

**GPS SURVEY REPORT
WINNEBAGO COUNTY, IOWA GIS
DECEMBER 2002**

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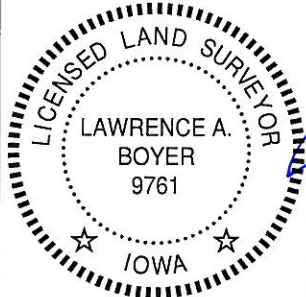
	<p>I hereby certify that this land surveying document was prepared and the related survey work was performed by me or under my direct personal supervision and that I am a duly licensed Land Surveyor under the laws of the State of Iowa.</p>
	<p><i>Lawrence A. Boyer</i> <i>December 18, 2002</i> Lawrence A. Boyer Date License Number 9761 Date of Survey: <i>SEPTEMBER 19, 2002</i> My license renewal date is December 31, 2002. Sheets covered by this seal: <i>SHEETS 1 TO 94</i></p>

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Section 1
Project Report

GPS SURVEY REPORT WINNEBAGO COUNTY, IOWA GIS

1. Introduction

This GPS survey for the Winnebago County GIS established horizontal and vertical control at sixty-three locations in the countywide area at approximately three mile intervals. The work was performed for Winnebago County as a basis for ground control for aerial photography and mapping. Permanent Bernsten NGS style monuments were placed at fifty-eight new locations. Five existing NGS style monuments along the Hancock County line were observed. An additional fifteen GPS stations were existing horizontal and vertical control. The total number of GPS stations observed for the Winnebago County GIS is seventy-eight.

2. Existing Horizontal and Vertical Control

Six National Geodetic Survey (NGS) High Accuracy Reference Network (HARN) stations were found in the project vicinity and used as follows:

Winnebago County Network Point	NGS PID	Designation	Use
2002-1	OO0687	41 1	Horizontal and Vertical
2002-4	OO1179	Joice Reset	Horizontal
2002-23	OO1209	Clover	Horizontal
2002-28	AC4902	Miniow	Horizontal
2002-31	AC4900	Fure	Horizontal
2002-35	AC4898	Food	Horizontal

Four U.S. Coast and Geodetic Survey (NGS) benchmarks were found in the project vicinity and used as follows:

Winnebago County Network Point	NGS PID	Designation	Use
2002-19	OO0700	Forest City	Vertical (ECC)
2002-27	OO0693	Q 34	Vertical (ECC)
2002-29	OO1472	TT 79 WM	Vertical
2002-36	OP0029	L 4	Vertical

Six U.S. Geological Survey (USGS) benchmarks were found in the project vicinity where no NGS control was available and used as follows:

Winnebago County Network Point	Designation	Use
2002-3	12 SAN 1972	Vertical
2002-24	25 WEK 1972	Vertical
2002-25	24 WEK 1972	Vertical
2002-32	TT 8 WM	Vertical
2002-33	MNDOT ROME-36	Vertical
2002-34	MNDOT ROME-31	Vertical

Benchmarks used as vertical control in obstructed locations required conventional leveling techniques to establish a nearby eccentric point coded ECC.

3. Horizontal and Vertical Datum

The horizontal datum is the Iowa State Plane Coordinate System, North Zone (1401) North American Datum 1983 (NAD 83) 1996 adjustment.

The vertical datum is the North American Vertical Datum of 1988 (NAVD 1988).

4. Personnel, Equipment and Methods

Personnel were as follows: Lawrence A. Boyer, GPS Manager; Timothy Lovik, instrument person; Brian J. Diehl, instrument person; Scott C. Jones, instrument person; Steven J. Lentz, instrument person.

Two Trimble Navigation 4800 dual frequency receivers and two Trimble Navigation 5700 dual frequency receivers were used for the GPS observations. The receivers collected data simultaneously using a minimum 20 minute fast static observation technique. The sampling rate was 15 seconds and the elevation mask was 15 degrees. Each receiver was mounted on a fixed height tripod.

There were fifty-two sessions observed for the project beginning on March 21, 2002 and ending on April 4, 2002. All observations were made to top of monuments placed or found. Differences from the top of monument to ground level were noted and reported for mapping purposes.

The placement of permanent monuments required coordination with local utilities. The result was the locations of all permanent monuments were compatible with underground utilities as determined during reconnaissance.

5. Network Adjustment

Trimble Geomatics Office™ software was used for the network adjustment. A free horizontal adjustment was made using the HARN station at 2002-1 as the only fixed control. This free adjustment fit the remaining five HARN stations well. A minimally constrained horizontal adjustment was then made using the remaining HARN stations one at a time until all six HARN stations were held as fixed horizontal control.

A free vertical adjustment was made to ellipsoidal heights using the HARN station at 2002-1 as the only fixed control. The ellipsoidal height differences from this free adjustment were noted at all of the NGS benchmarks. A minimally constrained vertical adjustment for ellipsoidal height was then made one at a time until all of the remaining NGS benchmarks were held as fixed vertical control.

A constrained adjustment modeled with GEIOD99 was made holding all NGS benchmarks one at a time, as fixed vertical control at the published NAVD 88 elevations. This adjustment was compared to the converted NAVD 88 elevations of the six USGS benchmarks and fit well. The fully constrained final adjustment used six HARN stations as fixed horizontal control, five NGS benchmarks and six USGS benchmarks as fixed vertical control with GEIOD99 modeled from the benchmarks.

Section 2
Network Map

Section 3
Coordinate List

Project : WINNEBAGO GIS

User name	WHKS	Date & Time	3:53:07 PM 12/17/2002
Coordinate System	US State Plane 1983	Zone	Iowa North 1401
Project Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD 88	Geoid Model	GEOID99 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Point listing

Name	Northing	Easting	Elevation	Feature Code
2002-1	3873362.265	4920757.252	1265.998	HARN 41 1
2002-3	3962762.835	4932496.808	1264.873	USGS 12 SAN 1972
2002-4	3958527.821	4945575.639	1343.457	HARN JOICE RESET
2002-19	3923015.753	4884399.375	1277.780	BM FOREST CITY ECC
2002-23	3910491.842	4827991.814	1305.473	HARN CLOVER
2002-24	3920858.328	4790619.395	1182.711	USGS 25 WEK 1972
2002-25	3936644.633	4790768.403	1172.298	USGS 24 WEK 1972
2002-27	3973528.282	4895120.130	1227.337	BM Q 34 ECC
2002-28	4009597.320	4959944.213	1266.279	HARN MINIOW
2002-29	4009622.720	4956084.875	1269.489	BM TT 79 WM
2002-31	4010880.889	4865834.157	1261.437	HARN FURE
2002-32	4010070.610	4855296.787	1248.019	USGS TT 8 WM
2002-33	4009907.100	4818139.957	1152.714	MNDOT ROME 36
2002-34	4010136.442	4786431.594	1126.851	MNDOT ROME 31
2002-35	4010337.546	4765214.821	1112.488	HARN FOOD
2002-36	4047285.529	4765541.816	1096.071	BM L 4
G1	3920926.908	4795955.357	1183.633	ALMON
G2	3920323.564	4827453.206	1256.764	ALMON
G3	3920604.355	4859018.542	1275.104	ALMON
G4	3920266.205	4890063.185	1228.885	ALMON
G5	3920480.286	4921845.032	1262.878	ALMON
G101	3923699.092	4905976.778	1242.069	ALMON
G102	3923267.823	4875630.799	1243.819	ALMON
G103	3921120.772	4843310.852	1300.282	ALMON
G104	3922026.647	4811676.098	1228.340	ALMON
G105	3936695.011	4796364.896	1166.327	ALMON
G106	3936587.899	4811759.340	1198.068	ALMON
G107	3936555.060	4827483.998	1242.154	ALMON
G108	3936211.097	4843134.584	1274.162	ALMON
G109	3936324.421	4858955.571	1285.767	ALMON
G110	3936359.693	4874337.567	1269.792	ALMON
G111	3936598.809	4889711.810	1269.627	ALMON
G112	3936408.290	4906103.492	1232.055	ALMON
G113	3936475.972	4921842.155	1221.399	ALMON
G114	3952522.123	4921847.792	1248.425	ALMON
G115	3952101.888	4905980.963	1276.586	ALMON
G116	3951624.618	4890130.705	1249.327	ALMON
G117	3952346.600	4874255.271	1273.003	ALMON
G118	3952299.903	4860298.536	1287.982	ALMON
G119	3952358.680	4843187.920	1277.757	ALMON
G120	3952460.843	4827562.984	1204.698	ALMON
G121	3952437.540	4811727.612	1182.807	ALMON

G122	3952580.873	4796221.745	1192.205	ALMON
G123	3968437.863	4796407.591	1173.901	ALMON
G124	3968485.996	4811723.960	1191.555	ALMON
G125	3968148.110	4827601.677	1202.798	ALMON
G126	3968042.815	4843249.131	1237.189	ALMON
G127	3968148.321	4859081.086	1255.027	ALMON
G128	3967827.251	4874378.680	1238.143	ALMON
G129	3968089.853	4890054.910	1264.155	ALMON
G130	3968253.186	4906037.882	1290.109	ALMON
G131	3965670.690	4920743.118	1244.980	ALMON
G132	3984250.395	4921826.841	1294.698	ALMON
G133	3984263.937	4906032.293	1262.919	ALMON
G134	3984234.322	4890056.244	1288.435	ALMON
G135	3984205.750	4873783.980	1275.592	ALMON
G136	3984248.983	4859054.030	1237.688	ALMON
G137	3984284.165	4844161.384	1234.321	ALMON
G138	3984354.398	4827736.387	1199.450	ALMON
G139	3984342.011	4811824.315	1196.259	ALMON
G140	3983918.097	4796279.053	1178.236	ALMON
G141	4000214.984	4797299.226	1140.907	ALMON
G142	4000311.391	4811788.343	1167.648	ALMON
G143	4000226.526	4827694.401	1193.068	ALMON
G144	4000006.693	4843409.382	1238.853	ALMON
G145	3999888.170	4859126.196	1244.530	ALMON
G146	3999905.022	4874422.963	1264.771	ALMON
G147	4000001.892	4889434.896	1276.455	ALMON
G148	3999580.613	4906180.306	1277.268	ALMON
G149	4000250.732	4921914.874	1303.436	ALMON
G150	4009523.996	4921303.552	1273.144	ALMON
G151	4009554.059	4906168.138	1236.602	ALMON
G152	4009590.981	4889758.018	1286.805	ALMON
G153	4009567.434	4874491.426	1260.563	ALMON
G154	4009617.640	4859142.095	1242.373	ALMON
G155	4009621.512	4843085.160	1224.181	ALMON
G156	4009778.732	4827747.629	1181.190	ALMON
G157	4009846.480	4811909.473	1141.810	ALMON
G158	4009983.404	4796480.590	1136.475	ALMON

Section 4
NGS Data Sheets

2002-1.txt

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000687 *****
000687 FBN - This is a Federal Base Network Control Station.
000687 DESIGNATION - 41 1
000687 PID - 000687
000687 STATE/COUNTY- IA/HANCOCK
000687 USGS QUAD - MILLER (1972)
000687
000687 *CURRENT SURVEY CONTROL
000687
000687* NAD 83(1996)- 43 07 33.22864(N) 093 30 06.64456(W) ADJUSTED
000687* NAVD 88 - 385.877 (meters) 1266.00 (feet) ADJUSTED
000687
000687 X - -284,798.750 (meters) COMP
000687 Y - -4,653,958.035 (meters) COMP
000687 Z - 4,337,964.369 (meters) COMP
000687 LAPLACE CORR- 9.55 (seconds) DEFLEC99
000687 ELLIP HEIGHT- 357.09 (meters) GPS OBS
000687 GEOID HEIGHT- -28.80 (meters) GEOID99
000687 DYNAMIC HT - 385.771 (meters) 1265.65 (feet) COMP
000687 MODELED GRAV- 980,334.0 (mgal) NAVD 88
000687
000687 HORZ ORDER - B
000687 VERT ORDER - FIRST CLASS II
000687 ELLP ORDER - FOURTH CLASS I
000687
000687.The horizontal coordinates were established by GPS observations
000687.and adjusted by the National Geodetic Survey in August 1997.
000687
000687.The orthometric height was determined by differential leveling
000687.and adjusted by the National Geodetic Survey in June 1991.
000687
000687.The X, Y, and Z were computed from the position and the ellipsoidal ht.
000687
000687.The Laplace correction was computed from DEFLEC99 derived deflections.
000687
000687.The ellipsoidal height was determined by GPS observations
000687.and is referenced to NAD 83.
000687
000687.The geoid height was determined by GEOID99.
000687
000687.The dynamic height is computed by dividing the NAVD 88
000687.geopotential number by the normal gravity value computed on the
000687.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
000687.degrees latitude (g = 980.6199 gals.).
000687
000687.The modeled gravity was interpolated from observed gravity values.
000687
000687; North East Units Scale Converg.
000687;SPC IA N - 1,180,603.179 1,499,849.810 MT 0.99997731 -0 00 04.5
000687;UTM 15 - 4,774,917.792 459,178.961 MT 0.99962050 -0 20 35.0
000687
000687 SUPERSEDED SURVEY CONTROL
000687
000687 NAD 83(1986)- 43 07 33.22055(N) 093 30 06.63372(W) AD( ) 3
000687 NGVD 29 - 385.855 (m) 1265.93 (f) ADJ UNCH 1 2
000687
000687.Superseded values are not recommended for survey control.
000687.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
000687.See file dsdata.txt to determine how the superseded data were derived.
000687

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OO0687_MARKER: DD = SURVEY DISK
 OO0687_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 OO0687_STAMPING: 41 1
 OO0687_MAGNETIC: N = NO MAGNETIC MATERIAL
 OO0687_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 OO0687+STABILITY: SURFACE MOTION
 OO0687_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 OO0687+SATELLITE: SATELLITE OBSERVATIONS - June 26, 1989

OO0687	HISTORY	- Date	Condition	Recov. By
OO0687	HISTORY	- UNK	MONUMENTED	IAGS
OO0687	HISTORY	- 1934	GOOD	NGS
OO0687	HISTORY	- 19890626	GOOD	NGS
OO0687	HISTORY	- 19950601	GOOD	IAHD
OO0687	HISTORY	- 19960925	GOOD	IADT

OO0687
 OO0687 STATION DESCRIPTION
 OO0687

OO0687'DESCRIBED BY NATIONAL GEODETIC SURVEY 1934
 OO0687'1.2 MI W FROM GARNER.
 OO0687'IN HANCOCK COUNTY, 1.2 MILES WEST ALONG U.S. HIGHWAY 18 FROM THE
 OO0687'COUNTY-ROAD CROSSING AT VENTURA, CERRO GORDO COUNTY, IN SEC. 24, T. 96
 OO0687'N., R. 23 W., 1127 FEET SOUTHWEST OF A COPPER PLUG IN THE PAVEMENT,
 OO0687'62.6 FEET SOUTHEAST OF BLACK DIAMOND TELEPHONE POLE 5, 20 FEET SOUTH
 OO0687'OF THE PAVEMENT, AND 3.3 FEET NORTH OF A FENCE. A STATE SURVEY
 OO0687'STANDARD DISK, STAMPED 41-1 AND SET IN THE TOP OF A CONCRETE POST.

