219   STATION DESCRIPTION
JZ2219
JZ2219'DESCRIBED BY COAST AND GEODETIC SURVEY 1947
JZ2219'4.2 MI S FROM COLUMBUS.
JZ2219'ABOUT 4.05 MILES SOUTH ALONG ALTERNATE U.S. HIGHWAY 31 FROM THE
JZ2219'COURT HOUSE AT COLUMBUS, THENCE ABOUT 0.1 MILE WEST ALONG A
JZ2219'BLACK TOP ROAD, THENCE ABOUT 100 YARDS SOUTH ALONG A BLACK TOP
JZ2219'ROAD RUNNING ALONG THE EAST SIDE OF THE COLUMBUS AIRPORT, AT
JZ2219'THE NORTHEAST CORNER OF THE FIELD, ABOUT 53 YARDS SOUTH OF THE
JZ2219'SOUTHEAST CORNER OF THE BETHEL BAPTIST CHURCH, 20 FEET WEST OF
JZ2219'THE CENTER LINE OF THE BLACK TOP ROAD, 7 FEET SOUTH OF THE
JZ2219'NORTHEAST FENCE CORNER POST, 1 FOOT EAST OF THE FENCE LINE, 2
JZ2219'FEET NORTH OF A WHITE WOODEN WITNESS POST, ABOUT LEVEL WITH THE
JZ2219'ROAD AND SET IN THE TOP OF A CONCRETE POST PROJECTING 5 INCHES.
JZ2219
JZ2219   STATION RECOVERY (1997)
JZ2219
JZ2219'RECOVERY NOTE BY SCHNEIDER ENGINEERING CORPORATION 1997 (RGR)
JZ2219'STATION IS ABOUT 5.3 KILOMETERS (3.30 MI) SOUTH OF COLUMBUS AND 1.6
JZ2219'KILOMETERS (1.00 MI) NORTH OF WALESBORO. OWNERSHIP--BETHEL BAPTIST

JZ2219'CHURCH, 142 DEAVER ROAD, COLUMBUS IN 47201, PHONE 812-342-4005. TO
JZ2219'REACH THE STATION FROM THE INTERSECTION OF STATE HIGHWAYS 46 AND 11,
JZ2219'SOUTHWEST OF COLUMBUS, TURN SOUTH FROM STATE ROAD 46 ON TO STATE ROAD
JZ2219'11, ABOUT 5.3 KILOMETERS (3.30 MI) SOUTH TO DEAVER ROAD. TURN WEST ON
JZ2219'TO DEAVER ROAD, ABOUT 0.2 KILOMETERS (0.10 MI) WEST TO COUNTY ROAD 50
JZ2219'WEST. TURN SOUTH ON TO COUNTY ROAD 50 WEST, ABOUT 100 METERS (328.1
JZ2219'FT) SOUTH TO ENTRANCE OF BETHEL BAPTIST CHURCH CEMETERY, WEST OF
JZ2219'COUNTRY ROAD 50 WEST. THE STATION IS SOUTHWEST OF THE INTERSECTION OF
JZ2219'THE CEMETERY ENTRANCE AND COUNTY ROAD 50 WEST, 5.3 METERS (17.4 FT)
JZ2219'WEST OF CENTER OF COUNTY ROAD 50 WEST, 13.8 METERS (45.3 FT) FROM
JZ2219'NEAREST TELEPHONE POLE TO NORTHEAST, 8.6 METERS (28.2 FT)
JZ2219'EAST-SOUTHEAST FROM SOUTHEAST CORNER OF WAGNER TOMBSTONE AND 8.2
JZ2219'METERS (26.9 FT) NORTHEAST OF NORTHEAST CORNER OF SWEENY TOMBSTONE.
JZ2219
JZ2219   STATION RECOVERY (2001)
JZ2219
JZ2219'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2001 (BJM)
JZ2219'RECOVERED AS DESCRIBED.
JZ2219'
JZ2219
JZ2219   STATION RECOVERY (2010)
JZ2219
JZ2219'RECOVERY NOTE BY AERO METRIC INC 2010
JZ2219'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 JZ2075 ***********************************************************************
 JZ2075  DESIGNATION -  J 9
 JZ2075  PID         -  JZ2075
 JZ2075  STATE/COUNTY-  IN/SHELBY
 JZ2075  USGS QUAD   -  HOPE (1993)
 JZ2075
 JZ2075                         *CURRENT SURVEY CONTROL
 JZ2075  ______________________________________________________________________
 JZ2075* NAD 83(1986)-  39 21 53.      (N)    085 49 52.      (W)     SCALED
 JZ2075* NAVD 88     -       210.930   (meters)     692.03    (feet)  ADJUSTED
 JZ2075  ______________________________________________________________________
 JZ2075  GEOID HEIGHT-          -33.86  (meters)                      GEOID09
 JZ2075  DYNAMIC HT  -          210.802 (meters)      691.61   (feet)  COMP
 JZ2075  MODELED GRAV-      980,017.4   (mgal)                        NAVD 88
 JZ2075
 JZ2075  VERT ORDER  -  FIRST     CLASS II
 JZ2075
 JZ2075.The horizontal coordinates were scaled from a topographic map and have
 JZ2075.an estimated accuracy of +/- 6 seconds.
 JZ2075
 JZ2075.The orthometric height was determined by differential leveling and
 JZ2075.adjusted in June 1991.
 JZ2075
 JZ2075.The geoid height was determined by GEOID09.
 JZ2075
 JZ2075.The dynamic height is computed by dividing the NAVD 88
 JZ2075.geopotential number by the normal gravity value computed on the
 JZ2075.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 JZ2075.degrees latitude (g = 980.6199 gals.).
 JZ2075
 JZ2075.The modeled gravity was interpolated from observed gravity values.
 JZ2075
 JZ2075;                    North         East     Units  Estimated Accuracy
 JZ2075;SPC IN E     -   457,000.       85,830.      MT  (+/- 180 meters Scaled)
 JZ2075
 JZ2075                          SUPERSEDED SURVEY CONTROL
 JZ2075
 JZ2075  NGVD 29 (??/??/92)  211.046  (m)          692.41   (f) ADJ UNCH    1 2
 JZ2075
 JZ2075.Superseded values are not recommended for survey control.
 JZ2075.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 JZ2075.See file dsdata.txt to determine how the superseded data were derived.
 JZ2075
 JZ2075_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SFJ006579(NAD 83)
 JZ2075_MARKER: DB = BENCH MARK DISK
 JZ2075_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 JZ2075_SP_SET: SET IN TOP OF CONCRETE MONUMENT
 JZ2075_STAMPING: ELEV 692.407 FT 211.046 M J 9 1930
 JZ2075_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 JZ2075+STABILITY: SURFACE MOTION
 JZ2075_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 JZ2075+SATELLITE: SATELLITE OBSERVATIONS - March 17, 2010
 JZ2075
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JZ2075 HISTORY   - Date   Condition   Report By
JZ2075 HISTORY   - 1930   MONUMENTED   CGS
JZ2075 HISTORY   - 1947   GOOD   NGS
JZ2075 HISTORY   - 1984   GOOD   INDNR
JZ2075 HISTORY   - 20030327 GOOD   INDNR
JZ2075 HISTORY   - 20061102 GOOD   INDNR
JZ2075 HISTORY   - 20100317 GOOD   AEROME
JZ2075
JZ2075   STATION DESCRIPTION
JZ2075
JZ2075'DESCRIBED BY NATIONAL GEODETIC SURVEY 1947
JZ2075'AT FLAT ROCK.
JZ2075'AT FLAT ROCK, ABOUT 2 1/2 RAILS NORTH OF THE MAIN STREET
JZ2075'CROSSING OF THE PENNSYLVANIA RAILROAD, 126 FEET NORTH AND ACROSS
JZ2075'THE STREET FROM THE NORTHEAST CORNER OF THE STATION, 11 FEET
JZ2075'WEST OF THE WEST RAIL OF THE MAIN TRACK, 69 FEET NORTH OF THE
JZ2075'NORTHEAST CORNER OF MOHRS HARDWARE STORE, 15.5 FEET SOUTH OF A
JZ2075'TELEGRAPH POLE, 1.5 FEET NORTH OF A WHITE WOODEN WITNESS POST, 1
JZ2075'FOOT BELOW TRACK LEVEL AND SET IN THE TOP OF A CONCRETE POST
JZ2075'PROJECTING ABOUT 5 INCHES.
JZ2075
JZ2075   STATION RECOVERY (1984)
JZ2075
JZ2075'RECOVERY NOTE BY IN DEPT OF NAT RES 1984
JZ2075'THE RAILROAD IS ABAND. AND THE RAILS REMOVED. THE WITNESS POST IS
JZ2075'GONE. THE MARK IS APPROX. 15 FT. WEST OF THE CENTERLINE OF THE DIRT
JZ2075'ROAD ALONG THE OLD ABAND. RAILROAD GRADE.
JZ2075
JZ2075   STATION RECOVERY (2003)
JZ2075
JZ2075'RECOVERY NOTE BY IN DEPT OF NAT RES 2003 (RWW)
JZ2075'RECOVERED IN GOOD CONDITION.
JZ2075
JZ2075   STATION RECOVERY (2006)
JZ2075
JZ2075'RECOVERY NOTE BY IN DEPT OF NAT RES 2006 (RWW)
JZ2075'RECOVERED IN GOOD CONDITION.
JZ2075
JZ2075   STATION RECOVERY (2010)
JZ2075
JZ2075'RECOVERY NOTE BY AERO METRIC INC 2010
JZ2075'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 MD1344 ***********************************************************************
 MD1344  DESIGNATION -  J 160
 MD1344  PID         -  MD1344
 MD1344  STATE/COUNTY-  IN/ELKHART
 MD1344  USGS QUAD   -  GOSHEN (1994)
 MD1344
 MD1344                        *CURRENT SURVEY CONTROL
 MD1344  ______________________________________________________________________
 MD1344* NAD 83(2007)-  41 31 47.29471(N)    085 49 30.65760(W)     NO CHECK
 MD1344* NAVD 88     -       246.949  (meters)     810.20   (feet)  ADJUSTED
 MD1344  ______________________________________________________________________
 MD1344  EPOCH DATE  -        2002.00
 MD1344  X           -     348,124.792 (meters)                     COMP
 MD1344  Y           -  -4,769,255.260 (meters)                     COMP
 MD1344  Z           -   4,206,792.342 (meters)                     COMP
 MD1344  LAPLACE CORR-          2.22  (seconds)                     DEFLEC09
 MD1344  ELLIP HEIGHT-         213.411 (meters)          (02/10/07) NO CHECK
 MD1344  GEOID HEIGHT-         -33.53  (meters)                     GEOID09
 MD1344  DYNAMIC HT  -         246.852 (meters)     809.88  (feet)  COMP
 MD1344
 MD1344  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 MD1344  Type    PID    Designation                      North   East  Ellip
 MD1344  ----------------------------------------------------------------------
 MD1344  NETWORK MD1344 J 160                             1.33   0.82   3.39
 MD1344  ----------------------------------------------------------------------
 MD1344  MODELED GRAV-     980,220.9   (mgal)                       NAVD 88
 MD1344
 MD1344  VERT ORDER  -  FIRST     CLASS II
 MD1344
 MD1344.The horizontal coordinates were established by GPS observations
 MD1344.and adjusted by the National Geodetic Survey in February 2007.
 MD1344
 MD1344.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 MD1344.See National Readjustment for more information.
 MD1344.No horizontal observational check was made to the station.
 MD1344.The horizontal coordinates are valid at the epoch date displayed above.
 MD1344.The epoch date for horizontal control is a decimal equivalence
 MD1344.of Year/Month/Day.
 MD1344
 MD1344.The orthometric height was determined by differential leveling and
 MD1344.adjusted in June 1991.
 MD1344
 MD1344.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 MD1344
 MD1344.The Laplace correction was computed from DEFLEC09 derived deflections.
 MD1344
 MD1344.The ellipsoidal height was determined by GPS observations
 MD1344.and is referenced to NAD 83.
 MD1344
 MD1344.The geoid height was determined by GEOID09.
 MD1344
 MD1344.The dynamic height is computed by dividing the NAVD 88
 MD1344.geopotential number by the normal gravity value computed on the
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MD1344.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
MD1344.degrees latitude (g = 980.6199 gals.).
MD1344
MD1344.The modeled gravity was interpolated from observed gravity values.
MD1344
MD1344;   North   East   Units Scale Factor Converg.
MD1344;SPC IN E   -   697,407.897   86,771.030   MT 0.99996882   -0 06 18.4
MD1344;SPC IN E   - 2,288,079.08   284,681.29   sFT 0.99996882   -0 06 18.4
MD1344;UTM 16   - 4,598,239.306   598,009.384   MT 0.99971821   +0 46 44.3
MD1344
MD1344!   - Elev Factor x Scale Factor =   Combined Factor
MD1344!SPC IN E   -   0.99996653 x   0.99996882 =   0.99993535
MD1344!UTM 16   -   0.99996653 x   0.99971821 =   0.99968475
MD1344
MD1344   SUPERSEDED SURVEY CONTROL
MD1344
MD1344 NAD 83(1997)- 41 31 47.29423(N)   085 49 30.65692(W) AD(   ) 1
MD1344 ELLIP H (02/05/07) 213.403 (m)   GP(   ) 3 1
MD1344 NAD 83(1997)- 41 31 47.29473(N)   085 49 30.65764(W) AD(   ) 1
MD1344 ELLIP H (11/27/02) 213.414 (m)   GP(   ) 4 1
MD1344 NAD 83(1997)- 41 31 47.29463(N)   085 49 30.65771(W) AD(   ) 1
MD1344 ELLIP H (03/18/02) 213.416 (m)   GP(   ) 4 1
MD1344 NAVD 88 (03/18/02) 246.95   (m)   810.2   (f) LEVELING   3
MD1344 NGVD 29 (??/??/92) 247.073 (m)   810.61   (f) ADJ UNCH   1 2
MD1344
MD1344.Superseded values are not recommended for survey control.
MD1344.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
MD1344.See file dsdata.txt to determine how the superseded data were derived.
MD1344
MD1344_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TEL9800998239(NAD 83)
MD1344_MARKER: DB = BENCH MARK DISK
MD1344_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
MD1344_SP_SET: CONCRETE POST
MD1344_STAMPING: J 160 1946
MD1344_MARK LOGO: CGS
MD1344_PROJECTION: PROJECTING 8 CENTIMETERS
MD1344_MAGNETIC: N = NO MAGNETIC MATERIAL
MD1344_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
MD1344+STABILITY: SURFACE MOTION
MD1344_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
MD1344+SATELLITE: SATELLITE OBSERVATIONS - March 09, 2010
MD1344
MD1344 HISTORY   - Date   Condition   Report By
MD1344 HISTORY   - 1946   MONUMENTED   CGS
MD1344 HISTORY   - 1955   GOOD   NGS
MD1344 HISTORY   - 19870730 GOOD   NGS
MD1344 HISTORY   - 19930108 GOOD   NGS
MD1344 HISTORY   - 20010529 GOOD   WOOLPT
MD1344 HISTORY   - 20061109 GOOD   WOOLPT
MD1344 HISTORY   - 20100309 GOOD   AEROME
MD1344
MD1344   STATION DESCRIPTION
MD1344
MD1344'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
MD1344'2.1 MI N FROM NEW PARIS.
MD1344'ABOUT 2.1 MILES NORTH ALONG THE NEW YORK CENTRAL RAILROAD FROM
MD1344'THE STATION AT NEW PARIS, AT A PAVED ROAD CROSSING, 78 FEET
MD1344'NORTH OF AND ACROSS THE ROAD FROM POLE NO. 59/14, 39 FEET NORTH
MD1344'OF THE CENTER LINE OF THE PAVED ROAD, 28 FEET EAST OF THE EAST
MD1344'RAIL OF THE TRACK, 21.5 FEET NORTH OF THE FENCE CORNER, 1.5
MD1344'FEET WEST OF THE FENCE LINE, AND 2 FEET NORTH OF A WHITE WOODEN
MD1344'WITNESS POST. SET ABOUT LEVEL WITH THE TRACK, AND IN THE TOP
MD1344'OF A CONCRETE POST PROJECTING 5 INCHES. NOTE-- THE PAVED ROAD IN
MD1344'THE DESCRIPTION IS COUNTY ROAD 42, DELETE THE REFERENCE TO POLE
MD1344'59/14.
MD1344

MD1344 STATION RECOVERY (1955)
MD1344
MD1344'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1955
MD1344'RECOVERED IN GOOD CONDITION.
MD1344
MD1344 STATION RECOVERY (1987)
MD1344
MD1344'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1987
MD1344'FROM THE JUNCTION OF STATE ROUTES 119 WEST AND 15 IN GOSHEN, GO SOUTH
MD1344'ON STATE ROUTE 15 FOR 3.35 MILES (5.39 KM) TO A SIDE ROAD LEFT,
MD1344'COUNTY ROAD 42 LEADING TO GOSHEN MUNICIPAL AIRPORT. TURN LEFT GOING
MD1344'0.1 MILE (0.2 KM) TO A RAILROAD CROSSING AND THE MARK IN THE
MD1344'NORTHEAST QUADRANT OF THE INTERSECTION OF COUNTY ROAD 42 AND THE
MD1344'RAILROAD TRACKS, 39.0 FEET (11.9 M) NORTH OF THE CENTER OF COUNTY
MD1344'ROAD 42, 28.0 FEET (8.5 M) EAST FROM THE EAST RAIL, 21.5 FEET (6.6 M)
MD1344'NORTH FROM A CONCRETE FENCE CORNER POST, 3.0 FEET (0.9 M)
MD1344'NORTH-NORTHWEST FROM A WITNESS POST AND 1.0 FOOT (0.3 M) WEST FROM A
MD1344'NORTH-SOUTH FENCE LINE.
MD1344
MD1344 STATION RECOVERY (1993)
MD1344
MD1344'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993 (RHK)
MD1344'0.2 KM (0.10 MI) NORTH ALONG MAIN STREET FROM THE POST OFFICE IN NEW
MD1344'PARIS, THENCE 0.2 KM (0.10 MI) WEST ALONG COUNTY ROAD 46, THENCE 3.4
MD1344'KM (2.10 MI) NORTHERLY ALONG THE CONRAIL RAILROAD AT THE JUNCTION OF
MD1344'COUNTY ROAD 42, 12.3 M (40.4 FT) NORTH OF THE CENTERLINE OF COUNTY
MD1344'ROAD 42, 8.7 M (28.5 FT) EAST OF AND LEVEL WITH THE NEAR RAIL, 8.4 M
MD1344'(27.6 FT) NORTHEAST OF A CROSSING SIGNAL LIGHT POLE, 0.9 M (3.0 FT)
MD1344'NORTHWEST OF A WITNESS POST, 0.6 M (2.0 FT) WEST OF A FENCE, AND THE
MD1344'MONUMENT PROJECTS 6 CM ABOVE THE GROUND SURFACE.
MD1344
MD1344 STATION RECOVERY (2001)
MD1344
MD1344'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2001 (BJM)
MD1344'RECOVERED AS DESCRIBED.
MD1344'
MD1344'
MD1344'
MD1344
MD1344 STATION RECOVERY (2006)
MD1344
MD1344'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2006 (JKN)
MD1344'THIS STATION WAS RECOVERED AS DESCRIBED AND FOUND IN GOOD CONDITION.
MD1344
MD1344 STATION RECOVERY (2010)
MD1344
MD1344'RECOVERY NOTE BY AERO METRIC INC 2010
MD1344'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 JA1618 ***********************************************************************
 JA1618  DESIGNATION -  J 354
 JA1618  PID         -  JA1618
 JA1618  STATE/COUNTY-  IN/DAVIESS
 JA1618  USGS QUAD   -  EPSOM (1984)
 JA1618
 JA1618                         *CURRENT SURVEY CONTROL
 JA1618  ______________________________________________________________________
 JA1618* NAD 83(1986)-  38 51 29.     (N)    087 06 41.     (W)     SCALED
 JA1618* NAVD 88     -       146.020  (meters)     479.07   (feet)  ADJUSTED
 JA1618  ______________________________________________________________________
 JA1618  GEOID HEIGHT-         -32.52  (meters)                     GEOID09
 JA1618  DYNAMIC HT  -         145.930 (meters)     478.77   (feet)  COMP
 JA1618  MODELED GRAV-     980,007.4   (mgal)                       NAVD 88
 JA1618
 JA1618  VERT ORDER  -  FIRST     CLASS II
 JA1618
 JA1618.The horizontal coordinates were scaled from a topographic map and have
 JA1618.an estimated accuracy of +/- 6 seconds.
 JA1618
 JA1618.The orthometric height was determined by differential leveling and
 JA1618.adjusted in June 1991.
 JA1618
 JA1618.Photographs are available for this station.
 JA1618
 JA1618.The geoid height was determined by GEOID09.
 JA1618
 JA1618.The dynamic height is computed by dividing the NAVD 88
 JA1618.geopotential number by the normal gravity value computed on the
 JA1618.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 JA1618.degrees latitude (g = 980.6199 gals.).
 JA1618
 JA1618.The modeled gravity was interpolated from observed gravity values.
 JA1618
 JA1618;                    North         East     Units  Estimated Accuracy
 JA1618;SPC IN W     -   400,740.      897,570.      MT  (+/- 180 meters Scaled)
 JA1618
 JA1618                          SUPERSEDED SURVEY CONTROL
 JA1618
 JA1618.No superseded survey control is available for this station.
 JA1618
 JA1618_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SDJ903010(NAD 83)
 JA1618_MARKER: I = METAL ROD
 JA1618_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
 JA1618_SP_SET: STAINLESS STEEL ROD
 JA1618_STAMPING: J 354 1985
 JA1618_MARK LOGO: NGS
 JA1618_PROJECTION: FLUSH
 JA1618_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 JA1618_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 JA1618+SATELLITE: SATELLITE OBSERVATIONS - May 11, 2010
 JA1618_ROD/PIPE-DEPTH: 15.6 meters
 JA1618
```

```
JA1618  HISTORY     - Date     Condition        Report By
JA1618  HISTORY     - 1985     MONUMENTED       NGS
JA1618  HISTORY     - 20030321 GOOD             LNDMRK
JA1618  HISTORY     - 20080226 GOOD             JCLS
JA1618  HISTORY     - 20100511 GOOD             AEROME
JA1618
JA1618                          STATION DESCRIPTION
JA1618
JA1618'DESCRIBED BY NATIONAL GEODETIC SURVEY 1985
JA1618'25.1 KM (15.6 MI) NE FROM WASHINGTON.
JA1618'25.1 KM (15.6 MI) NORTHEASTERLY ALONG STATE HIGHWAY 57 FROM ITS
JA1618'JUNCTION WITH U.S. HIGHWAY 50 IN WASHINGTON, 86.0 M (282.2 FT) SOUTH
JA1618'OF THE CENTER OF A DRIVEWAY LEADING WEST TO A HOUSE, 73.8 M (242.0 FT)
JA1618'NORTHWEST OF THE CENTERLINE OF THE HIGHWAY, 21.0 M (68.9 FT) WEST OF
JA1618'THE NEAR RAIL OF THE CONRAIL RAILROAD, 7.1 M (23.3 FT) WEST OF THE
JA1618'CENTERLINE OF COUNTY ROAD 300 EAST, AND 0.9 M (3.0 FT) SOUTH OF
JA1618'UTILITY POLE NUMBER V6-27.  NOTE--ACCESS TO DATUM POINT IS HAD THROUGH
JA1618'A 5-INCH LOGO CAP.
JA1618'THE MARK IS 0.3 METERS  SE FROM  A WITNESS POST
JA1618'THE MARK IS 0.6 M ABOVE THE ROAD.
JA1618
JA1618                          STATION RECOVERY (2003)
JA1618
JA1618'RECOVERY NOTE BY LANDMARK SURVEYING INCORPORATED 2003 (DLH)
JA1618'THE NGS DESCRIPTION IS ADEQUATE.
JA1618
JA1618                          STATION RECOVERY (2008)
JA1618
JA1618'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2008
JA1618'RECOVERED IN GOOD CONDITION.
JA1618
JA1618                          STATION RECOVERY (2010)
JA1618
JA1618'RECOVERY NOTE BY AERO METRIC INC 2010
JA1618'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA2083 ***********************************************************************
 KA2083  DESIGNATION -  K 81 RESET
 KA2083  PID         -  KA2083
 KA2083  STATE/COUNTY-  IN/OWEN
 KA2083  USGS QUAD   -  CATARACT (1986)
 KA2083
 KA2083                         *CURRENT SURVEY CONTROL
 KA2083  ______________________________________________________________________
 KA2083* NAD 83(1986)-  39 26 32.      (N)     086 47 02.      (W)      SCALED
 KA2083* NAVD 88     -       239.56    (meters)     786.0     (feet)   RESET
 KA2083  ______________________________________________________________________
 KA2083  GEOID HEIGHT-         -32.89  (meters)                          GEOID09
 KA2083  VERT ORDER  -  THIRD
 KA2083
 KA2083.The horizontal coordinates were scaled from a topographic map and have
 KA2083.an estimated accuracy of +/- 6 seconds.
 KA2083
 KA2083.The orthometric height was computed from unverified reset data.
 KA2083
 KA2083.The geoid height was determined by GEOID09.
 KA2083
 KA2083;                    North         East     Units  Estimated Accuracy
 KA2083;SPC IN W     -    465,630.      925,780.      MT   (+/- 180 meters Scaled)
 KA2083
 KA2083                           SUPERSEDED SURVEY CONTROL
 KA2083
 KA2083  NGVD 29 (04/16/04)  239.68   (m)           786.4    (f) RESET       3
 KA2083
 KA2083.Superseded values are not recommended for survey control.
 KA2083.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 KA2083.See file dsdata.txt to determine how the superseded data were derived.
 KA2083
 KA2083_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ185658(NAD 83)
 KA2083_MARKER: DV = VERTICAL CONTROL DISK
 KA2083_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 KA2083_SP_SET: CONCRETE POST
 KA2083_STAMPING: K 81 RESET 1988
 KA2083_MARK LOGO: NGS
 KA2083_MAGNETIC: N = NO MAGNETIC MATERIAL
 KA2083_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 KA2083+STABILITY: SURFACE MOTION
 KA2083_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 KA2083+SATELLITE: SATELLITE OBSERVATIONS - May 12, 2010
 KA2083
 KA2083  HISTORY     - Date     Condition        Report By
 KA2083  HISTORY     - 1988     MONUMENTED       INHD
 KA2083  HISTORY     - 20100512 GOOD             AEROME
 KA2083
 KA2083                           STATION DESCRIPTION
 KA2083
 KA2083'DESCRIBED BY INDIANA HIGHWAY DEPARTMENT 1988
 KA2083'FROM THE POST OFFICE IN CLOVERDALE GO 5.2 MILES (8.4 KM) SOUTH ON US
 KA2083'231, THENCE ABOUT 1.05 MILES (1.69 KM) WEST ALONG AN ASPHALT ROAD
```

KA2083'LEADING TO CATARACT FALLS STATE PARK, 80 FEET (24.4 M) WEST OF THE
KA2083'CENTER OF A FIELD ENTRANCE, 17 FEET (5.2 M) WEST OF A POWER LINE
KA2083'POLE, 46 FEET (14.0 M) NORTH OF AND 3 FEET (0.9 M) LOWER THAN THE
KA2083'CENTERLINE OF THE ROAD, SET IN THE TOP OF A CONCRETE POST PROJECTING
KA2083'10 INCHES ABOVE GROUND.
KA2083
KA2083 STATION RECOVERY (2010)
KA2083
KA2083'RECOVERY NOTE BY AERO METRIC INC 2010
KA2083'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 JZ2225 ***********************************************************************
 JZ2225  CBN         -  This is a Cooperative Base Network Control Station.
 JZ2225  DESIGNATION -  K 268
 JZ2225  PID         -  JZ2225
 JZ2225  STATE/COUNTY-  IN/BARTHOLOMEW
 JZ2225  USGS QUAD   -  ELIZABETHTOWN (1993)
 JZ2225
 JZ2225                        *CURRENT SURVEY CONTROL
 JZ2225  ______________________________________________________________________
 JZ2225* NAD 83(2007)-  39 13 26.47033(N)    085 50 24.88145(W)     ADJUSTED
 JZ2225* NAVD 88     -       194.349  (meters)     637.63   (feet)  ADJUSTED
 JZ2225  ______________________________________________________________________
 JZ2225  EPOCH DATE  -        2002.00
 JZ2225  X           -     358,899.122 (meters)                     COMP
 JZ2225  Y           -  -4,934,728.562 (meters)                     COMP
 JZ2225  Z           -   4,011,715.516 (meters)                     COMP
 JZ2225  LAPLACE CORR-          -2.33  (seconds)                    DEFLEC09
 JZ2225  ELLIP HEIGHT-         160.400 (meters)          (02/10/07) ADJUSTED
 JZ2225  GEOID HEIGHT-         -33.92  (meters)                     GEOID09
 JZ2225  DYNAMIC HT  -         194.229 (meters)     637.23  (feet)  COMP
 JZ2225
 JZ2225  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 JZ2225  Type    PID    Designation                      North   East  Ellip
 JZ2225  ----------------------------------------------------------------------
 JZ2225  NETWORK JZ2225 K 268                             0.73   0.51   1.84
 JZ2225  ----------------------------------------------------------------------
 JZ2225  MODELED GRAV-     980,008.0   (mgal)                       NAVD 88
 JZ2225
 JZ2225  VERT ORDER  -  SECOND    CLASS 0
 JZ2225
 JZ2225.The horizontal coordinates were established by GPS observations
 JZ2225.and adjusted by the National Geodetic Survey in February 2007.
 JZ2225
 JZ2225.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 JZ2225.See National Readjustment for more information.
 JZ2225.The horizontal coordinates are valid at the epoch date displayed above.
 JZ2225.The epoch date for horizontal control is a decimal equivalence
 JZ2225.of Year/Month/Day.
 JZ2225
 JZ2225.The orthometric height was determined by differential leveling and
 JZ2225.adjusted in June 1991.
 JZ2225
 JZ2225.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 JZ2225
 JZ2225.The Laplace correction was computed from DEFLEC09 derived deflections.
 JZ2225
 JZ2225.The ellipsoidal height was determined by GPS observations
 JZ2225.and is referenced to NAD 83.
 JZ2225
 JZ2225.The geoid height was determined by GEOID09.
 JZ2225
 JZ2225.The dynamic height is computed by dividing the NAVD 88
 JZ2225.geopotential number by the normal gravity value computed on the
```

JZ2225.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
JZ2225.degrees latitude (g = 980.6199 gals.).
JZ2225
JZ2225.The modeled gravity was interpolated from observed gravity values.
JZ2225
JZ2225;   North   East   Units Scale Factor Converg.
JZ2225;SPC IN E   -   441,379.936   85,011.571   MT 0.99996943   -0 06 35.1
JZ2225;SPC IN E   - 1,448,094.01   278,908.80   sFT 0.99996943   -0 06 35.1
JZ2225;UTM 16   - 4,342,277.489   600,109.174   MT 0.99972340   +0 44 00.4
JZ2225
JZ2225!   - Elev Factor x Scale Factor =   Combined Factor
JZ2225!SPC IN E   -   0.99997484 x   0.99996943 =   0.99994427
JZ2225!UTM 16   -   0.99997484 x   0.99972340 =   0.99969824
JZ2225
JZ2225   SUPERSEDED SURVEY CONTROL
JZ2225
JZ2225 NAD 83(1997)- 39 13 26.47053(N)   085 50 24.88135(W) AD(   ) B
JZ2225 ELLIP H (04/10/98) 160.415 (m)   GP(   ) 4 1
JZ2225 NAVD 88 (04/10/98) 194.35   (m)   637.6   (f) LEVELING   3
JZ2225 NGVD 29 (??/??/92) 194.472 (m)   638.03   (f) ADJ UNCH   2 0
JZ2225
JZ2225.Superseded values are not recommended for survey control.
JZ2225.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
JZ2225.See file dsdata.txt to determine how the superseded data were derived.
JZ2225
JZ2225_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SFJ0010942277(NAD 83)
JZ2225_MARKER: DB = BENCH MARK DISK
JZ2225_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
JZ2225_SP_SET: SET IN TOP OF CONCRETE MONUMENT
JZ2225_STAMPING: K 268 1947
JZ2225_MARK LOGO: CGS
JZ2225_PROJECTION: FLUSH
JZ2225_MAGNETIC: N = NO MAGNETIC MATERIAL
JZ2225_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
JZ2225+STABILITY: SURFACE MOTION
JZ2225_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
JZ2225+SATELLITE: SATELLITE OBSERVATIONS - March 17, 2010
JZ2225
JZ2225 HISTORY   - Date   Condition   Report By
JZ2225 HISTORY   - 1947   MONUMENTED   CGS
JZ2225 HISTORY   - 19970819 GOOD   SEC
JZ2225 HISTORY   - 20010529 GOOD   WOOLPT
JZ2225 HISTORY   - 20100317 GOOD   AEROME
JZ2225
JZ2225   STATION DESCRIPTION
JZ2225
JZ2225'DESCRIBED BY COAST AND GEODETIC SURVEY 1947
JZ2225'1.1 MI W FROM PETERSVILLE.
JZ2225'ABOUT 1.1 MILE WEST ALONG STATE HIGHWAY 46 FROM THE CROSSROADS
JZ2225'AT PETERSVILLE, ABOUT 35 YARDS NORTHEAST AND ACROSS THE HIGHWAY
JZ2225'FROM A SINCLAIR SERVICE STATION AND STORE, AT THE JUNCTION WITH
JZ2225'A FARM ROAD LEADING NORTH TO GEORGE ROBERTSONS FARM HOUSE, 30
JZ2225'FEET NORTH OF THE CENTER LINE OF THE HIGHWAY, 24 FEET WEST OF THE
JZ2225'CENTER LINE OF THE FARM ROAD, 8 FEET WEST OF A CONCRETE FENCE
JZ2225'POST, 88 FEET EAST OF TELEPHONE POLE NUMBER 104, 1 FOOT SOUTH
JZ2225'OF A FENCE LINE, 2 FEET EAST OF A WHITE WOODEN WITNESS POST,
JZ2225'ABOUT LEVEL WITH THE HIGHWAY AND SET IN THE TOP OF A CONCRETE
JZ2225'POST PROJECTING ABOUT 5 INCHES.
JZ2225
JZ2225   STATION RECOVERY (1997)
JZ2225
JZ2225'RECOVERY NOTE BY SCHNEIDER ENGINEERING CORPORATION 1997 (RGR)
JZ2225'THE STATION IS LOCATED AT 5.95 KM (3.70 MI) WEST OF THE JUNCTION OF
JZ2225'STATE ROAD 9 AND HIGHWAY 46, ALONG THE NORTH SIDE OF HIGHWAY 46, WEST
JZ2225'OF A DRIVEWAY AND ACROSS FROM BUSHS MARKET. OWNERSHIP--STATE OF
JZ2225'INDIANA. CONTACT IS HENRY ALDRIDGE, 317-232-6764, INDOT. IT IS 7.62

```
JZ2225'METERS (25.00 FT) WEST OF THE CENTER OF A DRIVEWAY ENTRANCE TO
JZ2225'PROPERTY OWNED BY TIM ECKLEMAN, 9.14 METERS (29.99 FT) NORTH OF
JZ2225'HIGHWAY 46 CENTERLINE, 2.26 METERS (7.41 FT) WEST OF THE CENTER OF A
JZ2225'CONCRETE GATE POST WEST OF THE DRIVEWAY, 26.76 METERS (87.80 FT) EAST
JZ2225'OF A TELEPHONE POLE, FLUSH WITH GROUND AND ABOUT 6 INCHES BELOW THE
JZ2225'LEVEL OF THE ROAD.
JZ2225
JZ2225                          STATION RECOVERY (2001)
JZ2225
JZ2225'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2001 (BJM)
JZ2225'RECOVERED AS DESCRIBED.
JZ2225'
JZ2225
JZ2225                          STATION RECOVERY (2010)
JZ2225
JZ2225'RECOVERY NOTE BY AERO METRIC INC 2010
JZ2225'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 LB1420 ***********************************************************************
 LB1420  DESIGNATION -  M 107
 LB1420  PID         -  LB1420
 LB1420  STATE/COUNTY-  IN/JASPER
 LB1420  USGS QUAD   -  REMINGTON (1980)
 LB1420
 LB1420                        *CURRENT SURVEY CONTROL
 LB1420  ______________________________________________________________________
 LB1420* NAD 83(1986)-  40 52 00.      (N)    087 09 17.      (W)      SCALED
 LB1420* NAVD 88     -       204.949  (meters)     672.40    (feet)   ADJUSTED
 LB1420  ______________________________________________________________________
 LB1420  GEOID HEIGHT-         -33.47  (meters)                        GEOID09
 LB1420  DYNAMIC HT  -         204.859 (meters)     672.11    (feet)   COMP
 LB1420  MODELED GRAV-     980,179.9   (mgal)                          NAVD 88
 LB1420
 LB1420  VERT ORDER  -  SECOND    CLASS 0
 LB1420
 LB1420.The horizontal coordinates were scaled from a topographic map and have
 LB1420.an estimated accuracy of +/- 6 seconds.
 LB1420
 LB1420.The orthometric height was determined by differential leveling and
 LB1420.adjusted in June 1991.
 LB1420
 LB1420.The geoid height was determined by GEOID09.
 LB1420
 LB1420.The dynamic height is computed by dividing the NAVD 88
 LB1420.geopotential number by the normal gravity value computed on the
 LB1420.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 LB1420.degrees latitude (g = 980.6199 gals.).
 LB1420
 LB1420.The modeled gravity was interpolated from observed gravity values.
 LB1420
 LB1420;                    North         East     Units  Estimated Accuracy
 LB1420;SPC IN W     -   623,750.      893,980.      MT   (+/- 180 meters Scaled)
 LB1420
 LB1420                          SUPERSEDED SURVEY CONTROL
 LB1420
 LB1420  NGVD 29 (??/??/92)  205.032  (m)          672.68    (f) ADJ UNCH    2 0
 LB1420
 LB1420.Superseded values are not recommended for survey control.
 LB1420.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 LB1420.See file dsdata.txt to determine how the superseded data were derived.
 LB1420
 LB1420_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TDL869239(NAD 83)
 LB1420_MARKER: DB = BENCH MARK DISK
 LB1420_SETTING: 30 = SET IN A LIGHT STRUCTURE
 LB1420_SP_SET: CULVERT
 LB1420_STAMPING: M 107 1946
 LB1420_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
 LB1420_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 LB1420+SATELLITE: SATELLITE OBSERVATIONS - March 10, 2010
 LB1420
 LB1420  HISTORY     - Date     Condition        Report By
```

```
LB1420  HISTORY     - 1946     MONUMENTED       CGS
LB1420  HISTORY     - 20071110 GOOD             GEOCAC
LB1420  HISTORY     - 20080808 GOOD             GEOCAC
LB1420  HISTORY     - 20100310 GOOD             AEROME
LB1420
LB1420                          STATION DESCRIPTION
LB1420
LB1420'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
LB1420'7.4 MI E FROM FORESMAN.
LB1420'ABOUT 7.35 MILES EAST ALONG STATE HIGHWAY 16 FROM BROWNS STORE AT
LB1420'FORESMAN, ABOUT 4.9 MILE SOUTH ALONG STATE HIGHWAY 53 FROM THE
LB1420'COURT HOUSE AT RENSSELAER, ABOUT 7.0 MILES NORTH OF REMINGTON,
LB1420'AT THE INTERSECTION OF STATE HIGHWAY 16 AND 53, 190 FEET WEST
LB1420'OF THE CENTER OF THE INTERSECTION, 21 FEET NORTH OF THE CENTER
LB1420'LINE OF HIGHWAY 16, SET IN THE TOP OF THE EAST END OF THE NORTH
LB1420'CONCRETE HEADWALL OF 16-INCH PIPE CULVERT NUMBER 58, AND ABOUT
LB1420'LEVEL WITH THE HIGHWAY.
LB1420
LB1420                          STATION RECOVERY (2007)
LB1420
LB1420'RECOVERY NOTE BY GEOCACHING 2007 (BPS)
LB1420'RECOVERED IN GOOD CONDITION.
LB1420
LB1420                          STATION RECOVERY (2008)
LB1420
LB1420'RECOVERY NOTE BY GEOCACHING 2008 (BPS)
LB1420'RECOVERED IN GOOD CONDITION.
LB1420
LB1420                          STATION RECOVERY (2010)
LB1420
LB1420'RECOVERY NOTE BY AERO METRIC INC 2010
LB1420'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA1732 ***********************************************************************
 KA1732  DESIGNATION -  M 360
 KA1732  PID         -  KA1732
 KA1732  STATE/COUNTY-  IN/VIGO
 KA1732  USGS QUAD   -  NEW GOSHEN (1986)
 KA1732
 KA1732                         *CURRENT SURVEY CONTROL
 KA1732  ______________________________________________________________________
 KA1732* NAD 83(1986)-  39 35 25.      (N)    087 26 14.      (W)     SCALED
 KA1732* NAVD 88     -       179.778   (meters)     589.82    (feet)  ADJUSTED
 KA1732  ______________________________________________________________________
 KA1732  GEOID HEIGHT-          -32.67  (meters)                       GEOID09
 KA1732  DYNAMIC HT  -          179.677 (meters)      589.49   (feet)  COMP
 KA1732  MODELED GRAV-      980,062.7   (mgal)                         NAVD 88
 KA1732
 KA1732  VERT ORDER  -  FIRST     CLASS II
 KA1732
 KA1732.The horizontal coordinates were scaled from a topographic map and have
 KA1732.an estimated accuracy of +/- 6 seconds.
 KA1732
 KA1732.The orthometric height was determined by differential leveling and
 KA1732.adjusted in June 1991.
 KA1732
 KA1732.The geoid height was determined by GEOID09.
 KA1732
 KA1732.The dynamic height is computed by dividing the NAVD 88
 KA1732.geopotential number by the normal gravity value computed on the
 KA1732.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 KA1732.degrees latitude (g = 980.6199 gals.).
 KA1732
 KA1732.The modeled gravity was interpolated from observed gravity values.
 KA1732
 KA1732;                    North         East     Units  Estimated Accuracy
 KA1732;SPC IN W     -   482,090.      869,600.      MT  (+/- 180 meters Scaled)
 KA1732
 KA1732                           SUPERSEDED SURVEY CONTROL
 KA1732
 KA1732.No superseded survey control is available for this station.
 KA1732
 KA1732_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SDJ624823(NAD 83)
 KA1732_MARKER: I = METAL ROD
 KA1732_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
 KA1732_SP_SET: STAINLESS STEEL ROD
 KA1732_STAMPING: M 360 1986
 KA1732_MARK LOGO: NGS
 KA1732_PROJECTION: PROJECTING 3 CENTIMETERS
 KA1732_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 KA1732_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 KA1732+SATELLITE: SATELLITE OBSERVATIONS - May 13, 2010
 KA1732_ROD/PIPE-DEPTH: 13.1 meters
 KA1732
 KA1732  HISTORY     - Date     Condition        Report By
 KA1732  HISTORY     - 1986     MONUMENTED       NGS
```

KA1732 HISTORY   - 20100513 GOOD   AEROME
KA1732
KA1732   STATION DESCRIPTION
KA1732
KA1732'DESCRIBED BY NATIONAL GEODETIC SURVEY 1986
KA1732'7.6 KM (4.7 MI) SOUTH FROM CLINTON.
KA1732'7.6 KM (4.7 MI) SOUTHERLY ALONG STATE HIGHWAY 63 FROM ITS JUNCTION
KA1732'WITH STATE HIGHWAY 163 IN CLINTON, 1.2 KM (0.75 MI) SOUTH OF THE
KA1732'INTERSECTION OF WEST ROAD LEADING EAST TO SHEPARDSVILLE, 74.1 M (243.1
KA1732'FT) NORTH OF THE CENTER OF NORTH ROAD, 18.8 M (61.7 FT) EAST OF THE
KA1732'CENTERLINE OF THE NORTH BOUND LANES OF THE HIGHWAY, AND 14.2 M (46.6
KA1732'FT) SOUTH OF A LONE COTTONWOOD TREE. NOTE--ACCESS TO DATUM POINT IS
KA1732'HAD THROUGH A 5-INCH LOGO CAP.
KA1732'THE MARK IS 0.4 METERS W FROM A WITNESS POST AND FENCE
KA1732'THE MARK IS 0.6 M ABOVE THE HIGHWAY.
KA1732
KA1732   STATION RECOVERY (2010)
KA1732
KA1732'RECOVERY NOTE BY AERO METRIC INC 2010 (MB)
KA1732'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA0393 ***********************************************************************
 KA0393  CBN         -  This is a Cooperative Base Network Control Station.
 KA0393  DESIGNATION -  N 13
 KA0393  PID         -  KA0393
 KA0393  STATE/COUNTY-  IN/MORGAN
 KA0393  USGS QUAD   -  PARAGON (1987)
 KA0393
 KA0393                        *CURRENT SURVEY CONTROL
 KA0393  ______________________________________________________________________
 KA0393* NAD 83(2007)-  39 24 26.35855(N)    086 30 42.28154(W)     ADJUSTED
 KA0393* NAVD 88     -       180.749  (meters)     593.01   (feet)  ADJUSTED
 KA0393  ______________________________________________________________________
 KA0393  EPOCH DATE  -        2002.00
 KA0393  X           -     300,256.209 (meters)                     COMP
 KA0393  Y           -  -4,925,715.717 (meters)                     COMP
 KA0393  Z           -   4,027,452.386 (meters)                     COMP
 KA0393  LAPLACE CORR-          -0.21  (seconds)                    DEFLEC09
 KA0393  ELLIP HEIGHT-         147.757 (meters)          (02/10/07) ADJUSTED
 KA0393  GEOID HEIGHT-         -32.98  (meters)                     GEOID09
 KA0393  DYNAMIC HT  -         180.646 (meters)     592.67  (feet)  COMP
 KA0393
 KA0393  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KA0393  Type    PID    Designation                       North   East  Ellip
 KA0393  ----------------------------------------------------------------------
 KA0393  NETWORK KA0393 N 13                               0.80   0.57   1.94
 KA0393  ----------------------------------------------------------------------
 KA0393  MODELED GRAV-     980,052.3   (mgal)                       NAVD 88
 KA0393
 KA0393  VERT ORDER  -  FIRST     CLASS II
 KA0393
 KA0393.The horizontal coordinates were established by GPS observations
 KA0393.and adjusted by the National Geodetic Survey in February 2007.
 KA0393
 KA0393.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KA0393.See National Readjustment for more information.
 KA0393.The horizontal coordinates are valid at the epoch date displayed above.
 KA0393.The epoch date for horizontal control is a decimal equivalence
 KA0393.of Year/Month/Day.
 KA0393
 KA0393.The orthometric height was determined by differential leveling and
 KA0393.adjusted in June 1991.
 KA0393
 KA0393.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KA0393
 KA0393.The Laplace correction was computed from DEFLEC09 derived deflections.
 KA0393
 KA0393.The ellipsoidal height was determined by GPS observations
 KA0393.and is referenced to NAD 83.
 KA0393
 KA0393.The geoid height was determined by GEOID09.
 KA0393
 KA0393.The dynamic height is computed by dividing the NAVD 88
 KA0393.geopotential number by the normal gravity value computed on the
```

KA0393.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
KA0393.degrees latitude (g = 980.6199 gals.).
KA0393
KA0393.The modeled gravity was interpolated from observed gravity values.
KA0393
KA0393;   North   East   Units Scale Factor Converg.
KA0393;SPC IN W   -   461,871.283   949,228.026   MT 0.99999649   +0 21 46.3
KA0393;SPC IN W   - 1,515,322.70 3,114,258.95   sFT 0.99999649   +0 21 46.3
KA0393;UTM 16   - 4,362,092.810   542,035.491   MT 0.99962176   +0 18 35.9
KA0393
KA0393!   - Elev Factor x Scale Factor =   Combined Factor
KA0393!SPC IN W   -   0.99997682 x   0.99999649 =   0.99997331
KA0393!UTM 16   -   0.99997682 x   0.99962176 =   0.99959859
KA0393
KA0393   SUPERSEDED SURVEY CONTROL
KA0393
KA0393 NAD 83(1997)- 39 24 26.35867(N)   086 30 42.28161(W) AD(   ) B
KA0393 ELLIP H (04/10/98) 147.766 (m)   GP(   ) 4 1
KA0393 NAVD 88 (04/10/98) 180.75   (m)   593.0   (f) LEVELING   3
KA0393 NGVD 29 (??/??/92) 180.877 (m)   593.43   (f) ADJ UNCH   1 2
KA0393
KA0393.Superseded values are not recommended for survey control.
KA0393.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KA0393.See file dsdata.txt to determine how the superseded data were derived.
KA0393
KA0393_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ4203562092(NAD 83)
KA0393_MARKER: DB = BENCH MARK DISK
KA0393_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KA0393_SP_SET: SET IN TOP OF CONCRETE MONUMENT
KA0393_STAMPING: N 13 1930 593.427
KA0393_MARK LOGO: CGS
KA0393_MAGNETIC: N = NO MAGNETIC MATERIAL
KA0393_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KA0393+STABILITY: SURFACE MOTION
KA0393_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KA0393+SATELLITE: SATELLITE OBSERVATIONS - May 12, 2010
KA0393
KA0393 HISTORY   - Date   Condition   Report By
KA0393 HISTORY   - 1930   MONUMENTED   CGS
KA0393 HISTORY   - 1946   GOOD   NGS
KA0393 HISTORY   - 19970818 GOOD   SEC
KA0393 HISTORY   - 20100512 GOOD   AEROME
KA0393
KA0393   STATION DESCRIPTION
KA0393
KA0393'DESCRIBED BY NATIONAL GEODETIC SURVEY 1946
KA0393'3.1 MI NE FROM PARAGON.
KA0393'3.1 MILES NORTHEAST ALONG THE PENNSYLVANIA RAILROAD FROM THE
KA0393'STATION AT PARAGON, MORGAN COUNTY, 0.5 MILE WEST OF BROWNS
KA0393'CROSSING, OPPOSITE POLE 35-30, AT A ROAD CROSSING NEAR BRIDGE
KA0393'35/65, 57 FEET EAST OF THE CENTERLINE OF THE ROAD, 23.4 FEET
KA0393'SOUTH OF THE SOUTH RAIL, AND 1.5 FEET NORTH OF A WHITE WOODEN
KA0393'WITNESS POST. A STANDARD DISK, STAMPED 593.427 N 13 1930
KA0393'AND SET IN THE TOP OF A CONCRETE POST PROJECTING 3 INCHES ABOVE
KA0393'GROUND.
KA0393
KA0393   STATION RECOVERY (1997)
KA0393
KA0393'RECOVERY NOTE BY SCHNEIDER ENGINEERING CORPORATION 1997 (RGR)
KA0393'THE STATION IS LOCATED 3 MILES (4.8 KM) NORTHEAST OF PARAGON AND 5
KA0393'MILES (8.0 KM) SOUTHWEST OF MARTINSVILLE. FROM THE INTERSECTION OF
KA0393'STATE HIGHWAYS 39 AND 67 AT THE NORTHWEST SIDE OF MARTINSVILLE, GO
KA0393'SOUTHWEST ON STATE HIGHWAY 67 FOR 3.7 MILES (6.0 KM) TO A CROSSROAD
KA0393'(COUNTY ROAD 450 WEST OR BUFFALO ROAD). TURN LEFT, SOUTH ON COUNTY
KA0393'ROAD 450 WEST AND CROSS RAILROAD TRACKS TO THE STATION ON LEFT.
KA0393'STATION IS IN THE RIGHT-OF-WAY OF CONRAIL RAILROAD, AVON DIVISION,

KA0393'SUPERINTENDENT 317-838-3200. THE STATION IS SET IN A SQUARE CONCRETE
KA0393'MONUMENT. IT IS 73.40 METERS (240.81 FT) WEST OF POWER POLE 855-6591,
KA0393'29.12 METERS (95.54 FT) SOUTH OF THE CENTERLINE OF STATE HIGHWAY 67,
KA0393'16.61 METERS (54.49 FT) EAST OF THE CENTERLINE OF COUNTY ROAD 450
KA0393'WEST, 7.92 METERS (25.98 FT) NORTHEAST OF POWER POLE 855-6590, 7.07 M
KA0393'(23.2 FT) SOUTH OF SOUTHERNMOST RAILROAD AND ABOUT 0.9 METERS (3.0 FT)
KA0393'BELOW LEVEL OF TRACKS.
KA0393
KA0393 STATION RECOVERY (2010)
KA0393
KA0393'RECOVERY NOTE BY AERO METRIC INC 2010
KA0393'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 LB1306 ***********************************************************************
 LB1306  DESIGNATION -  NEW L 5
 LB1306  PID         -  LB1306
 LB1306  STATE/COUNTY-  IN/NEWTON
 LB1306  USGS QUAD   -  MOUNT AYR (1980)
 LB1306
 LB1306                        *CURRENT SURVEY CONTROL
 LB1306  ______________________________________________________________________
 LB1306* NAD 83(1986)-  40 52 43.      (N)    087 18 24.      (W)      SCALED
 LB1306* NAVD 88     -       197.731   (meters)     648.72    (feet)   ADJUSTED
 LB1306  ______________________________________________________________________
 LB1306  GEOID HEIGHT-         -33.30  (meters)                        GEOID09
 LB1306  DYNAMIC HT  -         197.644 (meters)     648.44    (feet)   COMP
 LB1306  MODELED GRAV-     980,182.4   (mgal)                          NAVD 88
 LB1306
 LB1306  VERT ORDER  -  SECOND    CLASS 0
 LB1306
 LB1306.The horizontal coordinates were scaled from a topographic map and have
 LB1306.an estimated accuracy of +/- 6 seconds.
 LB1306
 LB1306.The orthometric height was determined by differential leveling and
 LB1306.adjusted in June 1991.
 LB1306
 LB1306.The geoid height was determined by GEOID09.
 LB1306
 LB1306.The dynamic height is computed by dividing the NAVD 88
 LB1306.geopotential number by the normal gravity value computed on the
 LB1306.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 LB1306.degrees latitude (g = 980.6199 gals.).
 LB1306
 LB1306.The modeled gravity was interpolated from observed gravity values.
 LB1306
 LB1306;                    North         East     Units  Estimated Accuracy
 LB1306;SPC IN W     -   625,100.      881,180.      MT  (+/- 180 meters Scaled)
 LB1306
 LB1306                          SUPERSEDED SURVEY CONTROL
 LB1306
 LB1306  NGVD 29 (??/??/92)  197.809  (m)          648.98    (f) ADJ UNCH    2 0
 LB1306
 LB1306.Superseded values are not recommended for survey control.
 LB1306.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 LB1306.See file dsdata.txt to determine how the superseded data were derived.
 LB1306
 LB1306_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TDL741253(NAD 83)
 LB1306_MARKER: DD = SURVEY DISK
 LB1306_SETTING: 36 = SET IN A MASSIVE STRUCTURE
 LB1306_SP_SET: BRIDGE
 LB1306_STAMPING: NEW L 5
 LB1306_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 LB1306_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 LB1306+SATELLITE: SATELLITE OBSERVATIONS - March 10, 2010
 LB1306
 LB1306  HISTORY     - Date     Condition        Report By
```

```
LB1306  HISTORY     - UNK      MONUMENTED       INHD
LB1306  HISTORY     - 1946     GOOD             NGS
LB1306  HISTORY     - 20080921 GOOD             GEOCAC
LB1306  HISTORY     - 20100310 GOOD             AEROME
LB1306
LB1306                          STATION DESCRIPTION
LB1306
LB1306'DESCRIBED BY NATIONAL GEODETIC SURVEY 1946
LB1306'5.7 MI S FROM MT AYR.
LB1306'ABOUT 5.7 MILES SOUTH ALONG STATE HIGHWAY 55 FROM THE SCHOOL
LB1306'BUILDING AT MT. AYR, ABOUT 0.9 MILE NORTH OF THE INTERSECTION
LB1306'WITH STATE HGIHWAY 16, SET IN THE TOP OF THE NORTHWEST WINGWALL
LB1306'OF A 20-FOOT CONCRETE BRIDGE (THE SECOND CONCRETE BRIDGE SOUTH
LB1306'OF SILVER GATES FARM), ABOUT 0.5 FOOT ABOVE HIGHWAY LEVEL.
LB1306
LB1306                          STATION RECOVERY (2008)
LB1306
LB1306'RECOVERY NOTE BY GEOCACHING 2008 (BPS)
LB1306'RECOVERED IN GOOD CONDITION.
LB1306
LB1306                          STATION RECOVERY (2010)
LB1306
LB1306'RECOVERY NOTE BY AERO METRIC INC 2010
LB1306'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 ME1419 ***********************************************************************
 ME1419  DESIGNATION -  P 157
 ME1419  PID         -  ME1419
 ME1419  STATE/COUNTY-  IN/JASPER
 ME1419  USGS QUAD   -  PARR (1980)
 ME1419
 ME1419                         *CURRENT SURVEY CONTROL
 ME1419  ______________________________________________________________________
 ME1419* NAD 83(1986)-  41 01 38.      (N)     087 11 57.      (W)      SCALED
 ME1419* NAVD 88     -       209.273   (meters)      686.59    (feet)   ADJUSTED
 ME1419  ______________________________________________________________________
 ME1419  GEOID HEIGHT-          -33.51  (meters)                         GEOID09
 ME1419  DYNAMIC HT  -          209.183 (meters)      686.29    (feet)   COMP
 ME1419  MODELED GRAV-      980,189.5   (mgal)                           NAVD 88
 ME1419
 ME1419  VERT ORDER  -  SECOND    CLASS 0
 ME1419
 ME1419.The horizontal coordinates were scaled from a topographic map and have
 ME1419.an estimated accuracy of +/- 6 seconds.
 ME1419
 ME1419.The orthometric height was determined by differential leveling and
 ME1419.adjusted in June 1991.
 ME1419
 ME1419.The geoid height was determined by GEOID09.
 ME1419
 ME1419.The dynamic height is computed by dividing the NAVD 88
 ME1419.geopotential number by the normal gravity value computed on the
 ME1419.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 ME1419.degrees latitude (g = 980.6199 gals.).
 ME1419
 ME1419.The modeled gravity was interpolated from observed gravity values.
 ME1419
 ME1419;                    North         East     Units  Estimated Accuracy
 ME1419;SPC IN W     -    641,590.      890,260.      MT  (+/- 180 meters Scaled)
 ME1419
 ME1419                          SUPERSEDED SURVEY CONTROL
 ME1419
 ME1419  NGVD 29 (??/??/92)  209.359  (m)           686.87   (f) ADJ UNCH    2 0
 ME1419
 ME1419.Superseded values are not recommended for survey control.
 ME1419.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 ME1419.See file dsdata.txt to determine how the superseded data were derived.
 ME1419
 ME1419_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TDL832417(NAD 83)
 ME1419_MARKER: DB = BENCH MARK DISK
 ME1419_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 ME1419_SP_SET: SET IN TOP OF CONCRETE MONUMENT
 ME1419_STAMPING: P 157 1946
 ME1419_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 ME1419+STABILITY: SURFACE MOTION
 ME1419_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 ME1419+SATELLITE: SATELLITE OBSERVATIONS - March 10, 2010
 ME1419
```

