PHOTOGRAMMETRIC GROUND CONTROL SURVEY REPORT

HILLSDALE, JACKSON & LENAWEE COUNTIES

1.5 PPMS LIDAR PROJECT
UNITED STATES GEOLOGICAL SURVEY (USGS)

CONTRACT NUMBER: GP10PC00057

TASK ORDER NUMBER: GP10PD02054

Woolpert Project Number: 70840

PREPARED BY:

WOOLPERT, INC.
4454 Idea Center Boulevard
Dayton, OH 45430-1500
February 2010

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NOTICE OF PROPRIETARY INFORMATION

PHOTOGRAMMETRIC GROUND CONTROL SURVEY REPORT

HILLSDALE, JACKSON, & LENAWEE COUNTIES 1.5 PPMS LIDAR PROJECT

Contract Number: GP10PC00057
Task Order Number: GP10PD02054

Woolpert, Inc. Project Number 70840

For:
United States Geological Survey (USGS)
1400 Independence Road
Rolla, Missouri 65401

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Summary of Contents

SECTION 1: PHOTOGRAMMETRIC GROUND CONTROL SURVEY REPORT

Introduction

This report contains a comprehensive outline of the Photogrammetric Ground Control Survey that supported the 2010 Hillsdale, Jackson, & Lenawee Counties LIDAR Project; Contract Number G10PC00057 / Task Order Number G10PD02054, for the United States Geological Survey (USGS). All surveys were performed in such a way as to achieve the necessary ground control positional accuracies to support 1.5 Points per Meter Squared (PPMS) LiDAR data.

Project Area

The entire project area encompasses approximately 2,092 square miles of Hillsdale, Jackson, and Lenawee Counties, Michigan.

Purpose

The purpose of this survey was to establish three-dimensional coordinates for twenty-eight (28) new photogrammetric supplemental ground control stations and twenty (20) photogrammetric ground control quality check points throughout the project area to support 1.5 PPMS LiDAR data at 95% confidence level as outlined in the *Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy (NSSDA),* published by the Federal Geographic Data Committee (FGDC-STD-007.3-1998), to comply with FEMA guidelines.

Date of Survey

All ground control field operations took place between Dec. 06, 2010 and Dec. 10, 2010.

Monumentation

Prior to the LIDAR mission, Woolpert field crews performed a field reconnaissance to verify the existence and suitability of pre-selected existing National Geodetic Survey (NGS) control stations. These existing control stations were utilized to insure that quality x, y, and z coordinate values were computed for each of the newly established photogrammetric control stations.

Woolpert surveyed twenty-eight (28) new photogrammetric supplemental ground control stations in specific areas throughout the project limits. Each supplemental ground control station was observed on a variety of terrain types that were suitable for both GPS and LiDAR measurement. These stations were used to calibrate the mission's vertical values.

Woolpert also established twenty (20) photogrammetric ground control quality check points in designated locations to verify the accuracy of the LiDAR mission. These newly established quality check points where also observed on a variety of terrain types that were suitable for both GPS and LiDAR measurement

Recovery information sheets for the newly established supplemental control stations can be found in Section 3. A control diagram showing the ground control stations used to support this photogrammetric mapping project can be found in Section 5 of this report.

GPS Equipment

Woolpert utilized three (3) Trimble Navigation R8/5800 series GPS receivers with three (3) Trimble Navigation TSC2 data collectors as rovers, and used one (1) Trimble 4700 and one (1) Trimble 5700 GPS receiver as bases for this project.

Methodology

Rapid Static GPS

Rapid-Static GPS surveying techniques were used for measuring of all ground control stations and the GPS control network. Each observation session utilized a 15-second sync rate, with a 15° elevation mask, lasting between 20-90 minutes depending on the baseline length, number of satellites and satellite geometry.

GPS Data Analysis, Processing, and Adjustment

All ground control observations were processed using Trimble Navigation's Trimble Geomatics Office (TGO) Version 1.63. After the post-processing of the raw data was completed, the network was subjected to rigorous loop-closure analysis; whereby, unacceptable GPS vectors were removed and field blunders, if any, were detected and eliminated. Once this process was completed, Woolpert performed unconstrained and constrained least-squares adjustments using Trimble's Total Control (TTC) software Version 2.73 and the Geoid 09 model. Both unconstrained and constrained adjustments were computed using trivial and nontrivial baselines.

Daily processing allowed the field crews to discover any weak links in the network and immediately schedule re-observations of the affected baselines, if necessary. Once the fieldwork was complete, the processed baselines were then run through a rigorous loop closure analysis. Any baselines that failed this analysis were either reprocessed or removed from the network.

After an acceptable unconstrained least-squares adjustment was obtained, Woolpert performed a fully constrained least-squares adjustment by fixing the GPS network NGS Continuously Operating Reference Stations (CORS) and existing NGS control stations with known coordinate data. During this project, the following stations were fixed during the constrained adjustment:

Dimension	Existing NGS Control and CORS Stations
3-D Control Stations	E 109, E 113, J 114, L 330, MIDD REF B, & MIMR REF A
3-D CORS Stations	ADRI, MIHD, and UNIV

Datum Reference and Final Coordinates

For this survey, the GPS control was based on two coordinate zones, Zone 16 North and Zone 17 North of the Universal Transverse Mercator (UTM) Coordinate System, referenced to the NAD 83(2007) datum,

expressed in meters. The coordinates for the ground control survey can be found in Section 2 of this report.

Accuracy Statement

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

The ground control survey meets positional accuracies necessary to support 1.5 points per square meter LiDAR data at 95% confidence level as outlined in the *Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy (NSSDA),* published by the Federal Geographic Data Committee (FGDC-STD-007.3-1998), to comply with FEMA guidelines.

SECTION 2: GROUND CONTROL STATION COORDINATE LISTING

This section includes a complete listing of the final Universal Transverse Mercator (UTM) coordinates and Orthometric Heights for Hillsdale, Jackson and Lenawee Counties, for both Zone 16 North and Zone 17 North of the Universal Transverse Mercator Coordinate System, referenced to the NAD 83(2007) Datum, expressed in meters.

HILLSDALE, JACKSON, AND LENAWEE COUNTIES
1.5 PPSM LIDAR PROJECT
LOCATION: HILLSDALE, JACKSON, & LENAWEE CO'S, MICHIGAN
HORIZONTAL DATUM: NAD 83(2007)
VERTICAL DATUM: GEOID 09
UNITS: METERS
COORDINATE SYSTEM: UNIVERSAL TRANSVERSE MERCATOR, 16 NORTH
GEOID MODEL: GEOID 09
COORDINATE SYSTEM: GRID
DATE: DECEMBER 2010

Photogrammetric Supplemental Ground Control Stations:

Station Name	Northing (Meters)	Easting (Meters)	Elevation (Meters)	Station Description
1	4698782.28	687612.77	297.465	SHORT GRASS
2	4698595.83	696669.71	287.306	BARE EARTH
4	4699306.07	714020.5	293.013	SHORT GRASS
5	4699166.49	722568.99	289.628	SHORT GRASS
6	4699891.19	735242.81	292.792	SHORT GRASS
7	4683330.87	688977.61	301.193	SHORT GRASS
8	4681254.72	711085.73	305.496	SHORT GRASS
9	4684642.92	735779.73	310.791	DIRT
10	4669920.6	689087.13	318.662	GRAVEL
12	4661178.68	689462.63	309.754	SHORT GRASS
13	4660979.97	694787.46	335.189	GRAVEL
14	4661057.51	705434.63	338.534	SHORT GRASS
15	4661147.23	712671.3	328.237	SHORT GRASS
16	4661338.62	720734.03	326.838	CONC DRIVE
17	4661606.5	729146.93	296.952	DIRT
21	4641518.19	707708.42	354.998	GRAVEL
22	4641295.1	718426.09	293.974	CONC DRIVE
23	4640883.92	730369.57	273.504	SHORT GRASS
24	4642034.72	744932.31	232.843	DIRT & GRASS
25	4641961.45	764429.24	207.016	DIRT
26	4619667.65	684180.83	323.412	MED. GRASS
27	4620169.32	696954.17	291.449	SHORT GRASS
28	4621526.76	714087.84	272.97	BARE EARTH
30	4623525.63	740730.8	236.819	DIRT
31	4624266.26	756255.17	222.745	CONC
32	4624873.86	767656.02	213.001	SHORT GRASS
33	4659674.07	679215.86	301.128	EARTH/GRAVEL
34	4662009.61	748460.44	260.146	GRAVEL

Photogrammetric Ground Control Quality Check Points:

Station Name	Northing (Meters)	Easting (Meters)	Elevation (Meters)	Station Description
3	4698804.477	705429.624	294.656	GRAVEL
19	4639218.943	682286.518	313.236	BARE EARTH
29	4622477.760	723857.595	254.200	DIRT &SHORT GRAS
35	4662006.927	765795.230	224.665	DIRT-SHORT GRASS
36	4691882.688	689175.685	290.280	FIRT
38	4676812.678	736626.123	308.736	CONC SLAB
39	4676454.641	688224.704	309.140	SHORT GRASS
40	4690229.509	701390.379	284.279	SHORT GRASS
42	4671661.963	726084.338	298.959	CONC DRIVE
43	4693845.482	724346.596	286.967	DIRT
44	4647941.250	686634.481	334.274	CONC
45	4649910.824	701793.085	361.381	BARE EARTH
47	4649953.511	739142.872	272.585	SHORT GRASS
48	4649853.117	754743.916	245.906	SHORT GRASS
49	4631642.487	687045.903	343.697	GRAVEL
50	4628368.815	700142.609	312.014	SHORT GRASS
52	4630780.198	727363.222	254.546	SHORT GRASS
53	4631420.672	738599.470	240.928	SHORT GRASS
54	4632171.384	753758.339	213.653	DIRT
55	4649810.731	713934.237	345.023	SHORT GRASS

HILLSDALE, JACKSON, AND LENAWEE COUNTIES
1.5 PPSM LIDAR PROJECT
LOCATION: HILLSDALE JACKSON, & LENAWEE CO'S, MICHIGAN
HORIZONTAL DATUM: NAD 83(2007)
VERTICAL DATUM: GEOID 09
UNITS: METERS
COORDINATE SYSTEM: UNIVERSAL TRANSVERSE MERCATOR, 17 NORTH
GEOID MODEL: GEOID 09
COORDINATE SYSTEM: GRID
DATE: DECEMBER 2010

Photogrammetric Supplemental Ground Control Stations:

Station Name	Northing (Meters)	Easting (Meters)	Elevation (Meters)	Station Description
1	4702969.34	193953.44	297.465	SHORT GRASS
2	4702143.22	202980.59	287.306	BARE EARTH
4	4701626.22	220346.98	293.013	SHORT GRASS
5	4700883.12	228867.23	289.628	SHORT GRASS
6	4700711.08	241563.36	292.792	SHORT GRASS
7	4687449.04	194225.34	301.193	SHORT GRASS
8	4683819.23	216145.03	305.496	SHORT GRASS
9	4685460.76	241023.57	310.791	DIRT
10	4674054.74	193390.55	318.662	GRAVEL
12	4665301.76	193151.13	309.754	SHORT GRASS
13	4664729.56	198452.52	335.189	GRAVEL
14	4664059.55	209085.13	338.534	SHORT GRASS
15	4663641.17	216313.72	328.237	SHORT GRASS
16	4663266.35	224373.11	326.838	CONC DRIVE
17	4662943.31	232786.47	296.952	DIRT
21	4644398.88	209985.38	354.998	GRAVEL
22	4643426.63	220665.91	293.974	CONC DRIVE
23	4642181.21	232555	273.504	SHORT GRASS
24	4642311.28	247164.57	232.843	DIRT & GRASS
25	4640875.48	266607.31	207.016	DIRT
26	4624230.36	184973.92	323.412	MED. GRASS
27	4623840.75	197760.44	291.449	SHORT GRASS
28	4624001.38	214956.35	272.97	BARE EARTH
30	4624139.14	241681.1	236.819	DIRT
31	4623796.22	257219.54	222.745	CONC
32	4623607.93	268633.27	213.001	SHORT GRASS
33	4664519.14	182815.99	301.128	EARTH/GRAVEL
34	4661990.53	252082.89	260.146	GRAVEL

Photogrammetric Ground Control Quality Check Points:

Station Name	Northing (Meters)	Easting (Meters)	Elevation (Meters)	Station Description
3	4701732.558	211738.248	294.656	GRAVEL
19	4643882.088	184448.085	313.236	BARE EARTH
29	4624269.510	224772.316	254.200	DIRT &SHORT GRAS
35	4660772.093	269372.909	224.665	DIRT-SHORT GRASS
36	4695971.662	195026.256	290.280	FIRT
38	4677589.281	241316.831	308.736	CONC SLAB
39	4680637.991	192989.382	309.140	SHORT GRASS
40	4693459.596	207101.557	284.279	SHORT GRASS
42	4673191.537	230436.851	298.959	CONC DRIVE
43	4695448.374	230265.269	286.967	DIRT
44	4652285.493	189399.436	334.274	CONC
45	4653189.553	204668.890	361.381	BARE EARTH
47	4650616.349	241942.834	272.585	SHORT GRASS
48	4649424.124	257498.900	245.906	SHORT GRASS
49	4635985.455	188669.943	343.697	GRAVEL
50	4631803.004	201515.048	312.014	SHORT GRASS
52	4632309.664	228849.481	254.546	SHORT GRASS
53	4632164.534	240105.279	240.928	SHORT GRASS
54	4631855.649	255280.152	213.653	DIRT
55	4652239.154	216779.267	345.023	SHORT GRASS

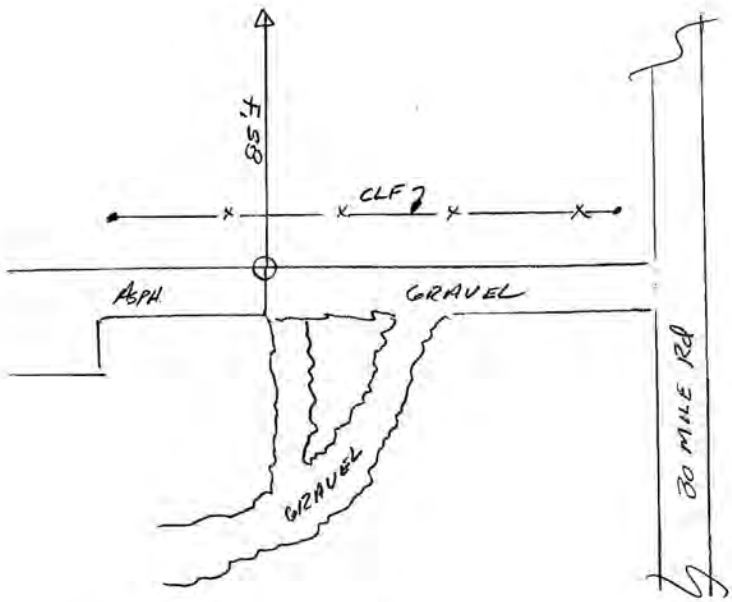
SECTION 3: GROUND CONTROL STATION RECOVERY INFORMATION SHEETS

This section the Station Recovery Logs of each of the ground control stations established for the Hillsdale, Jackson, & Lenawee Counties 1.5 PPSM LiDAR Project. Each station recovery log contains a sketch and point information.

GPS Observation Log Sheet

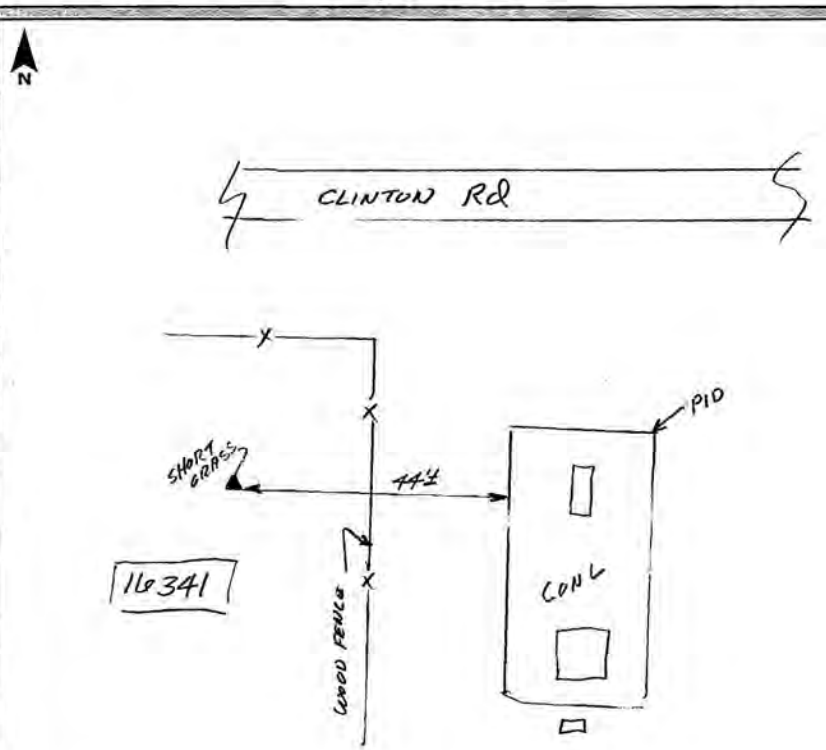
Project Name:		Project Number:	70840	Survey Date:	12-9-10
Station Name:	1_ SHORT GRASS	Operator Name:	Kevin Sells		
Latitude:	42-25-07.28408	Julian Day:	343	Session No.	
Longitude:	84-43-10,88948	Start Time:	10:02	End Time:	10:22
Ellip. Height:	262,949m	Data File Name:			
Type of Mark:	ON SHORT GRASS	Type of Reciever:	Trimble [redacted] Internal		
Stamping on Mark:		Type of Antenna:	Trimble [redacted] Internal		
Weather Condition:	PTLY CLDY, 10°	Antenna Height:	2.000m	to bottom of antenna mount	

N



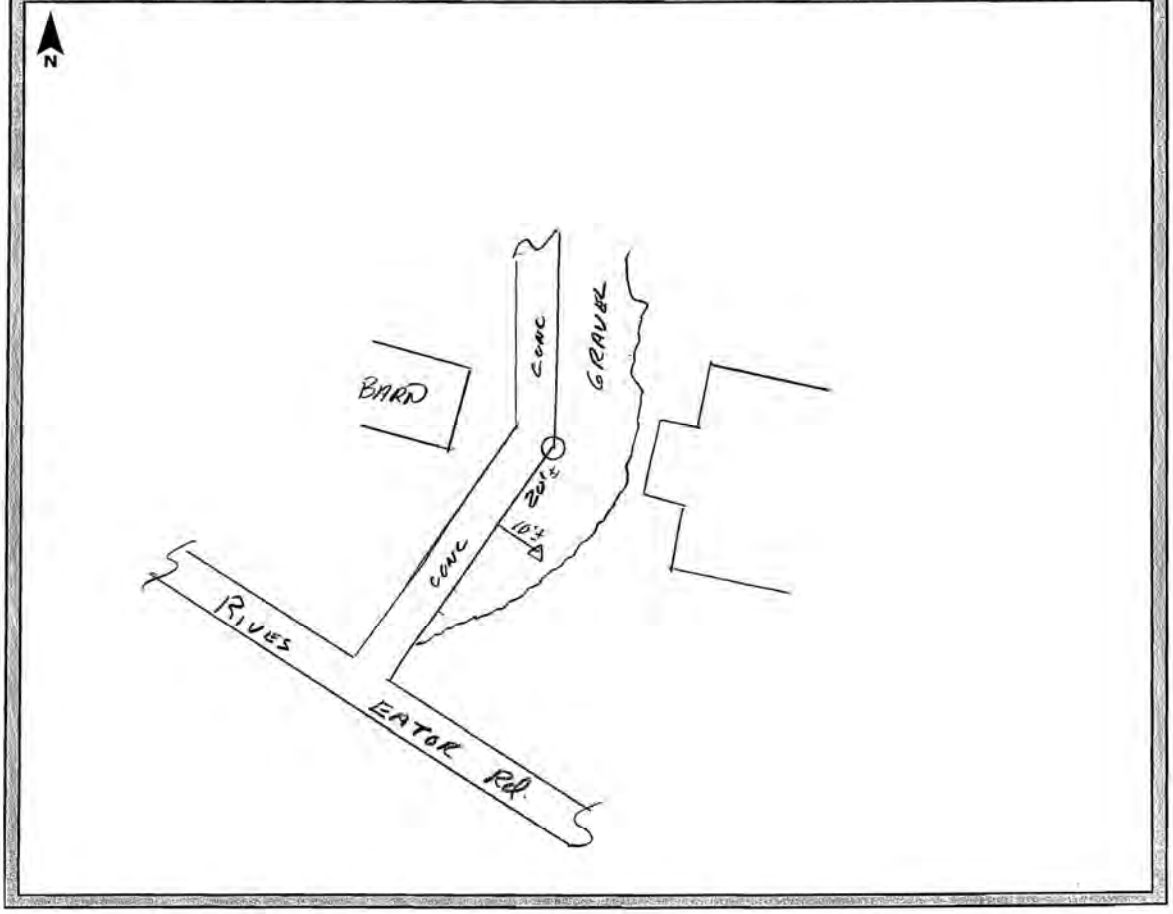
GPS Observation Log Sheet

Project Name:		**Project Number:** 70840	**Survey Date:** 12-7-10
Station Name:	2 - SHORT GRASS	**Operator Name:**	Kevin Sells
Latitude:	42-24-53.134	**Julian Day:** 341	**Session No.**
Longitude:	84-36-35.107	**Start Time:** 10:32	**End Time:** 10:52
Ellip. Height:	253.657	**Data File Name:**	
Type of Mark:	SHORT GRASS	**Type of Reciever:**	Trimble [redacted] Internal
Stamping on Mark:		**Type of Antenna:**	Trimble [redacted] Internal
Weather Condition:	LT. SNOW COVER, 10°	**Antenna Height:** 2.000m	to bottom of antenna mount



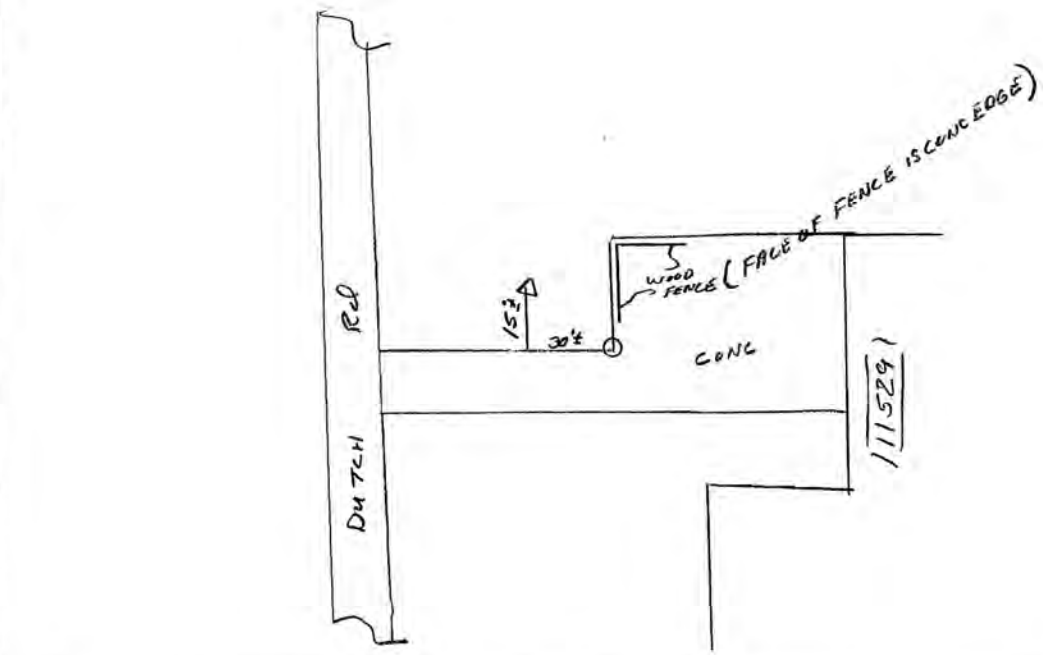
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12-8-10
Station Name:	3 – GRAVEL	Operator Name:	Kevin Sells		
Latitude:	42-24-51.72798	Julian Day:	342	Session No.	
Longitude:	84-30-11.68522	Start Time:	5:08	End Time:	5:28
Ellip. Height:	256.343m	Data File Name:			
Type of Mark:	ON GRAVEL	Type of Reciever:	Trimble [redacted] Internal		
Stamping on Mark:		Type of Antenna:	Trimble [redacted] Internal		
Weather Condition:	cloudy, 26°	Antenna Height:	2.000m	to bottom of antenna mount	



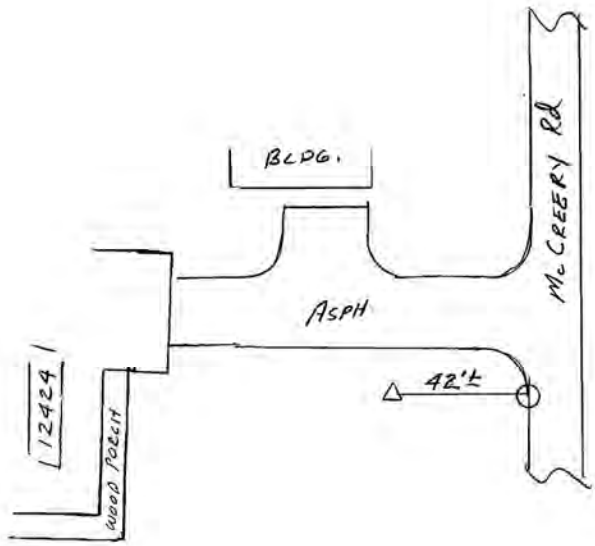
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12-08-10
Station Name:	4 - SHORT GRASS	Operator Name:	Kevin Sells		
Latitude:	42-24-59.66321	Julian Day:	342	Session No.	
Longitude:	84-23-55.75107	Start Time:	4:01	End Time:	4:21
Ellip. Height:	256.949	Data File Name:			
Type of Mark:	ON SHORT GRASS	Type of Reciever:	Trimble [redacted] Internal		
Stamping on Mark:		Type of Antenna:	Trimble [redacted] Internal		
Weather Condition:	CLOUDY, 26°	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

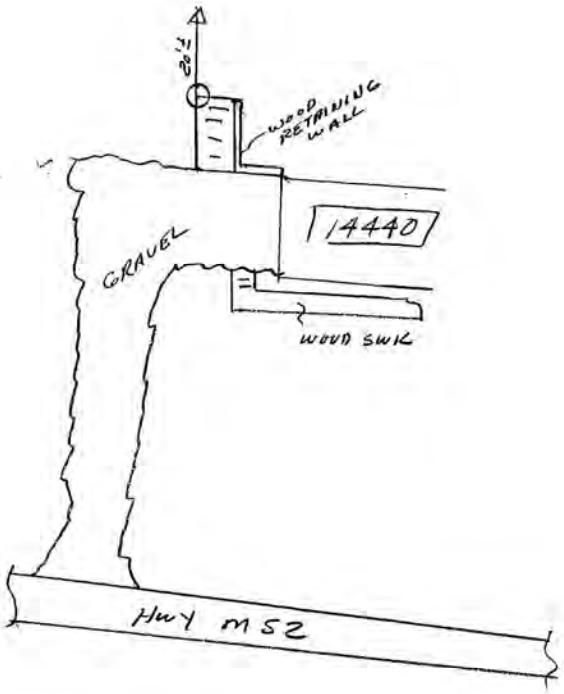
Project Name:		Project Number:	70840	Survey Date:	12-E-10
Station Name:	5_SHORT GRASS	Operator Name:	Kevin Sells		
Latitude:	42-24-46.48113	Julian Day:	342	Session No.	
Longitude:	84-17-42.35188	Start Time:	3:02	End Time:	
Ellip. Height:	256.803m	Data File Name:			
Type of Mark:	ON SHORT GRASS	Type of Reciever:	Trimble ■ Internal		
Stamping on Mark:		Type of Antenna:	Trimble ■ Internal		
Weather Condition:	LT. SNOW, 26°	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

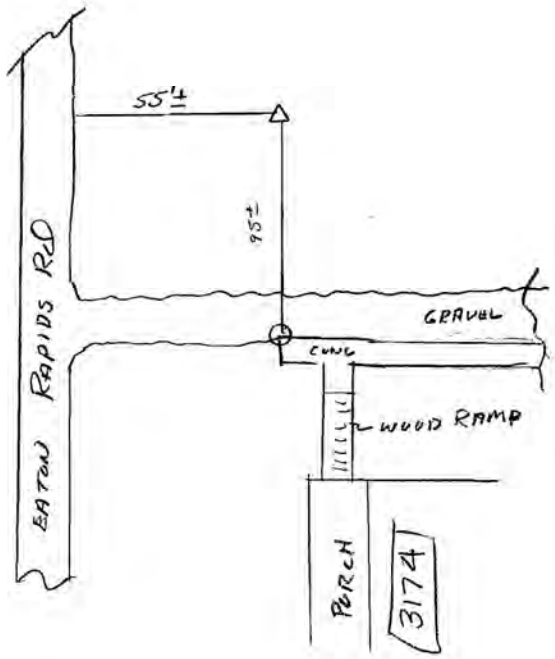
Project Name:		Project Number:	70840	Survey Date:	12-8-10
Station Name:	6 _ SHORT GRASS	Operator Name:	Kevin Sells		
Latitude:	42-24-56.49350	Julian Day:	342	Session No.	
Longitude:	84-08-27.36418	Start Time:	1:52	End Time:	
Ellip. Height:	254.405M	Data File Name:			
Type of Mark:	ON SHORT GRASS	Type of Reciever:	Trimble ● Internal		
Stamping on Mark:		Type of Antenna:	Trimble ● Internal		
Weather Condition:	CLOUDY, 26°	Antenna Height:	2.000m	to bottom of antenna mount	