OO0687
 OO0687 STATION RECOVERY (1989)
 OO0687

OO0687'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989
 OO0687'THE STATION IS LOCATED ABOUT 2.5 KM (1.55 MI) WEST-SOUTHWEST OF
 OO0687'VENTURA, 8.05 KM (5.00 MI) EAST-NORTHEAST OF GARNER, ON THE SOUTH SIDE
 OO0687'OF A PAVED ROAD AND JUST EAST OF A ROAD LEADING SOUTH INTO THE VENTURA
 OO0687'MARSH WILDLIFE MANAGEMENT AREA. OWNERSHIP--DEPARTMENT OF
 OO0687'TRANSPORTATION, 800 LINCOLN WAY, AMES, IA 50010, PHONE 515-239-1101.
 OO0687'TO REACH THE STATION FROM THE JUNCTION OF US HIGHWAY 18 AND US HIGHWAY
 OO0687'69 SOUTH IN GARNER, GO EAST ON STATE HIGHWAY 18 FOR 8.2 KM (5.10 MI)
 OO0687'TO THE JUNCTION OF COUNTY ROAD R 70. TURN RIGHT, SOUTH, ON COUNTY
 OO0687'ROAD R 70 FOR 0.05 KM (0.05 MI) TO A PAVED ROAD ON THE LEFT JUST SOUTH
 OO0687'OF A RAILROAD CROSSING. TURN LEFT, EAST, ON THE PAVED ROAD FOR 1.3 KM
 OO0687'(0.80 MI) TO THE MARK ON THE RIGHT, JUST PAST THE ENTRANCE ROAD
 OO0687'LEADING INTO THE VENTURA MARSH WILDLIFE MANAGMENT AREA.
 OO0687'THE STATION IS A STANDARD CGS AND STATE SURVEY DISK PROJECTING ABOUT
 OO0687'4-INCHES ABOVE THE GROUND. LOCATED 38.5 M (126.3 FT) EAST OF THE
 OO0687'CENTER OF THE ROAD LEADING INTO THE WILDLIFE MANAGEMENT AREA, 9.0 M
 OO0687'(29.5 FT) SOUTH OF THE CENTER OF THE PAVED ROAD, 6.1 M (20.0 FT) NORTH
 OO0687'OF A BARBED WIRE FENCE, 5.3 M (17.4 FT) SOUTHEAST OF A HIGHWAY SIGN
 OO0687'WITH A CURVE SYMBOL AND 0.2 M (0.7 FT) NORTH OF A METAL WITNESS POST.
 OO0687'DESCRIBED BY M. L. MCCREADY.

OO0687
 OO0687 STATION RECOVERY (1995)
 OO0687

OO0687'RECOVERY NOTE BY IOWA HIGHWAY DEPARTMENT 1995
 OO0687'RECOVERED AS DESCRIBED.

OO0687
 OO0687 STATION RECOVERY (1996)
 OO0687

OO0687'RECOVERY NOTE BY IOWA DEPARTMENT OF TRANSPORTATION 1996 (SRM)
 OO0687'RECOVERED AS DESCRIBED BY IOWA DOT. A PINK STATE HARN SURVEY SIGN WAS
 OO0687'SET 6.1 M (20.0 FT) SOUTH IN THE R.O.W. FENCE.

2002-4.TXT

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OO1179 *****
OO1179 CBN - This is a Cooperative Base Network Control Station.
OO1179 DESIGNATION - JOICE RESET
OO1179 PID - OO1179
OO1179 STATE/COUNTY- IA/WORTH
OO1179 USGS QUAD - FERTILE (1972)
OO1179
OO1179 *CURRENT SURVEY CONTROL
OO1179
OO1179* NAD 83(1996)- 43 21 34.26088(N) 093 24 30.73393(W) ADJUSTED
OO1179* NAVD 88 - 409.4 (meters) 1343. (feet) GPS OBS
OO1179
OO1179 X - -276,162.974 (meters) COMP
OO1179 Y - -4,636,681.737 (meters) COMP
OO1179 Z - 4,356,888.184 (meters) COMP
OO1179 LAPLACE CORR- 6.57 (seconds) DEFLEC99
OO1179 ELLIP HEIGHT- 380.29 (meters) GPS OBS
OO1179 GEOID HEIGHT- -29.14 (meters) GEOID99
OO1179
OO1179 HORZ ORDER - B
OO1179 ELLP ORDER - FOURTH CLASS I
OO1179
OO1179.The horizontal coordinates were established by GPS observations
OO1179.and adjusted by the National Geodetic Survey in January 1997.
OO1179.No horizontal observational check was made to the station.
OO1179
OO1179.The orthometric height was determined by GPS observations and a
OO1179.high-resolution geoid model.
OO1179
OO1179.The X, Y, and Z were computed from the position and the ellipsoidal ht.
OO1179
OO1179.The Laplace correction was computed from DEFLEC99 derived deflections.
OO1179
OO1179.The ellipsoidal height was determined by GPS observations
OO1179.and is referenced to NAD 83.
OO1179
OO1179.The geoid height was determined by GEOID99.
OO1179
OO1179;
OO1179;SPC IA N - 1,206,561.693 1,507,414.470 MT 1.00001829 +0 03 43.2
OO1179;UTM 15 - 4,800,820.828 466,895.591 MT 0.99961348 -0 16 49.8
OO1179
OO1179: Primary Azimuth Mark Grid Az
OO1179:SPC IA N - JOICE AZ MK 250 53 41.9
OO1179:UTM 15 - JOICE AZ MK 251 14 14.9
OO1179
OO1179|-----|
OO1179| PID Reference Object Distance Geod. Az |
OO1179| | | | dddmmss.s |
OO1179| JOICE RM 3 20.494 METERS 00715 |
OO1179| OO1130 MANLEY ROUND HOUSE CHIMNEY APPROX.17.9 KM 1130132.5 |
OO1179| OO1129 MANLEY STANDPIPE APPROX.18.4 KM 1154859.6 |
OO1179| OO1181 HANLONTOWN GRACE LUTH CH SPIRE APPROX. 9.3 KM 1631845.8 |
OO1179| AC5727 JOICE RM 1 74.963 METERS 18049 |
OO1179| OO1182 FERTILE LUTH CH SPIRE APPROX.10.5 KM 1881633.4 |
OO1179| OO1195 FOREST CITY STANDPIPE APPROX.21.9 KM 2403840.8 |
OO1179| JOICE AZ MK 2505725.1 |
OO1179| JOICE RM 4 19.628 METERS 27015 |
OO1179| AC5728 JOICE RM 2 4.775 METERS 27122 |
OO1179| OO1177 JOICE FARMERS ELEVATOR E GABLE APPROX. 3.5 KM 2744141.1 |

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OO1179| OO1180 JOICE WHEELERS ELEV E GABLE APPROX. 3.5 KM 2763836.9 |
 OO1179| OO1185 LAKE MILLS STANDPIPE APPROX.12.0 KM 3024623.7 |
 OO1179|-----|
 OO1179
 OO1179 SUPERSEDED SURVEY CONTROL
 OO1179
 OO1179 NAD 83(1986)- 43 21 34.25234(N) 093 24 30.72972(W) AD() 1
 OO1179 NAD 27 - 43 21 34.41500(N) 093 24 29.98400(W) AD() 1
 OO1179 NGVD 29 - 408.6 (m) 1341. (f) VERT ANG
 OO1179

OO1179.Superseded values are not recommended for survey control.
 OO1179.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 OO1179.See file dsdata.txt to determine how the superseded data were derived.
 OO1179

OO1179_MARKER: DS = TRIANGULATION STATION DISK
 OO1179_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 OO1179_STAMPING: JOICE 1926 1971
 OO1179_MAGNETIC: N = NO MAGNETIC MATERIAL
 OO1179_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 OO1179+STABILITY: SURFACE MOTION
 OO1179_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 OO1179+SATELLITE: SATELLITE OBSERVATIONS - March 11, 1996
 OO1179

OO1179	HISTORY	- Date	Condition	Recov. By
OO1179	HISTORY	- 1971	MONUMENTED	NGS
OO1179	HISTORY	- 1971	GOOD	NGS
OO1179	HISTORY	- 1972	GOOD	USGS
OO1179	HISTORY	- 19960311	GOOD	MNDT
OO1179	HISTORY	- 19960916	GOOD	IADT

OO1179

STATION DESCRIPTION

OO1179

OO1179'DESCRIBED BY NATIONAL GEODETIC SURVEY 1971 (JLC)
 OO1179'THE STATION MARK WAS RECOVERED AND FOUND IN GOOD CONDITION
 OO1179'BUT INFORMATION OBTAINED FROM THE WORTH COUNTY ENGINEER STATED
 OO1179'THAT THEIR OFFICE HAD LOWERED THE SURFACE MARK. HIS RECORDS
 OO1179'INDICATE THAT THE HORIZONTAL POSITION OF THE SURFACE MARK
 OO1179'HAD BEEN HELD AND THE MARK LOWERED 4.77 FEET DURING ROAD
 OO1179'CONSTRUCTION IN 1955. THE UNDERGROUND MARK, REFERENCE MARKS
 OO1179'1 AND 2 WERE DESTROYED AT THE SAME TIME. THE SURFACE MARK WAS
 OO1179'RESTAMPED, REFERENCE MARKS 3 AND 4 AND AN AZIMUTH MARK WERE
 OO1179'ESTABLISHED AT THIS TIME. FOLLOWING IS A NEW AND COMPLETE
 OO1179'DESCRIPTION.
 OO1179'

OO1179'

OO1179'THE STATION IS LOCATED ABOUT 6 MILES NORTH OF FERTILE, 2-1/2 MILES
 OO1179'EAST OF JOICE IN THE SE 1/4 OF SEC. 26, T. 99 N., R. 22 W.
 OO1179'AND ON ROAD RIGHT-OF-WAY.
 OO1179'

OO1179'

OO1179'TO REACH THE STATION FROM THE POST OFFICE IN JOICE, GO EAST ON
 OO1179'STATE HIGHWAY 397 FOR 0.1 MILE TO A CROSS ROAD. TURN RIGHT
 OO1179'AND GO SOUTH ON A PAVED ROAD FOR 0.4 MILE TO A T-ROAD. TURN
 OO1179'LEFT AND GO EAST ON A PAVED ROAD FOR 0.5 MILE TO A SIDE ROAD
 OO1179'RIGHT. **CONTINUE EAST ON THE PAVED ROAD FOR 1.45 MILE TO
 OO1179'A CROSS ROAD. TURN LEFT AND GO NORTH ON A GRAVELED ROAD
 OO1179'0.1 MILE TO A PIPE LINE CROSSING. CONTINUE NORTH ON THE
 OO1179'GRAVELED ROAD FOR 0.05 MILE TO THE STATION ON THE RIGHT.
 OO1179'

OO1179'

OO1179'THE STATION MARK IS A STANDARD DISK STAMPED JOICE 1926 1971.
 OO1179'THE SURFACE DISK IS SET IN THE TOP OF A 12-INCH SQUARE CONCRETE
 OO1179'MONUMENT THAT PROJECTS 3 INCHES ABOVE THE GROUND SURFACE.
 OO1179'IT IS 56 FEET SOUTH OF THE CENTER OF A FIELD ENTRANCE, 34 FEET
 OO1179'EAST OF THE CENTER OF A GRAVELED ROAD, 10 FEET WEST OF A WIRE

OO1179'FENCE, 5 FEET WEST OF A METAL WITNESS POST AND ABOUT 4 FEET
OO1179'LOWER THAN THE ROAD SURFACE.