ME1419 HISTORY   - Date   Condition   Report By
ME1419 HISTORY   - 1946   MONUMENTED   CGS
ME1419 HISTORY   - 20080921 GOOD   GEOCAC
ME1419 HISTORY   - 20100310 GOOD   AEROME
ME1419
ME1419   STATION DESCRIPTION
ME1419
ME1419'DESCRIBED BY COAST AND GEODETIC SURVEY 1946
ME1419'1 MI E FROM PARR.
ME1419'ABOUT 1.0 MILE EAST ALONG STATE HIGHWAY 14 FROM THE CROSS ROADS
ME1419'AT PARR, AT THE JUNCTION WITH A ROAD LEADING NORTH, 32 FEET
ME1419'NORTH OF THE CENTER LINE OF THE HIGHWAY, 49 FEET EAST OF THE
ME1419'CENTER LINE OF THE ROAD LEADING NORTH, 6 FEET EAST OF A CONCRETE
ME1419'CORNER FENCE POST, 1 FOOT SOUTH OF A WIRE FENCE, 0.5 FOOT BELOW THE
ME1419'LEVEL OF THE HIGHWAY, SET IN THE TOP OF A CONCRETE POST PROJECTING
ME1419'5 INCHES.
ME1419
ME1419   STATION RECOVERY (2008)
ME1419
ME1419'RECOVERY NOTE BY GEOCACHING 2008 (BPS)
ME1419'RECOVERED IN GOOD CONDITION.
ME1419
ME1419   STATION RECOVERY (2010)
ME1419
ME1419'RECOVERY NOTE BY AERO METRIC INC 2010
ME1419'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 HZ1690 ***********************************************************************
 HZ1690  DESIGNATION -  Q 60 X
 HZ1690  PID         -  HZ1690
 HZ1690  STATE/COUNTY-  IN/JACKSON
 HZ1690  USGS QUAD   -  CHESTNUT RIDGE (1983)
 HZ1690
 HZ1690                         *CURRENT SURVEY CONTROL
 HZ1690  ______________________________________________________________________
 HZ1690* NAD 83(1986)-  38 55 37.      (N)    085 52 17.      (W)     SCALED
 HZ1690* NAVD 88     -       177.384   (meters)     581.97    (feet)  ADJUSTED
 HZ1690  ______________________________________________________________________
 HZ1690  GEOID HEIGHT-         -33.84  (meters)                       GEOID09
 HZ1690  DYNAMIC HT  -         177.271 (meters)     581.60    (feet)  COMP
 HZ1690  MODELED GRAV-     979,991.4   (mgal)                         NAVD 88
 HZ1690
 HZ1690  VERT ORDER  -  SECOND    CLASS 0
 HZ1690
 HZ1690.The horizontal coordinates were scaled from a topographic map and have
 HZ1690.an estimated accuracy of +/- 6 seconds.
 HZ1690
 HZ1690.The orthometric height was determined by differential leveling and
 HZ1690.adjusted in June 1991.
 HZ1690
 HZ1690.The geoid height was determined by GEOID09.
 HZ1690
 HZ1690.The dynamic height is computed by dividing the NAVD 88
 HZ1690.geopotential number by the normal gravity value computed on the
 HZ1690.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 HZ1690.degrees latitude (g = 980.6199 gals.).
 HZ1690
 HZ1690.The modeled gravity was interpolated from observed gravity values.
 HZ1690
 HZ1690;                    North         East     Units  Estimated Accuracy
 HZ1690;SPC IN E     -   408,410.       82,250.      MT  (+/- 180 meters Scaled)
 HZ1690
 HZ1690                          SUPERSEDED SURVEY CONTROL
 HZ1690
 HZ1690  NGVD 29 (??/??/92)  177.504  (m)          582.36   (f) ADJ UNCH    2 0
 HZ1690
 HZ1690.Superseded values are not recommended for survey control.
 HZ1690.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 HZ1690.See file dsdata.txt to determine how the superseded data were derived.
 HZ1690
 HZ1690_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ978092(NAD 83)
 HZ1690_MARKER: DB = BENCH MARK DISK
 HZ1690_SETTING: 36 = SET IN A MASSIVE STRUCTURE
 HZ1690_SP_SET: ABUTMENT
 HZ1690_STAMPING: Q 60 X 1934
 HZ1690_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 HZ1690_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 HZ1690+SATELLITE: SATELLITE OBSERVATIONS - March 16, 2010
 HZ1690
 HZ1690  HISTORY     - Date     Condition        Report By
```

HZ1690 HISTORY   - 1934   MONUMENTED   CGS
HZ1690 HISTORY   - 20030915 GOOD   INDIV
HZ1690 HISTORY   - 20100316 GOOD   AEROME
HZ1690
HZ1690   STATION DESCRIPTION
HZ1690
HZ1690'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
HZ1690'2.3 MI S FROM SEYMOUR.
HZ1690'2.3 MILES SOUTH ALONG THE PENNSYLVANIA RAILROAD FROM THE
HZ1690'STATION AT SEYMOUR, JACKSON COUNTY, 0.3 MILE SOUTH OF MILEPOST
HZ1690'61, AT A DIRTROAD CROSSING, 6 RAILS NORTH OF THE CENTERLINE OF
HZ1690'THE ROAD, 9.5 FEET EAST OF THE EAST RAIL, AT BRIDGE NO. 61/30,
HZ1690'IN THE TOP OF THE SOUTH END OF THE EAST ABUTMENT, 2.7 FEET
HZ1690'SOUTH OF THE NORTH END OF THE ABUTMENT, AND ABOUT 1-1/2 FEET
HZ1690'HIGHER THAN THE TRACK. A STANDARD DISK, STAMPED Q 60 X 1934.
HZ1690
HZ1690   STATION RECOVERY (2003)
HZ1690
HZ1690'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2003 (JRW)
HZ1690'THE DIRT ROAD CROSSING IS NOW PAVED, AND THE STATION IS ABOUT 0.8 M
HZ1690'(2.5 FT) LOWER THAN THE TRACK. THE DISK IS CURRENTLY STABLE BUT THE
HZ1690'CONCRETE HEADWALL IS DETERIORATING AND THE DISK MAY COME LOOSE IN THE
HZ1690'FUTURE.
HZ1690
HZ1690   STATION RECOVERY (2010)
HZ1690
HZ1690'RECOVERY NOTE BY AERO METRIC INC 2010
HZ1690'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA0405 ***********************************************************************
 KA0405  CBN         -  This is a Cooperative Base Network Control Station.
 KA0405  DESIGNATION -  S 280
 KA0405  PID         -  KA0405
 KA0405  STATE/COUNTY-  IN/GREENE
 KA0405  USGS QUAD   -  SOLSBERRY (1983)
 KA0405
 KA0405                        *CURRENT SURVEY CONTROL
 KA0405  ______________________________________________________________________
 KA0405* NAD 83(2007)-  39 00 57.25631(N)    086 50 24.41395(W)     ADJUSTED
 KA0405* NAVD 88     -       204.997  (meters)     672.56   (feet)  ADJUSTED
 KA0405  ______________________________________________________________________
 KA0405  EPOCH DATE  -        2002.00
 KA0405  X           -     273,536.847 (meters)                     COMP
 KA0405  Y           -  -4,954,804.979 (meters)                     COMP
 KA0405  Z           -   3,993,797.397 (meters)                     COMP
 KA0405  LAPLACE CORR-          -1.82  (seconds)                    DEFLEC09
 KA0405  ELLIP HEIGHT-         172.126 (meters)          (02/10/07) ADJUSTED
 KA0405  GEOID HEIGHT-         -32.87  (meters)                     GEOID09
 KA0405  DYNAMIC HT  -         204.870 (meters)     672.14  (feet)  COMP
 KA0405
 KA0405  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 KA0405  Type    PID    Designation                      North   East  Ellip
 KA0405  ----------------------------------------------------------------------
 KA0405  NETWORK KA0405 S 280                             0.65   0.47   1.65
 KA0405  ----------------------------------------------------------------------
 KA0405  MODELED GRAV-     980,002.1   (mgal)                       NAVD 88
 KA0405
 KA0405  VERT ORDER  -  FIRST     CLASS II
 KA0405
 KA0405.The horizontal coordinates were established by GPS observations
 KA0405.and adjusted by the National Geodetic Survey in February 2007.
 KA0405
 KA0405.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 KA0405.See National Readjustment for more information.
 KA0405.The horizontal coordinates are valid at the epoch date displayed above.
 KA0405.The epoch date for horizontal control is a decimal equivalence
 KA0405.of Year/Month/Day.
 KA0405
 KA0405.The orthometric height was determined by differential leveling and
 KA0405.adjusted in June 1991.
 KA0405
 KA0405.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 KA0405
 KA0405.The Laplace correction was computed from DEFLEC09 derived deflections.
 KA0405
 KA0405.The ellipsoidal height was determined by GPS observations
 KA0405.and is referenced to NAD 83.
 KA0405
 KA0405.The geoid height was determined by GEOID09.
 KA0405
 KA0405.The dynamic height is computed by dividing the NAVD 88
 KA0405.geopotential number by the normal gravity value computed on the
```

KA0405.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
KA0405.degrees latitude (g = 980.6199 gals.).
KA0405
KA0405.The modeled gravity was interpolated from observed gravity values.
KA0405
KA0405;   North   East   Units Scale Factor Converg.
KA0405;SPC IN W   -   418,290.030   921,063.724   MT 0.99997213   +0 09 11.2
KA0405;SPC IN W   - 1,372,339.87 3,021,856.57   sFT 0.99997213   +0 09 11.2
KA0405;UTM 16   - 4,318,553.686   513,841.627   MT 0.99960236   +0 06 02.4
KA0405
KA0405!   - Elev Factor x Scale Factor =   Combined Factor
KA0405!SPC IN W   -   0.99997299 x   0.99997213 =   0.99994513
KA0405!UTM 16   -   0.99997299 x   0.99960236 =   0.99957537
KA0405
KA0405   SUPERSEDED SURVEY CONTROL
KA0405
KA0405 NAD 83(1997)- 39 00 57.25641(N)   086 50 24.41413(W) AD(   ) B
KA0405 ELLIP H (04/10/98) 172.133 (m)   GP(   ) 4 1
KA0405 NAVD 88 (04/10/98) 205.00   (m)   672.6   (f) LEVELING   3
KA0405 NGVD 29 (??/??/92) 205.125 (m)   672.98   (f) ADJ UNCH   1 2
KA0405
KA0405.Superseded values are not recommended for survey control.
KA0405.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
KA0405.See file dsdata.txt to determine how the superseded data were derived.
KA0405
KA0405_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SEJ1384118553(NAD 83)
KA0405_MARKER: DB = BENCH MARK DISK
KA0405_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
KA0405_SP_SET: SET IN TOP OF CONCRETE MONUMENT
KA0405_STAMPING: S 280 1949
KA0405_MARK LOGO: CGS
KA0405_MAGNETIC: N = NO MAGNETIC MATERIAL
KA0405_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
KA0405+STABILITY: SURFACE MOTION
KA0405_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
KA0405+SATELLITE: SATELLITE OBSERVATIONS - May 11, 2010
KA0405
KA0405 HISTORY   - Date   Condition   Report By
KA0405 HISTORY   - 1949   MONUMENTED   CGS
KA0405 HISTORY   - 19970818 SEE DESCRIPTION SEC
KA0405 HISTORY   - 20100511 GOOD   AEROME
KA0405
KA0405   STATION DESCRIPTION
KA0405
KA0405'DESCRIBED BY COAST AND GEODETIC SURVEY 1949
KA0405'0.4 MI E FROM PARK.
KA0405'0.4 MILE EAST ALONG THE GRAVEL ROAD FROM THE PARK SCHOOL AT
KA0405'PARK, ABOUT 0.8 MILE WEST FROM THE JUNCTION OF A ROAD NORTH,
KA0405'AT A T FENCE CORNER AT AN ABANDONED CHURCH, 52 FEET WEST-NORTHWEST
KA0405'OF THE NORTHWEST CORNER OF THE CHURCH, 39 FEET SOUTHEAST AND
KA0405'ACROSS THE ROAD FROM POWER POLE WITH A TRANSFORMER, 18 FEET SOUTH
KA0405'OF THE CENTER LINE OF THE ROAD, 2 FEET WEST OF THE T FENCE CORNER,
KA0405'2 FEET SOUTH OF A WHITE WOODEN WITNESS POST, ABOUT 2 FEET ABOVE
KA0405'THE LEVEL OF THE ROAD AND SET IN THE TOP OF A CONCRETE POST
KA0405'PROJECTING 4 INCHES.
KA0405
KA0405   STATION RECOVERY (1997)
KA0405
KA0405'RECOVERY NOTE BY SCHNEIDER ENGINEERING CORPORATION 1997 (RGR)
KA0405'FROM BLOOMFIELD, TRAVEL 7.64 KM (4.75 MI) EAST OF U.S. 54. TURN SOUTH
KA0405'ON TO COUNTY ROAD 530 EAST AND TRAVEL 1.45 KM (0.90 MI) TO THE
KA0405'JUNCTION WITH COUNTY ROAD 50 NORTH. TRAVEL EAST ON COUNTY ROAD 50
KA0405'NORTH FOR 0.25 KM (0.15 MI) TO THE JUNCTION WITH 500 EAST. TRAVEL
KA0405'SOUTH ON 500 EAST FOR 2.25 KM (1.40 MI) TO THE INTERSECTION OF COUNTY
KA0405'ROAD 50 SOUTH WITH 500 EAST. TURN EAST AND TRAVEL ON COUNTY ROAD 50
KA0405'SOUTH FOR 0.72 KM (0.45 MI). THE STATION IS LOCATED SOUTH OF COUNTY

KA0405'ROAD 50 SOUTH, ON THE COUNTY RIGHT-OF-WAY ADJACENT TO THE PROPERTY OF
KA0405'CHARLES HELMS. CONTACT DAVID O. ANDERSON, COUNTY ROAD SUPERVISOR,
KA0405'COURTHOUSE, ROOM G05, BLOOMFIELD IN 47424, PHONE 812-384-2017. LOCATED
KA0405'6.71 METERS (22.01 FT) WEST AND 0.91 METERS (2.99 FT) SOUTH OF A
KA0405'TELEPHONE POLE, 5.33 METERS (17.49 FT) SOUTH OF THE COUNTY ROAD 50
KA0405'SOUTH CENTER, 101 METERS (331.4 FT) WEST OF THE CENTER OF THE WEST
KA0405'DRIVEWAY ON THE PROPERTY OWNED BY CHARLES HELMS, 78.5 METERS (257.5
KA0405'FT) EAST OF THE CENTER OF THE EAST DRIVEWAY ON PROPERTY OWNED BY RALPH
KA0405'RAPER, ABOUT 0.3 METERS (1.0 FT) ABOVE THE ROAD LEVEL, IN THE TOP OF A
KA0405'ROUND CONCRETE MONUMENT PROJECTING 20 CM ABOVE GROUND. THE MONUMENT
KA0405'APPEARS TO HAVE BEEN STRUCK, AS A PORTION OF THE TOP OF THE CONCRETE
KA0405'MONUMENT ON THE WEST SIDE IS MISSING. IT ALSO APPEARS TO HAVE BEEN
KA0405'DISTURBED, AS THE TOP OF THE MONUMENT SLOPES, 5/16 INCH PER FOOT TO
KA0405'THE EAST.
KA0405
KA0405   STATION RECOVERY (2010)
KA0405
KA0405'RECOVERY NOTE BY AERO METRIC INC 2010
KA0405'RECOVERED IN GOOD CONDITION.