N



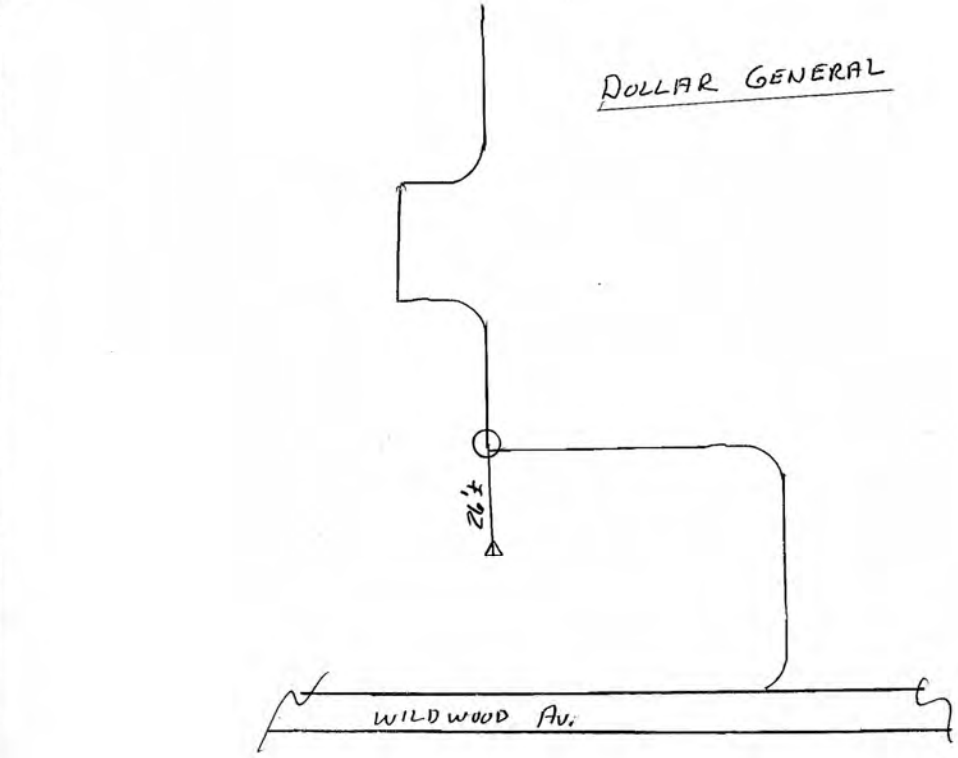
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12-9-10
Station Name:	7_ SHORT GRASS	Operator Name:	Kevin Sells		
Latitude:	42-16-45.49050	Julian Day:	343	Session No.	
Longitude:	84-42-29.36597	Start Time:	1:45	End Time:	2:05
Ellip. Height:	262.932m	Data File Name:			
Type of Mark:	IN WHEAT FIELD	Type of Reciever:	Trimble Internal		
Stamping on Mark:		Type of Antenna:	Trimble Internal		
Weather Condition:	PTLY CLDY, 16°	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

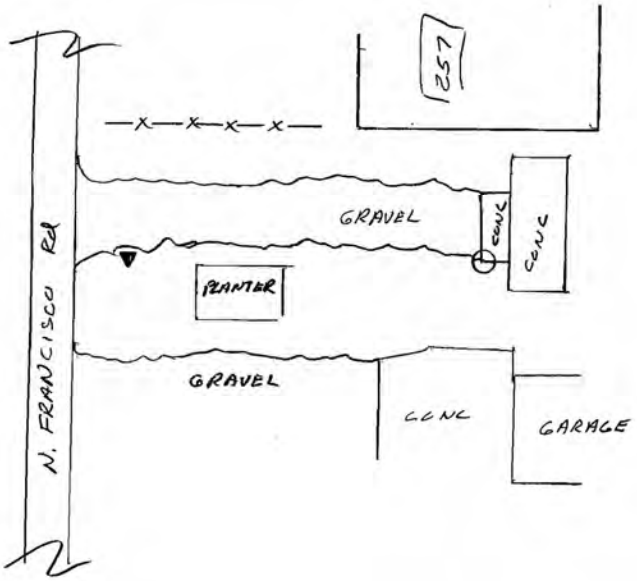
Project Name:		Project Number: 70840	Survey Date: 12-8-10
Station Name:	8 – SHORT GRASS	Operator Name:	Kevin Sells
Latitude:	42-15-17.91010	Julian Day: 342	Session No.
Longitude:	84-26-27.81691	Start Time: 10:25	End Time: 10:46
Ellip. Height:	269.650M	Data File Name:	
Type of Mark:	GROUND - SHORT GRASS	Type of Reciever:	Trimble ■ Internal
Stamping on Mark:		Type of Antenna:	Trimble ■ Internal
Weather Condition:	SNOWING, 24°	Antenna Height: 2.000m	to bottom of antenna mount



GPS Observation Log Sheet

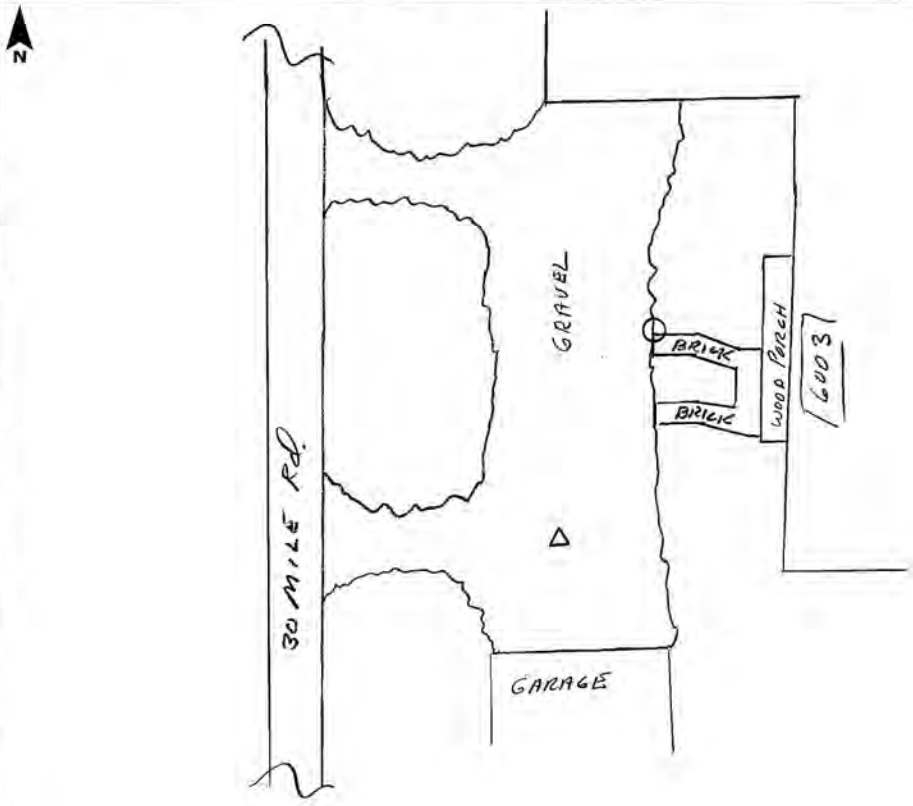
Project Name:		Project Number: 70840	Survey Date: 12-9-10
Station Name:	9 – DIRT	Operator Name:	Kevin Sells
Latitude:	42-16-42.17411	Julian Day: 343	Session No.
Longitude:	84-08-26.29377	Start Time: 5:34	End Time: 5:54
Ellip. Height:	275.839M	Data File Name:	
Type of Mark:	ON DIRT	Type of Reciever:	Trimble [redacted] Internal
Stamping on Mark:		Type of Antenna:	Trimble [redacted] Internal
Weather Condition:	CLOUDY, 15°	Antenna Height: 2.000m	to bottom of antenna mount

N



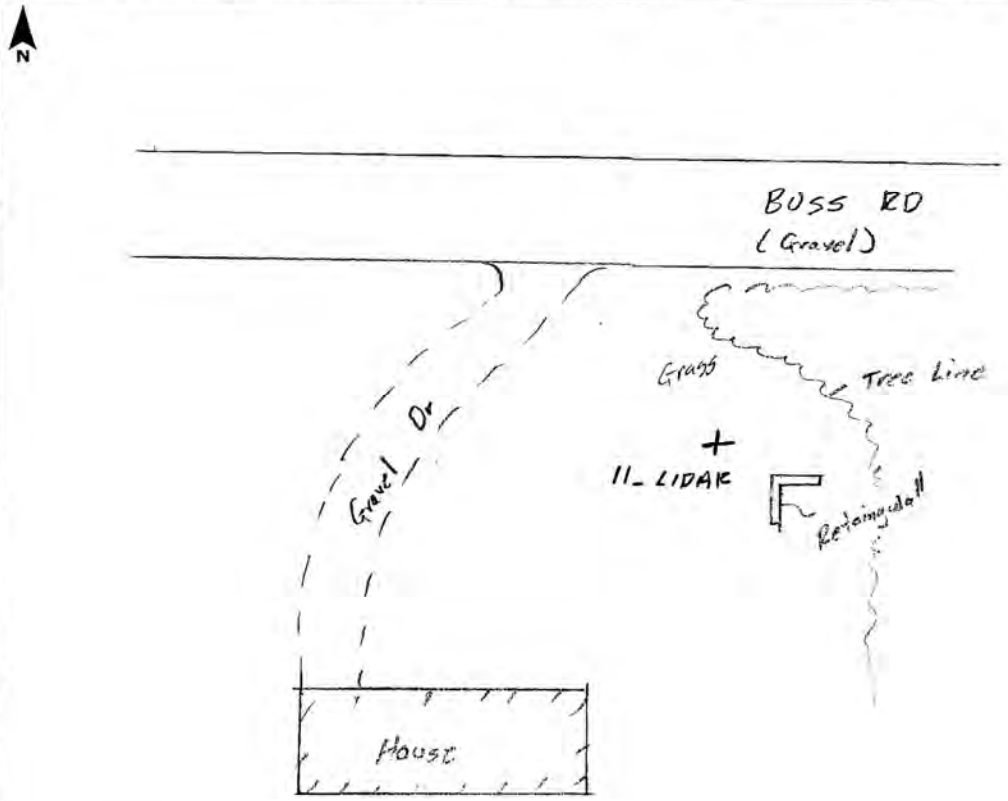
GPS Observation Log Sheet

Project Name:		**Project Number:** 70840	**Survey Date:** 12-9-10
Station Name: 10_ GRAVEL		**Operator Name:** Kevin Sells	
Latitude: 42-09-30.92753		**Julian Day:** 343	**Session No.**
Longitude: 84-42-40.30008		**Start Time:** 3:52	**End Time:** 4:17
Ellip. Height: 286.232m		**Data File Name:**	
Type of Mark: ON GRAVEL		**Type of Reciever:** Trimble [redacted] Internal	
Stamping on Mark:		**Type of Antenna:** Trimble [redacted] Internal	
Weather Condition: PTLY CLOY, 18°		**Antenna Height:** 2.000m	to bottom of antenna mount



GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/9/10
Station Name:	11_LIDAR	Operator Name:	Dave Quinn		
Latitude:	42°09'05.60302	Julian Day:	343	Session No.	
Longitude:	84°07'59.70068	Start Time:	11:42	End Time:	12:07
Ellip. Height:	830.385	Data File Name:			
Type of Mark:	Short Grass	Type of Reciever:	Trimble R8 Internal	4712129959	
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Sunny, 20's	Antenna Height:	2.000m	to bottom of antenna mount	

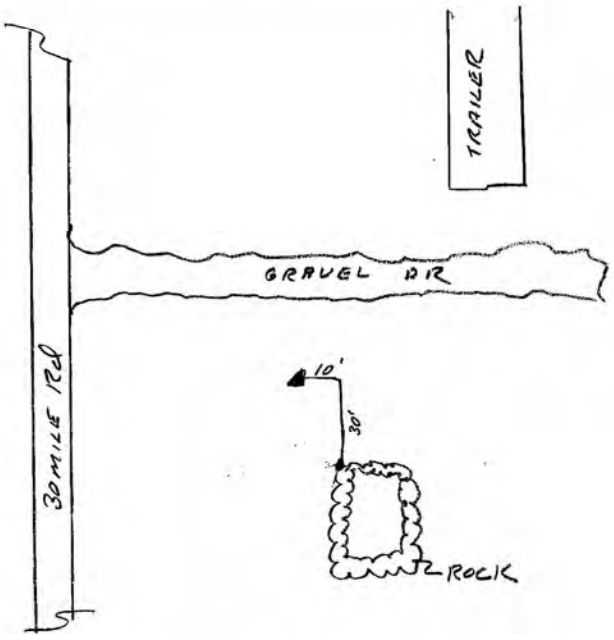


GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12-7-10
Station Name:	12 – SHORT GRASS	Operator Name:	Kevin Sells
Latitude:	42-04-47.49327	Julian Day: 341	Session No.
Longitude:	84-42-34.22054	Start Time: 2:30	End Time: 2:51
Ellip. Height:	272.310m	Data File Name:	
Type of Mark:	SHORT GRASS	Type of Reciever:	Trimble [redacted] Internal
Stamping on Mark:		Type of Antenna:	Trimble [redacted] Internal
Weather Condition:	CLOUDY, 10°	Antenna Height:	2.000m to bottom of antenna mount

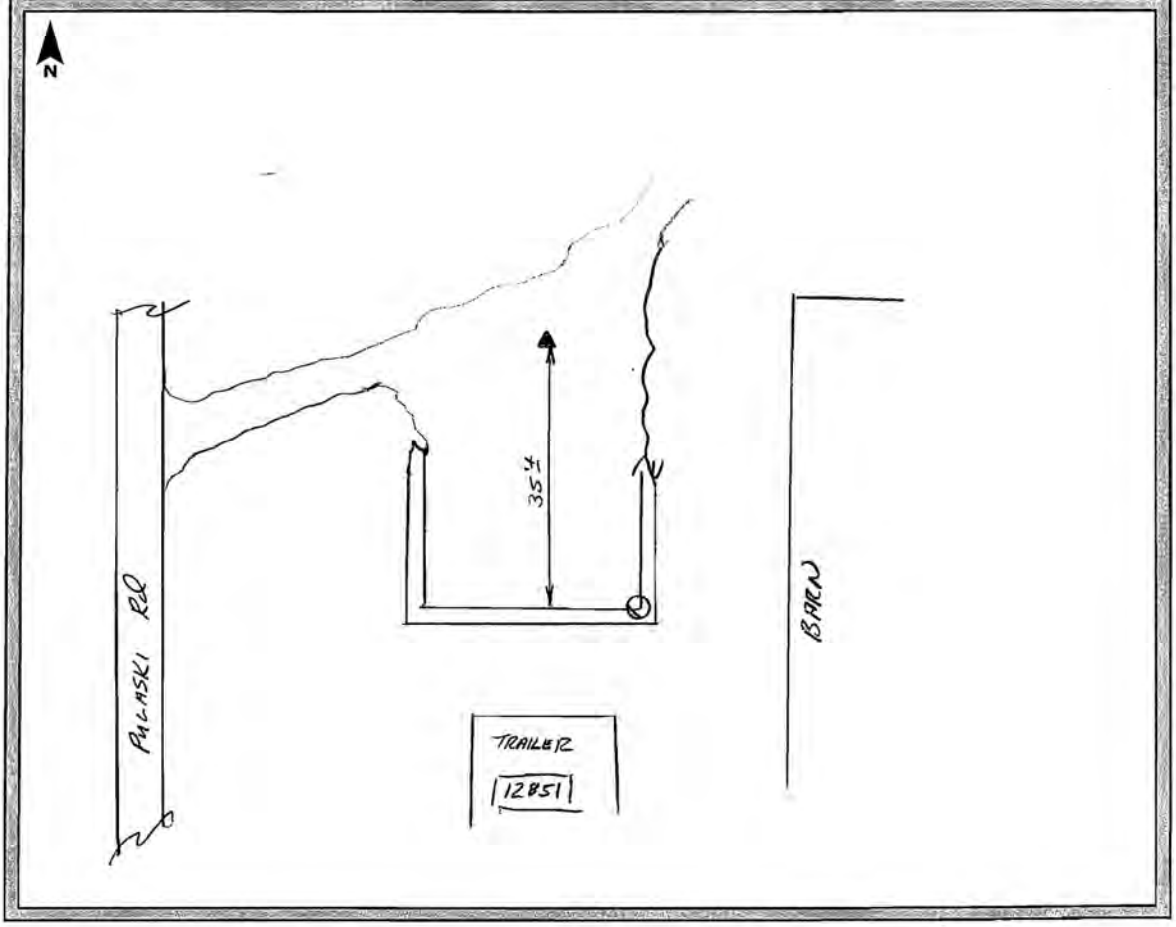
N

BATTERY ON DATA COLLECTOR TO LOW



GPS Observation Log Sheet

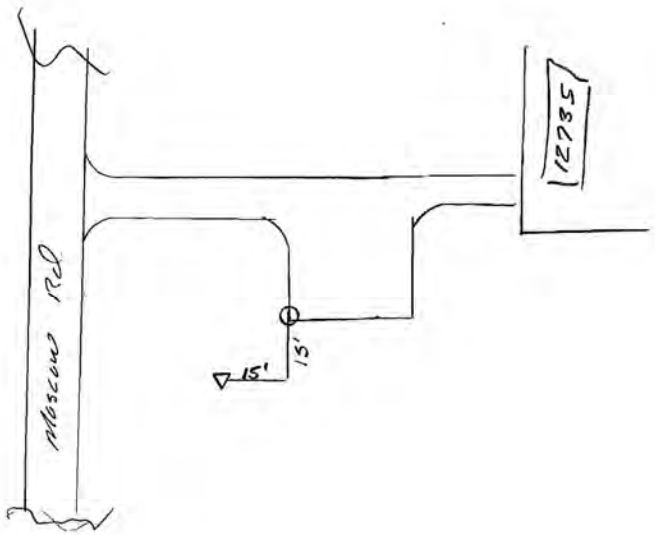
Project Name:		**Project Number:**	70840	**Survey Date:**	12-7-10
Station Name:	13 – GRAVEL	**Operator Name:**	Kevin Sells		
Latitude:	42-04-36.35216	**Julian Day:**	341	**Session No.**	
Longitude:	84-38-42.82886	**Start Time:**	12:27	**End Time:**	12:53
Ellip. Height:	301.463m	**Data File Name:**			
Type of Mark:	ON GRAVEL	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:		**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	LT. SNOW COVER, 10°	**Antenna Height:**	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

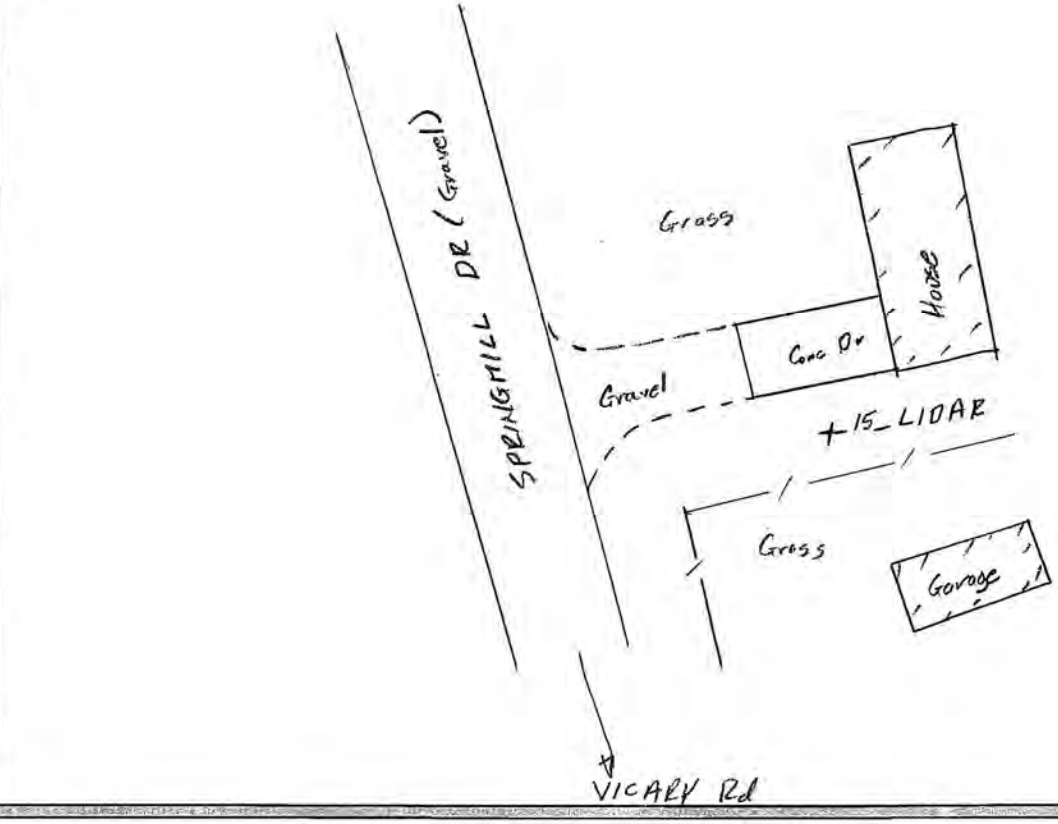
Project Name:		**Project Number:** 70840	**Survey Date:** 12-1-10
Station Name: 14_SHORT GRASS		**Operator Name:** Kevin Seils	
Latitude: 42-04-29.02618		**Julian Day:** 341	**Session No.**
Longitude: 84-30-59.85250		**Start Time:** 3:45	**End Time:** 4:05
Ellip. Height: 303.508M		**Data File Name:**	
Type of Mark: GROUND		**Type of Reciever:** Trimble ■ Internal	
Stamping on Mark:		**Type of Antenna:** Trimble ■ Internal	
Weather Condition: CLOUDY, 12°		**Antenna Height:** 2.000m	to bottom of antenna mount

N



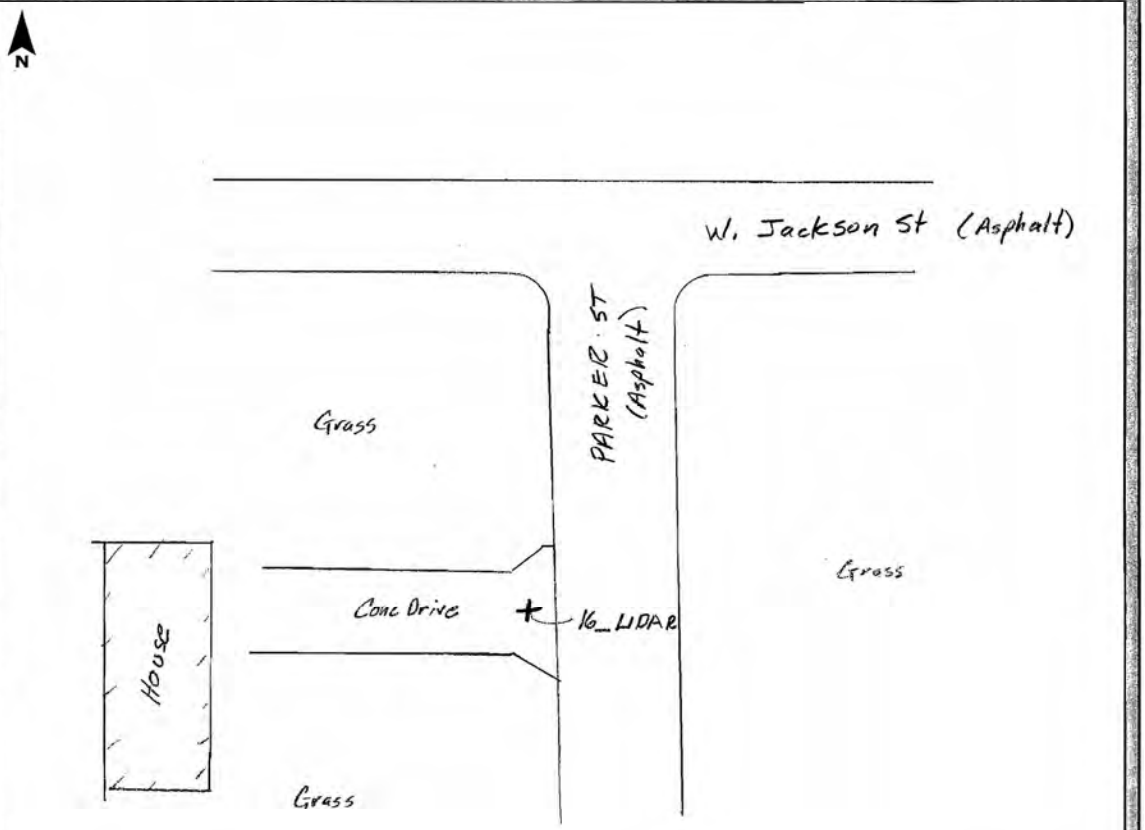
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/9/10
Station Name:	15_LIDAR	Operator Name:	Dave Quinn
Latitude:	42°04'25.01940	Julian Day: 343	Session No.
Longitude:	84° 25' 45.00675	Start Time: 4:50	End Time: 5:12
Ellip. Height:	953.737	Data File Name:	
Type of Mark:	SHORT GRASS	Type of Reciever: Trimble R8 Internal	4712129959
Stamping on Mark:	None	Type of Antenna: Trimble R8 Internal	
Weather Condition:	Cloudy, 20s	Antenna Height: 2.000m	to bottom of antenna mount



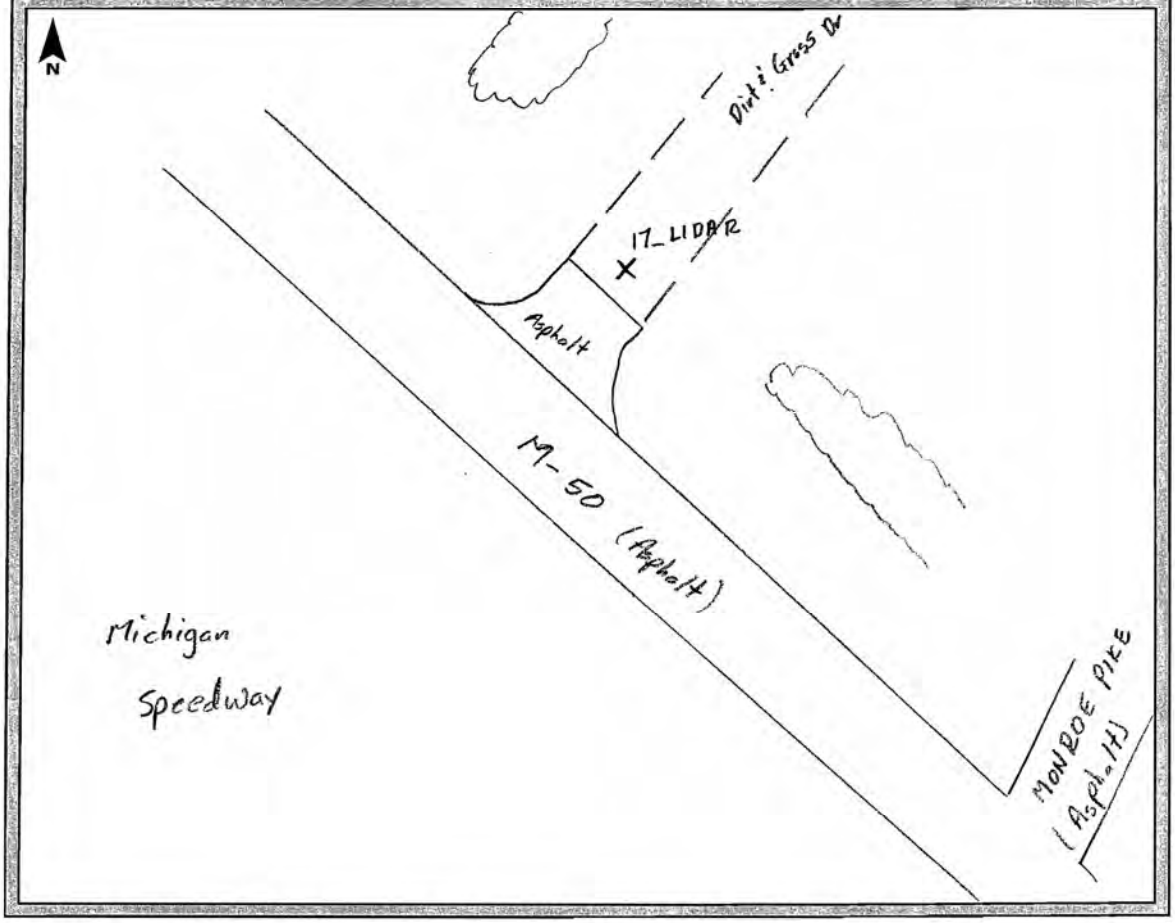
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/8/12
Station Name:	16_LIDAR	Operator Name:	Dave Quinn
Latitude:	42°04'23.26206	Julian Day: 342	Session No.
Longitude:	84°19'54.35338	Start Time: 9:06	End Time: 9:27
Ellip. Height:	953.485	Data File Name:	
Type of Mark:	CONC DRIVE	Type of Reciever:	Trimble R8 Internal 4712129959
Stamping on Mark:	NONE	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's, Snowing	Antenna Height: 2.000m	to bottom of antenna mount



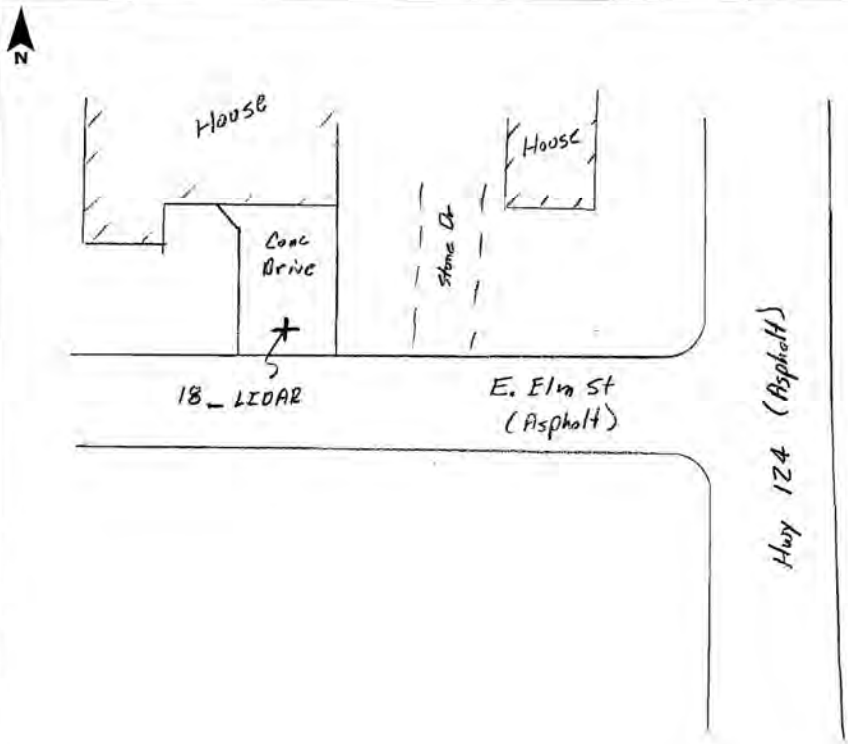
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/8/10
Station Name:	17_LIDAR	Operator Name:	Dave Quinn		
Latitude:	42°04'23.27232	Julian Day:	352	Session No.	
Longitude:	84° 13' 48.26185	Start Time:	10:13	End Time:	10:35
Ellip. Height:	856.237	Data File Name:			
Type of Mark:	Dirt & Grass	Type of Reciever:	Trimble R8 Internal	4712129959	
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Clouding, 20's, Snowing	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/8/10
Station Name:	18_LIDAR	Operator Name:	Dave Quinn
Latitude:	42° 04' 29.41282	Julian Day: 342	Session No.
Longitude:	84° 08' 15.26679	Start Time: 11:14	End Time: 11:34
Ellip. Height:	869.100	Data File Name:	
Type of Mark:	CONC DRIVE	Type of Reciever:	Trimble R8 Internal 4712129959
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's	Antenna Height:	2.000m to bottom of antenna mount