OO1179'

OO1179'REFERENCE MARK 3, A STANDARD DISK STAMPED JOICE 1926 NO 3 1971,
OO1179'IS SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT
OO1179'THAT PROJECTS 2 INCHES ABOVE THE GROUND SURFACE. IT IS 41 FEET
OO1179'EAST OF THE CENTER OF THE GRAVELED ROAD, 11 FEET NORTH OF THE
OO1179'CENTER OF THE FIELD ENTRANCE AND 2 FEET WEST OF THE WIRE FENCE.
OO1179'

OO1179'REFERENCE MARK 4, A STANDARD DISK STAMPED JOICE 1926 NO 4 1971,
OO1179'IS SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT
OO1179'THAT PROJECTS 2 INCHES ABOVE THE GROUND SURFACE. IT IS 73 FEET
OO1179'SOUTH OF THE CENTER OF A FIELD ENTRANCE, 31 FEET WEST OF THE
OO1179'CENTER OF THE GRAVELED ROAD, 1 FOOT EAST OF A WIRE FENCE
OO1179'

OO1179'THE AZIMUTH MARK, A STANDARD DISK STAMPED JOICE 1926 1971, IS
OO1179'SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT
OO1179'THAT PROJECTS 4 INCHES ABOVE THE GROUND SURFACE. IT IS 50 FEET
OO1179'WEST OF THE CENTER OF A PAVED ROAD, 2 FEET SOUTH OF A POWER POLE
OO1179'AND 2 FEET NORTH OF A METAL WITNESS POST.
OO1179'

OO1179'**TO REACH THE AZIMUTH MARK FROM THIS POINT, GO SOUTH ON A
OO1179'PAVED ROAD FOR 0.4 MILE TO THE AZIMUTH MARK ON THE RIGHT.
OO1179'

OO1179'HEIGHT OF LIGHT ABOVE STATION MARK 73.2 FEET.

OO1179

OO1179

STATION RECOVERY (1972)

OO1179

OO1179'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1972

OO1179'ALL MARKS FOUND IN GOOD CONDITION. DISTANCES AND DIRECTIONS

OO1179'CHECKED EXCEPT R.M. 4 IS OBSCURED. DESCRIPTION ADEQUATE.

OO1179

OO1179

STATION RECOVERY (1996)

OO1179

OO1179'RECOVERY NOTE BY MN DEPT OF TRANSP 1996 (GWO)

OO1179'THE STATION WAS RECOVERED IN GOOD CONDITION. RM 3 AND RM 4 WERE
OO1179'SEARCHED FOR AND NOT FOUND. A RR SPIKE WAS SET BY THE MARK TO MAKE IT
OO1179'MAGNETIC. A NEW DESCRIPTION FOLLOWS. THE MARK IS ABOUT 2.5 MI (4.0
OO1179'KM) EAST OF THE TOWN OF JOICE-IA IN THE SE 1/4 OF SECTION 26, T99N,
OO1179'R22W. TO REACH THE MARK FROM THE IA-MN BORDER ON FAI 35, GO SOUTH ON
OO1179'FAI 35 FOR 9.9 MI (15.9 KM) TO EXIT 208, THEN GO WEST FOR 2.9 MI (4.7
OO1179'KM) ON CO RD A38, THEN GO NORTH ON A GRAVEL RD (EVERGREEN RD) FOR 0.15
OO1179'MI (0.24 KM) TO THE MARK ON THE RIGHT. THE MARK, A DISK SET IN A CONC
OO1179'MON, IS 34 FT (10.4 M) EAST OF A GRAVEL RD, 56 FT (17.1 M) SOUTH OF A
OO1179'FIELD ENT, 5.0 FT (1.5 M) WEST OF A WIT POST, 276.7 FT (84.3 M) NNW OF
OO1179'A GASOLINE WIT POST, 64.4 FT (19.6 M) EAST OF RM 4, AND 67.24 FT
OO1179'(20.49 M) SOUTH OF RM 3. RECOVERED AND DESCRIBED BY GREGORY W.
OO1179'OBERN, CHECKED BY J.E.M.

OO1179

OO1179

STATION RECOVERY (1996)

OO1179

OO1179'RECOVERY NOTE BY IOWA DEPARTMENT OF TRANSPORTATION 1996 (SRM)

OO1179'RECOVERED IN 1996 BY IOWA DOT. TO REACH THE STATION FROM THE
OO1179'INTERSECTION OF INTERSTATE 35 SOUTHBOUND ON-OFF RAMP AND COUNTY ROAD
OO1179'A 38, GO WEST ON COUNTY ROAD A 38 FOR 2.9 MI (4.7 KM) TO A CROSSROAD,
OO1179'EVERGREEN AVENUE. TURN RIGHT AND GO NORTH ON EVERGREEN AVE. FOR 0.15
OO1179'MI (0.24 KM) TO THE STATION ON THE RIGHT, IN THE SOUTHEAST 1/4 OF
OO1179'SECTION 26, T 99 N, R 22 W. THE MONUMENT IS 1.5 M (4.9 FT) WEST OF A
OO1179'WHITE METAL WITNESS POST, AND 2.6 M (8.5 FT) WEST OF A PINK STATE HARN
OO1179'SURVEY SIGN.

2002-19.TXT

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OO0700 *****
OO0700 DESIGNATION - FOREST CITY
OO0700 PID - OO0700
OO0700 STATE/COUNTY- IA/WINNEBAGO
OO0700 USGS QUAD - FOREST CITY (1972)
OO0700
OO0700 *CURRENT SURVEY CONTROL
OO0700
OO0700* NAD 83(1996)- 43 15 45.85237(N) 093 38 18.86043(W) ADJUSTED
OO0700* NAVD 88 - 390.319 (meters) 1280.57 (feet) ADJUSTED
OO0700
OO0700 LAPLACE CORR- 0.67 (seconds) DEFLEC99
OO0700 GEOID HEIGHT- -29.40 (meters) GEOID99
OO0700 DYNAMIC HT - 390.199 (meters) 1280.18 (feet) COMP
OO0700 MODELED GRAV- 980,302.9 (mgal) NAVD 88
OO0700
OO0700 HORZ ORDER - SECOND
OO0700 VERT ORDER - SECOND CLASS 0
OO0700
OO0700.The horizontal coordinates were established by classical geodetic methods
OO0700.and adjusted by the National Geodetic Survey in May 1999.
OO0700
OO0700.The orthometric height was determined by differential leveling
OO0700.and adjusted by the National Geodetic Survey in June 1991.
OO0700
OO0700.The Laplace correction was computed from DEFLEC99 derived deflections.
OO0700
OO0700.The geoid height was determined by GEOID99.
OO0700
OO0700.The dynamic height is computed by dividing the NAVD 88
OO0700.geopotential number by the normal gravity value computed on the
OO0700.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
OO0700.degrees latitude (g = 980.6199 gals.).
OO0700
OO0700.The modeled gravity was interpolated from observed gravity values.
OO0700
OO0700;
OO0700;          North          East          Units          Scale          Converg.
OO0700;SPC IA N - 1,195,814.654 1,488,748.954 MT 0.99999928 -0 05 38.1
OO0700;UTM 15 - 4,790,189.878 448,173.274 MT 0.99963304 -0 26 15.5
OO0700
OO0700 SUPERSEDED SURVEY CONTROL
OO0700
OO0700 NAD 83(1996)- 43 15 45.85237(N) 093 38 18.86043(W) AD( ) 2
OO0700 NAD 83(1986)- 43 15 45.84440(N) 093 38 18.85400(W) AD( ) 2
OO0700 NAD 27 - 43 15 46.00725(N) 093 38 18.08685(W) AD( ) 2
OO0700 NGVD 29 - 390.279 (m) 1280.44 (f) ADJ UNCH 2 0
OO0700
OO0700.Superseded values are not recommended for survey control.
OO0700.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
OO0700.See file dsdata.txt to determine how the superseded data were derived.
OO0700
OO0700_MARKER: DB = BENCH MARK DISK
OO0700_SETTING: 30 = CONCRETE BASE
OO0700_STAMPING: FOREST CITY 1934
OO0700_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
OO0700
OO0700 HISTORY - Date Condition Recov. By
OO0700 HISTORY - 1934 MONUMENTED CGS
OO0700 HISTORY - 1942 GOOD NGS

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OO0700 HISTORY - 1971 GOOD NGS
 OO0700 HISTORY - 1971 GOOD NGS

OO0700

OO0700 STATION DESCRIPTION

OO0700

OO0700'DESCRIBED BY NATIONAL GEODETIC SURVEY 1942

OO0700'IN FOREST CITY.

OO0700'AT FOREST CITY, AT THE INTERSECTION OF WEST I STREET AND SOUTH CLARK

OO0700'STREET, AT THE CANNON IN THE SOUTHEAST CORNER OF THE COURTHOUSE

OO0700'SQUARE, IN THE TOP OF THE CONCRETE BASE, 83 FEET NORTH OF THE

OO0700'CENTERLINE OF WEST I STREET, 48 FEET WEST OF THE CENTERLINE OF SOUTH

OO0700'CLARK STREET, AND 6 INCHES WEST OF THE SOUTHEAST CORNER OF THE BASE. A

OO0700'STANDARD DISK, STAMPED FOREST CITY 1934.

OO0700

OO0700 STATION RECOVERY (1971)

OO0700

OO0700'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1971

OO0700'THE STATION IS LOCATED IN THE TOWN OF FOREST CITY, IN THE

OO0700'CENTER OF TOWN AND ON THE EAST SIDE OF THE COUNTY COURTHOUSE.

OO0700'

OO0700'BM FOREST CITY, A STANDARD BENCH MARK DISK STAMPED FOREST

OO0700'CITY 1934 1280.440, IS CEMENTED IN A DRILL HOLE IN THE CONCRETE

OO0700'FOOTING FOR A BRICK PIER. IT IS 99 FEET SOUTH OF THE CENTER

OO0700'OF THE SIDEWALK LEADING TO THE MAIN ENTRANCE OF THE COURTHOUSE,

OO0700'49 FEET WEST OF THE CENTER OF SOUTH CLARK STREET AND AT THE

OO0700'SOUTHEAST CORNER OF THE BRICK PIER.

OO0700

OO0700 STATION RECOVERY (1971)

OO0700

OO0700'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1971

OO0700'RECOVERED IN GOOD CONDITION.

1 National Geodetic Survey, Retrieval Date = OCTOBER 3, 2000

2002-23.TXT

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OO1209 *****
OO1209 CBN - This is a Cooperative Base Network Control Station.
OO1209 DESIGNATION - CLOVER
OO1209 PID - OO1209
OO1209 STATE/COUNTY- IA/HANCOCK
OO1209 USGS QUAD - CRYSTAL LAKE (1972)
OO1209
OO1209 *CURRENT SURVEY CONTROL
OO1209
OO1209* NAD 83(1996)- 43 13 38.05195(N) 093 50 59.62281(W) ADJUSTED
OO1209* NAVD 88 - 397.9 (meters) 1305. (feet) GPS OBS
OO1209
OO1209 X - -312,547.597 (meters) COMP
OO1209 Y - -4,644,463.902 (meters) COMP
OO1209 Z - 4,346,182.966 (meters) COMP
OO1209 LAPLACE CORR- -3.45 (seconds) DEFLEC99
OO1209 ELLIP HEIGHT- 368.65 (meters) GPS OBS
OO1209 GEOID HEIGHT- -29.25 (meters) GEOID99
OO1209
OO1209 HORZ ORDER - B
OO1209 ELLP ORDER - FOURTH CLASS I
OO1209
OO1209.The horizontal coordinates were established by GPS observations
OO1209.and adjusted by the National Geodetic Survey in August 1997.
OO1209
OO1209.The orthometric height was determined by GPS observations and a
OO1209.high-resolution geoid model.
OO1209
OO1209.The X, Y, and Z were computed from the position and the ellipsoidal ht.
OO1209
OO1209.The Laplace correction was computed from DEFLEC99 derived deflections.
OO1209
OO1209.The ellipsoidal height was determined by GPS observations
OO1209.and is referenced to NAD 83.
OO1209
OO1209.The geoid height was determined by GEOID99.
OO1209
OO1209;
OO1209; North East Units Scale Converg.
OO1209;SPC IA N - 1,191,920.297 1,471,574.848 MT 0.99999303 -0 14 13.7
OO1209;UTM 15 - 4,786,400.144 430,982.107 MT 0.99965860 -0 34 55.6
OO1209
OO1209; Primary Azimuth Mark Grid Az
OO1209;SPC IA N - CLOVER AZ MK 266 08 00.4
OO1209;UTM 15 - CLOVER AZ MK 266 28 42.3
OO1209
OO1209|-----|
OO1209| PID Reference Object Distance Geod. Az |
OO1209| | | | dddmmss.s |
OO1209| CLOVER RM 1 18.306 METERS 08207 |
OO1209| CLOVER AZ MK 2655346.7 |
OO1209| CLOVER RM 2 19.729 METERS 27616 |
OO1209|-----|
OO1209
OO1209 SUPERSEDED SURVEY CONTROL
OO1209
OO1209 NAD 83(1986)- 43 13 38.04404(N) 093 50 59.61670(W) AD( ) 1
OO1209 NAD 27 - 43 13 38.18857(N) 093 50 58.80923(W) AD( ) 1
OO1209 NGVD 29 - 397.4 (m) 1304. (f) VERT ANG
OO1209
OO1209.Superseded values are not recommended for survey control.