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

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.85
1        National Geodetic Survey,   Retrieval Date = JULY 12, 2010
 KA1127 ***********************************************************************
 KA1127  DESIGNATION -  Z 293
 KA1127  PID         -  KA1127
 KA1127  STATE/COUNTY-  IN/VIGO
 KA1127  USGS QUAD   -  TERRE HAUTE (1993)
 KA1127
 KA1127                         *CURRENT SURVEY CONTROL
 KA1127  ______________________________________________________________________
 KA1127* NAD 83(1986)-  39 22 38.      (N)    087 27 56.      (W)     SCALED
 KA1127* NAVD 88     -       144.557   (meters)     474.27    (feet)  ADJUSTED
 KA1127  ______________________________________________________________________
 KA1127  GEOID HEIGHT-          -32.51  (meters)                       GEOID09
 KA1127  DYNAMIC HT  -          144.474 (meters)      474.00   (feet)  COMP
 KA1127  MODELED GRAV-      980,054.1   (mgal)                         NAVD 88
 KA1127
 KA1127  VERT ORDER  -  FIRST     CLASS II
 KA1127
 KA1127.The horizontal coordinates were scaled from a topographic map and have
 KA1127.an estimated accuracy of +/- 6 seconds.
 KA1127
 KA1127.The orthometric height was determined by differential leveling and
 KA1127.adjusted in June 1991.
 KA1127
 KA1127.The geoid height was determined by GEOID09.
 KA1127
 KA1127.The dynamic height is computed by dividing the NAVD 88
 KA1127.geopotential number by the normal gravity value computed on the
 KA1127.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 KA1127.degrees latitude (g = 980.6199 gals.).
 KA1127
 KA1127.The modeled gravity was interpolated from observed gravity values.
 KA1127
 KA1127;                    North         East     Units  Estimated Accuracy
 KA1127;SPC IN W     -   458,440.      867,070.      MT  (+/- 180 meters Scaled)
 KA1127
 KA1127                          SUPERSEDED SURVEY CONTROL
 KA1127
 KA1127  NGVD 29 (??/??/92)  144.660  (m)          474.61   (f) ADJ UNCH    1 2
 KA1127
 KA1127.Superseded values are not recommended for survey control.
 KA1127.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 KA1127.See file dsdata.txt to determine how the superseded data were derived.
 KA1127
 KA1127_U.S. NATIONAL GRID SPATIAL ADDRESS: 16SDJ599587(NAD 83)
 KA1127_MARKER: DB = BENCH MARK DISK
 KA1127_SETTING: 46 = COPPER-CLAD STEEL ROD W/O SLEEVE (10 FT.+)
 KA1127_SP_SET: 60 FEET
 KA1127_STAMPING: Z 193 1956
 KA1127_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 KA1127_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 KA1127+SATELLITE: SATELLITE OBSERVATIONS - May 13, 2010
 KA1127
 KA1127  HISTORY     - Date     Condition        Report By
```

KA1127 HISTORY   - 1956   MONUMENTED   CGS
KA1127 HISTORY   - 20100513 GOOD   AEROME
KA1127
KA1127   STATION DESCRIPTION
KA1127
KA1127'DESCRIBED BY COAST AND GEODETIC SURVEY 1956
KA1127'0.8 MI NE FROM PRAIRIETON.
KA1127'ABOUT 0.8 MILE NORTHEAST ALONG STATE HIGHWAY 63 FROM THE METHODIST
KA1127'CHURCH AT PRAIRIETON, IN SECTION 34, T.11 N., R.10 W., ABOUT 0.35
KA1127'MILE SOUTHWEST OF JUNCTION OF A NARROW BLACK TOP ROAD LEADING
KA1127'SOUTH, 29 FEET NORTHWEST OF CENTER LINE OF HIGHWAY, 61 3/4 FEET
KA1127'EAST AND ACROSS A DRIVE FROM THE EAST CORNER OF HOUSE NO. 691
KA1127'(BROWN SHINGLE SIDING), 19 FEET NORTHEAST OF CENTER LINE OF DRIVE,
KA1127'272 1/2 FEET SOUTHWEST OF SOUTHWEST END OF NORTHWEST HEAD WALL
KA1127'OF A 2-FOOT CONCRETE BOX CULVERT UNDER HIGHWAY, 5 FEET NORTHEAST
KA1127'OF POWER POLE NO. 307/107, 1 1/2 FEET NORTHEAST OF A WHITE
KA1127'WOODEN WITNESS POST, ABOUT 1/2 FOOT BELOW LEVEL OF HIGHWAY AND
KA1127'IS A DISK ON TOP OF COPPER-COATED STEEL ROD ABOUT FLUSH WITH
KA1127'GROUND AND PROTECTED BY A 4-INCH TILE WHICH PROJECTS 3 INCHES.
KA1127'THE ROD WAS DRIVEN TO A DEPTH OF 60-FEET IN GROUND.
KA1127
KA1127   STATION RECOVERY (2010)
KA1127
KA1127'RECOVERY NOTE BY AERO METRIC INC 2010 (MB)
KA1127'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base Control

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 3.18.10

SITE NUMBER 1
SITE NAME G 129

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:11 a.
STOP 12:11 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CD
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.243

STATION DESCRIPTIONS fnd USC + GS
cap/conc. mon "G 129 1946"

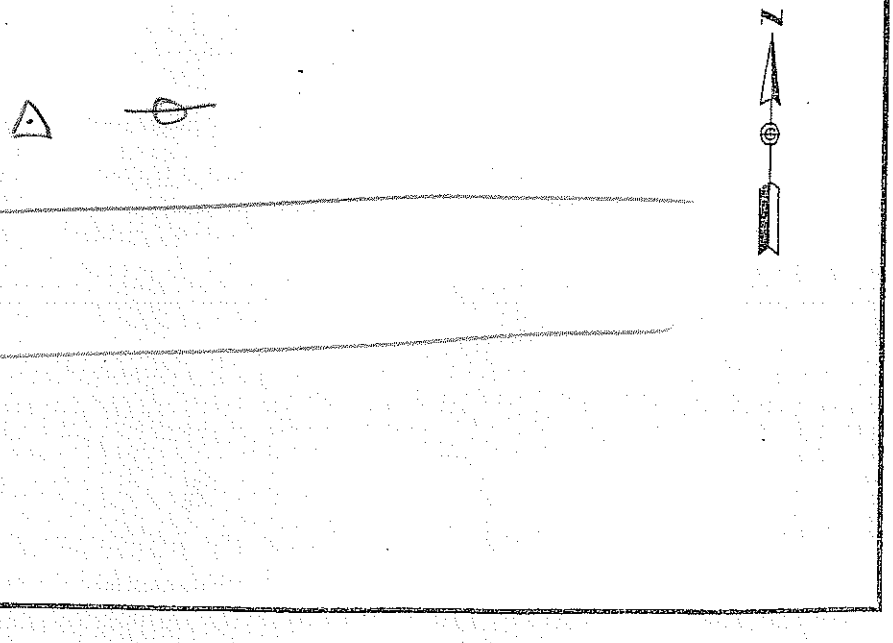
AT502 1.603

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
911	6.7	4/4
1111		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT I-100118 Area 1
OPERATOR MB
DATE 3-18-10

SITE NUMBER 2
SITE NAME 107

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:55 p
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.323

STATION DESCRIPTIONS set rebar + cap

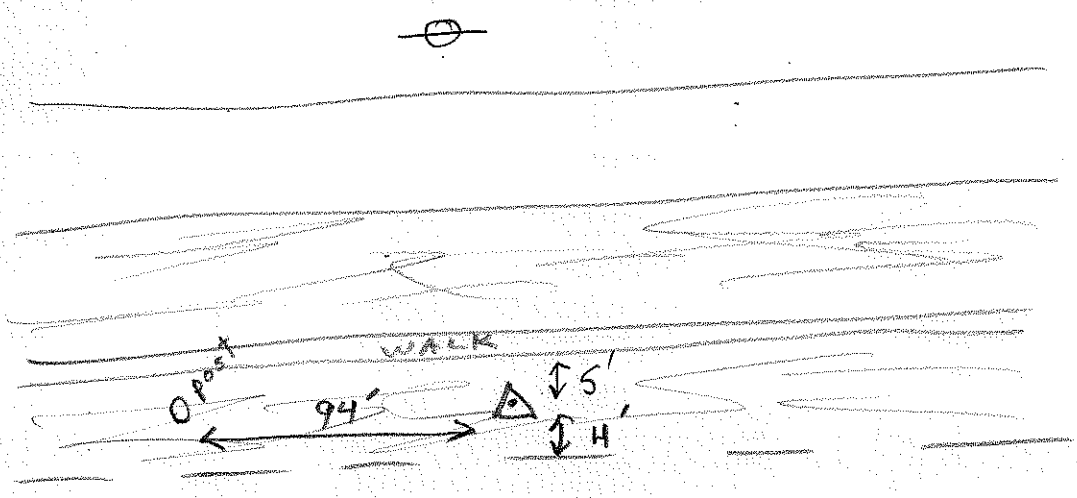
AT502 1683

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1155	2.0	8/10

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
40° 36' 09.5"
86° 51' 30.0"

SKETCH



FIELD

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base Control

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 3·18·10

SITE NUMBER 1
SITE NAME Q 28

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:16 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: tree SE

HEIGHT READINGS MTS FT
1.031

STATION DESCRIPTIONS fnd USC+GS
cap/conc. mon "Q 28 1934"

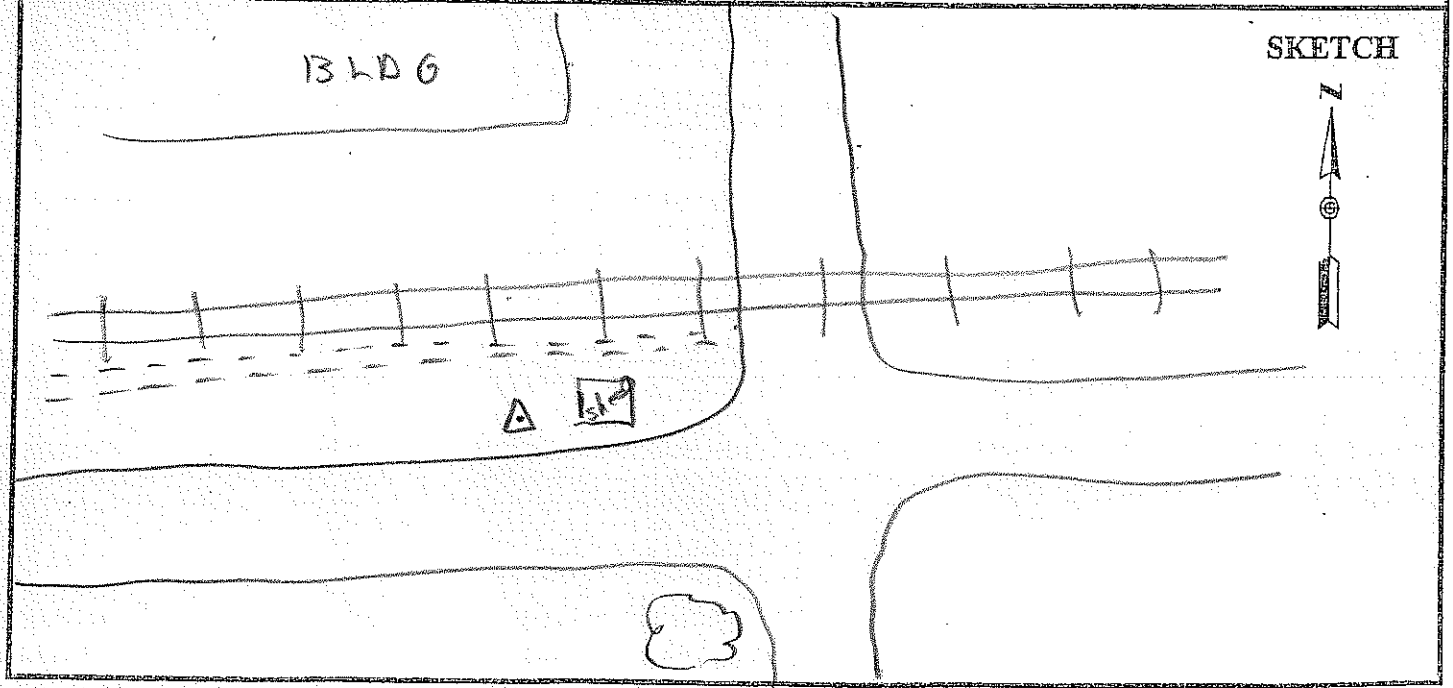
AT 502 1391

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
816	2.7	6/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ P7

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 3·18·10

SITE NUMBER 1
SITE NAME 22

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:35 a.
STOP 11:13 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.447

STATION DESCRIPTIONS in paved area

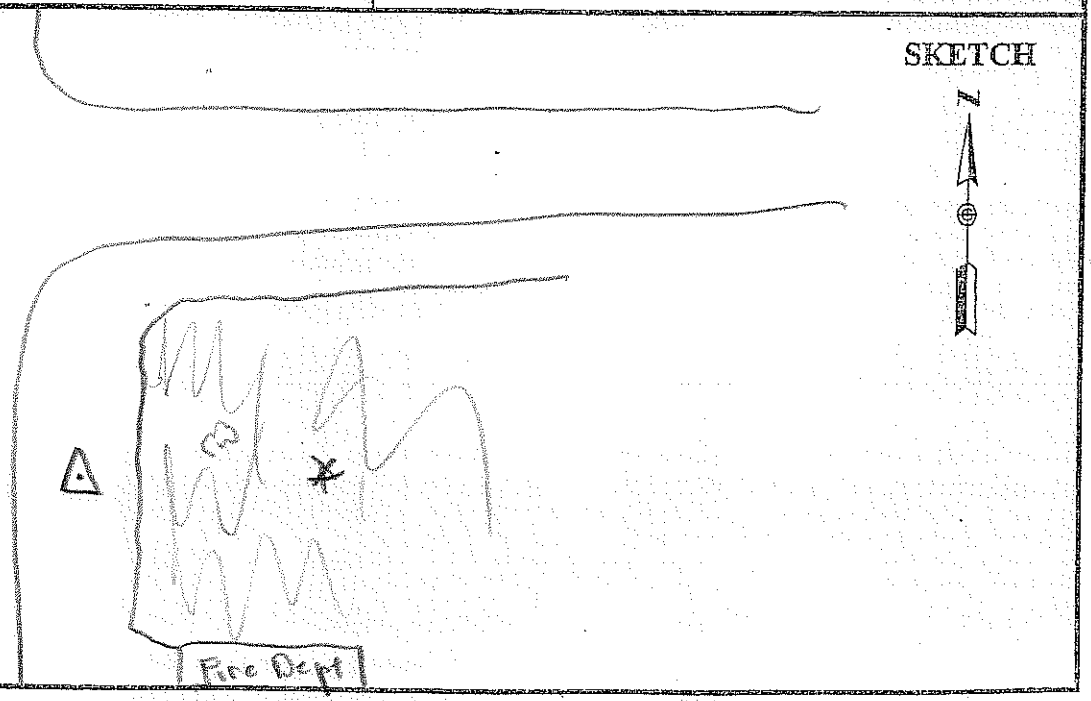
AT502 1807

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
935	3.1	6/7
1013		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PT

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 3.18.10

SITE NUMBER 2
SITE NAME 23

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:22 a.
STOP 11:50 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.365

AT502 1.725

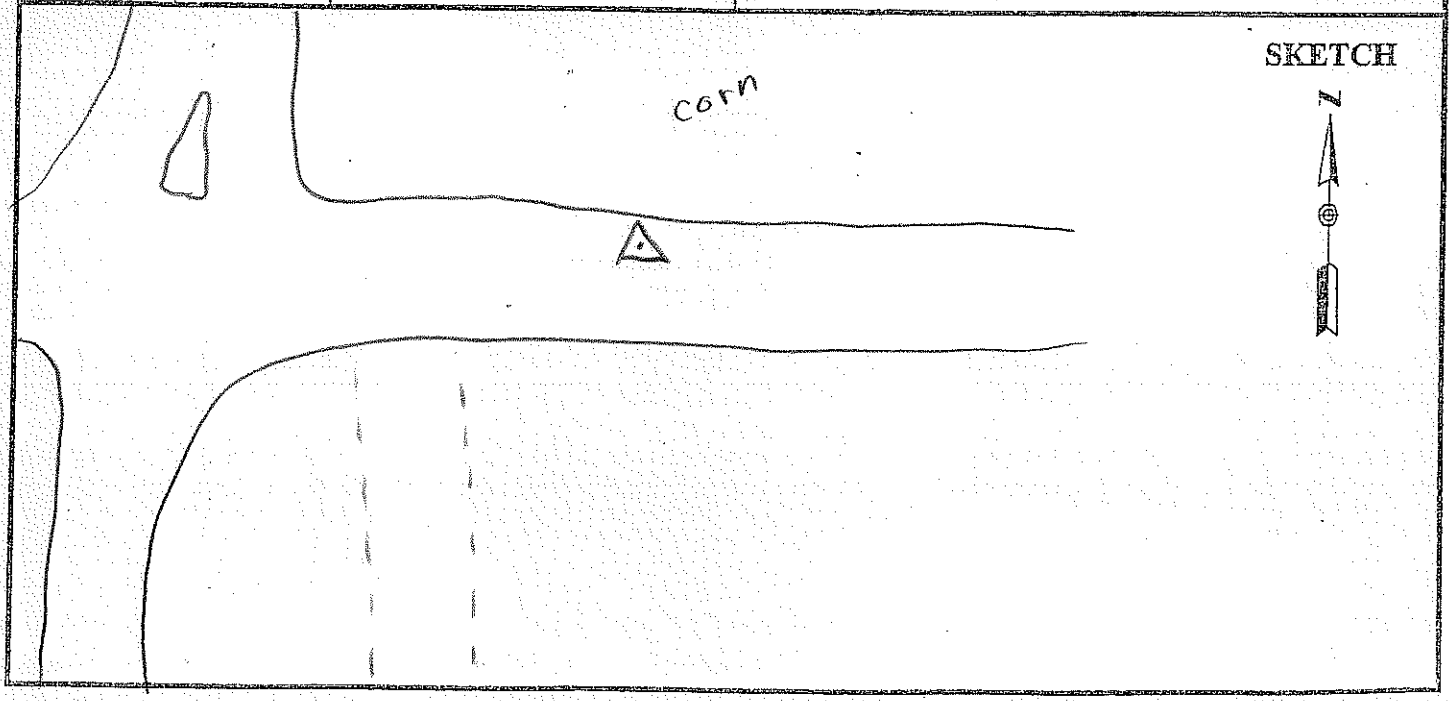
STATION DESCRIPTIONS W bound lane

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1022	3.5	6/6
1050		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 3-18-10

SITE NUMBER 3
SITE NAME B 120

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:33 p
STOP 2:33 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: trees NW

HEIGHT READINGS MTS FT
1.239

STATION DESCRIPTIONS fnd USC+GS cap/conc. mon
" B 120 1940"

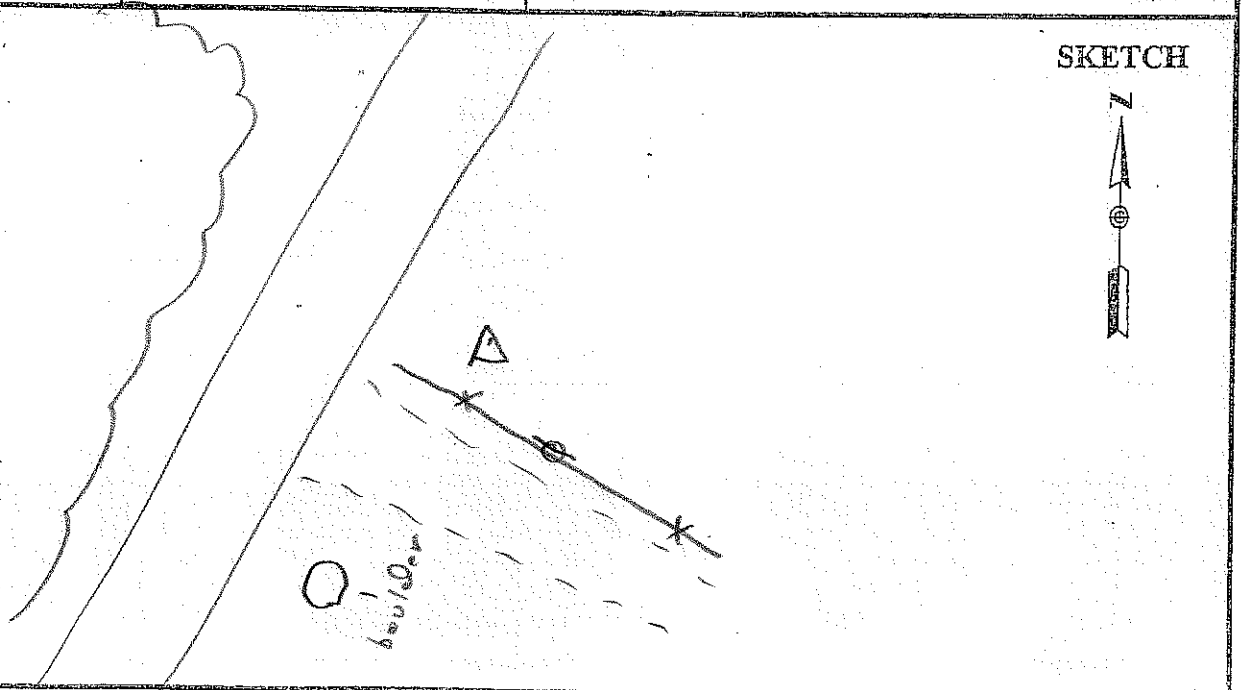
AT502 1599

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1233	2.0	10/10
1333		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 4.14.10

SITE NUMBER 1
SITE NAME 107

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:35a
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 231
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS:

HEIGHT READINGS MTS FT
1.297

STATION DESCRIPTIONS

AT502 1.657

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1135a	4.8	5/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

See previous

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base Control

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 4.14.10

SITE NUMBER 1
SITE NAME Q 28

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:05 p
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS:

HEIGHT READINGS MTS FT
1.105
AT502 1.465

STATION DESCRIPTIONS

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1205	2.7	6/10

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

See previous

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 √RT lidar

PROJECT 1-100118 Area 1
OPERATOR NB
DATE 4-14-10

SITE NUMBER 1
SITE NAME 24

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:16 P
STOP 12:44 P

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: tree E + W

HEIGHT READINGS MTS FT
1.461

AT 502 1.821

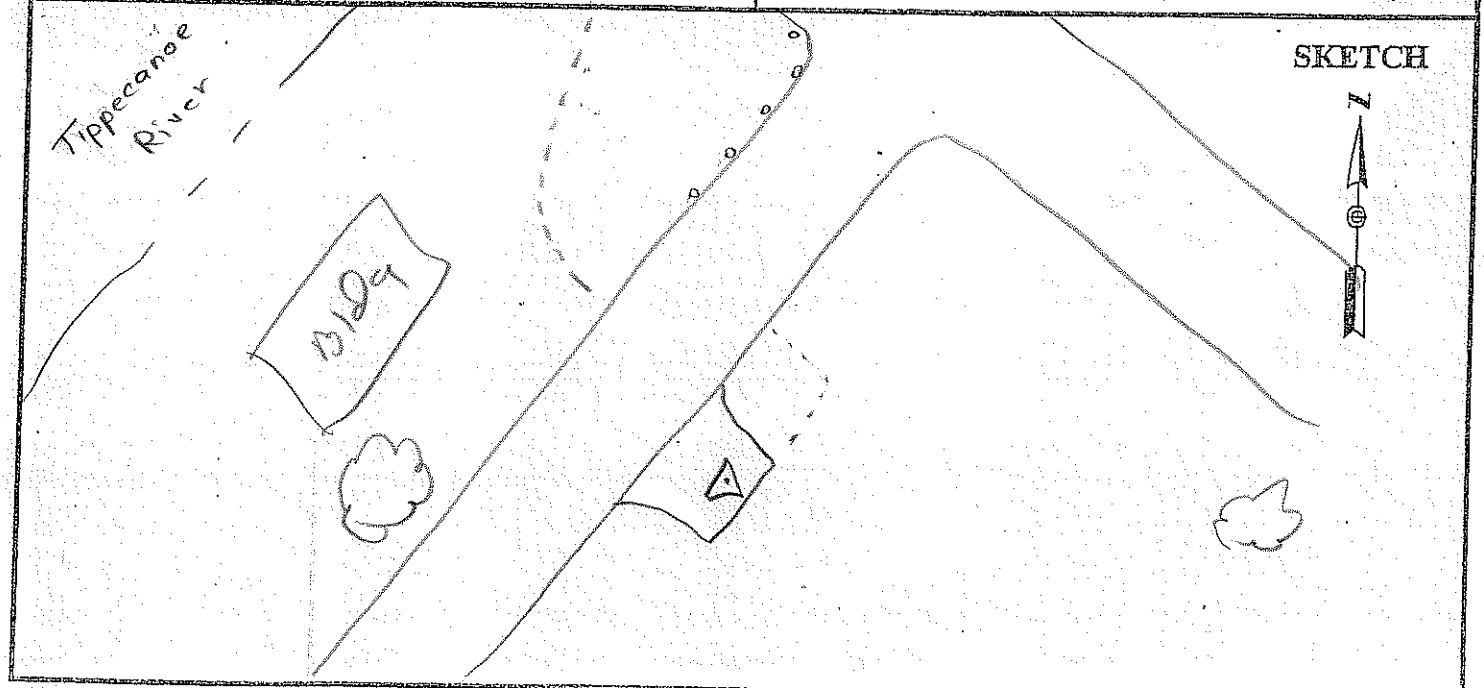
STATION DESCRIPTIONS in small parking area

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1216	7.0	4/5

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

✓ PT lidar

PROJECT 1-100118 Area 1
OPERATOR MB
DATE 4.14.10

SITE NUMBER 2
SITE NAME 25

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:02 p
STOP 1:20 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: trees NW ⇔ NE

HEIGHT READINGS MTS FT
1.410

STATION DESCRIPTIONS W bound lane

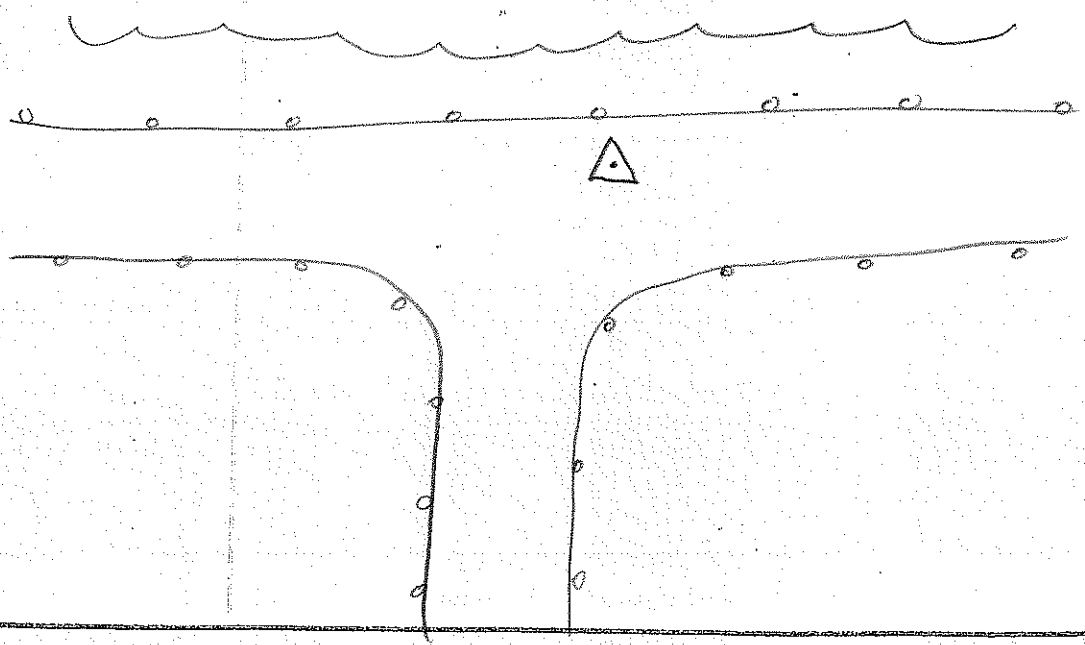
AT502 1.770

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1302	2.1	9/9
1320		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

√ PT lidar

PROJECT 1-100118 Area 1
OPERATOR MG
DATE 4-14-10

SITE NUMBER 3
SITE NAME 26

TRACKING TIMES (LOCAL) MEASURE √
START 1:36 p
STOP 2:03 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: trees NW

HEIGHT READINGS MTS FT
1.388

STATION DESCRIPTIONS in gravel area

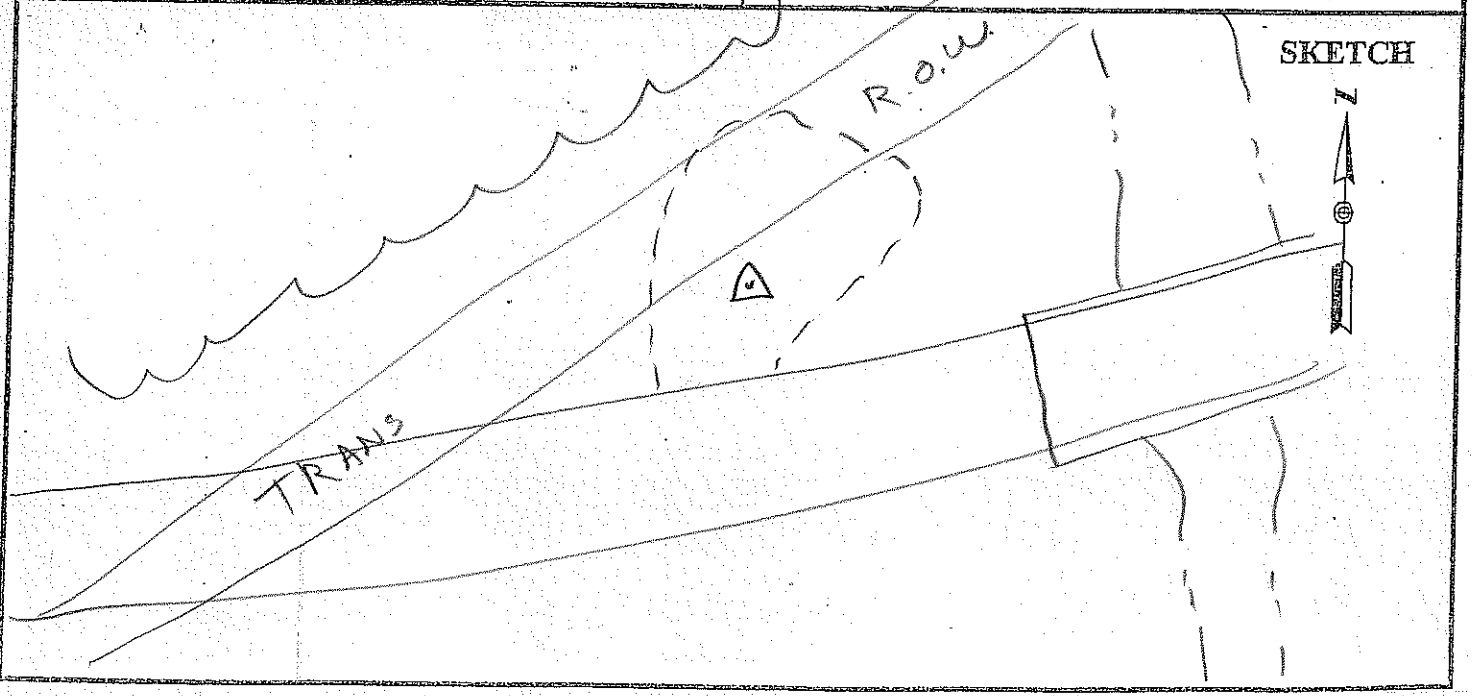
AT502 1748

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1336	2.2	10/10
1403		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3.17.10

SITE NUMBER 1
SITE NAME 106

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:15 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.181

STATION DESCRIPTIONS set rebar + cap

AT 502 1.541

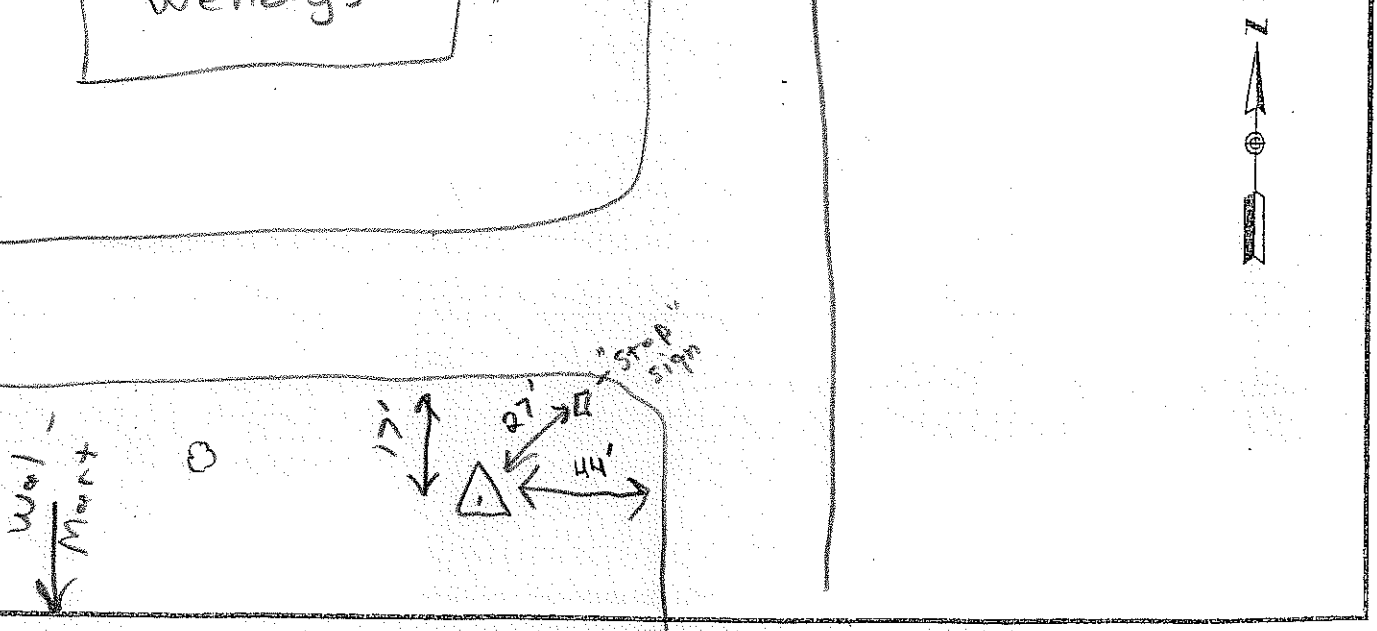
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
915	2.7	7/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
39° 11' 56.0"
85° 56' 41.8"

"Wendys"

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base Control

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3.17.10

SITE NUMBER 1
SITE NAME K 268

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:47 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.297

STATION DESCRIPTIONS fnd USC + GS cap/conc mon "K 268 1947"

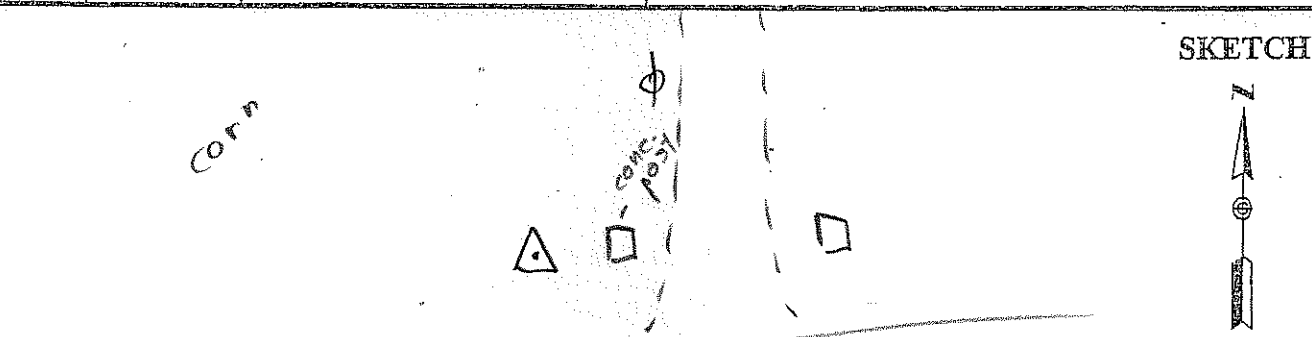
AT502 1657

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
947	3.2	6/6

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 2
OPERATOR NB
DATE 3.17.10

SITE NUMBER 1
SITE NAME J 9

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:19 a.
STOP 11:50 a

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees N, W + SW

HEIGHT READINGS MTS FT
1.145

STATION DESCRIPTIONS fnd USC+GS cap/conc. mon " Elev. 692.407 FT 211.046M J 9 1930"

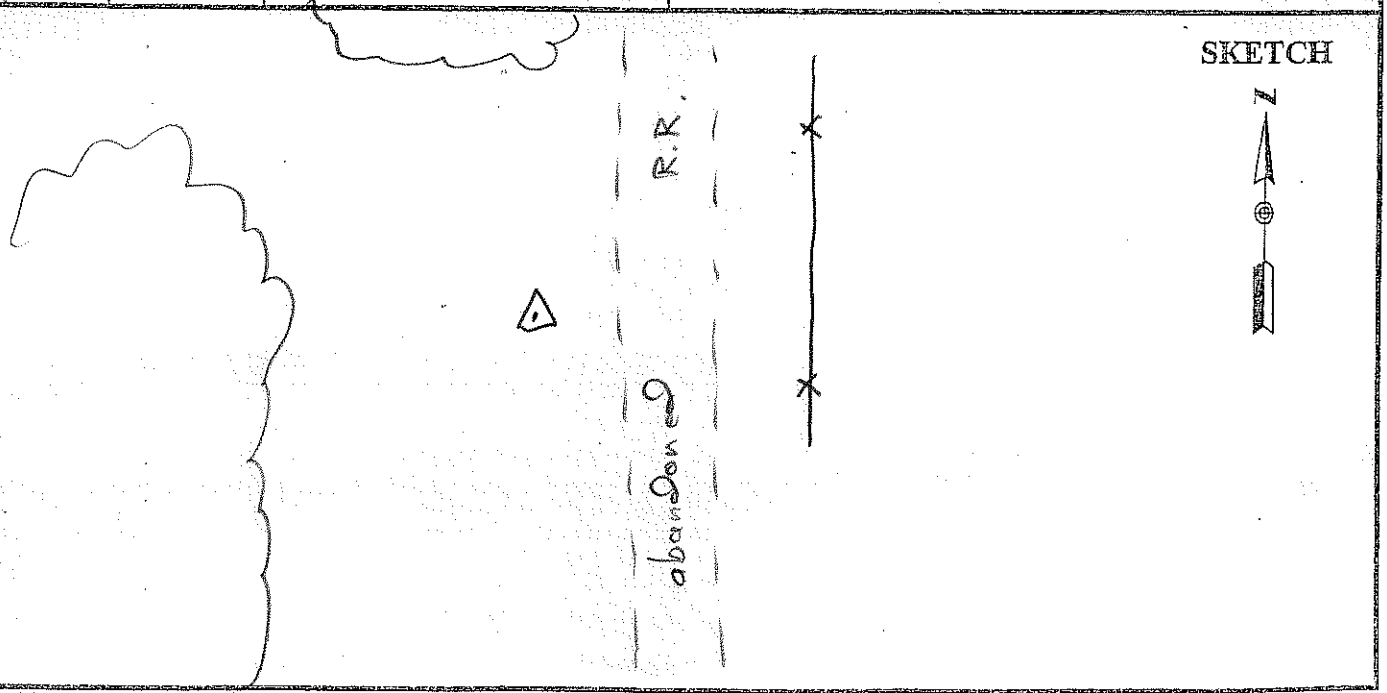
AT 502 1505

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1019	2.3	6/8
1050		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3.17.10

SITE NUMBER 2
SITE NAME 17

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:06 p
STOP 12:27 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.388

STATION DESCRIPTIONS W bound lane

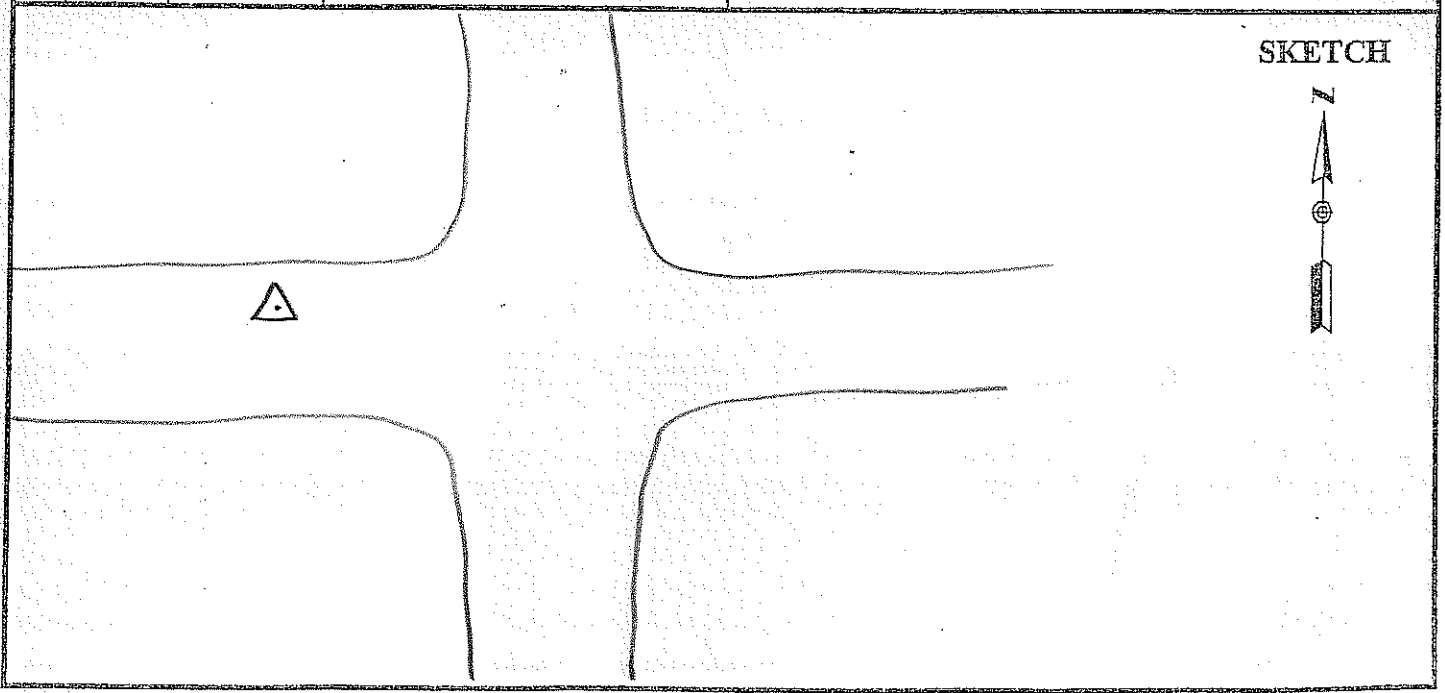
AT502 1.748

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1106	2.6	7/8
1127		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3.17.10

SITE NUMBER 3
SITE NAME 18

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:44 p
STOP 1:02 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.363
AT 50 > 1.723

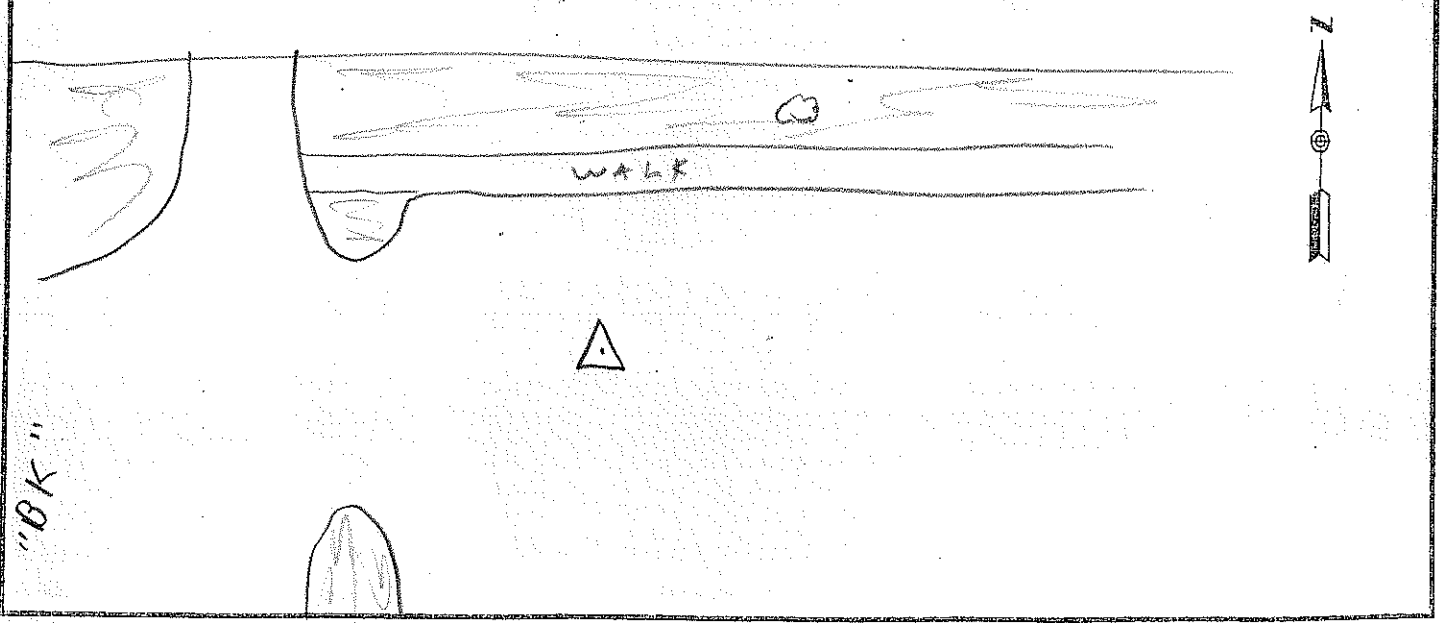
STATION DESCRIPTIONS NW area of parking lot

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1144	2.8	7/7
1202		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3.17.10

SITE NUMBER 4
SITE NAME H 271

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:14 p
STOP 1:33 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.297

STATION DESCRIPTIONS Fnd USC+GS
cap/conc. mon.

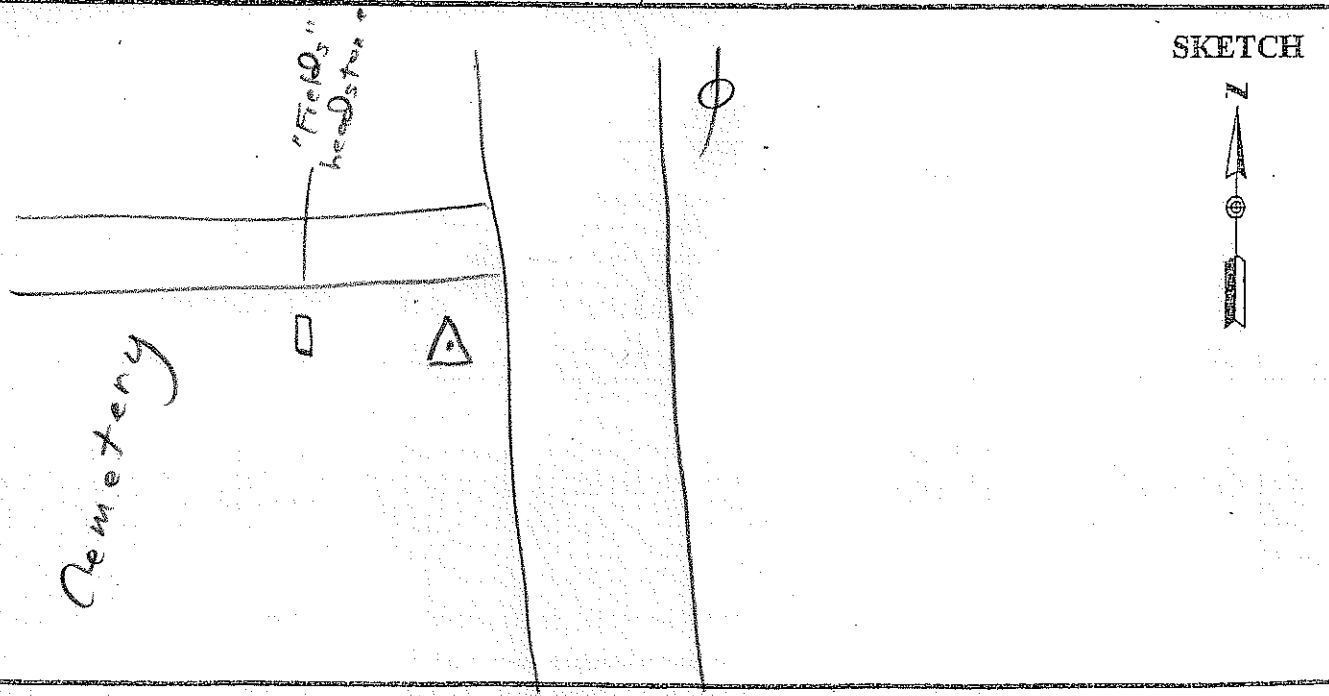
AT502 1.657

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1214	1.9	10/10
1232		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3-17-10

SITE NUMBER 5
SITE NAME 19

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:38 p
STOP 1:52 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.410
AT502 1.770

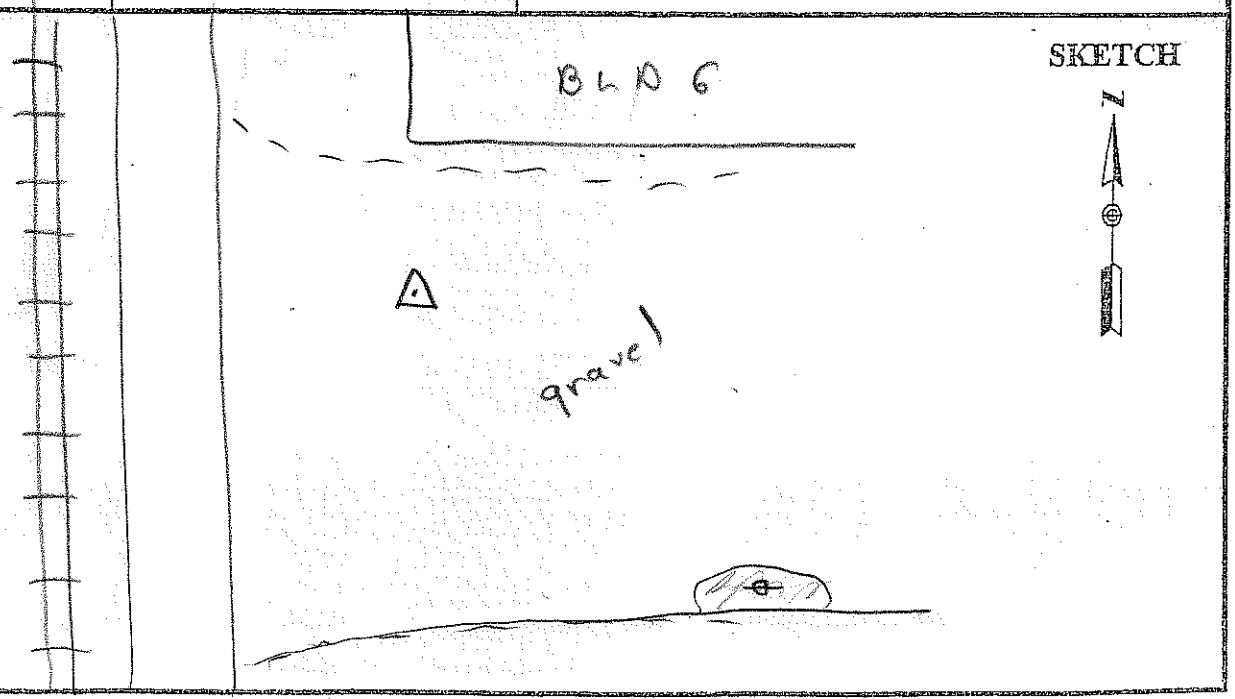
STATION DESCRIPTIONS in parking lot.

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1238	2.0	9/10
1257		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, ~~WISCONSIN~~ 53083 √ AT

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3·17·10

SITE NUMBER 6
SITE NAME 20

TRACKING TIMES (LOCAL) MEASURE √
START 2:15 p
STOP 2:31 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.411
AT502 1.771

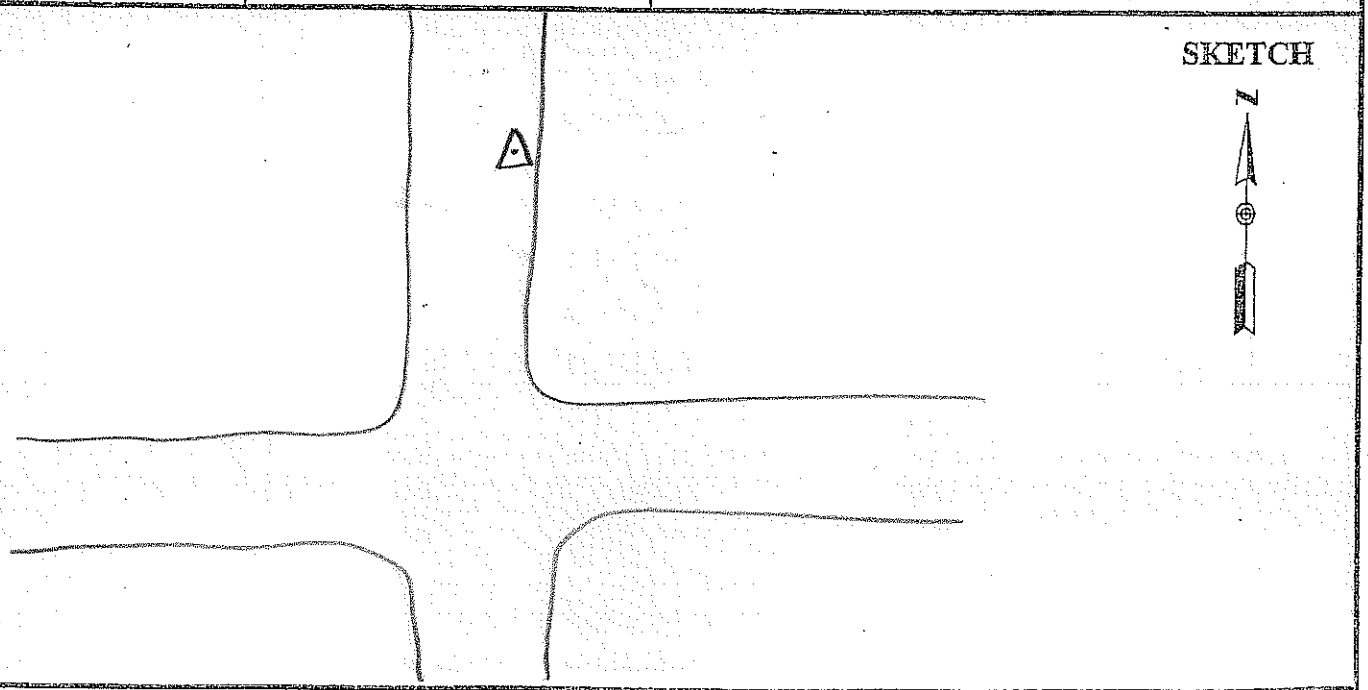
STATION DESCRIPTIONS N bound lane

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1315	1.9	11/11
1331		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 2
OPERATOR MB
DATE 3.17.10

SITE NUMBER 7
SITE NAME 21

TRACKING TIMES (LOCAL) MEASURE ✓
START 2:57 p
STOP 3:15 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.435
AT 502 1.795

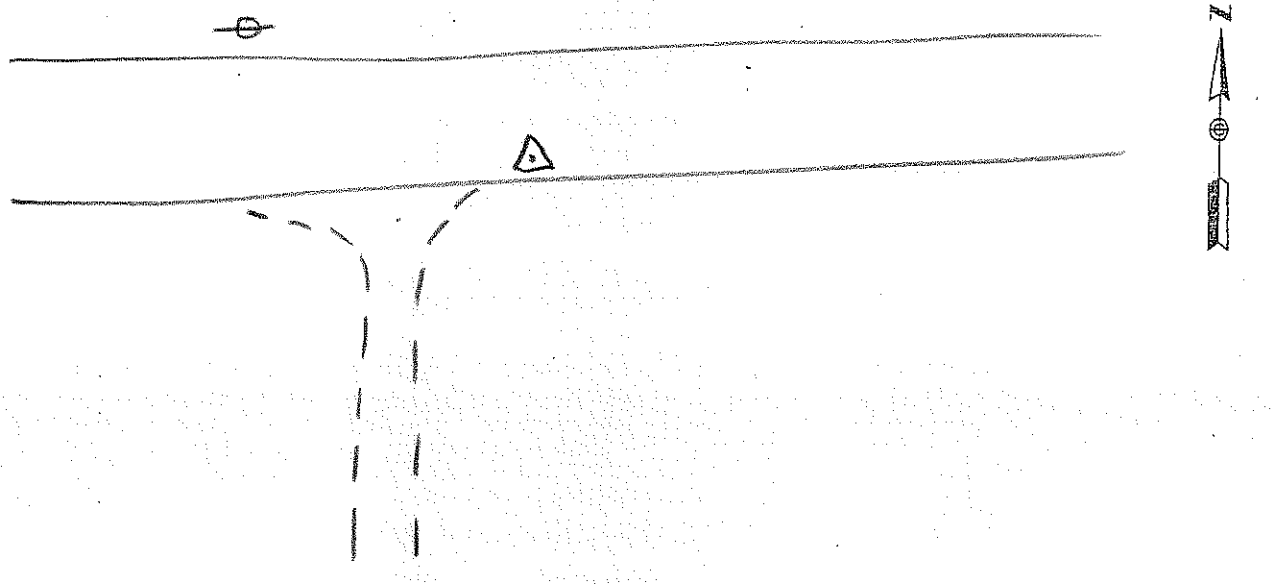
STATION DESCRIPTIONS E bound lane

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1357	1.9	10/10
1415		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 5.13.10

SITE NUMBER 1
SITE NAME 111

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:05 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.267

STATION DESCRIPTIONS Set 6" nail

AT502 1627

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
605	2.2	7/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
39° 25' 45.4"
087° 19' 49.0"

SKETCH

A
exit ramp
EB entrance ramp

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 3
OPERATOR MD
DATE 5-13-10

SITE NUMBER 1
SITE NAME 112

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:22a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS:

HEIGHT READINGS MTS FT
1.185

STATION DESCRIPTIONS

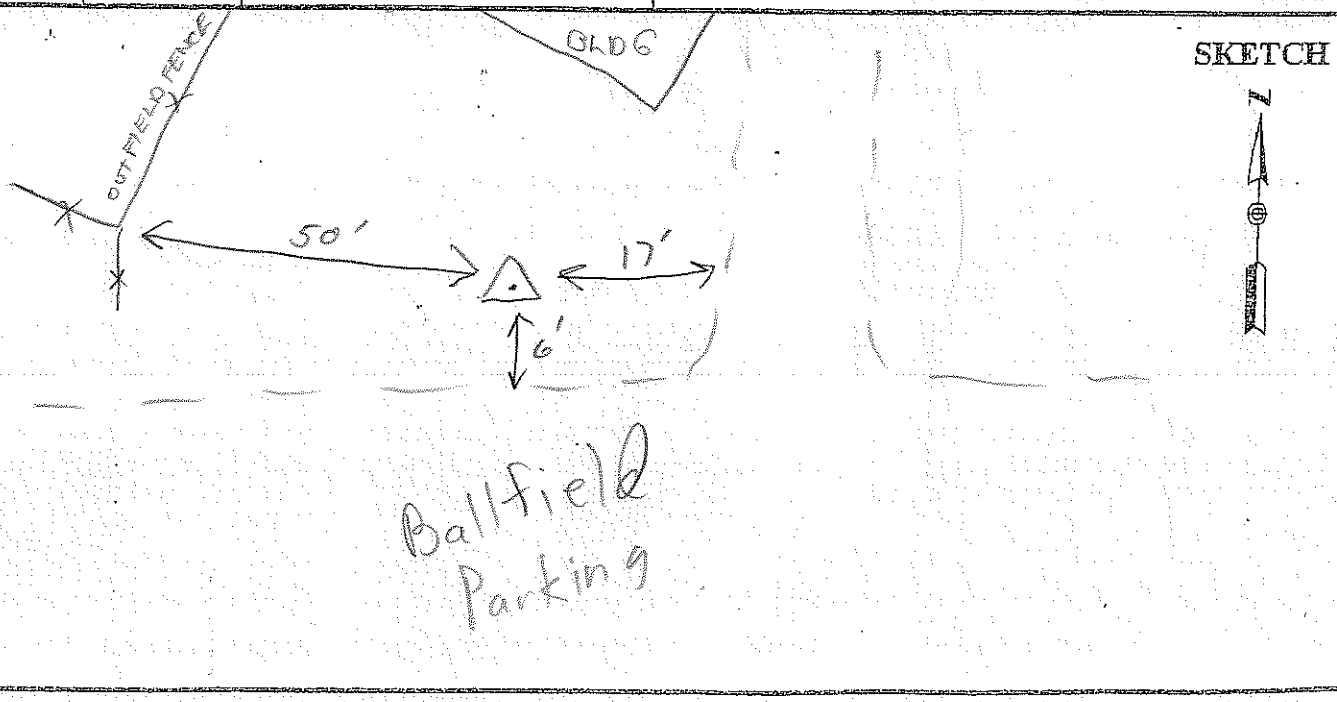
AT502 1.545

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
622	2.6	9/9

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
39° 28' 47.3"
087° 19' 48.4"

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 8-13-10

SITE NUMBER 1
SITE NAME B 70

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:49 a.
STOP 8:29 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees SW

HEIGHT READINGS MTS FT
1.217

STATION DESCRIPTIONS Fnd USC + GS cap/conc. mon.
Unable to read stamping

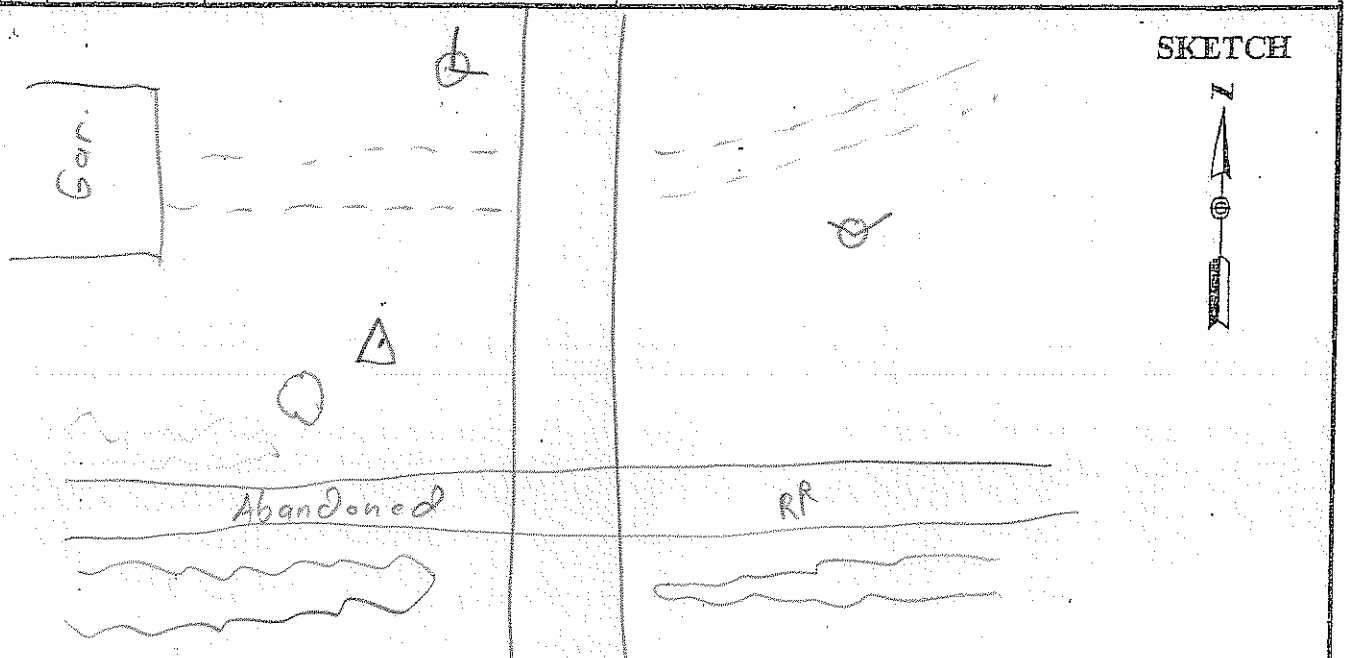
AT502 1377

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
649	3.0	5/5
729		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓pt.

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 5.13.10

SITE NUMBER 2
SITE NAME 35

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:53a.