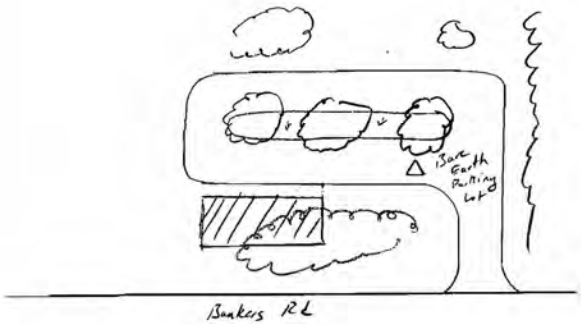


GPS Observation Log Sheet

Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	07 Dec 2010
Station Name:	19. Bare Earth	**Operator Name:**	Jeff Robotham		
Latitude:	41 - 53 - 02. 87	**Julian Day:**	341	**Session No.**	2
Longitude:	84 - 48 - 10.80	**Start Time:**	11:25	**End Time:**	12:00
Ellip. Height:	927. 9'	**Data File Name:**	6293 341 1		
Type of Mark:	Bare Earth	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	None	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	21° windy	**Antenna Height:**	2.000m	to bottom of antenna mount	

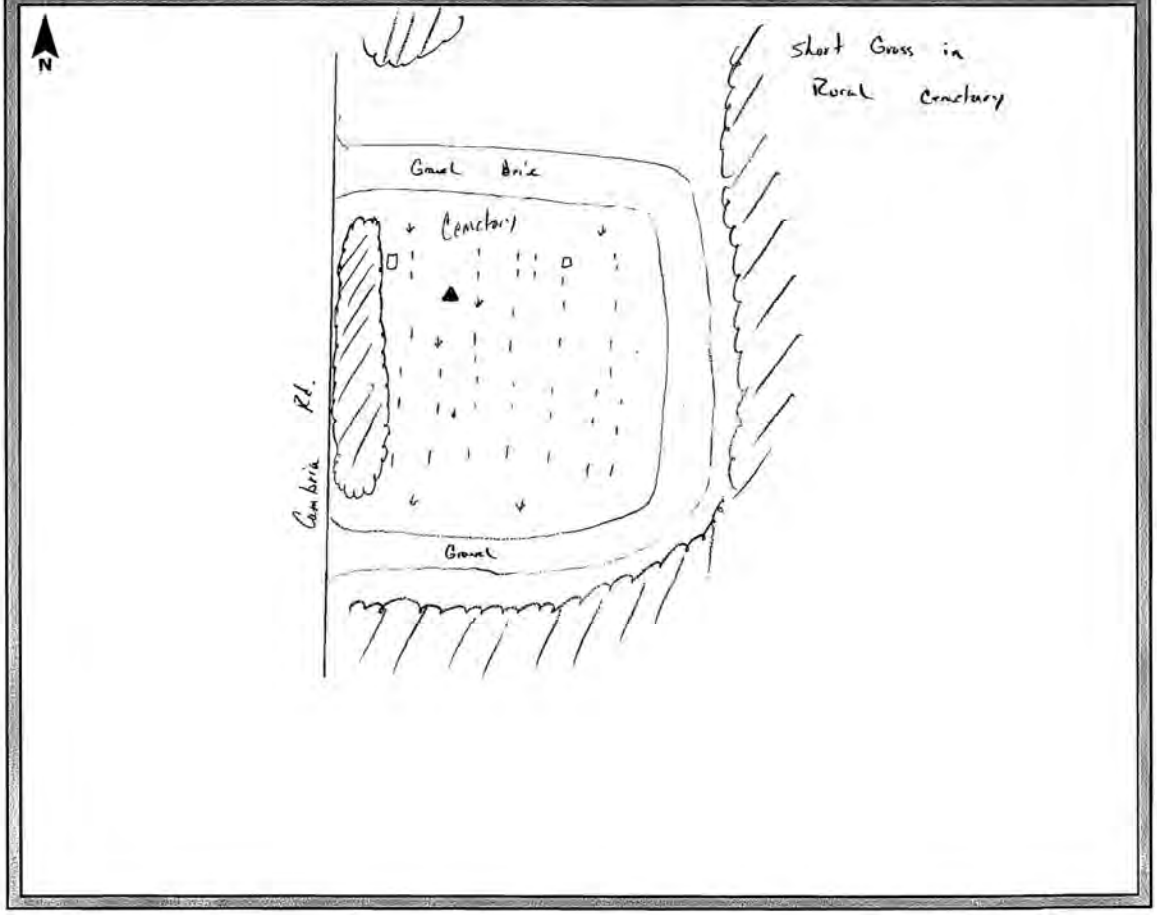
N

Bare Earth Parking Lot @ the Coon Hunters Club. Reading



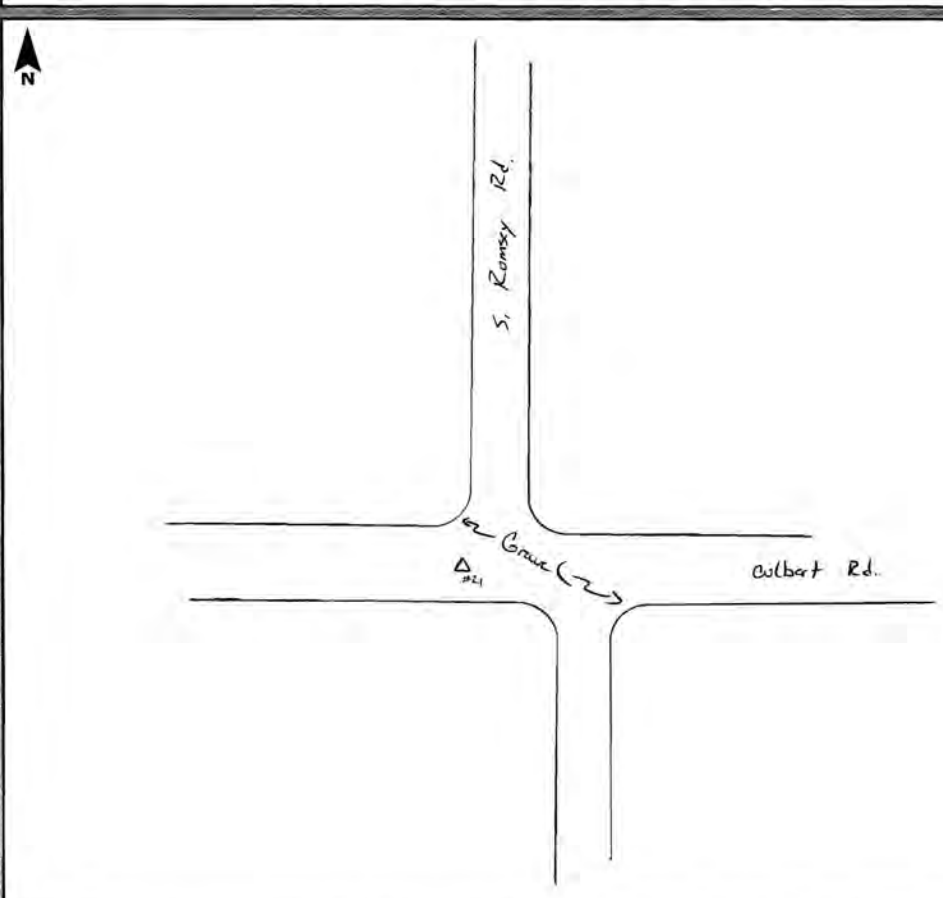
GPS Observation Log Sheet

Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:** 70840	**Survey Date:** 07 Dec 2010
Station Name:	20- Short Grass	**Operator Name:**	Jeff Robotham
Latitude:	41-54-02.02	**Julian Day:** 341	**Session No.** 1
Longitude:	84-39-02.92	**Start Time:** 10:16	**End Time:** 10:41
Ellip. Height:	1057.8'	**Data File Name:**	6293 3410
Type of Mark:	Short Grass	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	None	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	20° windy	**Antenna Height:** 2.000m	to bottom of antenna mount



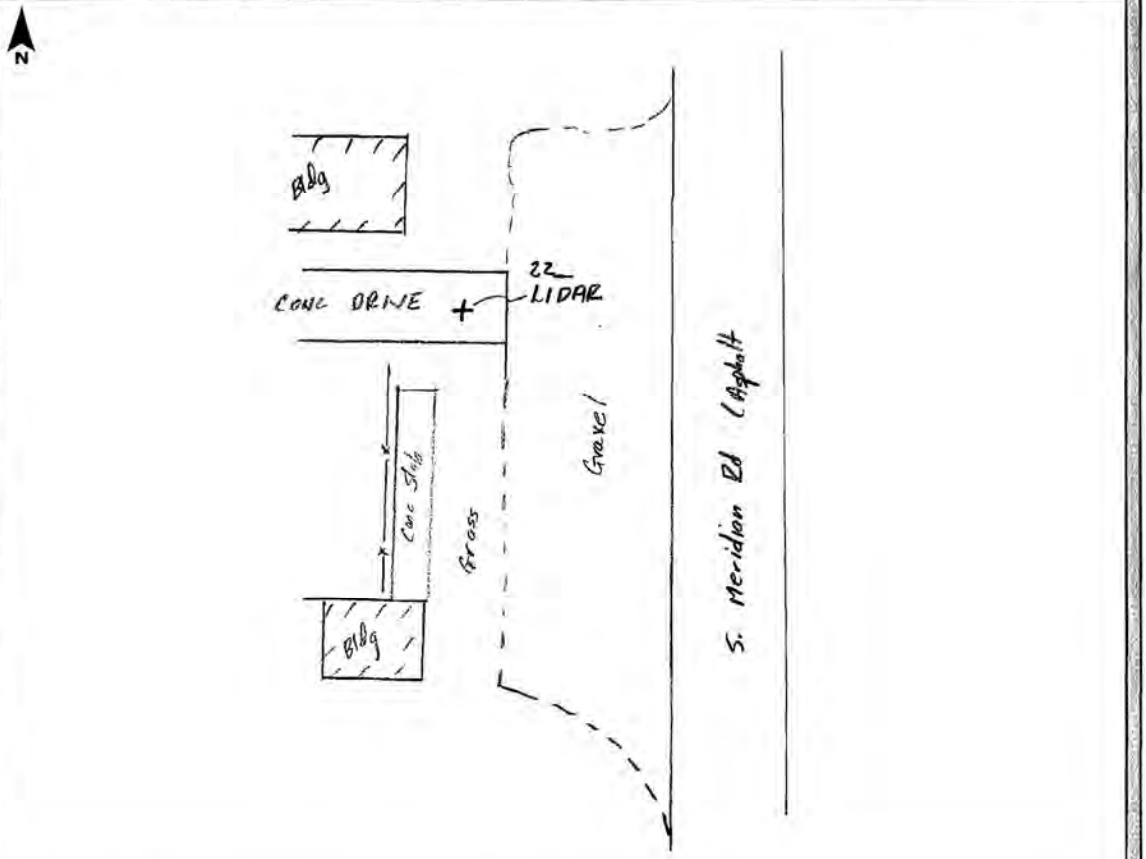
GPS Observation Log Sheet

Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	08 Dec 2010
Station Name:	Z1_ Gravel	**Operator Name:**	Jeff Robotham		
Latitude:	41-53-53.96	**Julian Day:**	342	**Session No.**	6
Longitude:	84-29-45.82	**Start Time:**	15:35	**End Time:**	
Ellip. Height:	1055.9'	**Data File Name:**	6293 342 5		
Type of Mark:	Gravel Road	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	27, windy	**Antenna Height:**	2.000m	to bottom of antenna mount	



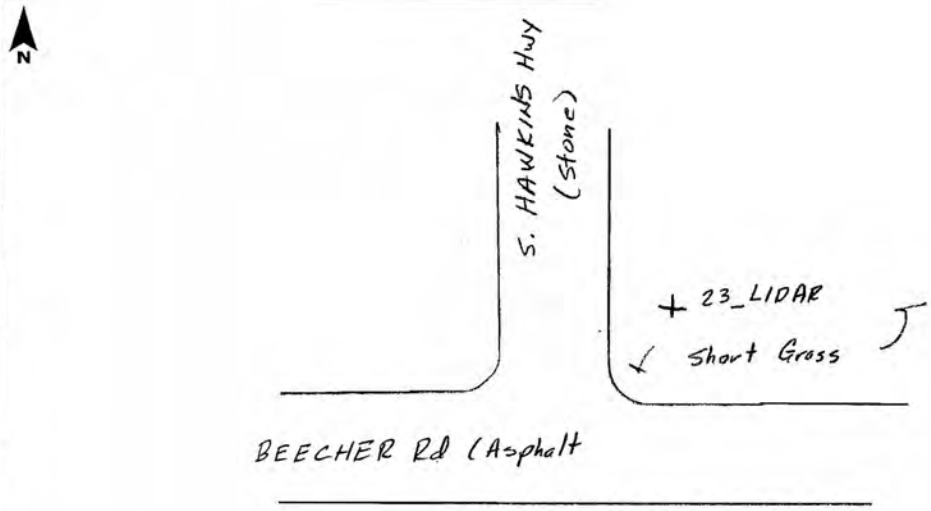
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/8/10
Station Name:	22_LIDAR	Operator Name:	Dave Quinn		
Latitude:	41° 53' 36.32542	Julian Day:	342	Session No.	
Longitude:	84° 22' 01.40640	Start Time:	4:58	End Time:	5:18
Ellip. Height:	841.818	Data File Name:			
Type of Mark:	CONC DRIVE	Type of Reciever:	Trimble R8 Internal		4712129959
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Cloudy, 20s	Antenna Height:	2.000m	to bottom of antenna mount	



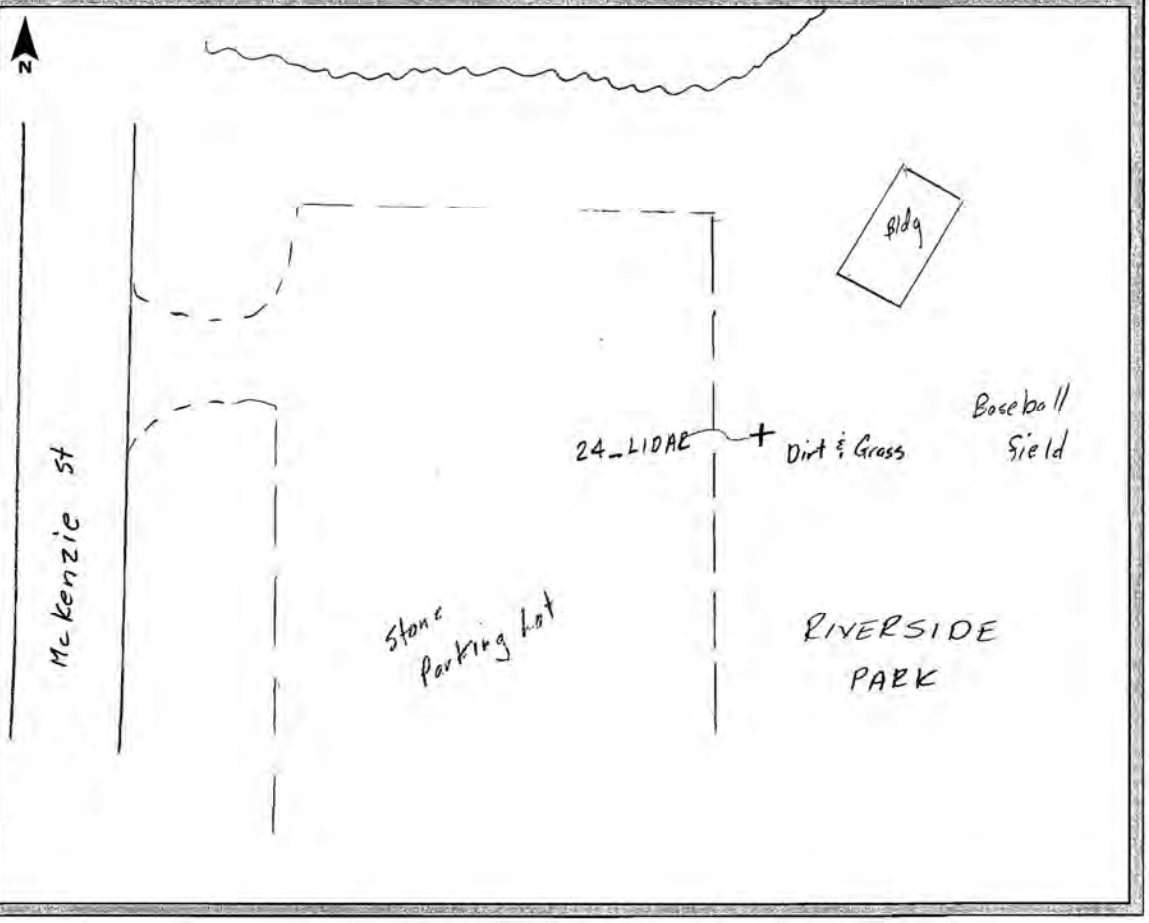
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/8/10
Station Name:	23_LIDAR	Operator Name:	Dave Quinn
Latitude:	41° 53' 10.83090	Julian Day: 342	Session No.
Longitude:	84° 13' 24.28220	Start Time: 4:22	End Time: 4:42
Ellip. Height:	777.935	Data File Name:	
Type of Mark:	SHORT GRASS	Type of Reciever: Trimble R8 Internal	47121299599
Stamping on Mark:	None	Type of Antenna: Trimble R8 Internal	
Weather Condition:	Cloudy, 20s	Antenna Height: 2.000m	to bottom of antenna mount



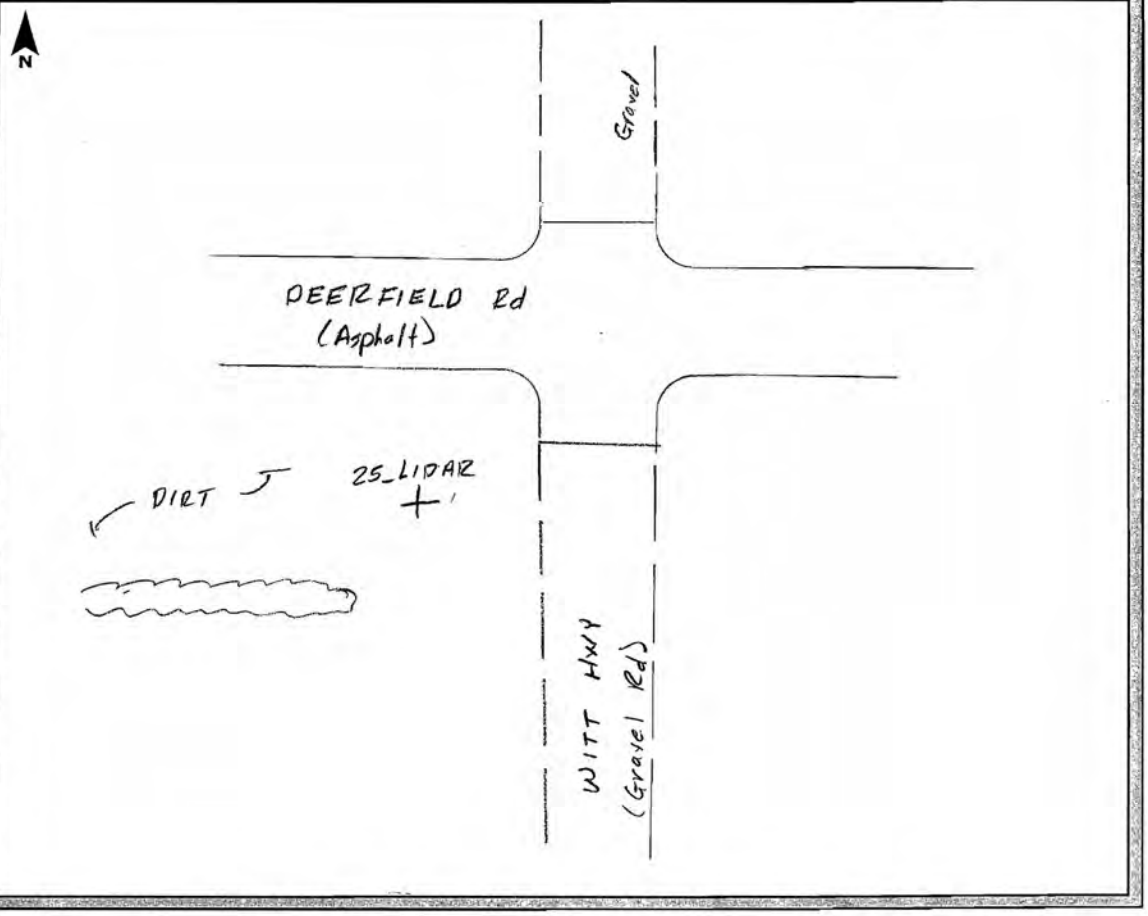
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/8/10
Station Name:	24_LIDAR	Operator Name:	Dave Quinn		
Latitude:	41° 53' 32.32609	Julian Day:	342	Session No.	
Longitude:	84° 02' 51.50520	Start Time:	12:47	End Time:	1:07
Ellip. Height:	650.759	Data File Name:			
Type of Mark:	DIRT & GRASS	Type of Reciever:	Trimble R8 Internal	4712129959	
Stamping on Mark:	NONE	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Cloudy, 20's	Antenna Height:	2.000m	to bottom of antenna mount	



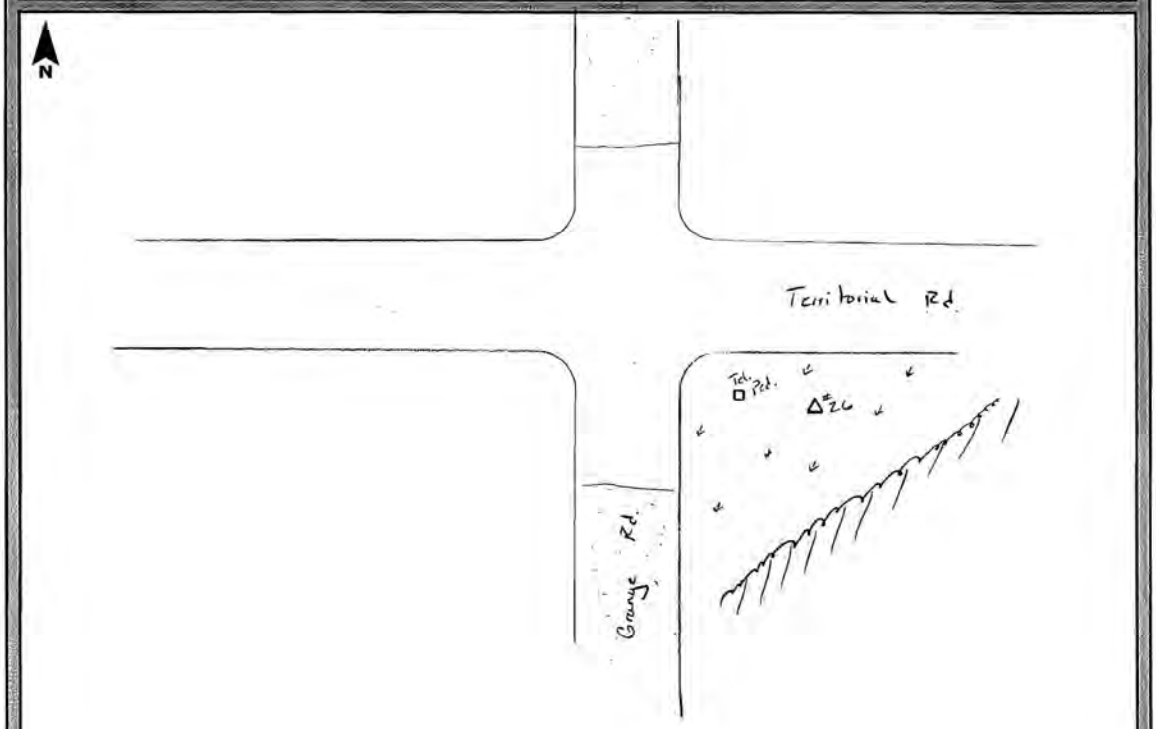
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/7/10
Station Name:	25_LIDAR	Operator Name:	Dave Quinn
Latitude:	41°53' 07.32202	Julian Day: 341	Session No.
Longitude:	83° 48' 46.83259	Start Time: 3:12	End Time: 3:33
Ellip. Height:	558.504	Data File Name:	
Type of Mark:	DIRT	Type of Reciever:	Trimble R8 Internal
Stamping on Mark:	NONE	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's, Windy	Antenna Height:	2.000m to bottom of antenna mount



GPS Observation Log Sheet

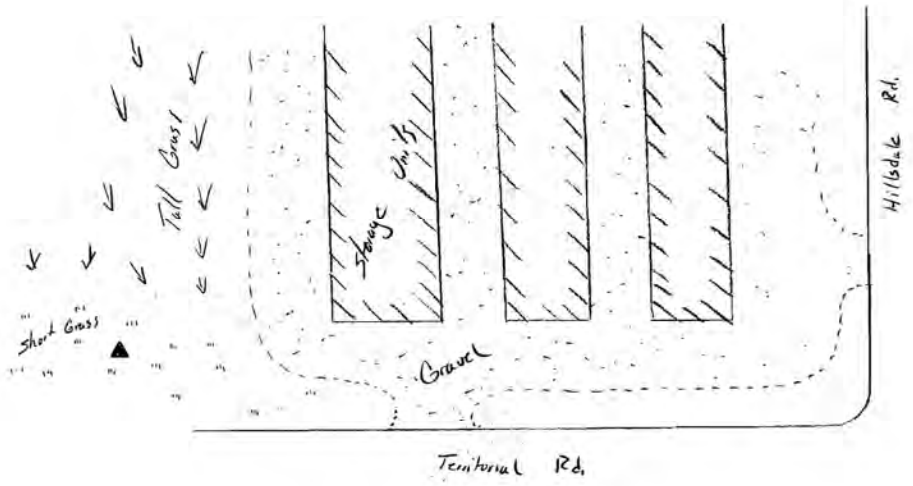
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	07 Dec 2010
Station Name:	26- Med. Grass	**Operator Name:**	Jeff Robotham		
Latitude:	41- 42- 27.00	**Julian Day:**	341	**Session No.**	4
Longitude:	84 -47 -10. 51	**Start Time:**	13:45	**End Time:**	14.06
Ellip. Height:	935. 7'	**Data File Name:**	6293341 3		
Type of Mark:	Med Grass	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	23° Wind.	**Antenna Height:**	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

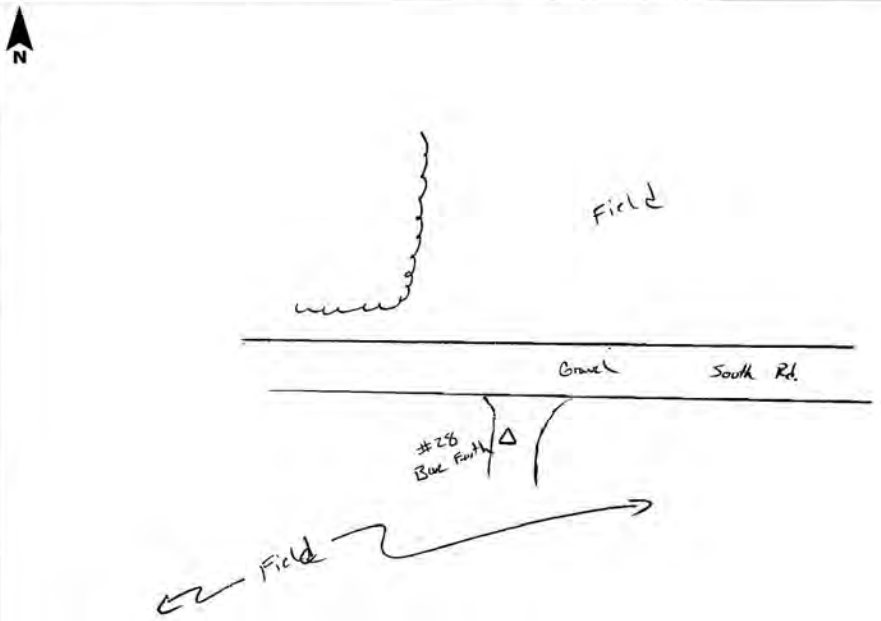
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	07 Dec 2010
Station Name:	27- Short Grass	**Operator Name:**	Jeff Robotham		
Latitude:	41- 42- 32.22	**Julian Day:**	341	**Session No.**	5
Longitude:	84- 37- 57.67	**Start Time:**	14:53	**End Time:**	15:09
Ellip. Height:	836.1'	**Data File Name:**	6293 341 4		
Type of Mark:	Short Grass	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	26° Windy	**Antenna Height:**	2.000m	to bottom of antenna mount	

N



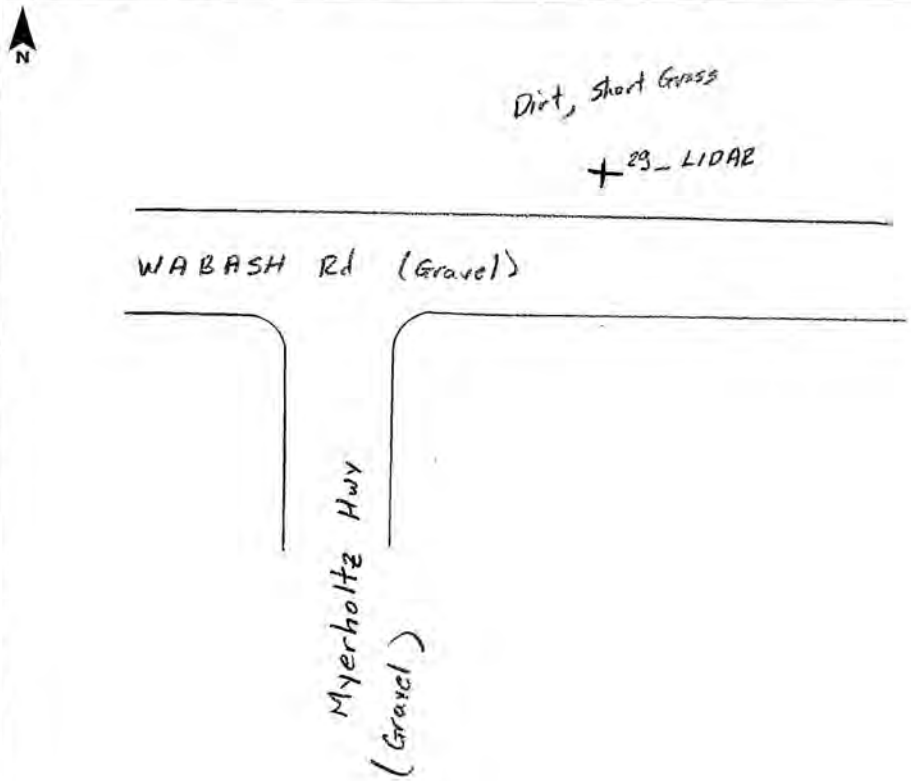
GPS Observation Log Sheet

Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	07 Dec 2010
Station Name:	28_Bare Earth	**Operator Name:**	Jeff Robotham		
Latitude:	41 -43- 00.29	**Julian Day:**	341	**Session No.**	7
Longitude:	84 -25- 35.19	**Start Time:**	16:31	**End Time:**	17:03
Ellip. Height:	778.8'	**Data File Name:**	6293 341 6		
Type of Mark:	Bare Earth	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	25°, Windy	**Antenna Height:**	2.000m	to bottom of antenna mount	