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001209.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
001209.See file dsdata.txt to determine how the superseded data were derived.
001209
001209_MARKER: DS = TRIANGULATION STATION DISK
001209_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
001209_STAMPING: CLOVER 1971
001209_MAGNETIC: N = NO MAGNETIC MATERIAL
001209_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
001209+STABILITY: SURFACE MOTION
001209_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
001209+SATELLITE: SATELLITE OBSERVATIONS - September 25, 1996
001209
001209 HISTORY - Date Condition Recov. By
001209 HISTORY - 1971 MONUMENTED NGS
001209 HISTORY - 1972 GOOD USGS
001209 HISTORY - 19960925 GOOD IADT
001209
001209 STATION DESCRIPTION
001209
001209'DESCRIBED BY NATIONAL GEODETIC SURVEY 1971 (JLC)
001209'THE STATION IS LOCATED ABOUT 3 MILES WEST OF CRYSTAL LAKE,
001209'3 MILES EAST OF WODEN, 2 MILES SOUTH OF THE WINNEBAGO-HANCOCK
001209'COUNTY LINE AND ON STATE RIGHT-OF-WAY. IT IS IN THE SOUTHWEST
001209'1/4 OF SECTION 7, T 97 N, R 25 W.
001209'
001209'TO REACH THE STATION FROM THE POST OFFICE IN WODEN, GO WEST ON
001209'A PAVED STREET FOR 0.1 MILE TO A T-ROAD, TURN LEFT AND GO
001209'SOUTH ON STATE HIGHWAY 111 FOR 0.2 MILE TO A FORK, TAKE THE
001209'LEFT FORK AND GO EAST ON STATE HIGHWAY 111 FOR 2.8 MILES TO
001209'A FIELD ENTRANCE ROAD AND THE AZIMUTH MARK ON THE RIGHT.
001209'CONTINUE EAST ON STATE HIGHWAY 111 FOR 0.25 MILE TO A FIELD
001209'ENTRANCE ROAD AND THE STATION ON THE LEFT.
001209'
001209'STATION MARKS ARE STANDARD DISKS STAMPED CLOVER 1971. THE SURFACE
001209'DISK IS SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE
001209'MONUMENT THAT IS FLUSH WITH THE GROUND SURFACE. IT IS 112 FEET
001209'NORTH OF A TELEPHONE POLE WITH A TRIANGULAR BLAZE, 50 FEET
001209'NORTH OF THE CENTER OF STATE HIGHWAY 111 AND 22 FEET EAST
001209'OF THE CENTER OF THE FIELD ENTRANCE ROAD. THE UNDERGROUND
001209'DISK IS SET IN THE TOP OF AN IRREGULAR MASS OF CONCRETE 40
001209'INCHES BELOW THE GROUND SURFACE.
001209'
001209'REFERENCE MARK 1, A STANDARD DISK STAMPED CLOVER NO 1 1971,
001209'IS SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT
001209'THAT IS FLUSH WITH THE GROUND SURFACE. IT IS 126 FEET
001209'NORTH-NORTHEAST OF THE TELEPHONE POLE, 79 FEET EAST OF THE CENTER
001209'OF THE FIELD ENTRANCE ROAD AND 59 FEET NORTH OF THE CENTER OF
001209'STATE HIGHWAY 111.
001209'
001209'REFERENCE MARK 2, A STANDARD DISK STAMPED CLOVER NO 2 1971,
001209'IS SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT
001209'THAT IS FLUSH WITH THE GROUND SURFACE. IT IS 143 FEET NORTHWEST
001209'OF THE TELEPHONE POLE, 57 FEET NORTH OF THE CENTER OF STATE
001209'HIGHWAY 111 AND 43 FEET WEST OF THE CENTER OF THE FIELD
001209'ENTRANCE ROAD.
001209'
001209'THE AZIMUTH MARK, A STANDARD DISK STAMPED CLOVER 1971, IS SET
001209'IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT THAT
001209'IS FLUSH WITH THE GROUND SURFACE. IT IS 59 FEET SOUTH OF THE
001209'CENTER OF STATE HIGHWAY 111, 9 FEET EAST OF THE CENTER OF THE
001209'FIELD ENTRANCE ROAD, 2 FEET WEST-NORTHWEST OF A METAL WITNESS
001209'POST AND 1-FOOT NORTH OF A WIRE FENCE.

OO1209'

OO1209'HEIGHT OF LIGHT ABOVE STATION MARK 26.5 METERS.

OO1209

OO1209

STATION RECOVERY (1972)

OO1209

OO1209'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1972

OO1209'ALL MARKS FOUND IN GOOD CONDITION. DESCRIPTION ADEQUATE AND

OO1209'DISTANCES CHECKED.

OO1209

OO1209

STATION RECOVERY (1996)

OO1209

OO1209'RECOVERY NOTE BY IOWA DEPARTMENT OF TRANSPORTATION 1996 (SRM)

OO1209'RECOVERED IN 1996 BY IOWA DOT. STATION IS LOCATED 3.2 MI (5.1 KM)

OO1209'EAST OF WODEN AND 2.6 MI (4.2 KM) WEST OF CRYSTAL LAKE IN THE

OO1209'SOUTHWEST 1/4 OF SECTION 7, T 97 N, R 25 W. TO REACH THE STATION FROM

OO1209'THE INTERSECTION OF PAVED COUNTY ROAD B 14 (WEST) AND PAVED COUNTY

OO1209'ROAD R 20 ON THE NORTH SIDE OF THE TOWN OF WODEN, GO SOUTH ON R 20 FOR

OO1209'0.8 MI (1.3 KM) TO A Y-INTERSECTION IN THE TOWN OF WODEN. FOLLOW THE

OO1209'CURVE LEFT (ONTO COUNTY ROAD R 35) AND GO EAST FOR 3.2 MI (5.1 KM) TO

OO1209'A FIELD ENTRANCE AND THE STATION, BOTH ON THE LEFT, NORTH SIDE OF THE

OO1209'ROAD. RESET ORANGE CARSONITE MARKER 0.5 M (1.6 FT) WEST OF THE

OO1209'MONUMENT, AND SET A PINK STATE HARN SURVEY SIGN 1.0 M (3.3 FT) NORTH

OO1209'OF THE MONUMENT. THE MONUMENT IS 50 FT (15.2 M) NORTH OF THE

OO1209'CENTERLINE OF COUNTY ROAD R 35, 22 FT (6.7 M) EAST OF THE CENTER OF A

OO1209'FIELD ENTRANCE, AND IS FLUSH WITH THE GROUND.

1 National Geodetic Survey, Retrieval Date = OCTOBER 3, 2000

OO0693'THE FENCE. A STANDARD DISK, STAMPED Q 34 1934 AND SET IN THE TOP OF A
OO0693'CONCRETE POST PROJECTING 4 INCHES ABOVE GROUND. NOTE-- THE MINNEAPOLIS
OO0693'AND ST. LOUIS RAILWAY HAS BEEN MERGED WITH THE CHICAGO AND
OO0693'NORTHWESTERN RAILWAY ON NOVEMBER 1960.

1 National Geodetic Survey, Retrieval Date = OCTOBER 3, 2000

AC4902_SLEEVE-DEPTH : 0.9 meters

AC4902

AC4902	HISTORY	- Date	Condition	Recov. By
AC4902	HISTORY	- 1994	MONUMENTED	MNDT

AC4902

AC4902

STATION DESCRIPTION

AC4902

AC4902'DESCRIBED BY MN DEPT OF TRANSP 1994

AC4902'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994. THE MARK IS
 AC4902'LOCATED ABOUT 5-1/4 MI WSW OF THE TOWN OF GORDONSVILLE IN THE SE 1/4
 AC4902'OF SECTION 33, T101N, R21W. TO REACH THE MARK FROM THE JCT OF TH 65
 AC4902'AND CO RD 1 IN GORDONSVILLE, GO EAST ON CO RD 1 FOR 5.9 TO THE JCT OF
 AC4902'CO RD 1 AND FAI 35 AND THE MARK ON THE LEFT. THE MARK IS AT FAI 35 MP
 AC4902'0.0, 21.0 FT (6.4 M) NORTH OF CO RD 1, 117 FT (35.7 M) WEST OF FAI 35,
 AC4902'10.3 FT (3.1 M) WNW OF CO RD 1 BRDG NO 24862 OVER FAI 35, 4.3 FT (1.3
 AC4902'M) NORTH OF THE GUARD RAIL, AND 3.3 FT (1.0 M) NORTH OF A WIT POST.
 AC4902'THE MARK IS A PUNCH MARK ON THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY
 AC4902'24 FT (7.3 M) LONG STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC
 AC4902'Stabilizer SLEEVE. ACCESS TO THE DATUM POINT IS THROUGH A 5 INCH LOGO
 AC4902'CAP THAT IS FLUSH WITH THE GROUND, STAMPED---MINIOW 1995---, SET ON
 AC4902'TOP OF A 5 INCH DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE FILLED WITH
 AC4902'SILICA SAND AND SET IN CONCRETE. A METAL SPIKE WAS PLACED IN THE
 AC4902'SILICA SAND MAKING THE MARK MAGNETIC. DESCRIBED BY DAVID K. HERDER,
 AC4902'TYPED BY J.E.M.

1 National Geodetic Survey, Retrieval Date = OCTOBER 4, 2000

2002-29.TXT

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OO1472 *****
OO1472 DESIGNATION - TT 79 WM
OO1472 PID - OO1472
OO1472 STATE/COUNTY- MN/FREEBORN
OO1472 USGS QUAD - FERTILE NE (1972)
OO1472
OO1472 *CURRENT SURVEY CONTROL
OO1472
OO1472* NAD 83(1996)- 43 29 58.74165(N) 093 22 07.40965(W) ADJUSTED
OO1472* NAVD 88 - 386.941 (meters) 1269.49 (feet) ADJUSTED
OO1472
OO1472 X - -272,311.153 (meters) COMP
OO1472 Y - -4,626,170.919 (meters) COMP
OO1472 Z - 4,368,179.825 (meters) COMP
OO1472 LAPLACE CORR- 4.80 (seconds) DEFLEC99
OO1472 ELLIP HEIGHT- 357.71 (meters) GPS OBS
OO1472 GEOID HEIGHT- -29.24 (meters) GEOID99
OO1472 DYNAMIC HT - 386.838 (meters) 1269.15 (feet) COMP
OO1472 MODELED GRAV- 980,341.8 (mgal) NAVD 88
OO1472
OO1472 HORZ ORDER - SECOND
OO1472 VERT ORDER - SECOND CLASS I
OO1472 ELLP ORDER - FOURTH CLASS I
OO1472
OO1472.The horizontal coordinates were established by GPS observations
OO1472.and adjusted by the National Geodetic Survey in March 1999.
OO1472
OO1472.The orthometric height was determined by differential leveling
OO1472.and adjusted by the National Geodetic Survey in June 1991.
OO1472
OO1472.The X, Y, and Z were computed from the position and the ellipsoidal ht.
OO1472
OO1472.The Laplace correction was computed from DEFLEC99 derived deflections.
OO1472
OO1472.The ellipsoidal height was determined by GPS observations
OO1472.and is referenced to NAD 83.
OO1472
OO1472.The geoid height was determined by GEOID99.
OO1472
OO1472.The dynamic height is computed by dividing the NAVD 88
OO1472.geopotential number by the normal gravity value computed on the
OO1472.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
OO1472.degrees latitude (g = 980.6199 gals.).
OO1472
OO1472.The modeled gravity was interpolated from observed gravity values.
OO1472
OO1472;
OO1472;SPC MN S - North East Units Scale Converg.
OO1472;UTM 15 - 155,716.079 851,058.974 MT 1.00007352 +0 26 32.9
OO1472; - 4,816,368.588 470,190.500 MT 0.99961093 -0 15 13.7
OO1472
OO1472 SUPERSEDED SURVEY CONTROL
OO1472
OO1472 NAD 83(1986)- 43 29 58.72814(N) 093 22 07.40412(W) AD( ) 2
OO1472
OO1472.Superseded values are not recommended for survey control.
OO1472.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
OO1472.See file dsdata.txt to determine how the superseded data were derived.
OO1472
OO1472_MARKER: DB = BENCH MARK DISK
OO1472_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

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OO1472_STAMPING: TT 79 WM 1952
 OO1472_MAGNETIC: O = OTHER; SEE DESCRIPTION
 OO1472_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 OO1472+STABILITY: SURFACE MOTION
 OO1472_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 OO1472+SATELLITE: SATELLITE OBSERVATIONS - November 12, 1991

OO1472
 OO1472 HISTORY - Date Condition Recov. By
 OO1472 HISTORY - 1952 MONUMENTED USGS
 OO1472 HISTORY - 1981 GOOD MNDT
 OO1472 HISTORY - 19911112 GOOD MNDT
 OO1472 HISTORY - 19911112 GOOD MNDT

OO1472
 OO1472 STATION DESCRIPTION
 OO1472

OO1472'DESCRIBED BY MN DEPT OF TRANSP 1981
 OO1472'6 MI EAST FROM EMMONS.

OO1472'THE MARK IS LOCATED 6.2 MILES EAST ALONG COUNTY ROAD 1 FROM ITS
 OO1472'JUNCTION WITH TRUNK HIGHWAY 69 AT EMMONS AND IS IN THE SE 1/4 OF
 OO1472'SECTION 32, T101N, R21W. THE MARK IS 400 FEET EAST OF A T-ROAD TO
 OO1472'THE SOUTH, 40.7 FEET NORTH OF AND 3 FEET LOWER THAN THE CENTERLINE OF
 OO1472'COUNTY ROAD 1, 24 FEET OF A POWER POLE MARKED REA 15 XS-10, 6.8 FEET
 OO1472'WEST-SOUTHWEST OF A WOOD CORNER FENCE POST AND 1.5 FEET SOUTH OF A
 OO1472'STEEL WITNESS POST. THE MARK, A STANDARD USGS BENCH MARK DISK
 OO1472'STAMPED---TT 79 WM 1952 1269---, IS SET IN THE TOP OF A CONCRETE POST
 OO1472'THAT IS FLUSH WITH THE GROUND. A RAILROAD SPIKE BURIED ADJACENT TO
 OO1472'THE POST MAKES THE MARK MAGNETIC.

OO1472
 OO1472 STATION RECOVERY (1991)
 OO1472

OO1472'RECOVERY NOTE BY MN DEPT OF TRANSP 1991 (HTS)
 OO1472'RECOVERED AS DESCRIBED IN ALBERT LEA USGS QUAD 10, LINE 8 AND IN MNDT
 OO1472'LINE VFAIR.

OO1472
 OO1472 STATION RECOVERY (1991)
 OO1472

OO1472'RECOVERY NOTE BY MN DEPT OF TRANSP 1991 (HTS)
 OO1472'RECOVERED AS DESCRIBED.

1 National Geodetic Survey, Retrieval Date = OCTOBER 4, 2000

2002-31.TXT

AC4900 *****

AC4900 CBN - This is a Cooperative Base Network Control Station.