STOP 9:10a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.368

STATION DESCRIPTIONS parking lot

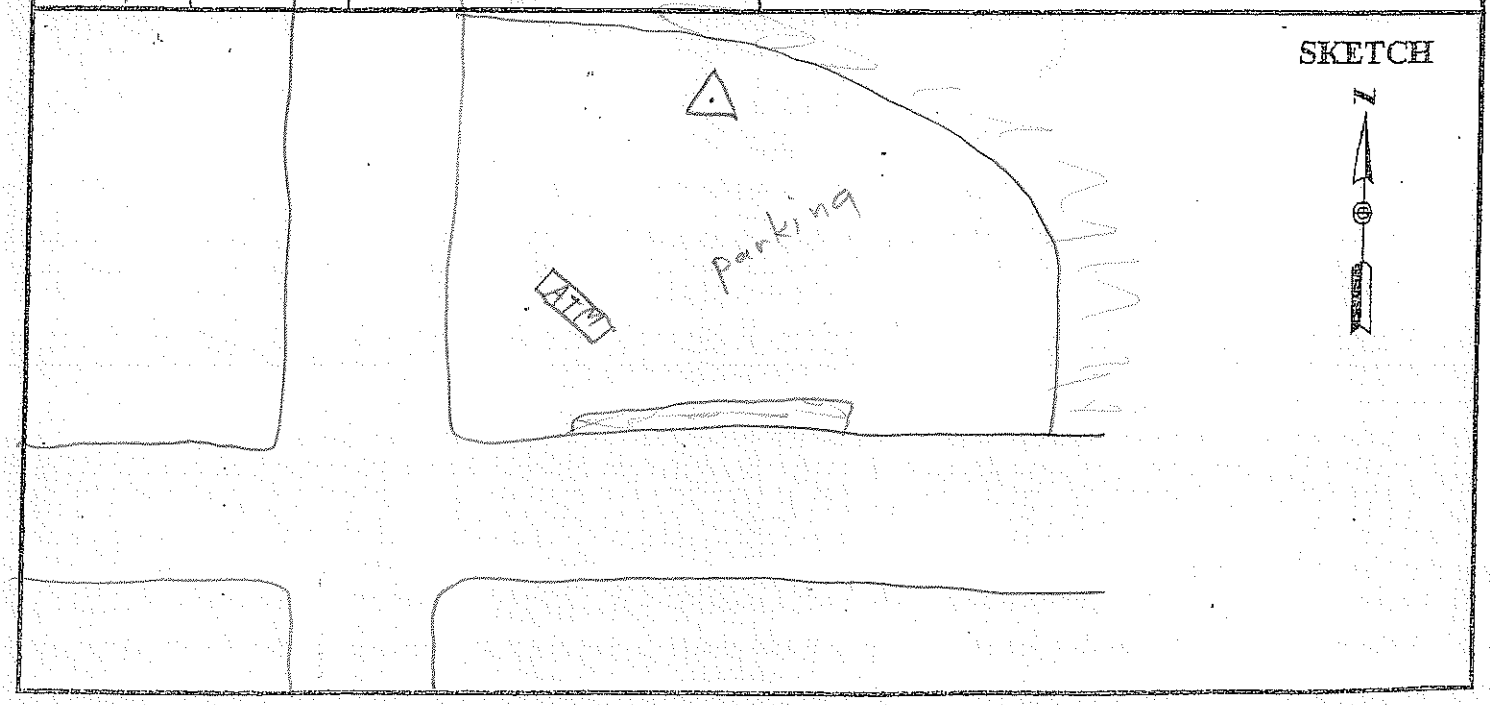
AT502 1728

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
753	2.4	8/8
810		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓PT.

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 5.13.10

SITE NUMBER 3
SITE NAME 36

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:38a.
STOP 10:01a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees NNE

HEIGHT READINGS MTS FT
1.393

STATION DESCRIPTIONS SE corner of parking lot

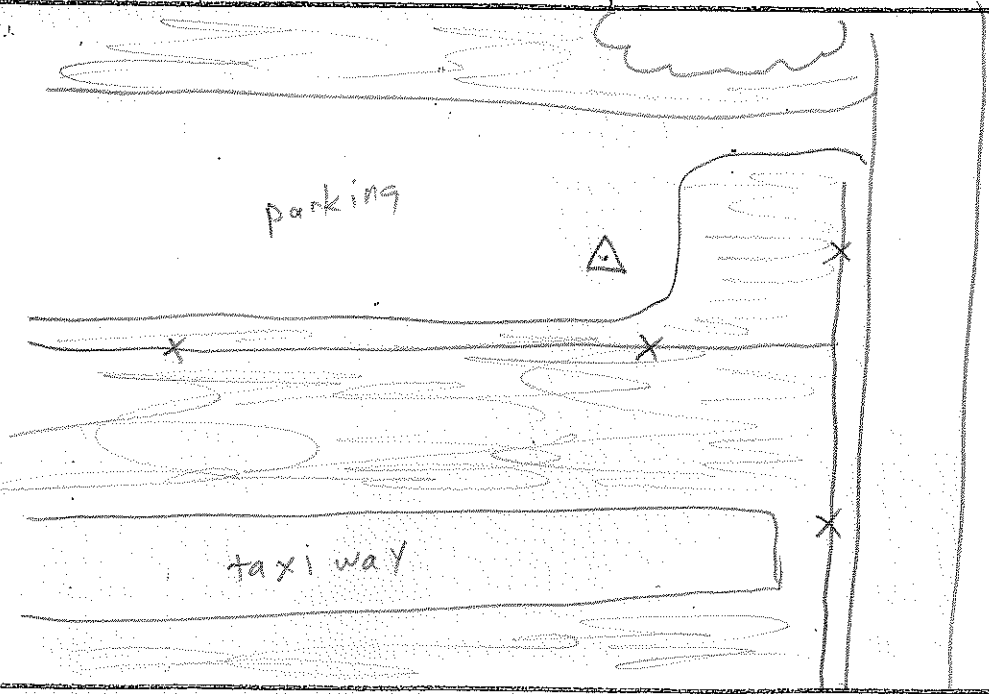
AT502 1.753

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
838	5.3	9/9
901		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 5·13·10

SITE NUMBER 4
SITE NAME M 360

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:26 a.
STOP 11:00 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD >31
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/~~9500~~ 0.389
~~500~~ 0.360

OBSTRUCTIONS: tree N + S

HEIGHT READINGS MTS FT
1.572
AT 502 1.932

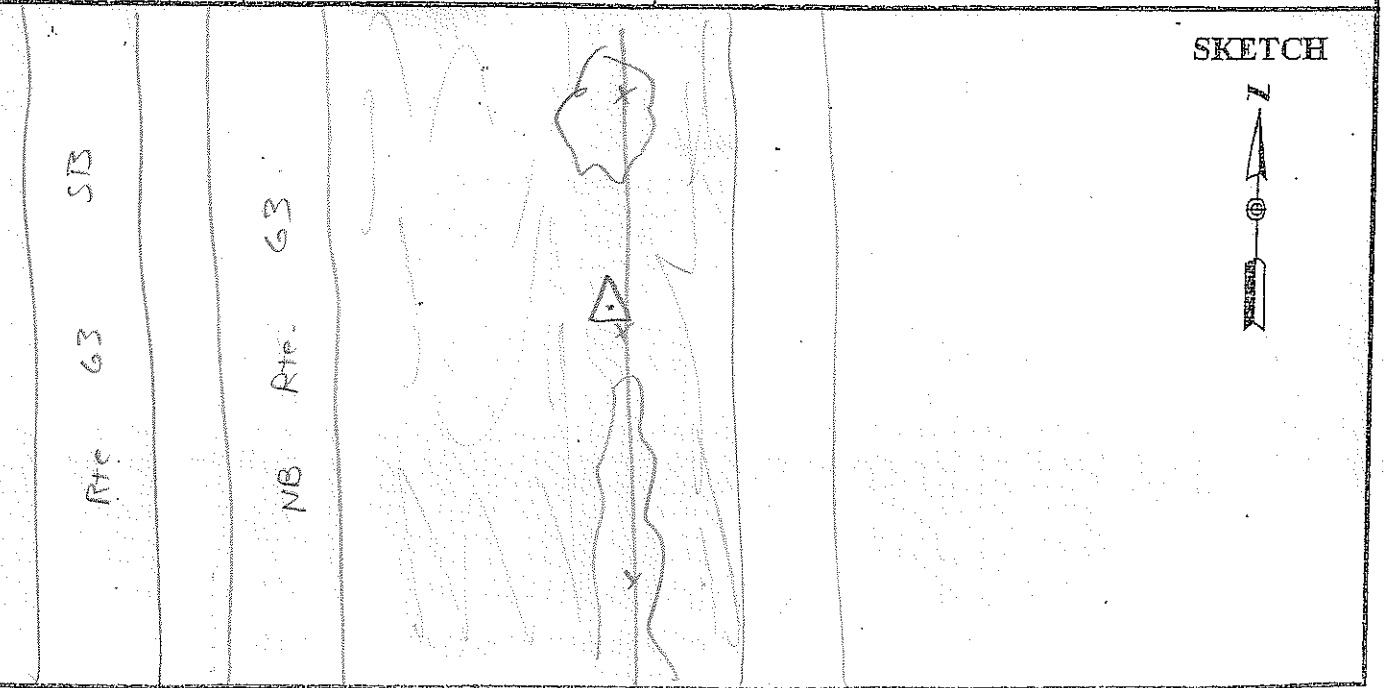
STATION DESCRIPTIONS Fnd pin in handhole "M 360 1986"

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
926	1.9	11/11
1000		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 √PT

PROJECT 1-100118 Area 3
OPERATOR MD
DATE 5-13-10

SITE NUMBER 5
SITE NAME 37

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:15 a.
STOP 11:36 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.418

STATION DESCRIPTIONS W. side of road

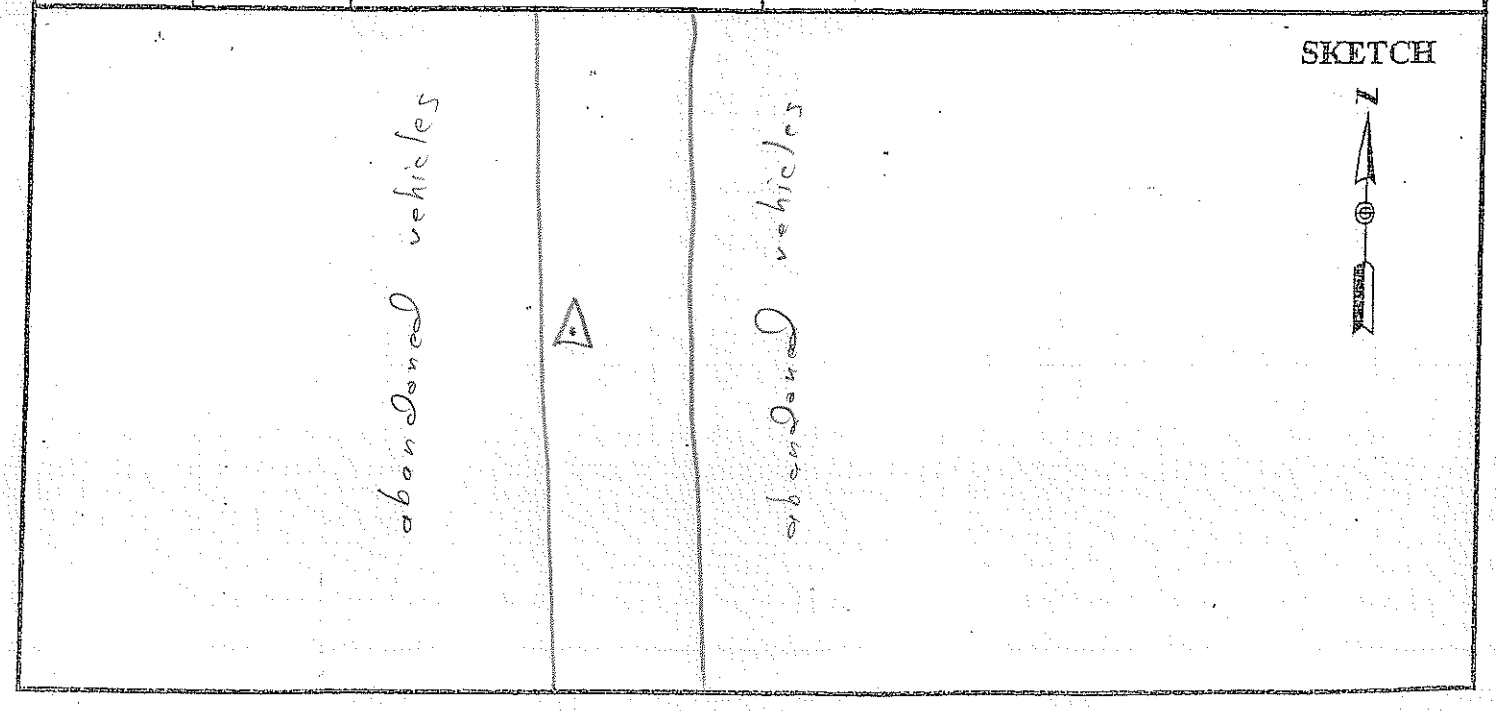
AT502 1-778

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1015	2.2	11/11
1036		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 5.13.10

SITE NUMBER 6
SITE NAME 2293

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:03 p
STOP 12:30 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) 0.360

OBSTRUCTIONS: trees N
PP south

HEIGHT READINGS MTS FT
1.308

STATION DESCRIPTIONS USC+GS cap
on metal rod "Z 193 1956"

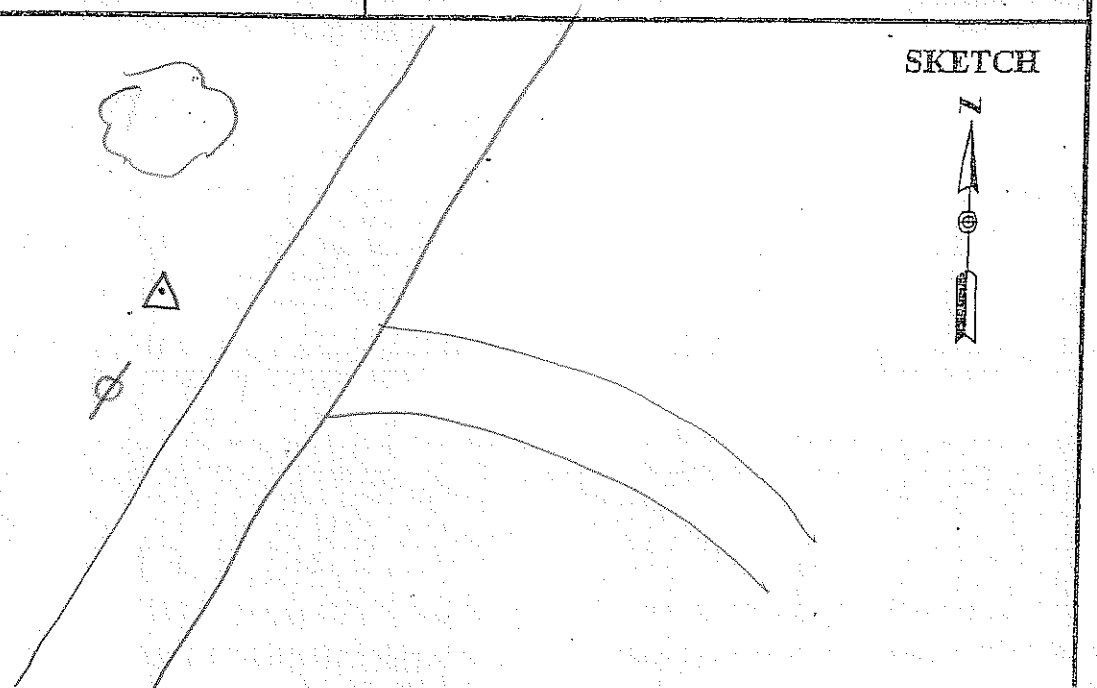
AT502 1.668

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1103	2.1	9/9
1130		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

√ PT

PROJECT 1-100118 Area 3
OPERATOR MB
DATE 5·13·10

SITE NUMBER 7
SITE NAME 38

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:42 p
STOP 1:05 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: trees S.

HEIGHT READINGS MTS FT
1.365

STATION DESCRIPTIONS S. side road

AT 502 1.725

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1142	2.8	6/6
1205		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

Federal Prison

SKETCH

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT.

PROJECT 1-100138 Area 3
OPERATOR MB
DATE 5·13·10

SITE NUMBER 8
SITE NAME 39

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:20 p
STOP 1:38 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.385

STATION DESCRIPTIONS N side of parking lot

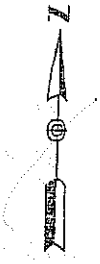
AT 502 1745

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1220	3.6	6/7
1238		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



Parking

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base - Control

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5.12.10

SITE NUMBER 1
SITE NAME E 13

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:35a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. C13
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees N

HEIGHT READINGS MTS FT
1.106
AT502 1.466

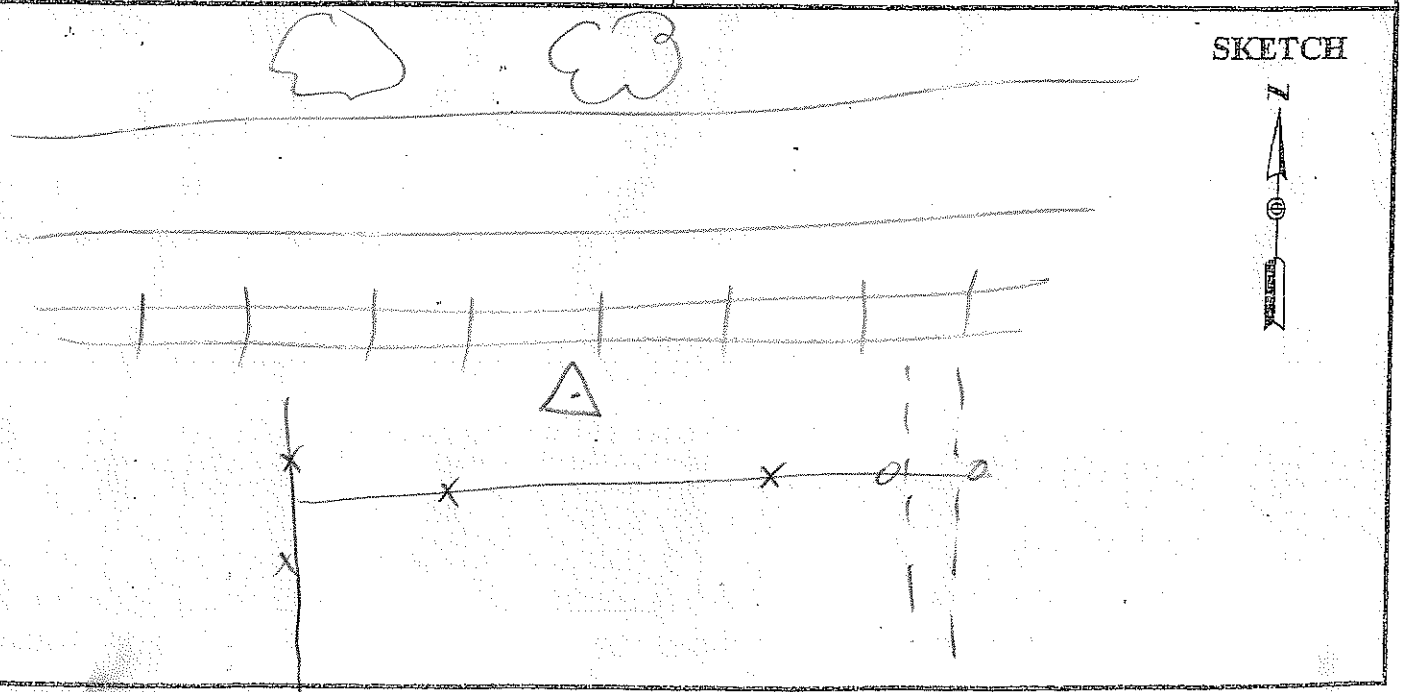
STATION DESCRIPTIONS USC + GS
cap/conc. mon
"562.302 E 13 1930"

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
635	2.4	6/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 4
OPERATOR NB
DATE 5.12.10

SITE NUMBER 1
SITE NAME 110

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:50 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.271

STATION DESCRIPTIONS Set 6" nail

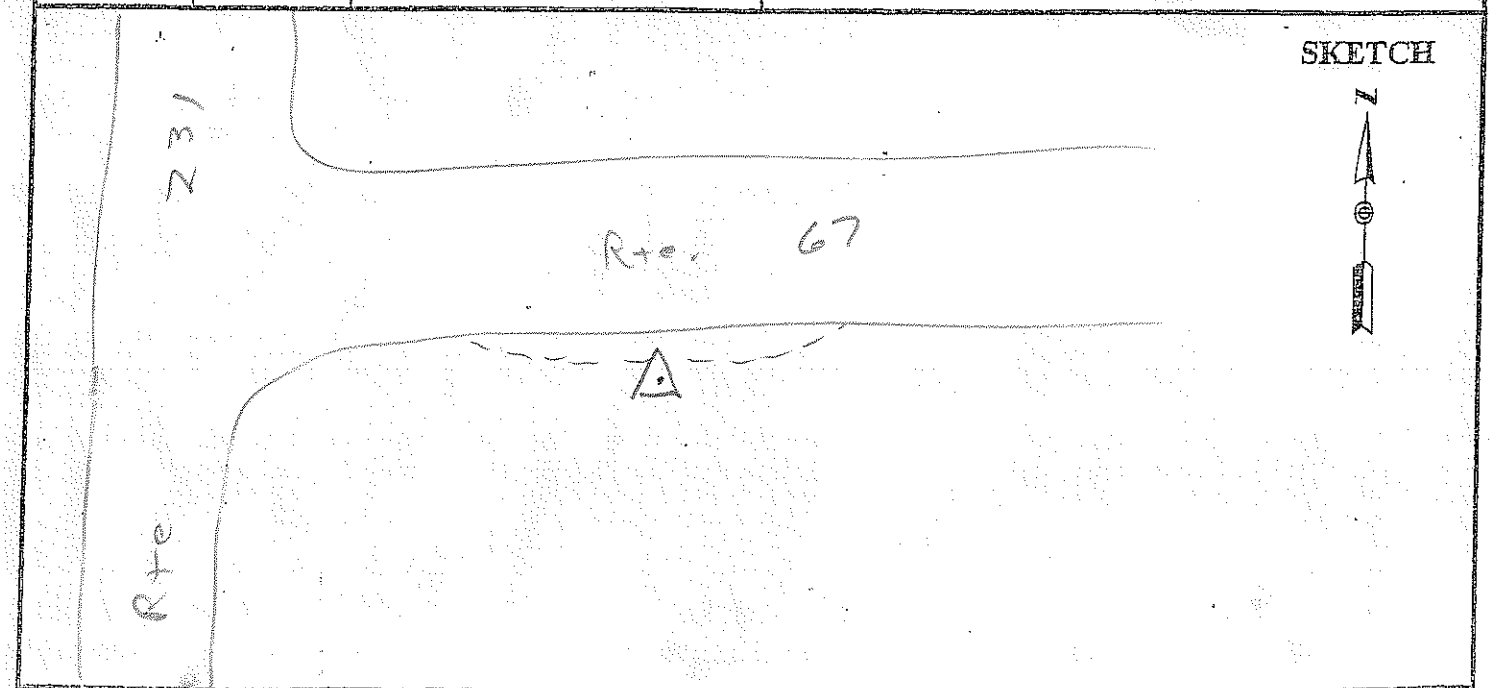
LT 502 1.691

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
650	2.2	8/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
39 21 21.3
86 44 20.6

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5.12.10

SITE NUMBER 1
SITE NAME N 13

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:12a
STOP 8:47a

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
~~399E/9500~~ ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.321

STATION DESCRIPTIONS Fnd USC + GS cap/conc mon "N 13 1430 593.427

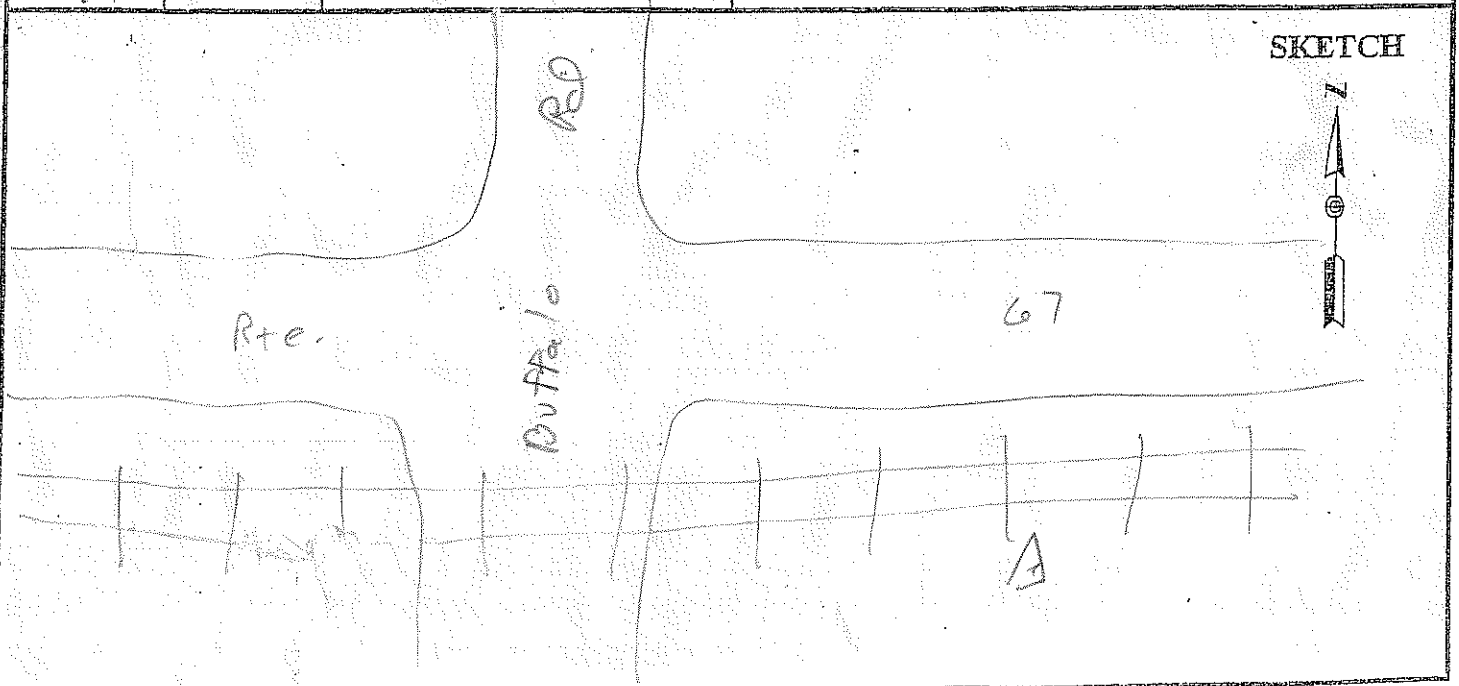
AT 502 1681

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
712	2.2	8/8
947		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5-12-10

SITE NUMBER 2
SITE NAME K 81 RESET

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:19 a.
STOP 9:46 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.004

STATION DESCRIPTIONS Fnd cap/conc. mon "K 81 RESET 1988"

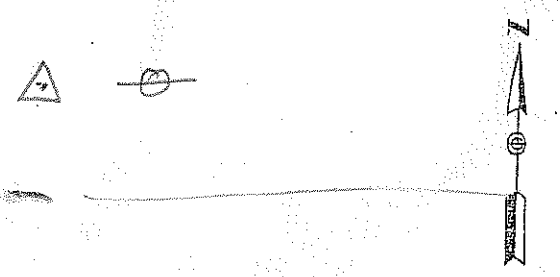
AT 502 1.364

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
819	1.7	10/10
846		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5-12-10

SITE NUMBER 3
SITE NAME A 353

TRACKING TIMES (LOCAL) MEASURE V
START 10:40 a.
STOP 11:40 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.430
AT502 1.790

STATION DESCRIPTIONS pin in handhole

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
940	2.8	10/11
1040		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
FOR DESCRIPTION SEE SHEET IN AREA 6

SKETCH

see Area 6

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

1/PT

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5.12.10

SITE NUMBER 4
SITE NAME 31

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:14 p
STOP 12:30 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.380

STATION DESCRIPTIONS in S. shoulder

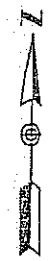
AT502 1.740

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1114	2.2	6/6
1130		

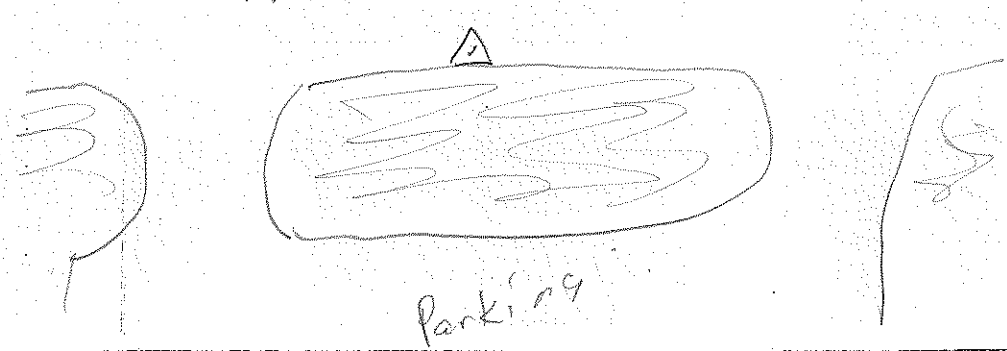
WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



B.K.

Rtes 46/67/231



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 √ PT

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5-12-10

SITE NUMBER 5
SITE NAME 32

TRACKING TIMES (LOCAL) MEASURE √
START 12:37 p
STOP 12:53 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.347

STATION DESCRIPTIONS E side road

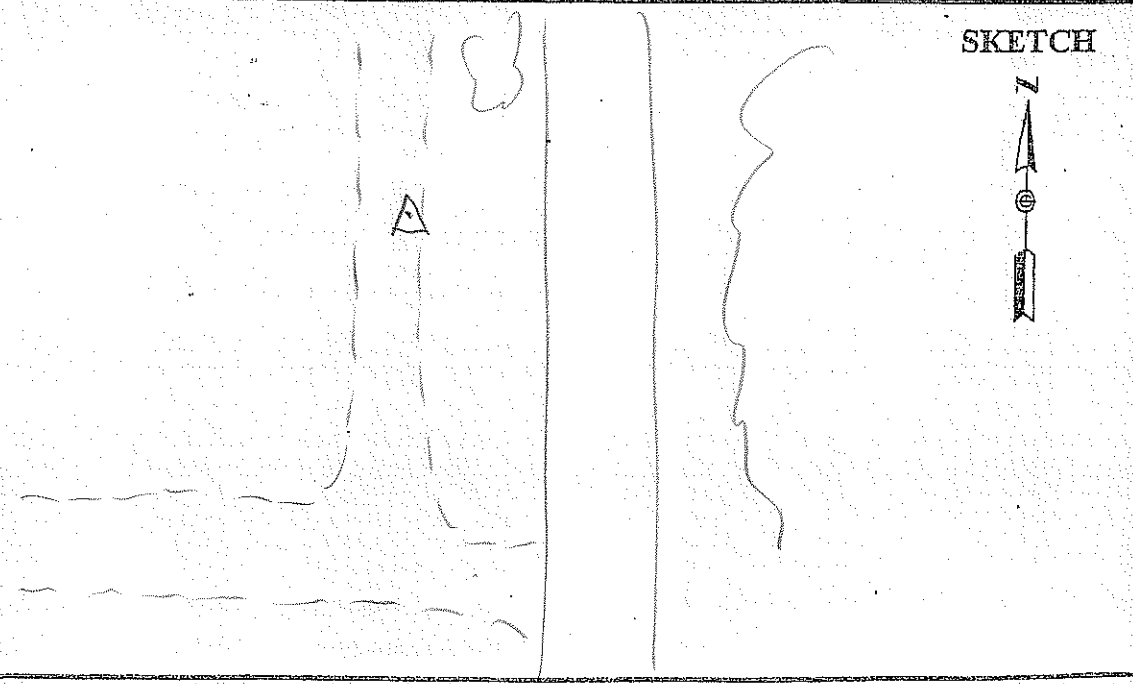
AT502 1707

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1137	2.6	11/11
1153		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

√ FT

PROJECT 1-100118 Area H
OPERATOR NB
DATE 5.12.10

SITE NUMBER 6
SITE NAME 33

TRACKING TIMES (LOCAL) MEASURE √
START 1:01 p
STOP 1:17 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
~~500~~ 0.360

OBSTRUCTIONS: trees NW

HEIGHT READINGS MTS FT
1.410

AT502 1.770

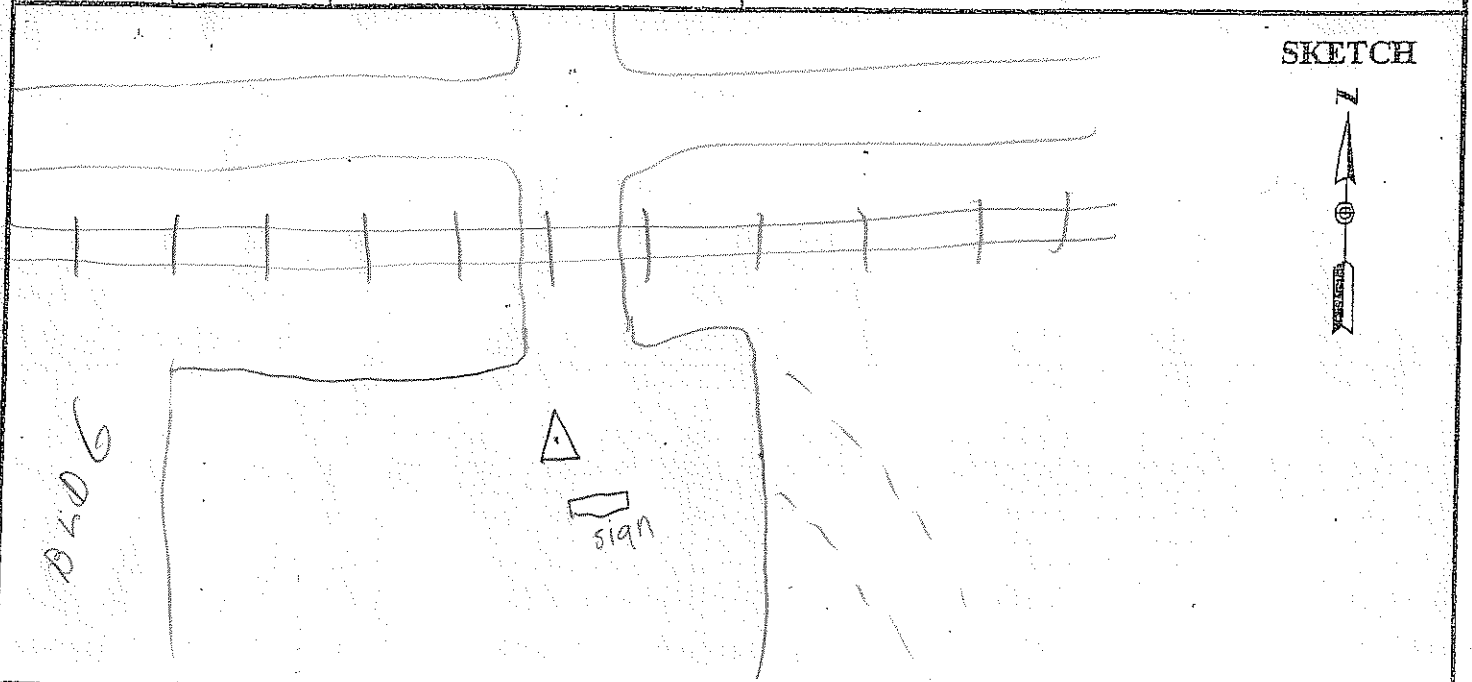
STATION DESCRIPTIONS in parking lot

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1201	2.3	7/7
1217		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 4
OPERATOR MB
DATE 5.12.10

SITE NUMBER 7
SITE NAME 34

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:24 p
STOP 1:40 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: trees NW → W + S

HEIGHT READINGS MTS FT
1.394

STATION DESCRIPTIONS in gravel area

AT 502 1754

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1224	4.2	6/6
1240		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base Control

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3.16.10

SITE NUMBER 1
SITE NAME Q 60 X

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:36
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.060
AT502 1.420

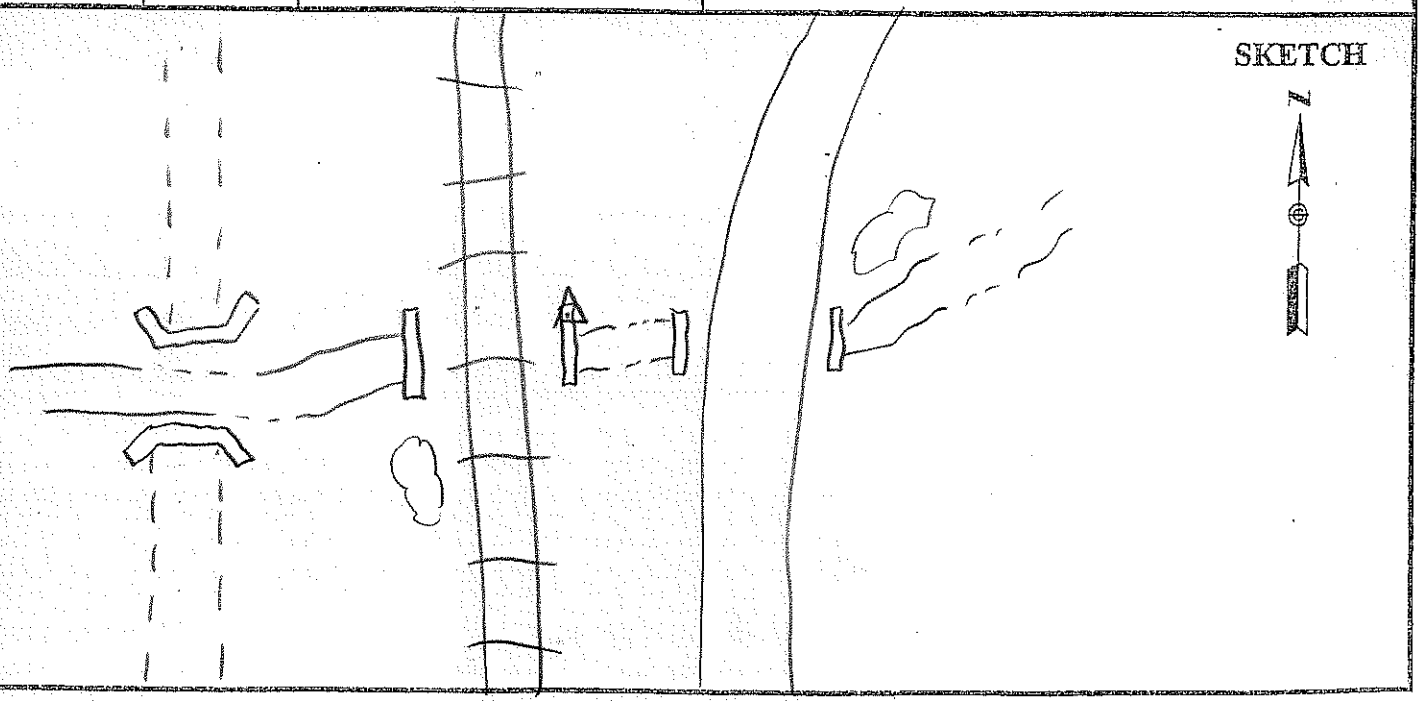
STATION DESCRIPTIONS fnd USC + GS
cap in N end headwall
"Q 60 X 1934"

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1036	2.3	8/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3·16·10

SITE NUMBER 1
SITE NAME 105

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:01 p
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. C13
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: post NW

HEIGHT READINGS MTS FT
1.353

STATION DESCRIPTIONS rebar + cap

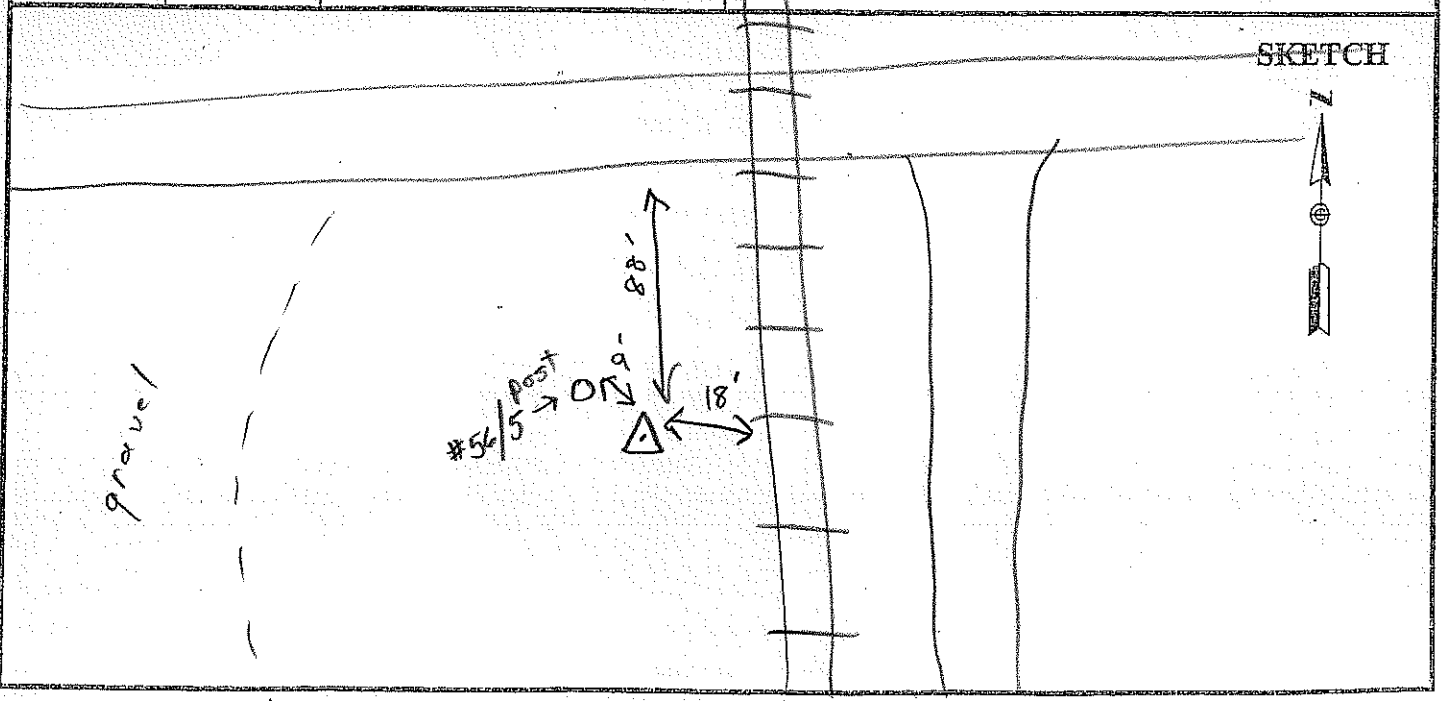
AT502 1713

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
2.4	1101	8/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
38° 59' 13.1"
85° 53' 40.8"

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN ~~53083~~ CONTROL

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3·16·10

SITE NUMBER 1
SITE NAME H 271

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:38 p
STOP 1:15 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.247

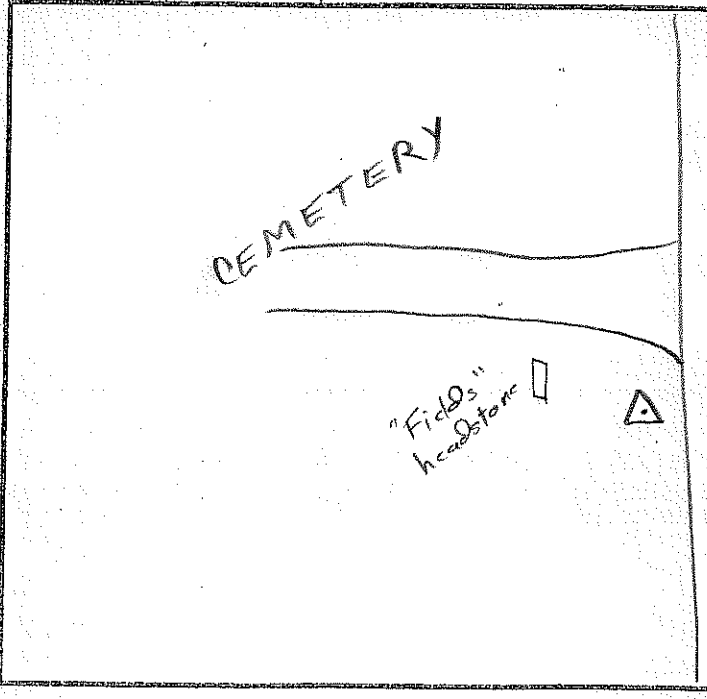
STATION DESCRIPTIONS fnd USC+GS cap/conc. mon. "H 271 1947"

AT502 1607

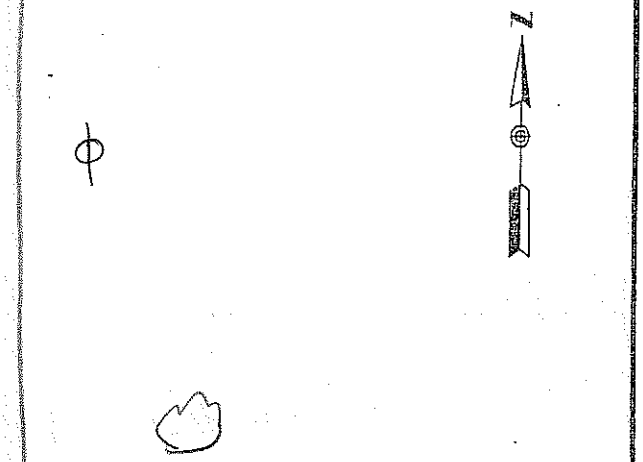
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1138	2.9	6/6
1215		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS



SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ~~53083~~ 1 PT.

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3-16-10

SITE NUMBER 2
SITE NAME 12

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:36 P
STOP 1:54 P

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. C13
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.295

STATION DESCRIPTIONS S bound shoulder

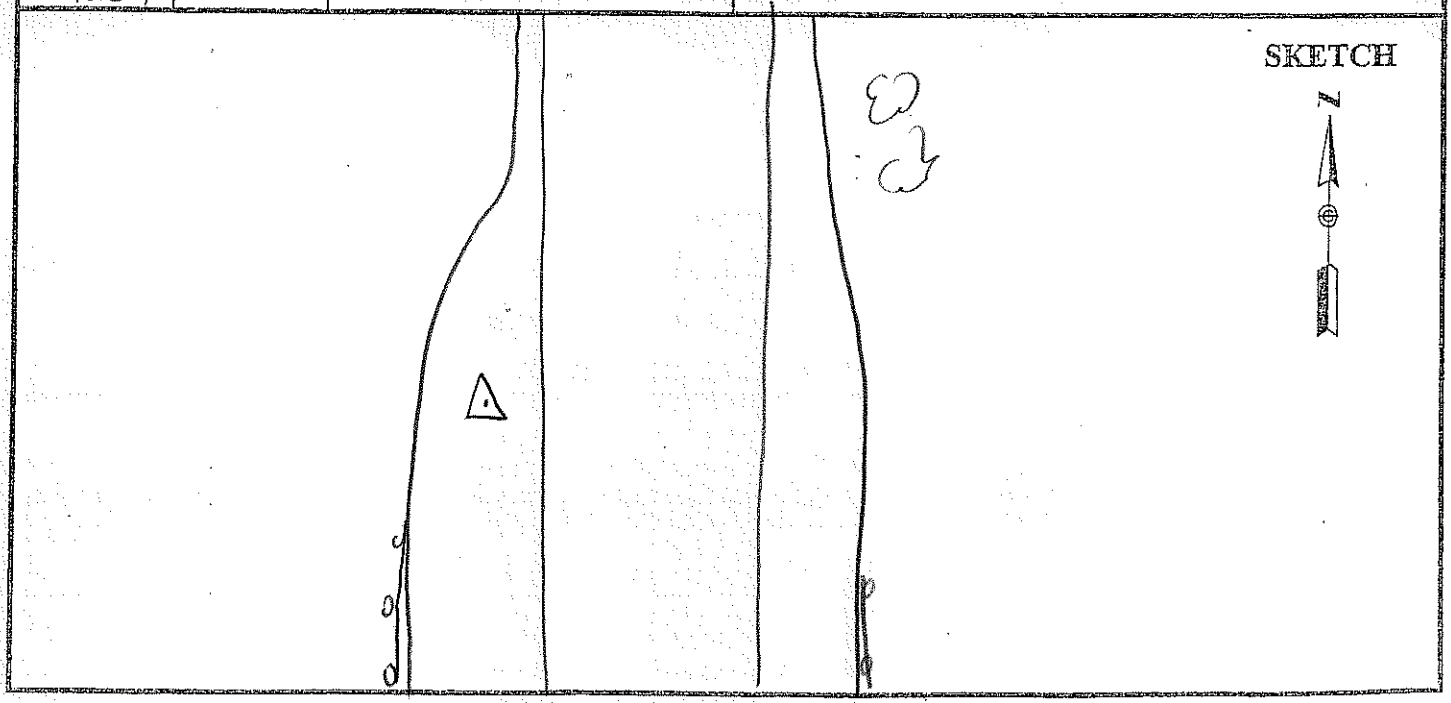
AT502 1655

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1236	2.0	10/10
1254		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, ~~WISCONSIN~~ 53083 1 PT.

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3.16.10

SITE NUMBER 3
SITE NAME 13

TRACKING TIMES (LOCAL) MEASURE ✓
START 2:11 p
STOP 2:29 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: bldg NE

HEIGHT READINGS MTS FT
1.361

STATION DESCRIPTIONS in parking area

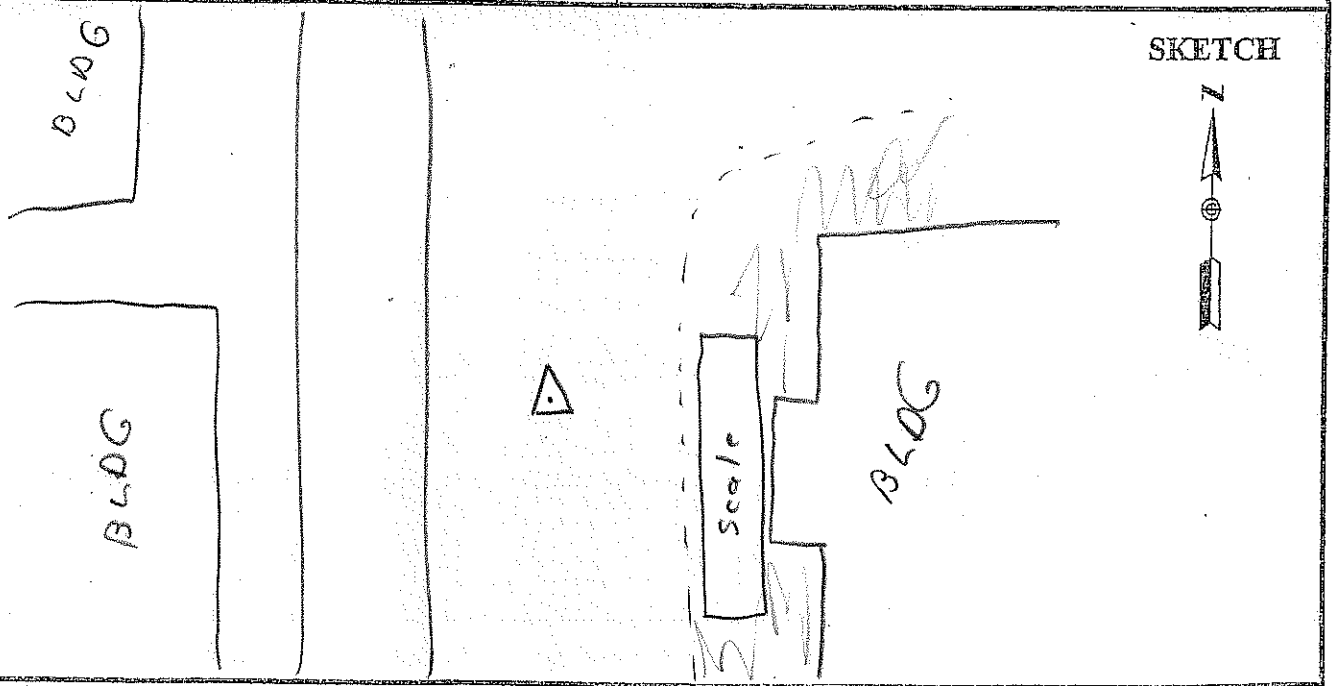
AT502 1721

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1311	6.0	4/5
1329		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Control

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3·16·10

SITE NUMBER 4
SITE NAME E 10

TRACKING TIMES (LOCAL) MEASURE ✓
START 3:17 p
STOP 3:47 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.227

STATION DESCRIPTIONS DnD USC+GS
cap/conc. mon. "E 10 1930"

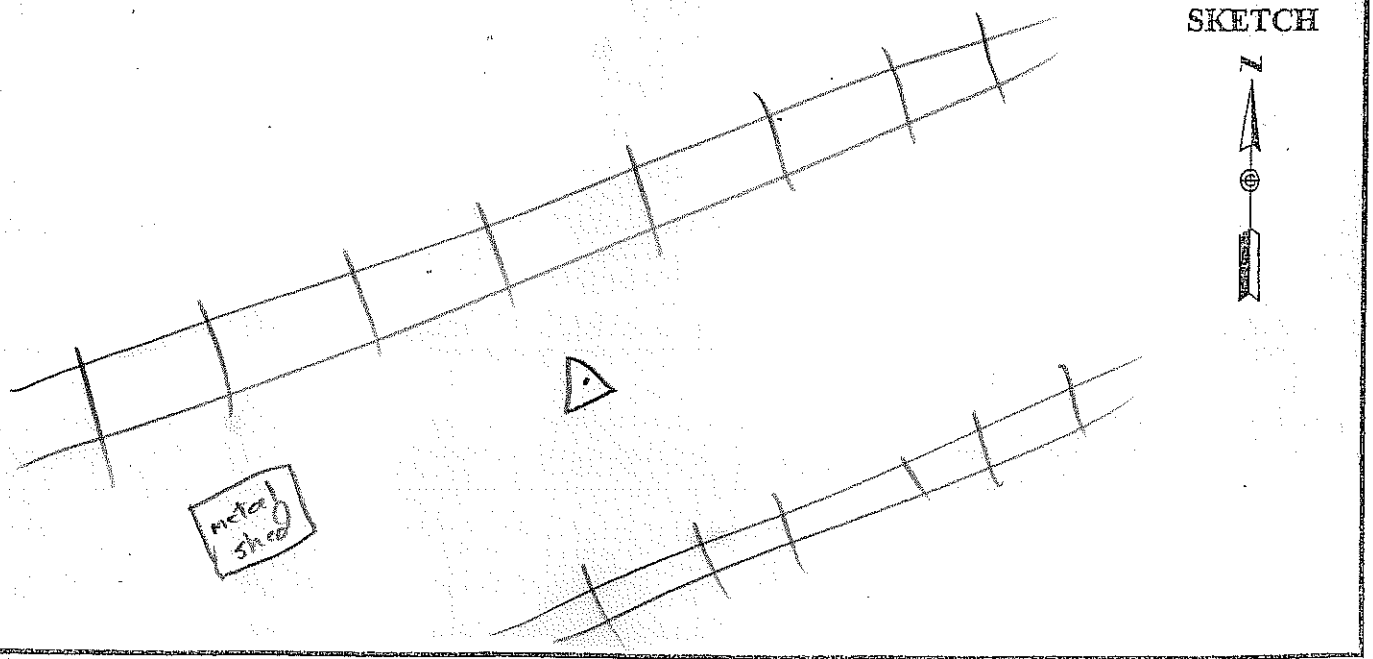
AT50L 1587

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1417	2.3	5/6
1447		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 5
OPERATOR 3.17.10
DATE MD

SITE NUMBER 1
SITE NAME 105

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:30a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: post NW

HEIGHT READINGS MTS FT
1.314

STATION DESCRIPTIONS rebar/cap

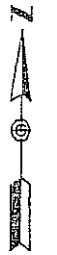
AT502 1.674

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
830	3.0	7/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



See previous

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base control

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3-17-10

SITE NUMBER 1
SITE NAME Q 60 X

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:57a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.026

STATION DESCRIPTIONS cap on headwall

AT502
1386

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
857	2.6	7/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

see previous

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 V PT

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3.17.10

SITE NUMBER 1
SITE NAME 14

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:02 a.
STOP 8:15 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.392

STATION DESCRIPTIONS NW area of parking lot

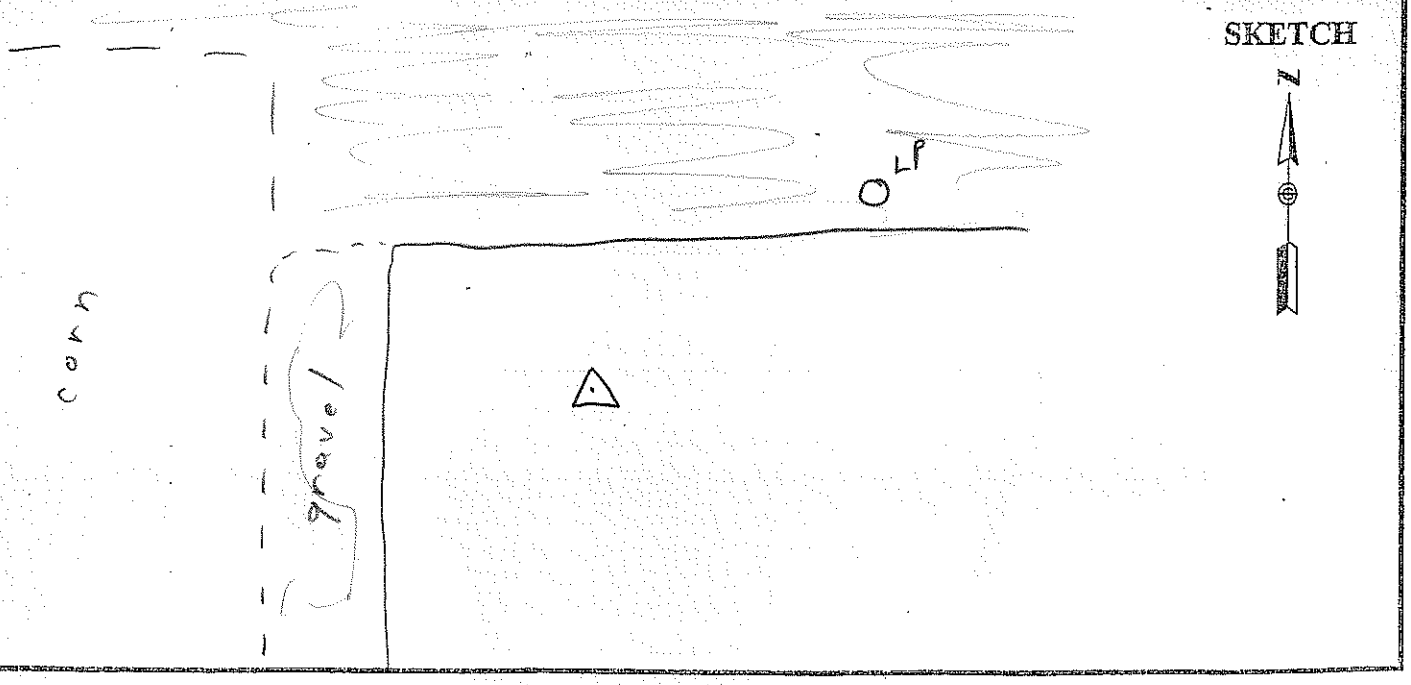
AT502 1752

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
702	3.4	6/6
715		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
~~SHEBOYGAN, WISCONSIN 53083~~ ✓ PT

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3.17.10

SITE NUMBER 2
SITE NAME 15

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:35 a.
STOP 8:52 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.411
AT502 1.771

STATION DESCRIPTIONS S bound lane

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
735	2.5	8/8
752		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 5
OPERATOR MB
DATE 3·17·10

SITE NUMBER 3
SITE NAME 16

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:01a.
STOP 9:19a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. QB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.400
AT502 1.760

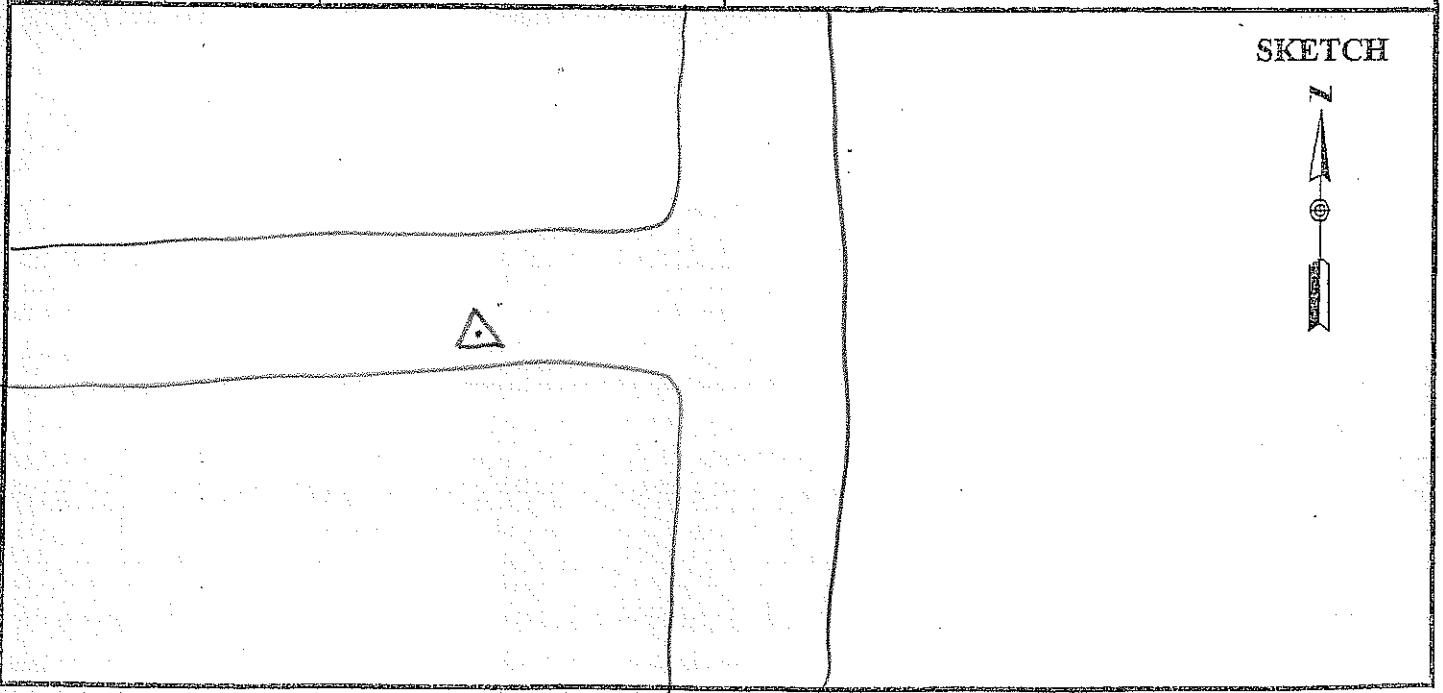
STATION DESCRIPTIONS E bound lane

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
801	3.5	7/7
819		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 6
OPERATOR NB
DATE 5.11.10

SITE NUMBER 1
SITE NAME 108

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:03 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.366

STATION DESCRIPTIONS set nobar + cap

CAN BE USED AS A ✓PT.

AT502 1726

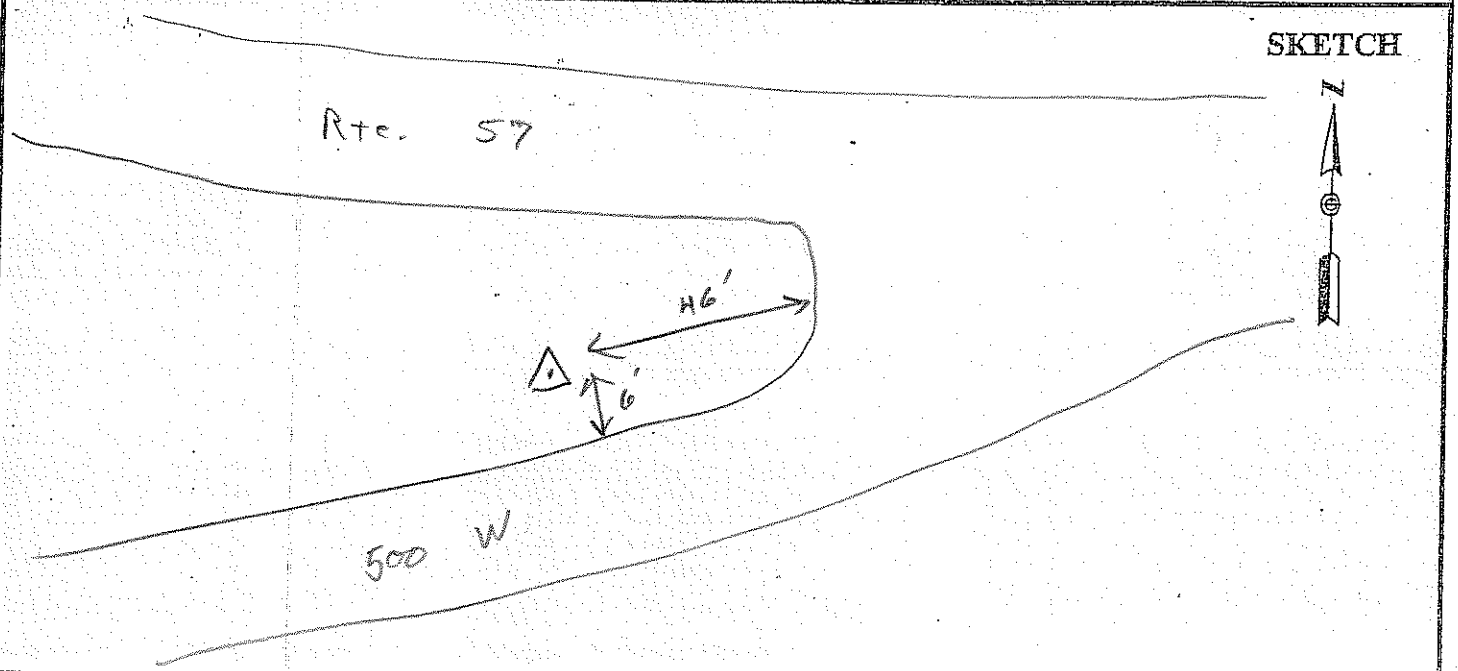
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
603	2.6	8/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

38° 54' 36.8"
087° 02' 04.2"

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 6
OPERATOR MB
DATE 5.11.10

SITE NUMBER 1
SITE NAME 109

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:27 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. OB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: PP east

HEIGHT READINGS MTS FT
1.276

STATION DESCRIPTIONS set 6" nail

AT 502 1636

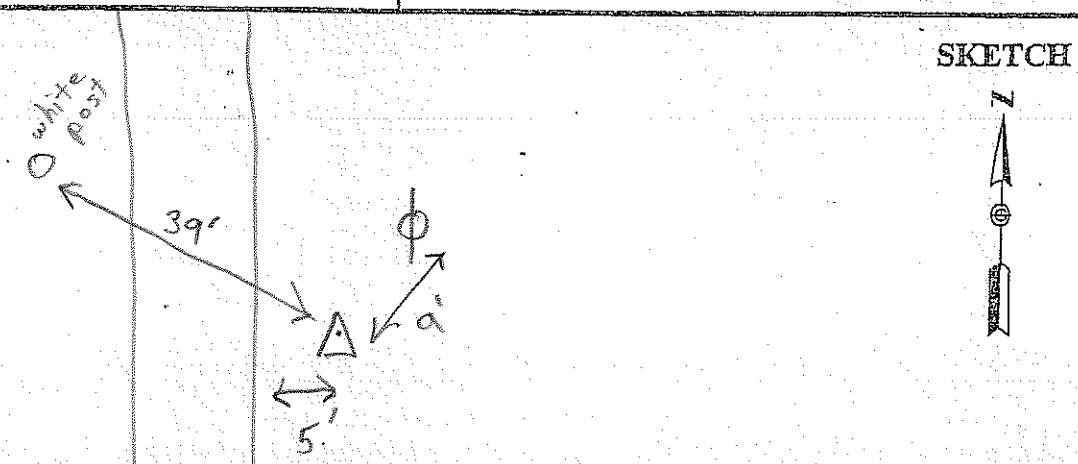
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
627	2.1	7/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

38° 56' 39.6"
087° 08' 07.3"

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Control

PROJECT 1-100118 Area 6
OPERATOR MB
DATE 5.11.10

SITE NUMBER 1
SITE NAME 5280

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:07 a.
STOP 8:37 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
.972

STATION DESCRIPTIONS fnd USC + GS
cap/conc. mon. "5280 1948"

AT502 1332

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
707	3.0	5/6
737		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

Control

PROJECT 1-100118 Area 6
OPERATOR MB
DATE 5.11.10

SITE NUMBER 2
SITE NAME A 353

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:07 a.
STOP 9:30 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.430

STATION DESCRIPTIONS pin in handhole