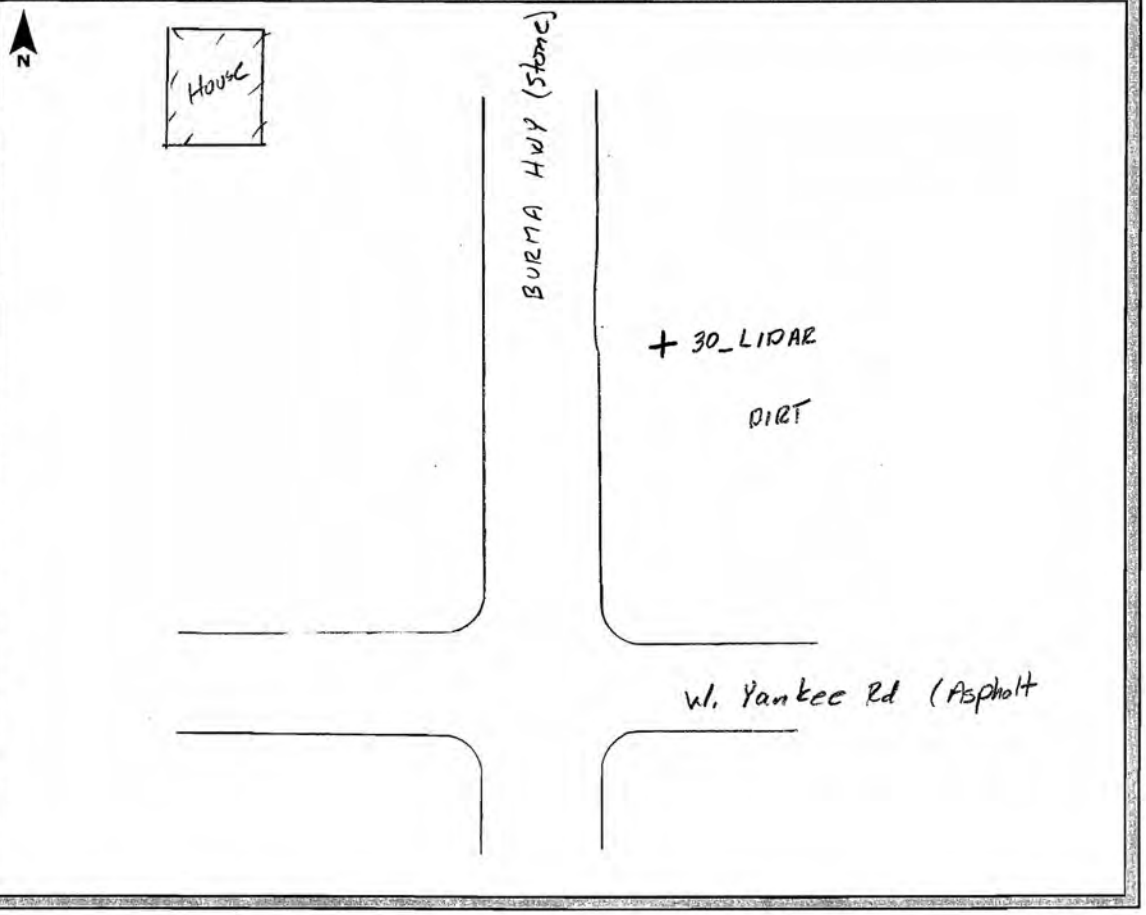
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/8/10
Station Name:	29_LIDAR	Operator Name:	Dave Quinn		
Latitude:	41° 43' 21.40144	Julian Day:	342	Session No.	
Longitude:	84° 18' 31.58140	Start Time:	3:07	End Time:	3:28
Ellip. Height:	723.822	Data File Name:			
Type of Mark:	DIRT & SHORT GRASS	Type of Reciever:	Trimble R8 Internal	4712123959	
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Cloudy, 20's	Antenna Height:	2.000m	to bottom of antenna mount	



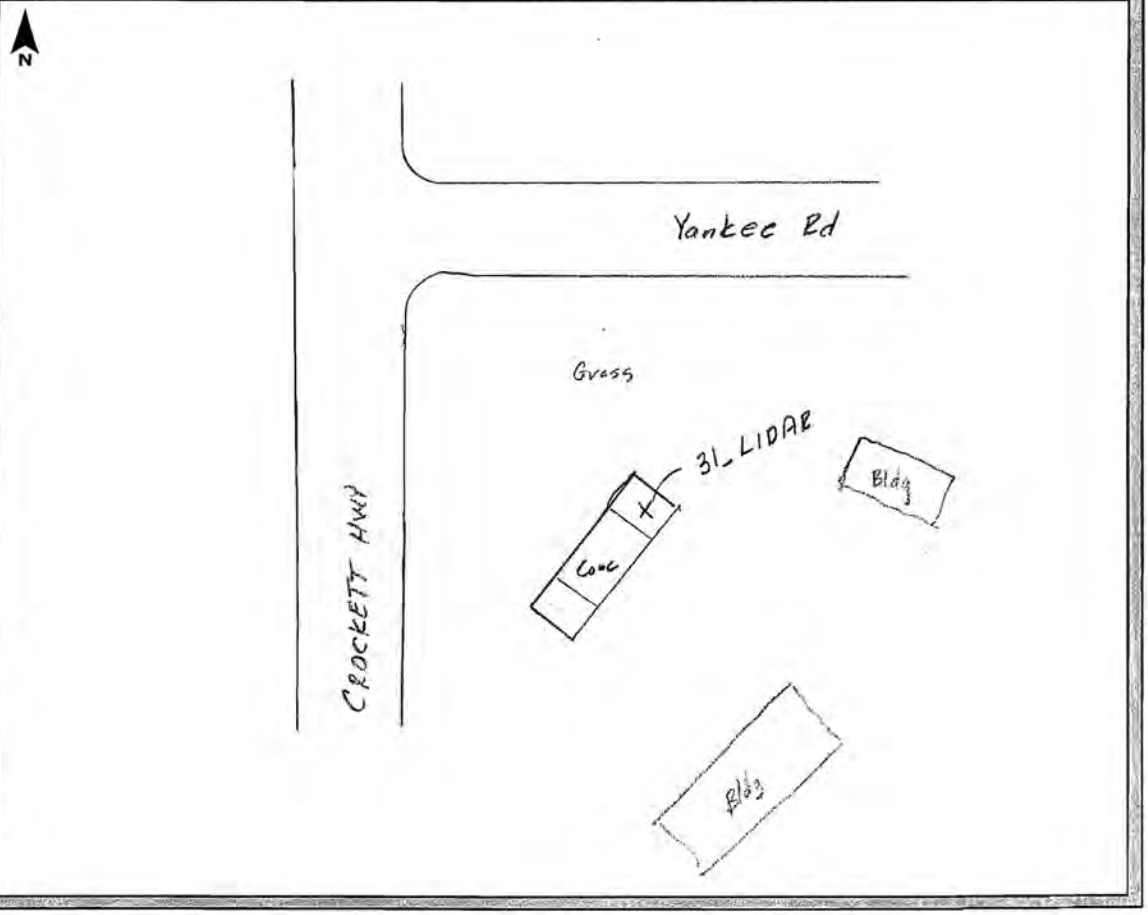
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/8/10
Station Name:	30_LIDAR	Operator Name:	Dave Quinn		
Latitude:	41°43' 37.60534"	Julian Day:	342	Session No.	
Longitude:	84°04' 20.61512	Start Time:	2:15	End Time:	2:36
Ellip. Height:	657.884	Data File Name:			
Type of Mark:	DIRT	Type of Reciever:	Trimble R8 Internal	4712129959	
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Cloudy, 20's	Antenna Height:	2.000m	to bottom of antenna mount	



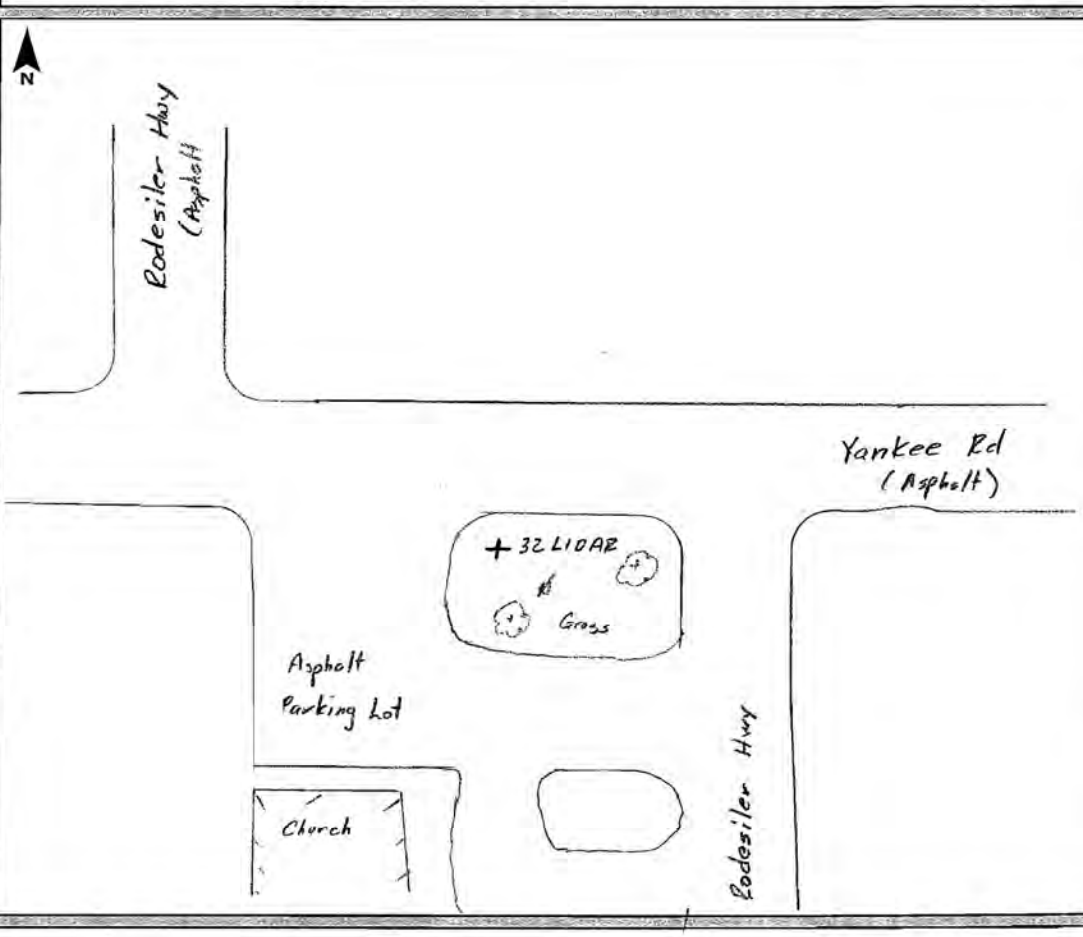
GPS Observation Log Sheet

Project Name:		**Project Number:**	70840	**Survey Date:**	12/7/10
Station Name:	31_LIDAR	**Operator Name:**	Dave Quinn		
Latitude:	41°43'44.11238	**Julian Day:**	341	**Session No.**	
Longitude:	83°55'08.41659	**Start Time:**	4:40	**End Time:**	5:00
Ellip. Height:	608.799	**Data File Name:**			
Type of Mark:	Conc Slab	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	None	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	Cloudy, 20's, Windy	**Antenna Height:**	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

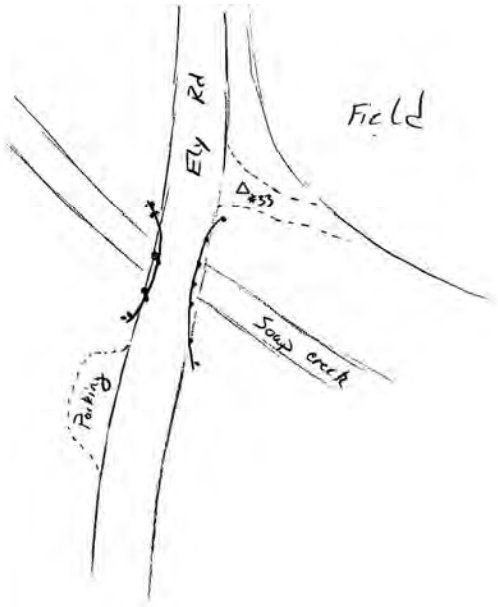
Project Name:		Project Number: 70840	Survey Date: 12/7/10
Station Name:	32_LIDAR	Operator Name:	Dave Quinn
Latitude:	41° 43' 50.28455	Julian Day: 341	Session No.
Longitude:	83° 46' 54.72570	Start Time: 4:04	End Time: 4:25
Ellip. Height:	579.426	Data File Name:	
Type of Mark:	Short Grass	Type of Reciever:	Trimble R8 Internal
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's, Windy	Antenna Height:	2.000m to bottom of antenna mount



GPS Observation Log Sheet

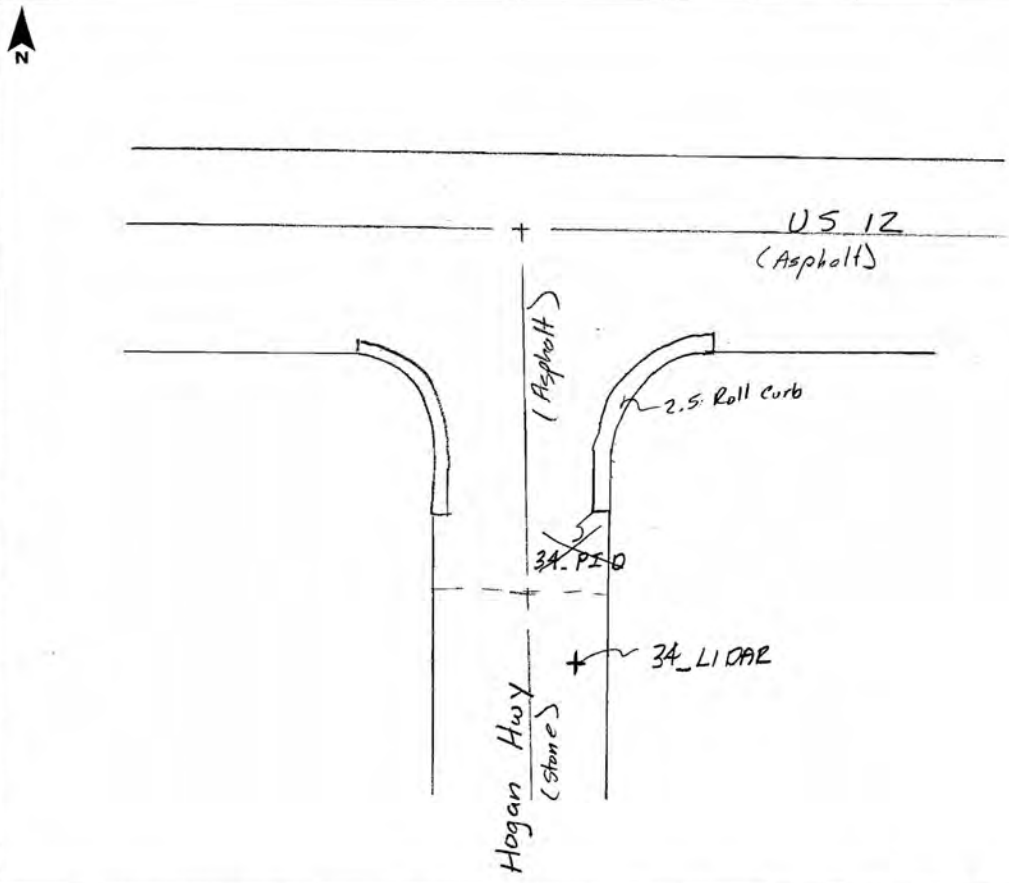
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	08 Dec 2010
Station Name:	33_ Earth/Gravel	**Operator Name:**	Jeff Robotham		
Latitude:	42-04-07.31	**Julian Day:**	342	**Session No.**	7
Longitude:	84-30-01.45	**Start Time:**	16:49	**End Time:**	17:09
Ellip. Height:	864.1'	**Data File Name:**	6293 342 6		
Type of Mark:	Earth/Gravel (Field entrance)	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	25°, snowing	**Antenna Height:**	2.000m	to bottom of antenna mount	

N



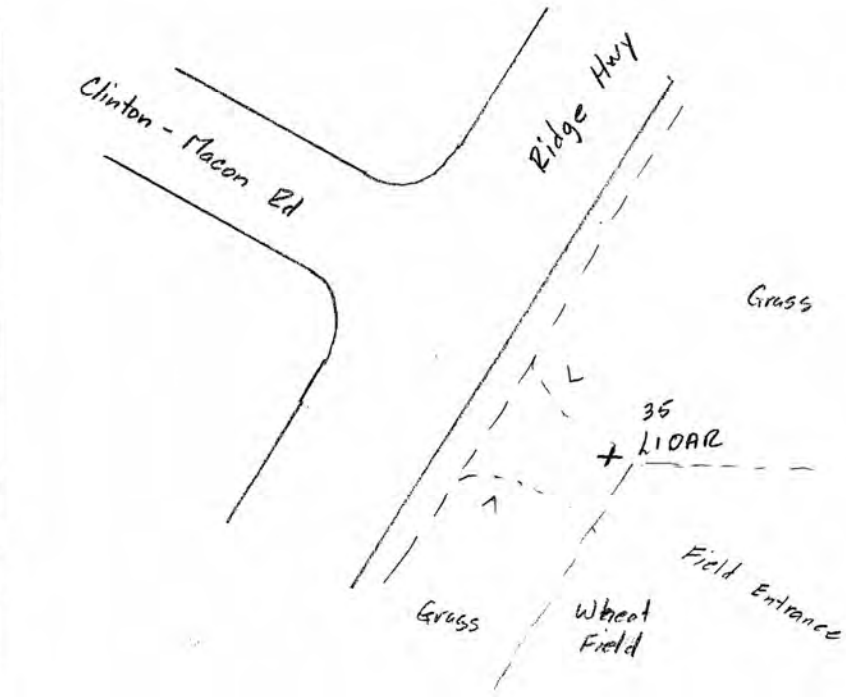
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/7/10
Station Name:	34_PID LIDAR	Operator Name:	Dave Quinn
Latitude:	42°04'15.61036	Julian Day: 341	Session No.
Longitude:	83°59'48.14579	Start Time: 1:09	End Time: 1:08
Ellip. Height:	729.735	Data File Name:	
Type of Mark:	~~Cor Cons Curb~~ Gravel / Stone	Type of Reciever:	Trimble R8 Internal
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's Windy	Antenna Height: 2.000m	to bottom of antenna mount



GPS Observation Log Sheet

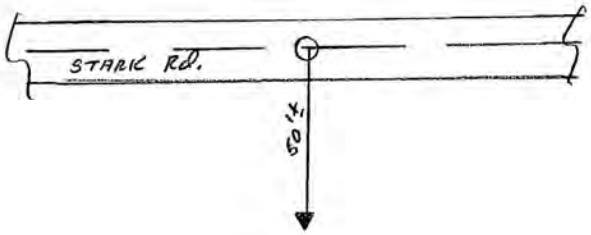
Project Name:		Project Number: 70840	Survey Date: 12/7/10
Station Name:	35_LIDAR	Operator Name:	Dave Quinn
Latitude:	42°03'54.65990	Julian Day: 341	Session No.
Longitude:	83°47'15.00753	Start Time: 1:50	End Time: 2:10
Ellip. Height:	609.47	Data File Name:	
Type of Mark:	Dirt - Short Grass	Type of Reciever:	Trimble R8 Internal
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's, Windy	Antenna Height: 2.000m	to bottom of antenna mount



GPS Observation Log Sheet

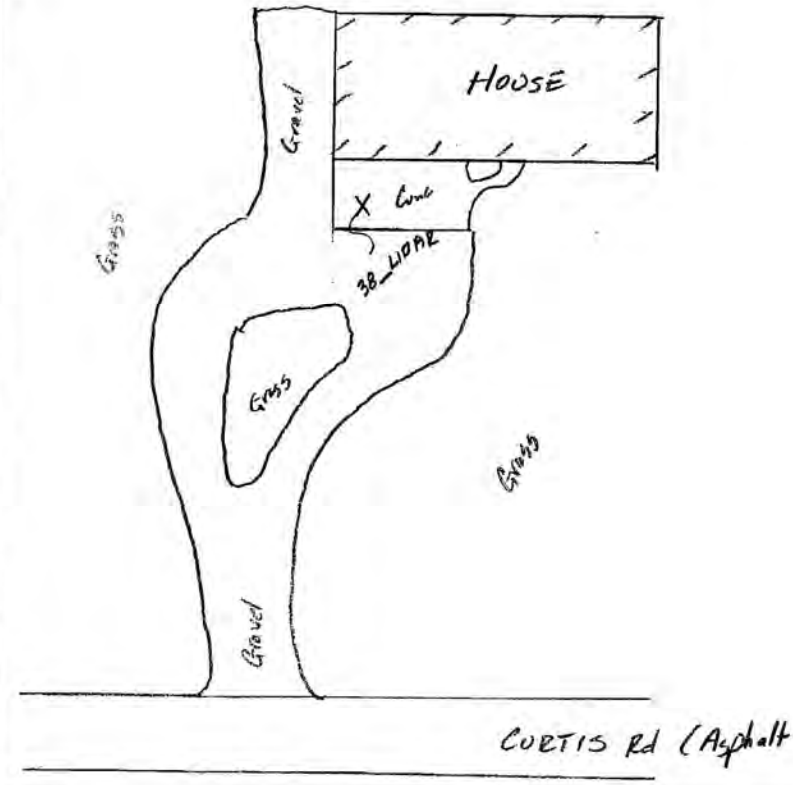
Project Name:		**Project Number:** 70840	**Survey Date:** 12-9-10
Station Name: 36 – DIRT		**Operator Name:** Kevin Sells	
Latitude: 42-21-22.42743		**Julian Day:** 343	**Session No.**
Longitude: 84-42-10.71300		**Start Time:** 11:12	**End Time:** 11:32
Ellip. Height: 258.124		**Data File Name:**	
Type of Mark: CORN FIELD		**Type of Reciever:** Trimble [redacted] Internal	
Stamping on Mark:		**Type of Antenna:** Trimble [redacted] Internal	
Weather Condition: PTLY CLOUDY, 12°		**Antenna Height:** 2.000m	to bottom of antenna mount

N



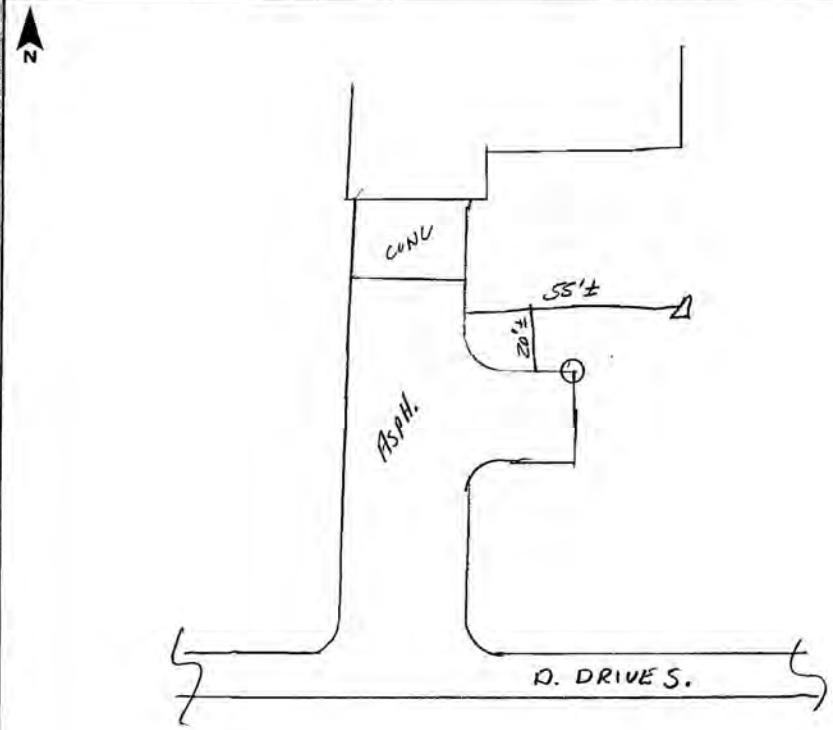
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/9/10
Station Name:	38_LIDAR	Operator Name:	Dave Quinn		
Latitude:	42°12'27.63923	Julian Day:	343	Session No.	
Longitude:	84°08'00.89653	Start Time:	1:34	End Time:	1:55
Ellip. Height:	876.188	Data File Name:			
Type of Mark:	CONC SLAB	Type of Reciever:	Trimble R8 Internal	4712129959	
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Sunny, 20's	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12-9-10
Station Name:	39_ SHORT GRASS	Operator Name:	Kevin Sells		
Latitude:	42-13-03.35883	Julian Day:	343	Session No.	
Longitude:	84-43-10.27558	Start Time:	2:48	End Time:	3:42
Ellip. Height:	274.989M	Data File Name:			
Type of Mark:	ON SHORT GRASS	Type of Reciever:	Trimble [redacted] Internal		
Stamping on Mark:		Type of Antenna:	Trimble [redacted] Internal		
Weather Condition:	PTLY CLDY 18°	Antenna Height:	2.000m	to bottom of antenna mount	

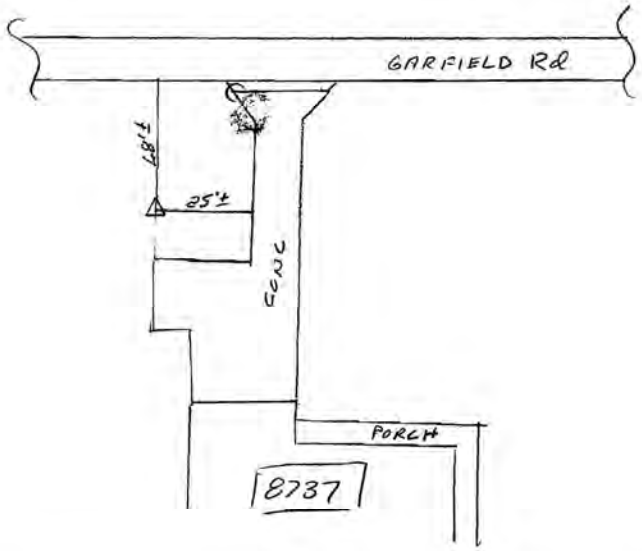


MOVED ROD DIDNOT STORE TILL 3:30

GPS Observation Log Sheet

Project Name:		**Project Number:**	70840	**Survey Date:**	12-9-10
Station Name:	40 – SHORT GRASS	**Operator Name:**	Kevin Sells		
Latitude:	42-20-17.83459	**Julian Day:**	343	**Session No.**	
Longitude:	84-33-19.27548	**Start Time:**	12:31	**End Time:**	12:5
Ellip. Height:	249.315	**Data File Name:**			
Type of Mark:	ON SHORT GRASS	**Type of Reciever:**	Trimble [redacted] Internal		
Stamping on Mark:		**Type of Antenna:**	Trimble [redacted] Internal		
Weather Condition:	PTLY CLDY, 16°	**Antenna Height:**	2.000m	to bottom of antenna mount	