AC4900 DESIGNATION - FURE

AC4900 PID - AC4900

AC4900 STATE/COUNTY- MN/FARIBAULT

AC4900 USGS QUAD - KIESTER (1982)

AC4900

AC4900 *CURRENT SURVEY CONTROL

AC4900

AC4900*	NAD 83(1996)-	43 30 10.75818(N)	093 42 31.84507(W)	ADJUSTED
AC4900*	NAVD 88	- 384.4 (meters)	1261. (feet)	GPS OBS

AC4900

AC4900	X	- 299,751.578 (meters)	COMP
AC4900	Y	- 4,624,216.329 (meters)	COMP
AC4900	Z	- 4,368,447.106 (meters)	COMP
AC4900	LAPLACE CORR-	-3.25 (seconds)	DEFLEC99
AC4900	ELLIP HEIGHT-	355.19 (meters)	GPS OBS
AC4900	GEOID HEIGHT-	-29.27 (meters)	GEOID99

AC4900

AC4900 HORZ ORDER - B

AC4900 ELLP ORDER - FOURTH CLASS I

AC4900

AC4900.The horizontal coordinates were established by GPS observations
AC4900.and adjusted by the National Geodetic Survey in January 1997.

AC4900

AC4900.The orthometric height was determined by GPS observations and a
AC4900.high-resolution geoid model.

AC4900

AC4900.The X, Y, and Z were computed from the position and the ellipsoidal ht.

AC4900

AC4900.The Laplace correction was computed from DEFLEC99 derived deflections.

AC4900

AC4900.The ellipsoidal height was determined by GPS observations
AC4900.and is referenced to NAD 83.

AC4900

AC4900.The geoid height was determined by GEOID99.

AC4900

AC4900;	North	East	Units	Scale	Converg.
AC4900;SPC MN S	- 155,931.737	823,548.077	MT	1.00007252	+0 12 14.7
AC4900;UTM 15	- 4,816,917.286	442,696.581	MT	0.99964039	-0 29 16.7

AC4900

AC4900 SUPERSEDED SURVEY CONTROL

AC4900

AC4900.No superseded survey control is available for this station.

AC4900

AC4900_MARKER: I = METAL ROD

AC4900_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)

AC4900_STAMPING: FURE 1995

AC4900_PROJECTION: FLUSH

AC4900_MAGNETIC: I = MARKER IS A STEEL ROD

AC4900_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

AC4900_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AC4900+SATELLITE: SATELLITE OBSERVATIONS - December 05, 1996

AC4900_ROD/PIPE-DEPTH: 8 meters

AC4900

AC4900	HISTORY	- Date	Condition	Recov. By
AC4900	HISTORY	- 1994	MONUMENTED	MNDT
AC4900	HISTORY	- 19961205	GOOD	NGS

AC4900

AC4900 STATION DESCRIPTION

AC4900

AC4900'DESCRIBED BY MN DEPT OF TRANSP 1994

AC4900'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994. THE MARK IS
AC4900'LOCATED ABOUT 2-1/4 MI SOUTH OF THE TOWN OF KIESTER IN THE SE 1/4 OF
AC4900'SECTION 33, T101N, R24W. TO REACH THE MARK FROM THE JCT OF TH 22 AND
AC4900'CO RD 2 IN KIESTER, GO SOUTH ON TH 22 FOR 2.25 MI (3.62 KM) TO TH 22
AC4900'MP 0.4 AND THE MARK ON THE RIGHT. THE MARK IS 51.3 FT (15.6 M) WEST
AC4900'OF TH 22, 26.0 FT (7.9 M) NORTH OF A FIELD ENT, 44.7 FT (13.6 M) SW OF
AC4900'A DELINEATOR SIGN POST, AND 3.3 FT (1.0 M) SOUTH OF A WIT POST. THE
AC4900'MARK IS A PUNCH MARK ON THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 28 FT
AC4900'(8.5 M) LONG STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC
AC4900'STABILIZER SLEEVE. ACCESS TO THE DATUM POINT IS THROUGH A 5 INCH LOGO
AC4900'CAP THAT IS FLUSH WITH THE GROUND, STAMPED---FURE 1995---, SET ON TOP
AC4900'OF A 5 INCH DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE FILLED WITH
AC4900'SILICA SAND AND SET IN CONCRETE. A METAL SPIKE WAS PLACED IN THE
AC4900'SILICA SAND MAKING THE MARK MAGNETIC. DESCRIBED BY DAVID K. HERDER,
AC4900'TYPED BY J.E.M.

AC4900

AC4900

STATION RECOVERY (1996)

AC4900

AC4900'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (JDS)

AC4900'FROM KIESTER MN., ALONG THE IOWA-MINNESOTA BORDER, 2.25 MI (3.62 KM)
AC4900'SOUTH ALONG TH 22 FROM THE JUNCTION OF TH 22 AND CO RD 2 IN KIESTER,
AC4900'AT TH 22 MP 0.4, 51.3 FT (15.6 M) WEST OF TH 22, 26 FT (7.9 M) NORTH
AC4900'OF FIELD ENT, 44.7 FT (13.6 M) SW OF DELINEATER SIGN POST, 3.3 FT (1.0
AC4900'M) SOUTH OF WITNESS POST, STATION IS A PUNCH MARK ON A 28 FT (8.5 M)
AC4900'LONG DRIVEN STEEL ROD WITH ACCESS COVER.

1 National Geodetic Survey, Retrieval Date = OCTOBER 4, 2000

2002-35.TXT

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AC4898 *****
AC4898 CBN - This is a Cooperative Base Network Control Station.
AC4898 DESIGNATION - FOOD
AC4898 PID - AC4898
AC4898 STATE/COUNTY- MN/FARIBAULT
AC4898 USGS QUAD - ELMORE (1967)
AC4898
AC4898 *CURRENT SURVEY CONTROL
AC4898
AC4898* NAD 83(1996)- 43 30 00.70894(N) 094 05 16.89977(W) ADJUSTED
AC4898* NAVD 88 - 339.1 (meters) 1113. (feet) GPS OBS
AC4898
AC4898 X - -330,360.643 (meters) COMP
AC4898 Y - -4,622,312.087 (meters) COMP
AC4898 Z - 4,368,191.494 (meters) COMP
AC4898 LAPLACE CORR- -3.02 (seconds) DEFLEC99
AC4898 ELLIP HEIGHT- 310.68 (meters) GPS OBS
AC4898 GEOID HEIGHT- -28.42 (meters) GEOID99
AC4898
AC4898 HORZ ORDER - B
AC4898 ELLP ORDER - FOURTH CLASS I
AC4898
AC4898.The horizontal coordinates were established by GPS observations
AC4898.and adjusted by the National Geodetic Survey in January 1997.
AC4898
AC4898.The orthometric height was determined by GPS observations and a
AC4898.high-resolution geoid model.
AC4898
AC4898.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4898
AC4898.The Laplace correction was computed from DEFLEC99 derived deflections.
AC4898
AC4898.The ellipsoidal height was determined by GPS observations
AC4898.and is referenced to NAD 83.
AC4898
AC4898.The geoid height was determined by GEOID99.
AC4898
AC4898; North East Units Scale Converg.
AC4898;SPC MN S - 155,583.474 792,880.113 MT 1.00007336 -0 03 42.1
AC4898;UTM 15 - 4,816,938.185 412,039.131 MT 0.99969517 -0 44 56.4
AC4898
AC4898 SUPERSEDED SURVEY CONTROL
AC4898
AC4898.No superseded survey control is available for this station.
AC4898
AC4898_MARKER: I = METAL ROD
AC4898_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AC4898_STAMPING: FOOD 1995
AC4898_PROJECTION: RECESSED 7 CENTIMETERS
AC4898_MAGNETIC: N = NO MAGNETIC MATERIAL
AC4898_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4898_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4898+SATELLITE: SATELLITE OBSERVATIONS - December 06, 1996
AC4898_ROD/PIPE-DEPTH: 11 meters
AC4898_SLEEVE-DEPTH : 1 meters
AC4898
AC4898 HISTORY - Date Condition Recov. By
AC4898 HISTORY - 1995 MONUMENTED MNDT
AC4898 HISTORY - 19961206 GOOD NGS

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AC4898

AC4898

STATION DESCRIPTION

AC4898

AC4898'DESCRIBED BY MN DEPT OF TRANSP 1995

AC4898'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994. THE MARK IS

AC4898'LOCATED ABOUT 1/2 MI SOUTH OF THE TOWN OF ELMORE IN THE SW 1/4 OF

AC4898'SECTION 33, T101N, R27W. TO REACH THE MARK FROM THE JCT OF TH 169 AND

AC4898'CO RD 9 IN ELMORE, AT TH 169 MP 0.0, GO SOUTH ON CO RD 9 FOR 0.5 MI

AC4898'(0.8 KM) AND THE MARK ON THE LEFT. THE MARK IS 146.5 FT (44.7 M) EAST

AC4898'OF TH 169, 50.0 FT (15.2 M) NORTH OF CO RD 102 (MN/IA STATE LINE) ,

AC4898'29.0 FT (8.8 M) ENE OF A CABLE MARKER, 3.1 FT (0.9 M) WEST OF A R/W

AC4898'POST, AND 3.0 FT (0.9 M) EAST OF A WIT POST. THE MARK IS A PUNCH MARK

AC4898'ON THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 36 FT (11.0 M) LONG

AC4898'STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE.

AC4898'ACCESS TO THE DATUM POINT IS THROUGH A 5 INCH LOGO CAP THAT IS FLUSH

AC4898'WITH THE GROUND, STAMPED----FOOD 1995----, SET ON TOP OF A 5 INCH

AC4898'DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND AND

AC4898'SET IN CONCRETE. A METAL SPIKE WAS PLACED IN THE SILICA SAND MAKING

AC4898'THE MARK MAGNETIC. DESCRIBED BY DAVID K. HERDER, TYPED BY J.E.M.

AC4898

AC4898

STATION RECOVERY (1996)

AC4898

AC4898'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (JDS)

AC4898'THE STATION IS LOCATED 0.5 MI (0.8 KM) SOUTH OF ELMORE ON THE HIGHWAY

AC4898'RIGHT OF WAY, IN THE NORTH EAST ANGLE OF THE JUNCTION OF U.S. HWY 169

AC4898'AND COUNTY ROAD 102, WHICH IS ALSO THE MINNESOTA-IOWA STATE LINE.

AC4898'OWNERSHIP--MINNESOTA DEPARTMENT OF TRANSPORTATION. TO REACH THE

AC4898'STATION FROM THE JUNCTION OF US HWY 169 AND COUNTY ROAD 9 AT THE

AC4898'INTERSECTION OF YOUNG AVE AND WEST RAMUSSEN ST IN ELMORE, PROCEED

AC4898'SOUTH ON HWY 169 FOR 0.5 MI (0.8 KM) TO THE JUNCTION OF COUNTY ROAD

AC4898'102 ON THE LEFT. TURN LEFT AND PROCEED EAST ON CR 102 FOR 146 FT

AC4898'(44.5 M) TO THE STATION ON THE LEFT. THE STATION IS LOCATED 146 FT

AC4898'(44.5 M) EAST OF THE CENTERLINE OF HWY 169, 51 FT (15.5 M) NORTH OF

AC4898'THE CENTER OF CR 102 AND THE MINNESOTA-IOWA STATE LINE, 29.5 FT (9.0

AC4898'M) EAST-NORTHEAST OF AN UNDERGROUND CABLE JUNCTION BOX WITH A 4.7 FT

AC4898'(1.4 M) WOOD POST, 3.1 FT (0.9 M) WEST OF A RIGHT OF WAY POST, AND 3.0

AC4898'FT (0.9 M) EAST OF A MNDT/NGS METAL WITNESS POST. THE STATION IS A

AC4898'FLANGE ENCASED STAINLESS STEEL ROD W/ SLEEVE, ABOUT 3.3 FT (1.0 M)

AC4898'BELOW ROAD LEVEL AND 7 CM BELOW GROUND LEVEL.

1 National Geodetic Survey, Retrieval Date = OCTOBER 4, 2000

2002-36.TXT

OP0029 *****

OP0029 DESIGNATION - L 4

OP0029 PID - OP0029

OP0029 STATE/COUNTY- MN/FARIBAULT

OP0029 USGS QUAD - ELMORE (1967)

OP0029

OP0029 *CURRENT SURVEY CONTROL

OP0029

OP0029*	NAD 83(1996)-	43 36 05.60540(N)	094 05 15.94868(W)	ADJUSTED
OP0029*	NAVD 88	- 334.083 (meters)	1096.07 (feet)	ADJUSTED
OP0029	X	- 329,785.941 (meters)		COMP
OP0029	Y	- 4,614,570.253 (meters)		COMP
OP0029	Z	4,376,350.354 (meters)		COMP
OP0029	LAPLACE CORR-	-2.97 (seconds)		DEFLEC99
OP0029	ELLIP HEIGHT-	305.71 (meters)		GPS OBS
OP0029	GEOID HEIGHT-	-28.38 (meters)		GEOID99
OP0029	DYNAMIC HT -	334.016 (meters)	1095.85 (feet)	COMP
OP0029	MODELED GRAV-	980,407.3 (mgal)		NAVD 88

OP0029

OP0029 HORZ ORDER - SECOND

OP0029 VERT ORDER - FIRST CLASS II

OP0029 ELLP ORDER - FOURTH CLASS I

OP0029

OP0029.This mark is at Blue Earth Airport (SBU)

OP0029

OP0029.The horizontal coordinates were established by GPS observations

OP0029.and adjusted by the National Geodetic Survey in March 1999.

OP0029

OP0029.The orthometric height was determined by differential leveling

OP0029.and adjusted by the National Geodetic Survey in June 1991.