"A 353 1985"

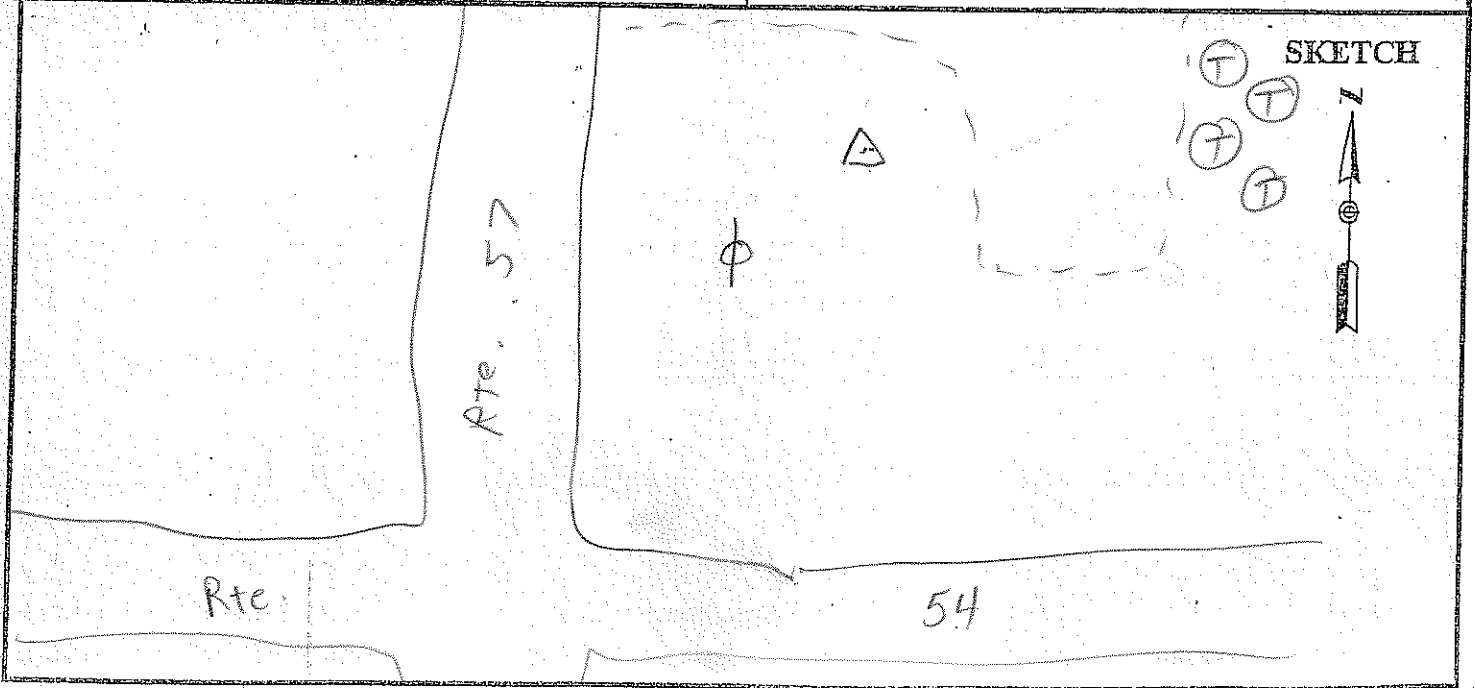
AT502 1790

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
807	1.8	9/10
830		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 √pt.

PROJECT 1-100118 Area 6
OPERATOR MB
DATE 5-11-10

SITE NUMBER 3
SITE NAME 27

TRACKING TIMES (LOCAL) MEASURE √
START 9:52a.
STOP 10:06a

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/~~9500~~ 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.360

AT502 1.720

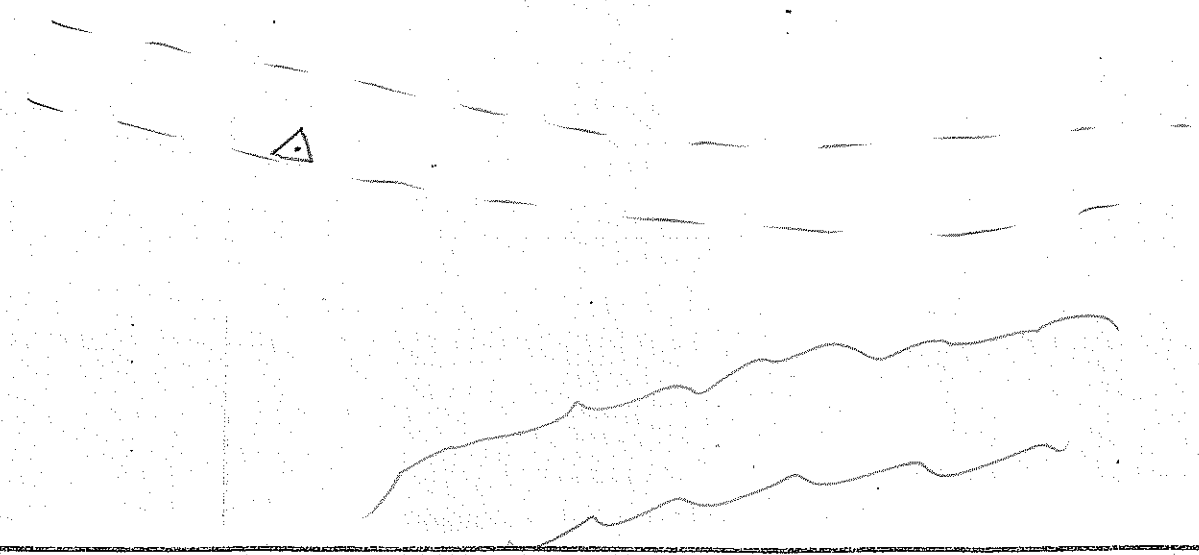
STATION DESCRIPTIONS SW side of road

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
852	4.0	7/7
906		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

√ pt

PROJECT 1-100118 Area 6
OPERATOR NB
DATE 5.11.10

SITE NUMBER 4
SITE NAME 28

TRACKING TIMES (LOCAL) MEASURE √
START 10:24 a.
STOP 10:40 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/~~9500~~ ~~0.389~~
~~500~~ 0.360

OBSTRUCTIONS: trees NW

HEIGHT READINGS MTS FT
1.356

STATION DESCRIPTIONS in driveway

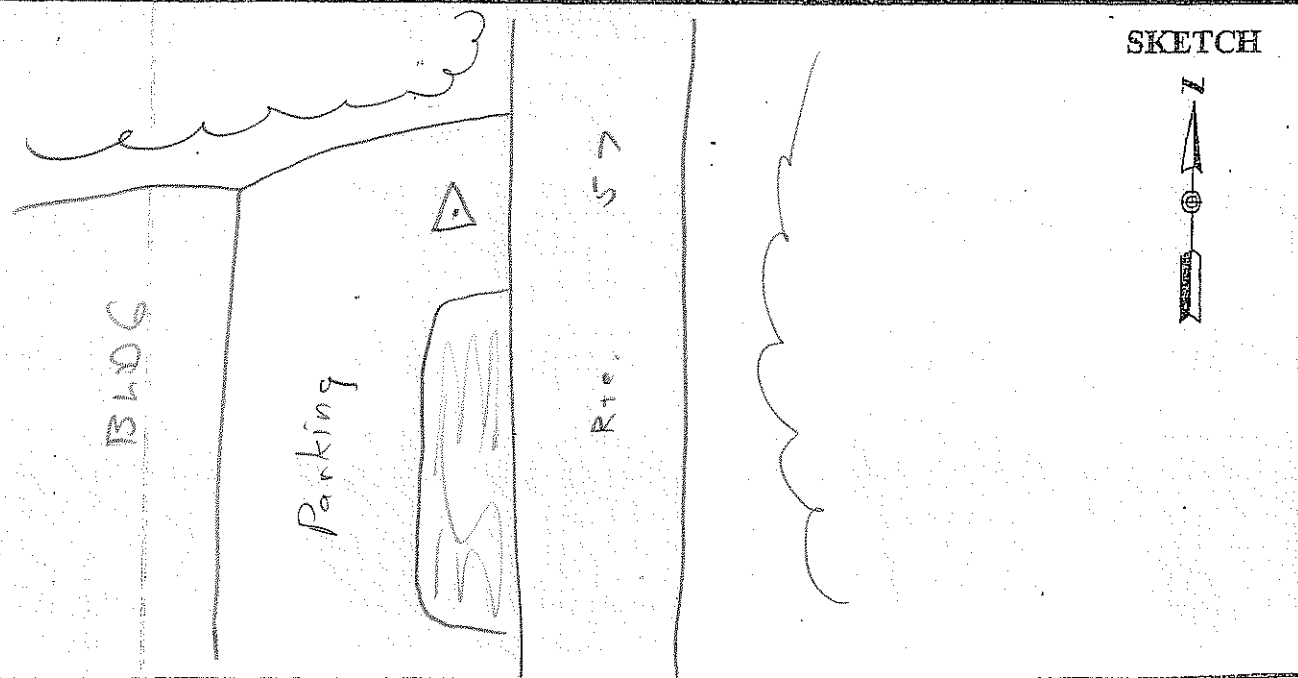
AT502 1.716

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
924	2.6	9/9
940		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ DT

PROJECT I-100118 Area 6
OPERATOR MB
DATE 5.10.10

SITE NUMBER 5
SITE NAME 29

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:55 a
STOP 11:40 a

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
~~500~~ 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.392

STATION DESCRIPTIONS N. side road

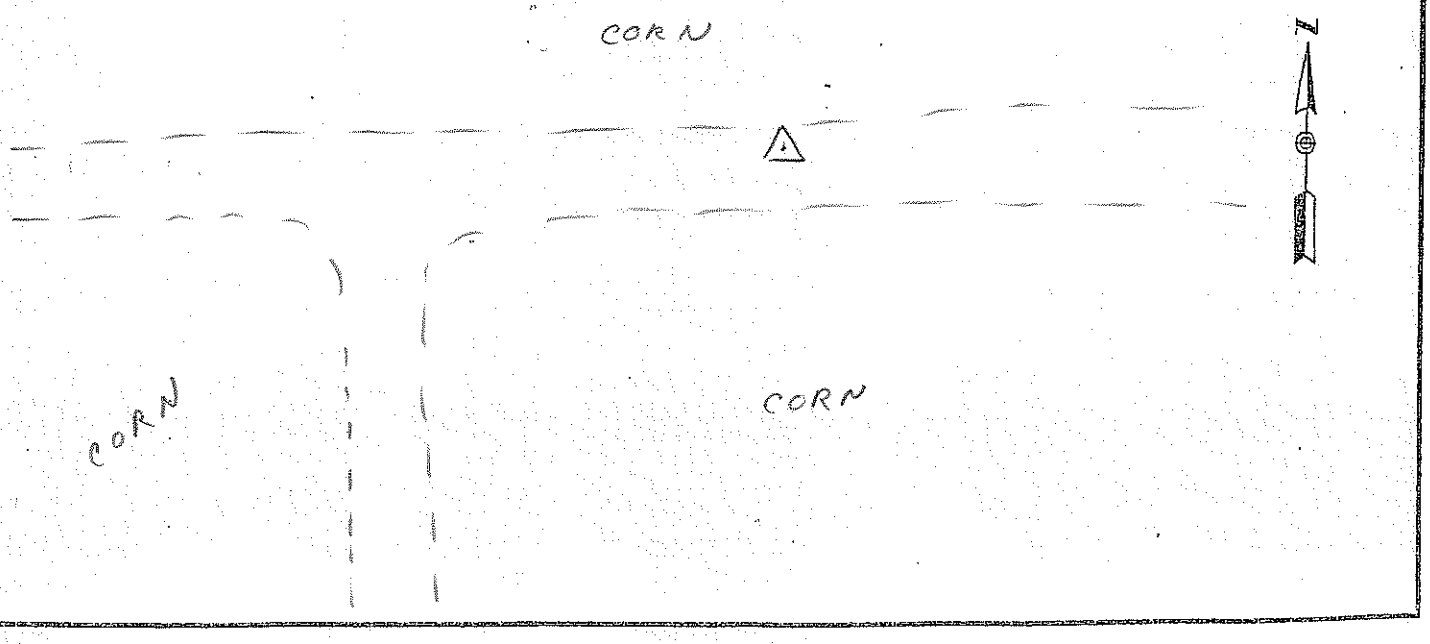
AT502 1.752

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
955	2.0	11/11
1040		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 CONTROL

PROJECT 1-100118 Area 6
OPERATOR NB
DATE 5-11-10

SITE NUMBER 6
SITE NAME J 354

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:41 a.
STOP 12:00 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS:

HEIGHT READINGS MTS FT
1.470

STATION DESCRIPTIONS pin in handhole
" J 354 1985 "

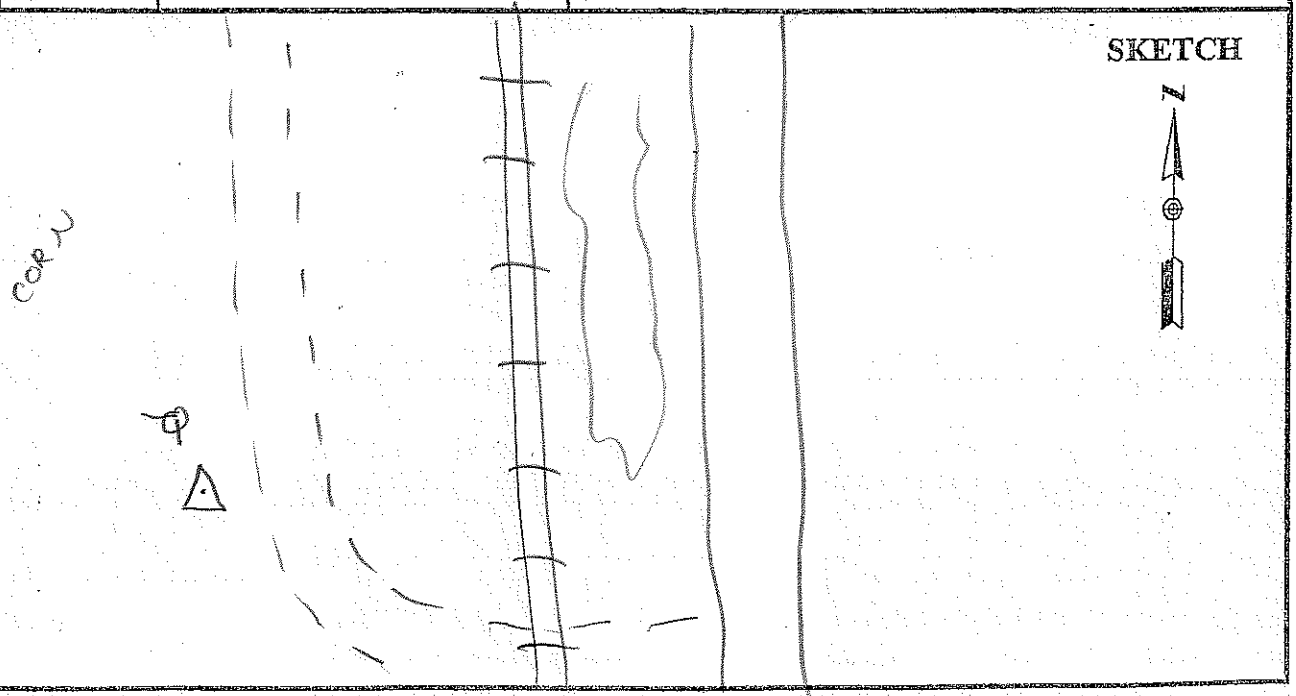
AT 502 1.830

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1041	2.2	11/11
1100		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ RT

PROJECT 1-100118
OPERATOR MB
DATE 5.11.10

SITE NUMBER 7
SITE NAME 30

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:14 p
STOP 12:30 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 603
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) ~~0.360~~

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.328

STATION DESCRIPTIONS N. side road

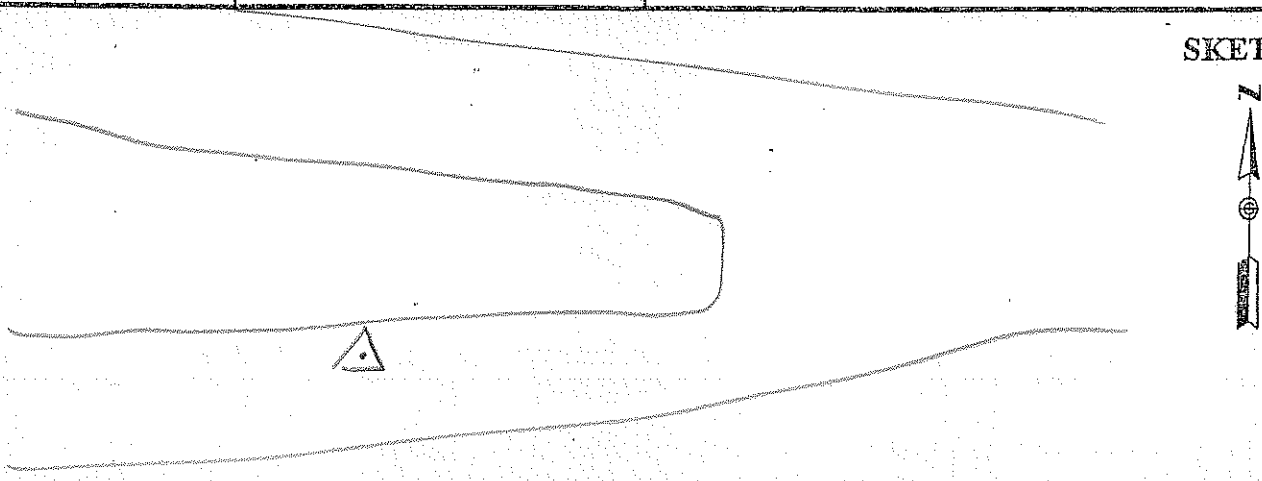
AT 502 1688

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1114	5.8	5/5
1130		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3-11-10

SITE NUMBER 1
SITE NAME 103

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:08 a
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: tree NNW

HEIGHT READINGS MTS FT
1.332

STATION DESCRIPTIONS fnd INDOT
plastic cap on nail
CAN BE CHECKPOINT

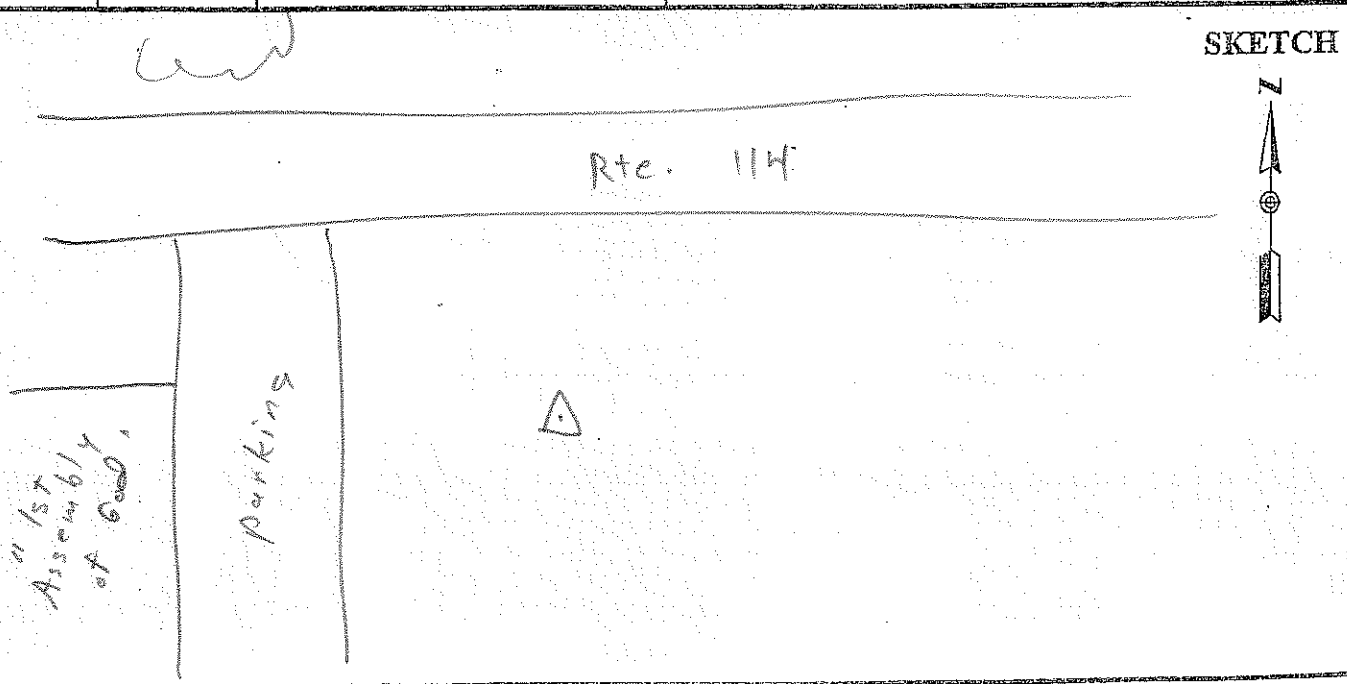
ATSO2 1.692

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
808	1.9	9/9

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
40 56 26.2
087 09 40.5

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 7
OPERATOR MG
DATE 3.11.10

SITE NUMBER 1
SITE NAME 104

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:20a
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.218

STATION DESCRIPTIONS set rebar + cap

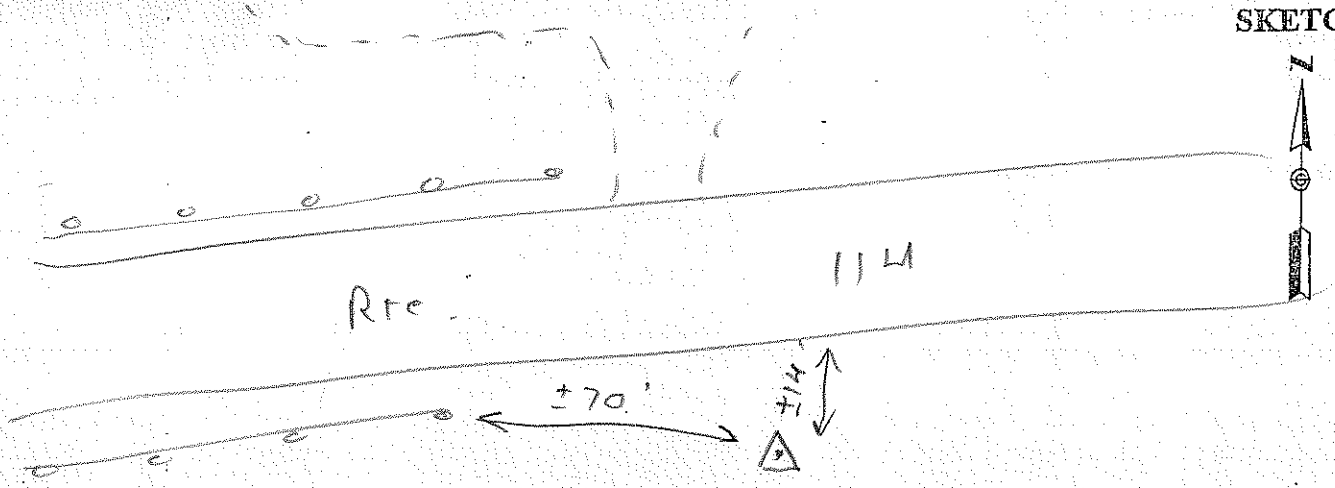
AT502 1578

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
820	2.0	8/8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
HO 56 00.6
087 07 38.4

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Vert. Control

PROJECT 1-100118 Area 7
OPERATOR MG
DATE 3-11-10

SITE NUMBER 1
SITE NAME M 107

TRACKING TIMES (LOCAL) MEASURE _____
START 8:00a.
STOP 8:17a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO. _____
SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: trees WNW

HEIGHT READINGS MTS FT
.978 _____

STATION DESCRIPTIONS fnd cap on headwall "M 107 1946"

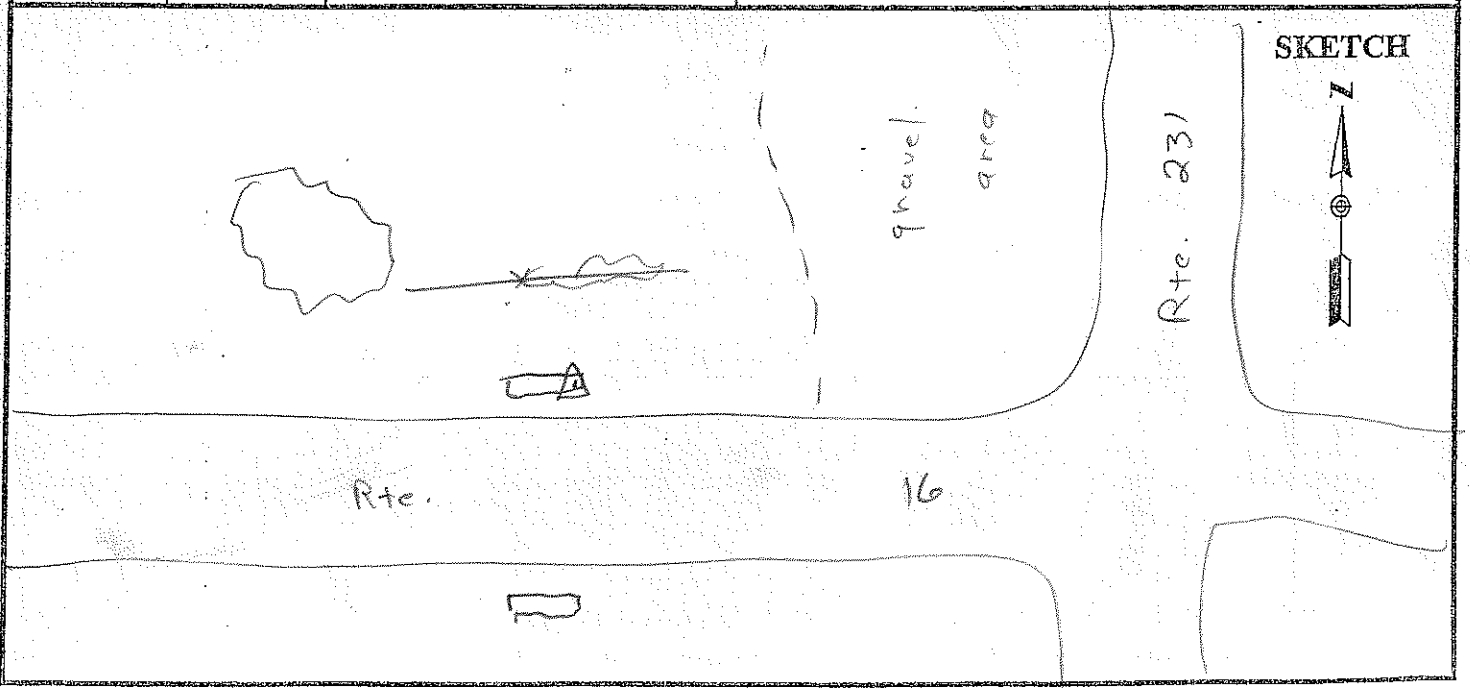
AT502 1338

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
900	2.7	6/8
917		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Vert. Control

PROJECT I-100118 Area 7
OPERATOR MB
DATE 3.11.10

SITE NUMBER 2
SITE NAME New L 5

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:34a.
STOP 9:00a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: ~~none~~ sign E

HEIGHT READINGS MTS FT
.950

STATION DESCRIPTIONS Rnd cap on wingwall "New L 5"

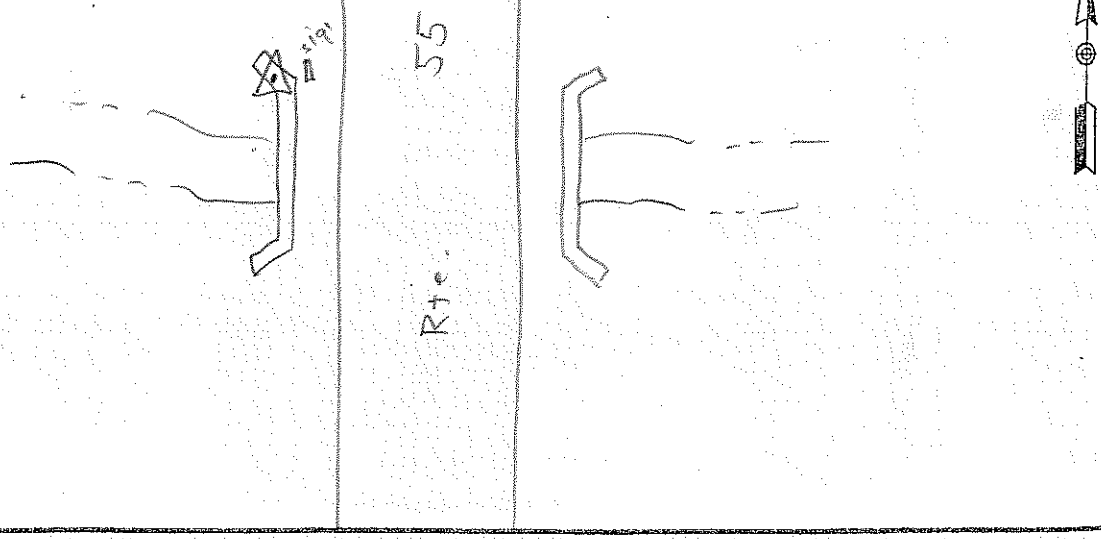
AT502 1.310

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
934	1.8	8/9
1000		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Vert. Control

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3.11.10

SITE NUMBER 3
SITE NAME P157

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:27a
STOP 9:49a

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/~~9500~~ ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.173

STATION DESCRIPTIONS fnd cap /conc. mon
"P 157 1946"

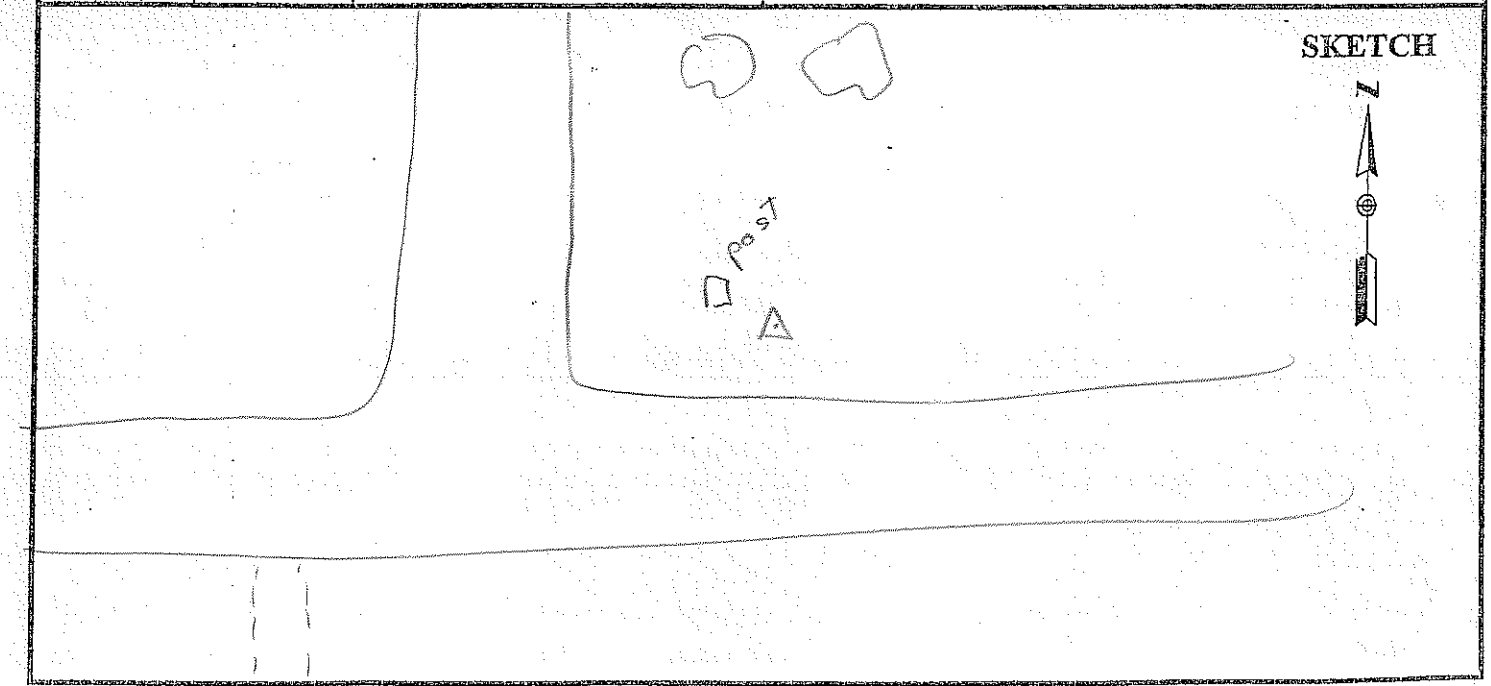
ATSO7 1533

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1027	2.5	8/8
1049		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 1 pt

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3.11.10

SITE NUMBER 4
SITE NAME 7

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:57 a.
STOP 11:12 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.352

STATION DESCRIPTIONS in asphalt parking lot

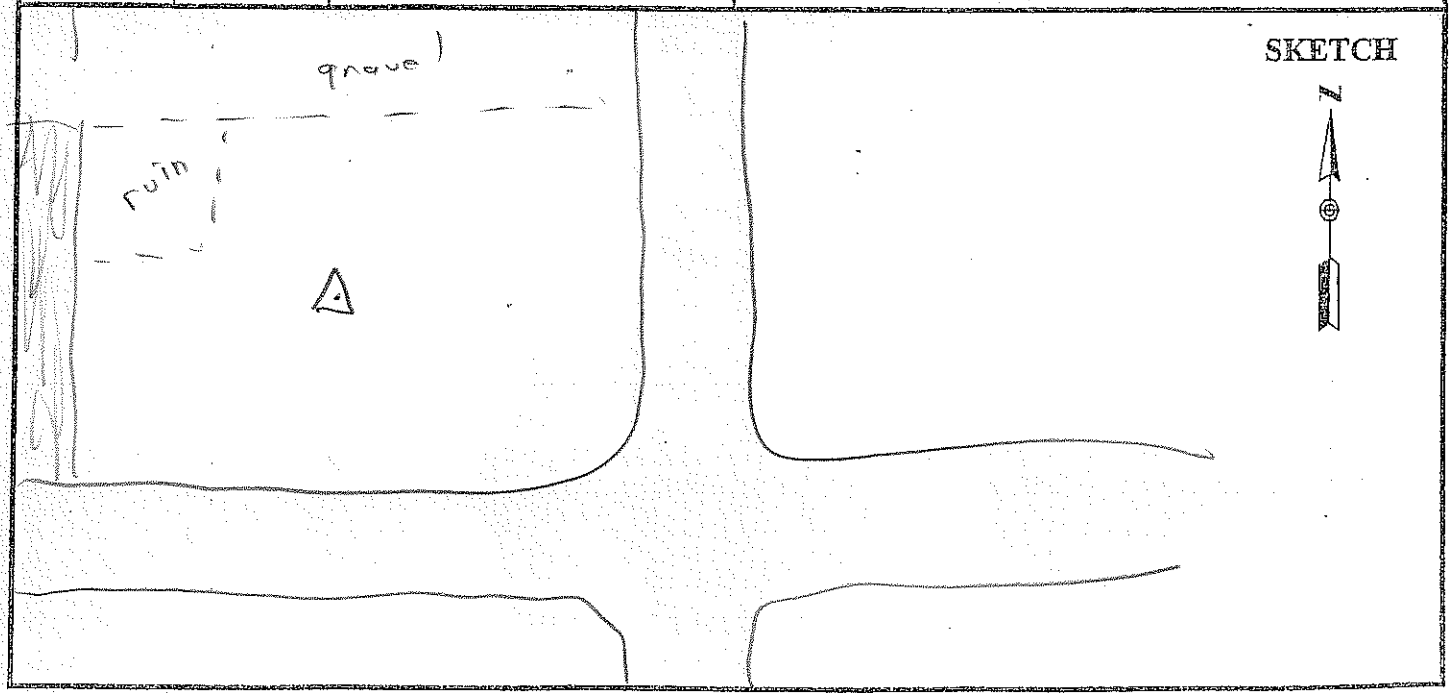
AT502 1.712

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1157	2.6	7/7
1212		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3.11.10

SITE NUMBER 5
SITE NAME 8

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:20 a.
STOP 11:35 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.379

STATION DESCRIPTIONS N. end of hospital parking - E of helipad

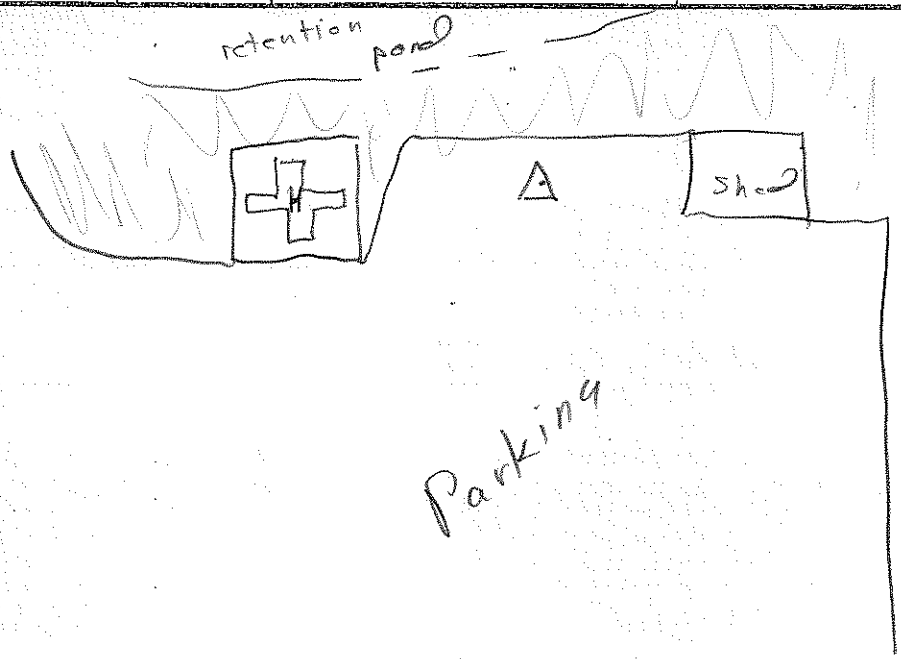
AT502 1739

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1220	1.9	10/10
1235		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3.11.10

SITE NUMBER 6
SITE NAME 9

TRACKING TIMES (LOCAL) MEASURE ✓
START 11:46 a
STOP 12:01 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.365

STATION DESCRIPTIONS in shoulder

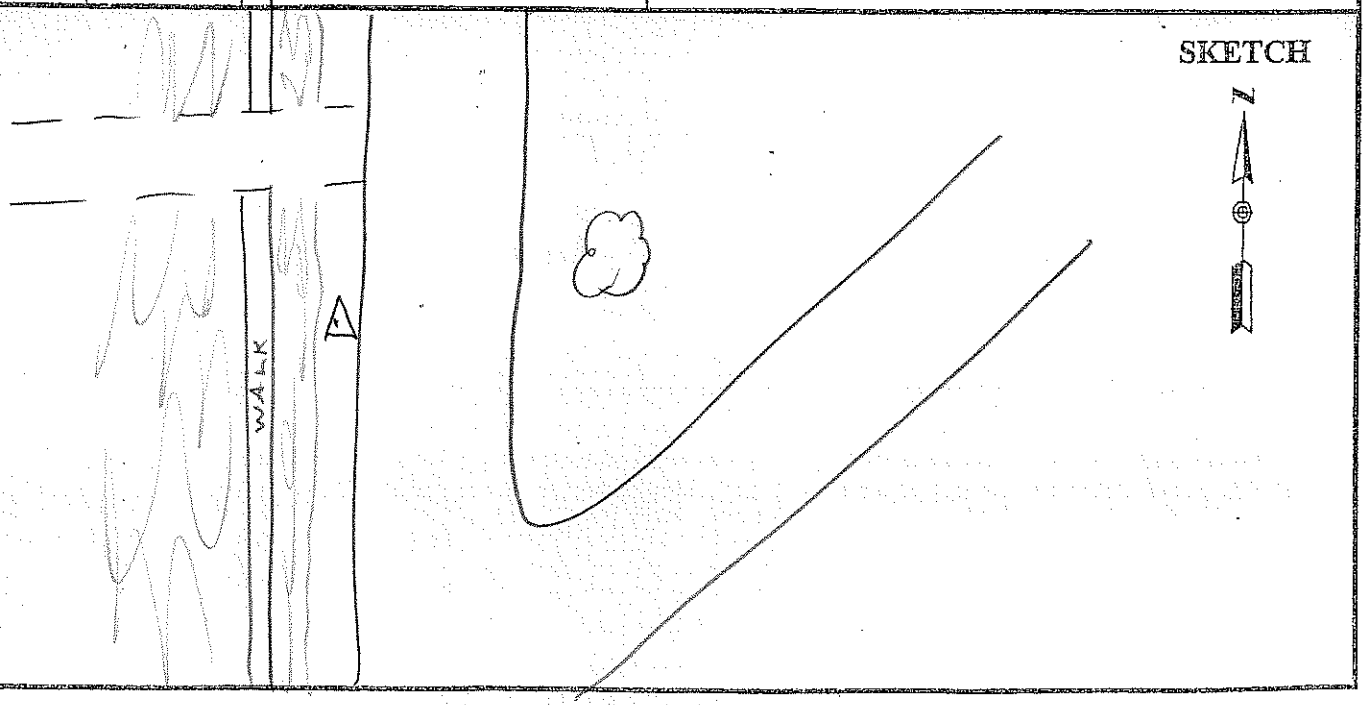
AT502 1725

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1246	3.0	9/9
1301		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 1/PT

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3·11·10

SITE NUMBER 7
SITE NAME 10

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:11 p
STOP 12:26 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 231
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.355

STATION DESCRIPTIONS in asphalt parking lot

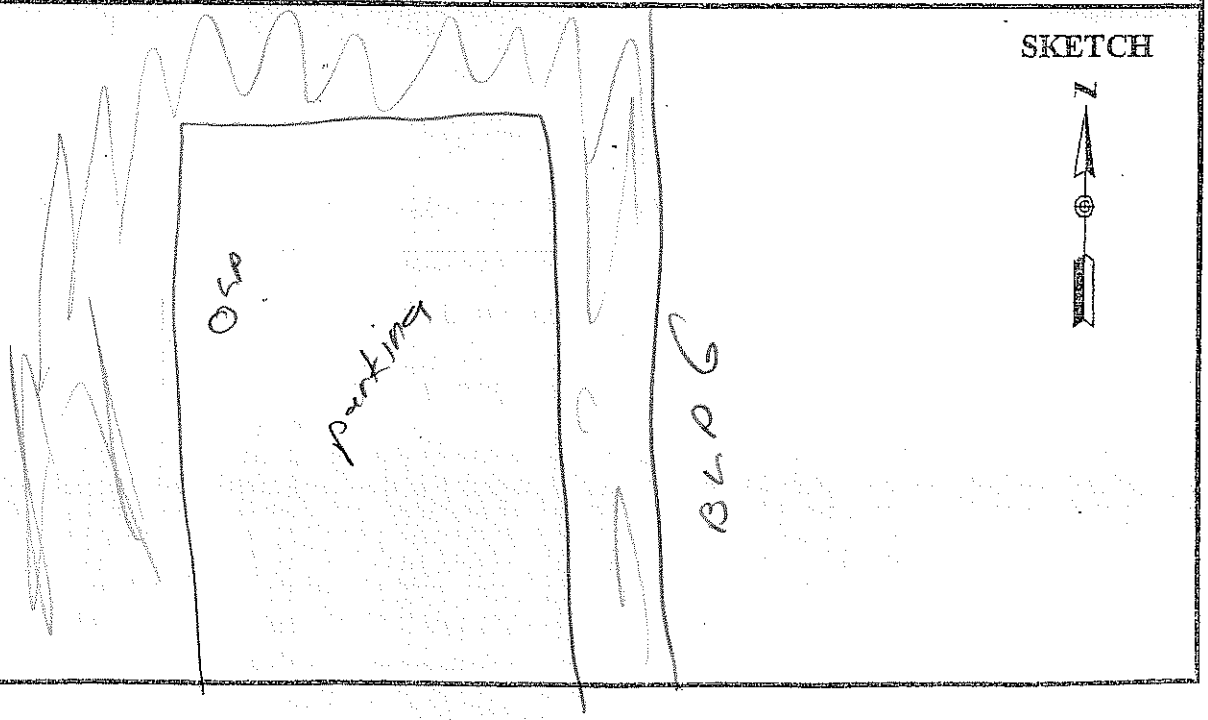
AT502 1.715

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1311	2.6	7/7
1326		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 √ PT

PROJECT 1-100118 Area 7
OPERATOR MB
DATE 3.11.10

SITE NUMBER 8
SITE NAME 11

TRACKING TIMES (LOCAL) MEASURE ✓
START 12:34 p
STOP 12:49 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.421

AT 502 1.781

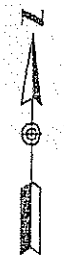
STATION DESCRIPTIONS E bound lane

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1334	3.2	7/7
1349		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.10.10

SITE NUMBER 1
SITE NAME 101

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:02 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.275

STATION DESCRIPTIONS nil

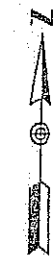
AT502 1625

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
702		7/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



Sec
previous

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3·10·10

SITE NUMBER 1
SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:14 a.
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.324

STATION DESCRIPTIONS nail

AT502 1.684

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
714	2.4	7/7

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH

See previous

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT.

PROJECT 1-100118 Area 8
OPERATOR NB
DATE 3·10·10

SITE NUMBER 1
SITE NAME 1

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:29a.
STOP 7:44a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees NE + NW

HEIGHT READINGS MTS FT
1.373

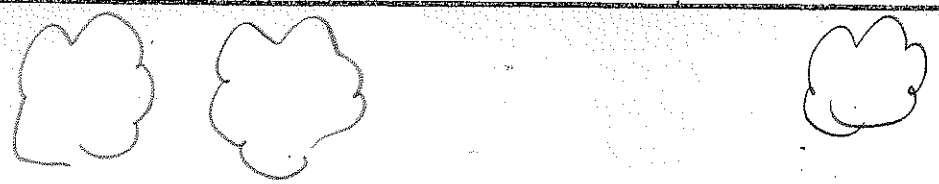
STATION DESCRIPTIONS E. bound lane

AT502 1.733

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
729	5.2	6/6
744		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS



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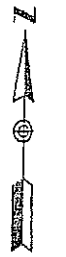


AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3·10·10

SITE NUMBER 2
SITE NAME 2

TRACKING TIMES (LOCAL) MEASURE ✓
START 7:57 a.
STOP 8:12 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: trees W

HEIGHT READINGS MTS FT
1.373

STATION DESCRIPTIONS SE area of cul-de-sac

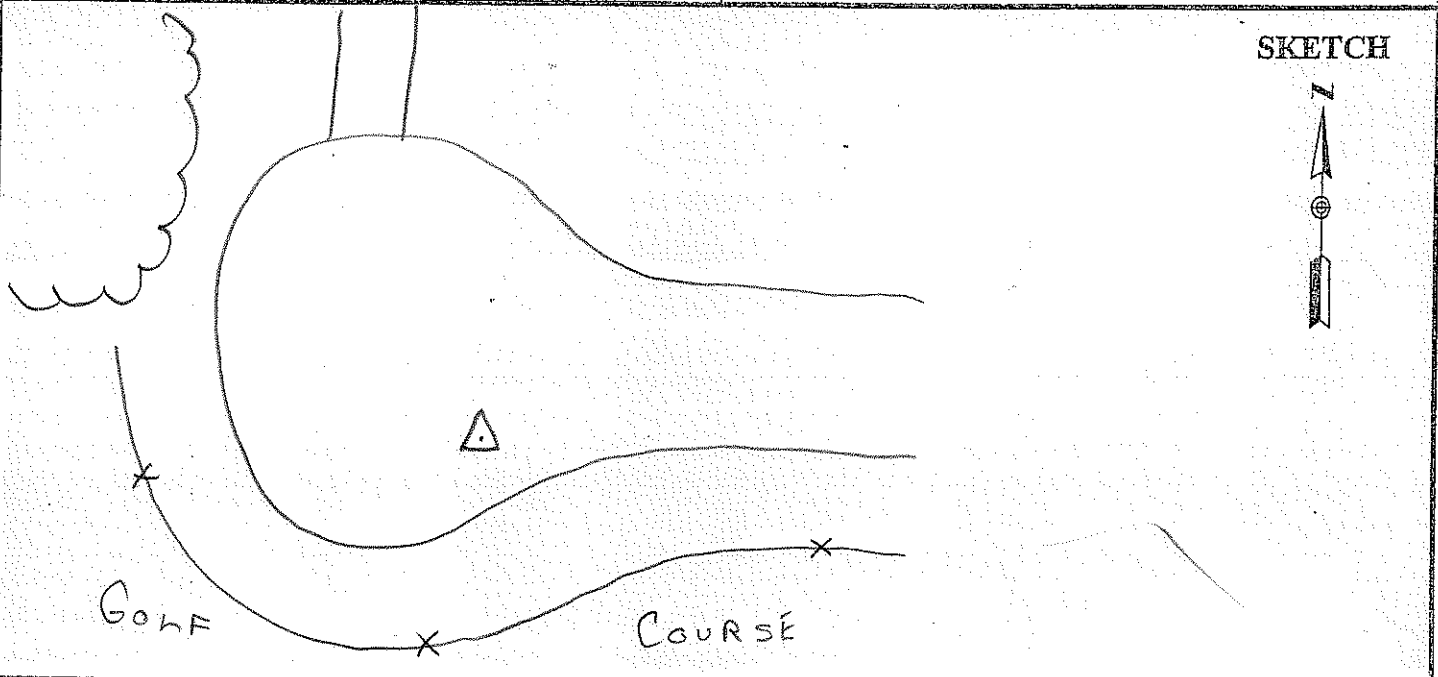
AT502 1.733

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
757	4.7	6/7
812		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 1-100118 Area 8
OPERATOR MG
DATE 3.10.10

SITE NUMBER 3
SITE NAME 3

TRACKING TIMES (LOCAL) MEASURE ✓
START 8:22a.
STOP 8:38a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.346

AT502 1.706

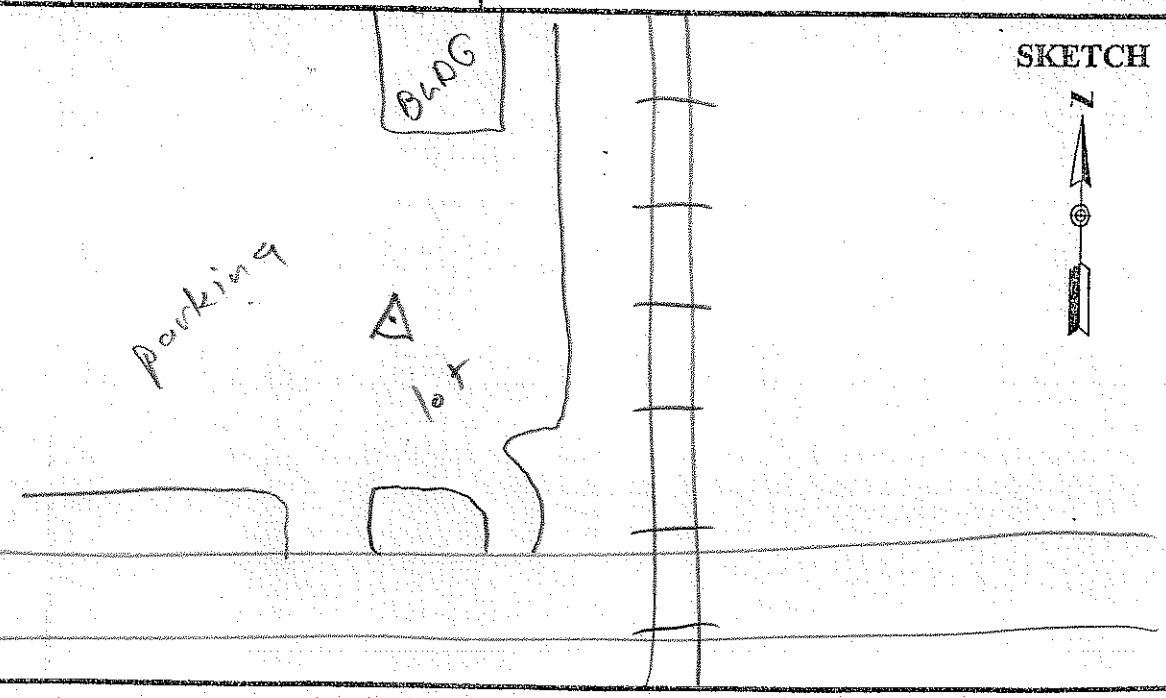
STATION DESCRIPTIONS SE area of parking lot

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
822	4.2	9/9
838		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Vert. Control

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.10.10

SITE NUMBER 4
SITE NAME A 168

TRACKING TIMES (LOCAL) MEASURE ✓
START 9:09 a.
STOP 9:39 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: tree NW + E

HEIGHT READINGS MTS FT
1.339

STATION DESCRIPTIONS

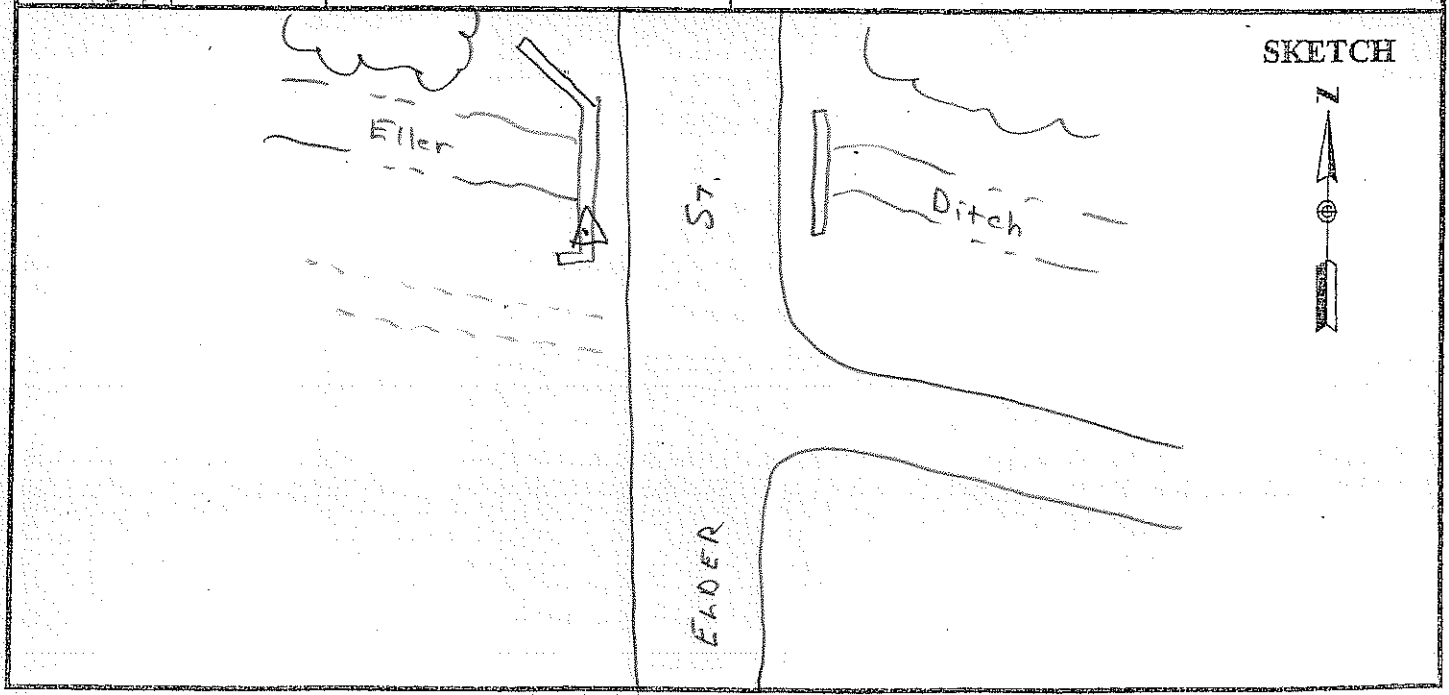
AT502 1699

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
909	2.3	8/8
939		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ PT

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.10.10

SITE NUMBER 5
SITE NAME 4

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:12 a.
STOP 10:30 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
~~399E/9500~~ ~~0.389~~
500 0.360

HEIGHT READINGS MTS FT
1.425

AT502 1.785

OBSTRUCTIONS: none

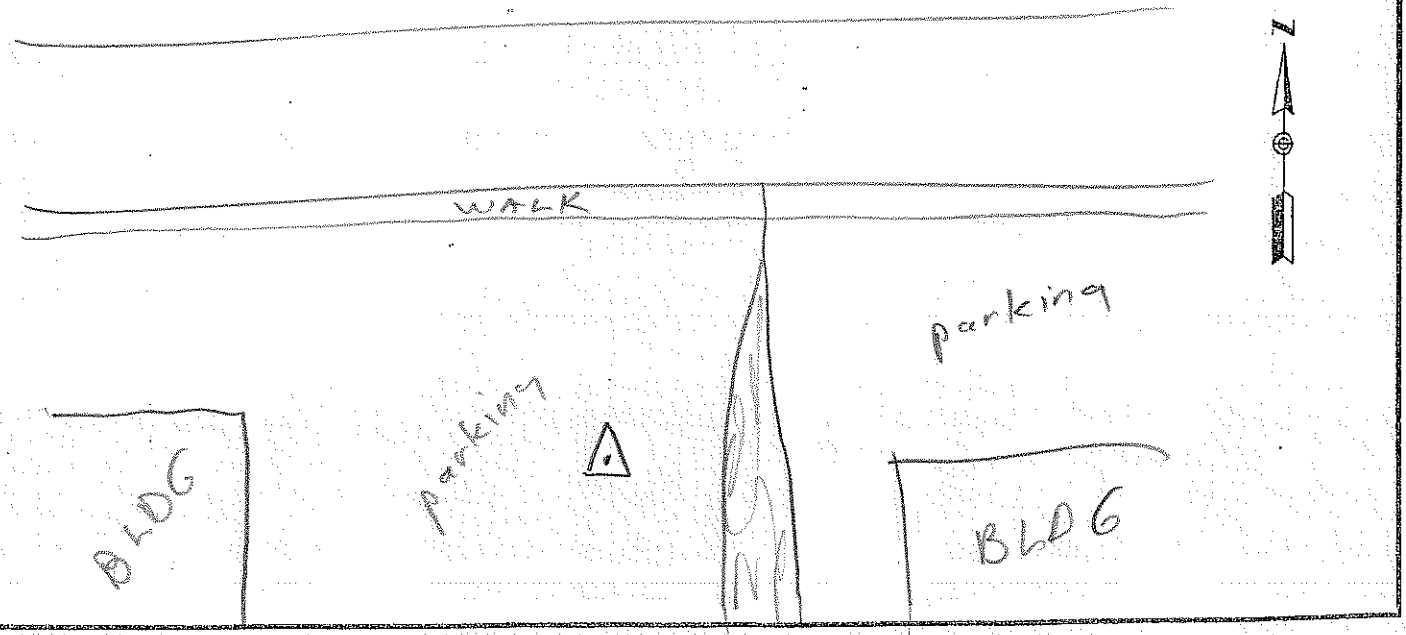
STATION DESCRIPTIONS parking lot

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1012	3.4	8/8
1030		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 ✓ AT

PROJECT 1-100118 Area 8
OPERATOR NB
DATE 3.10.10

SITE NUMBER 6
SITE NAME 5

TRACKING TIMES (LOCAL) MEASURE ✓
START 10:43 a.
STOP 11:05 a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. QB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
(500) (0.360)

OBSTRUCTIONS: trees W, SW + SE

HEIGHT READINGS MTS FT
1.390

STATION DESCRIPTIONS in N bound side of road

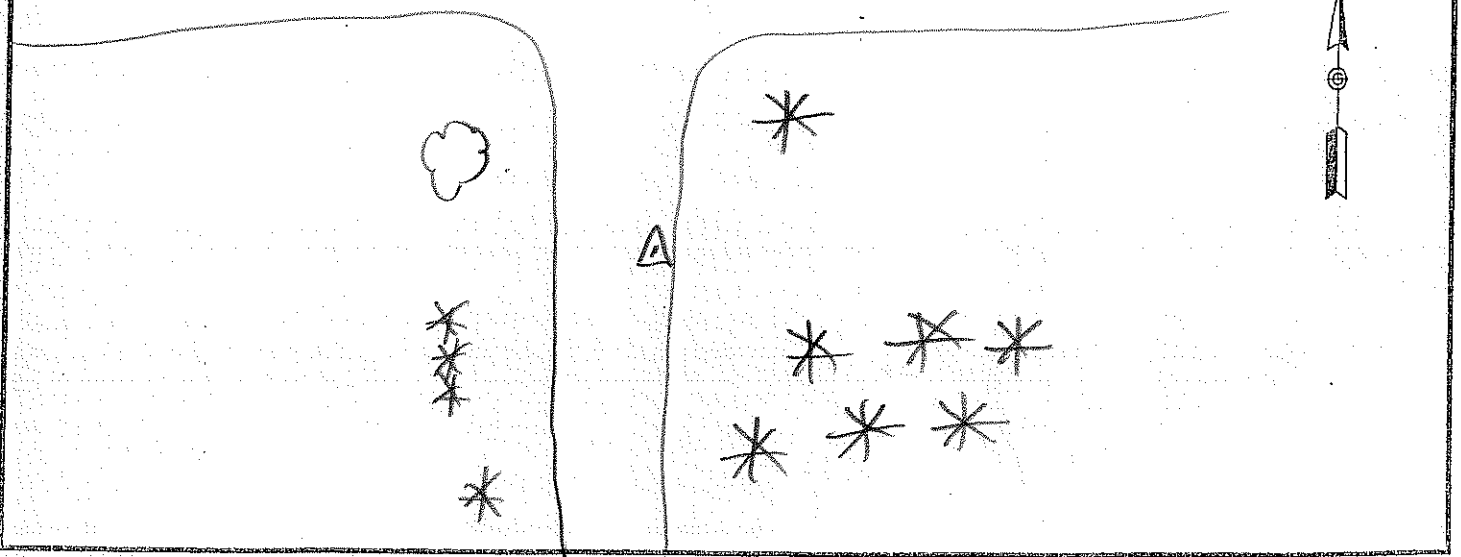
AT502 1.750

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1043	2.8	7/7
1105		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN ~~53083~~ √ PT

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3·10·10

SITE NUMBER 7
SITE NAME 6

TRACKING TIMES (LOCAL) MEASURE √
START 11:16a.
STOP 11:44a.

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
(500) (0.360)

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.364

STATION DESCRIPTIONS in airport parking lot

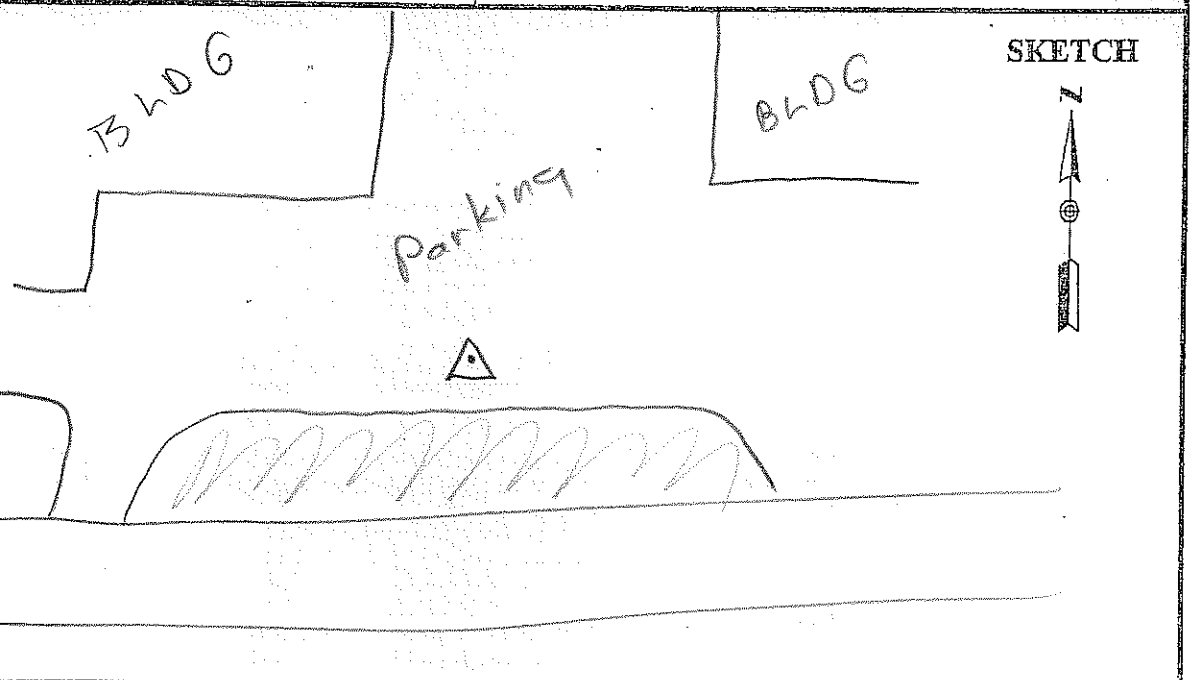
AT502 1724

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1116	2.0	8/8
1144		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



RENSSELAER

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.9.10

SITE NUMBER 1
SITE NAME 101

TRACKING TIMES (LOCAL) MEASURE V
START 1:32 p
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 732
BATTERY NO. CR
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.298

STATION DESCRIPTIONS set nail E. of Hobby Lobby parking lot and W. of stream

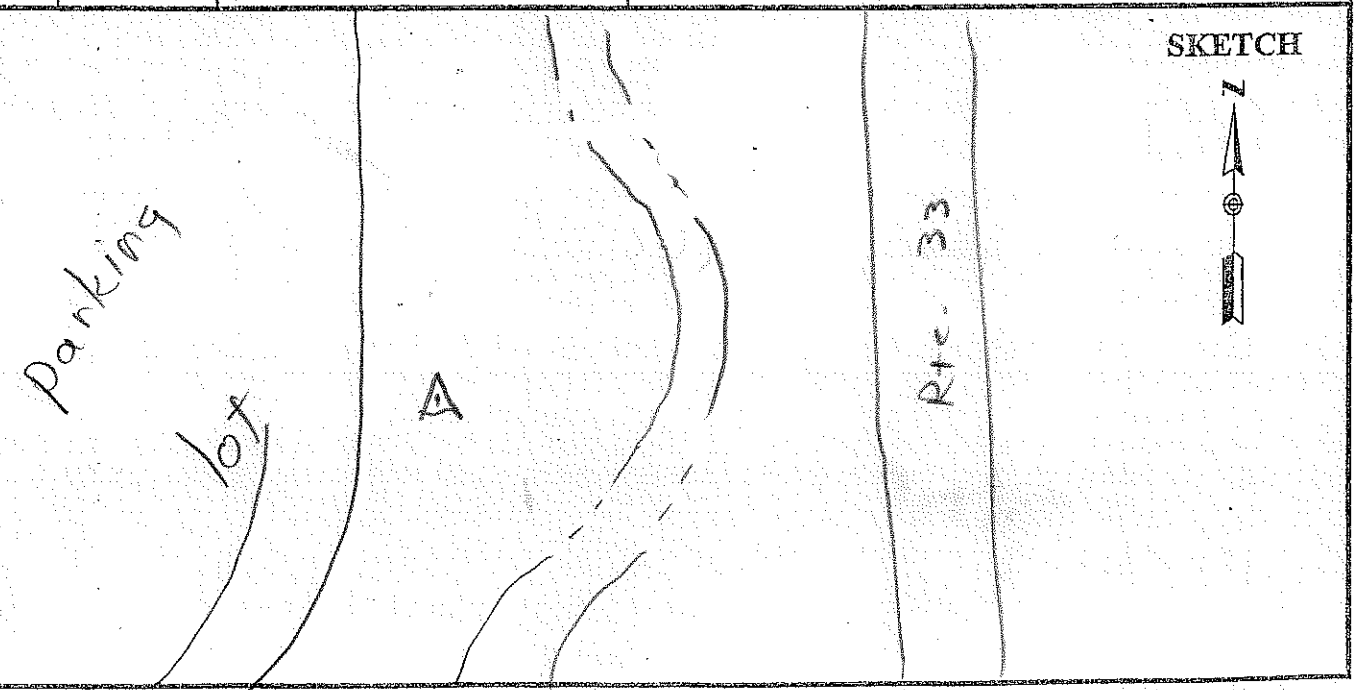
AT502 1658

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1332	2.3	10/10

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
41 38 36
85 55 50

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Base

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.9.10

SITE NUMBER 1
SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE ✓
START 1:48 P
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD 704
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 ~~0.389~~
500 0.360

OBSTRUCTIONS: none

HEIGHT READINGS MTS FT
1.238

STATION DESCRIPTIONS set 6" nail NW of exit ramp

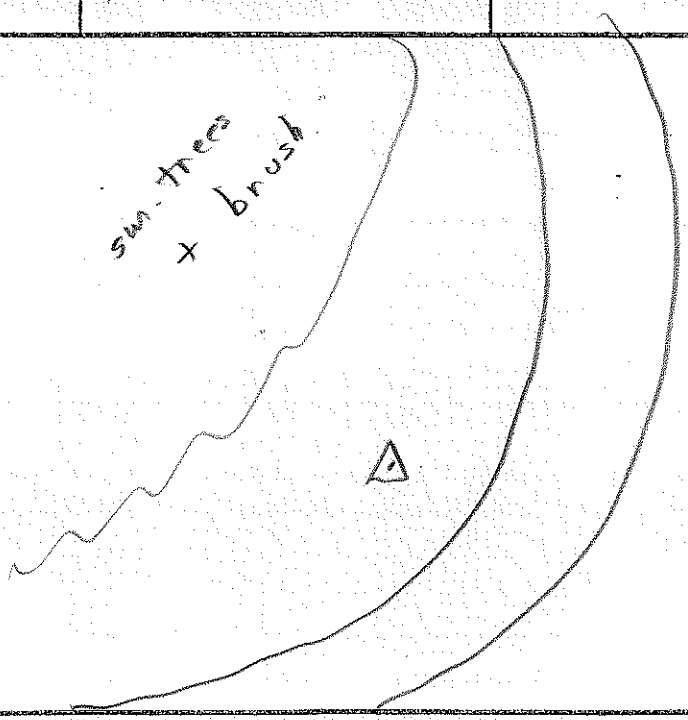
AT502 1.598

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1348	3.8	8/9

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
41 39 56
85 53 07

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Vert. Control

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.9.10

SITE NUMBER 1
SITE NAME 14403

TRACKING TIMES (LOCAL) MEASURE ✓
START 2:41p
STOP 3:08p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees N.

HEIGHT READINGS MTS FT
1.340
AT502 1.700

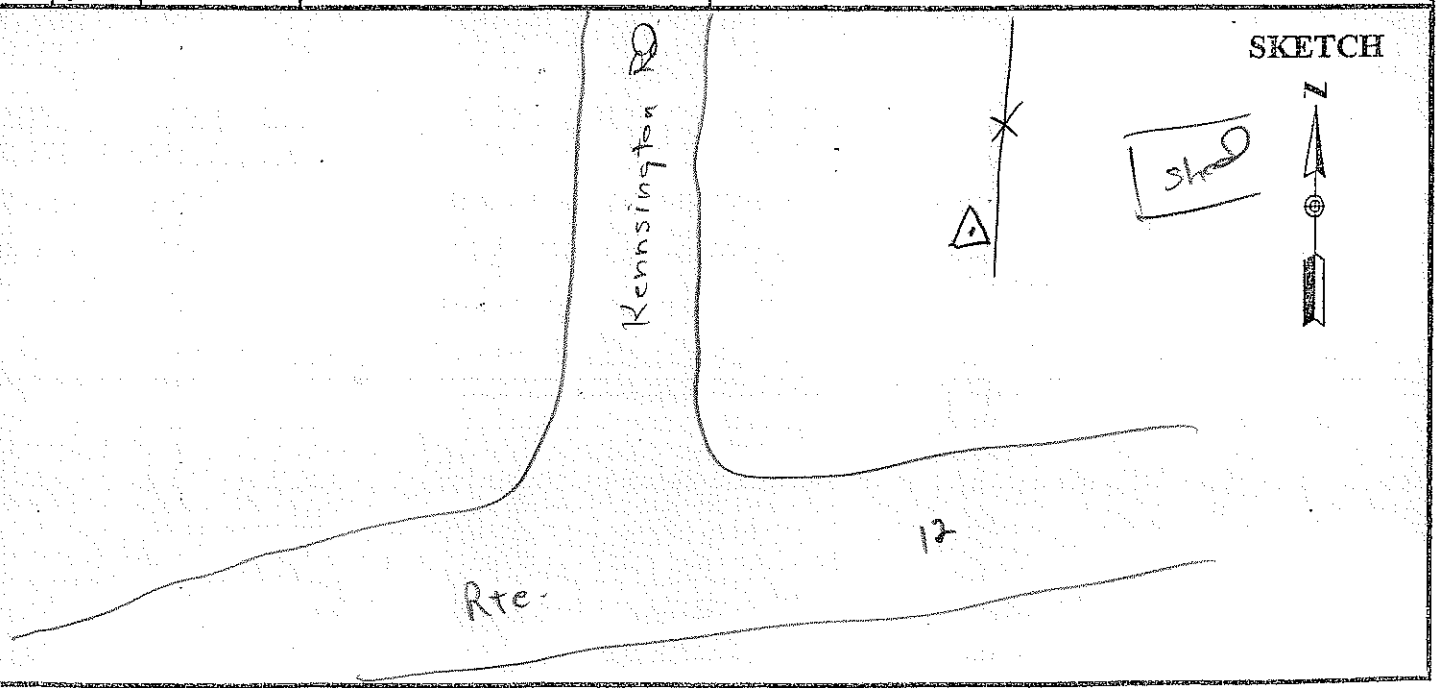
STATION DESCRIPTIONS MDOT
cap "14403 2001"

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1441	3.4	5/5
1508		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 Vert. Control

PROJECT 1-100118 Area 8
OPERATOR MB
DATE 3.9.10

SITE NUMBER 2
SITE NAME J 160

TRACKING TIMES (LOCAL) MEASURE ✓
START 4:02 p
STOP 4:27 p

SENSOR TYPE 500 9500 399 299
MEMORY CARD 731
BATTERY NO. CB
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: trees NE

HEIGHT READINGS MTS FT
1.221

STATION DESCRIPTIONS Rnd USC+GS cap/ conc. mon. "J 160 1946"

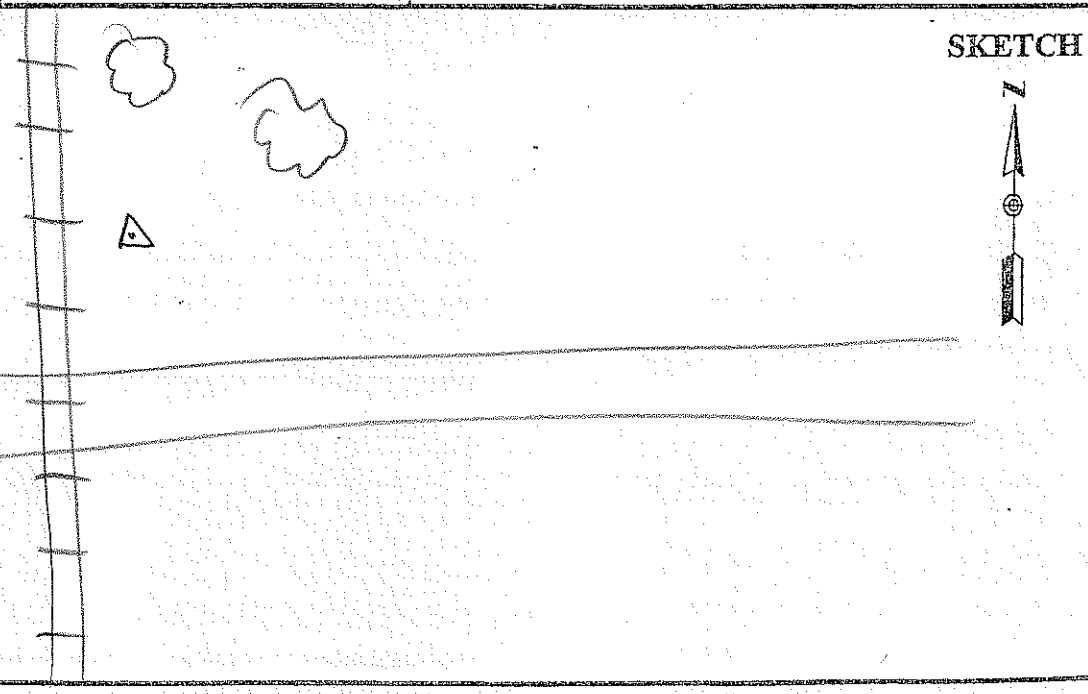
AT502 1581

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1602	2.3	7/9
1627		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

SKETCH



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================================================================================
                    USGS-Indiana Floods, IN - Constrained
GeoLab V2.4d                GRS 80             UNITS: m,DMS          Page 0001
================================================================================
21:50:33, Mon May 17, 2010

INI file:    C:\WINNT\GEOLAB.INI
Input file:  R:\1100118\GEOM~9FV\SURVEY\GEO\C.IOB
Output file: R:\1100118\GEOM~9FV\SURVEY\GEO\C.LST

Geoid File:  C:\GEOLAB2\G2009U07.GEO
```