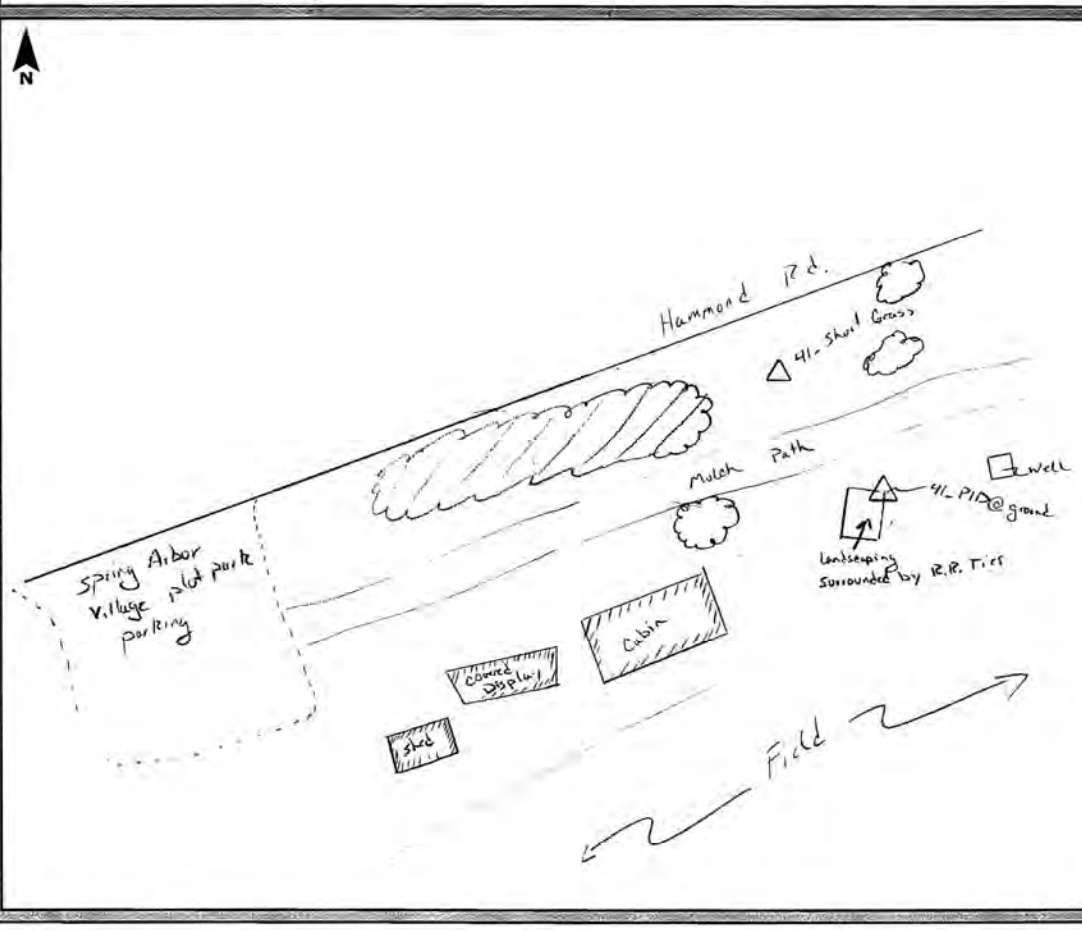
N



GPS Observation Log Sheet

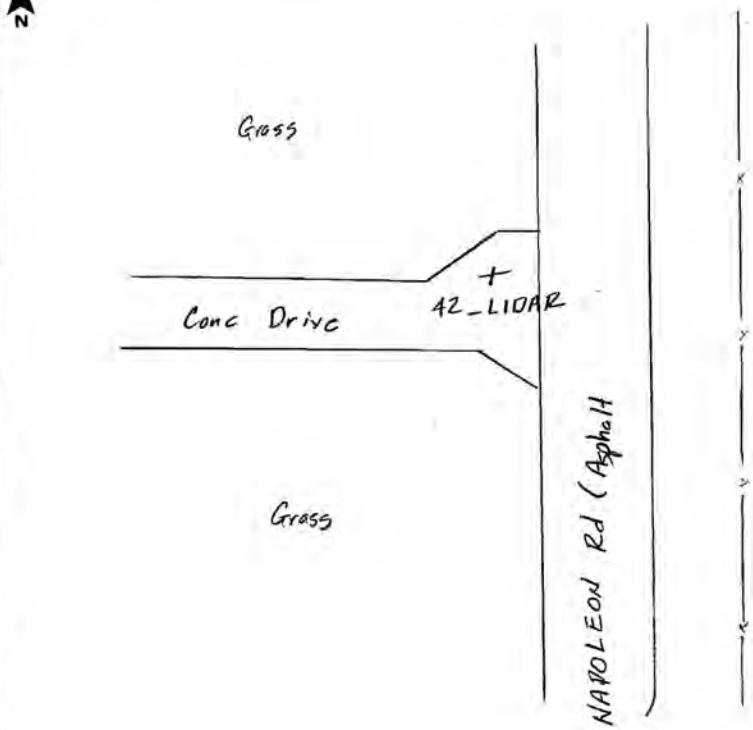
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840
Station Name:	41_ Short Grass 41_PID	**Operator Name:**	Jeff Robotham
Latitude:	42-11-21.67 42-11-21.27	**Julian Day:**	343
Longitude:	84-34-30.38 84-34-30.51	**Start Time:**	16:07 15.40
Ellip. Height:	890.6' 882.9'	**Data File Name:**	6293 343 3 6293 343 2
Type of Mark:	short Grass PID	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	NA NA	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	20°, Windy	**Antenna Height:**	2.000m to bottom of antenna mount

Session No. 4
3



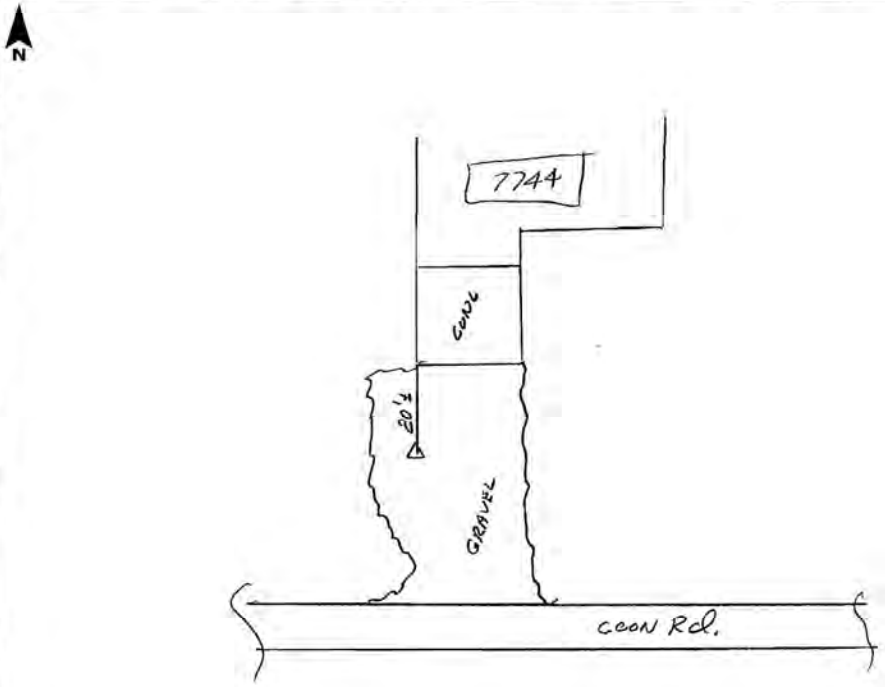
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/3/10
Station Name:	42_LIDAR	Operator Name:	Dave Quinn
Latitude:	42° 09' 52.03478	Julian Day: 343	Session No.
Longitude:	84° 15' 47.33401	Start Time: 3:32	End Time: 3:53
Ellip. Height:	865.158	Data File Name:	
Type of Mark:	Conc Drive	Type of Reciever:	Trimble R8 Internal 4712129959
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Sunny, 20's	Antenna Height: 2.000m	to bottom of antenna mount



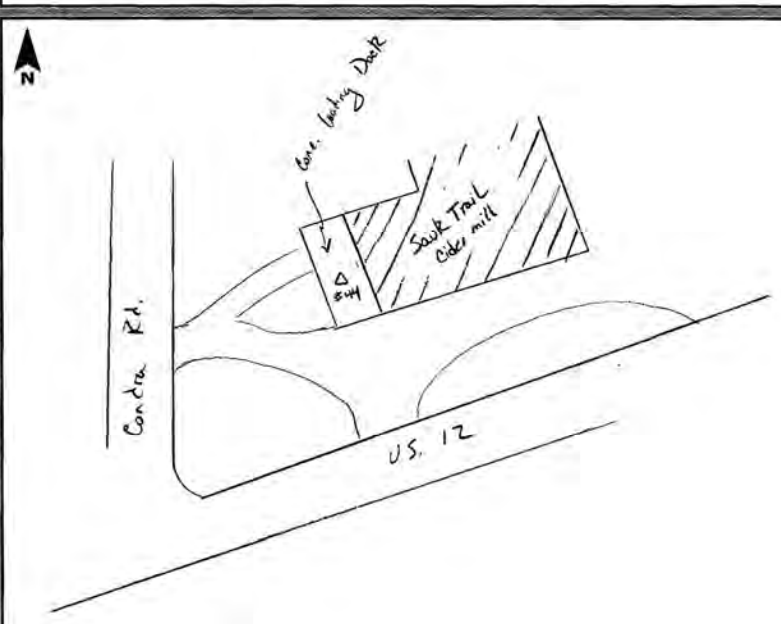
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12-8-10
Station Name:	43 – DIRT	Operator Name:	Kevin Sells		
Latitude:	42-21-52.32105	Julian Day:	342	Session No.	
Longitude:	84-16-32.08221	Start Time:	11:38	End Time:	11:58
Ellip. Height:	250.692m	Data File Name:			
Type of Mark:	ON DIRT	Type of Reciever:	Trimble ■ Internal		
Stamping on Mark:		Type of Antenna:	Trimble ■ Internal		
Weather Condition:	LT SNOW COVER, 24°	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

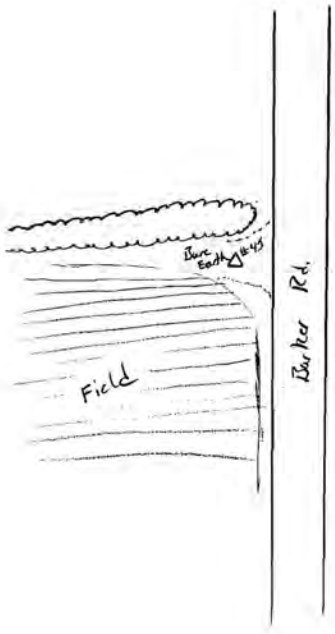
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	08 Dec 2010
Station Name:	44 - Conc.	**Operator Name:**	Jeff Robotham		
Latitude:	41 - 57 - 41.00	**Julian Day:**	342	**Session No.**	2
Longitude:	84 - 44 - 52.37	**Start Time:**	11:33	**End Time:**	
Ellip. Height:	980.8'	**Data File Name:**	6293 342 1		
Type of Mark:	Conc. loading dock	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	25°, snow	**Antenna Height:**	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

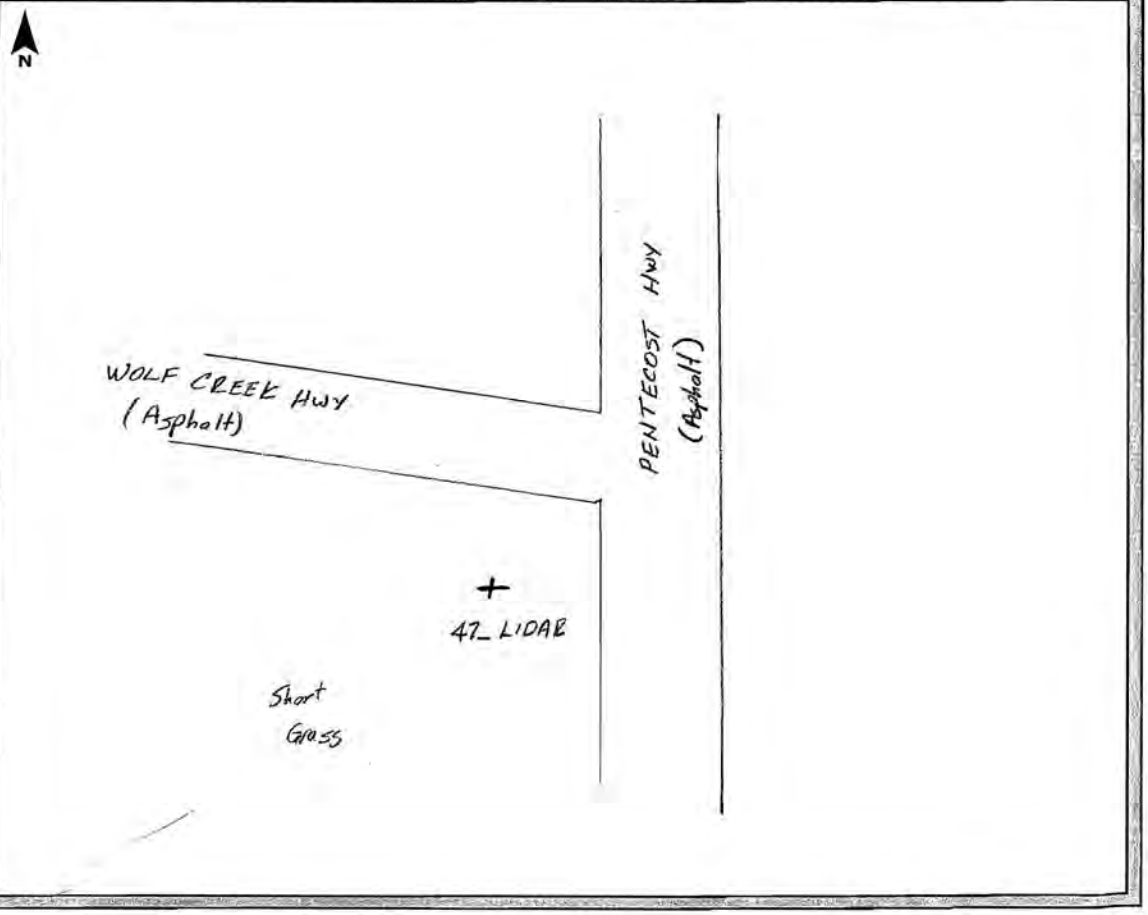
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:** 70840	**Survey Date:** 08 Dec 2010
Station Name:	45. Bare Earth	**Operator Name:**	Jeff Robotham
Latitude:	41 - 58 - 31.35	**Julian Day:** 342	**Session No.** 3
Longitude:	84 - 33 - 31.97	**Start Time:** 12:46	**End Time:**
Ellip. Height:	1066.5'	**Data File Name:**	6293 342 2
Type of Mark:	Bare Earth	**Type of Reciever:**	Trimble R8 Internal
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal
Weather Condition:	25°	**Antenna Height:** 2.000m	to bottom of antenna mount

N



GPS Observation Log Sheet

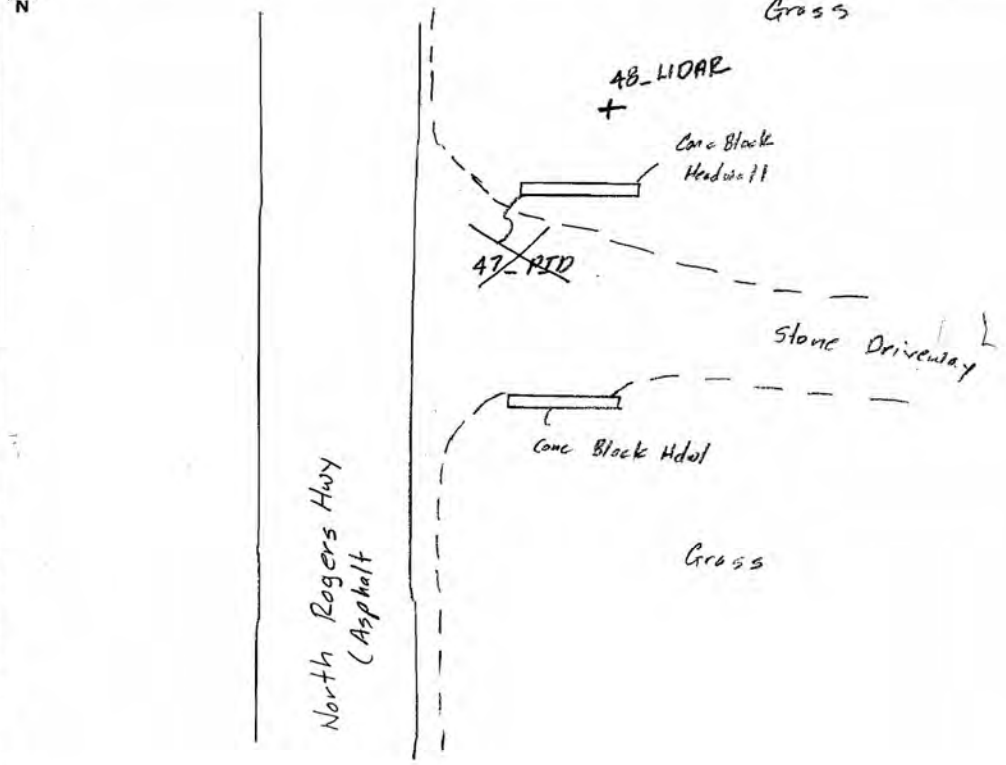
Project Name:		Project Number: 70840	Survey Date: 12/8/10
Station Name:	47_LIDAR	Operator Name:	Dave Quinn
Latitude:	41°57' 55.12569	Julian Day: 342	Session No.
Longitude:	84°06' 50.87724	Start Time: 12:01	End Time: 12:23 21
Ellip. Height:	772.288	Data File Name:	
Type of Mark:	SHORT GRASS	Type of Reciever: Trimble R8 Internal	4712129959
Stamping on Mark:	None	Type of Antenna: Trimble R8 Internal	
Weather Condition:	Cloudy, 20's	Antenna Height: 2.000m	to bottom of antenna mount



GPS Observation Log Sheet

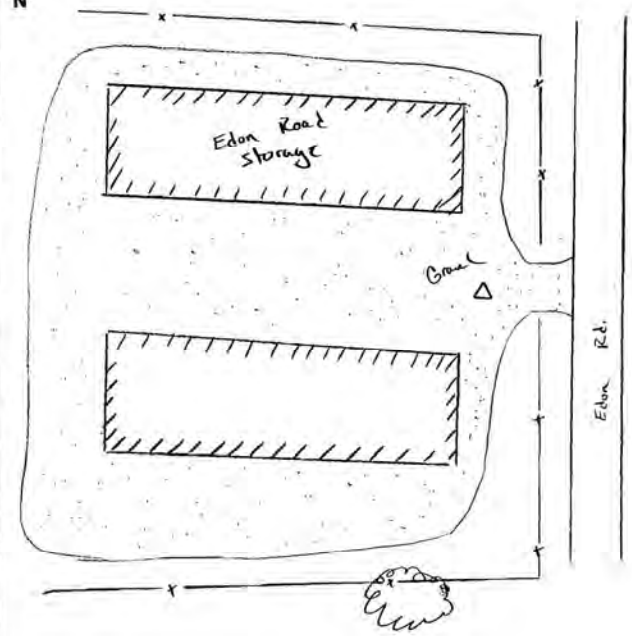
Project Name:		Project Number: 70840	Survey Date: 12/7/10
Station Name:	48_LIDAR	Operator Name:	Dave Quinn
Latitude:	41° 57' 34.28217°	Julian Day: 341	Session No.
Longitude:	83° 55' 34.17890	Start Time: 2:35	End Time:
Ellip. Height:	682.533	Data File Name:	
Type of Mark:	Cor Conc Block Headwall	Type of Reciever:	Trimble R8 Internal
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	P. Cloudy, 20's, Windy	Antenna Height: 2.000m	to bottom of antenna mount

102-2380



GPS Observation Log Sheet

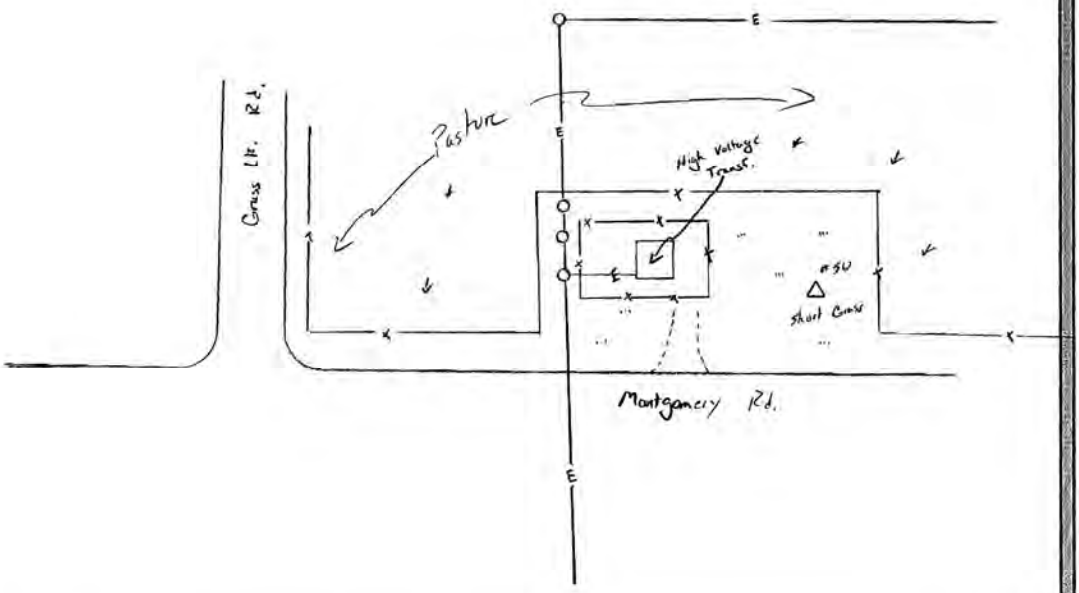
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	07 Dec 2010
Station Name:	49_ Gravel	**Operator Name:**	Jeff Robotham		
Latitude:	41 - 48 - 52.59	**Julian Day:**	341	**Session No.**	3
Longitude:	84 - 44 - 38.03	**Start Time:**	12:30	**End Time:**	12:55
Ellip. Height:	1009.6	**Data File Name:**	6293 341 2		
Type of Mark:	Gravel	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	None	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	22° Windy	**Antenna Height:**	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

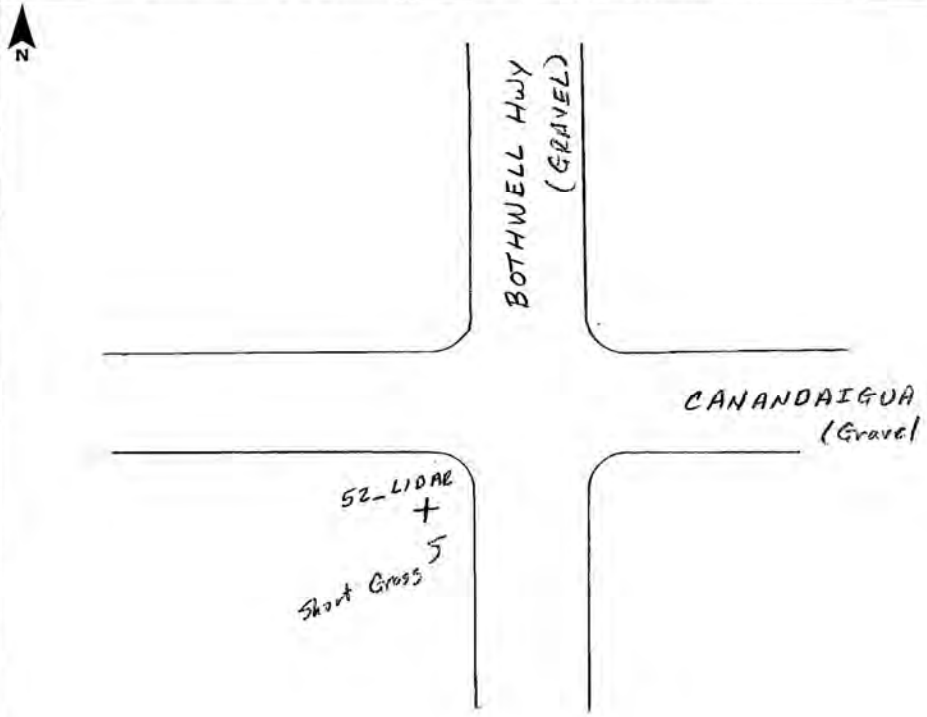
Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	07 Dec 2010
Station Name:	50- Short Grass	**Operator Name:**	Jeff Robotham		
Latitude:	41- 46- 54.98	**Julian Day:**	341	**Session No.**	6
Longitude:	84- 35- 29.90	**Start Time:**	15:42	**End Time:**	16:03
Ellip. Height:	906.3'	**Data File Name:**	6293 341 5		
Type of Mark:	Short Grass	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	NA	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	25°, Windy	**Antenna Height:**	2.000m	to bottom of antenna mount	

N



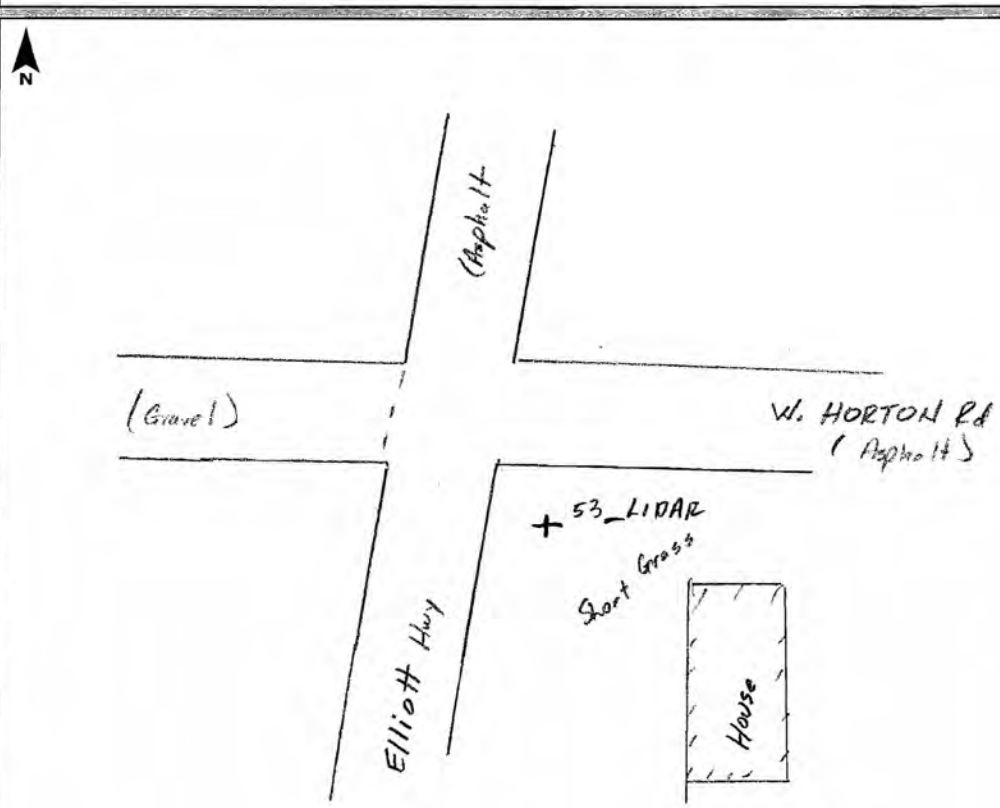
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/8/10
Station Name:	52_LIDAR	Operator Name:	Dave Quinn
Latitude:	41° 47' 46.72956	Julian Day: 342	Session No.
Longitude:	84° 15' 48.56339	Start Time: 3:44	End Time: 4:05
Ellip. Height:	720.475	Data File Name:	
Type of Mark:	SHORT GRASS	Type of Reciever: Trimble R8 Internal	4712123959
Stamping on Mark:	None	Type of Antenna: Trimble R8 Internal	
Weather Condition:	Cloudy, 20's	Antenna Height: 2.000m	to bottom of antenna mount



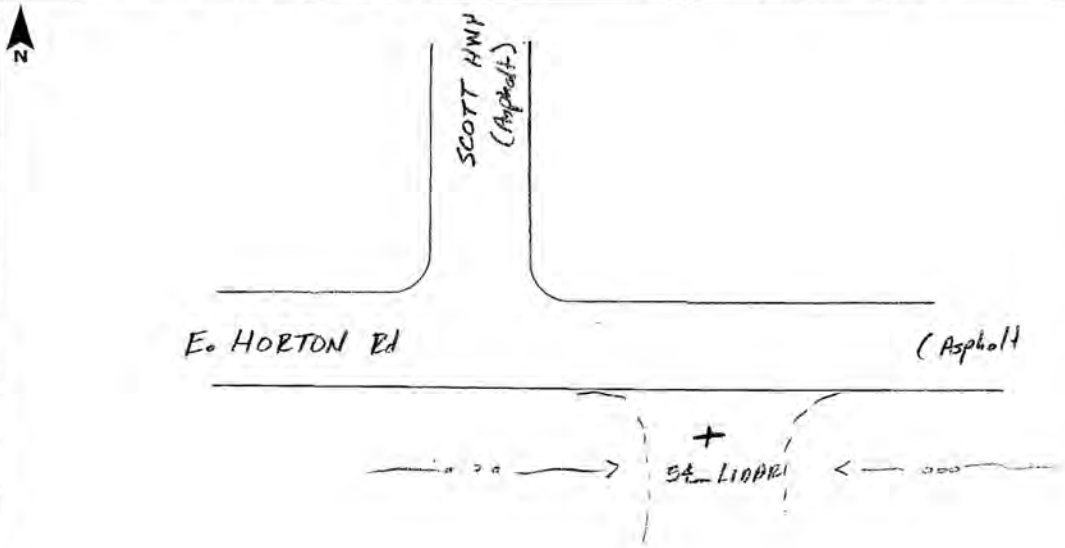
GPS Observation Log Sheet

Project Name:		Project Number: 70840	Survey Date: 12/8/16
Station Name:	53_LIDAR	Operator Name:	Dave Quinn
Latitude:	41° 47' 55.57004"	Julian Day: 342	Session No.
Longitude:	84° 07' 41.33068	Start Time: 1:33	End Time: 1:54
Ellip. Height:	670.091	Data File Name:	
Type of Mark:	Short Grass	Type of Reciever:	Trimble R8 Internal 4712129959
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal
Weather Condition:	Cloudy, 20's	Antenna Height:	2.000m to bottom of antenna mount



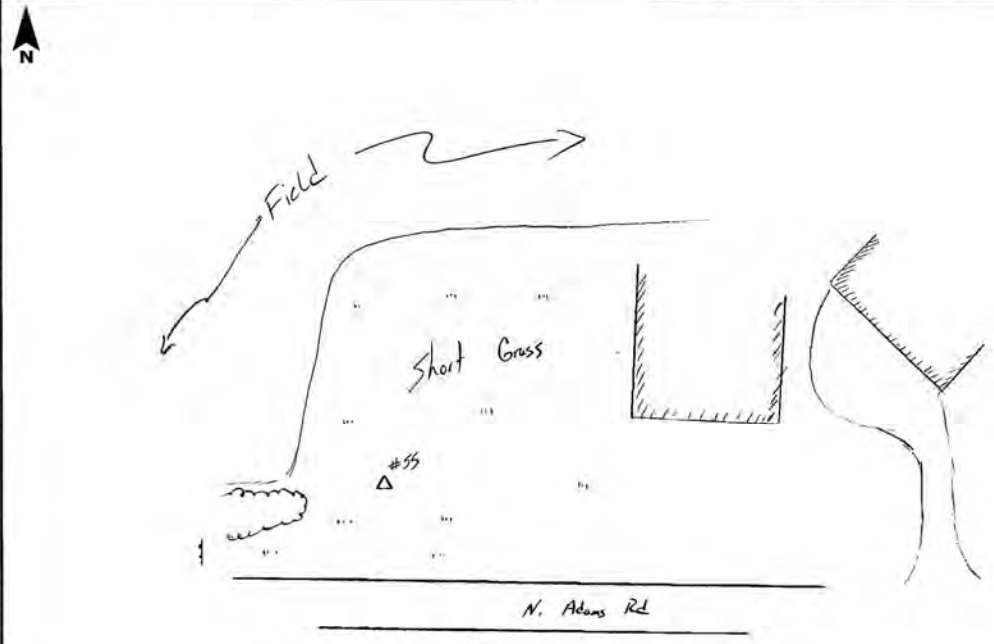
GPS Observation Log Sheet

Project Name:		Project Number:	70840	Survey Date:	12/7/10
Station Name:	54_LIDAR	Operator Name:	Dave Quinn		
Latitude:	41°48'03,01945	Julian Day:	341	Session No.	
Longitude:	83°56'44.23361	Start Time:	5:16	End Time:	5:35
Ellip. Height:	586.413	Data File Name:			
Type of Mark:	Dirt, Short Grass	Type of Reciever:	Trimble R8 Internal		
Stamping on Mark:	None	Type of Antenna:	Trimble R8 Internal		
Weather Condition:	Cloudy, 10's, Windy	Antenna Height:	2.000m	to bottom of antenna mount	



GPS Observation Log Sheet

Project Name:	Hillsdale/Jackson/Lenawaee Counties, MI	**Project Number:**	70840	**Survey Date:**	08 Dec 2010
Station Name:	55_ Short Grass	**Operator Name:**	Jeff Robotham		
Latitude:	41- 58- 16.59	**Julian Day:**	342	**Session No.**	4
Longitude:	84- 25- 05.02	**Start Time:**	13:41	**End Time:**	14:03
Ellip. Height:	1014.6	**Data File Name:**	6293 342 3		
Type of Mark:	Short Grass	**Type of Reciever:**	Trimble R8 Internal		
Stamping on Mark:	N/A	**Type of Antenna:**	Trimble R8 Internal		
Weather Condition:	25°	**Antenna Height:**	2.000m	to bottom of antenna mount	



SECTION 4: EXISTING NGS CONTROL INFORMATION SHEETS

This section contains the published National Geodetic Survey (NGS) Data Sheets used in the final control network for the Hillsdale, Jackson, and Lenawee Counties 1.5 PPSM LiDAR Project.