OP0029

OP0029.The X, Y, and Z were computed from the position and the ellipsoidal ht.

OP0029

OP0029.The Laplace correction was computed from DEFLEC99 derived deflections.

OP0029

OP0029.The ellipsoidal height was determined by GPS observations

OP0029.and is referenced to NAD 83.

OP0029

OP0029.The geoid height was determined by GEOID99.

OP0029

OP0029.The dynamic height is computed by dividing the NAVD 88

OP0029.geopotential number by the normal gravity value computed on the

OP0029.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

OP0029.degrees latitude (g = 980.6199 gals.).

OP0029

OP0029.The modeled gravity was interpolated from observed gravity values.

OP0029

OP0029;		North	East	Units	Scale	Converg.
OP0029;SPC MN S	-	166,845.566	792,913.573	MT	1.00004434	-0 03 41.5
OP0029;UTM 15	-	4,828,194.970	412,207.757	MT	0.99969480	-0 45 00.8

OP0029

OP0029 SUPERSEDED SURVEY CONTROL

OP0029

OP0029	NAD 83(1986)-	43 36 05.59782(N)	094 05 15.94664(W)	AD() 2
OP0029	NGVD 29	- 334.038 (m)	1095.92 (f)	ADJ UNCH 1 2

OP0029

OP0029.Superseded values are not recommended for survey control.

OP0029.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

OP0029.See file dsdata.txt to determine how the superseded data were derived.

OP0029
 OP0029 MARKER: DB = BENCH MARK DISK
 OP0029 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
 OP0029 STAMPING: L 4 1930 1095.923
 OP0029 MAGNETIC: N = NO MAGNETIC MATERIAL
 OP0029 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
 OP0029+STABILITY: SURFACE MOTION
 OP0029 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 OP0029+SATELLITE: SATELLITE OBSERVATIONS - July 03, 1990

OP0029

HISTORY	- Date	Condition	Recov. By
OP0029	HISTORY - 1930	MONUMENTED	CGS
OP0029	HISTORY - 1976	GOOD	MNDT
OP0029	HISTORY - 1980	GOOD	MNDT
OP0029	HISTORY - 19900703	GOOD	NGS

OP0029
 OP0029 STATION DESCRIPTION

OP0029'DESCRIBED BY MN DEPT OF TRANSP 1976
 OP0029'1.75 MI S FROM BLUE EARTH.
 OP0029'THE BENCH MARK IS 2.6 MILES SOUTH OF THE EAST JUNCTION TH 16 AND 169,
 OP0029'7TH STREET IN BLUE EARTH. A STANDARD USC AND GS DISK STAMPED L4 1930
 OP0029'1095.923 AND SET IN THE TOP OF A CONCRETE MONUMENT. 2.3 MILES SOUTH
 OP0029'ALONG THE CHICAGO AND NORTHWESTERN RAILWAY FROM BLUE EARTH, FARIBAULT
 OP0029'COUNTY, 0.5 MILE SOUTH OF RR MILEPOST L C 36, AT A TOWNSHIP ROAD
 OP0029'CROSSING, 41 FEET NORTH OF THE GRAVEL TOWNSHIP ROAD, 48 FEET EAST OF
 OP0029'THE CENTERLINE OF THE RAILROAD TRACKS, IN THE NORTHWEST CORNER OF THE
 OP0029'INTERSECTION TH 169 AND TOWNSHIP ROAD, 53 FEET WEST OF TH 169 STA.
 OP0029'370+58, 1.5 FEET SOUTH OF A STEEL WITNESS POST, AND ABOUT LEVEL WITH
 OP0029'THE GROUND. TH 169 M.P. 7.0. SW 1/4, SEC 28, T 102N, R 27W.

OP0029
 OP0029 STATION RECOVERY (1980)

OP0029
 OP0029'RECOVERY NOTE BY MN DEPT OF TRANSP 1980
 OP0029'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED IN NGS LINE 68
 OP0029'MINN AND IS LOCATED ABOUT 2.6 MILES SOUTH ALONG TRUNK HIGHWAY 169
 OP0029'FROM ITS JUNCTION WITH OLD TRUNK HIGHWAY 16 AT BLUE EARTH AND IS NEAR
 OP0029'HIGHWAY 169 MILE POST 7 IN THE SW 1/4 OF SECTION 28, T102N, R27W.
 OP0029'THE MARK IS 81.5 FEET WEST OF MILE POST 7, 52.5 FEET WEST OF THE
 OP0029'CENTERLINE OF HIGHWAY 169, 40 FEET NORTH OF THE CENTER OF A TOWNSHIP
 OP0029'ROAD, 24.9 FEET NORTHWEST OF THE NORTH END OF AN 18 INCH METAL
 OP0029'CULVERT UNDER THE TOWNSHIP ROAD AND 0.9 FOOT EAST OF A STEEL WITNESS
 OP0029'POST. THE MARK, A STANDARD CGS BENCH MARK DISK STAMPED---L 4 1930
 OP0029'1195.923---, IS SET IN THE TOP OF A CONCRETE POST THAT IS FLUSH WITH
 OP0029'THE GROUND. A RAILROAD SPIKE BURIED ADJACENT TO THE POST MAKES THE
 OP0029'MARK MAGNETIC.

OP0029
 OP0029 STATION RECOVERY (1990)

OP0029
 OP0029'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1990
 OP0029'STATION IS LOCATED ABOUT 54.8 KM (34.1 MI) WEST OF ALBERT LEA, 6.9 KM
 OP0029'(4.3 MI) SOUTH OF BLUE EARTH, AT A GRAVEL CROSSROADS, AND ABOUT 0.81
 OP0029'KM (0.50 MI) NORTH OF AIRPORT ENTRANCE ROAD. OWNERSHIP-STATE OF
 OP0029'MINNESOTA.
 OP0029'TO REACH THE STATION FROM THE INTERSTATE 90 AND U.S.HIGHWAY 169 SOUTH
 OP0029'INTERCHANGE, LOCATED AT THE NORTH SIDE OF BLUE EARTH, GO SOUTH ALONG
 OP0029'U.S.HIGHWAY 169 FOR 6.5 KM (4.0 MI) TO THE STATION ON THE RIGHT AT A
 OP0029'CROSSROADS.
 OP0029'STATION MARK IS A CGS BENCH MARK DISK STAMPED---L 4 1930---, SET IN
 OP0029'THE TOP OF A 30-CM SQUARE CONCRETE POST FLUSH WITH THE GROUND
 OP0029'SURFACE. IT IS 16.0 M (52.5 FT) WEST OF THE CENTERLINE OF HIGHWAY,
 OP0029'12.0 M (39.4 FT) NORTH OF THE CENTERLINE OF A GRAVEL ROAD, 3.0 M

OP0029' (9.8 FT) NORTHWEST OF A TELEPHONE JUNCTION BOX, 0.31 M (1.02 FT) EAST
OP0029' OF A METAL WITNESS POST AND ABOUT 0.61 M (2.00 FT) BELOW THE LEVEL OF
OP0029' THE HIGHWAY.

OP0029' DESCRIBED BY G.F.S.

1 National Geodetic Survey, Retrieval Date = OCTOBER 4, 2000

Section 5
Winnebago County Monument
Data Sheets

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G1**

	US SURVEY FEET	METRIC
Northing:	3920926.908	1195100.912
Easting:	4795955.357	1461810.117
Elevation:	1183.633	360.772
Ellipsoid Height:	1088.472	331.767
Geoid 99 Height:	-95.162	-29.005

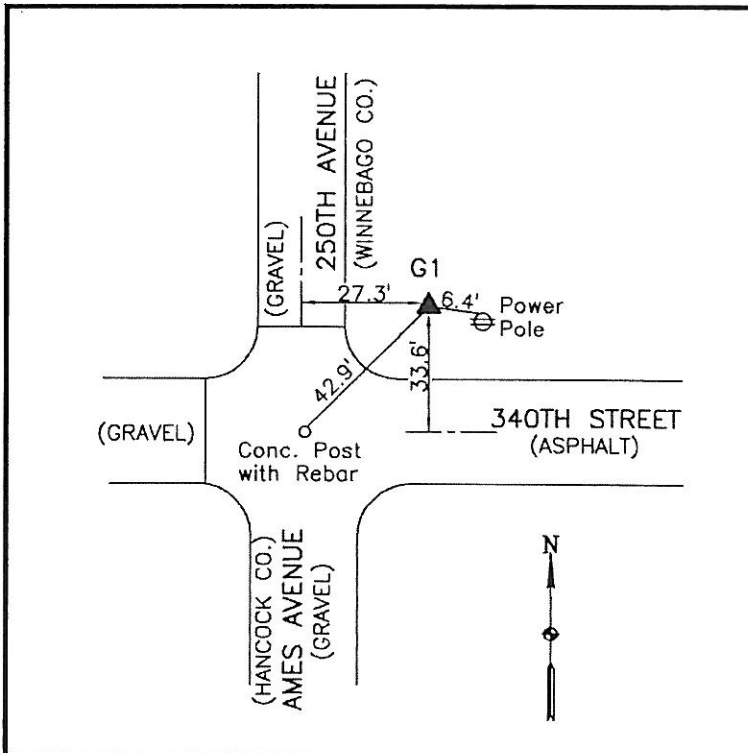
Latitude:	43°15'19.58088"N
Longitude:	93°58'13.11022"W
Scale Factor:	0.9999979679
Convergence:	-0°19'07"
Combined Factor:	0.99994604

Description:

Found NGS Style Aluminum Monument With Access Cover

Location:

NE Corner of 340th Street and 250th Avenue - near SW Corner Section 31-T98N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G2**

	US SURVEY FEET	METRIC
Northing:	3920323.564	1194917.012
Easting:	4827453.206	1471410.680
Elevation:	1256.764	383.062
Ellipsoid Height:	1160.905	353.844
Geoid 99 Height:	-95.859	-29.218

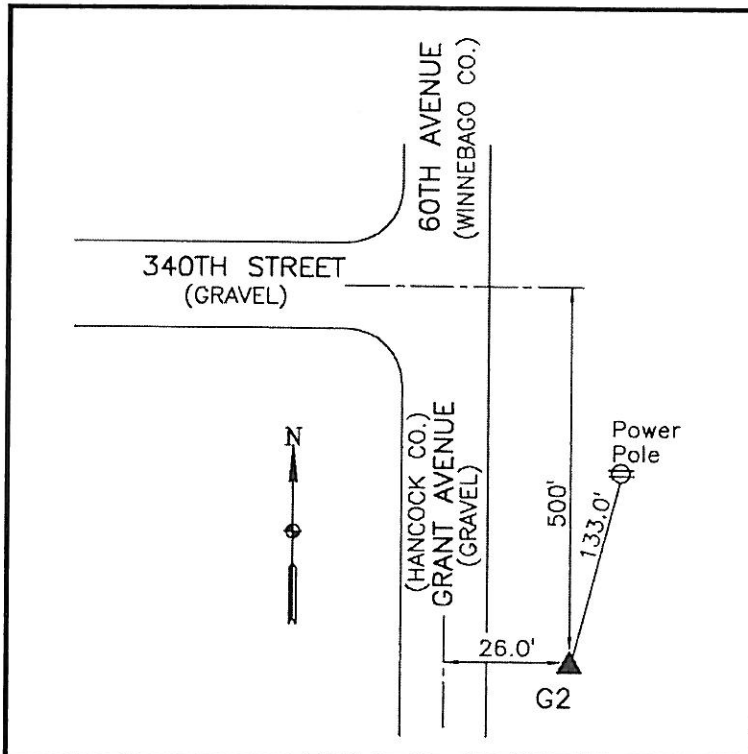
Latitude:	43°15'15.13500"N
Longitude:	93°51'07.45065"W
Scale Factor:	0.9999977467
Convergence:	-0°14'19"
Combined Factor:	0.99994236

Description:

Found NGS Style Aluminum Monument With Access Cover

Location:

On the east side of Grant Avenue (Hancock Co.) - 500'± south of NW Corner Section 6-T97N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G3**

	US SURVEY FEET	METRIC
Northing:	3920604.355	1195002.597
Easting:	4859018.542	1481031.814
Elevation:	1275.104	388.652
Ellipsoid Height:	1178.753	359.285
Geoid 99 Height:	-96.351	-29.368

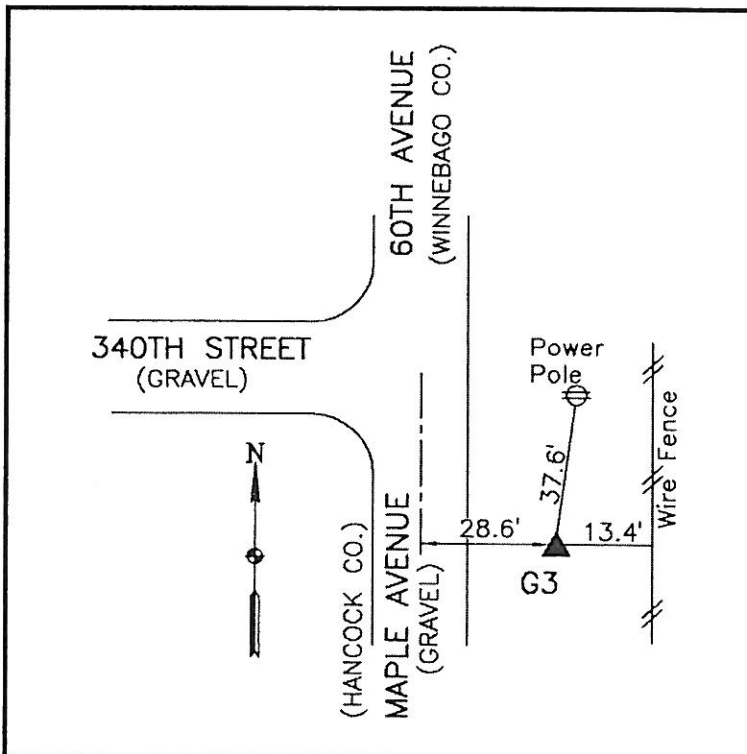
Latitude:	43°15'18.98819"N
Longitude:	93°44'00.93003"W
Scale Factor:	0.9999979384
Convergence:	-0°09'30"
Combined Factor:	0.99994170