PARAMETERS		OBSERVATIONS	
Description	Number	Description	Number
No. of Stations	80	Directions	0
Coord Parameters	185	Distances	0
Free Latitudes	66	Azimuths	0
Free Longitudes	66	Vertical Angles	0
Free Heights	53	Zenithal Angles	0
Fixed Coordinates	55	Angles	0
Astro. Latitudes	0	Heights	0
Astro. Longitudes	0	Height Differences	0
Geoid Records	0	Auxiliary Params.	0
All Aux. Pars.	0	2-D Coords.	0
Direction Pars.	0	2-D Coord. Diffs.	0
Scale Parameters	0	3-D Coords.	0
Constant Pars.	0	3-D Coord. Diffs.	513
Rotation Pars.	0		
Translation Pars.	0		
	---		---
Total Parameters	185	Total Observations	513
Degrees of Freedom =	328		

SUMMARY OF SELECTED OPTIONS

OPTION	SELECTION
Computation Mode	Adjustment
Maximum Iterations	5
Convergence Criterion	0.00100
Confidence Level for Statistics	95.000
Covariance Matrix Computation	Connected Portion Only
Residual Rejection Criterion	Tau Max
Confidence Region Types	3D Station Relative
Relative Confidence Regions	Connected Only
Variance Factor (VF) Known	Yes
CMULT (Multiply Parm Cov With VF)	Yes
RMULT (Multiply Res Cov With VF)	No
Force Convergence in Max Iters	Yes
Distances Affect 3D	No
Full Inverse Computed	No
Normals Reordered	Yes
Coordinates Generated	No
Geoid Interpolation Method	Bi-Linear

```
================================================================================
                    USGS-Indiana Floods, IN - Constrained
GeoLab V2.4d                 GRS 80             UNITS: m,DMS          Page 0002
================================================================================
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USGS-Indiana Floods, IN - Constrained

GeoLab V2.4d GRS 80 UNITS: m,DMS

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
NEO	000	1	4612760.852 0.003	588446.604 0.003	227.412 0.003	UTM 16
SFMC		1	0.99969627	0 42 22.408488		UTM 16
NEO	000	10	4530203.625 0.002	486643.236 0.002	201.542 0.002	UTM 16
SFMC		10	0.99960220	0 -6 14.079428		UTM 16
NEO	000	101	4610731.185 0.002	589065.219 0.002	232.294 0.002	UTM 16
SFMC		101	0.99969762	0 42 38.544976		UTM 16
NEO	000	102	4613264.329 0.003	592795.696 0.003	240.753 0.003	UTM 16
SFMC		102	0.99970597	0 44 27.817332		UTM 16
NEO	000	103	4532174.510 0.001	486426.650 0.001	200.427 0.001	UTM 16
SFMC		103	0.99960227	0 -6 20.382924		UTM 16
NEO	000	104	4531382.774 0.001	489280.158 0.001	201.876 0.001	UTM 16
SFMC		104	0.99960141	0 -5 0.340389		UTM 16
NEO	000	105	4315911.896 0.012	595732.987 0.012	176.675 0.003	UTM 16
SFMC		105	0.99971285	0 41 43.715980		UTM 16
NEO	000	106	4339377.062 0.003	591101.725 0.003	189.904 0.003	UTM 16
SFMC		106	0.99970219	0 40 0.625122		UTM 16
NEO	000	107	4494656.504 0.010	511985.318 0.010	205.882 0.010	UTM 16
SFMC		107	0.99960177	0 5 31.903758		UTM 16
NEO	000	108	4306814.528 0.005	497008.037 0.005	173.863 0.004	UTM 16
SFMC		108	0.99960011	0 -1 18.030505		UTM 16
NEO	000	109	4310598.359 0.005	496937.139 0.005	153.756 0.004	UTM 16
SFMC		109	0.99960012	0 -1 19.976675		UTM 16
NEO	000	11	4528978.272 0.003	484459.718 0.003	198.203 0.003	UTM 16
SFMC		11	0.99960297	0 -7 15.063133		UTM 16
NEO	000	110	4356305.173 0.007	522482.427 0.007	227.480 0.003	UTM 16
SFMC		110	0.99960622	0 9 55.720334		UTM 16
NEO	000	111	4364472.305 0.011	471573.628 0.011	168.061 0.009	UTM 16
SFMC		111	0.99960995	0-12 35.186776		UTM 16
NEO	000	112	4370076.620 0.010	471608.846 0.010	158.625 0.007	UTM 16
SFMC		112	0.99960992	0-12 35.605012		UTM 16
NEO	000	12	4318148.246 0.012	595968.323 0.012	177.158 0.003	UTM 16
SFMC		12	0.99971340	0 41 51.671784		UTM 16
NEO	000	13	4314321.172 0.013	589851.943 0.013	172.023 0.004	UTM 16
SFMC		13	0.99969941	0 39 8.743054		UTM 16
NEO	000	14	4312106.913	598469.350	179.245	UTM 16

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
			0.013	0.013	0.003	
SFMC		14	0.99971939	0 42 52.117478	UTM 16	
NEO	001	14403	4625632.411	591688.053	248.553	UTM 16
			0.008	0.008	0.000	
SFMC		14403	0.99970345	0 44 6.300677	UTM 16	
NEO	000	15	4308330.220	591507.867	183.658	UTM 16
			0.013	0.013	0.005	
SFMC		15	0.99970311	0 39 47.421524	UTM 16	
NEO	000	16	4305702.159	594770.044	172.068	UTM 16
			0.013	0.013	0.004	
SFMC		16	0.99971059	0 41 10.424210	UTM 16	
NEO	000	17	4351020.448	592812.323	201.445	UTM 16
			0.007	0.007	0.008	
SFMC		17	0.99970606	0 40 54.832190	UTM 16	
NEO	000	18	4339526.470	590324.491	191.050	UTM 16
			0.003	0.003	0.003	
SFMC		18	0.99970045	0 39 40.262748	UTM 16	
NEO	000	19	4334767.445	592999.822	187.213	UTM 16
			0.005	0.005	0.005	
SFMC		19	0.99970649	0 40 47.011358	UTM 16	
NEO	000	2	4614075.632	588343.942	225.955	UTM 16
			0.003	0.003	0.004	
SFMC		2	0.99969604	0 42 20.513374	UTM 16	
NEO	000	20	4338210.101	597925.632	203.210	UTM 16
			0.004	0.004	0.004	
SFMC		20	0.99971807	0 42 59.431844	UTM 16	
NEO	000	21	4347070.023	596794.963	199.328	UTM 16
			0.005	0.005	0.005	
SFMC		21	0.99971536	0 42 36.906581	UTM 16	
NEO	000	22	4525747.215	521378.990	203.365	UTM 16
			0.011	0.011	0.011	
SFMC		22	0.99960563	0 9 57.907714	UTM 16	
NEO	000	23	4519399.693	519897.365	205.588	UTM 16
			0.011	0.011	0.011	
SFMC		23	0.99960487	0 9 15.352005	UTM 16	
NEO	000	24	4508388.097	520591.400	190.875	UTM 16
			0.010	0.010	0.010	
SFMC		24	0.99960522	0 9 32.717771	UTM 16	
NEO	000	25	4500300.200	520689.270	178.739	UTM 16
			0.011	0.011	0.012	
SFMC		25	0.99960527	0 9 33.963903	UTM 16	
NEO	000	26	4493772.658	519242.368	170.703	UTM 16
			0.011	0.011	0.012	
SFMC		26	0.99960456	0 8 52.718510	UTM 16	
NEO	000	27	4310042.895	494945.282	146.818	UTM 16
			0.005	0.005	0.004	
SFMC		27	0.99960031	0 -2 11.963972	UTM 16	
NEO	000	28	4308610.119	498312.688	166.084	UTM 16
			0.005	0.005	0.004	
SFMC		28	0.99960004	0 0-44.030563	UTM 16	
NEO	000	29	4307640.322	494555.345	145.403	UTM 16
			0.005	0.005	0.004	

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
SFMC		29	0.99960037	0 -2 22.034417		UTM 16
NEO	000	3	4615896.806	586097.248	223.842	UTM 16
			0.005	0.005	0.005	
SFMC		3	0.99969122	0 41 17.344359		UTM 16
NEO	000	30	4306794.769	496993.879	174.017	UTM 16
			0.005	0.005	0.004	
SFMC		30	0.99960011	0 -1 18.399240		UTM 16
NEO	000	31	4348639.145	519689.687	168.431	UTM 16
			0.007	0.007	0.002	
SFMC		31	0.99960477	0 8 40.442008		UTM 16
NEO	000	32	4347849.277	519246.377	184.505	UTM 16
			0.007	0.007	0.002	
SFMC		32	0.99960456	0 8 28.595750		UTM 16
NEO	000	33	4348534.123	521189.659	170.458	UTM 16
			0.007	0.007	0.002	
SFMC		33	0.99960553	0 9 20.070279		UTM 16
NEO	000	34	4349300.234	521057.794	183.141	UTM 16
			0.007	0.007	0.002	
SFMC		34	0.99960546	0 9 16.721602		UTM 16
NEO	000	35	4369467.918	469043.973	155.679	UTM 16
			0.010	0.010	0.008	
SFMC		35	0.99961180	0-13 43.704653		UTM 16
NEO	000	36	4377823.366	468166.636	150.878	UTM 16
			0.012	0.012	0.010	
SFMC		36	0.99961248	0-14 9.315822		UTM 16
NEO	000	37	4371370.621	461762.954	144.249	UTM 16
			0.013	0.013	0.011	
SFMC		37	0.99961800	0-16 58.056795		UTM 16
NEO	000	38	4361594.053	459736.973	147.057	UTM 16
			0.016	0.016	0.014	
SFMC		38	0.99961996	0-17 48.647377		UTM 16
NEO	000	39	4362566.410	465732.983	152.480	UTM 16
			0.013	0.013	0.011	
SFMC		39	0.99961446	0-15 9.792044		UTM 16
NEO	000	4	4604765.043	596311.607	237.975	UTM 16
			0.006	0.006	0.006	
SFMC		4	0.99971415	0 46 1.443223		UTM 16
NEO	000	5	4600624.937	597589.560	244.597	UTM 16
			0.009	0.009	0.009	
SFMC		5	0.99971720	0 46 34.414986		UTM 16
NEO	000	6	4597512.822	600627.338	250.299	UTM 16
			0.011	0.011	0.012	
SFMC		6	0.99972461	0 47 58.540946		UTM 16
NEO	000	7	4532643.502	487271.957	203.241	UTM 16
			0.002	0.001	0.002	
SFMC		7	0.99960199	0 -5 56.746985		UTM 16
NEO	000	8	4531553.591	488391.137	201.041	UTM 16
			0.001	0.001	0.002	
SFMC		8	0.99960166	0 -5 25.265828		UTM 16
NEO	000	9	4531184.041	486853.827	202.237	UTM 16
			0.002	0.002	0.002	
SFMC		9	0.99960213	0 -6 8.295979		UTM 16

USGS-Indiana Floods, IN - Constrained

GeoLab V2.4d GRS 80 UNITS: m,DMS

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
NEO	001	A 168	4610553.396 0.011	573767.399 0.011	226.705 0.000	UTM 16
SFMC		A 168	0.99966696	0 35 19.047979		UTM 16
NEO	001	A 353	4320373.532 0.007	499023.802 0.007	154.784 0.000	UTM 16
SFMC		A 353	0.99960001	0 0-25.570382		UTM 16
NEO	111	B 120	4470527.609 0.000	521076.353 0.000	207.733 0.000	UTM 16
SFMC		B 120	0.99960547	0 9 39.195438		UTM 16
NEO	111	B 70	4372252.130 0.000	486205.522 0.000	205.387 0.000	UTM 16
SFMC		B 70	0.99960234	0 -6 7.386333		UTM 16
NEO	001	E 10	4300910.353 0.019	578292.416 0.019	163.669 0.000	UTM 16
SFMC		E 10	0.99967548	0 33 57.830665		UTM 16
NEO	001	E 13	4348551.965 0.007	521075.106 0.007	171.263 0.000	UTM 16
SFMC		E 13	0.99960547	0 9 17.045717		UTM 16
NEO	111	G 129	4537064.774 0.000	511093.942 0.000	204.987 0.000	UTM 16
SFMC		G 129	0.99960151	0 5 11.382096		UTM 16
NEO	111	H 271	4333888.728 0.000	593288.792 0.000	186.402 0.000	UTM 16
SFMC		H 271	0.99970716	0 40 53.921436		UTM 16
NEO	111	INBD	4301691.515 0.000	541443.975 0.000	195.355 0.000	UTM 16
SFMC		INBD	0.99962115	0 17 59.057569		UTM 16
NEO	111	INCL	4376325.380 0.000	517054.807 0.000	282.807 0.000	UTM 16
SFMC		INCL	0.99960358	0 7 34.809741		UTM 16
NEO	111	INEL	4610188.011 0.000	586104.781 0.000	252.871 0.000	UTM 16
SFMC		INEL	0.99969124	0 41 13.095713		UTM 16
NEO	111	INLN	4320085.711 0.000	486725.381 0.000	161.938 0.000	UTM 16
SFMC		INLN	0.99960217	0 -5 47.680359		UTM 16
NEO	111	INRN	4532814.425 0.000	488250.995 0.000	210.992 0.000	UTM 16
SFMC		INRN	0.99960170	0 -5 29.324056		UTM 16
NEO	111	INWL	4478585.147 0.000	506257.526 0.000	221.750 0.000	UTM 16
SFMC		INWL	0.99960048	0 2 52.404133		UTM 16
NEO	111	J 160	4598239.306 0.000	598009.384 0.000	246.949 0.000	UTM 16
SFMC		J 160	0.99971821	0 46 44.317147		UTM 16
NEO	001	J 354	4301051.419 0.007	490340.463 0.007	146.020 0.000	UTM 16
SFMC		J 354	0.99960115	0 -4 11.454646		UTM 16
NEO	001	J 9	4357922.030 0.011	600679.205 0.011	210.930 0.000	UTM 16
SFMC		J 9	0.99972480	0 44 28.743009		UTM 16
NEO	111	K 268	4342277.489	600109.175	194.349	UTM 16

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING / STD DEV	EASTING / STD DEV	O-HEIGHT / STD DEV	MAPPROJ
			0.000	0.000	0.000	
SFMC		K 268	0.99972340	0 44 0.372458		UTM 16
NEO	001	K 81 RESET	4365881.965	518555.238	239.560	UTM 16
			0.007	0.007	0.000	
SFMC		K 81 RESET	0.99960424	0 8 13.171691		UTM 16
NEO	000	M 107	4523952.286	486909.559	204.975	UTM 16
			0.004	0.004	0.004	
SFMC		M 107	0.99960211	0 -6 5.894394		UTM 16
NEO	001	M 360	4382355.947	462440.810	179.778	UTM 16
			0.016	0.016	0.000	
SFMC		M 360	0.99961737	0-16 43.528989		UTM 16
NEO	111	N 13	4362092.810	542035.491	180.749	UTM 16
			0.000	0.000	0.000	
SFMC		N 13	0.99962176	0 18 35.867422		UTM 16
NEO	001	NEW L 5	4525347.270	474168.140	197.731	UTM 16
			0.008	0.008	0.000	
SFMC		NEW L 5	0.99960821	0-12 2.347627		UTM 16
NEO	001	P 157	4541803.072	483223.893	209.273	UTM 16
			0.006	0.006	0.000	
SFMC		P 157	0.99960346	0 -7 51.574474		UTM 16
NEO	000	Q 28	4510863.913	519950.185	207.864	UTM 16
			0.009	0.009	0.010	
SFMC		Q 28	0.99960490	0 9 15.319876		UTM 16
NEO	001	Q 60 X	4309273.832	597850.097	177.384	UTM 16
			0.012	0.012	0.000	
SFMC		Q 60 X	0.99971790	0 42 33.621568		UTM 16
NEO	111	S 280	4318553.686	513841.627	204.997	UTM 16
			0.000	0.000	0.000	
SFMC		S 280	0.99960236	0 6 2.352767		UTM 16
NEO	001	Z 293	4358783.051	459887.129	144.557	UTM 16
			0.016	0.016	0.000	
SFMC		Z 293	0.99961981	0-17 43.704515		UTM 16

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	1	N 41 39	42.10335	W 85 56	15.52986	193.830	
				0.003		0.003		0.003
PLH	000	10	N 40 55	22.22030	W 87 09	31.07612	168.075	
				0.002		0.002		0.002
PLH	000	101	N 41 38	36.05283	W 85 55	49.87388	198.699	
				0.002		0.002		0.002
PLH	000	102	N 41 39	56.64521	W 85 53	7.22514	207.245	
				0.003		0.003		0.003
PLH	000	103	N 40 56	26.12309	W 87 09	40.49170	166.961	
				0.001		0.001		0.001
PLH	000	104	N 40 56	0.59985	W 87 07	38.40669	168.377	
				0.001		0.001		0.001
PLH	000	105	N 38 59	13.10005	W 85 53	40.74035	142.867	
				0.012		0.012		0.003
PLH	000	106	N 39 11	55.96901	W 85 56	41.88857	156.131	
				0.003		0.003		0.003
PLH	000	107	N 40 36	9.47171	W 86 51	30.01424	172.106	
				0.010		0.010		0.010
PLH	000	108	N 38 54	36.80125	W 87 02	4.23223	141.225	
				0.005		0.005		0.004
PLH	000	109	N 38 56	39.55270	W 87 02	7.23694	121.109	
				0.005		0.005		0.004
PLH	000	11	N 40 54	42.34324	W 87 11	4.32271	164.766	
				0.003		0.003		0.003
PLH	000	110	N 39 21	21.25003	W 86 44	20.58287	194.546	
				0.007		0.007		0.003
PLH	000	111	N 39 25	45.54623	W 87 19	49.02693	135.340	
				0.011		0.011		0.009
PLH	000	112	N 39 28	47.34210	W 87 19	48.41208	125.839	
				0.010		0.010		0.007
PLH	000	12	N 39 00	25.54286	W 85 53	29.82849	143.348	
				0.012		0.012		0.003
PLH	000	13	N 38 58	23.74829	W 85 57	45.90760	138.296	
				0.013		0.013		0.004
PLH	000	14	N 38 57	8.59397	W 85 51	48.99335	145.401	
				0.013		0.013		0.003
PLH	001	14403	N 41 46	38.07480	W 85 53	48.26109	215.179	
				0.008		0.008		0.000
PLH	000	15	N 38 55	8.81052	W 85 56	39.98415	149.893	
				0.013		0.013		0.005
PLH	000	16	N 38 53	42.32147	W 85 54	25.84669	138.252	
				0.013		0.013		0.004
PLH	000	17	N 39 18	12.95589	W 85 55	24.81383	167.685	
				0.007		0.007		0.008
PLH	000	18	N 39 12	1.10710	W 85 57	14.21521	157.291	
				0.003		0.003		0.003
PLH	000	19	N 39 09	25.73598	W 85 55	25.04885	153.412	
				0.005		0.005		0.005
PLH	000	2	N 41 40	24.76993	W 85 56	19.26821	192.389	
				0.003		0.003		0.004
PLH	000	20	N 39 11	15.44795	W 85 51	58.05255	169.324	
				0.004		0.004		0.004

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	21	N 39 16	3.26120	W 85 52	40.60139	165.461	
				0.005		0.005		0.005
PLH	000	22	N 40 52	57.08588	W 86 44	46.48418	169.658	
				0.011		0.011		0.011
PLH	000	23	N 40 49	31.36888	W 86 45	50.52359	171.849	
				0.011		0.011		0.011
PLH	000	24	N 40 43	34.19423	W 86 45	22.20010	157.063	
				0.010		0.010		0.010
PLH	000	25	N 40 39	11.88588	W 86 45	18.98811	144.866	
				0.011		0.011		0.012
PLH	000	26	N 40 35	40.31373	W 86 46	21.31943	136.818	
				0.011		0.011		0.012
PLH	000	27	N 38 56	21.49958	W 87 03	29.96757	114.198	
				0.005		0.005		0.004
PLH	000	28	N 38 55	35.06514	W 87 01	10.07647	133.423	
				0.005		0.005		0.004
PLH	000	29	N 38 55	3.54870	W 87 03	46.09639	112.795	
				0.005		0.005		0.004
PLH	000	3	N 41 41	24.69909	W 85 57	55.47290	190.268	
				0.005		0.005		0.005
PLH	000	30	N 38 54	36.16008	W 87 02	4.81977	141.379	
				0.005		0.005		0.004
PLH	000	31	N 39 17	12.81842	W 86 46	18.08405	135.483	
				0.007		0.007		0.002
PLH	000	32	N 39 16	47.23173	W 86 46	36.67051	151.560	
				0.007		0.007		0.002
PLH	000	33	N 39 17	9.28415	W 86 45	15.48243	137.501	
				0.007		0.007		0.002
PLH	000	34	N 39 17	34.14759	W 86 45	20.90047	150.185	
				0.007		0.007		0.002
PLH	000	35	N 39 28	27.27874	W 87 21	35.67025	122.936	
				0.010		0.010		0.008
PLH	000	36	N 39 32	58.19205	W 87 22	13.82947	118.084	
				0.012		0.012		0.010
PLH	000	37	N 39 29	27.94306	W 87 26	40.80385	111.624	
				0.013		0.013		0.011
PLH	000	38	N 39 24	10.48456	W 87 28	3.49700	114.527	
				0.016		0.016		0.014
PLH	000	39	N 39 24	42.95838	W 87 23	52.97444	119.855	
				0.013		0.013		0.011
PLH	000	4	N 41 35	19.60033	W 85 50	40.13901	204.437	
				0.006		0.006		0.006
PLH	000	5	N 41 33	4.82113	W 85 49	47.37620	211.062	
				0.009		0.009		0.009
PLH	000	6	N 41 31	22.57309	W 85 47	38.14774	216.801	
				0.011		0.011		0.012
PLH	000	7	N 40 56	41.38142	W 87 09	4.37523	169.764	
				0.002		0.001		0.002
PLH	000	8	N 40 56	6.09574	W 87 08	16.43482	167.552	
				0.001		0.001		0.002
PLH	000	9	N 40 55	54.02742	W 87 09	22.14705	168.767	
				0.002		0.002		0.002

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	001	A 168	N 41 38	35.91270	W 86 06	51.16560	192.943	
				0.011		0.011		0.000
PLH	001	A 353	N 39 01	56.68594	W 87 00	40.60338	122.101	
				0.007		0.007		0.000
PLH	111	B 120	N 40 23	6.26402	W 86 45	6.07485	173.913	
				0.000		0.000		0.000
PLH	111	B 70	N 39 29	59.19999	W 87 09	37.58224	172.451	
				0.000		0.000		0.000
PLH	001	E 10	N 38 51	12.73230	W 86 05	51.75493	130.121	
				0.019		0.019		0.000
PLH	001	E 13	N 39 17	9.87299	W 86 45	20.26215	138.307	
				0.007		0.007		0.000
PLH	111	G 129	N 40 59	4.84804	W 86 52	5.22931	171.315	
				0.000		0.000		0.000
PLH	111	H 271	N 39 08	57.12407	W 85 55	13.44609	152.599	
				0.000		0.000		0.000
PLH	111	INBD	N 38 51	47.10448	W 86 31	20.30531	162.336	
				0.000		0.000		0.000
PLH	111	INCL	N 39 32	11.11661	W 86 48	5.53081	249.870	
				0.000		0.000		0.000
PLH	111	INEL	N 41 38	19.61356	W 85 57	58.10929	219.226	
				0.000		0.000		0.000
PLH	111	INLN	N 39 01	46.98784	W 87 09	12.11518	129.432	
				0.000		0.000		0.000
PLH	111	INRN	N 40 56	46.97723	W 87 08	22.51382	177.504	
				0.000		0.000		0.000
PLH	111	INWL	N 40 27	28.46841	W 86 55	34.30893	188.076	
				0.000		0.000		0.000
PLH	111	J 160	N 41 31	47.29471	W 85 49	30.65760	213.419	
				0.000		0.000		0.000
PLH	001	J 354	N 38 51	29.66453	W 87 06	40.79086	113.501	
				0.007		0.007		0.000
PLH	001	J 9	N 39 21	53.62442	W 85 49	52.68450	177.074	
				0.011		0.011		0.000
PLH	111	K 268	N 39 13	26.47033	W 85 50	24.88144	160.423	
				0.000		0.000		0.000
PLH	001	K 81 RESET	N 39 26	32.24191	W 86 47	3.72147	206.673	
				0.007		0.007		0.000
PLH	000	M 107	N 40 51	59.50403	W 87 09	19.21497	171.501	
				0.004		0.004		0.004
PLH	001	M 360	N 39 35	24.38073	W 87 26	14.66117	147.105	
				0.016		0.016		0.000
PLH	111	N 13	N 39 24	26.35855	W 86 30	42.28154	147.774	
				0.000		0.000		0.000
PLH	001	NEW L 5	N 40 52	43.65352	W 87 18	23.72297	164.430	
				0.008		0.008		0.000
PLH	001	P 157	N 41 01	38.15894	W 87 11	58.40397	175.767	
				0.006		0.006		0.000
PLH	000	Q 28	N 40 44	54.54392	W 86 45	49.25040	174.076	
				0.009		0.009		0.010
PLH	001	Q 60 X	N 38 55	36.95293	W 85 52	16.17359	143.540	
				0.012		0.012		0.000

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	111	S 280	N 39 00	57.25631	W 86 50	24.41395	172.127	
				0.000		0.000	0.000	
PLH	001	Z 293	N 39 22	39.32752	W 87 27	56.61255	112.049	
				0.016		0.016	0.000	

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Geoid Values:

CODE	NAME	N/S DEFLECTION	E/W DEFLECTION	UNDULATION
GEOI	1	- 0 0 2.6	- 0 0 2.5	-33.581
GEOI	10	+ 0 0 0.1	+ 0 0 2.0	-33.467
GEOI	101	- 0 0 2.4	- 0 0 2.5	-33.595
GEOI	102	- 0 0 2.4	- 0 0 2.2	-33.508
GEOI	103	+ 0 0 0.4	+ 0 0 1.9	-33.466
GEOI	104	+ 0 0 0.2	+ 0 0 1.7	-33.498
GEOI	105	- 0 0 0.2	+ 0 0 2.0	-33.808
GEOI	106	- 0 0 0.2	+ 0 0 3.0	-33.773
GEOI	107	- 0 0 0.7	+ 0 0 2.3	-33.776
GEOI	108	+ 0 0 0.6	+ 0 0 2.0	-32.639
GEOI	109	+ 0 0 0.3	+ 0 0 2.2	-32.648
GEOI	11	+ 0 0 0.2	+ 0 0 2.2	-33.437
GEOI	110	- 0 0 1.5	+ 0 0 1.0	-32.934
GEOI	111	+ 0 0 2.5	+ 0 0 1.9	-32.721
GEOI	112	+ 0 0 2.1	+ 0 0 2.0	-32.786
GEOI	12	- 0 0 0.1	+ 0 0 1.8	-33.810
GEOI	13	- 0 0 0.6	+ 0 0 2.6	-33.727
GEOI	14	- 0 0 0.2	+ 0 0 1.6	-33.844
GEOI	14403	- 0 0 2.8	- 0 0 2.0	-33.374
GEOI	15	- 0 0 0.5	+ 0 0 2.4	-33.766
GEOI	16	- 0 0 0.4	+ 0 0 1.6	-33.816
GEOI	17	- 0 0 2.1	+ 0 0 3.5	-33.760
GEOI	18	- 0 0 0.3	+ 0 0 3.0	-33.759
GEOI	19	+ 0 0 0.4	+ 0 0 2.5	-33.801
GEOI	2	- 0 0 2.6	- 0 0 2.4	-33.566
GEOI	20	+ 0 0 0.5	+ 0 0 2.2	-33.885
GEOI	21	- 0 0 0.9	+ 0 0 2.8	-33.867
GEOI	22	- 0 0 1.2	+ 0 0 0.4	-33.707
GEOI	23	- 0 0 1.1	+ 0 0 0.8	-33.739
GEOI	24	- 0 0 1.6	+ 0 0 1.6	-33.812
GEOI	25	- 0 0 1.4	+ 0 0 2.2	-33.873
GEOI	26	- 0 0 0.9	+ 0 0 2.4	-33.885
GEOI	27	+ 0 0 0.5	+ 0 0 2.2	-32.619
GEOI	28	+ 0 0 0.5	+ 0 0 2.1	-32.661
GEOI	29	+ 0 0 0.6	+ 0 0 2.2	-32.608
GEOI	3	- 0 0 2.8	- 0 0 2.1	-33.574
GEOI	30	+ 0 0 0.6	+ 0 0 2.0	-32.638
GEOI	31	- 0 0 0.4	+ 0 0 0.8	-32.949
GEOI	32	- 0 0 0.2	+ 0 0 1.2	-32.945
GEOI	33	- 0 0 0.2	+ 0 0 0.7	-32.957
GEOI	34	- 0 0 0.5	+ 0 0 0.8	-32.956
GEOI	35	+ 0 0 2.0	+ 0 0 2.4	-32.743
GEOI	36	+ 0 0 1.2	+ 0 0 3.0	-32.794
GEOI	37	+ 0 0 0.9	+ 0 0 3.4	-32.625
GEOI	38	+ 0 0 1.6	+ 0 0 2.3	-32.530
GEOI	39	+ 0 0 2.1	+ 0 0 2.1	-32.625
GEOI	4	- 0 0 1.3	- 0 0 2.2	-33.539
GEOI	5	- 0 0 0.3	- 0 0 2.2	-33.535
GEOI	6	+ 0 0 0.1	- 0 0 1.7	-33.498
GEOI	7	+ 0 0 0.7	+ 0 0 1.7	-33.477
GEOI	8	+ 0 0 0.3	+ 0 0 1.7	-33.489
GEOI	9	+ 0 0 0.4	+ 0 0 1.8	-33.470
GEOI	A 168	- 0 0 2.8	- 0 0 0.8	-33.762

Geoid Values:

CODE	NAME	N/S DEFLECTION	E/W DEFLECTION	UNDULATION
GEOI	A 353	+ 0 0 0.1	+ 0 0 2.3	-32.683
GEOI	B 120	+ 0 0 2.3	+ 0 0 1.6	-33.820
GEOI	B 70	+ 0 0 2.5	+ 0 0 0.8	-32.936
GEOI	E 10	- 0 0 1.2	+ 0 0 3.4	-33.548
GEOI	E 13	- 0 0 0.2	+ 0 0 0.7	-32.956
GEOI	G 129	+ 0 0 0.3	+ 0 0 0.2	-33.672
GEOI	H 271	+ 0 0 0.4	+ 0 0 2.4	-33.803
GEOI	INBD	+ 0 0 0.1	+ 0 0 0.4	-33.019
GEOI	INCL	+ 0 0 1.2	- 0 0 0.8	-32.937
GEOI	INEL	- 0 0 2.1	- 0 0 2.3	-33.645
GEOI	INLN	- 0 0 0.1	+ 0 0 2.5	-32.506
GEOI	INRN	+ 0 0 0.6	+ 0 0 1.6	-33.488
GEOI	INWL	+ 0 0 1.3	+ 0 0 2.4	-33.674
GEOI	J 160	- 0 0 0.1	- 0 0 1.9	-33.530
GEOI	J 354	+ 0 0 0.9	+ 0 0 2.4	-32.519
GEOI	J 9	- 0 0 2.1	+ 0 0 2.8	-33.856
GEOI	K 268	+ 0 0 0.3	+ 0 0 2.0	-33.926
GEOI	K 81 RESET	+ 0 0 0.4	- 0 0 0.3	-32.887
GEOI	M 107	- 0 0 0.1	+ 0 0 1.8	-33.474
GEOI	M 360	+ 0 0 0.7	+ 0 0 4.4	-32.673
GEOI	N 13	- 0 0 2.0	+ 0 0 0.2	-32.975
GEOI	NEW L 5	+ 0 0 0.3	+ 0 0 1.6	-33.301
GEOI	P 157	+ 0 0 2.3	+ 0 0 1.1	-33.505
GEOI	Q 28	- 0 0 1.3	+ 0 0 1.2	-33.788
GEOI	Q 60 X	- 0 0 0.4	+ 0 0 1.4	-33.843
GEOI	S 280	- 0 0 0.1	+ 0 0 1.6	-32.870
GEOI	Z 293	+ 0 0 1.8	+ 0 0 2.2	-32.508

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 031810R.ASC ,obs#:		1				
DXCT		Q 28	107	-7403.49860	-0.002	-0.121
				0.016	0.015	0.10
DYCT		Q 28	107	-10984.26500	0.027	1.841
				0.016	0.015	1.52
DZCT		Q 28	107	-12285.36700	-0.008	-0.517
				0.016	0.015	0.42
GROUP: 031810R.ASC ,obs#:		2				
DXCT		Q 28	107	-7403.49640	-0.004	-0.270
				0.016	0.015	0.22
DYCT		Q 28	107	-10984.25190	0.014	0.963
				0.016	0.015	0.79
DZCT		Q 28	107	-12285.37630	0.002	0.111
				0.016	0.015	0.09
GROUP: 031810R.ASC ,obs#:		3				
DXCT		Q 28	22	917.72360	-0.002	-0.288
				0.013	0.008	0.15
DYCT		Q 28	22	9800.57910	-0.016	-1.985
				0.013	0.008	1.06
DZCT		Q 28	22	11262.74370	0.004	0.535
				0.013	0.008	0.29
GROUP: 031810R.ASC ,obs#:		4				
DXCT		G 129	22	10662.40250	0.002	0.286
				0.013	0.008	0.16
DYCT		G 129	22	-6848.60430	0.017	1.988
				0.014	0.009	1.10
DZCT		G 129	22	-8571.88980	-0.005	-0.549
				0.014	0.008	0.30
GROUP: 031810R.ASC ,obs#:		5				
DXCT		Q 28	23	-344.80870	0.001	0.303
				0.008	0.003	0.09
DYCT		Q 28	23	5569.50880	0.002	0.773
				0.008	0.003	0.24
DZCT		Q 28	23	6464.17390	0.001	0.230
				0.008	0.003	0.07
GROUP: 031810R.ASC ,obs#:		6				
DXCT		G 129	23	9399.87990	-0.004	-0.303
				0.017	0.014	0.21
DYCT		G 129	23	-11079.62900	-0.011	-0.772
				0.018	0.014	0.55
DZCT		G 129	23	-13370.46470	-0.003	-0.228
				0.018	0.014	0.16
GROUP: 031810R.ASC ,obs#:		7				
DXCT		Q 28	B 120	2498.41080	-0.003	-0.096
				0.036	0.034	0.08
DYCT		Q 28	B 120	-26145.46360	0.026	0.769
				0.036	0.034	0.65
DZCT		Q 28	B 120	-30656.63750	-0.008	-0.234
				0.036	0.034	0.20
GROUP: 031810R.ASC ,obs#:		8				
DXCT		107	B 120	9901.90740	0.001	0.025
				0.023	0.020	0.02

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DYCT		107	B 120	-15161.20320	0.004	0.176
				0.023	0.020	0.14
DZCT		107	B 120	-18371.26670	-0.004	-0.205
				0.023	0.020	0.16
GROUP: 031810R.ASC ,obs#: 9						
DXCT		107	B 120	9901.90860	-0.001	-0.034
				0.023	0.020	0.03
DYCT		107	B 120	-15161.21270	0.013	0.641
				0.023	0.020	0.51
DZCT		107	B 120	-18371.25010	-0.021	-1.013
				0.023	0.021	0.81
GROUP: 031810R.ASC ,obs#: 10						
DXCT		Q 28	G 129	-9744.68490	0.001	0.058
				0.024	0.022	0.05
DYCT		Q 28	G 129	16649.14910	0.002	0.068
				0.024	0.023	0.06
DZCT		Q 28	G 129	19834.63110	0.011	0.502
				0.024	0.023	0.41
GROUP: 041410R.ASC ,obs#: 11						
DXCT		107	24	8127.88500	0.003	0.249
				0.014	0.013	0.20
DYCT		107	24	9418.04740	0.003	0.216
				0.015	0.013	0.17
DZCT		107	24	10396.20800	0.003	0.244
				0.014	0.013	0.20
GROUP: 041410R.ASC ,obs#: 12						
DXCT		Q 28	24	724.38790	-0.000	-0.245
				0.002	0.000	0.03
DYCT		Q 28	24	-1566.18730	-0.000	-0.182
				0.003	0.000	0.03
DZCT		Q 28	24	-1889.16340	-0.000	-0.217
				0.002	0.000	0.03
GROUP: 041410R.ASC ,obs#: 13						
DXCT		107	25	8501.21020	0.003	0.530
				0.009	0.006	0.29
DYCT		107	25	4164.64020	-0.004	-0.689
				0.009	0.006	0.38
DZCT		107	25	4252.85060	0.001	0.243
				0.009	0.006	0.13
GROUP: 041410R.ASC ,obs#: 14						
DXCT		Q 28	25	1097.71600	-0.003	-0.531
				0.009	0.006	0.30
DYCT		Q 28	25	-6819.60550	0.004	0.690
				0.009	0.006	0.39
DZCT		Q 28	25	-8032.52120	-0.001	-0.245
				0.009	0.006	0.14
GROUP: 041410R.ASC ,obs#: 15						
DXCT		107	26	7278.06070	-0.004	-1.903
				0.006	0.002	0.61
DYCT		107	26	-154.45010	0.005	2.253
				0.007	0.002	0.71
DZCT		107	26	-705.89250	0.000	0.055

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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                          0.006    0.002     0.02
GROUP: 041410R.ASC ,obs#:   16
DXCT              Q 28         26                  -125.46950    0.025    1.931
                                                          0.015    0.013     1.48
DYCT              Q 28         26                -11138.65120   -0.031   -2.274
                                                          0.016    0.014     1.83
DZCT              Q 28         26                -12991.26710    0.000    0.006
                                                          0.015    0.013     0.00
GROUP: 041410R.ASC ,obs#:   17
DXCT              107          Q 28                7403.49220    0.008    0.554
                                                          0.016    0.015     0.45
DYCT              107          Q 28               10984.22730    0.010    0.695
                                                          0.016    0.015     0.57
DZCT              107          Q 28               12285.37750   -0.003   -0.192
                                                          0.016    0.015     0.16
GROUP: 031710R.ASC ,obs#:   18
DXCT              106          17                  1322.54060   -0.004   -0.553
                                                          0.010    0.007     0.34
DYCT              106          17                  7459.73310    0.003    0.373
                                                          0.010    0.007     0.23
DZCT              106          17                  9010.37910    0.001    0.123
                                                          0.010    0.007     0.08
GROUP: 031710R.ASC ,obs#:   19
DXCT              K 268        17                 -7573.13440    0.004    0.553
                                                          0.010    0.007     0.33
DYCT              K 268        17                  5055.29010   -0.003   -0.371
                                                          0.010    0.007     0.23
DZCT              K 268        17                  6845.13600   -0.001   -0.118
                                                          0.010    0.007     0.07
GROUP: 031710R.ASC ,obs#:   20
DXCT              106          18                  -780.77410    0.000    0.000*
                                                          0.001    0.000     0.00
DYCT              106          18                    44.20810    0.000    0.001
                                                          0.001    0.000     0.00
DZCT              106          18                   123.52870   -0.000    0.000*
                                                          0.001    0.000     0.00
GROUP: 031710R.ASC ,obs#:   21
DXCT              K 268        18                 -9676.44100   -0.000   -0.032
                                                          0.009    0.008     0.03
DYCT              K 268        18                 -2360.24020   -0.000   -0.000
                                                          0.009    0.009     0.00
DZCT              K 268        18                 -2041.71620    0.000    0.009
                                                          0.009    0.008     0.01
GROUP: 031710R.ASC ,obs#:   22
DXCT              106          19                  2047.11420   -0.001   -0.424
                                                          0.004    0.002     0.16
DYCT              106          19                 -2786.63230    0.000    0.130
                                                          0.004    0.002     0.05
DZCT              106          19                 -3593.22600    0.001    0.524
                                                          0.004    0.002     0.20
GROUP: 031710R.ASC ,obs#:   23
DXCT              K 268        19                 -6848.55710    0.003    0.425
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================================================================================
Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                          0.009    0.008     0.32
DYCT              K 268        19                   -5191.07930   -0.001   -0.135
                                                          0.009    0.008     0.10
DZCT              K 268        19                   -5758.46570   -0.004   -0.526
                                                          0.009    0.008     0.40
GROUP: 031710R.ASC ,obs#:   24
DXCT              106          20                    6851.20690   -0.006   -1.364
                                                          0.006    0.005     0.92
DYCT              106          20                    -311.53110   -0.007   -1.540
                                                          0.006    0.005     1.04
DZCT              106          20                    -960.16680    0.004    0.889
                                                          0.006    0.005     0.60
GROUP: 031710R.ASC ,obs#:   25
DXCT              K 268        20                   -2044.46950    0.003    1.361
                                                          0.004    0.002     0.62
DYCT              K 268        20                   -2715.98990    0.003    1.549
                                                          0.004    0.002     0.71
DZCT              K 268        20                   -3125.40550   -0.002   -0.904
                                                          0.004    0.002     0.42
GROUP: 031710R.ASC ,obs#:   26
DXCT              106          21                    5428.98460   -0.003   -0.500
                                                          0.008    0.007     0.36
DYCT              106          21                    5216.66500   -0.004   -0.565
                                                          0.008    0.007     0.41
DZCT              106          21                    5913.14030    0.005    0.654
                                                          0.008    0.007     0.47
GROUP: 031710R.ASC ,obs#:   27
DXCT              K 268        21                   -3466.68730    0.001    0.499
                                                          0.005    0.003     0.22
DYCT              K 268        21                    2812.21130    0.001    0.570
                                                          0.005    0.003     0.26
DZCT              K 268        21                    3747.90170   -0.002   -0.659
                                                          0.005    0.003     0.29
GROUP: 031710R.ASC ,obs#:   28
DXCT              106          H 271                 2364.56940    0.013    2.917
                                                          0.005    0.004     2.16
DYCT              106          H 271                -3321.91040    0.007    1.495
                                                          0.005    0.005     1.17
DZCT              106          H 271                -4277.97000   -0.010   -2.365
                                                          0.005    0.004     1.76
GROUP: 031710R.ASC ,obs#:   29
DXCT              K 268        H 271                -6531.09510    0.010    1.060
                                                          0.010    0.010     0.93
DYCT              K 268        H 271                -5726.35440    0.003    0.267
                                                          0.010    0.010     0.24
DZCT              K 268        H 271                -6443.20620   -0.019   -1.993
                                                          0.010    0.010     1.76
GROUP: 031710R.ASC ,obs#:   30
DXCT              106          J 9                   8946.84170   -0.005   -0.325
                                                          0.018    0.015     0.23
DYCT              106          J 9                  12326.78060    0.000    0.029
                                                          0.019    0.017     0.02
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Residuals (critical value = 4.020):
                                                    OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                       STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
DZCT              106          J 9                 14280.09430    0.006    0.383
                                                         0.019    0.017     0.31
GROUP: 031710R.ASC ,obs#:   31
DXCT              K 268        J 9                    51.16640    0.003    0.405
                                                         0.014    0.008     0.21
DYCT              K 268        J 9                  9922.34090   -0.008   -0.658
                                                         0.014    0.012     0.52
DZCT              K 268        J 9                 12114.85280    0.003    0.267
                                                         0.014    0.011     0.20
GROUP: 031710R.ASC ,obs#:   32
DXCT              106          K 268                8895.67090   -0.004   -0.476
                                                         0.008    0.008     0.39
DYCT              106          K 268                2404.44810    0.000    0.026
                                                         0.008    0.008     0.02
DZCT              106          K 268                2165.23950    0.005    0.679
                                                         0.008    0.008     0.56
GROUP: 031710R.ASC ,obs#:   33
DXCT              106          K 268                8895.67470   -0.008   -0.961
                                                         0.008    0.008     0.79
DYCT              106          K 268                2404.45000   -0.002   -0.217
                                                         0.008    0.008     0.18
DZCT              106          K 268                2165.24140    0.003    0.437
                                                         0.008    0.008     0.36
GROUP: 051310R.ASC ,obs#:   34
DXCT              INLN         111                -16608.72950   -0.002   -0.050
                                                         0.041    0.040     0.04
DYCT              INLN         111                27285.00670    0.031    0.780
                                                         0.041    0.040     0.67
DZCT              INLN         111                34369.20460   -0.033   -0.831
                                                         0.041    0.040     0.71
GROUP: 051310R.ASC ,obs#:   35
DXCT              112          111                  151.61580    0.000    0.125
                                                         0.005    0.001     0.01
DYCT              112          111                -3567.01790   -0.001   -0.879
                                                         0.006    0.001     0.12
DZCT              112          111                -4323.06370    0.001    0.931
                                                         0.005    0.001     0.11
GROUP: 051310R.ASC ,obs#:   36
DXCT              112          35                 -2542.70080   -0.000   -0.203
                                                         0.002    0.000     0.01
DYCT              112          35                  -509.48240   -0.000   -0.607
                                                         0.002    0.000     0.03
DZCT              112          35                  -479.46130    0.000    1.048
                                                         0.002    0.000     0.05
GROUP: 051310R.ASC ,obs#:   37
DXCT              INLN         35                 -19303.05720    0.009    0.200
                                                         0.046    0.045     0.17
DYCT              INLN         35                 30342.54950    0.025    0.542
                                                         0.046    0.045     0.47
DZCT              INLN         35                 38212.81920   -0.046   -1.015
                                                         0.046    0.045     0.88
GROUP: 051310R.ASC ,obs#:   38
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Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DXCT		112	36	-3697.86510	0.000	0.161
				0.007	0.001	0.02
DYCT		112	36	4762.64090	-0.000	-0.137
				0.008	0.001	0.02
DZCT		112	36	5963.44220	0.001	0.824
				0.008	0.001	0.10
GROUP: 051310R.ASC ,obs#: 39						
DXCT		INLN	36	-20458.20400	-0.008	-0.160
				0.053	0.052	0.14
DYCT		INLN	36	35614.69040	0.007	0.133
				0.053	0.052	0.11
DZCT		INLN	36	44655.72040	-0.043	-0.823
				0.053	0.052	0.71
GROUP: 051310R.ASC ,obs#: 40						
DXCT		112	37	-9881.90320	-0.000	-0.192
				0.009	0.001	0.03
DYCT		112	37	357.12550	0.001	0.639
				0.009	0.002	0.10
DZCT		112	37	957.36460	0.000	0.207
				0.009	0.001	0.03
GROUP: 051310R.ASC ,obs#: 41						
DXCT		INLN	37	-26642.26010	0.009	0.191
				0.050	0.049	0.16
DYCT		INLN	37	31209.21440	-0.031	-0.641
				0.050	0.049	0.55
DZCT		INLN	37	39649.60980	-0.010	-0.215
				0.050	0.049	0.18
GROUP: 051310R.ASC ,obs#: 42						
DXCT		112	38	-11581.05240	0.001	0.418
				0.013	0.004	0.10
DYCT		112	38	-5947.33680	-0.000	-0.001
				0.013	0.004	0.00
DZCT		112	38	-6601.21470	0.003	0.768
				0.013	0.004	0.19
GROUP: 051310R.ASC ,obs#: 43						
DXCT		INLN	38	-28341.38130	-0.017	-0.416
				0.044	0.041	0.34
DYCT		INLN	38	24904.72010	-0.000	-0.007
				0.044	0.041	0.01
DZCT		INLN	38	32091.05390	-0.031	-0.767
				0.044	0.041	0.63
GROUP: 051310R.ASC ,obs#: 44						
DXCT		112	39	-5621.67740	0.000	0.213
				0.008	0.002	0.04
DYCT		112	39	-5047.84170	-0.001	-0.525
				0.009	0.002	0.10
DZCT		112	39	-5824.01660	0.001	0.595
				0.009	0.002	0.10
GROUP: 051310R.ASC ,obs#: 45						
DXCT		INLN	39	-22382.01660	-0.008	-0.196
				0.042	0.040	0.16
DYCT		INLN	39	25804.19360	0.020	0.506

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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                          0.042    0.040     0.43
DZCT              INLN         39                   32868.24200   -0.023   -0.580
                                                          0.042    0.040     0.49
GROUP: 051310R.ASC ,obs#:   46
DXCT              112          B 70                 14513.92140   -0.002   -0.294
                                                          0.013    0.008     0.17
DYCT              112          B 70                  2073.31840    0.000    0.009
                                                          0.013    0.010     0.01
DZCT              112          B 70                  1739.95700   -0.015   -1.561
                                                          0.013    0.010     1.05
GROUP: 051310R.ASC ,obs#:   47
DXCT              INLN         B 70                 -2246.42940    0.001    0.021
                                                          0.046    0.046     0.02
DYCT              INLN         B 70                 32925.36090    0.014    0.307
                                                          0.046    0.046     0.27
DZCT              INLN         B 70                 40432.22040   -0.044   -0.954
                                                          0.047    0.047     0.85
GROUP: 051310R.ASC ,obs#:   48
DXCT              112          INLN                 16760.35160   -0.004   -0.094
                                                          0.046    0.045     0.08
DYCT              112          INLN                -30852.04140   -0.015   -0.336
                                                          0.046    0.045     0.29
DZCT              112          INLN                -38692.27210    0.038    0.836
                                                          0.046    0.045     0.72
GROUP: 051310R.ASC ,obs#:   49
DXCT              112          M 360                -9569.49870   -0.000   -0.010
                                                          0.014    0.003     0.00
DYCT              112          M 360                 7349.05310    0.011    1.169
                                                          0.014    0.009     0.69
DZCT              112          M 360                 9457.42650   -0.008   -1.046
                                                          0.014    0.008     0.53
GROUP: 051310R.ASC ,obs#:   50
DXCT              INLN         M 360               -26329.83540   -0.011   -0.189
                                                          0.059    0.057     0.16
DYCT              INLN         M 360                38201.06770    0.053    0.908
                                                          0.059    0.058     0.79
DZCT              INLN         M 360                48149.71040   -0.058   -1.001
                                                          0.059    0.058     0.86
GROUP: 051310R.ASC ,obs#:   51
DXCT              112          Z 293               -11337.69360    0.002    0.338
                                                          0.014    0.005     0.10
DYCT              112          Z 293                -7720.44670   -0.003   -0.331
                                                          0.015    0.010     0.21
DZCT              112          Z 293                -8775.48340    0.005    0.516
                                                          0.014    0.009     0.28
GROUP: 051310R.ASC ,obs#:   52
DXCT              INLN         Z 293               -28098.02830   -0.011   -0.291
                                                          0.042    0.038     0.24
DYCT              INLN         Z 293                23131.60980   -0.003   -0.082
                                                          0.042    0.040     0.07
DZCT              INLN         Z 293                29916.76750   -0.012   -0.302
                                                          0.042    0.040     0.25
```

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 051210R.ASC ,obs#:		53				
DXCT		E 13	110	1151.01500	0.002	0.333
				0.007	0.006	0.26
DYCT		E 13	110	4942.25060	-0.004	-0.570
				0.007	0.006	0.45
DZCT		E 13	110	6033.03260	0.004	0.666
				0.007	0.006	0.53
GROUP: 051210R.ASC ,obs#:		54				
DXCT		E 13	31	-1386.92390	-0.000	-0.899
				0.001	0.000	0.17
DYCT		E 13	31	-18.62560	0.001	2.180
				0.002	0.000	0.65
DZCT		E 13	31	68.51860	-0.000	-1.376
				0.002	0.000	0.33
GROUP: 051210R.ASC ,obs#:		55				
DXCT		110	31	-2537.94370	0.002	0.385
				0.007	0.006	0.30
DYCT		110	31	-4960.86080	-0.011	-1.680
				0.007	0.007	1.34
DZCT		110	31	-5964.52320	0.005	0.705
				0.007	0.007	0.56
GROUP: 051210R.ASC ,obs#:		56				
DXCT		E 13	32	-1802.86900	-0.000	-0.939
				0.002	0.000	0.20
DYCT		E 13	32	-554.94110	0.001	1.903
				0.002	0.001	0.58
DZCT		E 13	32	-532.07620	-0.001	-1.337
				0.002	0.000	0.30
GROUP: 051210R.ASC ,obs#:		57				
DXCT		110	32	-2953.89070	0.004	0.584
				0.008	0.007	0.47
DYCT		110	32	-5497.17560	-0.011	-1.567
				0.008	0.007	1.26
DZCT		110	32	-6565.11910	0.006	0.763
				0.008	0.007	0.61
GROUP: 051210R.ASC ,obs#:		58				
DXCT		E 13	33	114.98350	0.000	2.128
				0.001	0.000	2.26
DYCT		E 13	33	-4.37190	-0.001	-2.525
				0.002	0.000	10.32
DZCT		E 13	33	-14.56610	0.000	1.954
				0.001	0.000	2.54
GROUP: 051210R.ASC ,obs#:		59				
DXCT		110	33	-1036.03010	-0.003	-0.514
				0.007	0.006	0.41
DYCT		110	33	-4946.63590	0.016	2.489
				0.007	0.006	2.00
DZCT		110	33	-6047.60390	0.001	0.213
				0.007	0.006	0.17
GROUP: 051210R.ASC ,obs#:		60				
DXCT		E 13	34	-41.58130	0.000	0.469
				0.001	0.000	0.17

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DYCT		E 13	34	463.25500	-0.000	-0.652
				0.002	0.001	0.62
DZCT		E 13	34	586.92510	0.000	0.711
				0.001	0.000	0.34
GROUP: 051210R.ASC ,obs#:		61				
DXCT		110	34	-1192.59900	0.001	0.138
				0.006	0.006	0.11
DYCT		110	34	-4478.99500	0.002	0.438
				0.007	0.006	0.35
DZCT		110	34	-5446.10800	-0.003	-0.612
				0.006	0.006	0.48
GROUP: 051210R.ASC ,obs#:		62				
DXCT		E 13	A 353	-21097.90460	0.023	0.755
				0.032	0.030	0.64
DYCT		E 13	A 353	-18946.05050	0.020	0.629
				0.032	0.031	0.55
DZCT		E 13	A 353	-21846.78460	0.023	0.751
				0.032	0.031	0.65
GROUP: 051210R.ASC ,obs#:		63				
DXCT		110	A 353	-22248.90720	0.008	0.227
				0.038	0.037	0.19
DYCT		110	A 353	-23888.28730	0.009	0.249
				0.038	0.037	0.22
DZCT		110	A 353	-27879.83370	0.035	0.956
				0.038	0.037	0.83
GROUP: 051210R.ASC ,obs#:		64				
DXCT		E 13	K 81 RESET	-3089.67160	0.004	0.308
				0.015	0.014	0.24
DYCT		E 13	K 81 RESET	10790.35120	0.031	2.039
				0.016	0.015	1.76
DZCT		E 13	K 81 RESET	13452.29450	-0.012	-0.789
				0.016	0.015	0.66
GROUP: 051210R.ASC ,obs#:		65				
DXCT		110	K 81 RESET	-4240.68460	0.000	0.032
				0.009	0.006	0.02
DYCT		110	K 81 RESET	5848.13420	0.001	0.100
				0.009	0.008	0.08
DZCT		110	K 81 RESET	7419.25580	-0.010	-1.311
				0.009	0.007	0.92
GROUP: 051210R.ASC ,obs#:		66				
DXCT		110	N 13	19335.70540	-0.011	-0.642
				0.018	0.017	0.53
DYCT		110	N 13	4804.83640	-0.029	-1.679
				0.018	0.017	1.43
DZCT		110	N 13	4382.88540	0.011	0.656
				0.018	0.017	0.55
GROUP: 051210R.ASC ,obs#:		67				
DXCT		E 13	N 13	20486.72060	-0.009	-0.423
				0.022	0.021	0.36
DYCT		E 13	N 13	9747.10220	-0.048	-2.211
				0.022	0.022	1.92
DZCT		E 13	N 13	10415.90860	0.025	1.155

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.022	0.022	1.00
GROUP: INCL.ASC	,obs#:	68				
DXCT		INCL	31	3547.45960	-0.003	-0.132
				0.025	0.024	0.11
DYCT		INCL	31	-17329.02240	-0.034	-1.409
				0.025	0.024	1.22
DZCT		INCL	31	-21476.99110	0.004	0.153
				0.025	0.024	0.13
GROUP: INCL.ASC	,obs#:	69				
DXCT		INCL	32	3131.50510	0.006	0.253
				0.025	0.024	0.21
DYCT		INCL	32	-17865.35400	-0.018	-0.714
				0.025	0.025	0.62
DZCT		INCL	32	-22077.60330	0.021	0.850
				0.025	0.025	0.73
GROUP: INCL.ASC	,obs#:	70				
DXCT		INCL	33	5049.35920	0.005	0.217
				0.025	0.024	0.18
DYCT		INCL	33	-17314.82400	0.019	0.783
				0.025	0.024	0.68
DZCT		INCL	33	-21560.07160	0.000	0.008
				0.025	0.024	0.01
GROUP: INCL.ASC	,obs#:	71				
DXCT		INCL	34	4892.80550	-0.006	-0.261
				0.024	0.023	0.22
DYCT		INCL	34	-16847.18780	0.011	0.445
				0.024	0.024	0.39
DZCT		INCL	34	-20958.58620	0.006	0.253
				0.024	0.024	0.22
GROUP: INCL.ASC	,obs#:	72				
DXCT		INCL	A 353	-16163.53580	0.035	0.675
				0.052	0.051	0.59
DYCT		INCL	A 353	-36256.53890	0.076	1.476
				0.052	0.052	1.30
DZCT		INCL	A 353	-43392.26840	0.001	0.026
				0.052	0.052	0.02
GROUP: INCL.ASC	,obs#:	73				
DXCT		E 13	INCL	-4934.38360	0.003	0.125
				0.025	0.024	0.11
DYCT		E 13	INCL	17310.43780	-0.006	-0.248
				0.025	0.024	0.22
DZCT		E 13	INCL	21545.47790	0.028	1.143
				0.025	0.024	0.99
GROUP: INCL.ASC	,obs#:	74				
DXCT		110	INCL	-6085.39760	-0.000	-0.006
				0.018	0.017	0.00
DYCT		110	INCL	12368.17990	0.005	0.271
				0.018	0.018	0.23
DZCT		110	INCL	15512.46060	0.008	0.471
				0.018	0.017	0.40
GROUP: INCL.ASC	,obs#:	75				
DXCT		INCL	K 81 RESET	1844.71570	-0.002	-0.397

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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                           0.009    0.006     0.23
DYCT              INCL         K 81 RESET         -6520.05040    0.001    0.084
                                                           0.009    0.008     0.07
DZCT              INCL         K 81 RESET         -8093.22650    0.004    0.518
                                                           0.009    0.008     0.37
GROUP: INCL.ASC    ,obs#:   76
DXCT              INCL         N 13                25421.11170   -0.019   -0.764
                                                           0.025    0.025     0.67
DYCT              INCL         N 13                -7563.34880   -0.029   -1.132
                                                           0.025    0.025     1.00
DZCT              INCL         N 13               -11129.56730   -0.005   -0.189
                                                           0.025    0.025     0.17
GROUP: 031610R.ASC ,obs#:   77
DXCT              Q 60 X       105                 -2331.86770    0.002    0.274
                                                           0.006    0.006     0.22
DYCT              Q 60 X       105                  4034.40230   -0.000   -0.040
                                                           0.006    0.006     0.03
DZCT              Q 60 X       105                  5182.85700   -0.012   -2.233
                                                           0.006    0.006     1.78
GROUP: 031610R.ASC ,obs#:   78
DXCT              Q 60 X       12                  -2170.60880    0.002    0.299
                                                           0.008    0.007     0.24
DYCT              Q 60 X       12                   5455.03940    0.007    0.894
                                                           0.008    0.007     0.72
DZCT              Q 60 X       12                   6919.38780   -0.013   -1.770
                                                           0.008    0.007     1.43
GROUP: 031610R.ASC ,obs#:   79
DXCT              105          12                    161.25970   -0.000   -0.268
                                                           0.002    0.000     0.06
DYCT              105          12                   1420.64440   -0.001   -0.970
                                                           0.002    0.001     0.22
DZCT              105          12                   1736.52930    0.001    1.808
                                                           0.002    0.000     0.39
GROUP: 031610R.ASC ,obs#:   80
DXCT              Q 60 X       13                  -8150.47160    0.003    0.413
                                                           0.008    0.007     0.32
DYCT              Q 60 X       13                   2664.02540   -0.001   -0.095
                                                           0.008    0.007     0.07
DZCT              Q 60 X       13                   3996.89210   -0.009   -1.232
                                                           0.008    0.007     0.95
GROUP: 031610R.ASC ,obs#:   81
DXCT              105          13                  -5818.60180   -0.001   -0.152
                                                           0.005    0.004     0.10
DYCT              105          13                  -1370.37750    0.000    0.032
                                                           0.005    0.004     0.02
DZCT              105          13                  -1185.96340    0.002    0.457
                                                           0.005    0.004     0.31
GROUP: 031610R.ASC ,obs#:   82
DXCT              Q 60 X       E 10               -19250.17980   -0.005   -0.386
                                                           0.019    0.013     0.23
DYCT              Q 60 X       E 10                -6469.04680    0.042    2.500
                                                           0.019    0.017     1.99
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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
DZCT              Q 60 X       E 10               -6350.34640   -0.045   -2.919
                                                         0.019    0.015     2.12
GROUP: 031610R.ASC ,obs#:   83
DXCT              105          E 10              -16918.31660   -0.002   -0.130
                                                         0.020    0.015     0.08
DYCT              105          E 10              -10503.46230    0.056    3.019
                                                         0.021    0.018     2.42
DZCT              105          E 10              -11533.20500   -0.031   -1.813
                                                         0.020    0.017     1.35
GROUP: 031610R.ASC ,obs#:   84
DXCT              Q 60 X       H 271              -5364.40080   -0.003   -0.187
                                                         0.022    0.018     0.14
DYCT              Q 60 X       H 271              15189.86520    0.030    1.465
                                                         0.022    0.021     1.22
DZCT              Q 60 X       H 271              19172.34620   -0.027   -1.377
                                                         0.022    0.020     1.09
GROUP: 031610R.ASC ,obs#:   85
DXCT              105          H 271              -3032.53670   -0.001   -0.130
                                                         0.016    0.010     0.07
DYCT              105          H 271              11155.48000    0.014    0.962
                                                         0.016    0.014     0.75
DZCT              105          H 271              13989.48910   -0.015   -1.164
                                                         0.016    0.013     0.82
GROUP: 031710R.ASC ,obs#:   86
DXCT              105          14                  2856.87390   -0.000   -0.047
                                                         0.004    0.003     0.03
DYCT              105          14                 -2217.12760    0.001    0.486
                                                         0.004    0.003     0.31
DZCT              105          14                 -2983.56370   -0.004   -1.317
                                                         0.004    0.003     0.84
GROUP: 031710R.ASC ,obs#:   87
DXCT              Q 60 X       14                   525.00750    0.000    0.070
                                                         0.003    0.001     0.03
DYCT              Q 60 X       14                  1817.27670   -0.001   -0.569
                                                         0.003    0.001     0.26
DZCT              Q 60 X       14                  2199.27530    0.002    1.345
                                                         0.003    0.001     0.57
GROUP: 031710R.ASC ,obs#:   88
DXCT              105          15                 -3967.73550    0.004    0.664
                                                         0.008    0.006     0.45
DYCT              105          15                 -5036.69510   -0.005   -0.886
                                                         0.008    0.006     0.61
DZCT              105          15                 -5854.03390   -0.002   -0.360
                                                         0.008    0.006     0.25
GROUP: 031710R.ASC ,obs#:   89
DXCT              Q 60 X       15                 -6299.59560   -0.002   -0.664
                                                         0.006    0.003     0.33
DYCT              Q 60 X       15                 -1002.30120    0.003    0.884
                                                         0.006    0.003     0.45
DZCT              Q 60 X       15                  -671.19260    0.001    0.355
                                                         0.006    0.003     0.18
GROUP: 031710R.ASC ,obs#:   90
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Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DXCT		105	16	-625.50560	0.001	0.132
				0.009	0.008	0.10
DYCT		105	16	-6468.92270	0.000	0.063
				0.009	0.008	0.05
DZCT		105	16	-7936.80780	-0.011	-1.429
				0.009	0.008	1.11
GROUP: 031710R.ASC ,obs#:		91				
DXCT		Q 60 X	16	-2957.37050	-0.000	-0.136
				0.004	0.002	0.05
DYCT		Q 60 X	16	-2434.52000	-0.000	-0.074
				0.004	0.002	0.03
DZCT		Q 60 X	16	-2753.97700	0.002	1.430
				0.004	0.002	0.52
GROUP: 031710R.ASC ,obs#:		92				
DXCT		105	Q 60 X	2331.86420	0.002	0.356
				0.006	0.006	0.28
DYCT		105	Q 60 X	-4034.39860	-0.003	-0.626
				0.006	0.006	0.50
DZCT		105	Q 60 X	-5182.83930	-0.005	-0.956
				0.006	0.006	0.76
GROUP: INBD.ASC ,obs#:		93				
DXCT		105	13	-5818.60180	-0.001	-0.152
				0.005	0.004	0.10
DYCT		105	13	-1370.37750	0.000	0.032
				0.005	0.004	0.02
DZCT		105	13	-1185.96340	0.002	0.457
				0.005	0.004	0.31
GROUP: INBD.ASC ,obs#:		94				
DXCT		Q 60 X	INBD	-56070.30800	0.001	0.021
				0.050	0.049	0.02
DYCT		Q 60 X	INBD	-8202.36030	0.015	0.305
				0.050	0.050	0.27
DZCT		Q 60 X	INBD	-5504.80390	0.011	0.230
				0.050	0.049	0.20
GROUP: INBD.ASC ,obs#:		95				
DXCT		105	INBD	-53738.44550	0.005	0.098
				0.049	0.048	0.08
DYCT		105	INBD	-12236.75640	0.009	0.187
				0.049	0.049	0.16
DZCT		105	INBD	-10687.65960	0.022	0.462
				0.049	0.048	0.40
GROUP: INBD.ASC ,obs#:		96				
DXCT		H 271	INBD	-50705.90150	-0.001	-0.023
				0.054	0.054	0.02
DYCT		H 271	INBD	-23392.20230	-0.039	-0.714
				0.054	0.054	0.63
DZCT		H 271	INBD	-24677.16190	0.051	0.940
				0.054	0.054	0.83
GROUP: 051110R.ASC ,obs#:		97				
DXCT		108	109	-196.12210	-0.001	-0.193
				0.003	0.003	0.15
DYCT		108	109	2387.19250	-0.002	-0.718

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.003	0.003	0.56
DZCT		108	109	2932.18680	-0.000	-0.149
				0.003	0.003	0.12
GROUP: 051110R.ASC ,obs#: 98						
DXCT		108	27	-2168.13050	0.000	0.054
				0.003	0.003	0.04
DYCT		108	27	1940.45800	0.001	0.288
				0.004	0.003	0.21
DZCT		108	27	2494.83330	0.001	0.463
				0.003	0.003	0.33
GROUP: 051110R.ASC ,obs#: 99						
DXCT		109	27	-1972.00770	0.000	0.024
				0.002	0.001	0.01
DYCT		109	27	-446.73140	-0.000	-0.174
				0.002	0.001	0.09
DZCT		109	27	-437.35140	-0.000	-0.413
				0.002	0.001	0.18
GROUP: 051110R.ASC ,obs#: 100						
DXCT		INLN	27	8542.74370	-0.003	-0.272
				0.011	0.010	0.22
DYCT		INLN	27	-5878.98480	-0.003	-0.249
				0.011	0.011	0.20
DZCT		INLN	27	-7811.85540	-0.001	-0.082
				0.011	0.011	0.07
GROUP: 051110R.ASC ,obs#: 101						
DXCT		108	28	1244.05640	-0.000	-0.156
				0.002	0.001	0.08
DYCT		108	28	1200.93770	0.002	1.807
				0.002	0.001	1.05
DZCT		108	28	1393.03430	-0.000	-0.270
				0.002	0.001	0.15
GROUP: 051110R.ASC ,obs#: 102						
DXCT		109	28	1440.17870	0.000	0.139
				0.002	0.001	0.08
DYCT		109	28	-1186.24790	-0.002	-1.627
				0.002	0.002	1.02
DZCT		109	28	-1539.15270	0.000	0.203
				0.002	0.001	0.12
GROUP: 051110R.ASC ,obs#: 103						
DXCT		INLN	28	11954.92670	0.001	0.053
				0.014	0.014	0.04
DYCT		INLN	28	-6618.49580	-0.010	-0.744
				0.015	0.014	0.64
DZCT		INLN	28	-8913.66000	0.003	0.223
				0.015	0.014	0.19
GROUP: 051110R.ASC ,obs#: 104						
DXCT		108	29	-2478.72230	0.000	0.177
				0.002	0.001	0.08
DYCT		108	29	413.16330	0.002	1.305
				0.002	0.001	0.65
DZCT		108	29	623.93940	-0.003	-2.669
				0.002	0.001	1.34

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 051110R.ASC ,obs#: 105						
DXCT		109	29	-2282.59880	-0.001	-0.234
				0.003	0.003	0.16
DYCT		109	29	-1974.02200	-0.003	-1.278
				0.003	0.003	0.90
DZCT		109	29	-2308.25710	0.007	2.507
				0.003	0.003	1.76
GROUP: 051110R.ASC ,obs#: 106						
DXCT		INLN	29	8232.14700	0.002	0.177
				0.013	0.012	0.14
DYCT		INLN	29	-7406.28140	0.000	0.010
				0.013	0.012	0.01
DZCT		INLN	29	-9682.76180	0.007	0.565
				0.013	0.012	0.47
GROUP: 051110R.ASC ,obs#: 107						
DXCT		108	30	-13.48880	0.000	2.026
				0.001	0.000	10.59
DYCT		108	30	-13.25370	-0.001	-2.639
				0.001	0.000	31.55
DZCT		108	30	-15.28920	0.001	2.777
				0.001	0.000	22.82
GROUP: 051110R.ASC ,obs#: 108						
DXCT		109	30	182.63520	-0.001	-0.351
				0.003	0.003	0.28
DYCT		109	30	-2400.45170	0.007	2.176
				0.004	0.003	1.80
DZCT		109	30	-2947.46920	-0.006	-1.887
				0.004	0.003	1.53
GROUP: 051110R.ASC ,obs#: 109						
DXCT		INLN	30	10697.37210	0.011	0.745
				0.015	0.014	0.63
DYCT		INLN	30	-7832.70060	-0.000	-0.010
				0.015	0.015	0.01
DZCT		INLN	30	-10321.97200	-0.007	-0.522
				0.015	0.014	0.45
GROUP: 051110R.ASC ,obs#: 110						
DXCT		108	A 353	1566.60880	0.002	0.175
				0.012	0.010	0.13
DYCT		108	A 353	8639.49610	-0.016	-1.390
				0.012	0.011	1.13
DZCT		108	A 353	10534.39150	0.004	0.403
				0.012	0.011	0.32
GROUP: 051110R.ASC ,obs#: 111						
DXCT		109	A 353	1762.73340	-0.000	-0.015
				0.009	0.006	0.01
DYCT		109	A 353	6252.30250	-0.012	-1.639
				0.009	0.008	1.23
DZCT		109	A 353	7602.20230	0.007	1.012
				0.009	0.007	0.72
GROUP: 051110R.ASC ,obs#: 112						
DXCT		INLN	A 353	12277.48500	-0.003	-0.362
				0.011	0.009	0.26