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 = DECEMBER  3, 2010
 NF0150 ***********************************************************************
 NF0150  DESIGNATION -  E 109
 NF0150  PID         -  NF0150
 NF0150  STATE/COUNTY-  MI/JACKSON
 NF0150  USGS QUAD   -  MICHIGAN CENTER (1971)
 NF0150
 NF0150                         *CURRENT SURVEY CONTROL
 NF0150  ______________________________________________________________________
 NF0150* NAD 83(2007)-  42 11 48.59791(N)    084 21 54.40076(W)     ADJUSTED
 NF0150* NAVD 88     -       293.340  (meters)     962.40   (feet)  ADJUSTED
 NF0150  ______________________________________________________________________
 NF0150  EPOCH DATE  -        2002.00
 NF0150  X           -     464,682.261 (meters)                     COMP
 NF0150  Y           -  -4,709,665.060 (meters)                     COMP
 NF0150  Z           -   4,262,000.215 (meters)                     COMP
 NF0150  LAPLACE CORR-          -1.69  (seconds)                    DEFLEC09
 NF0150  ELLIP HEIGHT-         259.035 (meters)          (10/23/09) ADJUSTED
 NF0150  GEOID HEIGHT-         -34.30  (meters)                     GEOID09
 NF0150  DYNAMIC HT  -         293.233 (meters)     962.05  (feet)  COMP
 NF0150  MODELED GRAV-     980,249.1   (mgal)                       NAVD 88
 NF0150
 NF0150  HORZ ORDER  -  B
 NF0150  VERT ORDER  -  FIRST     CLASS II
 NF0150  ELLP ORDER  -  THIRD     CLASS I
 NF0150
 NF0150.The horizontal coordinates were established by GPS observations
 NF0150.and adjusted by the MI DEPT OF TRANSP in October 2009.
 NF0150
 NF0150.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 NF0150.See National Readjustment for more information.
 NF0150.The horizontal coordinates are valid at the epoch date displayed above.
 NF0150.The epoch date for horizontal control is a decimal equivalence
 NF0150.of Year/Month/Day.
 NF0150
 NF0150.The orthometric height was determined by differential leveling and
 NF0150.adjusted in September 2009.
 NF0150
 NF0150.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 NF0150
 NF0150.The Laplace correction was computed from DEFLEC09 derived deflections.
 NF0150
 NF0150.The ellipsoidal height was determined by GPS observations
 NF0150.and is referenced to NAD 83.
 NF0150
 NF0150.The geoid height was determined by GEOID09.
 NF0150
 NF0150.The dynamic height is computed by dividing the NAVD 88
 NF0150.geopotential number by the normal gravity value computed on the
 NF0150.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 NF0150.degrees latitude (g = 980.6199 gals.).
 NF0150
 NF0150.The modeled gravity was interpolated from observed gravity values.
 NF0150
 NF0150;                    North         East     Units Scale Factor Converg.
 NF0150;SPC MI S     -    77,403.265 4,000,128.461   MT  0.99997848   +0 00 03.8
 NF0150;SPC MI S     -   253,947.72 13,123,781.04   iFT  0.99997848   +0 00 03.8
```

```
NF0150;UTM  16      - 4,674,991.888   717,549.057   MT  1.00018237   +1 46 13.8
NF0150
NF0150!             -  Elev Factor  x  Scale Factor =   Combined Factor
NF0150!SPC MI S     -   0.99995938  x   0.99997848  =   0.99993786
NF0150!UTM  16      -   0.99995938  x   1.00018237  =   1.00014174
NF0150
NF0150                          SUPERSEDED SURVEY CONTROL
NF0150
NF0150  NAD 83(2007)-  42 11 48.60213(N)    084 21 54.39456(W) AD(       ) 0
NF0150  ELLIP H (02/10/07)  258.847  (m)                       GP(       )
NF0150  ELLIP H (07/17/02)  259.072  (m)                       GP(       ) 4 1
NF0150  NAD 83(1994)-  42 11 48.59695(N)    084 21 54.39898(W) AD(       ) 1
NF0150  ELLIP H (02/03/97)  259.059  (m)                       GP(       ) 4 1
NF0150  NAD 83(1986)-  42 11 48.59833(N)    084 21 54.42129(W) AD(       ) 1
NF0150  NAVD 88 (06/15/91)  293.264  (m)          962.15   (f) UNKNOWN     2 0
NF0150  NGVD 29 (??/??/92)  293.383  (m)          962.54   (f) ADJ UNCH    2 0
NF0150
NF0150.Superseded values are not recommended for survey control.
NF0150.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
NF0150.See file dsdata.txt to determine how the superseded data were derived.
NF0150
NF0150_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM1754974991(NAD 83)
NF0150_MARKER: DB = BENCH MARK DISK
NF0150_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
NF0150_SP_SET: CONCRETE POST
NF0150_STAMPING: E 109 1934
NF0150_MARK LOGO: CGS
NF0150_PROJECTION: PROJECTING 25 CENTIMETERS
NF0150_MAGNETIC: R = STEEL ROD IMBEDDED IN MONUMENT
NF0150_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
NF0150+STABILITY: SURFACE MOTION
NF0150_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
NF0150+SATELLITE: SATELLITE OBSERVATIONS - September 25, 2009
NF0150
NF0150  HISTORY     - Date     Condition        Report By
NF0150  HISTORY     - 1934     MONUMENTED       CGS
NF0150  HISTORY     - 19910131 GOOD             MIDH
NF0150  HISTORY     - 20010530 GOOD             ADVANC
NF0150  HISTORY     - 20080529 GOOD             COLEM
NF0150  HISTORY     - 20090925 GOOD             JCLS
NF0150
NF0150                          STATION DESCRIPTION
NF0150
NF0150'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
NF0150'4.5 MI S FROM JACKSON.
NF0150'4.5 MILES SOUTH ALONG THE CINCINNATI NORTHERN RAILROAD FROM
NF0150'THE STATION AT JACKSON, JACKSON COUNTY, 63 FEET SOUTHEAST OF
NF0150'THE EAST RAIL AT THE CROSSING OF THE CENTERLINE OF STATE HIGHWAY
NF0150'50, 48 FEET SOUTH OF THE CENTERLINE OF THE HIGHWAY, 27.5 FEET
NF0150'EAST OF THE EAST RAIL, 13 FEET SOUTH OF POLE 4+05, 3.5 FEET
NF0150'WEST OF THE WIRE FENCE, AND 3 FEET LOWER THAN THE TRACK.  A
NF0150'STANDARD DISK, STAMPED E 109 1934 AND SET IN THE TOP OF A
NF0150'CONCRETE POST.
NF0150
NF0150                          STATION RECOVERY (1991)
NF0150
NF0150'RECOVERY NOTE BY MI DEPT OF HIGHWAYS 1991
NF0150'STATION IS LOCATED IN QUAD 420842, IN THE SOUTHEAST 1/4 OF SECTION 19,
NF0150'T-3-S, R-1-E, NAPOLEON TOWNSHIP, JACKSON COUNTY. IT IS ABOUT 3-1/2
NF0150'MILES SOUTH OF JACKSON, 3-1/2 MILES SOUTHWEST OF MICHIGAN CENTER, ON
NF0150'THE RAILROAD RIGHT-OF-WAY AND ON THE MICHIGAN CENTER QUADRANGLE MAP.
NF0150'TO REACH THE STATION FROM THE U.S. 127 AND STATE ROUTE M-50 (EXIT 15)
NF0150'INTERCHANGE ON THE SOUTHEAST SIDE OF JACKSON, GO EAST ON M-50 FOR 0.3
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NF0150'MI (0.5 KM) TO THE RAILROAD TRACKS AND THE STATION ON THE RIGHT IN
NF0150'THE SOUTHEAST QUADRANT OF THE INTERSECTION AS DESCRIBED.
NF0150'STATION PROJECTS 14 CM ABOVE THE GROUND SURFACE.  IT IS LOCATED 54.5
NF0150'FT (16.6 M) SOUTH OF THE CENTERLINE OF M-50, 27.8 FT (8.5 M) EAST OF
NF0150'THE EAST RAIL OF THE PENN CENTRAL RAILROAD, 9.2 FT (2.8 M) SOUTHEAST
NF0150'OF A POWER POLE, 5.0 FT (1.5 M) SOUTHWEST OF A CHAIN LINK FENCE
NF0150'CORNER, AND 1.5 FT (0.5 M) NORTH OF A METAL WITNESS POST WITH SIGN.
NF0150
NF0150                          STATION RECOVERY (2001)
NF0150
NF0150'RECOVERY NOTE BY ADVANCED SURVEY AND MAP 2001 (LRF)
NF0150'RECOVERED IN GOOD CONDITION.
NF0150
NF0150                          STATION RECOVERY (2008)
NF0150
NF0150'RECOVERY NOTE BY COLEMAN ENGINEERING COMPANY 2008 (JV)
NF0150'RECOVERED AS DESCRIBED.
NF0150
NF0150                          STATION RECOVERY (2009)
NF0150
NF0150'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2009 (MRY)
NF0150'RECOVERED IN GOOD CONDITION.
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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 = DECEMBER  3, 2010
 MD0612 ***********************************************************************
 MD0612  CBN         -  This is a Cooperative Base Network Control Station.
 MD0612  DESIGNATION -  E 113
 MD0612  PID         -  MD0612
 MD0612  STATE/COUNTY-  MI/BRANCH
 MD0612  USGS QUAD   -  COLDWATER WEST (1960)
 MD0612
 MD0612                        *CURRENT SURVEY CONTROL
 MD0612  ______________________________________________________________________
 MD0612* NAD 83(2007)-  41 56 06.03187(N)    085 00 12.06948(W)     ADJUSTED
 MD0612* NAVD 88     -       295.182  (meters)     968.44   (feet)  ADJUSTED
 MD0612  ______________________________________________________________________
 MD0612  EPOCH DATE  -        2002.00
 MD0612  X           -     413,888.910 (meters)                     COMP
 MD0612  Y           -  -4,733,962.288 (meters)                     COMP
 MD0612  Z           -   4,240,411.467 (meters)                     COMP
 MD0612  LAPLACE CORR-          -2.85  (seconds)                    DEFLEC09
 MD0612  ELLIP HEIGHT-         261.770 (meters)          (02/10/07) ADJUSTED
 MD0612  GEOID HEIGHT-         -33.42  (meters)                     GEOID09
 MD0612  DYNAMIC HT  -         295.076 (meters)     968.10  (feet)  COMP
 MD0612
 MD0612  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 MD0612  Type    PID    Designation                       North   East  Ellip
 MD0612  ----------------------------------------------------------------------
 MD0612  NETWORK MD0612 E 113                               0.65   0.39   1.47
 MD0612  ----------------------------------------------------------------------
 MD0612  MODELED GRAV-     980,254.2   (mgal)                       NAVD 88
 MD0612  OBS GRAVITY -     980,255.9   (mgal)                       GRAV_OBS
 MD0612
 MD0612  VERT ORDER  -  SECOND    CLASS 0
 MD0612
 MD0612.The horizontal coordinates were established by GPS observations
 MD0612.and adjusted by the National Geodetic Survey in February 2007.
 MD0612
 MD0612.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 MD0612.See National Readjustment for more information.
 MD0612.The horizontal coordinates are valid at the epoch date displayed above.
 MD0612.The epoch date for horizontal control is a decimal equivalence
 MD0612.of Year/Month/Day.
 MD0612
 MD0612.The orthometric height was determined by differential leveling and
 MD0612.adjusted in June 1991.
 MD0612
 MD0612.Photographs are available for this station.
 MD0612
 MD0612.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 MD0612
 MD0612.The Laplace correction was computed from DEFLEC09 derived deflections.
 MD0612
 MD0612.The ellipsoidal height was determined by GPS observations
 MD0612.and is referenced to NAD 83.
 MD0612
 MD0612.The geoid height was determined by GEOID09.
 MD0612
 MD0612.The dynamic height is computed by dividing the NAVD 88
 MD0612.geopotential number by the normal gravity value computed on the
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MD0612.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
MD0612.degrees latitude (g = 980.6199 gals.).
MD0612
MD0612.The modeled gravity was interpolated from observed gravity values.
MD0612.The observed gravity was obtained from relative gravimeter ties
MD0612.to the IGSN71 gravity network.
MD0612
MD0612;                    North         East     Units Scale Factor Converg.
MD0612;SPC MI S     -    48,520.687 3,947,194.667   MT  1.00004314   -0 25 59.8
MD0612;SPC MI S     -   159,188.61 12,950,113.74   iFT  1.00004314   -0 25 59.8
MD0612;UTM  16      - 4,644,488.254   665,529.379   MT  0.99993717   +1 20 04.7
MD0612
MD0612!             -  Elev Factor  x  Scale Factor =   Combined Factor
MD0612!SPC MI S     -   0.99995894  x   1.00004314  =   1.00000208
MD0612!UTM  16      -   0.99995894  x   0.99993717  =   0.99989612
MD0612
MD0612                          SUPERSEDED SURVEY CONTROL
MD0612
MD0612  ELLIP H (07/12/02)  261.801  (m)                       GP(       ) 4 2
MD0612  NAD 83(1994)-  41 56 06.03145(N)    085 00 12.06931(W) AD(       ) B
MD0612  ELLIP H (09/20/95)  261.826  (m)                       GP(       ) 1 2
MD0612  NAVD 88 (09/20/95)  295.18   (m)          968.4    (f) LEVELING    3
MD0612  NGVD 29 (??/??/92)  295.312  (m)          968.87   (f) ADJ UNCH    2 0
MD0612
MD0612.Superseded values are not recommended for survey control.
MD0612.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
MD0612.See file dsdata.txt to determine how the superseded data were derived.
MD0612
MD0612_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TFM6552944488(NAD 83)
MD0612_MARKER: DB = BENCH MARK DISK
MD0612_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
MD0612_SP_SET: SET IN TOP OF CONCRETE MONUMENT
MD0612_STAMPING: E 113 1934
MD0612_MARK LOGO: CGS
MD0612_MAGNETIC: N = NO MAGNETIC MATERIAL
MD0612_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
MD0612+STABILITY: SURFACE MOTION
MD0612_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
MD0612+SATELLITE: SATELLITE OBSERVATIONS - December 19, 2006
MD0612
MD0612  HISTORY     - Date     Condition        Report By
MD0612  HISTORY     - 1934     MONUMENTED       CGS
MD0612  HISTORY     - 1977     GOOD             MIDH
MD0612  HISTORY     - 19931217 GOOD             LOCENG
MD0612  HISTORY     - 19940627 GOOD             MIDT
MD0612  HISTORY     - 19940727 GOOD             NGS
MD0612  HISTORY     - 19970805 GOOD             NGS
MD0612  HISTORY     - 20040417 GOOD             JCLS
MD0612  HISTORY     - 20040419 GOOD             JCLS
MD0612  HISTORY     - 20061219 GOOD             HEI
MD0612
MD0612                          STATION DESCRIPTION
MD0612
MD0612'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
MD0612'AT COLDWATER.
MD0612'AT COLDWATER, BRANCH COUNTY, ON THE NEW YORK CENTRAL RAILROAD,
MD0612'57 YARDS EAST OF THE SOUTHEAST CORNER OF THE STATION, AT THE
MD0612'CROSSING OF U.S. HIGHWAY 27, 76 YARDS WEST OF THE CENTERLINE OF
MD0612'THE HIGHWAY, 27.8 FEET NORTH OF A WATER TOWER, AND 2 YARDS WEST
MD0612'OF A POLE.  A STANDARD DISK, STAMPED E 113 1934 AND SET IN THE
MD0612'TOP OF A CONCRETE POST.
MD0612
MD0612                          STATION RECOVERY (1977)
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MD0612
MD0612'RECOVERY NOTE BY MI DEPT OF HIGHWAYS 1977
MD0612'RECOVERED IN GOOD CONDITION.
MD0612
MD0612                          STATION RECOVERY (1993)
MD0612
MD0612'RECOVERY NOTE BY LOCAL ENGINEER (INDIVIDUAL OR FIRM) 1993 (ERR)
MD0612'RECOVERED IN GOOD CONDITION.  NOTE--ADD THE FOLLOWING CORRECTIONS.
MD0612'168.5 FEET (51.4 M) EAST OF SOUTHEAST CORNER OF RAILROAD STATION (NOW
MD0612'A STORE), 32.2 FEET (9.8 M) NORTH OF NORTH RAIL OF MAIN RAILROAD
MD0612'TRACK, 4.0 FEET (1.2 M) WEST OF WEST FACE OF POWERPOLE, 72.2 FEET
MD0612'(22.0 M) SOUTH OF A CONCRETE CURB, SOUTH SIDE OF PARK AVENUE, 97 FEET
MD0612'(29.6 M) NORTHEAST OF NORTHEAST CORNER OF RR FREIGHT SHED (NOW A
MD0612'RESTRAURANT).  TABLET IS 2 INCHES ABOVE GROUND LINE.  IDENTIFICATION
MD0612'SIGN BESIDE TABLET.
MD0612
MD0612                          STATION RECOVERY (1994)
MD0612
MD0612'RECOVERY NOTE BY MICHIGAN DEPARTMENT OF TRANSPORTATION 1994 (CFS)
MD0612'STATION IS LOCATED IN QUAD 410851.  IT IS ON THE COLDWATER EAST
MD0612'QUADRANGLE MAP IN THE NORTHWEST 1/4 OF SECTION 22, T-6-S, R-6-W,
MD0612'COLDWATER TOWNSHIP.  ABOUT 11.0 MI (17.7 KM) NORTHEAST OF BRONSON, 7.0
MD0612'MI (11.3 KM) WEST OF QUINCY, 11.0 MI (17.7 KM) SOUTHEAST OF UNION CITY
MD0612'IN A GARDEN AREA BETWEEN THE OLD TRAIN STATION AND INTERSTATE HIGHWAY
MD0612'69 BUSINESS ROUTE (DIVISION STREET) .  TO REACH FROM THE INTERSECTION
MD0612'OF U.S.  HIGHWAY 12 AND INTERSTATE HIGHWAY 69 BUSINESS ROUTE
MD0612'SOUTHBOUND GO SOUTH ALONG INTERSTATE HIGHWAY 69 BUSINESS ROUTE FOR 0.4
MD0612'MI (0.6 KM) TO THE STATION ON THE RIGHT AS DESCRIBED. STATION IS 32.6
MD0612'FT (9.9 M) NORTH FROM THE NEAR RAIL OF THE RAILROAD TRACKS, 24.0 FT
MD0612'(7.3 M) NORTHWEST FROM THE NORTHWEST CORNER OF A CONCRETE FOUNDATION,
MD0612'54.0 FT (16.5 M) SOUTH FROM A UTILITY POLE GUY WIRE AT BASE, 4.5 FT
MD0612'(1.4 M) FROM THE CENTER OF A UTILITY POLE AND 1.0 FT (0.3 M) NORTHWEST
MD0612'FROM A METAL WITNESS POST AND SIGN.
MD0612
MD0612                          STATION RECOVERY (1994)
MD0612
MD0612'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1994 (CFS)
MD0612'STATION IS LOCATED IN COLDWATER, AL0NG THE OLD NEW YORK CENTRAL
MD0612'RAILROAD, AT THE CROSSING OF BUSINESS LOOP 69, NEAR VICTORIA STATION.
MD0612'OWNERSHIP--MRS.  NANCY VANDERBOSCH-SMITH, 29 WEST PARK AVENUE,
MD0612'COLDWATER MI 49036, PHONE 517-278-4947.  NO ADVANCE NOTICE REQUIRED.
MD0612'NO LEGAL PARKING ON PARK AVENUE, VEHICLE CAN BE PARKED AT SOUTHEAST
MD0612'CORNER OF VICTORIA STATION PARKING LOT.  TO REACH FROM THE JUNCTION OF
MD0612'BUSINESS LOOP 69 AND U.S.  HIGHWAY 12 IN DOWNTOWN COLDWATER, GO SOUTH
MD0612'ON BUSINESS LOOP 69 (DIVISION STREET) FOR 0.35 MI (0.56 KM) TO A CROSS
MD0612'STREET, E.  PARK AVE ON THE LEFT AND W.  PARK AVE.  ON THE RIGHT.
MD0612'TURN RIGHT AND GO WESTERLY FOR ABOUT 0.05 MI (0.08 KM) TO THE STATION
MD0612'ON THE LEFT.  STATION PROJECTS 7 CM ABOVE GROUND.  IT IS APPROXIMATELY
MD0612'51.2 M (168.0 FT) EAST OF THE SOUTHEAST CORNER OF VICTORIA STATION
MD0612'(OLD RAILROAD DEPOT) , 22.2 M (72.8 FT) SOUTH OF THE SOUTH CURB OF
MD0612'WEST PARK AVENUE, 9.9 M (32.5 FT) NORTH OF THE NORTH RAIL OF THE NORTH
MD0612'1 OF 3 RAILROAD TRACKS, 7.2 M (23.6 FT) NORTH OF THE NORTHWEST CORNER
MD0612'OF A 1.6 M (5.2 FT) BY 3.2 M (10.5 FT) CONCRETE FOUNDATION, 1.35 M
MD0612'(4.43 FT) WEST OF A UTILITY POLE, AND 0.22 M (0.72 FT) NORTHWEST OF A
MD0612'METAL WITNESS POST.
MD0612
MD0612                          STATION RECOVERY (1997)
MD0612
MD0612'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1997 (CSM)
MD0612'STATION IS LOCATED IN COLDWATER, ALONG THE NEW YORK CENTRAL RAILROAD,
MD0612'AT THE CROSSING OF BUSINESS LOOP 69, NEAR VICTORIA STATION.
MD0612'OWNERSHIP--MRS. NANCY VANDERBOSCH-SMITH, 29 WEST PARK AVENUE,
MD0612'COLDWATER MI 49036, PHONE 517-278-4947.  NO ADVANCE NOTICE REQUIRED.
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MD0612'NO LEGAL PARKING ON PARK AVENUE, VEHICLE CAN BE PARKED AT SOUTHEAST
MD0612'CORNER OF VICTORIA STATION PARKING LOT.  TO REACH THE STATION FROM THE
MD0612'JUNCTION OF BUSINESS LOOP 69 AND U.S. HIGHWAY 12 IN DOWNTOWN
MD0612'COLDWATER, GO SOUTH ON BUSINESS LOOP 69 (DIVISION STREET) FOR 0.35 MI
MD0612'(0.56 KM) TO A CROSS STREET, PARK AVE.  TURN RIGHT AND GO WESTERLY FOR
MD0612'0.05 MI (0.08 KM) TO THE STATION ON LEFT.  THE STATION PROJECTS 7 CM
MD0612'ABOVE GROUND.  LOCATED APPROXIMATELY 51.2 M (168.0 FT) EAST OF THE
MD0612'SOUTHEAST CORNER OF VICTORIA STATION (OLD RAILROAD DEPOT), 22.2 M
MD0612'(72.8 FT) SOUTH OF THE SOUTH CURB OF WEST PARK AVENUE, 9.9 M (32.5 FT)
MD0612'NORTH OF THE NORTH RAIL OF THE NORTH 1 OF 3 RAILROAD TRACKS, 7.2 M
MD0612'(23.6 FT) NORTH OF THE NORTHWEST CORNER OF A 1.6 M (5.2 FT) BY 3.2 M
MD0612'(10.5 FT) CONCRETE FOUNDATION, 6.10 M (20.01 FT) NORTHWEST OF HIGH
MD0612'TENSION POWERLINE POLE NUMBER 6501 AND 0.37 M (1.21 FT) SOUTH OF A
MD0612'FIBERGLASS WITNESS POST.
MD0612
MD0612                          STATION RECOVERY (2004)
MD0612
MD0612'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2004 (MRY)
MD0612'RECOVERED IN GOOD CONDITION.
MD0612
MD0612                          STATION RECOVERY (2004)
MD0612
MD0612'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2004
MD0612'RECOVERED IN GOOD CONDITION.
MD0612
MD0612                          STATION RECOVERY (2006)
MD0612
MD0612'RECOVERY NOTE BY HOLLAND ENGINEERING, INCORPORATED 2006 (BAD)
MD0612'RECOVERED IN GOOD CONDITION.
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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 = DECEMBER  6, 2010
 MD1938 ***********************************************************************
 MD1938  DESIGNATION -  HILLPORT
 MD1938  PID         -  MD1938
 MD1938  STATE/COUNTY-  MI/HILLSDALE
 MD1938  USGS QUAD   -  NORTH ADAMS (1979)
 MD1938
 MD1938                         *CURRENT SURVEY CONTROL
 MD1938  ______________________________________________________________________
 MD1938* NAD 83(1994)-  41 55 17.73159(N)    084 35 05.81843(W)     ADJUSTED
 MD1938* NAVD 88     -       356.2    (meters)    1169.     (feet)  GPS OBS
 MD1938  ______________________________________________________________________
 MD1938  X           -     448,545.605 (meters)                     COMP
 MD1938  Y           -  -4,731,849.877 (meters)                     COMP
 MD1938  Z           -   4,239,343.175 (meters)                     COMP
 MD1938  LAPLACE CORR-          -2.81  (seconds)                    DEFLEC09
 MD1938  ELLIP HEIGHT-         322.317 (meters)          (07/17/02) ADJUSTED
 MD1938  GEOID HEIGHT-         -33.96  (meters)                     GEOID09
 MD1938  HORZ ORDER  -  FIRST
 MD1938  ELLP ORDER  -  FOURTH    CLASS I
 MD1938
 MD1938.The horizontal coordinates were established by GPS observations
 MD1938.and adjusted by the National Geodetic Survey in February 1997.
 MD1938
 MD1938.The orthometric height was determined by GPS observations and a
 MD1938.high-resolution geoid model.
 MD1938
 MD1938.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 MD1938
 MD1938.The Laplace correction was computed from DEFLEC09 derived deflections.
 MD1938
 MD1938.The ellipsoidal height was determined by GPS observations
 MD1938.and is referenced to NAD 83.
 MD1938
 MD1938.The geoid height was determined by GEOID09.
 MD1938
 MD1938;                    North         East     Units Scale Factor Converg.
 MD1938;SPC MI S     -    46,854.207 3,981,892.081   MT  1.00004701   -0 08 54.8
 MD1938;SPC MI S     -   153,721.15 13,063,950.40   iFT  1.00004701   -0 08 54.8
 MD1938;UTM  16      - 4,643,891.436   700,260.545   MT  1.00009351   +1 36 50.6
 MD1938
 MD1938!             -  Elev Factor  x  Scale Factor =   Combined Factor
 MD1938!SPC MI S     -   0.99994945  x   1.00004701  =   0.99999646
 MD1938!UTM  16      -   0.99994945  x   1.00009351  =   1.00004295
 MD1938
 MD1938:                Primary Azimuth Mark                     Grid Az
 MD1938:SPC MI S     -  HILLPORT AZ MK                          094 13 17.0
 MD1938:UTM  16      -  HILLPORT AZ MK                          092 27 31.6
 MD1938
 MD1938|----------------------------------------------------------------------|
 MD1938| PID    Reference Object                    Distance      Geod. Az   |
 MD1938|                                                          dddmmss.s |
 MD1938| MD1939 HILLPORT AZ MK                   APPROX. 0.5 KM 0940422.2 |
 MD1938|----------------------------------------------------------------------|
 MD1938
 MD1938                         SUPERSEDED SURVEY CONTROL
 MD1938
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MD1938  ELLIP H (02/03/97)  322.347  (m)                        GP(       ) 4 1
MD1938  NAD 83(1986)-  41 55 17.73885(N)    084 35 05.82670(W) AD(       ) 1
MD1938  NAD 83(1986)-  41 55 17.72893(N)    084 35 05.83340(W) AD(       ) 3
MD1938  NGVD 29 (03/27/91)  356.4    (m)         1169.     (f) GPS OBS
MD1938
MD1938.Superseded values are not recommended for survey control.
MD1938.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
MD1938.See file dsdata.txt to determine how the superseded data were derived.
MD1938
MD1938_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM0026043891(NAD 83)
MD1938_MARKER: F = FLANGE-ENCASED ROD
MD1938_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
MD1938_SP_SET: STAINLESS STEEL ROD IN SLEEVE
MD1938_STAMPING: HILLPORT 1989
MD1938_MARK LOGO: NGS
MD1938_PROJECTION: FLUSH
MD1938_MAGNETIC: N = NO MAGNETIC MATERIAL
MD1938_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
MD1938_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
MD1938+SATELLITE: SATELLITE OBSERVATIONS - April 26, 2000
MD1938_ROD/PIPE-DEPTH: 9.8  meters
MD1938_SLEEVE-DEPTH  : 1.0 meters
MD1938
MD1938  HISTORY     - Date     Condition        Report By
MD1938  HISTORY     - 1989     MONUMENTED       NGS
MD1938  HISTORY     - 20000426 GOOD             WOOLPT
MD1938
MD1938                          STATION DESCRIPTION
MD1938
MD1938'DESCRIBED BY NATIONAL GEODETIC SURVEY 1989
MD1938'THE STATION IS LOCATED ABOUT 2.0 KM (1.25 MI) EAST OF HILLSDALE, AT
MD1938'THE HILLSDALE MUNICIPAL AIRPORT, IN THE NORTHEAST ANGLE OF THE
MD1938'JUNCTION OF THE RUNWAY AND CONNECTING TAXIWAY.  OWNERSHIP---CITY OF
MD1938'HILLSDALE, C/O AIRPORT MANAGER BRUCE SHANEOUR, P.O. BOX 238, HILLSDALE
MD1938'MI 49242.  PHONE IS (517) 437-4755 OR HOME (517) 368-5170.
MD1938'TO REACH THE STATION FROM THE HILLSDALE COUNTY COURTHOUSE, GO NORTH
MD1938'FOR 0.4 KM (0.25 MI) ON STATE HIGHWAY 99 (HILLSDALE STREET) TO A
MD1938'STOPLIGHT AT THE JUNCTION OF HILLSDALE AND CARLETON STREETS.  TURN
MD1938'RIGHT AND GO SOUTHEAST FOR 0.2 KM (0.10 MI) ON CARLETON STREET TO A
MD1938'PAVED ROAD LEFT.  TURN LEFT AND GO NORTH FOR 0.4 KM (0.25 MI) ON OAK
MD1938'STREET TO A PAVED ROAD RIGHT.  TURN RIGHT AND GO EASTERLY FOR 2.9 KM
MD1938'(1.80 MI) ON STATE STREET AND STATE ROAD TO A CROSSROAD.  TURN RIGHT
MD1938'AND GO SOUTH THEN EAST FOR 1.3 KM (0.80 MI) ON AIRPORT ROAD, PASSING
MD1938'AIRPORT OFFICE AND HANGAR ON RIGHT, TO A PAVED ROAD RIGHT.  TURN RIGHT
MD1938'AND GO SOUTH FOR 80 METERS ON THE PAVED ROAD, PASSING BETWEEN HANGARS,
MD1938'TO A TAXIWAY.  TURN RIGHT AND GO WEST THEN SOUTHWEST FOR 0.1 KM
MD1938'(0.05 MI) ON THE TAXIWAY AND ACROSS AN APRON TO A TAXIWAY LEFT.  TURN
MD1938'LEFT AND GO SOUTH FOR 25 METERS ON THE CONNECTING TAXIWAY TO THE
MD1938'STATION ON THE LEFT BY THE TETRAHEDRON.
MD1938'THE STATION IS THE TOP CENTER OF A STAINLESS STEEL ROD RECESSED 8 CM
MD1938'BELOW GROUND DRIVEN TO SLOW TIME MET AT A DEPTH OF 9.8 METERS IN A
MD1938'GREASE FILLED SLEEVE EXTENDING TO A DEPTH OF 1.0 METER ENCASED IN A
MD1938'PVC PIPE COVERED BY A STANDARD NGS LOGO CAP FLUSH WITH THE GROUND.
MD1938'LOCATED 29.6 M (97.1 FT) NORTH FROM THE NORTH EDGE OF THE RUNWAY, 14.7
MD1938'M (48.2 FT) EAST FROM THE EAST EDGE OF A CONNECTING TAXIWAY, 8.3 M
MD1938'(27.2 FT) SOUTHWEST FROM THE SUPPORT LEG OF A TETRAHEDRON AND 0.7 M
MD1938'(2.3 FT) SOUTH FROM A CARSONITE WITNESS POST.
MD1938'DESCRIBED BY J.B. WARD.
MD1938'NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP.
MD1938
MD1938                          STATION RECOVERY (2000)
MD1938
MD1938'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2000 (GTF)
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MD1938'RECOVERED AS DESCRIBED.