Description:

Found NGS Style Aluminum Monument With Access Cover

Location:

SE Corner of 340th Street and 9th Avenue - near SW Corner Section 31-T98N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G4**

	US SURVEY FEET	METRIC
Northing:	3920266.205	1194899.529
Easting:	4890063.185	1490494.240
Elevation:	1228.885	374.565
Ellipsoid Height:	1132.484	345.182
Geoid 99 Height:	-96.401	-29.383

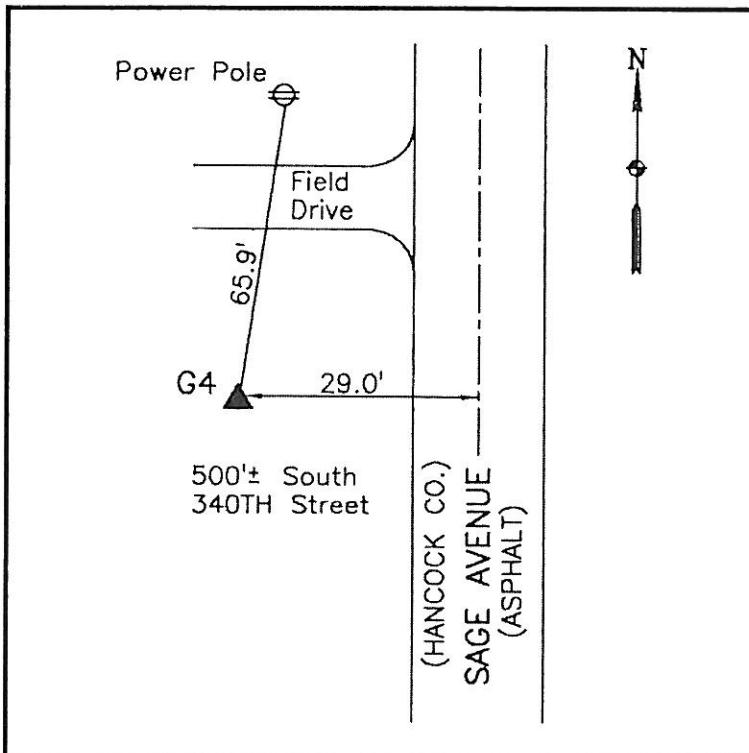
Latitude:	43°15'16.28427"N
Longitude:	93°37'01.42007"W
Scale Factor:	0.9999978039
Convergence:	-0°04'46"
Combined Factor:	0.99994377

Description:

Found NGS Style Aluminum Monument With Access Cover

Location:

On the west side of Sage Avenue (Hancock Co.) - 500'± south of the NW Corner Section 6-T97N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G5**

	US SURVEY FEET	METRIC
Northing:	3920480.286	1194964.781
Easting:	4921845.032	1500181.366
Elevation:	1262.878	384.926
Ellipsoid Height:	1167.192	355.761
Geoid 99 Height:	-95.685	-29.165

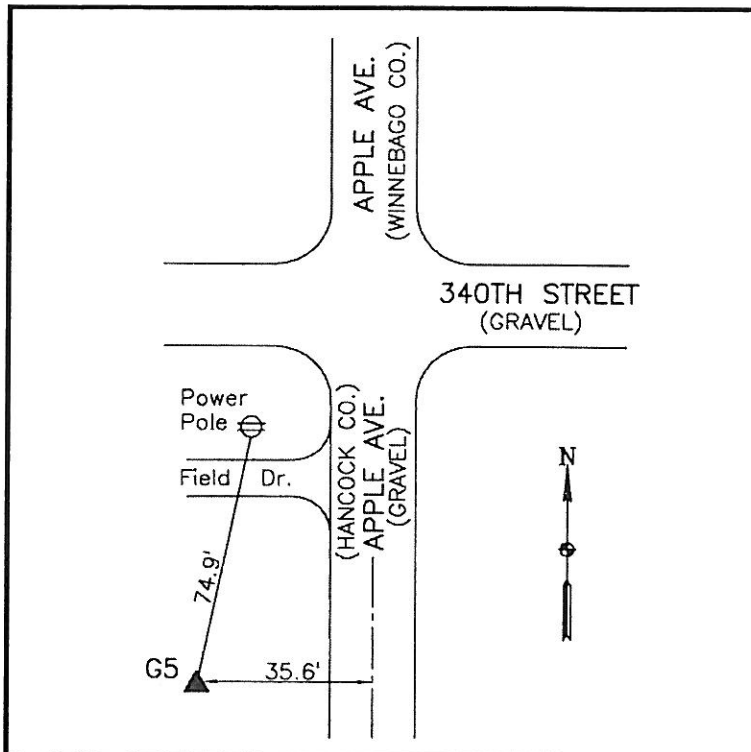
Latitude:	43°15'18.61189"N
Longitude:	93°29'51.95939"W
Scale Factor:	0.9999979197
Convergence:	0°00'05"
Combined Factor:	0.99994220

Description:

Found NGS Style Aluminum Monument With Access Cover

Location:

SW Corner of 340th Street and Apple Avenue - near SE Corner Section 36-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G101**

	US SURVEY FEET	METRIC
Northing:	3923699.092	1195945.875
Easting:	4905976.778	1495344.713
Elevation:	1242.069	378.583
Ellipsoid Height:	1145.884	349.266
Geoid 99 Height:	-96.185	-29.317

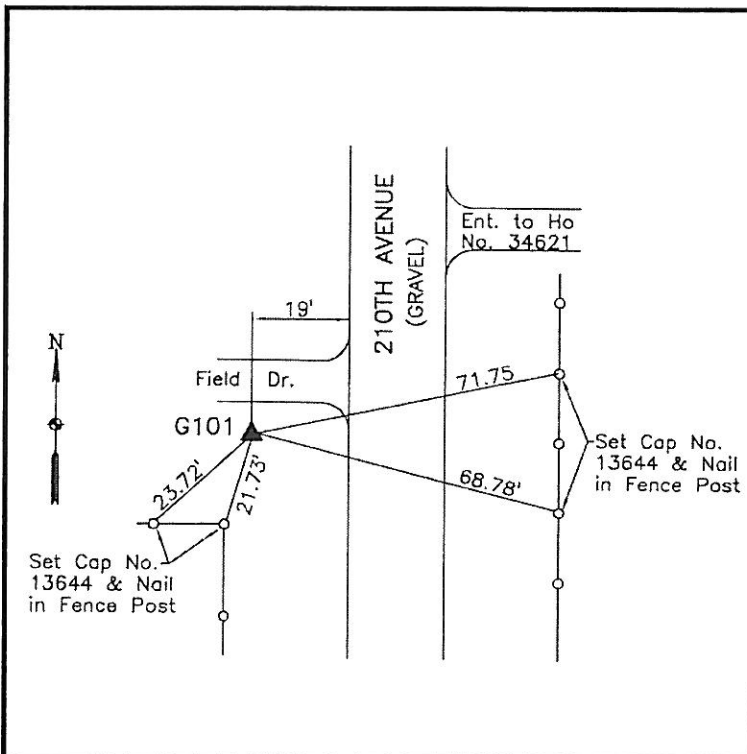
Latitude:	43°15'50.35210"N
Longitude:	93°33'26.41501"W
Scale Factor:	0.9999995114
Convergence:	-0°02'20"
Combined Factor:	0.99994484

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G101 and NGS Style Access Cover 2 " Deep.

Location:

West side 210th Avenue - 0.4± mile south of 430th Street (Highway 9) - near W1/4 Section 34-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G102**

	US SURVEY FEET	METRIC
Northing:	3923267.823	1195814.424
Easting:	4875630.799	1486095.240
Elevation:	1243.819	379.117
Ellipsoid Height:	1147.362	349.717
Geoid 99 Height:	-96.457	-29.400

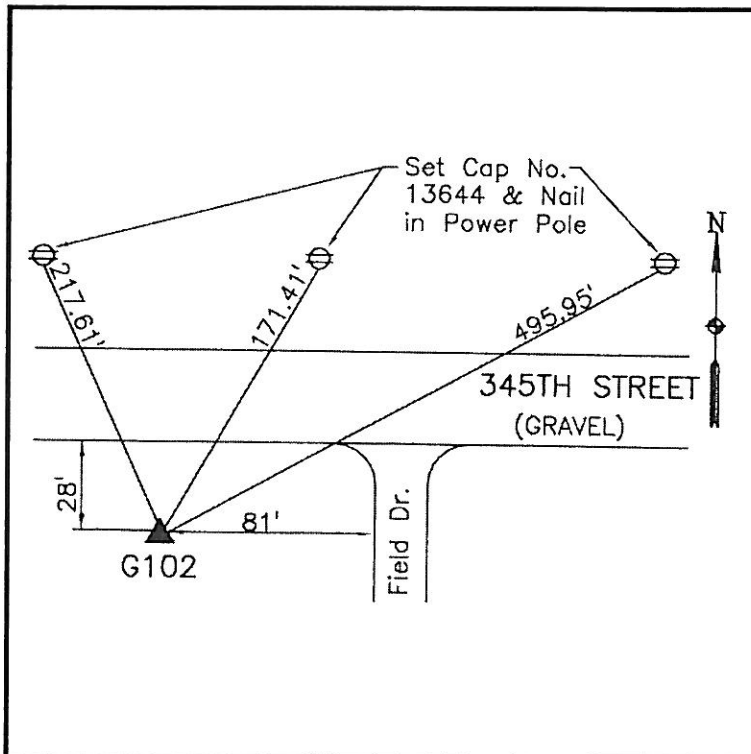
Latitude:	43°15'45.68736"N
Longitude:	93°40'16.52322"W
Scale Factor:	0.9999992760
Convergence:	-0°06'58"
Combined Factor:	0.99994453

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G102 and NGS Style Access Cover 2 " Deep.

Location:

On south side 345th Street - 90'± west of field entrance - 0.75± mile east of 145th Avenue - near W1/4 Section 34-T98N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G103**

	US SURVEY FEET	METRIC
Northing:	3921120.772	1195160.002
Easting:	4843310.852	1476244.100
Elevation:	1300.282	396.327
Ellipsoid Height:	1204.144	367.024
Geoid 99 Height:	-96.138	-29.303

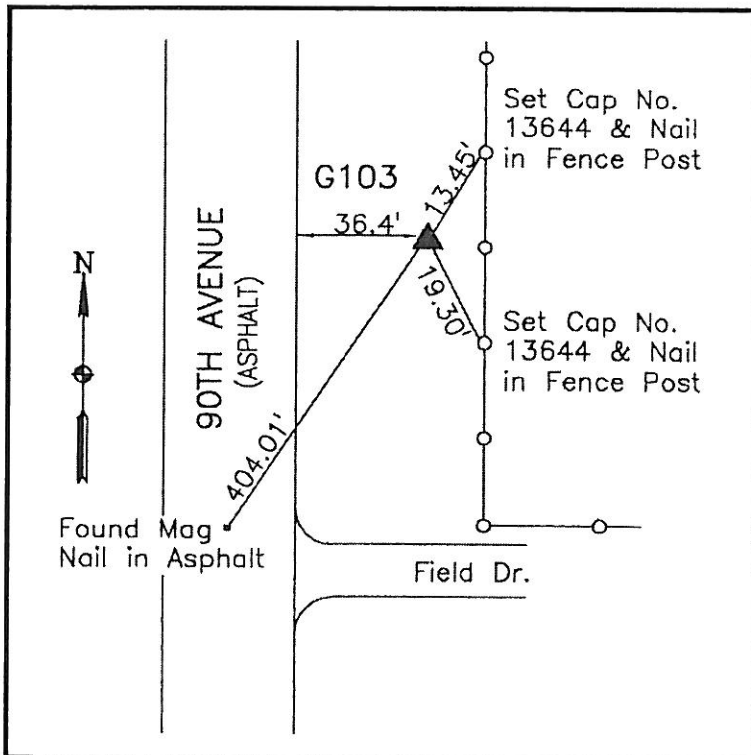
Latitude:	43°15'23.60591"N
Longitude:	93°47'33.20975"W
Scale Factor:	0.9999981685
Convergence:	-0°11'54"
Combined Factor:	0.99994072

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G103 and NGS Style Access Cover 2 " Deep.

Location:

On east side 90th Avenue - 300'± north of 340th Street - near SW Corner of Section 34-T98N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G104**

	US SURVEY FEET	METRIC
Northing:	3922026.647	1195436.113
Easting:	4811676.098	1466601.808
Elevation:	1228.340	374.399
Ellipsoid Height:	1132.832	345.288
Geoid 99 Height:	-95.508	-29.111

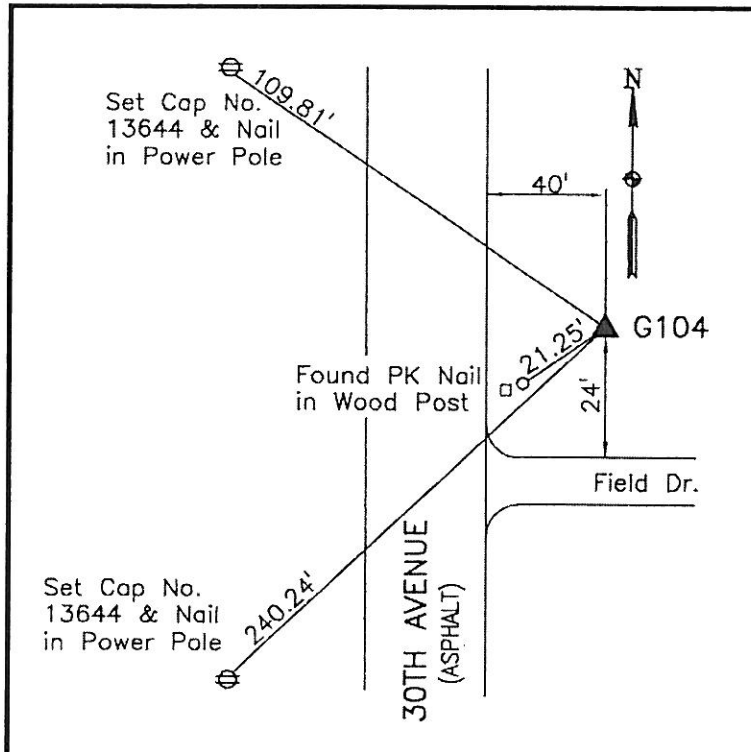
Latitude:	43°15'31.25219"N
Longitude:	93°54'40.75128"W
Scale Factor:	0.9999985507
Convergence:	-0°16'44"
Combined Factor:	0.99994450

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G104 and NGS Style Access Cover 3" Deep.