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DYCT		INLN	A 353	820.07010	-0.036	-3.550
				0.011	0.010	2.91
DZCT		INLN	A 353	227.67630	0.029	2.987
				0.011	0.010	2.34
GROUP: 051110R.ASC ,obs#: 113						
DXCT		108	INLN	-10710.87310	0.002	0.134
				0.015	0.014	0.11
DYCT		108	INLN	7819.43270	0.014	0.947
				0.015	0.014	0.81
DZCT		108	INLN	10306.69480	-0.004	-0.278
				0.015	0.014	0.24
GROUP: 051110R.ASC ,obs#: 114						
DXCT		109	INLN	-10514.75520	0.007	0.584
				0.012	0.011	0.48
DYCT		109	INLN	5432.24130	0.015	1.251
				0.012	0.012	1.05
DZCT		109	INLN	7374.51790	-0.013	-1.160
				0.012	0.012	0.96
GROUP: 051110R.ASC ,obs#: 115						
DXCT		108	J 354	-6473.17760	-0.000	-0.002
				0.008	0.005	0.00
DYCT		108	J 354	-3936.74860	-0.006	-0.939
				0.008	0.006	0.68
DZCT		108	J 354	-4509.53220	0.004	0.642
				0.008	0.006	0.43
GROUP: 051110R.ASC ,obs#: 116						
DXCT		109	J 354	-6277.05150	-0.003	-0.411
				0.010	0.008	0.30
DYCT		109	J 354	-6323.95500	0.010	1.086
				0.010	0.009	0.86
DZCT		109	J 354	-7441.71210	-0.003	-0.296
				0.010	0.009	0.23
GROUP: 051110R.ASC ,obs#: 117						
DXCT		INLN	J 354	4237.68390	0.010	0.621
				0.017	0.016	0.50
DYCT		INLN	J 354	-11756.20120	0.000	0.021
				0.017	0.017	0.02
DZCT		INLN	J 354	-14816.20860	-0.011	-0.652
				0.017	0.016	0.55
GROUP: 051110R.ASC ,obs#: 118						
DXCT		108	S 280	16431.83930	0.002	0.138
				0.018	0.018	0.12
DYCT		108	S 280	8243.31480	0.002	0.088
				0.018	0.018	0.08
DZCT		108	S 280	9142.08790	0.003	0.170
				0.018	0.018	0.15
GROUP: 051110R.ASC ,obs#: 119						
DXCT		109	S 280	16627.96340	0.001	0.062
				0.016	0.016	0.05
DYCT		109	S 280	5856.11630	0.010	0.599
				0.017	0.016	0.52
DZCT		109	S 280	6209.91800	-0.013	-0.832

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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                           0.017    0.016     0.72
GROUP: 051110R.ASC ,obs#:  120
DXCT              INLN         S 280              27142.71350   -0.001   -0.024
                                                           0.024    0.024     0.02
DYCT              INLN         S 280                423.86810    0.002    0.083
                                                           0.024    0.024     0.07
DZCT              INLN         S 280              -1164.59670   -0.003   -0.134
                                                           0.024    0.024     0.12
GROUP: 031110R.ASC ,obs#:  121
DXCT              103          10                   284.04670    0.000    0.359
                                                           0.002    0.001     0.18
DYCT              103          10                -1279.86770   -0.001   -0.941
                                                           0.002    0.001     0.50
DZCT              103          10                -1488.58730    0.002    1.532
                                                           0.002    0.001     0.82
GROUP: 031110R.ASC ,obs#:  122
DXCT              104          10                -2594.18430   -0.001   -0.331
                                                           0.003    0.002     0.23
DYCT              104          10                 -905.83010    0.002    0.859
                                                           0.003    0.002     0.60
DZCT              104          10                 -894.71480   -0.003   -1.483
                                                           0.003    0.002     1.04
GROUP: 031110R.ASC ,obs#:  123
DXCT              103          104                2878.23310   -0.001   -0.450
                                                           0.003    0.002     0.37
DYCT              103          104                -374.03990   -0.000   -0.178
                                                           0.003    0.002     0.14
DZCT              103          104                -593.86870    0.001    0.346
                                                           0.003    0.002     0.28
GROUP: 031110R.ASC ,obs#:  124
DXCT              103          11                -1855.69310   -0.001   -0.418
                                                           0.003    0.002     0.21
DYCT              103          11                -2189.77720    0.002    0.918
                                                           0.003    0.002     0.47
DZCT              103          11                -2420.32560   -0.000   -0.125
                                                           0.003    0.002     0.07
GROUP: 031110R.ASC ,obs#:  125
DXCT              104          11                -4733.92750    0.002    0.417
                                                           0.005    0.004     0.30
DYCT              104          11                -1815.73160   -0.004   -0.916
                                                           0.005    0.004     0.65
DZCT              104          11                -1826.45840    0.000    0.108
                                                           0.005    0.004     0.08
GROUP: 031110R.ASC ,obs#:  126
DXCT              103          7                    828.58770    0.000    0.616
                                                           0.001    0.000     0.22
DYCT              103          7                    347.87030    0.002    3.013
                                                           0.001    0.001     1.92
DZCT              103          7                    357.38980   -0.001   -2.515
                                                           0.001    0.000     1.22
GROUP: 031110R.ASC ,obs#:  127
DXCT              104          7                 -2049.64290   -0.001   -0.675
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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                          0.002    0.002     0.50
DYCT              104          7                      721.91760   -0.005   -2.738
                                                          0.002    0.002     2.16
DZCT              104          7                      951.25310    0.003    1.865
                                                          0.002    0.002     1.43
GROUP: 031110R.ASC ,obs#:  128
DXCT              103          8                     1984.10180   -0.001   -0.521
                                                          0.002    0.001     0.38
DYCT              103          8                     -306.98110    0.002    1.334
                                                          0.002    0.002     1.14
DZCT              103          8                     -466.32520   -0.001   -0.897
                                                          0.002    0.002     0.65
GROUP: 031110R.ASC ,obs#:  129
DXCT              104          8                     -894.13120    0.000    0.625
                                                          0.001    0.000     0.24
DYCT              104          8                       67.06280   -0.001   -1.433
                                                          0.002    0.001     1.34
DZCT              104          8                      127.54080    0.001    1.255
                                                          0.001    0.000     0.57
GROUP: 031110R.ASC ,obs#:  130
DXCT              103          9                      460.85340    0.000    0.083
                                                          0.001    0.000     0.03
DYCT              103          9                     -628.02830   -0.002   -3.229
                                                          0.002    0.001     2.20
DZCT              103          9                     -746.78810    0.001    1.269
                                                          0.001    0.000     0.58
GROUP: 031110R.ASC ,obs#:  131
DXCT              104          9                    -2417.37850   -0.000   -0.041
                                                          0.002    0.002     0.03
DYCT              104          9                     -253.99690    0.007    3.197
                                                          0.003    0.002     2.69
DZCT              104          9                     -152.91830   -0.001   -0.703
                                                          0.002    0.002     0.54
GROUP: 031110R.ASC ,obs#:  132
DXCT              103          INRN                  1801.19890   -0.000   -0.038
                                                          0.002    0.001     0.02
DYCT              103          INRN                   503.78420    0.001    0.718
                                                          0.002    0.001     0.43
DZCT              103          INRN                   492.84980   -0.000   -0.356
                                                          0.002    0.001     0.22
GROUP: 031110R.ASC ,obs#:  133
DXCT              104          INRN                 -1077.03310   -0.000   -0.056
                                                          0.002    0.001     0.03
DYCT              104          INRN                   877.82390    0.001    1.500
                                                          0.002    0.001     0.82
DZCT              104          INRN                  1086.71870   -0.001   -1.478
                                                          0.002    0.001     0.82
GROUP: 031110R.ASC ,obs#:  134
DXCT              103          INWL                 21643.09000   -0.004   -0.075
                                                          0.050    0.050     0.07
DYCT              103          INWL                -33898.19600   -0.037   -0.744
                                                          0.050    0.050     0.65
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Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DZCT		103	INWL	-40624.41580	0.030	0.590
				0.050	0.050	0.52
GROUP: 031110R.ASC ,obs#: 135						
DXCT		104	INWL	18764.85750	-0.003	-0.068
				0.049	0.049	0.06
DYCT		104	INWL	-33524.15600	-0.037	-0.760
				0.049	0.049	0.67
DZCT		104	INWL	-40030.54460	0.026	0.539
				0.049	0.049	0.47
GROUP: 031110R.ASC ,obs#: 136						
DXCT		103	M 107	764.54630	0.001	0.243
				0.007	0.006	0.17
DYCT		103	M 107	-5357.63580	0.004	0.648
				0.007	0.006	0.47
DZCT		103	M 107	-6213.45560	-0.001	-0.145
				0.007	0.006	0.11
GROUP: 031110R.ASC ,obs#: 137						
DXCT		104	M 107	-2113.68300	-0.001	-0.235
				0.007	0.005	0.16
DYCT		104	M 107	-4983.58930	-0.002	-0.423
				0.007	0.005	0.30
DZCT		104	M 107	-5619.58940	0.001	0.145
				0.007	0.005	0.10
GROUP: 031110R.ASC ,obs#: 138						
DXCT		INRN	M 107	-1036.65070	-0.000	-0.063
				0.008	0.007	0.05
DYCT		INRN	M 107	-5861.41450	-0.002	-0.369
				0.008	0.007	0.28
DZCT		INRN	M 107	-6706.30670	0.001	0.127
				0.008	0.007	0.10
GROUP: 031110R.ASC ,obs#: 139						
DXCT		INWL	M 107	-20878.55050	0.012	0.278
				0.043	0.043	0.24
DYCT		INWL	M 107	28540.57290	0.029	0.661
				0.044	0.043	0.58
DZCT		INWL	M 107	34410.95580	-0.026	-0.604
				0.044	0.043	0.53
GROUP: 031110R.ASC ,obs#: 140						
DXCT		103	NEW L 5	-12014.30980	0.006	0.628
				0.012	0.010	0.43
DYCT		103	NEW L 5	-5078.05150	-0.026	-2.243
				0.013	0.011	1.83
DZCT		103	NEW L 5	-5188.24440	0.015	1.397
				0.012	0.011	1.09
GROUP: 031110R.ASC ,obs#: 141						
DXCT		104	NEW L 5	-14892.53210	-0.004	-0.301
				0.014	0.012	0.22
DYCT		104	NEW L 5	-4703.99430	-0.043	-3.057
				0.015	0.014	2.61
DZCT		104	NEW L 5	-4594.39960	0.038	2.902
				0.014	0.013	2.35
GROUP: 031110R.ASC ,obs#: 142						

Residuals (critical value = 4.020):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DXCT		INRN	NEW L 5	-13815.50130	-0.001	-0.110
				0.014	0.012	0.08
DYCT		INRN	NEW L 5	-5581.84340	-0.019	-1.385
				0.014	0.014	1.18
DZCT		INRN	NEW L 5	-5681.09920	0.021	1.604
				0.014	0.013	1.30
GROUP: 031110R.ASC ,obs#: 143						
DXCT		INWL	NEW L 5	-33657.39780	0.008	0.159
				0.050	0.049	0.14
DYCT		INWL	NEW L 5	28820.16000	-0.004	-0.075
				0.050	0.050	0.07
DZCT		INWL	NEW L 5	35436.14740	0.010	0.192
				0.050	0.050	0.17
GROUP: 031110R.ASC ,obs#: 144						
DXCT		103	P 157	-3530.32600	0.001	0.175
				0.009	0.007	0.12
DYCT		103	P 157	6140.34180	-0.026	-3.137
				0.009	0.008	2.54
DZCT		103	P 157	7272.36650	0.022	2.740
				0.009	0.008	2.15
GROUP: 031110R.ASC ,obs#: 145						
DXCT		104	P 157	-6408.55730	0.001	0.058
				0.011	0.009	0.04
DYCT		104	P 157	6514.37800	-0.022	-2.159
				0.011	0.010	1.80
DZCT		104	P 157	7866.23810	0.018	1.842
				0.011	0.010	1.50
GROUP: 031110R.ASC ,obs#: 146						
DXCT		INRN	P 157	-5331.52540	0.002	0.246
				0.009	0.007	0.17
DYCT		INRN	P 157	5636.55520	-0.024	-2.881
				0.009	0.008	2.35
DZCT		INRN	P 157	6779.51700	0.022	2.695
				0.009	0.008	2.13
GROUP: 031110R.ASC ,obs#: 147						
DXCT		INWL	P 157	-25173.40330	-0.008	-0.130
				0.059	0.059	0.11
DYCT		INWL	P 157	40038.49040	0.059	0.998
				0.059	0.059	0.88
DZCT		INWL	P 157	47896.80780	-0.033	-0.564
				0.059	0.059	0.50
GROUP: 030910R.ASC ,obs#: 148						
DXCT		101	102	3636.44770	-0.005	-1.422
				0.004	0.003	1.10
DYCT		101	102	1910.60840	-0.006	-1.679
				0.004	0.003	1.29
DZCT		101	102	1863.50830	0.000	0.089
				0.004	0.003	0.07
GROUP: 030910R.ASC ,obs#: 149						
DXCT		102	14403	-1536.29460	0.003	0.350
				0.011	0.008	0.23
DYCT		102	14403	8147.56960	-0.024	-2.532