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 = DECEMBER  3, 2010
 MC0771 ***********************************************************************
 MC0771  DESIGNATION -  J 114
 MC0771  PID         -  MC0771
 MC0771  STATE/COUNTY-  MI/LENAWEE
 MC0771  USGS QUAD   -  TECUMSEH SOUTH (1972)
 MC0771
 MC0771                        *CURRENT SURVEY CONTROL
 MC0771  ______________________________________________________________________
 MC0771* NAD 83(2007)-  41 53 02.94554(N)    083 56 45.70181(W)     ADJUSTED
 MC0771* NAVD 88     -       217.946  (meters)     715.04   (feet)  ADJUSTED
 MC0771  ______________________________________________________________________
 MC0771  EPOCH DATE  -        2002.00
 MC0771  X           -     501,564.795 (meters)                     COMP
 MC0771  Y           -  -4,729,212.767 (meters)                     COMP
 MC0771  Z           -   4,236,154.824 (meters)                     COMP
 MC0771  LAPLACE CORR-          -2.73  (seconds)                    DEFLEC09
 MC0771  ELLIP HEIGHT-         182.933 (meters)          (09/24/08) ADJUSTED
 MC0771  GEOID HEIGHT-         -35.02  (meters)                     GEOID09
 MC0771  DYNAMIC HT  -         217.863 (meters)     714.77  (feet)  COMP
 MC0771  MODELED GRAV-     980,235.9   (mgal)                       NAVD 88
 MC0771
 MC0771  HORZ ORDER  -  FIRST
 MC0771  VERT ORDER  -  SECOND    CLASS 0
 MC0771  ELLP ORDER  -  THIRD     CLASS I
 MC0771
 MC0771.The horizontal coordinates were established by GPS observations
 MC0771.and adjusted by the MI DEPT OF TRANSP in September 2008.
 MC0771
 MC0771.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 MC0771.See National Readjustment for more information.
 MC0771.The horizontal coordinates are valid at the epoch date displayed above.
 MC0771.The epoch date for horizontal control is a decimal equivalence
 MC0771.of Year/Month/Day.
 MC0771
 MC0771.The orthometric height was determined by differential leveling and
 MC0771.adjusted in June 1991.
 MC0771
 MC0771.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 MC0771
 MC0771.The Laplace correction was computed from DEFLEC09 derived deflections.
 MC0771
 MC0771.The ellipsoidal height was determined by GPS observations
 MC0771.and is referenced to NAD 83.
 MC0771
 MC0771.The geoid height was determined by GEOID09.
 MC0771
 MC0771.The dynamic height is computed by dividing the NAVD 88
 MC0771.geopotential number by the normal gravity value computed on the
 MC0771.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 MC0771.degrees latitude (g = 980.6199 gals.).
 MC0771
 MC0771.The modeled gravity was interpolated from observed gravity values.
 MC0771
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MC0771;                    North         East      Units Scale Factor Converg.
MC0771;SPC MI S     -    42,759.159 4,034,915.233   MT  1.00005808   +0 17 10.5
MC0771;SPC MI S     -   140,285.95 13,237,910.87   iFT  1.00005808   +0 17 10.5
MC0771;UTM  17      - 4,641,111.307   255,563.034   MT  1.00033530   -1 58 04.1
MC0771;UTM  16      - 4,641,424.710   753,394.132   MT  1.00039018   +2 02 24.0
MC0771
MC0771!             -  Elev Factor  x  Scale Factor =   Combined Factor
MC0771!SPC MI S     -   0.99997131  x   1.00005808  =   1.00002939
MC0771!UTM  17      -   0.99997131  x   1.00033530  =   1.00030660
MC0771!UTM  16      -   0.99997131  x   1.00039018  =   1.00036148
MC0771
MC0771                          SUPERSEDED SURVEY CONTROL
MC0771
MC0771  NAVD 88 (09/24/08)  217.95   (m)          715.1    (f) LEVELING    3
MC0771  NGVD 29 (??/??/92)  218.095  (m)          715.53   (f) ADJ UNCH    2 0
MC0771
MC0771.Superseded values are not recommended for survey control.
MC0771.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
MC0771.See file dsdata.txt to determine how the superseded data were derived.
MC0771
MC0771_U.S. NATIONAL GRID SPATIAL ADDRESS: 17TKG5556341111(NAD 83)
MC0771_MARKER: DB = BENCH MARK DISK
MC0771_SETTING: 30 = SET IN A LIGHT STRUCTURE
MC0771_SP_SET: IN A BIG SLAB OF CONCRETE
MC0771_STAMPING: J 114 1934
MC0771_MARK LOGO: CGS
MC0771_MAGNETIC: N = NO MAGNETIC MATERIAL
MC0771_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
MC0771+STABILITY: SURFACE MOTION
MC0771_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
MC0771+SATELLITE: SATELLITE OBSERVATIONS - January 22, 2010
MC0771
MC0771  HISTORY     - Date     Condition        Report By
MC0771  HISTORY     - 1934     MONUMENTED       CGS
MC0771  HISTORY     - 20070629 GOOD             MIDT
MC0771  HISTORY     - 20100122 GOOD             MANNIK
MC0771
MC0771                          STATION DESCRIPTION
MC0771
MC0771'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
MC0771'AT LENAWEE JUNCTION.
MC0771'AT LENAWEE JUNCTION, LENAWEE COUNTY, AT THE JUNCTION OF THE
MC0771'JACKSON DIVISION WITH THE MONROE DIVISION OF THE NEW YORK CENTRAL
MC0771'RAILROAD, 6.6 FEET NORTH OF THE NORTH RAIL OF THE MONROE DIVISION
MC0771'TRACK, 6 FEET WEST OF THE WEST RAIL OF THE JACKSON DIVISION
MC0771'TRACK, IN THE TOP OF THE CONCRETE FOUNDATION AT THE SOUTHEAST
MC0771'CORNER OF A RAILROAD GATE, AND ABOUT 6 INCHES LOWER THAN THE TOP
MC0771'OF THE RAIL.  A STANDARD DISK, STAMPED J 114 1934.
MC0771
MC0771                          STATION RECOVERY (2007)
MC0771
MC0771'RECOVERY NOTE BY MICHIGAN DEPARTMENT OF TRANSPORTATION 2007 (AS)
MC0771'TO REACH THE STATION FROM THE INTERSECTION OF M-52 AND DEERFIELD ROAD
MC0771'IN THE CITY OF ADRIAN GO EASTERLY ON DEERFIELD ROAD FOR ABOUT 5.0 MI
MC0771'(8.0 KM) TO A SET OF ABANDONED RAILROAD TRACKS (STILL THERE) THAT
MC0771'CROSS DEERFIELD ROAD THAT ARE JUST BEFORE THE INTERSECTION OF LENAWEE
MC0771'ROAD AND DEERFIELD ROAD.
MC0771'
MC0771'THE STATION IS 65 FT (19.8 M) SOUTH OF THE CENTERLINE OF DEERFIELD
MC0771'ROAD, 15 FT (4.6 M) NORTH-NORTHWEST OF THE NORTHEAST CORNER OF THE
MC0771'CONCRETE FOUNDATION OF AN OLD RAILROAD STATION AT AN 'X' TRACK
MC0771'CROSSING, 6.7 FT (2.1 M) NORTH OF THE NORTHERN MOST RAIL RUNNING
MC0771'STRAIGHT EAST-WEST BOUND, 6.5 FT (2.0 M) WEST OF OF THE WESTERN MOST
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MC0771'RAIL OF A SET OF TRACKS THAT ARE CURVING BUT CURRENTLY GOING
MC0771'NORTH-SOUTH BOUND NEAR THE POINT,
MC0771
MC0771                          STATION RECOVERY (2010)
MC0771
MC0771'RECOVERY NOTE BY MANNIK AND SMITH INCORPORATED 2010 (PGF)
MC0771'GOOD GPS LOCATION
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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 = DECEMBER  3, 2010
 NF1162 ***********************************************************************
 NF1162  SACS        -  This is a Secondary Airport Control Station.
 NF1162  DESIGNATION -  L 330
 NF1162  PID         -  NF1162
 NF1162  STATE/COUNTY-  MI/JACKSON
 NF1162  USGS QUAD   -  JACKSON NORTH (1976)
 NF1162
 NF1162                        *CURRENT SURVEY CONTROL
 NF1162  ______________________________________________________________________
 NF1162* NAD 83(2007)-  42 15 17.41405(N)    084 27 37.27045(W)     ADJUSTED
 NF1162* NAVD 88     -       304.777  (meters)     999.92   (feet)  ADJUSTED
 NF1162  ______________________________________________________________________
 NF1162  EPOCH DATE  -        2002.00
 NF1162  X           -     456,435.654 (meters)                     COMP
 NF1162  Y           -  -4,706,129.497 (meters)                     COMP
 NF1162  Z           -   4,266,779.235 (meters)                     COMP
 NF1162  LAPLACE CORR-          -1.30  (seconds)                    DEFLEC09
 NF1162  ELLIP HEIGHT-         270.593 (meters)          (08/06/08) ADJUSTED
 NF1162  GEOID HEIGHT-         -34.19  (meters)                     GEOID09
 NF1162  DYNAMIC HT  -         304.668 (meters)     999.56  (feet)  COMP
 NF1162  MODELED GRAV-     980,256.0   (mgal)                       NAVD 88
 NF1162
 NF1162  HORZ ORDER  -  FIRST
 NF1162  VERT ORDER  -  FIRST     CLASS II
 NF1162  ELLP ORDER  -  THIRD     CLASS II
 NF1162
 NF1162.This mark is at Jackson Co-Reynolds Fld Airport (JXN)
 NF1162
 NF1162.The horizontal coordinates were established by GPS observations
 NF1162.and adjusted by the WOOLPERT CONSULTANTS in August 2008.
 NF1162
 NF1162.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 NF1162.See National Readjustment for more information.
 NF1162.The horizontal coordinates are valid at the epoch date displayed above.
 NF1162.The epoch date for horizontal control is a decimal equivalence
 NF1162.of Year/Month/Day.
 NF1162
 NF1162.The orthometric height was determined by differential leveling and
 NF1162.adjusted in June 1991.
 NF1162
 NF1162.Photographs are available for this station.
 NF1162
 NF1162.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 NF1162
 NF1162.The Laplace correction was computed from DEFLEC09 derived deflections.
 NF1162
 NF1162.The ellipsoidal height was determined by GPS observations
 NF1162.and is referenced to NAD 83.
 NF1162
 NF1162.The geoid height was determined by GEOID09.
 NF1162
 NF1162.The dynamic height is computed by dividing the NAVD 88
 NF1162.geopotential number by the normal gravity value computed on the
 NF1162.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 NF1162.degrees latitude (g = 980.6199 gals.).
 NF1162
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NF1162.The modeled gravity was interpolated from observed gravity values.
NF1162
NF1162;                    North         East     Units Scale Factor Converg.
NF1162;SPC MI S     -    83,850.392 3,992,269.328   MT  0.99996694   -0 03 49.5
NF1162;SPC MI S     -   275,099.71 13,097,996.48   iFT  0.99996694   -0 03 49.5
NF1162;UTM  16      - 4,681,194.248   709,492.936   MT  1.00014003   +1 42 30.1
NF1162
NF1162!             -  Elev Factor  x  Scale Factor =   Combined Factor
NF1162!SPC MI S     -   0.99995756  x   0.99996694  =   0.99992450
NF1162!UTM  16      -   0.99995756  x   1.00014003  =   1.00009759
NF1162
NF1162|---------------------------------------------------------------------|
NF1162| PID    Reference Object                    Distance      Geod. Az   |
NF1162|                                                          dddmmss.s |
NF1162| AA8110 JXN C                             245.181 METERS 03418      |
NF1162|---------------------------------------------------------------------|
NF1162
NF1162                          SUPERSEDED SURVEY CONTROL
NF1162
NF1162  NAD 83(2007)-  42 15 17.41793(N)    084 27 37.26395(W) AD(       ) 0
NF1162  ELLIP H (02/10/07)  270.467  (m)                       GP(       )
NF1162  ELLIP H (07/17/02)  270.679  (m)                       GP(       ) 4 1
NF1162  NAD 83(1994)-  42 15 17.41282(N)    084 27 37.26817(W) AD(       ) 1
NF1162  ELLIP H (02/03/97)  270.650  (m)                       GP(       ) 4 1
NF1162  NAD 83(1986)-  42 15 17.41414(N)    084 27 37.29049(W) AD(       ) 1
NF1162  NAVD 88 (04/10/92)  304.78   (m)          999.9    (f) LEVELING    3
NF1162  NGVD 29 (01/19/93)  304.897  (m)         1000.32   (f) ADJUSTED    1 2
NF1162
NF1162.Superseded values are not recommended for survey control.
NF1162.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
NF1162.See file dsdata.txt to determine how the superseded data were derived.
NF1162
NF1162_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM0949281194(NAD 83)
NF1162_MARKER: I = METAL ROD
NF1162_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
NF1162_SP_SET: STAINLESS STEEL ROD
NF1162_STAMPING: L 330 1985
NF1162_MARK LOGO: NGS
NF1162_PROJECTION: FLUSH
NF1162_MAGNETIC: N = NO MAGNETIC MATERIAL
NF1162_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
NF1162_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
NF1162+SATELLITE: SATELLITE OBSERVATIONS - August 28, 2008
NF1162_ROD/PIPE-DEPTH: 7.6  meters
NF1162
NF1162  HISTORY     - Date     Condition        Report By
NF1162  HISTORY     - 1985     MONUMENTED       NGS
NF1162  HISTORY     - 19910131 GOOD             MIDH
NF1162  HISTORY     - 19910707 GOOD             USPSQD
NF1162  HISTORY     - 19940521 GOOD             NGS
NF1162  HISTORY     - 20010530 GOOD             ADVANC
NF1162  HISTORY     - 20050622 GOOD             MIDT
NF1162  HISTORY     - 20050710 GOOD             GEOCAC
NF1162  HISTORY     - 20080828 GOOD             WOOLPT
NF1162
NF1162                          STATION DESCRIPTION
NF1162
NF1162'DESCRIBED BY NATIONAL GEODETIC SURVEY 1985
NF1162'3.5 KM (2.2 MI) WEST FROM JACKSON.
NF1162'THE MARK IS 0.4 M ABOVE THE AVENUE.
NF1162'3.4 KM (2.1 MI) WESTERLY ALONG MICHIGAN AVENUE FROM ITS JUNCTION WITH
NF1162'U.S. HIGHWAY 127 IN THE WEST EDGE OF JACKSON, THENCE 0.1 KM (0.05 MI)
NF1162'NORTH AND EAST ALONG WILDWOOD AVENUE, 71.7 M (235.2 FT) NORTH OF THE
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NF1162'CENTERLINE OF THE WEST BOUND LANES OF MICHIGAN AVENUE, 16.0 M (52.5
NF1162'FT) WEST OF THE CENTER OF THE ENTRANCE TO THE REYNOLDS MUNICIPAL
NF1162'AIRPORT, 14.0 M (45.9 FT) NORTH OF THE CENTERLINE OF WILDWOOD AVENUE,
NF1162'AND 6.3 M (20.7 FT) WEST-SOUTHWEST OF THE EAST FENCE CORNER OF A CHAIN
NF1162'LINK FENCE.  NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO
NF1162'CAP.
NF1162'THE MARK IS 0.4 METERS  S FROM  A WITNESS POST AND FENCE
NF1162
NF1162                          STATION RECOVERY (1991)
NF1162
NF1162'RECOVERY NOTE BY MI DEPT OF HIGHWAYS 1991
NF1162'STATION IS LOCATED IN QUAD 420842, IN THE NORTHWEST 1/4 OF SECTION 32,
NF1162'T-2-S, R-1-W, SANDSTONE TOWNSHIP, JACKSON COUNTY. IT IS ON THE
NF1162'NORTHWEST SIDE OF JACKSON, AND ON THE WILDWOOD AVENUE RIGHT-OF-WAY
NF1162'AND ON THE JACKSON NORTH QUADRANGLE MAP.
NF1162'TO REACH THE STATION FROM THE INTERSTATE 94 AND LAURENCE ROAD (AIRPORT
NF1162'EXIT 137) INTERCHANGE, GO SOUTH ON LAURENCE ROAD FOR 1.1 MI (1.8 KM)
NF1162'TO THE SECOND STOP LIGHT (WILDWOOD AVENUE), TURN RIGHT GOING WEST ON
NF1162'WILDWOOD ROAD FOR 0.65 MI (1.05 KM) TO THE AIRPORT ENTRANCE AND
NF1162'STATION ON THE RIGHT AS DESCRIBED.
NF1162'STATION IS ACCESSED THROUGH A 5 INCH LOGO CAP.  IT IS 52.5 FT
NF1162'(16.0 M) WEST OF THE CENTER OF THE AIRPORT ENTRANCE TO REYNOLDS
NF1162'FIELD, JACKSON MUNICIPAL AIRPORT, 49.5 FT (15.1 M) NORTH OF THE
NF1162'CENTERLINE OF WILDWOOD AVENUE, 20.7 FT (6.3 M) WEST OF THE EAST
NF1162'CORNER OF A CHAIN LINK FENCE, AND 1.5 FEET SOUTH OF A CHAIN LINK
NF1162'FENCE AND NGS CARSONITE WITNESS POST.
NF1162
NF1162                          STATION RECOVERY (1991)
NF1162
NF1162'RECOVERY NOTE BY US POWER SQUADRON 1991 (MAL)
NF1162'RECOVERED IN GOOD CONDITION.
NF1162
NF1162                          STATION RECOVERY (1994)
NF1162
NF1162'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1994 (CFS)
NF1162'STATION IS LOCATED ABOUT 5 KM (3.10 MI) NORTHWEST OF JACKSON, AT THE
NF1162'ENTRANCE ROAD TO THE JACKSON COUNTY AIRPORT, ON ROAD RIGHT-OF-WAY,
NF1162'ALONG A LOW AIRPORT PERIMETER CHAIN LINK FENCE, IN THE WEST CENTRAL
NF1162'32, T 2 S, R 1 W.  OWNERSHIP--STATE DEPARTMENT OF TRANSPORTATION.  TO
NF1162'REACH FROM THE OVERPASS AT THE JUNCTION OF INTERSTATE HIGHWAY 96 AND
NF1162'AIRPORT ROAD (EXIT 137) , ON THE NORTHWEST SIDE OF JACKSON, GO SOUTH
NF1162'ON AIRPORT ROAD FOR 0.92 KM (0.55 MI) TO A PAVED ROAD RIGHT.  TURN
NF1162'RIGHT, WEST, THEN SOUTH ON ARGYLE ROAD FOR 1.18 KM (0.75 MI) TO A
NF1162'T-ROAD.  TURN RIGHT, WEST, ON WILDWOOD AVENUE FOR 0.62 KM (0.40 MI) TO
NF1162'THE AIRPORT ENTRANCE ROAD ON THE RIGHT AND THE STATION IN THE
NF1162'NORTHWEST ANGLE OF THE JUNCTION.  STATION MARK IS A PUNCH HOLE TOP
NF1162'CENTER ON A STEEL ROD ENCASED IN A PVC PIPE WITH LOGO CAP SET IN A
NF1162'CONCRETE POST FLUSH WITH THE GROUND.  IT IS 16.0 M (52.5 FT) WEST OF
NF1162'THE ENTRANCE ROAD CENTER, 15.1 M (49.5 FT) NORTH OF THE CENTER OF
NF1162'WILDWOOD AVENUE, 6.3 M (20.7 FT) WEST OF A FENCE CORNER, AND 0.5 M
NF1162'(1.6 FT) SOUTH OF A FIBERGLASS WITNESS POST SET IN THE FENCE LINE.
NF1162'DESCRIBED BY MDOT, TYPED BY GRH
NF1162
NF1162                          STATION RECOVERY (2001)
NF1162
NF1162'RECOVERY NOTE BY ADVANCED SURVEY AND MAP 2001 (LRF)
NF1162'RECOVERED IN GOOD CONDITION.
NF1162
NF1162                          STATION RECOVERY (2005)
NF1162
NF1162'RECOVERY NOTE BY MICHIGAN DEPARTMENT OF TRANSPORTATION 2005 (SR)
NF1162'RECOVERED IN GOOD CONDITION.
NF1162
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NF1162                          STATION RECOVERY (2005)
NF1162
NF1162'RECOVERY NOTE BY GEOCACHING 2005 (WD)
NF1162'THE STATION IS LOCATED 52.5 FEET WEST OF THE CENTERLINE OF THE
NF1162'ENTRANCE ROAD, 49.5 FEET NORTH OF THE CENTERLINE OF WILDWOOD AVENUE,
NF1162'45.33 FEET SOUTH OF A CHAIN LINK FENCE THAT ENCLOSES AN AIR FORCE T-33
NF1162'JET AIRCRAFT STATIC DISPLAY, AND 1.33 FEET SOUTH OF AN ORANGE
NF1162'CARSONITE WITNESS POST.
NF1162
NF1162                          STATION RECOVERY (2008)
NF1162
NF1162'RECOVERY NOTE BY WOOLPERT CONSULTANTS 2008 (JAY)
NF1162'THIS STATION WAS FOUND AS DESCRIBED AND FOUND IN GOOD CONDITION.
NF1162'
NF1162'NOTE--THIS STATION IS NOW DESIGNATED AS A SECONDARY AIRPORT CONTROL
NF1162'STATION.
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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 = 7.80
1        National Geodetic Survey,   Retrieval Date = MARCH 11, 2010
 DL4072 ***********************************************************************
 DL4072  DESIGNATION -  MIDD REF B
 DL4072  PID         -  DL4072
 DL4072  STATE/COUNTY-  MI/MONROE
 DL4072  USGS QUAD   -  DUNDEE (1972)
 DL4072
 DL4072                        *CURRENT SURVEY CONTROL
 DL4072  ______________________________________________________________________
 DL4072* NAD 83(2007)-  41 57 02.39051(N)    083 38 29.20116(W)     ADJUSTED
 DL4072* NAVD 88     -       201.512  (meters)     661.13   (feet)  ADJUSTED
 DL4072  ______________________________________________________________________
 DL4072  EPOCH DATE  -        2002.00
 DL4072  X           -     526,150.046 (meters)                     COMP
 DL4072  Y           -  -4,721,562.291 (meters)                     COMP
 DL4072  Z           -   4,241,641.176 (meters)                     COMP
 DL4072  LAPLACE CORR-          -0.60  (seconds)                    USDV2009
 DL4072  ELLIP HEIGHT-         166.443 (meters)          (10/19/09) ADJUSTED
 DL4072  GEOID HEIGHT-         -35.07  (meters)                     GEOID09
 DL4072  DYNAMIC HT  -         201.439 (meters)     660.89  (feet)  COMP
 DL4072  MODELED GRAV-     980,256.2   (mgal)                       NAVD 88
 DL4072
 DL4072  HORZ ORDER  -  B
 DL4072  VERT ORDER  -  FIRST     CLASS II
 DL4072  ELLP ORDER  -  FIRST     CLASS I
 DL4072
 DL4072.The horizontal coordinates were established by GPS observations
 DL4072.and adjusted by the MI DEPT OF TRANSP in October 2009.
 DL4072
 DL4072.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 DL4072.See National Readjustment for more information.
 DL4072.The horizontal coordinates are valid at the epoch date displayed above.
 DL4072.The epoch date for horizontal control is a decimal equivalence
 DL4072.of Year/Month/Day.
 DL4072
 DL4072.The orthometric height was determined by differential leveling
 DL4072.and adjusted in September 2009.
 DL4072
 DL4072.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 DL4072
 DL4072.The Laplace correction was computed from USDV2009 derived deflections.
 DL4072
 DL4072.The ellipsoidal height was determined by GPS observations
 DL4072.and is referenced to NAD 83.
 DL4072
 DL4072.The geoid height was determined by GEOID09.
 DL4072
 DL4072.The dynamic height is computed by dividing the NAVD 88
 DL4072.geopotential number by the normal gravity value computed on the
 DL4072.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DL4072.degrees latitude (g = 980.6199 gals.).
 DL4072
 DL4072.The modeled gravity was interpolated from observed gravity values.
 DL4072
 DL4072;                    North         East     Units Scale Factor Converg.
 DL4072;SPC MI S     -    50,318.939 4,060,133.160   MT  1.00003870   +0 29 36.7
 DL4072;SPC MI S     -   165,088.38 13,320,646.85   iFT  1.00003870   +0 29 36.7
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DL4072;UTM  17      - 4,647,673.451   281,064.555   MT  1.00018985   -1 45 59.3
DL4072
DL4072!             -  Elev Factor  x  Scale Factor =   Combined Factor
DL4072!SPC MI S     -   0.99997390  x   1.00003870  =   1.00001259
DL4072!UTM  17      -   0.99997390  x   1.00018985  =   1.00016374
DL4072
DL4072                          SUPERSEDED SURVEY CONTROL
DL4072
DL4072.No superseded survey control is available for this station.
DL4072
DL4072_U.S. NATIONAL GRID SPATIAL ADDRESS: 17TKG8106447673(NAD 83)
DL4072_MARKER: DD = SURVEY DISK
DL4072_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
DL4072_STAMPING: MIDD REF B 2008
DL4072_MARK LOGO: MIDT
DL4072_PROJECTION: FLUSH
DL4072_MAGNETIC: N = NO MAGNETIC MATERIAL
DL4072_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DL4072_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DL4072+SATELLITE: SATELLITE OBSERVATIONS - June 28, 2008
DL4072
DL4072  HISTORY     - Date     Condition        Report By
DL4072  HISTORY     - 20080628 MONUMENTED       COLEM
DL4072
DL4072                          STATION DESCRIPTION
DL4072
DL4072'DESCRIBED BY COLEMAN ENGINEERING COMPANY 2008
DL4072'THE STATION IS LOCATED ABOUT 7.5 MI (12.1 KM) WEST-SOUTHWEST OF
DL4072'MAYBEE, 4.4 MI (7.1 KM) NORTHWEST OF IDA AND 1.0 MI (1.6 KM)
DL4072'EAST-SOUTHEAST OF DUNDEE.
DL4072'
DL4072'TO REACH THE STATION FROM THE JUNCTION OF US HIGHWAY 23 WITH STATE
DL4072'HIGHWAY 50 (TECUMSEH ROAD) (EXIT 17), LOCATED IN DUNDEE, MI, GO
DL4072'EAST-SOUTHEAST ON STATE HIGHWAY 50 FOR 1.7 MI (2.7 KM) TO ROD PARK ON
DL4072'THE RIGHT AND THE STATION ON THE RIGHT.
DL4072'
DL4072'THE STATION IS A BRASS MICHIGAN DEPARTMENT OF TRANSPORTATION HEIGHT
DL4072'MODERNIZATION MARK DISK SET IN THE TOP OF A 16 INCH (41 CM) DIAMETER
DL4072'CONCRETE POST, SET TO A DEPTH OF 8 FT (2.4 M),
DL4072'
DL4072'THE STATION IS 52 FT (15.8 M) NORTHEAST OF THE CORNER OF A BRICK
DL4072'RESTROOM AND STORAGE BUILDING, 43 FT (13.1 M) SOUTHEAST OF THE CORNER
DL4072'OF A WOOD DUNDEE RECREATION STORAGE BUILDING, 8 FT (2.4 M) WEST OF
DL4072'EDGE OF PAVEMENT OF THE WESTERN MOST ENTRANCE TO ROD PARK, AND 1 FT
DL4072'(0.3 M) EAST OF AN ORANGE CARSONITE WITNESS POST.
```

The NGS Data Sheet

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

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.80
1        National Geodetic Survey,   Retrieval Date = MARCH 11, 2010
 DL4051 ***********************************************************************
 DL4051  DESIGNATION -  MIMR REF A
 DL4051  PID         -  DL4051
 DL4051  STATE/COUNTY-  MI/WASHTENAW
 DL4051  USGS QUAD   -  MANCHESTER (1980)
 DL4051
 DL4051                         *CURRENT SURVEY CONTROL
 DL4051  ______________________________________________________________________
 DL4051* NAD 83(2007)-  42 09 27.65403(N)    084 02 18.50668(W)     ADJUSTED
 DL4051* NAVD 88     -       284.045  (meters)     931.90   (feet)  ADJUSTED
 DL4051  ______________________________________________________________________
 DL4051  EPOCH DATE  -        2002.00
 DL4051  X           -     491,826.418 (meters)                     COMP
 DL4051  Y           -  -4,709,836.680 (meters)                     COMP
 DL4051  Z           -   4,258,770.992 (meters)                     COMP
 DL4051  LAPLACE CORR-          -0.23  (seconds)                    USDV2009
 DL4051  ELLIP HEIGHT-         249.588 (meters)          (10/19/09) ADJUSTED
 DL4051  GEOID HEIGHT-         -34.44  (meters)                     GEOID09
 DL4051  DYNAMIC HT  -         283.942 (meters)     931.57  (feet)  COMP
 DL4051  MODELED GRAV-     980,251.5   (mgal)                       NAVD 88
 DL4051
 DL4051  HORZ ORDER  -  B
 DL4051  VERT ORDER  -  FIRST     CLASS II
 DL4051  ELLP ORDER  -  FIRST     CLASS I
 DL4051
 DL4051.The horizontal coordinates were established by GPS observations
 DL4051.and adjusted by the MI DEPT OF TRANSP in October 2009.
 DL4051
 DL4051.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 DL4051.See National Readjustment for more information.
 DL4051.The horizontal coordinates are valid at the epoch date displayed above.
 DL4051.The epoch date for horizontal control is a decimal equivalence
 DL4051.of Year/Month/Day.
 DL4051
 DL4051.The orthometric height was determined by differential leveling
 DL4051.and adjusted in September 2009.
 DL4051
 DL4051.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 DL4051
 DL4051.The Laplace correction was computed from USDV2009 derived deflections.
 DL4051
 DL4051.The ellipsoidal height was determined by GPS observations
 DL4051.and is referenced to NAD 83.
 DL4051
 DL4051.The geoid height was determined by GEOID09.
 DL4051
 DL4051.The dynamic height is computed by dividing the NAVD 88
 DL4051.geopotential number by the normal gravity value computed on the
 DL4051.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DL4051.degrees latitude (g = 980.6199 gals.).
 DL4051
 DL4051.The modeled gravity was interpolated from observed gravity values.
 DL4051
 DL4051;                    North         East     Units Scale Factor Converg.
 DL4051;SPC MI S     -    73,107.431 4,027,123.348   MT  0.99998684   +0 13 24.0
 DL4051;SPC MI S     -   239,853.78 13,212,346.94   iFT  0.99998684   +0 13 24.0
```