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Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                           0.011    0.010     1.97
DZCT              102          14403              9249.57640    0.019    2.013
                                                           0.011    0.009     1.51
GROUP: 030910R.ASC ,obs#:  150
DXCT              101          14403              2100.14980    0.001    0.105
                                                           0.013    0.011     0.08
DYCT              101          14403             10058.16400   -0.016   -1.292
                                                           0.014    0.013     1.08
DZCT              101          14403             11113.08690    0.017    1.385
                                                           0.013    0.012     1.11
GROUP: 030910R.ASC ,obs#:  151
DXCT              101          INEL              -2935.53220   -0.001   -0.720
                                                           0.003    0.001     0.28
DYCT              101          INEL               -561.17260    0.003    2.648
                                                           0.003    0.001     1.12
DZCT              101          INEL               -365.39630   -0.004   -2.928
                                                           0.003    0.001     1.22
GROUP: 030910R.ASC ,obs#:  152
DXCT              102          INEL              -6571.98070    0.005    0.842
                                                           0.006    0.006     0.67
DYCT              102          INEL              -2471.78140    0.010    1.638
                                                           0.006    0.006     1.30
DZCT              102          INEL              -2228.90500   -0.004   -0.614
                                                           0.006    0.006     0.49
GROUP: 030910R.ASC ,obs#:  153
DXCT              14403        INEL              -5035.68340   -0.001   -0.050
                                                           0.014    0.012     0.04
DYCT              14403        INEL             -10619.34640    0.029    2.122
                                                           0.015    0.014     1.79
DZCT              14403        INEL             -11478.47590   -0.028   -2.071
                                                           0.015    0.013     1.69
GROUP: 030910R.ASC ,obs#:  154
DXCT              J 160        INEL             -12299.18140    0.009    0.572
                                                           0.015    0.015     0.51
DYCT              J 160        INEL               7167.43210    0.003    0.179
                                                           0.015    0.015     0.16
DZCT              J 160        INEL               9057.41790   -0.002   -0.103
                                                           0.015    0.015     0.09
GROUP: 030910R.ASC ,obs#:  155
DXCT              102          J 160              5727.20150   -0.004   -0.320
                                                           0.014    0.014     0.28
DYCT              102          J 160             -9639.19490   -0.012   -0.825
                                                           0.014    0.014     0.74
DZCT              102          J 160            -11286.33850    0.014    0.976
                                                           0.014    0.014     0.85
GROUP: 030910R.ASC ,obs#:  156
DXCT              101          J 160              9363.64400   -0.004   -0.311
                                                           0.014    0.013     0.27
DYCT              101          J 160             -7728.59400   -0.010   -0.729
                                                           0.014    0.014     0.65
DZCT              101          J 160             -9422.81940    0.003    0.227
                                                           0.014    0.013     0.20
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Residuals (critical value = 4.020):
                                                    OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                       STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
GROUP: 031010R.ASC ,obs#:  157
DXCT              101          1                    -688.46380    0.001    0.829
                                                         0.002    0.001     0.31
DYCT              101          1                    1312.49850    0.000    0.371
                                                         0.002    0.001     0.20
DZCT              101          1                    1519.41640    0.001    0.691
                                                         0.002    0.001     0.31
GROUP: 031010R.ASC ,obs#:  158
DXCT              102          1                   -4324.90330   -0.003   -0.822
                                                         0.004    0.003     0.59
DYCT              102          1                    -598.10190   -0.002   -0.529
                                                         0.004    0.003     0.40
DZCT              102          1                    -344.08900   -0.003   -0.793
                                                         0.004    0.003     0.58
GROUP: 031010R.ASC ,obs#:  159
DXCT              101          102                  3636.43900    0.004    1.074
                                                         0.004    0.003     0.83
DYCT              101          102                  1910.59820    0.004    1.267
                                                         0.004    0.003     0.97
DZCT              101          102                  1863.51030   -0.002   -0.487
                                                         0.004    0.003     0.37
GROUP: 031010R.ASC ,obs#:  160
DXCT              101          2                    -836.79460   -0.000   -0.164
                                                         0.003    0.002     0.08
DYCT              101          2                    2180.39500   -0.002   -1.198
                                                         0.003    0.002     0.72
DZCT              101          2                    2501.81430    0.003    1.372
                                                         0.003    0.002     0.79
GROUP: 031010R.ASC ,obs#:  161
DXCT              102          2                   -4473.23820    0.001    0.190
                                                         0.004    0.003     0.13
DYCT              102          2                     269.78640    0.004    1.122
                                                         0.004    0.003     0.79
DZCT              102          2                     638.31250   -0.004   -1.307
                                                         0.004    0.003     0.90
GROUP: 031010R.ASC ,obs#:  162
DXCT              101          3                   -3143.27750    0.001    0.180
                                                         0.005    0.003     0.10
DYCT              101          3                    3251.39890   -0.002   -0.611
                                                         0.005    0.003     0.34
DZCT              101          3                    3881.32000    0.001    0.384
                                                         0.005    0.003     0.21
GROUP: 031010R.ASC ,obs#:  163
DXCT              102          3                   -6779.71880   -0.001   -0.180
                                                         0.006    0.005     0.12
DYCT              102          3                    1340.79140    0.003    0.610
                                                         0.006    0.005     0.41
DZCT              102          3                    2017.81450   -0.002   -0.383
                                                         0.006    0.005     0.26
GROUP: 031010R.ASC ,obs#:  164
DXCT              101          4                    7441.70310    0.002    0.371
                                                         0.008    0.006     0.23
```

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================================================================================
                    USGS-Indiana Floods, IN - Constrained
GeoLab V2.4d                GRS 80             UNITS: m,DMS          Page 0036
================================================================================
Residuals (critical value = 4.020):
                                                      OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
DYCT              101          4                    -3505.00550    0.001    0.119
                                                         0.008    0.006     0.08
DZCT              101          4                    -4527.51500   -0.002   -0.408
                                                         0.008    0.006     0.25
GROUP: 031010R.ASC ,obs#:  165
DXCT              102          4                     3805.26460   -0.002   -0.371
                                                         0.008    0.006     0.23
DYCT              102          4                    -5415.60670   -0.001   -0.119
                                                         0.008    0.006     0.07
DZCT              102          4                    -6391.02830    0.002    0.408
                                                         0.008    0.006     0.25
GROUP: 031010R.ASC ,obs#:  166
DXCT              101          5                     8861.59670    0.002    0.232
                                                         0.012    0.008     0.14
DYCT              101          5                    -6173.08820    0.008    0.936
                                                         0.012    0.008     0.58
DZCT              101          5                    -7634.09840   -0.003   -0.359
                                                         0.012    0.008     0.22
GROUP: 031010R.ASC ,obs#:  167
DXCT              102          5                     5225.15780   -0.002   -0.232
                                                         0.012    0.008     0.15
DYCT              102          5                    -8083.67520   -0.008   -0.936
                                                         0.012    0.009     0.59
DZCT              102          5                    -9497.61300    0.003    0.359
                                                         0.012    0.009     0.23
GROUP: 031010R.ASC ,obs#:  168
DXCT              101          6                    12002.31130    0.002    0.203
                                                         0.015    0.011     0.13
DYCT              101          6                    -8044.82220   -0.000   -0.045
                                                         0.016    0.011     0.03
DZCT              101          6                    -9991.57560   -0.006   -0.543
                                                         0.016    0.011     0.34
GROUP: 031010R.ASC ,obs#:  169
DXCT              102          6                     8365.87300   -0.002   -0.204
                                                         0.016    0.011     0.13
DYCT              102          6                    -9955.42580    0.001    0.047
                                                         0.016    0.011     0.03
DZCT              102          6                   -11855.09620    0.006    0.543
                                                         0.016    0.011     0.34
GROUP: 031010R.ASC ,obs#:  170
DXCT              101          A 168               -15267.42320    0.001    0.169
                                                         0.014    0.008     0.09
DYCT              101          A 168                -1060.14530   -0.036   -3.113
                                                         0.014    0.012     2.36
DZCT              101          A 168                   -7.08720    0.032    2.874
                                                         0.014    0.011     2.06
GROUP: 031010R.ASC ,obs#:  171
DXCT              102          A 168               -18903.86750    0.003    0.225
                                                         0.017    0.013     0.15
DYCT              102          A 168                -2970.74750   -0.036   -2.363
                                                         0.017    0.015     1.90
DZCT              102          A 168                -1870.59740    0.033    2.213
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================================================================================
                    USGS-Indiana Floods, IN - Constrained
GeoLab V2.4d                GRS 80             UNITS: m,DMS          Page 0037
================================================================================
Residuals (critical value = 4.020):
                                                        OBSERVATION RESIDUAL  STD RES
TYPE AT           FROM         TO                         STD DEV  STD DEV      PPM
---- ------------ ------------ ------------ ------------------ -------- --------
                                                           0.017    0.015     1.73
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                    USGS-Indiana Floods, IN - Constrained
GeoLab V2.4d                GRS 80             UNITS: m,DMS          Page 0038
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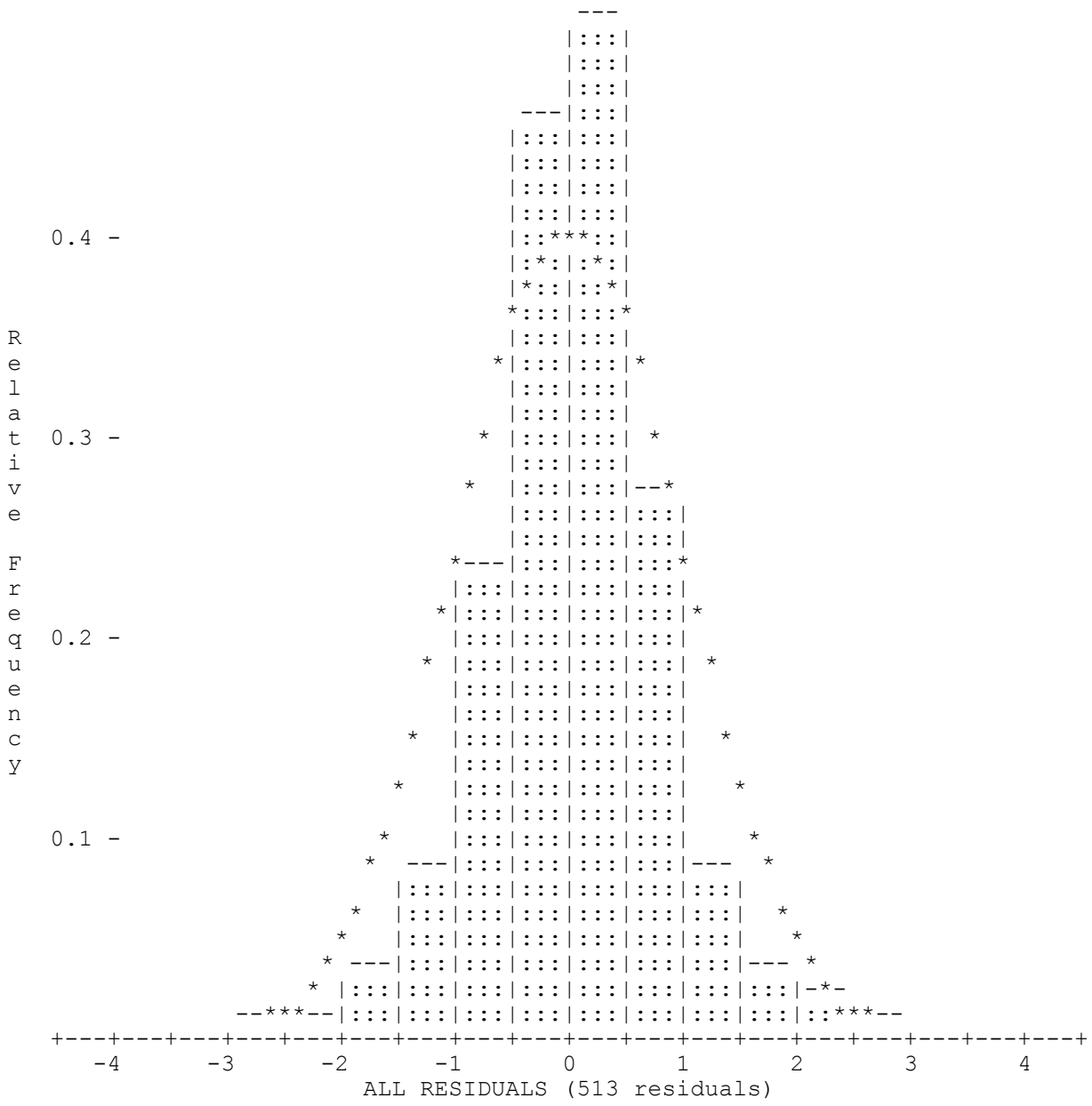

S T A T I S T I C S S U M M A R Y

Residual Critical Value Type	Tau Max
Residual Critical Value	4.0200
Number of Flagged Residuals	0
Convergence Criterion	0.0010
Final Iteration Counter Value	2
Confidence Level Used	95.0000
Estimated Variance Factor	1.0204
Number of Degrees of Freedom	328

Chi-Square Test on the Variance Factor:

8.8060e-01 < 1.0000 < 1.1965e+00 ?

THE TEST PASSES

NOTE: All confidence regions were computed using the following factors:

Variance factor used = 1.0204
3-D expansion factor = 2.7955

Note that, for relative confidence regions, precisions are computed from the ratio of the major semi-axis and the spatial distance between the two stations.

3D Station Confidence Regions (95.000 percent):

STATION	MAJ-SEMI	(AZ,VANG)	MED-SEMI	(AZ,VANG)	MIN-SEMI	(AZ,VANG)
1	0.009	(0, 90)	0.008	(0, 0)	0.008	(90, 0)
10	0.006	(0, 90)	0.005	(0, 0)	0.005	(90, 0)
101	0.007	(0, 0)	0.007	(90, 0)	0.006	(0, 90)
102	0.008	(0, 0)	0.008	(90, 0)	0.008	(0, 90)
103	0.004	(0, 90)	0.004	(0, 0)	0.004	(90, 0)
104	0.004	(0, 90)	0.003	(0, 0)	0.003	(90, 0)
105	0.034	(0, 0)	0.034	(90, 0)	0.007	(0, 90)
106	0.008	(0, 90)	0.008	(0, 0)	0.008	(90, 0)
107	0.028	(0, 90)	0.028	(0, 0)	0.028	(90, 0)
108	0.013	(0, 0)	0.013	(90, 0)	0.010	(0, 90)
109	0.013	(0, 0)	0.013	(90, 0)	0.010	(0, 90)
11	0.009	(0, 90)	0.008	(0, 0)	0.008	(90, 0)
110	0.019	(0, 0)	0.019	(90, 0)	0.009	(0, 90)
111	0.031	(0, 0)	0.031	(90, 2)	0.026	(270, 88)
112	0.028	(0, 0)	0.028	(90, 0)	0.021	(0, 90)
12	0.035	(0, 0)	0.035	(90, 0)	0.009	(0, 90)
13	0.036	(0, 0)	0.036	(90, 0)	0.012	(0, 90)
14	0.035	(0, 0)	0.035	(90, 0)	0.007	(0, 90)
14403	0.021	(0, 0)	0.021	(90, 0)	0.000	(0, 90)
15	0.037	(0, 0)	0.037	(90, 0)	0.013	(0, 90)
16	0.036	(0, 0)	0.036	(90, 0)	0.011	(0, 90)
17	0.021	(0, 90)	0.021	(0, 0)	0.021	(90, 0)
18	0.009	(0, 90)	0.008	(0, 0)	0.008	(90, 0)
19	0.013	(0, 90)	0.013	(0, 0)	0.013	(90, 0)
2	0.010	(0, 90)	0.010	(0, 0)	0.010	(90, 0)
20	0.010	(0, 90)	0.010	(0, 0)	0.010	(90, 0)
21	0.013	(0, 90)	0.013	(0, 0)	0.013	(90, 0)
22	0.030	(0, 90)	0.030	(0, 0)	0.030	(90, 0)
23	0.030	(0, 90)	0.030	(0, 0)	0.030	(90, 0)
24	0.028	(0, 90)	0.027	(0, 0)	0.027	(90, 0)
25	0.032	(0, 90)	0.032	(0, 0)	0.032	(90, 0)
26	0.032	(0, 90)	0.032	(0, 0)	0.032	(90, 0)
27	0.013	(0, 0)	0.013	(90, 0)	0.011	(0, 90)
28	0.013	(0, 0)	0.013	(90, 0)	0.011	(0, 90)
29	0.013	(0, 0)	0.013	(90, 0)	0.011	(0, 90)
3	0.013	(0, 0)	0.013	(90, 0)	0.013	(0, 90)
30	0.013	(90, 0)	0.013	(0, 0)	0.010	(0, 90)
31	0.019	(90, 0)	0.019	(0, 0)	0.005	(0, 90)
32	0.019	(0, 0)	0.019	(90, 0)	0.006	(0, 90)
33	0.019	(0, 0)	0.019	(90, 0)	0.005	(0, 90)
34	0.019	(0, 0)	0.019	(90, 0)	0.006	(0, 90)
35	0.029	(0, 0)	0.029	(90, 0)	0.022	(0, 90)
36	0.035	(0, 0)	0.035	(90, 0)	0.029	(0, 90)
37	0.037	(0, 0)	0.037	(90, 0)	0.032	(0, 90)
38	0.044	(180, 2)	0.044	(90, 0)	0.040	(0, 88)
39	0.036	(0, 0)	0.036	(90, 2)	0.031	(270, 88)
4	0.018	(0, 90)	0.018	(0, 0)	0.018	(90, 0)
5	0.025	(0, 90)	0.025	(0, 0)	0.025	(90, 0)
6	0.032	(0, 90)	0.032	(0, 0)	0.032	(90, 0)
7	0.005	(0, 90)	0.004	(0, 0)	0.004	(90, 0)
8	0.005	(0, 90)	0.004	(0, 0)	0.004	(90, 0)
9	0.005	(0, 90)	0.004	(0, 0)	0.004	(90, 0)
A 168	0.031	(0, 0)	0.031	(90, 0)	0.000	(0, 90)

USGS-Indiana Floods, IN - Constrained

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3D Station Confidence Regions (95.000 percent):

STATION	MAJ-SEMI	(AZ,VANG)	MED-SEMI	(AZ,VANG)	MIN-SEMI	(AZ,VANG)
A 353	0.018	(0, 0)	0.018	(90, 0)	0.000	(0, 90)
E 10	0.052	(0, 0)	0.052	(90, 0)	0.000	(0, 90)
E 13	0.018	(0, 0)	0.018	(90, 0)	0.000	(0, 90)
J 354	0.020	(0, 0)	0.020	(90, 0)	0.000	(0, 90)
J 9	0.032	(0, 0)	0.031	(90, 0)	0.000	(0, 90)
K 81 RESET	0.020	(0, 0)	0.020	(90, 0)	0.000	(0, 90)
M 107	0.012	(0, 90)	0.012	(0, 0)	0.012	(90, 0)
M 360	0.046	(0, 0)	0.046	(90, 0)	0.000	(0, 90)
NEW L 5	0.022	(0, 0)	0.022	(90, 0)	0.000	(0, 90)
P 157	0.016	(0, 0)	0.016	(90, 0)	0.000	(0, 90)
Q 28	0.027	(0, 90)	0.026	(0, 0)	0.026	(90, 0)
Q 60 X	0.035	(0, 0)	0.035	(90, 0)	0.000	(0, 90)
Z 293	0.046	(90, 0)	0.046	(0, 0)	0.000	(0, 90)

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
1	101	0.007 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2122.561	3.08
1	102	0.008 (0, 90)	0.007 (0, 0)	0.007 (90, 0)	4379.605	1.72
10	103	0.005 (0, 90)	0.004 (0, 0)	0.004 (90, 0)	1983.591	2.34
10	104	0.005 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2889.782	1.71
101	102	0.006 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	4510.741	1.24
101	14403	0.021 (0, 0)	0.021 (90, 0)	0.006 (0, 90)	15135.324	1.38
101	2	0.008 (0, 90)	0.007 (0, 0)	0.007 (90, 0)	3422.488	2.48
101	3	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	5959.566	1.98
101	4	0.017 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	9389.486	1.80
101	5	0.024 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	13225.519	1.81
101	6	0.032 (0, 90)	0.031 (0, 0)	0.031 (90, 0)	17567.197	1.80
101	A 168	0.030 (0, 0)	0.030 (90, 0)	0.006 (0, 90)	15304.189	1.96
101	INEL	0.007 (0, 0)	0.007 (90, 0)	0.006 (0, 90)	3010.944	2.23
101	J 160	0.007 (0, 0)	0.007 (90, 0)	0.006 (0, 90)	15368.752	0.44
102	14403	0.021 (0, 0)	0.021 (90, 0)	0.008 (0, 90)	12421.662	1.68
102	2	0.009 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	4526.597	1.95
102	3	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	7199.576	1.68
102	4	0.017 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	9200.763	1.83
102	5	0.024 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	13522.307	1.77
102	6	0.032 (0, 90)	0.031 (0, 0)	0.031 (90, 0)	17596.632	1.80
102	A 168	0.030 (0, 0)	0.030 (90, 0)	0.008 (0, 90)	19227.081	1.57
102	INEL	0.008 (0, 0)	0.008 (90, 0)	0.008 (0, 90)	7366.719	1.09
102	J 160	0.008 (0, 0)	0.008 (90, 0)	0.008 (0, 90)	15908.998	0.50
103	104	0.003 (0, 90)	0.003 (0, 0)	0.003 (90, 0)	2962.567	1.04
103	11	0.008 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	3754.556	2.13
103	7	0.004 (0, 90)	0.003 (0, 0)	0.002 (90, 0)	967.109	3.70

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
103	8	0.004 (0, 90)	0.003 (0, 0)	0.003 (90, 0)	2061.153	2.04
103	9	0.004 (0, 90)	0.003 (0, 0)	0.003 (90, 0)	1079.120	3.52
103	INRN	0.004 (0, 90)	0.004 (0, 0)	0.004 (90, 0)	1934.171	1.87
103	INWL	0.004 (0, 90)	0.004 (0, 0)	0.004 (90, 0)	57165.148	0.06
103	M 107	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	8239.890	1.48
103	NEW L 5	0.022 (0, 0)	0.022 (90, 0)	0.004 (0, 90)	14037.382	1.56
103	P 157	0.015 (0, 0)	0.015 (90, 0)	0.004 (0, 90)	10151.567	1.53
104	11	0.008 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	5389.146	1.52
104	7	0.004 (0, 90)	0.003 (0, 0)	0.003 (90, 0)	2372.148	1.75
104	8	0.004 (0, 90)	0.003 (0, 0)	0.002 (90, 0)	905.668	4.14
104	9	0.004 (0, 90)	0.004 (0, 0)	0.004 (90, 0)	2435.491	1.79
104	INRN	0.004 (0, 90)	0.003 (0, 0)	0.003 (90, 0)	1763.954	1.99
104	INWL	0.004 (0, 90)	0.003 (0, 0)	0.003 (90, 0)	55483.634	0.06
104	M 107	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	7802.796	1.56
104	NEW L 5	0.022 (0, 0)	0.022 (90, 0)	0.004 (0, 90)	16279.550	1.35
104	P 157	0.016 (0, 0)	0.015 (90, 0)	0.004 (0, 90)	12057.546	1.29
105	12	0.006 (0, 90)	0.006 (0, 0)	0.006 (90, 0)	2249.393	2.61
105	13	0.010 (0, 90)	0.010 (0, 0)	0.010 (90, 0)	6094.307	1.64
105	14	0.008 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	4688.182	1.81
105	15	0.014 (0, 90)	0.014 (0, 0)	0.014 (90, 0)	8682.222	1.61
105	16	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	10258.231	1.21
105	E 10	0.039 (0, 0)	0.039 (90, 0)	0.007 (0, 90)	23012.314	1.70
105	H 271	0.034 (0, 0)	0.034 (90, 0)	0.007 (0, 90)	18147.912	1.90
105	INBD	0.034 (0, 0)	0.034 (90, 0)	0.007 (0, 90)	56140.748	0.61
105	Q 60 X	0.007 (0, 90)	0.007 (0, 0)	0.007 (90, 0)	6969.640	1.07
106	17	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	11772.158	1.79

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
106	18	0.004 (0, 90)	0.002 (0, 0)	0.002 (90, 0)	791.721	4.50
106	19	0.011 (0, 90)	0.011 (0, 0)	0.011 (90, 0)	4986.708	2.30
106	20	0.011 (0, 90)	0.011 (0, 0)	0.011 (90, 0)	6925.165	1.62
106	21	0.014 (0, 90)	0.014 (0, 0)	0.014 (90, 0)	9573.540	1.45
106	H 271	0.008 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	5909.941	1.38
106	J 9	0.032 (0, 0)	0.032 (90, 0)	0.008 (0, 90)	20878.618	1.53
106	K 268	0.008 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	9465.862	0.86
107	24	0.018 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	16212.447	1.11
107	25	0.020 (0, 90)	0.020 (90, 0)	0.020 (0, 0)	10377.937	1.97
107	26	0.017 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	7313.839	2.35
107	B 120	0.028 (0, 90)	0.028 (0, 0)	0.028 (90, 0)	25795.607	1.10
107	Q 28	0.017 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	18066.425	0.94
108	109	0.005 (0, 90)	0.004 (0, 0)	0.004 (90, 0)	3786.140	1.22
108	27	0.006 (0, 90)	0.006 (0, 0)	0.006 (90, 0)	3832.802	1.60
108	28	0.005 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2220.468	2.30
108	29	0.006 (0, 90)	0.006 (0, 0)	0.005 (90, 0)	2589.221	2.27
108	30	0.003 (0, 90)	0.002 (90, 0)	0.001 (0, 0)	24.318	133.13
108	A 353	0.017 (0, 0)	0.017 (90, 0)	0.010 (0, 90)	13713.803	1.24
108	INLN	0.013 (0, 0)	0.013 (90, 0)	0.010 (0, 90)	16795.665	0.76
108	J 354	0.017 (90, 0)	0.017 (0, 0)	0.010 (0, 90)	8816.797	1.88
108	S 280	0.013 (0, 0)	0.013 (90, 0)	0.010 (0, 90)	20531.330	0.62
109	27	0.005 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2068.734	2.55
109	28	0.005 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2418.738	2.18
109	29	0.006 (0, 90)	0.006 (0, 0)	0.006 (90, 0)	3799.349	1.70
109	30	0.005 (0, 90)	0.004 (90, 0)	0.004 (0, 0)	3805.667	1.38
109	A 353	0.017 (0, 0)	0.017 (90, 0)	0.010 (0, 90)	9999.598	1.69

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
109	INLN	0.013 (0, 0)	0.013 (90, 0)	0.010 (0, 90)	13944.628	0.92
109	J 354	0.017 (0, 0)	0.017 (90, 0)	0.010 (0, 90)	11609.170	1.44
109	S 280	0.013 (0, 0)	0.013 (90, 0)	0.010 (0, 90)	18690.809	0.68
110	31	0.010 (0, 90)	0.009 (90, 0)	0.009 (0, 0)	8162.529	1.18
110	32	0.010 (0, 90)	0.010 (0, 0)	0.010 (90, 0)	9057.882	1.12
110	33	0.009 (0, 90)	0.009 (0, 0)	0.009 (90, 0)	7881.365	1.20
110	34	0.010 (0, 90)	0.009 (0, 0)	0.009 (90, 0)	7151.489	1.38
110	A 353	0.025 (0, 0)	0.025 (90, 0)	0.009 (0, 90)	42929.552	0.58
110	E 13	0.009 (0, 0)	0.009 (90, 0)	0.009 (0, 90)	7883.412	1.10
110	INCL	0.019 (0, 0)	0.019 (90, 0)	0.009 (0, 90)	20751.885	0.89
110	K 81 RESET	0.019 (0, 0)	0.019 (90, 0)	0.009 (0, 90)	10355.158	1.82
110	N 13	0.019 (0, 0)	0.019 (90, 0)	0.009 (0, 90)	20400.124	0.91
111	112	0.017 (90, 81)	0.014 (0, 0)	0.014 (270, 9)	5606.736	2.96
111	INLN	0.031 (0, 0)	0.031 (90, 2)	0.026 (270, 88)	46920.818	0.67
112	35	0.007 (0, 90)	0.007 (0, 0)	0.007 (90, 0)	2637.192	2.71
112	36	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	8480.543	2.49
112	37	0.025 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	9934.591	2.49
112	38	0.036 (147, 65)	0.035 (0, 21)	0.035 (265, 12)	14596.834	2.43
112	39	0.024 (131, 69)	0.023 (4, 13)	0.023 (270, 16)	9539.556	2.56
112	B 70	0.028 (0, 0)	0.028 (90, 0)	0.021 (0, 90)	14764.142	1.92
112	INLN	0.028 (0, 0)	0.028 (90, 0)	0.021 (0, 90)	52247.944	0.54
112	M 360	0.037 (0, 0)	0.037 (90, 0)	0.021 (0, 90)	15330.584	2.44
112	Z 293	0.039 (90, 0)	0.039 (0, 0)	0.021 (0, 90)	16283.662	2.37
12	Q 60 X	0.009 (0, 90)	0.009 (0, 0)	0.009 (90, 0)	9074.514	1.00
13	Q 60 X	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	9460.562	1.23
14	Q 60 X	0.007 (0, 90)	0.007 (0, 0)	0.007 (90, 0)	2900.852	2.46

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
14403	INEL	0.021 (0, 0)	0.021 (90, 0)	0.000 (0, 90)	16428.148	1.30
15	Q 60 X	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	6414.050	2.08
16	Q 60 X	0.011 (0, 90)	0.011 (0, 0)	0.011 (90, 0)	4717.765	2.31
17	K 268	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	11391.405	1.85
18	K 268	0.009 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	10167.244	0.86
19	K 268	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	10344.563	1.27
20	K 268	0.010 (0, 90)	0.010 (0, 0)	0.010 (90, 0)	4617.857	2.19
21	K 268	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	5828.654	2.19
22	G 129	0.030 (0, 90)	0.030 (0, 0)	0.030 (90, 0)	15299.261	1.97
22	Q 28	0.030 (0, 90)	0.030 (0, 0)	0.030 (90, 0)	14958.033	1.99
23	G 129	0.030 (0, 90)	0.030 (0, 0)	0.030 (90, 0)	19745.518	1.51
23	Q 28	0.020 (0, 90)	0.020 (0, 0)	0.020 (90, 0)	8539.549	2.36
24	Q 28	0.007 (0, 90)	0.006 (90, 0)	0.006 (0, 0)	2558.636	2.88
25	Q 28	0.021 (0, 90)	0.020 (90, 0)	0.020 (0, 0)	10594.025	1.94
26	Q 28	0.022 (0, 90)	0.022 (0, 0)	0.022 (90, 0)	17113.124	1.31
27	INLN	0.013 (0, 0)	0.013 (90, 0)	0.011 (0, 90)	12983.297	1.02
28	INLN	0.013 (0, 0)	0.013 (90, 0)	0.011 (0, 90)	16314.968	0.81
29	INLN	0.013 (0, 0)	0.013 (90, 0)	0.011 (0, 90)	14709.759	0.92
30	INLN	0.013 (90, 0)	0.013 (0, 0)	0.010 (0, 90)	16802.632	0.76
31	E 13	0.005 (0, 90)	0.004 (90, 0)	0.004 (0, 0)	1388.741	3.83
31	INCL	0.019 (90, 0)	0.019 (0, 0)	0.005 (0, 90)	27823.401	0.67
32	E 13	0.006 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	1959.950	3.20
32	INCL	0.019 (0, 0)	0.019 (90, 0)	0.006 (0, 90)	28572.671	0.66
33	E 13	0.005 (180, 67)	0.002 (90, 0)	0.002 (0, 23)	115.985	46.40
33	INCL	0.019 (0, 0)	0.019 (90, 0)	0.005 (0, 90)	28109.344	0.66
34	E 13	0.007 (133, 69)	0.003 (4, 13)	0.003 (270, 15)	748.876	8.91

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
34	INCL	0.019 (0, 0)	0.019 (90, 0)	0.006 (0, 90)	27331.830	0.68
35	INLN	0.029 (0, 0)	0.029 (90, 0)	0.022 (0, 90)	52473.760	0.55
36	INLN	0.035 (0, 0)	0.035 (90, 0)	0.029 (0, 90)	60671.860	0.57
37	INLN	0.037 (0, 0)	0.037 (90, 0)	0.032 (0, 90)	57060.611	0.64
38	INLN	0.044 (180, 2)	0.044 (90, 0)	0.040 (0, 88)	49530.936	0.88
39	INLN	0.036 (0, 0)	0.036 (90, 2)	0.031 (270, 88)	47403.927	0.76
A 353	E 13	0.025 (0, 0)	0.025 (90, 0)	0.000 (0, 90)	35796.001	0.70
A 353	INCL	0.018 (0, 0)	0.018 (90, 0)	0.000 (0, 90)	58810.532	0.31
A 353	INLN	0.018 (0, 0)	0.018 (90, 0)	0.000 (0, 90)	12306.944	1.48
B 120	Q 28	0.027 (0, 90)	0.026 (0, 0)	0.026 (90, 0)	40368.996	0.66
E 10	Q 60 X	0.039 (0, 0)	0.039 (90, 0)	0.000 (0, 90)	21277.808	1.84
E 13	INCL	0.018 (0, 0)	0.018 (90, 0)	0.000 (0, 90)	28075.042	0.66
E 13	K 81 RESET	0.019 (0, 0)	0.019 (90, 0)	0.000 (0, 90)	17519.769	1.11
E 13	N 13	0.018 (0, 0)	0.018 (90, 0)	0.000 (0, 90)	24964.016	0.74
G 129	Q 28	0.027 (0, 90)	0.026 (0, 0)	0.026 (90, 0)	27668.865	0.96
H 271	Q 60 X	0.035 (0, 0)	0.035 (90, 0)	0.000 (0, 90)	25041.717	1.38
INBD	Q 60 X	0.035 (0, 0)	0.035 (90, 0)	0.000 (0, 90)	56933.826	0.61
INCL	K 81 RESET	0.020 (0, 0)	0.020 (90, 0)	0.000 (0, 90)	10555.296	1.89
INLN	J 354	0.020 (0, 0)	0.020 (90, 0)	0.000 (0, 90)	19382.638	1.02
INLN	M 360	0.046 (0, 0)	0.046 (90, 0)	0.000 (0, 90)	66865.353	0.69
INLN	Z 293	0.046 (90, 0)	0.046 (0, 0)	0.000 (0, 90)	47112.454	0.98
INRN	M 107	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	8966.905	1.37
INRN	NEW L 5	0.022 (0, 0)	0.022 (90, 0)	0.000 (0, 90)	15946.785	1.38
INRN	P 157	0.016 (0, 0)	0.016 (90, 0)	0.000 (0, 90)	10303.289	1.51
INWL	M 107	0.012 (0, 90)	0.012 (0, 0)	0.012 (90, 0)	49341.579	0.25
INWL	NEW L 5	0.022 (0, 0)	0.022 (90, 0)	0.000 (0, 90)	56737.488	0.39

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
INWL	P 157	0.016 (0, 0)	0.016 (90, 0)	0.000 (0, 90)	67311.864	0.23
J 9	K 268	0.032 (0, 0)	0.031 (90, 0)	0.000 (0, 90)	15659.663	2.02

21:51:08, Mon May 17, 2010

Project Number: 1100118
Project Name: USGS-Indiana Flood LiDAR (ARRA)

Horizontal Datum: NAD83/07
Horizontal Coordinates: UTM16, meters
Vertical Datum: NAVD88

Station	Easting	Northing	Elevation
1	588446.604	4612760.852	227.412
2	588343.942	4614075.632	225.955
3	586097.248	4615896.806	223.842
4	596311.607	4604765.043	237.975
5	597589.560	4600624.937	244.597
6	600627.338	4597512.822	250.299
7	487271.957	4532643.502	203.241
8	488391.137	4531553.591	201.041
9	486853.827	4531184.041	202.237
10	486643.236	4530203.625	201.542
11	484459.718	4528978.272	198.203
12	595968.323	4318148.246	177.158
13	589851.943	4314321.172	172.023
14	598469.350	4312106.913	179.245
15	591507.867	4308330.220	183.658
16	594770.044	4305702.159	172.068
17	592812.323	4351020.448	201.445
18	590324.491	4339526.470	191.050
19	592999.822	4334767.445	187.213
20	597925.632	4338210.101	203.210
21	596794.963	4347070.023	199.328
22	521378.990	4525747.215	203.365
23	519897.365	4519399.693	205.588
24	520591.400	4508388.097	190.875
25	520689.270	4500300.200	178.739
26	519242.368	4493772.658	170.703
27	494945.282	4310042.895	146.818
28	498312.688	4308610.119	166.084
29	494555.345	4307640.322	145.403
30	496993.879	4306794.769	174.017
31	519689.687	4348639.145	168.431
32	519246.377	4347849.277	184.505
33	521189.659	4348534.123	170.458
34	521057.794	4349300.234	183.141
35	469043.973	4369467.918	155.679
36	468166.636	4377823.366	150.878
37	461762.954	4371370.621	144.249
38	459736.973	4361594.053	147.057
39	465732.983	4362566.410	152.480
101	589065.219	4610731.185	232.294
102	592795.696	4613264.329	240.753
103	486426.650	4532174.510	200.427
104	489280.158	4531382.774	201.876
105	595732.987	4315911.896	176.675
106	591101.725	4339377.062	189.904
107	511985.318	4494656.504	205.882
108	497008.037	4306814.528	173.863
109	496937.139	4310598.359	153.756
110	522482.427	4356305.173	227.480
111	471573.628	4364472.305	168.061
112	471608.846	4370076.620	158.625

14403	591688.053	4625632.411	248.553
A_168	573767.399	4610553.396	226.705
A_353	499023.802	4320373.532	154.784
B_120	521076.353	4470527.609	207.733
B_70	486205.522	4372252.130	205.387
E_10	578292.416	4300910.353	163.669
E_13	521075.106	4348551.965	171.263
G_129	511093.942	4537064.774	204.987
H_271	593288.792	4333888.728	186.402
INBD	541443.975	4301691.515	195.355
INCL	517054.807	4376325.380	282.807
INEL	586104.781	4610188.011	252.871
INLN	486725.381	4320085.711	161.938
INRN	488250.995	4532814.425	210.992
INWL	506257.526	4478585.147	221.750
J_160	598009.384	4598239.306	246.949
J_354	490340.463	4301051.419	146.020
J_9	600679.205	4357922.030	210.930
K_268	600109.175	4342277.489	194.349
K_81_RESET	518555.238	4365881.965	239.560
M_107	486909.559	4523952.286	204.975
M_360	462440.810	4382355.947	179.778
N_13	542035.491	4362092.810	180.749
NEW_L_5	474168.140	4525347.270	197.731
P_157	483223.893	4541803.072	209.273
Q_28	519950.185	4510863.913	207.864
Q_60_X	597850.097	4309273.832	177.384
S_280	513841.627	4318553.686	204.997
Z_293	459887.129	4358783.051	144.557

LIDAR FLIGHT L( )

ALTM

1

MISSION: MC40410A DATE: 4/4/10

PILOT: Nick OPERATOR: Jess AIRCRAFT: 43Q

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118							0915	1100	0181	ferry SBM → Columbus IN 1.7
Indiana Flood	2 test strips flown						1134	1139		static
6100309	102 N	160	32.4	22	70	1700	1649	1653		
	108 S	150	31.4				1655	1700		
	103 N	160	32.4				1704	1707		
	109 S	150	31.4				1710	1715		
	104 N	160	32.4				1718	1721		
	110 S	150	31.4				1724	1730		
	105 N	160	32.4				1733	1736		
	111 S	150	31.4				1739	1745		
	106 N	160	32.4				1747	1752		
	112 S	150	31.4				1755	1800		
	107 N	160	32.4				1803	1807		
	113 S	150	31.4				1810	1815		
	114 N	160	32.4				1819	1824		
	119 S	160	32.4				1827	1833		
	115 N	↓	↓	↓	↓	↓	1836	1842		
	120 S						1845	1851		
	116 N						1854	1900		
	121 S						1903	1910		

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
⊘	154	25	129	3.7	3.5				
○						WX			
○									

AERO-METRIC, INC. N.6216 Resource Drive Sheboygan Falls, WI. 53085 PHONE: 920-467-2655 FAX: 920-467-1220 E-Mail: amephoto@aerometric.com

LIDAR FLIGHT L(

MISSION: M040410 | DATE: 4/4/10 | 2

PILOT: Nick | OPERATOR: Jess | AIRCRAFT: 43Q

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118	117 N	160	32.4	22	70	1700	1913	1919		
	122 S	↓	↓	↓	↓	↓	1921	1927		
	118 N						1930	1936		
	123 S						1940	1946		37
	124 N						1950	1956		
	125 S						2000	2005		
	x-flt W						2007	2011		South end
	x-flt E						2014	2017		North end
	126 N	↓	↓	↓	↓	↓	2019	2021		
							2030	2035		static
							2110	2255		ferry 1.8

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
○									
○						WX			
○									

AERO-METRIC, INC. N.6216 Resource Drive Sheboygan Falls, WI. 53085 PHONE: 920-467-2655 FAX: 920-457-1451 E-Mail: amephoto@aerometric.com

Flight Log

Project Number: 0
S/N : 0
Operator : ???
Pilot(s) : ???
Aircraft : ???
Airport : ???
Mission : ???
Wheels Up : ???
Flight Length :
HOBBS Start :
HOBBS End :

Weather

Date : April 04, 2010
Julian Day : 094
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 02:13:51

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
16:45:18.645	16:46:51.144	102	1178	70	32.50	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:47:29.643	16:48:47.641	102	1730	70	32.50	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:49:53.64	16:53:38.636	102	1887	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:55:56.134	17:00:51.628	108	1879	70	31.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:03:58.125	17:07:20.121	103	1882	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:10:20.617	17:15:21.111	109	1887	70	31.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:18:21.108	17:21:50.104	104	1860	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:24:54.1	17:30:05.594	110	1882	70	31.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:33:09.09	17:36:55.586	105	1877	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:39:57.082	17:45:00.076	111	1867	70	31.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:47:57.073	17:52:02.568	106	1851	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:55:03.064	18:00:29.558	112	1886	70	31.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:03:11.054	18:07:14.549	107	1870	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:10:03.046	18:15:37.039	113	1861	70	31.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:19:14.535	18:24:38.528	114	1845	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:27:46.525	18:33:48.517	119	1897	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:36:50.514	18:42:32.007	115	1847	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:45:36.503	18:51:37.496	120	1887	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:54:46.492	19:00:28.985	116	1862	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:03:52.981	19:10:06.473	121	1874	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln

19:13:12.469	19:18:56.962	117	1854	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:21:44.459	19:27:49.451	122	1870	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:30:47.948	19:36:32.441	118	1863	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:40:08.936	19:46:10.429	123	1875	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:50:06.924	19:56:01.917	124	1865	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln
20:00:03.412	20:05:15.905	125	1894	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
20:07:40.902	20:11:19.398	125	1914	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
20:13:58.395	20:17:32.89	102	1869	70	32.40	22.00	NAR	OFF	OFF	179.00	USGS_Indiana_Floodplain_revised_fixline.pln
20:19:47.387	20:21:28.885	126	1858	70	32.40	22.00	NAR	OFF	OFF	359.00	USGS_Indiana_Floodplain_revised_fixline.pln

LIDAR FLIGHT LOG

MISSION: M040510A | DATE: 4-5-10 MON. | JS1

PILOT: ROBBIE | OPERATOR: JIM | AIRCRAFT: N3443Q

ALTM

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	GMT TIME START	GMT TIME STOP	Tranzpak Drive	REMARKS
1100118							16:30	17:36	184	
INDIANA								17:58		FERRY: SBM → EKM 1.1
LOOD PLAINS	2 TEST									FERRY: EKM → SITE .4
	4 314	155	31.9	22	70	1700	17:58	18:00		
	1 134	160	32.4				18:04	18:06		
	6 314	155	31.9				18:09	18:11		
	2 134	160	32.4				18:14	18:16		
	5 314	155	31.9				18:20	18:22		
	3 134	160	32.4				18:25	18:27		
	7 314	155	31.9				18:31	18:33		
	CROSS SW	145	30.8				18:37	18:39		
	15 117	160	32.4				18:42	18:44		
	8 297	155	31.9				18:47	18:49		
	16 117	160	32.4				18:51	18:53		
	9 297	155	31.9				18:55	18:58		
	17 117	160	32.4				19:00	19:02		
	10 297	155	31.9				19:05	19:07		
	18 117	160	32.4				19:10	19:12		
	11 297	155	31.9				19:15	19:18		
	19 117	160	32.4	↓	↓	↓	19:20	19:22		→ JS2

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
1100118	154	25/22	107	2.1	1.7				
	30%				3.8	WX			

AERO-METRIC, INC. N.6216 Resource Drive Sha...

T-370 P.01/02 F-778

3177059875

FROM-HAMPTON INN CARMEL

04-05-10 21:48

LIDAR FLIGHT LOG

MISSION: M0405 10A | DATE: 4-5-10 MON. | JS2

PILOT: ROBBIE | OPERATOR: JIM | AIRCRAFT: N3443Q | ALTM

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SOAN FREQ	SOAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118	12	297	155	31.9	22	70	1700	19:24	19:27		
INDIANA	~~20~~	117	160	32.4				19:29	19:29		NO GOOD - DO NOT EXTRACT
FLOOD PLAINS	20	117	160	32.4				19:34	19:36		
	13	297	155	31.9				19:39	19:41		
	21	117	160	32.4				19:44	19:46		
	14	297	155	31.9				19:53	19:54		
	22	117	160	32.4				19:58	19:59		
	CROSS	NE	↓	↓	↓	↓	↓	20:03	20:05		
									20:19		FERRY: SITE → EKM
								20:48	21:30		→ ~~J53 NEW MISSION~~ FERRY: EKM → ~~EKQ~~ .2 .7

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY

STATIC	START:	STOP:
WX		

NOTES:

FROM-HAMPTON INN CARMEL 04-05-10 21:48 T-370 P.02/02 F-778 3177059875

Flight Log

Project Number: 1100118
S/N : Indiana Flood Plains
Operator : Jim
Pilot(s) : Robbie
Aircraft : N3443q
Airport : KEKM
Mission : M040510A
Wheels Up : ???
Flight Length :
HOBBS Start :
HOBBS End :

Weather

Date : April 05, 2010
Julian Day : 095
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 00:45:37

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
17:54:44.534	17:55:06.533	4	1952	70	32.50	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:55:16.033	17:55:44.032	4	1934	70	32.50	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:58:32.529	18:00:35.027	4	1913	70	31.90	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:04:06.523	18:06:05.02	1	1920	70	32.40	22.00	NAR	OFF	OFF	134.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:09:45.516	18:11:39.514	6	1927	70	31.90	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:14:48.01	18:16:36.008	2	1925	70	32.40	22.00	NAR	OFF	OFF	134.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:20:38.504	18:22:40.502	5	1912	70	31.90	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:25:44.498	18:27:46.496	3	1906	70	32.40	22.00	NAR	OFF	OFF	134.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:31:58.491	18:33:38.989	7	1921	70	31.90	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:37:13.985	18:39:01.983	7	1962	70	30.80	22.00	NAR	OFF	OFF	314.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:42:24.48	18:44:21.978	15	1940	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:47:01.975	18:49:04.972	8	1937	70	31.90	22.00	NAR	OFF	OFF	297.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:51:47.969	18:53:22.468	16	1924	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:55:58.465	18:58:14.462	9	1937	70	31.90	22.00	NAR	OFF	OFF	297.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:00:44.959	19:02:22.958	17	1944	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:05:05.455	19:07:31.952	10	1927	70	31.90	22.00	NAR	OFF	OFF	297.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:10:29.449	19:12:20.447	18	1935	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
		11									
19:20:18.938	19:22:10.436	19	1943	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:24:44.933	19:27:12.93	12	1939	70	31.90	22.00	NAR	OFF	OFF	297.00	USGS_Indiana_Floodplain_revised_fixline.pln

19:29:35.927	19:29:56.927	20	1942	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:34:15.922	19:36:05.42	20	1920	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:39:32.416	19:41:51.913	13	1934	70	31.90	22.00	NAR	OFF	OFF	297.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:44:23.411	19:46:17.408	21	1952	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:53:44.9	19:55:59.397	14	1914	70	31.90	22.00	NAR	OFF	OFF	297.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:58:06.895	19:59:32.893	22	1917	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln
20:03:15.389	20:05:50.886	22	1912	70	32.40	22.00	NAR	OFF	OFF	117.00	USGS_Indiana_Floodplain_revised_fixline.pln

LIDAR FLIGHT LOG

MISSION: M0406010A **DATE:** 4-6-10 TUE

PILOT: NICK **OPERATOR:** JIM **AIRCRAFT:** N3443Q

ALTM JS1

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	GMT TIME START	GMT TIME STOP	Tranzpak Drive	REMARKS
1100118								12:16	12:43	184	FERRY: TYQ → SITE .4
INDIANA	2 TEST							12:42	12:43		
FLOOD PLAINS	140	210	135	29.7	22	70	1700	12:50	12:54		
	146	30	160	32.4				12:59	13:02		
	141	210	135	29.7				13:15	13:19		POOP JUMPED TO 4.13 NE, END. ON BORDER
	147	30	160	32.4				13:24	13:27		
	142	210	130	29.2				13:32	13:36		
	148	30	160	32.4				13:40	13:44		
	143	210	130	29.2				13:48	13:52		
	149	30	160	32.4				13:56	13:59		
	144	210	130	29.2				14:03	14:08		
10	150	30	160	32.4				14:12	14:15		
	145	210	135	29.7				14:18	14:23		
	152	30	160	32.4				14:26	14:29		
	151	210	135	29.7				14:34	14:38		
	153	30	160	32.4				14:42	14:43		
15	154	210	135	29.7				14:47	14:48		
	139	30	160	32.4				14:53	14:56		
	132	210	135	29.7				14:59	15:03		
18	X138	30	160	32.4				15:05	15:06		→ JS2 EYE SAFE SHUT OFF = NO EXTRACT

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
1100118	154	47/28	79	3.8	.7	4.5	12:16	16:45	
	48%					WK			
					4.5				

AERO-METRIC, INC. N 6216 Resource Drive

F-782 P.01/03 T-371 3177059875 FROM-HAMPTON INN CARMEL 04-06-10 17:15

LIDAR FLIGHT LOG

MISSION: Mo4061oA | DATE: 4-6-10 TUE | OPERATOR: JM | AIRCRAFT: N3443Q | ALTM | JS2

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118 18	138	30	160	32.4	22	70	1700	15:11	15:14	184	
INDIANA	131	210	135	29.7				15:17	15:21		
Load Plans 20	137	30	160	32.4				15:24	15:28		
	130	210	135	29.7				15:30	15:34		
	136	30	160	32.4				15:37	15:41		
	129	210	135	29.7				15:44	15:47		
	135	30	160	32.4				15:51	15:55		
21	128	210	135	29.7				15:58	16:01		
	134	~~210~~ 30	160	32.4				16:04	16:08		
	127	210	135	29.7				16:10	16:13		
	133	30	160	32.4				16:17	16:21		
	CROSS	SE	↓	↓	↓	↓	↓	16:25	16:29		
									16:45		FERRY: SITE → BAK
											→ JS3 NEW MISSION

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:
						WX		

NOTES:

AERO-METRIC INC.

LIDAR FLIGHT LOG

MISSION: M040610B | DATE: 4-6-10 TUE | JSJ

PILOT: Nick | OPERATOR: Jim | AIRCRAFT: N3443Q | ALTM

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118											
INDIANA	2 TEST							17:15	17:47	184	FERRY: RAK → SITE .4
FLOOD PLAINS	83	223	135	29.7	22	70	1700		17:47		
	79	43	160	32.4				17:48	17:51		
	84	223	125	28.6				17:54	17:56		
	80	43	160	32.4				17:59	18:02		
	85	223	125	28.6				18:05	18:07		
	81	43	160	32.4				18:10	18:12		
	86	223	125	28.6				18:15	18:17		
	82	43	160	32.4				18:20	18:21		
	CROSS	NW	↓	↓				18:25	18:27		
	87	238	125	28.6				18:30	18:32		
10	88	58	160	32.4				18:44	18:46		
	89	238	120	28.0				18:50	18:52		
	90	58	160	32.4				18:57	18:59		
	91	238	120	28.0				19:02	19:04		
	92	58	160	32.4				19:10	19:13		
15	CROSS	NW	↓	↓	↓	↓	↓	19:17	19:19		
								19:23	19:24		
									19:57		FERRY: SITE → ~~RAK~~ TYQ .6

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
1100118	154	75/14	65	1.6	1.0	2.7	17:15	19:57	
	57%				2.6	WX			

AERO-METRIC INC

Flight Log

Project Number: 1100118
S/N : Indiana Flood Plains
Operator : Jim
Pilot(s) : Nick
Aircraft : N3443Q
Airport : KTYQ
Mission : M040610A
Wheels Up : ???
Flight Length : 4.5
HOBBS Start : 12:16
HOBBS End : 16:45

Weather

Date : April 06, 2010
Julian Day : 096
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 01:41:06

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
12:42:50.523	12:43:18.523	140	1907	70	32.40	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
12:43:23.522	12:43:48.022	140	1895	70	32.40	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
12:50:22.015	12:54:37.01	140	1901	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
12:58:59.005	13:02:54.5	146	1858	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:15:47.985	13:19:54.98	141	1887	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:24:00.975	13:27:55.47	147	1878	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:24:00.975	13:27:56.97	147	1879	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:32:07.965	13:36:25.96	142	1857	70	29.20	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:40:35.455	13:44:10.451	148	1884	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:47:58.946	13:52:25.941	143	1891	70	29.20	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:56:27.436	13:59:51.931	149	1835	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:03:34.427	14:08:18.921	144	1883	70	29.20	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:11:58.916	14:15:07.913	150	1897	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:11:58.916	14:15:09.412	150	1896	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:11:58.916	14:15:10.912	150	1894	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:18:44.408	14:23:34.902	145	1870	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:26:43.398	14:29:28.895	152	1871	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:34:31.888	14:38:20.384	151	1872	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:42:39.378	14:43:38.377	153	1877	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:47:49.872	14:48:39.371	154	1866	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln

14:53:17.865	14:56:23.361	139	1866	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:59:16.857	15:03:18.352	132	1857	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:11:11.342	15:14:25.338	138	1856	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:17:16.335	15:21:07.33	131	1823	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:24:30.326	15:28:02.321	137	1837	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:30:56.818	15:34:35.313	130	1855	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:37:41.809	15:41:26.804	136	1861	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:44:22.301	15:47:45.797	129	1855	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:51:04.292	15:55:11.287	135	1865	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:58:06.784	16:01:20.779	128	1851	70	29.70	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:04:53.775	16:08:10.771	134	1876	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:10:51.767	16:13:14.264	127	1825	70	30.30	22.00	NAR	OFF	OFF	210.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:17:50.759	16:21:09.255	133	1884	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln
16:25:32.249	16:29:21.244	154	1850	70	32.40	22.00	NAR	OFF	OFF	30.00	USGS_Indiana_Floodplain_revised_fixline.pln

Flight Log

Project Number: 1100118
S/N : Indiana Flood Plains
Operator : Jim
Pilot(s) : Nick
Aircraft : N3443Q
Airport : KBAK
Mission : M040610B
Wheels Up : ???
Flight Length : 2.7
HOBBS Start : 17:15
HOBBS End : 19:57

Weather

Date : April 06, 2010
Julian Day : 096
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 00:30:56

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
17:42:59.603	17:43:25.102	83	2039	70	29.70	22.00	NAR	OFF	OFF	223.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:47:02.597	17:47:29.597	83	1882	70	29.70	22.00	NAR	OFF	OFF	223.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:48:31.596	17:51:02.592	83	1916	70	29.70	22.00	NAR	OFF	OFF	223.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:54:34.588	17:56:14.086	79	1890	70	32.40	22.00	NAR	OFF	OFF	43.00	USGS_Indiana_Floodplain_revised_fixline.pln
17:59:57.081	18:01:58.079	84	1900	70	28.60	22.00	NAR	OFF	OFF	223.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:05:31.574	18:07:25.072	80	1871	70	32.40	22.00	NAR	OFF	OFF	43.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:10:51.567	18:12:14.566	85	1896	70	28.60	22.00	NAR	OFF	OFF	223.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:15:45.561	18:17:44.059	81	1867	70	32.40	22.00	NAR	OFF	OFF	43.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:20:08.056	18:21:16.555	86	1934	70	28.60	22.00	NAR	OFF	OFF	223.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:25:06.05	18:27:02.048	82	1866	70	32.40	22.00	NAR	OFF	OFF	43.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:30:33.043	18:32:08.541	79	1884	70	32.40	22.00	NAR	OFF	OFF	43.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:44:31.026	18:46:36.024	87	1848	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:50:39.519	18:52:14.517	88	1884	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
18:57:06.011	18:59:26.008	89	1862	70	28.00	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:02:39.004	19:04:23.002	90	1843	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:10:00.996	19:13:33.491	91	1891	70	28.00	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:17:01.487	19:19:32.484	92	1850	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
19:23:25.979	19:24:29.478	92	1819	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln

Flight Log

Project Number: 0
S/N : 0
Operator : ???
Pilot(s) : ???
Aircraft : ???
Airport : ???
Mission : ???
Wheels Up : ???
Flight Length :
HOBBS Start :
HOBBS End :

Weather

Date : April 06, 2010
Julian Day : 096
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 01:20:22

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
21:27:33.081	21:29:57.578	93	2089	70	32.50	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
21:33:58.073	21:35:49.07	93	1852	70	32.50	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
21:41:48.063	21:45:19.059	93	1804	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
21:48:17.055	21:50:49.552	94	1781	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
21:55:57.046	21:59:16.042	95	1828	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
21:55:57.046	21:59:16.542	95	1828	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:02:00.538	22:04:17.036	96	1773	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:08:18.031	22:11:12.527	97	1807	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:13:49.524	22:15:10.523	98	1784	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:19:16.018	22:21:03.516	99	1831	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:23:04.013	22:24:05.512	101	1816	70	32.40	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:28:34.007	22:30:18.005	100	1831	70	28.60	22.00	NAR	OFF	OFF	238.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:33:52	22:36:08.998	101	1853	70	28.60	22.00	NAR	OFF	OFF	58.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:50:09.981	22:51:13.979	55	1808	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:55:41.974	22:57:13.972	56	1816	70	28.60	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
22:59:42.469	23:01:48.967	58	1783	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:06:20.961	23:09:06.958	57	1809	70	28.60	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:11:14.456	23:16:38.449	64	1815	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:22:45.942	23:25:35.939	59	1810	70	28.60	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:28:19.435	23:33:21.929	65	1764	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln

23:36:08.926	23:42:56.918	60	1753	70	28.60	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:45:25.915	23:50:25.409	66	1823	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:53:21.406	00:00:21.897	61	1777	70	28.60	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:02:44.894	00:07:38.889	67	1805	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:02:44.894	00:07:41.389	67	1807	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:13:26.882	00:16:05.879	67	1781	70	28.60	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:20:29.373	00:27:29.865	62	1812	70	28.60	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:31:43.86	00:34:09.357	55	1786	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:39:12.351	00:44:17.845	63	1782	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln

LIDAR FLIGHT LOG

JS1

SSION: M041410A | DATE: 4-14-10 WED | OPERATOR: JIM | AIRCRAFT: N3443Q

.OT: NICK

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	GMT TIME START	GMT TIME STOP	Tranzpak Drive	REMARKS
							13:11	13:39	0181	FERRY: TYQ → SITE .4
1100118								13:39		
INDIANA FLOOD	2 TEST									
	68 197	160	32.4	22	70	1700	13:45	13:50		
	73 17						13:54	13:59		
	69 197						14:02	14:07		
	74 17						14:11	14:16		
	70 197						14:19	14:24		
	75 17						14:28	14:33		
	71 197						14:37	14:42		
	76 17						14:45	14:48		
	78 197						14:53	14:54		
	72 17						14:57	15:02		
	CROSS N.END						15:05	15:07		
	77 197						15:10	15:11		
	CROSS S.END	/	/	/	/	/	15:15	15:17		
								15:53		FERRY: SITE → TYQ .6
									→ JS2	

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
⊘ 1100118	154	111/11	4:32	1.6	1.0	2.7	13:11	15:53	
○						WX HI BROKEN CLDS HAZE			
○									

AERO-METRIC, INC. N.6216 Resource Drive Sheboygan Falls, WI. 53085 PHONE: 920-467-2655 **FAX: 920-457-1451** E-Mail: amephoto@aerometric.com

LIDAR FLIGHT LOG

ALTM

JS2

MISSION: M041410B | DATE: 4-14-10 WED

PILOT: NICK | OPERATOR: JIM | AIRCRAFT: N3443Q

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118							17:16	17:36	0181	FERRY: TYQ → SITE .3
INDIANA FLOOD	2 TEST							17:36		
	36 7	160	32.4	22	70	1700	17:41	17:43		
	37 7						17:51	18:00		
	41 187						18:04	18:13		
	38 7						18:17	18:27		
	42 187						18:30	18:40		
	39 7						18:44	18:53		TURBULENT
	43 187						18:57	19:06		
	40 7						19:10	19:20		
	44 187						19:23	19:33		
	CROSS S. END						19:35	19:36		
	45 7						19:42	19:45		
	50 187						19:48	19:50		
	46 7						19:54	19:57		
	51 187						19:59	20:01		
	47 7						20:05	20:07		
	52 187						20:10	20:11		
	48 7						20:15	20:17		
	53 187						20:21	20:22		→ JS3

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
⊘ 1100118	154	122/19	13	3.0	.8	3.8	17:16	21:06	
○						WX HIGH THIN CIRRUS HAZE			
○					3.8				

AERO-METRIC, INC. N.6216 Resource Drive Sheboygan Falls, WI. 53085 PHONE: 920-467-2655 FAX: 920-457-1451 E-Mail: amephoto@aerometric.com

LIDAR FLIGHT LOG

JS3

MISSION: M0414108 **DATE:** 4-14-10 WED

PILOT: NICK **OPERATOR:** JIM **AIRCRAFT:** N3443Q

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118	49	7	160	32.4	22	70	1700	20:24	20:28	0181	
INDIANA FLOOD	54	187	↓	↓	↓	↓	↓	20:31	20:32		
	CROSS	N. END	↓	↓	↓	↓	↓	20:35	20:38		
									21:04		FERRY: SITE→TYQ .5
											→JS4

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:	NOTES:
○									
○						WX			
○									

AERO-METRIC, INC. N.6216 Resource Drive Sheboygan Falls, WI. 53085 PHONE: 920-467-2655 FAX: 920-457-1451 E-Mail: amephoto@aerometric.com

LIDAR FLIGHT LOG

ALTM

JS4

MISSION: M0414IOC | DATE: 4-4-10 WED

PILOT: ROBBIE | OPERATOR: JIM | AIRCRAFT: N3443Q

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SCAN FREQ	SCAN ANGLE	PRF	ALT (m)	TIME START	TIME STOP	Tranzpak Drive	REMARKS
1100118								22:32	23:03	0181	FERRY: TYQ → SITE .5
INDIANA FLOOD	2 TEST								23:03		
	23	62	160	32.4	22	70	1700	23:07	23:09		MILD TURBULENCE
	29	242	〃	〃	〃	〃	〃	23:12	23:14		
	24	62	〃	〃	〃	〃	〃	23:16	23:18		
	30	242	145	30.8	〃	〃	〃	23:21	23:23		
	25	62	160	32.4	〃	〃	〃	23:26	23:27		
	31	242	145	30.8	〃	〃	〃	23:30	23:32		
	26	62	160	32.4	〃	〃	〃	23:34	23:36		
	32	242	145	30.8	〃	〃	〃	23:39	23:41		
	27	62	160	32.4	〃	〃	〃	23:43	23:46		
	33	242	145	30.8	〃	〃	〃	23:48	23:50		
	28	62	160	32.4	〃	〃	〃	23:53	23:55		
	34	242	145	30.8	〃	〃	〃	23:57	23:59		
13	35	62	160	32.4	〃	〃	〃	00:03	00:04		
	CROSS	〃	〃	〃	〃	〃	〃	00:07	00:10		
									01:18		FERRY: SITE → SBM 1.1

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT SITE	AIRCRAFT FERRY	STATIC	START:	STOP:
⊗ 1100118	154	141/13	Ø	1.2	1.6	2.8	22:32	01:18
○					2.8	WX SCT 7.5K HAZE		
○								

NOTES:

AERO-METRIC, INC. N.6216 Resource Drive Sheboygan Falls, WI. 53085 PHONE: 920-467-2655 FAX: 920-457-1451 E-Mail: amephoto@aerometric.com

Flight Log

Project Number: 1100118
S/N : Indiana Flood Plains
Operator : Jim
Pilot(s) : Nick
Aircraft : N3443Q
Airport : KTYQ
Mission : M041410A
Wheels Up : ???
Flight Length : 2.7
HOBBS Start : 13:11
HOBBS End : 15:53

Weather

Date : April 14, 2010
Julian Day : 104
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 00:48:28

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
13:38:44.089	13:39:08.589	68	1877	70	32.50	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:39:21.588	13:39:46.588	68	1874	70	32.50	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:45:16.082	13:50:33.076	68	1895	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
13:54:10.572	13:58:59.067	73	1857	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:02:36.063	14:07:47.557	69	1861	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:11:15.553	14:16:08.547	74	1859	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:19:41.543	14:24:48.037	70	1854	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:28:21.532	14:33:00.027	75	1857	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:37:18.022	14:42:15.516	71	1852	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:45:40.012	14:48:39.008	76	1851	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:53:14.503	14:54:07.002	78	1866	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
14:57:30.498	15:02:29.992	72	1864	70	32.40	22.00	NAR	OFF	OFF	17.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:05:57.488	15:07:18.486	77	1861	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:10:37.982	15:11:31.481	77	1867	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln
15:15:10.477	15:17:34.474	67	1867	70	32.40	22.00	NAR	OFF	OFF	197.00	USGS_Indiana_Floodplain_revised_fixline.pln

Flight Log

Project Number: 1100118
S/N : Indiana Flood Plains
Operator : Jim
Pilot(s) : Nick
Aircraft : N3443Q
Airport : KTYQ
Mission : M041410B
Wheels Up : ???
Flight Length : 3.8
HOBBS Start : 17:16
HOBBS End : 21:06

Weather

Date : April 14, 2010
Julian Day : 104
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

Statistics

Laser Time : 01:39:52

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
17:35:41.092	17:36:03.092	36	1871	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
17:36:10.591	17:36:37.091	36	1892	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
17:41:53.584	17:43:37.582	36	1886	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
17:51:24.072	18:00:17.561	37	1878	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
18:04:08.057	18:13:45.045	41	1884	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
18:17:55.54	18:27:15.029	38	1881	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
18:30:53.025	18:40:13.014	42	1868	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
18:44:13.509	18:53:54.498	39	1881	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
18:57:34.493	19:06:44.483	43	1870	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:10:29.978	19:20:15.467	40	1887	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:23:55.962	19:32:58.952	44	1873	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:35:29.949	19:36:46.947	36	1875	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:42:23.44	19:45:39.437	45	1884	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:48:47.933	19:50:53.43	50	1872	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:54:10.926	19:56:58.423	46	1874	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
19:59:34.92	20:01:00.418	51	1850	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
20:04:59.914	20:07:33.411	47	1878	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
20:10:07.908	20:11:07.407	52	1858	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
20:15:12.902	20:17:41.399	48	1881	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
20:21:20.394	20:22:14.893	53	1862	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln

20:26:11.389	20:28:16.886	49	1887	70	32.40	22.00	NAR	OFF	OFF	7.01	USGS_Indiana_Floodplain_revised_fixline.pln
20:31:51.382	20:32:39.881	54	1855	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln
20:35:27.378	20:38:19.874	37	1869	70	32.40	22.00	NAR	OFF	OFF	187.01	USGS_Indiana_Floodplain_revised_fixline.pln

Flight Log

Project Number: 1100118
S/N : Indiana Flood Plains
Operator : Jim
Pilot(s) : Robbie
Aircraft : N3443Q
Airport : KTYQ
Mission : M041410C
Wheels Up : ???
Flight Length : 2.8
HOBBS Start : 22:32
HOBBS End : 01:18

Weather

Date : April 14, 2010
Julian Day : 104
Temperature : ???
Visibility : ???
Clouds : ???
Precipitation : ???
Wind Dir : ???
Wind Speed : ???
Pressure : ???

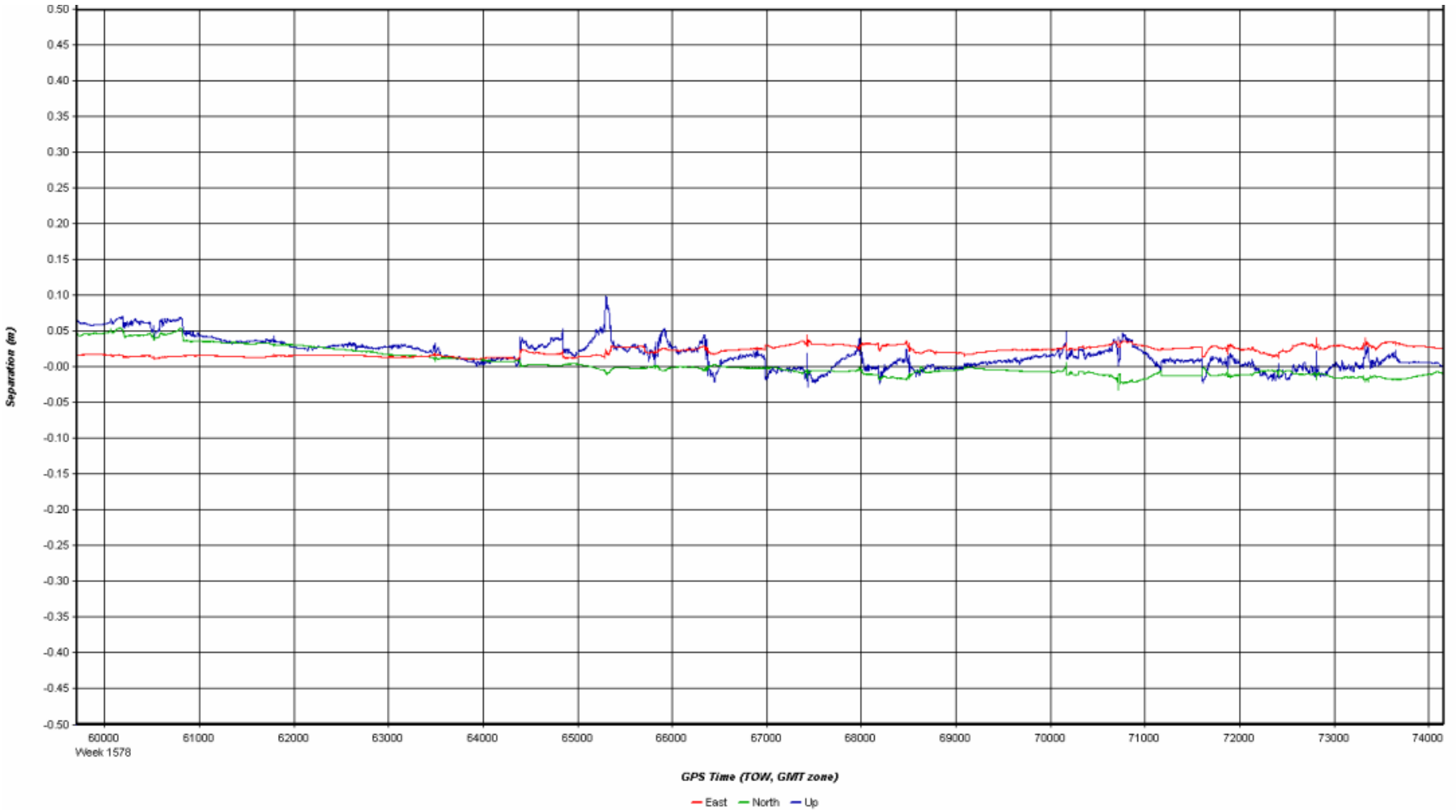
Statistics

Laser Time : 00:30:17

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
23:02:26.671	23:02:47.171	23	1943	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:03:07.17	23:03:31.67	23	1901	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:07:48.165	23:09:00.663	23	1925	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:12:09.659	23:14:48.156	29	1884	70	32.40	22.00	NAR	OFF	OFF	242.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:16:52.654	23:18:20.152	24	1892	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:21:24.148	23:23:52.645	30	1857	70	30.80	22.00	NAR	OFF	OFF	242.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:25:59.643	23:27:38.141	25	1908	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:30:04.138	23:32:42.635	31	1879	70	30.80	22.00	NAR	OFF	OFF	242.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:34:50.632	23:36:49.13	26	1875	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:39:15.627	23:41:52.624	32	1898	70	32.40	22.00	NAR	OFF	OFF	242.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:43:49.122	23:45:58.619	27	1894	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:48:13.616	23:50:47.114	33	1895	70	30.80	22.00	NAR	OFF	OFF	242.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:53:09.111	23:55:28.608	28	1886	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
23:57:18.106	23:59:45.603	34	1910	70	30.80	22.00	NAR	OFF	OFF	242.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:03:03.599	00:04:30.598	35	1952	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln
00:07:29.594	00:10:11.091	23	1874	70	32.40	22.00	NAR	OFF	OFF	62.00	USGS_Indiana_Floodplain_revised_fixline.pln

Separation Plot

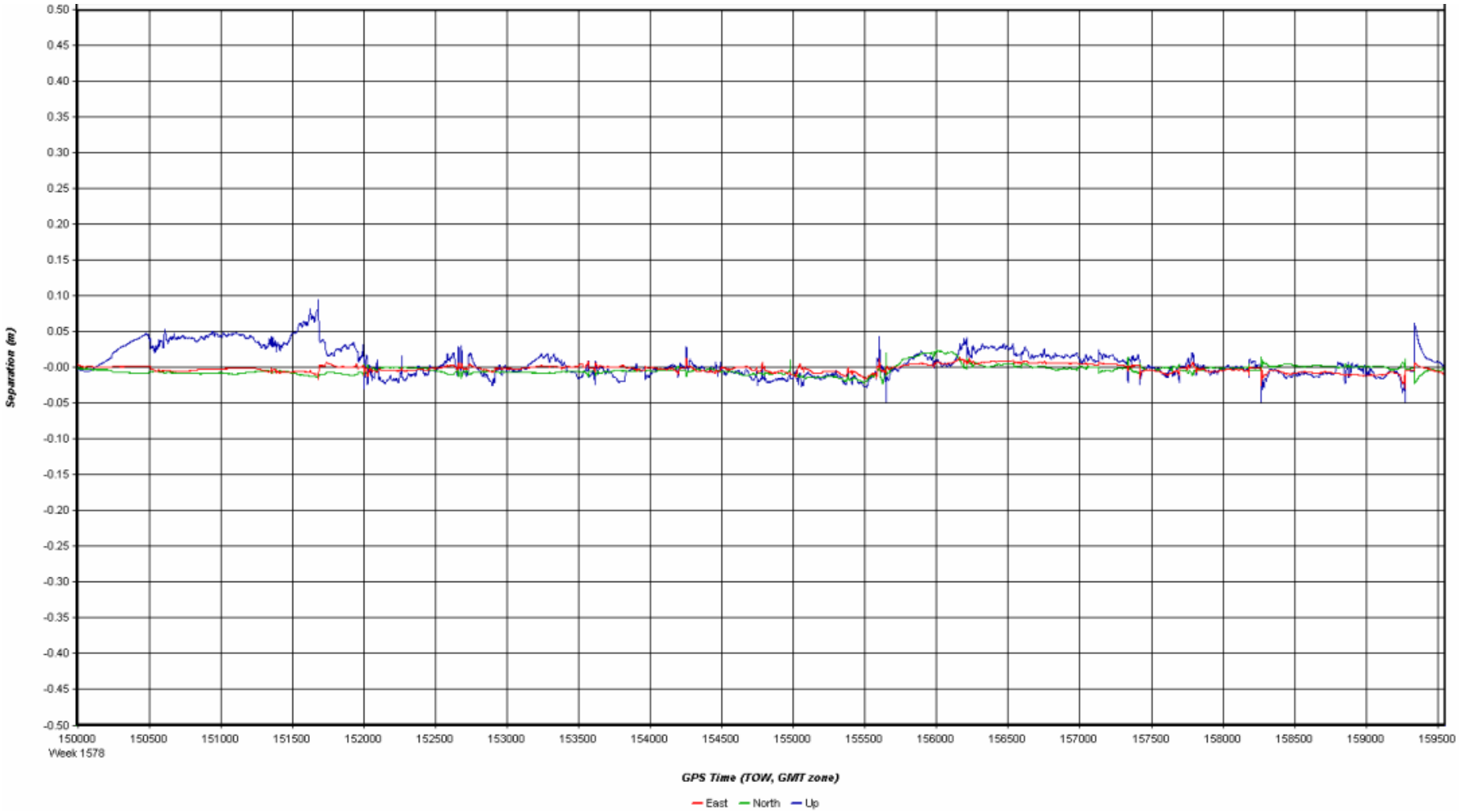
M040410A



N3443Q_M040410A_Sep_INCB_INMT_INSY-Cmb.doc

Separation Plot

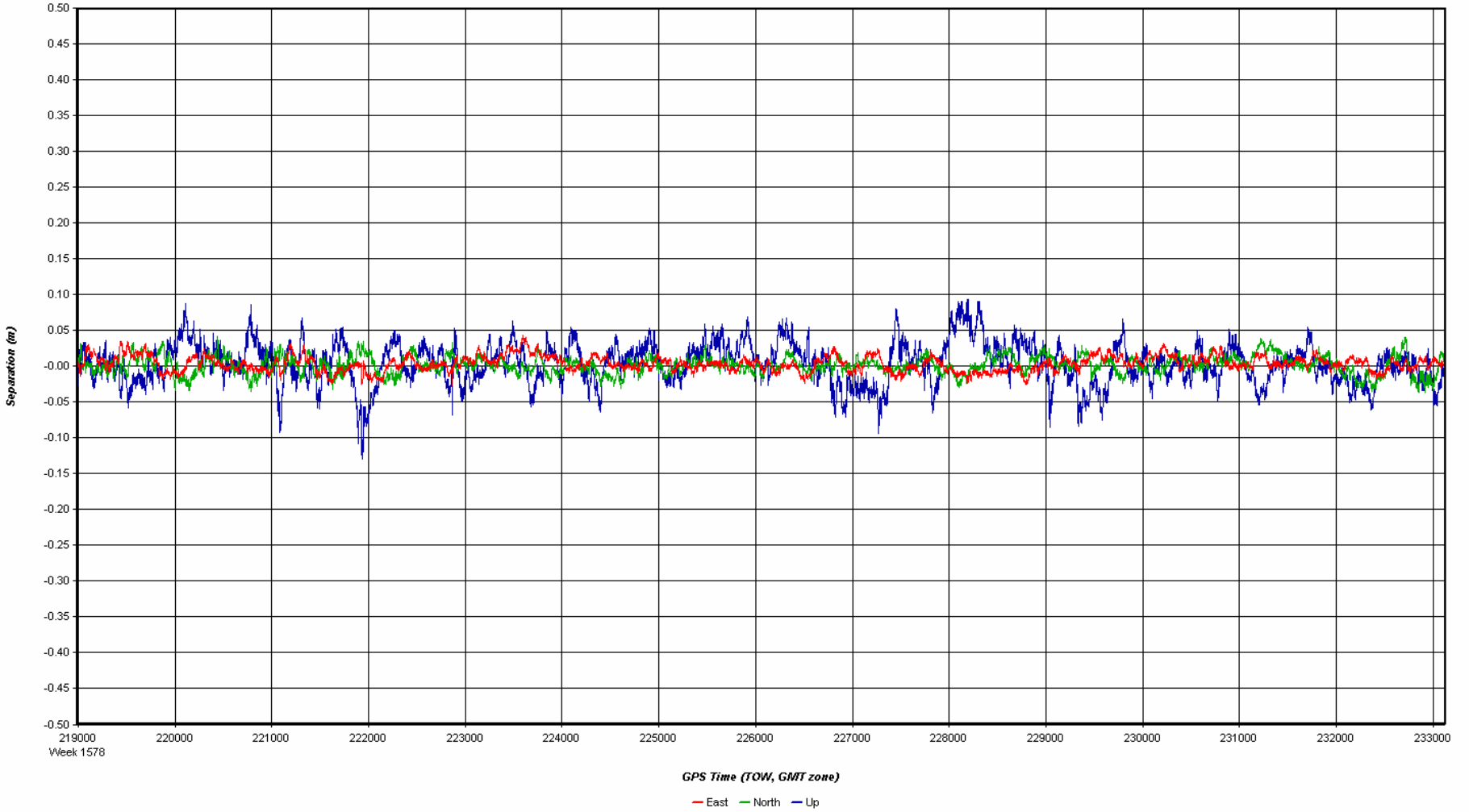
M040510A



N3443Q_M040510A_Sep_INBR_INEL_INSY-Cmb.doc

Separation Plot

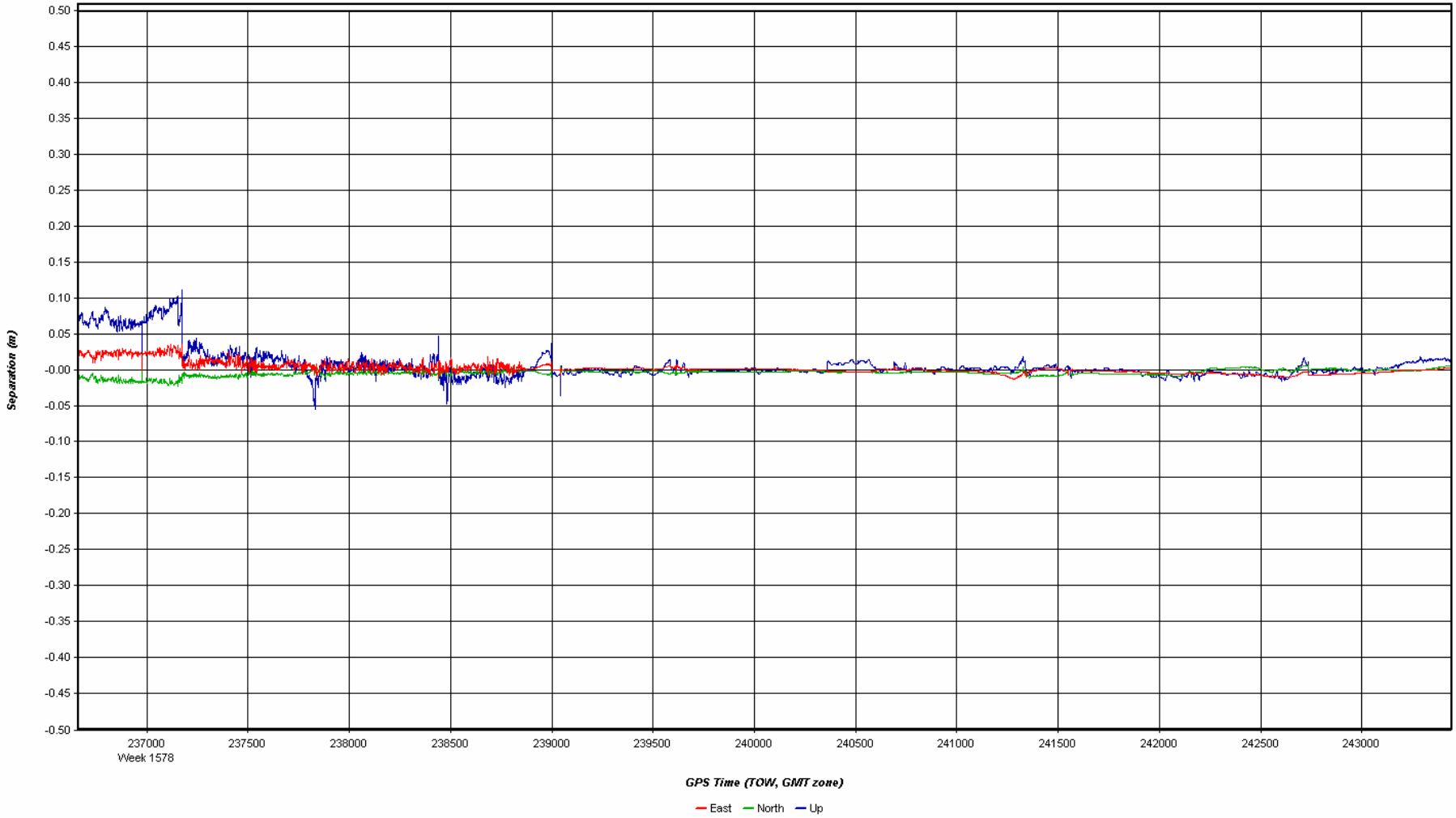
M040610A



N3443Q_M040610A_Sep_INCB_INSY-Cmb.doc

Separation Plot

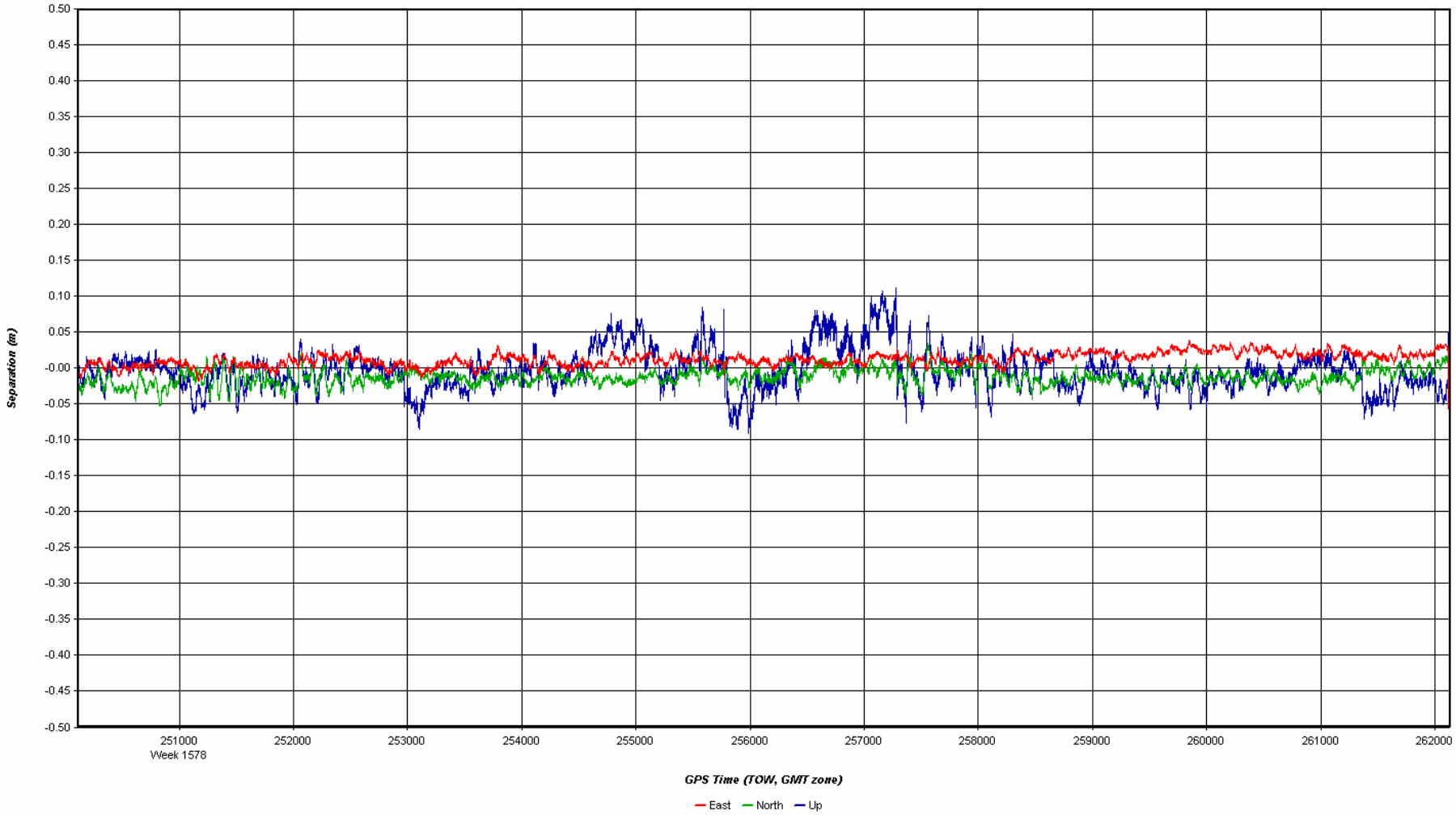
M040610B



N3443Q_M040610B_Sep_INAS_INCL_INLN-Cmb.doc

Separation Plot

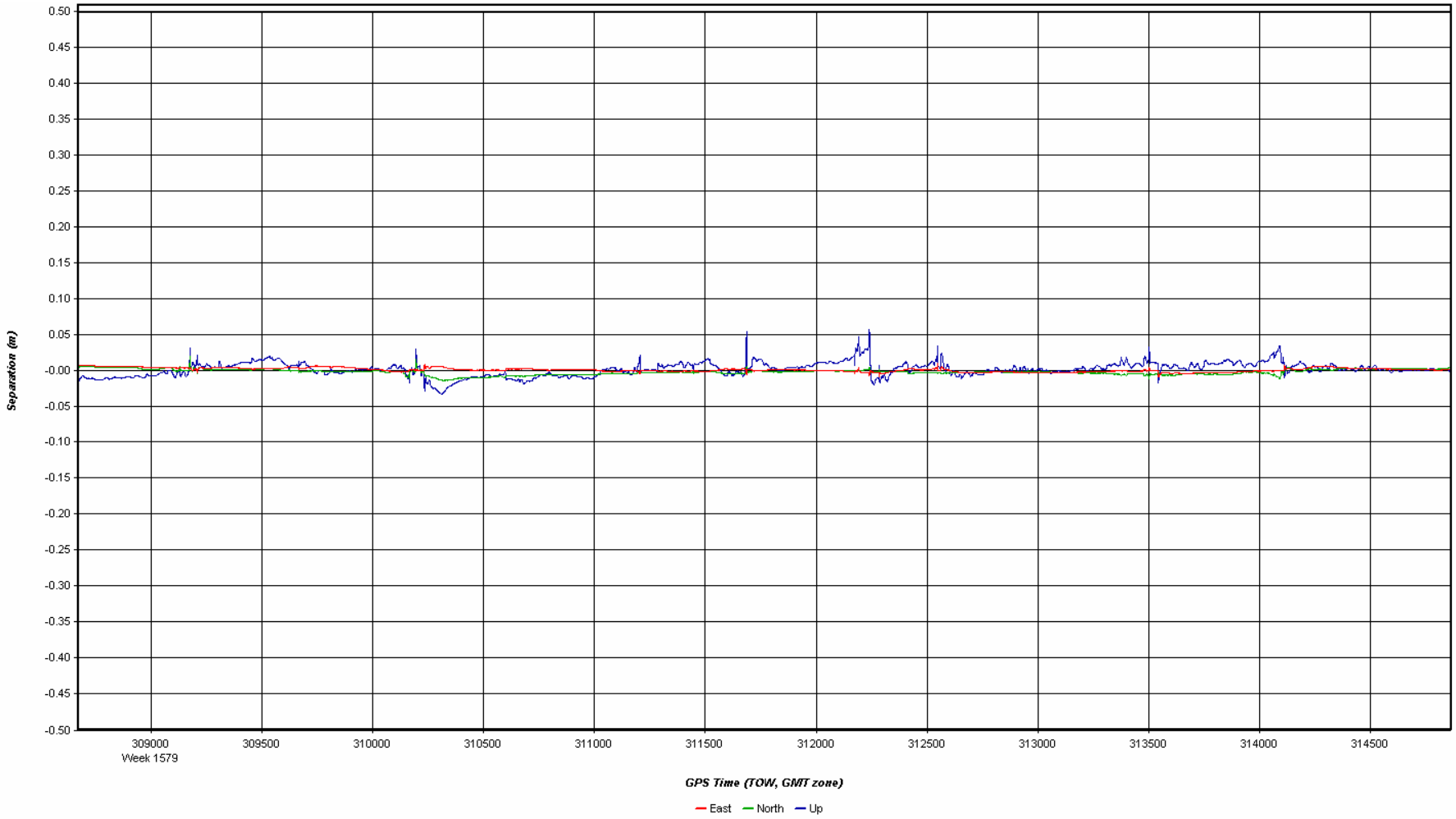
M040610C



N3443Q_M040610C_Sep_INAS-Rev_INMT-Cmb.doc

Separation Plot

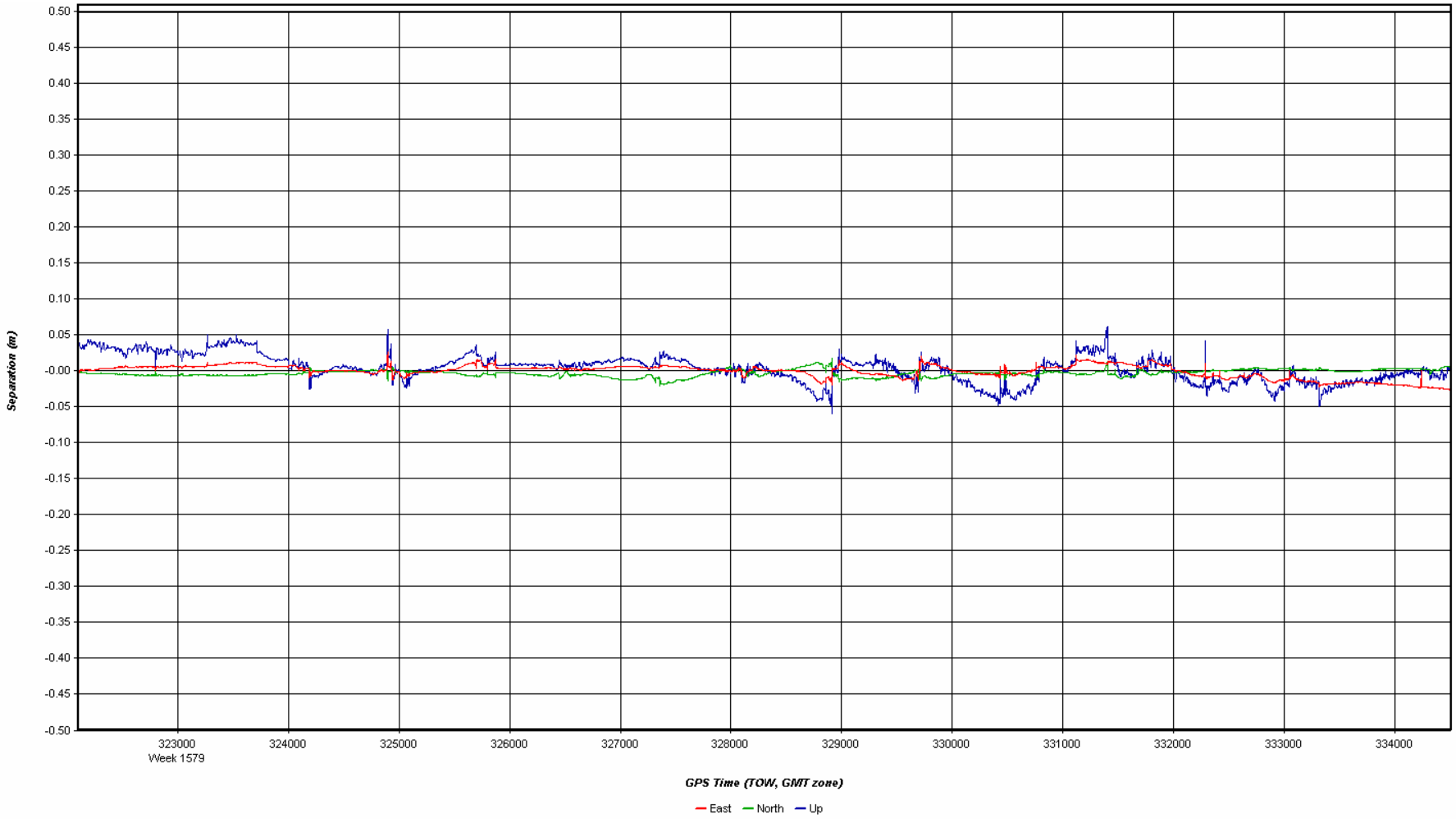
M041410A



N3443Q_M041410A_Sep_AS_INPD_INPL-Cmb.doc

Separation Plot

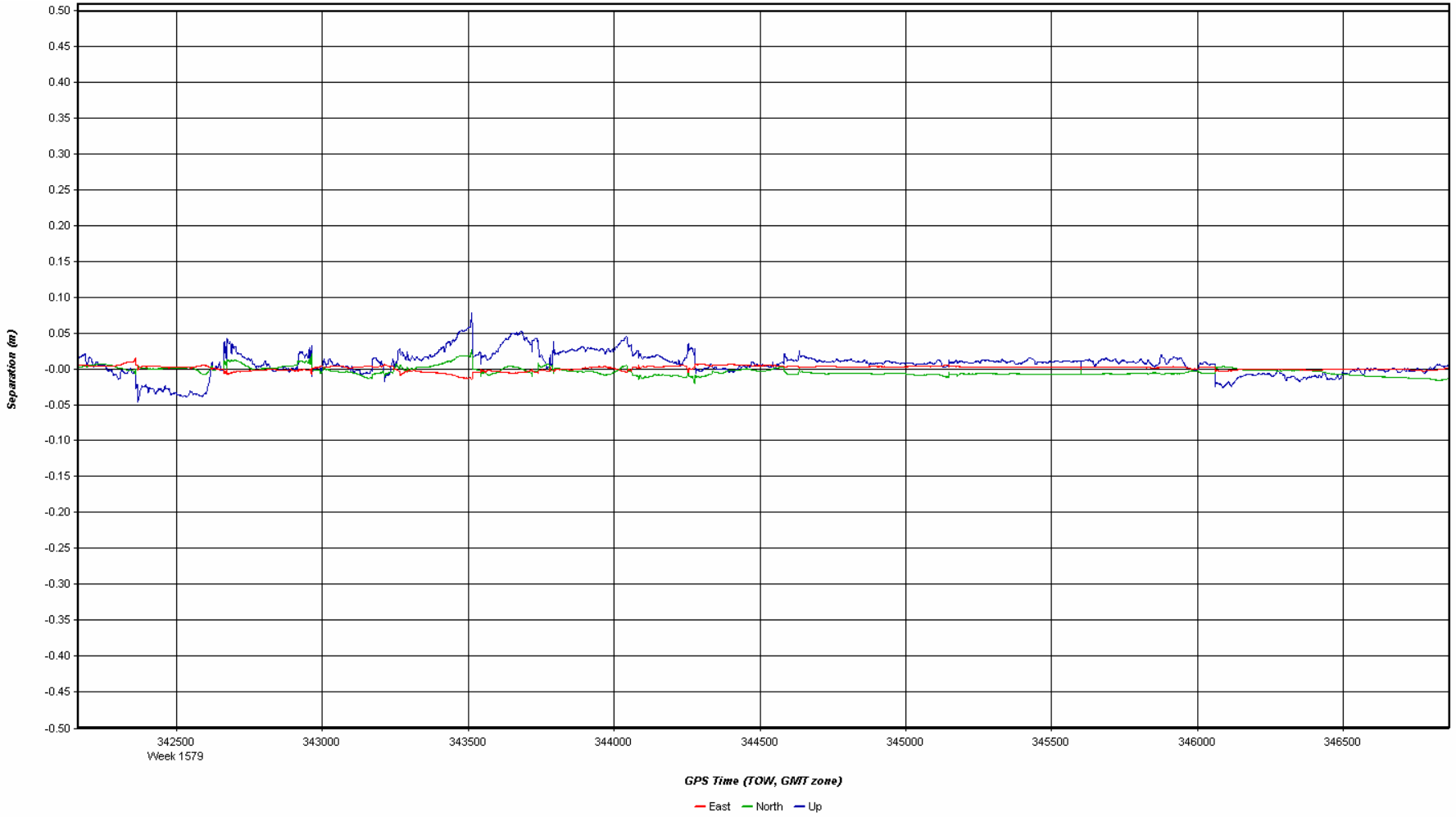
M041410B



N3443Q_M041410B_Sep_INFR_INMO_INPL-Cmb.doc

Separation Plot

M041410C



N3443Q_M041410C_Sep_INMO_INRN-Cmb.doc

R:\1100118\Lidar\QAQC\Indiana_Flood_Checkpoints.txt

Number	Easting	Northing	Known Z	Laser Z	Dz
1	588446.604	4612760.852	227.412	227.410	-0.002
2	588343.942	4614075.632	225.955	226.030	+0.075
3	586097.248	4615896.806	223.842	223.820	-0.022
4	596311.607	4604765.043	237.975	237.970	-0.005
5	597589.560	4600624.937	244.597	244.540	-0.057
6	600627.338	4597512.822	250.299	250.330	+0.031
7	487271.957	4532643.502	203.241	203.290	+0.049
8	488391.137	4531553.591	201.041	201.050	+0.009
9	486853.827	4531184.041	202.237	202.240	+0.003
10	486643.236	4530203.625	201.542	201.700	+0.158
11	484459.718	4528978.272	198.203	198.210	+0.007
12	595968.323	4318148.246	177.158	177.120	-0.038
13	589851.943	4314321.172	172.023	171.910	-0.113
14	598469.350	4312106.913	179.245	179.180	-0.065
15	591507.867	4308330.220	183.658	183.570	-0.088
16	594770.044	4305702.159	172.068	171.910	-0.158
17	592812.323	4351020.448	201.445	201.410	-0.035
18	590324.491	4339526.470	191.050	191.040	-0.010
19	592999.822	4334767.445	187.213	187.200	-0.013
20	597925.632	4338210.101	203.210	203.140	-0.070
21	596794.963	4347070.023	199.328	199.350	+0.022
22	521378.990	4525747.215	203.365	203.320	-0.045
23	519897.365	4519399.693	205.588	205.670	+0.082
24	520591.400	4508388.097	190.875	190.840	-0.035
25	520689.270	4500300.200	178.739	178.690	-0.049
26	519242.368	4493772.658	170.703	170.770	+0.067
27	494945.282	4310042.895	146.818	146.860	+0.042
28	498312.688	4308610.119	166.084	166.090	+0.006
29	494555.345	4307640.322	145.403	145.330	-0.073
30	496993.879	4306794.769	174.017	174.000	-0.017
31	519689.687	4348639.145	168.431	168.490	+0.059
32	519246.377	4347849.277	184.505	184.420	-0.085
33	521189.659	4348534.123	170.458	170.490	+0.032
34	521057.794	4349300.234	183.141	183.210	+0.069
35	469043.973	4369467.918	155.679	155.690	+0.011
36	468166.636	4377823.366	150.878	150.920	+0.042
37	461762.954	4371370.621	144.249	144.250	+0.001
38	459736.973	4361594.053	147.057	147.050	-0.007
39	465732.983	4362566.410	152.480	152.430	-0.050
101	589065.219	4610731.185	232.294	232.220	-0.074
102	592795.696	4613264.329	240.753	240.770	+0.017
103	486426.650	4532174.510	200.427	200.490	+0.063
104	489280.158	4531382.774	201.876	201.870	-0.006
105	595732.987	4315911.896	176.675	176.660	-0.015
106	591101.725	4339377.062	189.904	189.860	-0.044
107	511985.318	4494656.504	205.882	outside	*
108	497008.037	4306814.528	173.863	173.850	-0.013
109	496937.139	4310598.359	153.756	153.810	+0.054
110	522482.427	4356305.173	227.480	outside	*
111	471573.628	4364472.305	168.061	outside	*
112	471608.846	4370076.620	158.625	outside	*
14403	591688.053	4625632.411	248.553	outside	*
A_168	573767.399	4610553.396	226.705	outside	*
A_353	499023.802	4320373.532	154.784	outside	*
B_120	521076.353	4470527.609	207.733	outside	*
B_70	486205.522	4372252.130	205.387	outside	*
E_10	578292.416	4300910.353	163.669	outside	*
E_13	521075.106	4348551.965	171.263	removed	*
G_129	511093.942	4537064.774	204.987	outside	*
H_271	593288.792	4333888.728	186.402	removed	*
INBD	541443.975	4301691.515	195.355	outside	*
INCL	517054.807	4376325.380	282.807	outside	*
INEL	586104.781	4610188.011	252.871	outside	*
INLN	486725.381	4320085.711	161.938	outside	*
INRN	488250.995	4532814.425	210.992	outside	*
INWL	506257.526	4478585.147	221.750	outside	*
J_160	598009.384	4598239.306	246.949	removed	*
J_354	490340.463	4301051.419	146.020	outside	*
J_9	600679.205	4357922.030	210.930	outside	*
K_268	600109.175	4342277.489	194.349	removed	*
K_81_RESET	518555.238	4365881.965	239.560	outside	*
M_107	486909.559	4523952.286	204.975	outside	*

M_360	462440.810	4382355.947	179.778	outside	*
N_13	542035.491	4362092.810	180.749	outside	*
NEW_L_5	474168.140	4525347.270	197.731	outside	*
P_157	483223.893	4541803.072	209.273	outside	*
Q_28	519950.185	4510863.913	207.864	removed	*
Q_60_X	597850.097	4309273.832	177.384	removed	*
S_280	513841.627	4318553.686	204.997	outside	*
Z_293	459887.129	4358783.051	144.557	removed	*

Average dz	-0.006
Minimum dz	-0.158
Maximum dz	+0.158
Average magnitude	0.044
Root mean square	0.058
Std deviation	0.058