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DL4051;UTM  16      - 4,671,529.726   744,671.062   MT  1.00033666   +1 59 19.3
DL4051;UTM  17      - 4,671,753.361   248,971.156   MT  1.00037544   -2 02 25.5
DL4051
DL4051!             -  Elev Factor  x  Scale Factor =   Combined Factor
DL4051!SPC MI S     -   0.99996086  x   0.99998684  =   0.99994770
DL4051!UTM  16      -   0.99996086  x   1.00033666  =   1.00029750
DL4051!UTM  17      -   0.99996086  x   1.00037544  =   1.00033628
DL4051
DL4051                          SUPERSEDED SURVEY CONTROL
DL4051
DL4051.No superseded survey control is available for this station.
DL4051
DL4051_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM4467171529(NAD 83)
DL4051_MARKER: DD = SURVEY DISK
DL4051_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
DL4051_STAMPING: MIMR REF A 2008
DL4051_MARK LOGO: MIDT
DL4051_PROJECTION: FLUSH
DL4051_MAGNETIC: N = NO MAGNETIC MATERIAL
DL4051_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DL4051_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DL4051+SATELLITE: SATELLITE OBSERVATIONS - June 26, 2008
DL4051
DL4051  HISTORY     - Date     Condition        Report By
DL4051  HISTORY     - 20080626 MONUMENTED       COLEM
DL4051
DL4051                          STATION DESCRIPTION
DL4051
DL4051'DESCRIBED BY COLEMAN ENGINEERING COMPANY 2008
DL4051'THE STATION IS LOCATED ABOUT 7.5 MI (12.1 KM) EAST OF NORVELL, 7.0 MI
DL4051'(11.3 KM) WEST OF BRIDGEWATER AND 0.5 MI (0.8 KM) NORTH OF MANCHESTER.
DL4051'TO REACH THE STATION FROM THE JUNCTION OF DUTCH DRIVE WITH STATE
DL4051'HIGHWAY 52 (ANN ARBOR STREET) ABOUT 1 MI (1.6 KM) NORTH OF MANCHESTER,
DL4051'MICHIGAN, GO EAST ON DUTCH DRIVE FOR 0.15 MI (0.2 KM) TO THE STATION
DL4051'ON THE RIGHT.
DL4051'
DL4051'THE STATION IS A BRASS MICHIGAN DEPARTMENT OF TRANSPORTATION HEIGHT
DL4051'MODERNIZATION MARK DISK SET IN THE TOP OF A 16 INCH (41 CM) DIAMETER
DL4051'CONCRETE POST, SET TO A DEPTH OF 8 FT (2.4 M),
DL4051'
DL4051'THE STATION IS APPROXIMATELY 200 FT (61.0 M) NORTH OF A FOOTBALL FIELD
DL4051'AND TRACK, 150 FT (45.7 M) WEST OF THE WESTERN MOST DRIVEWAY OPENING
DL4051'FOR '20500 DUTCH DRIVE' (THE MANCHESTER HIGH SCHOOL), 6 FT (1.8 M)
DL4051'SOUTH OF THE EDGE OF CURB OF DUTCH DRIVE, 1 FT (0.3 M) SOUTH OF THE
DL4051'EDGE OF A SIDEWALK, AND 1 FT (0.3 M) NORTH OF AN ORANGE CARSONITE
DL4051'WITNESS POST.
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NGS Continuously Operating Reference Stations (CORS) Data Sheets

```
AJ7678 ********************************************************************
  AJ7678  CORS         -  This is a GPS Continuously Operating Reference Station.
  AJ7678  DESIGNATION  -  ADRIAN CORS ARP
  AJ7678  CORS_ID      -  ADRI
  AJ7678  PID          -  AJ7678
  AJ7678  STATE/COUNTY-  MI/LENAWEE
  AJ7678  USGS QUAD    -  ADRIAN (1979)
  AJ7678
  AJ7678                        *CURRENT SURVEY CONTROL
  AJ7678  ______________________________________________________________________
  AJ7678* NAD 83(CORS)-  41 55 08.33225(N)    084 01 27.38233(W)     ADJUSTED
  AJ7678* NAVD 88     -       241.988  (meters)     793.92   (feet)  ADJUSTED
  AJ7678  ______________________________________________________________________
  AJ7678  EPOCH DATE  -        2002.00
  AJ7678  X           -     494,838.884 (meters)                     COMP
  AJ7678  Y           -  -4,727,341.523 (meters)                     COMP
  AJ7678  Z           -   4,239,050.413 (meters)                     COMP
  AJ7678  ELLIP HEIGHT-         207.108 (meters)          (03/??/02) ADJUSTED
  AJ7678  GEOID HEIGHT-         -34.88  (meters)                     GEOID09
  AJ7678  HORZ ORDER  -  SPECIAL (CORS)
  AJ7678  VERT ORDER  -  FIRST     CLASS II
  AJ7678  ELLP ORDER  -  SPECIAL (CORS)
  AJ7678
  AJ7678.ITRF positions are available for this station.
  AJ7678.The coordinates were established by GPS observations
  AJ7678.and adjusted by the National Geodetic Survey in March 2002.
  AJ7678.The coordinates are valid at the epoch date displayed above.
  AJ7678.The epoch date for horizontal control is a decimal equivalence
  AJ7678.of Year/Month/Day.
  AJ7678
  AJ7678.The orthometric height was determined by differential leveling and
  AJ7678.adjusted in September 2009.
  AJ7678.No vertical observational check was made to the station.
  AJ7678
  AJ7678.The PID for the CORS L1 Phase Center is DG4064.
  AJ7678
  AJ7678.The XYZ, and position/ellipsoidal ht. are equivalent.
  AJ7678
  AJ7678.The ellipsoidal height was determined by GPS observations
  AJ7678.and is referenced to NAD 83.
  AJ7678
  AJ7678.The geoid height was determined by GEOID09.
  AJ7678
  AJ7678;                    North         East     Units Scale Factor Converg.
  AJ7678;SPC MI S     -    46,598.477 4,028,404.821   MT  1.00004777   +0 13 58.8
  AJ7678;SPC MI S     -   152,882.14 13,216,551.25   iFT  1.00004777   +0 13 58.8
  AJ7678
  AJ7678!             -  Elev Factor  x  Scale Factor =   Combined Factor
  AJ7678!SPC MI S     -   0.99996752  x   1.00004777  =   1.00001529
  AJ7678
  AJ7678                          SUPERSEDED SURVEY CONTROL
  AJ7678
  AJ7678  NAD 83(CORS)-  41 55 08.33225(N)    084 01 27.38234(W) AD(1997.00) c
  AJ7678  ELLIP H (01/??/02)  207.108  (m)                       GP(1997.00) c c
  AJ7678
  AJ7678.Superseded values are not recommended for survey control.
  AJ7678.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
  AJ7678.See file dsdata.txt to determine how the superseded data were derived.
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AJ7678
AJ7678_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM4676745064(NAD 83)
AJ7678_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
AJ7678_MAGNETIC: O = OTHER; SEE DESCRIPTION
AJ7678
AJ7678                          STATION DESCRIPTION
AJ7678
AJ7678'DESCRIBED BY NATIONAL GEODETIC SURVEY 2002
AJ7678'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
AJ7678'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AJ7678'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AJ7678'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
AJ7678'   HTTP://WWW.NGS.NOAA.GOV/CORS.

DG4064 ***********************************************************************
DG4064  CORS        -  This is a GPS Continuously Operating Reference Station.
DG4064  DESIGNATION -  ADRIAN CORS L1 PHASE CENTER
DG4064  CORS_ID     -  ADRI
DG4064  PID         -  DG4064
DG4064  STATE/COUNTY-  MI/LENAWEE
DG4064  USGS QUAD   -  ADRIAN (1979)
DG4064
DG4064                         *CURRENT SURVEY CONTROL
DG4064  ______________________________________________________________________
DG4064* NAD 83(CORS)-  41 55 08.33233(N)    084 01 27.38227(W)     ADJUSTED
DG4064* NAVD 88     -              **(meters)            **(feet)
DG4064  ______________________________________________________________________
DG4064  EPOCH DATE  -        2002.00
DG4064  X           -     494,838.894 (meters)                     COMP
DG4064  Y           -  -4,727,341.600 (meters)                     COMP
DG4064  Z           -   4,239,050.486 (meters)                     COMP
DG4064  ELLIP HEIGHT-         207.214 (meters)          (03/??/02) ADJUSTED
DG4064  GEOID HEIGHT-         -34.88  (meters)                     GEOID09
DG4064  HORZ ORDER  -  SPECIAL (CORS)
DG4064  ELLP ORDER  -  SPECIAL (CORS)
DG4064
DG4064.ITRF positions are available for this station.
DG4064.The coordinates were established by GPS observations
DG4064.and adjusted by the National Geodetic Survey in March 2002.
DG4064.The coordinates are valid at the epoch date displayed above.
DG4064.The epoch date for horizontal control is a decimal equivalence
DG4064.of Year/Month/Day.
DG4064
DG4064
DG4064.The PID for the CORS ARP is AJ7678.
DG4064
DG4064.The XYZ, and position/ellipsoidal ht. are equivalent.
DG4064
DG4064.The ellipsoidal height was determined by GPS observations
DG4064.and is referenced to NAD 83.
DG4064
DG4064.The geoid height was determined by GEOID09.
DG4064
DG4064;                   North         East     Units Scale Factor Converg.
DG4064;SPC MI S     -    46,598.480 4,028,404.822   MT  1.00004777   +0 13 58.8
DG4064;SPC MI S     -   152,882.15 13,216,551.25   iFT  1.00004777   +0 13 58.8
DG4064
DG4064!             -  Elev Factor  x  Scale Factor =   Combined Factor
DG4064!SPC MI S     -   0.99996750  x   1.00004777  =   1.00001527
DG4064
DG4064                         SUPERSEDED SURVEY CONTROL
DG4064
DG4064  NAD 83(CORS)-  41 55 08.33233(N)    084 01 27.38228(W) AD(1997.00) c
```

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DG4064  ELLIP H (01/??/02)  207.214  (m)                      GP(1997.00) c c
DG4064
DG4064.Superseded values are not recommended for survey control.
DG4064.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DG4064.See file dsdata.txt to determine how the superseded data were derived.
DG4064
DG4064_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM4676745064(NAD 83)
DG4064_MARKER: STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA
DG4064
DG4064                          STATION DESCRIPTION
DG4064
DG4064'DESCRIBED BY NATIONAL GEODETIC SURVEY
DG4064'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
DG4064'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DG4064'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DG4064'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
DG4064'   HTTP://WWW.NGS.NOAA.GOV/CORS.
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DJ8895 ***********************************************************************
DJ8895  CORS         -  This is a GPS Continuously Operating Reference Station.
DJ8895  DESIGNATION  -  HILLSDALE CORS ARP
DJ8895  CORS_ID      -  MIHD
DJ8895  PID          -  DJ8895
DJ8895  STATE/COUNTY-  MI/HILLSDALE
DJ8895  USGS QUAD    -  NORTH ADAMS (1979)
DJ8895
DJ8895                        *CURRENT SURVEY CONTROL
DJ8895  ______________________________________________________________________
DJ8895* NAD 83(CORS)-  41 53 19.72599(N)    084 36 58.80705(W)     ADJUSTED
DJ8895* NAVD 88     -              **(meters)           **(feet)
DJ8895  ______________________________________________________________________
DJ8895  EPOCH DATE  -        2002.00
DJ8895  X           -     446,182.764 (meters)                    COMP
DJ8895  Y           -  -4,734,527.590 (meters)                    COMP
DJ8895  Z           -   4,236,643.781 (meters)                    COMP
DJ8895  ELLIP HEIGHT-         337.965 (meters)          (01/??/08) ADJUSTED
DJ8895  GEOID HEIGHT-         -33.92  (meters)                    GEOID09
DJ8895  HORZ ORDER  -  SPECIAL (CORS)
DJ8895  ELLP ORDER  -  SPECIAL (CORS)
DJ8895
DJ8895.ITRF positions are available for this station.
DJ8895.The coordinates were established by GPS observations
DJ8895.and adjusted by the National Geodetic Survey in January 2008.
DJ8895.The coordinates are valid at the epoch date displayed above.
DJ8895.The epoch date for horizontal control is a decimal equivalence
DJ8895.of Year/Month/Day.
DJ8895
DJ8895
DJ8895.The PID for the CORS L1 Phase Center is DJ8896.
DJ8895
DJ8895.The XYZ, and position/ellipsoidal ht. are equivalent.
DJ8895
DJ8895.The ellipsoidal height was determined by GPS observations
DJ8895.and is referenced to NAD 83.
DJ8895
DJ8895.The geoid height was determined by GEOID09.
DJ8895
DJ8895;                    North         East     Units Scale Factor Converg.
DJ8895;SPC MI S     -    43,220.422 3,979,277.650   MT  1.00005668   -0 10 11.7
DJ8895;SPC MI S     -   141,799.28 13,055,372.87   iFT  1.00005668   -0 10 11.7
DJ8895
DJ8895!             -  Elev Factor  x  Scale Factor =   Combined Factor
DJ8895!SPC MI S     -   0.99994700  x   1.00005668  =   1.00000367
DJ8895
DJ8895                          SUPERSEDED SURVEY CONTROL
DJ8895
DJ8895.No superseded survey control is available for this station.
DJ8895
DJ8895_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TFM9775940178(NAD 83)
DJ8895_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
DJ8895
DJ8895                          STATION DESCRIPTION
DJ8895
DJ8895'DESCRIBED BY NATIONAL GEODETIC SURVEY 2008
DJ8895'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
DJ8895'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DJ8895'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DJ8895'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
DJ8895'   HTTP://WWW.NGS.NOAA.GOV/CORS.
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DJ8896 ***********************************************************************
DJ8896  CORS         -  This is a GPS Continuously Operating Reference Station.
DJ8896  DESIGNATION  -  HILLSDALE CORS L1 PHASE CENTER
DJ8896  CORS_ID      -  MIHD
DJ8896  PID          -  DJ8896
DJ8896  STATE/COUNTY-  MI/HILLSDALE
DJ8896  USGS QUAD    -  NORTH ADAMS (1979)
DJ8896
DJ8896                        *CURRENT SURVEY CONTROL
DJ8896  ______________________________________________________________________
DJ8896* NAD 83(CORS)-  41 53 19.72607(N)    084 36 58.80699(W)     ADJUSTED
DJ8896* NAVD 88     -              **(meters)           **(feet)
DJ8896  ______________________________________________________________________
DJ8896  EPOCH DATE   -        2002.00
DJ8896  X            -     446,182.773 (meters)                    COMP
DJ8896  Y            -  -4,734,527.667 (meters)                    COMP
DJ8896  Z            -   4,236,643.854 (meters)                    COMP
DJ8896  ELLIP HEIGHT-         338.072 (meters)          (01/??/08) ADJUSTED
DJ8896  GEOID HEIGHT-         -33.92  (meters)                    GEOID09
DJ8896  HORZ ORDER   -  SPECIAL (CORS)
DJ8896  ELLP ORDER   -  SPECIAL (CORS)
DJ8896
DJ8896.ITRF positions are available for this station.
DJ8896.The coordinates were established by GPS observations
DJ8896.and adjusted by the National Geodetic Survey in January 2008.
DJ8896.The coordinates are valid at the epoch date displayed above.
DJ8896.The epoch date for horizontal control is a decimal equivalence
DJ8896.of Year/Month/Day.
DJ8896
DJ8896
DJ8896.The PID for the CORS ARP is DJ8895.
DJ8896
DJ8896.The XYZ, and position/ellipsoidal ht. are equivalent.
DJ8896
DJ8896.The ellipsoidal height was determined by GPS observations
DJ8896.and is referenced to NAD 83.
DJ8896
DJ8896.The geoid height was determined by GEOID09.
DJ8896
DJ8896;                    North         East     Units Scale Factor Converg.
DJ8896;SPC MI S      -    43,220.425 3,979,277.651   MT  1.00005668   -0 10 11.7
DJ8896;SPC MI S      -   141,799.29 13,055,372.87   iFT  1.00005668   -0 10 11.7
DJ8896
DJ8896!              -  Elev Factor  x  Scale Factor =   Combined Factor
DJ8896!SPC MI S      -   0.99994698  x   1.00005668  =   1.00000366
DJ8896
DJ8896                          SUPERSEDED SURVEY CONTROL
DJ8896
DJ8896.No superseded survey control is available for this station.
DJ8896
DJ8896_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TFM9775940178(NAD 83)
DJ8896_MARKER: STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA
DJ8896
DJ8896                          STATION DESCRIPTION
DJ8896
DJ8896'DESCRIBED BY NATIONAL GEODETIC SURVEY
DJ8896'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
DJ8896'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DJ8896'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DJ8896'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
DJ8896'   HTTP://WWW.NGS.NOAA.GOV/CORS.
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AJ5573 ***********************************************************************
AJ5573  CORS        -  This is a GPS Continuously Operating Reference Station.
AJ5573  DESIGNATION -  JACKSON CORS ARP
AJ5573  CORS_ID     -  UNIV
AJ5573  PID         -  AJ5573
AJ5573  STATE/COUNTY-  MI/JACKSON
AJ5573  USGS QUAD   -  JACKSON NORTH (1976)
AJ5573
AJ5573                        *CURRENT SURVEY CONTROL
AJ5573  ______________________________________________________________________
AJ5573* NAD 83(CORS)-  42 17 08.20222(N)    084 23 09.29023(W)     ADJUSTED
AJ5573* NAVD 88     -              **(meters)           **(feet)
AJ5573  ______________________________________________________________________
AJ5573  EPOCH DATE  -        2002.00
AJ5573  X           -     462,324.191 (meters)                    COMP
AJ5573  Y           -  -4,703,240.512 (meters)                    COMP
AJ5573  Z           -   4,269,305.555 (meters)                    COMP
AJ5573  ELLIP HEIGHT-         265.649 (meters)          (03/??/02) ADJUSTED
AJ5573  GEOID HEIGHT-         -34.19  (meters)                    GEOID09
AJ5573  HORZ ORDER  -  SPECIAL (CORS)
AJ5573  ELLP ORDER  -  SPECIAL (CORS)
AJ5573
AJ5573.ITRF positions are available for this station.
AJ5573.The coordinates were established by GPS observations
AJ5573.and adjusted by the National Geodetic Survey in March 2002.
AJ5573.The coordinates are valid at the epoch date displayed above.
AJ5573.The epoch date for horizontal control is a decimal equivalence
AJ5573.of Year/Month/Day.
AJ5573
AJ5573
AJ5573.The PID for the CORS L1 Phase Center is DG4063.
AJ5573
AJ5573.The XYZ, and position/ellipsoidal ht. are equivalent.
AJ5573
AJ5573.The ellipsoidal height was determined by GPS observations
AJ5573.and is referenced to NAD 83.
AJ5573
AJ5573.The geoid height was determined by GEOID09.
AJ5573
AJ5573;                    North         East     Units Scale Factor Converg.
AJ5573;SPC MI S     -    87,264.534 3,998,412.560   MT  0.99996122   -0 00 47.2
AJ5573;SPC MI S     -   286,300.96 13,118,151.44   iFT  0.99996122   -0 00 47.2
AJ5573
AJ5573!             -  Elev Factor  x  Scale Factor =   Combined Factor
AJ5573!SPC MI S     -   0.99995834  x   0.99996122  =   0.99991956
AJ5573
AJ5573                          SUPERSEDED SURVEY CONTROL
AJ5573
AJ5573  NAD 83(CORS)-  42 17 08.20221(N)    084 23 09.29022(W) AD(1997.00) c
AJ5573  ELLIP H (10/??/01)  265.649  (m)                      GP(1997.00) c c
AJ5573
AJ5573.Superseded values are not recommended for survey control.
AJ5573.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ5573.See file dsdata.txt to determine how the superseded data were derived.
AJ5573
AJ5573_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM1552884797(NAD 83)
AJ5573_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
AJ5573
AJ5573                          STATION DESCRIPTION
AJ5573
AJ5573'DESCRIBED BY NATIONAL GEODETIC SURVEY 2002
AJ5573'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
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AJ5573'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AJ5573'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AJ5573'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
AJ5573'   HTTP://WWW.NGS.NOAA.GOV/CORS.

DG4063 ******************************************************************
DG4063  CORS        -  This is a GPS Continuously Operating Reference Station.
DG4063  DESIGNATION -  JACKSON CORS L1 PHASE CENTER
DG4063  CORS_ID     -  UNIV
DG4063  PID         -  DG4063
DG4063  STATE/COUNTY-  MI/JACKSON
DG4063  USGS QUAD   -  JACKSON NORTH (1976)
DG4063
DG4063                        *CURRENT SURVEY CONTROL
DG4063  ______________________________________________________________________
DG4063* NAD 83(CORS)-  42 17 08.20230(N)    084 23 09.29018(W)     ADJUSTED
DG4063* NAVD 88     -              **(meters)           **(feet)
DG4063  ______________________________________________________________________
DG4063  EPOCH DATE  -        2002.00
DG4063  X           -     462,324.199 (meters)                    COMP
DG4063  Y           -  -4,703,240.588 (meters)                    COMP
DG4063  Z           -   4,269,305.629 (meters)                    COMP
DG4063  ELLIP HEIGHT-         265.755 (meters)          (03/??/02) ADJUSTED
DG4063  GEOID HEIGHT-         -34.19  (meters)                    GEOID09
DG4063  HORZ ORDER  -  SPECIAL (CORS)
DG4063  ELLP ORDER  -  SPECIAL (CORS)
DG4063
DG4063.ITRF positions are available for this station.
DG4063.The coordinates were established by GPS observations
DG4063.and adjusted by the National Geodetic Survey in March 2002.
DG4063.The coordinates are valid at the epoch date displayed above.
DG4063.The epoch date for horizontal control is a decimal equivalence
DG4063.of Year/Month/Day.
DG4063
DG4063
DG4063.The PID for the CORS ARP is AJ5573.
DG4063
DG4063.The XYZ, and position/ellipsoidal ht. are equivalent.
DG4063
DG4063.The ellipsoidal height was determined by GPS observations
DG4063.and is referenced to NAD 83.
DG4063
DG4063.The geoid height was determined by GEOID09.
DG4063
DG4063;                    North         East     Units Scale Factor Converg.
DG4063;SPC MI S     -    87,264.537 3,998,412.561   MT  0.99996122   -0 00 47.2
DG4063;SPC MI S     -   286,300.97 13,118,151.45   iFT  0.99996122   -0 00 47.2
DG4063
DG4063!             -  Elev Factor  x  Scale Factor =   Combined Factor
DG4063!SPC MI S     -   0.99995832  x   0.99996122  =   0.99991954
DG4063
DG4063                         SUPERSEDED SURVEY CONTROL
DG4063
DG4063  NAD 83(CORS)-  42 17 08.20229(N)    084 23 09.29016(W) AD(1997.00) c
DG4063  ELLIP H (10/??/01)  265.756  (m)                      GP(1997.00) c c
DG4063
DG4063.Superseded values are not recommended for survey control.
DG4063.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DG4063.See file dsdata.txt to determine how the superseded data were derived.
DG4063
DG4063_U.S. NATIONAL GRID SPATIAL ADDRESS: 16TGM1552884797(NAD 83)
DG4063_MARKER: STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA
DG4063
```

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DG4063                          STATION DESCRIPTION
DG4063
DG4063'DESCRIBED BY NATIONAL GEODETIC SURVEY
DG4063'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
DG4063'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
DG4063'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
DG4063'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
DG4063'   HTTP://WWW.NGS.NOAA.GOV/CORS.
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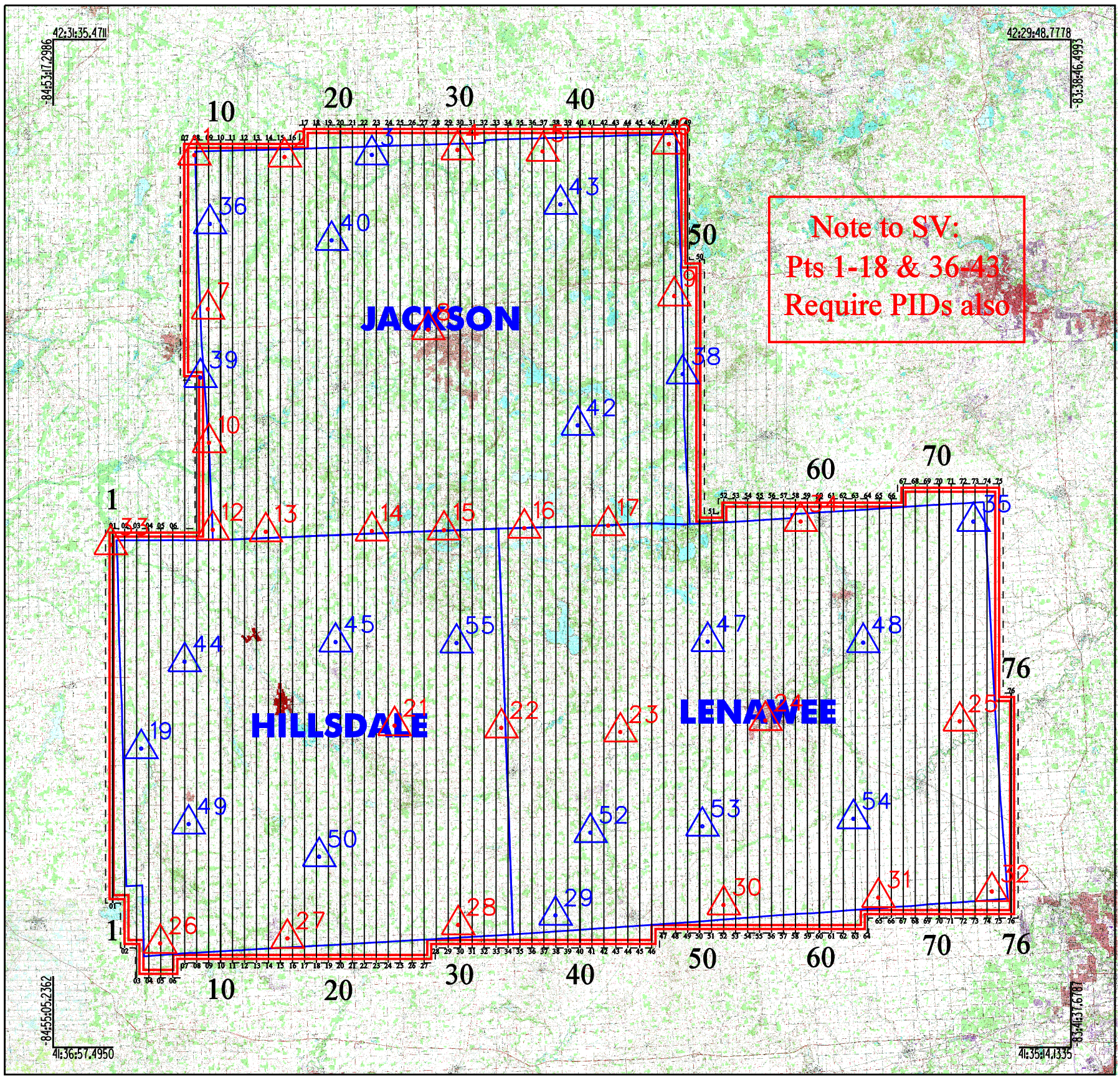
SECTION 5: GPS CONTROL DIAGRAM

This section contains a map of the photogrammetric ground control stations and surrounding area for the Hillsdale, Jackson, and Lenawee Counties 1.5 PPSM LiDAR Project.



Hillsdale/Jackson/Lenawee Counties, MI

1.5m Lidar Flight/Control Diagram

Map Scale: 1" = 12,000m

Coordinate System Info:
Coord. Sys.: UTM
Zone: 16-N
Horizontal Datum: NAD83
Vertical Datum:
Units: Meters
Tie into...:

- County Limits
- Project Boundary
- 1.5m Lidar Flights (1-76) @ 8,470' MSL
- 28 Proposed Control Points (Pts. 1-10, 12-17, 21-28, 30-34)
- 20 Proposed Control Points (Pts. 3, 19, 29, 35-36, 38-40, 42-45, 47-50, 52-55)

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