Location:

On east side 30th Avenue - 30'± north of field entrance - 0.3± mile north of SW Corner of Section 34-T98N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G105**

	US SURVEY FEET	METRIC
Northing:	3936695.011	1199907.039
Easting:	4796364.896	1461934.944
Elevation:	1166.327	355.497
Ellipsoid Height:	1071.361	326.552
Geoid 99 Height:	-94.965	-28.946

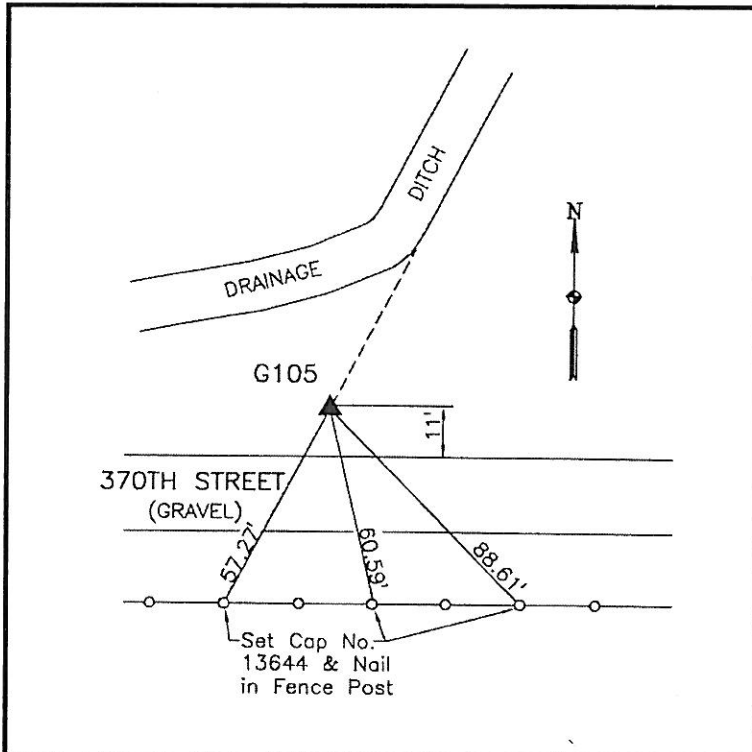
Latitude:	43°17'55.33735"N
Longitude:	93°58'08.75854"W
Scale Factor:	1.0000060112
Convergence:	-0°19'05"
Combined Factor:	0.99995490

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G105 and NGS Style Access Cover 2" Deep.

Location:

On north side 370th Street - 300'± east of 250th Avenue - near NW Corner Section 19-T98N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G106**

	US SURVEY FEET	METRIC
Northing:	3936587.899	1199874.391
Easting:	4811759.340	1466627.180
Elevation:	1198.068	365.172
Ellipsoid Height:	1102.730	336.113
Geoid 99 Height:	-95.338	-29.059

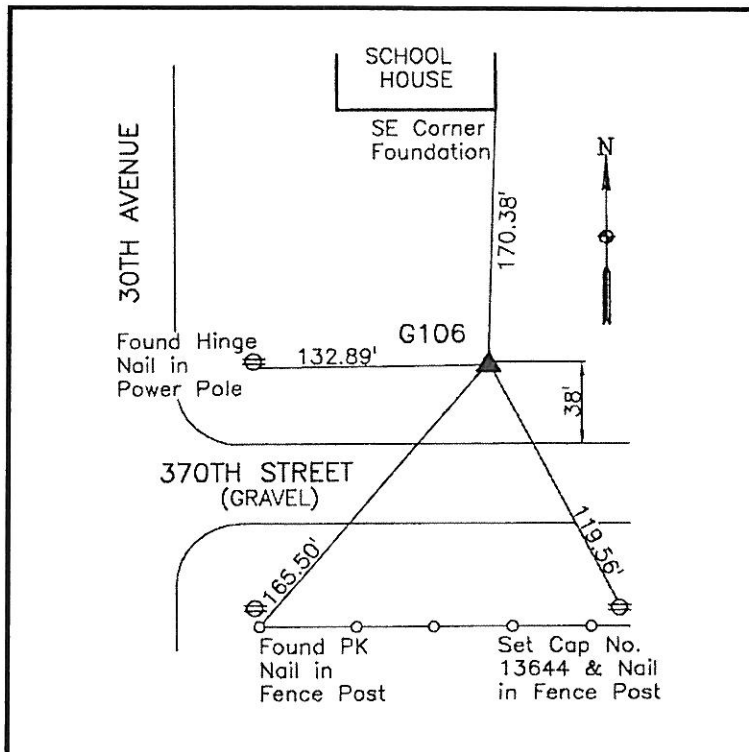
Latitude:	43°17'55.07115"N
Longitude:	93°54'40.58368"W
Scale Factor:	1.0000059970
Convergence:	-0°16'43"
Combined Factor:	0.99995338

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G106 and NGS Style Access Cover 1" Deep.

Location:

NE Corner of 370th Street and 30th Avenue (County Road R20) - SE Corner of school site - near NW Corner of Section 22-T98N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G107**

	US SURVEY FEET	METRIC
Northing:	3936555.060	1199864.382
Easting:	4827483.998	1471420.065
Elevation:	1242.154	378.609
Ellipsoid Height:	1146.450	349.439
Geoid 99 Height:	-95.705	-29.171

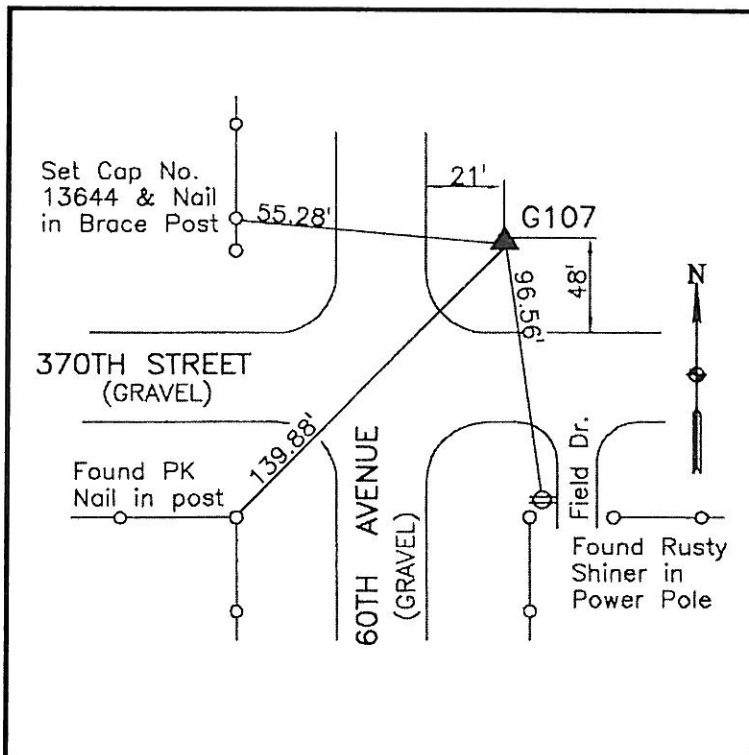
Latitude:	43°17'55.44810"N
Longitude:	93°51'07.94836"W
Scale Factor:	1.0000060171
Convergence:	-0°14'19"
Combined Factor:	0.99995132

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G107 and NGS Style Access Cover 2 " Deep.

Location:

NE Corner of 370th Street and 60th Avenue - near NW Corner of Section 19-T98N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G108**

	US SURVEY FEET	METRIC
Northing:	3936211.097	1199759.542
Easting:	4843134.584	1476190.373
Elevation:	1274.162	388.365
Ellipsoid Height:	1178.129	359.094
Geoid 99 Height:	-96.033	-29.271

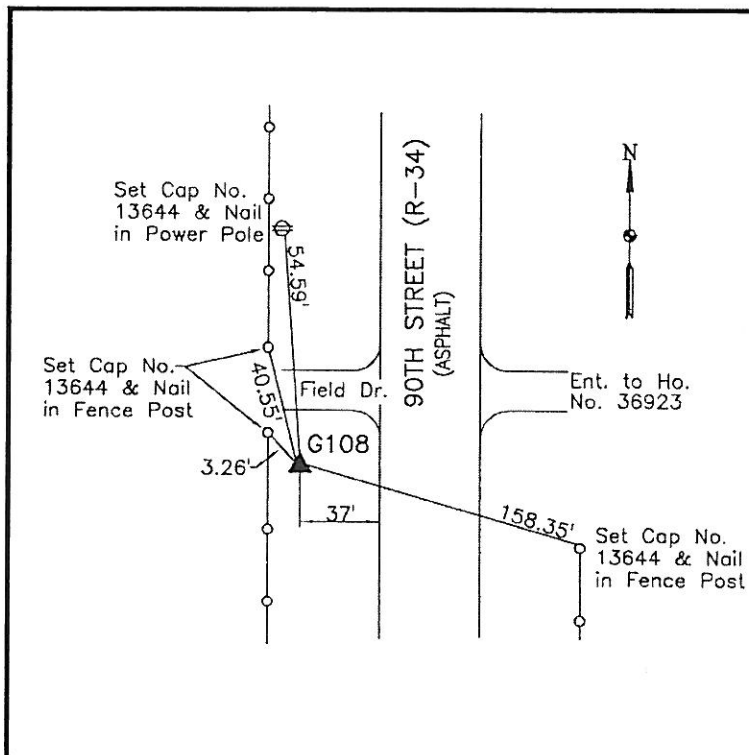
Latitude:	43°17'52.64118"N
Longitude:	93°47'36.29944"W
Scale Factor:	1.0000058671
Convergence:	-0°11'56"
Combined Factor:	0.99994966

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G108 and NGS Style Access Cover 2" Deep.

Location:

On west side 90th Avenue (County Road R34) - 20'± south of field entrance - 300'± south of 370th Street - near NW Corner Section 22-T98N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G109**

	US SURVEY FEET	METRIC
Northing:	3936324.421	1199794.083
Easting:	4858955.571	1481012.620
Elevation:	1285.767	391.902
Ellipsoid Height:	1189.479	362.554
Geoid 99 Height:	-96.288	-29.349

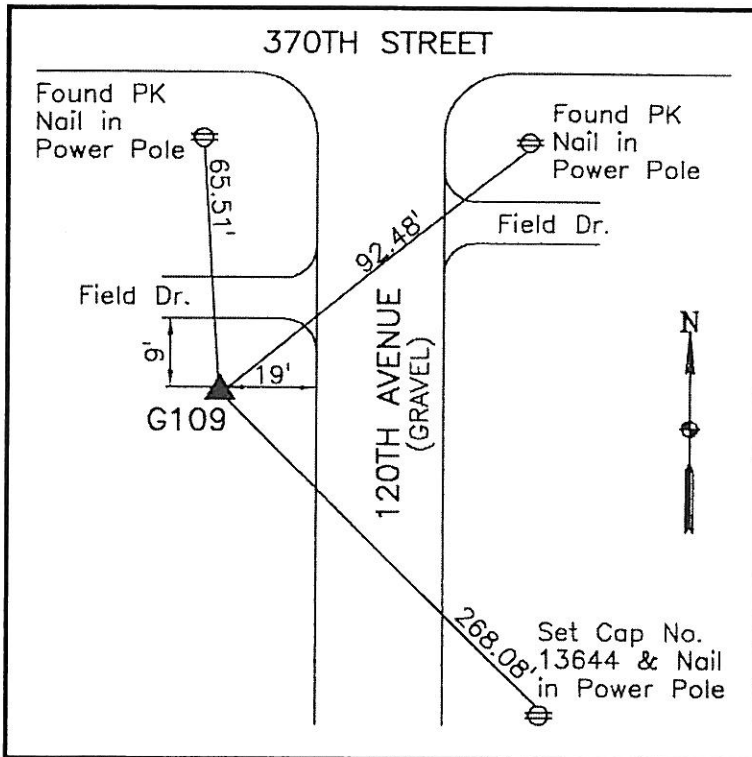
Latitude:	43°17'54.24786"N
Longitude:	93°44'02.36890"W
Scale Factor:	1.0000059529
Convergence:	-0°09'31"
Combined Factor:	0.99994920

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G109 and NGS Style Access Cover 2 " Deep.

Location:

On west side 120th Avenue - 15'± south of field entrance - 100'± south of 370th Street - near NW Corner Section 19-T98N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G110**

	US SURVEY FEET	METRIC
Northing:	3936359.693	1199804.834
Easting:	4874337.567	1485701.062
Elevation:	1269.792	387.034
Ellipsoid Height:	1173.341	357.635
Geoid 99 Height:	-96.452	-29.399

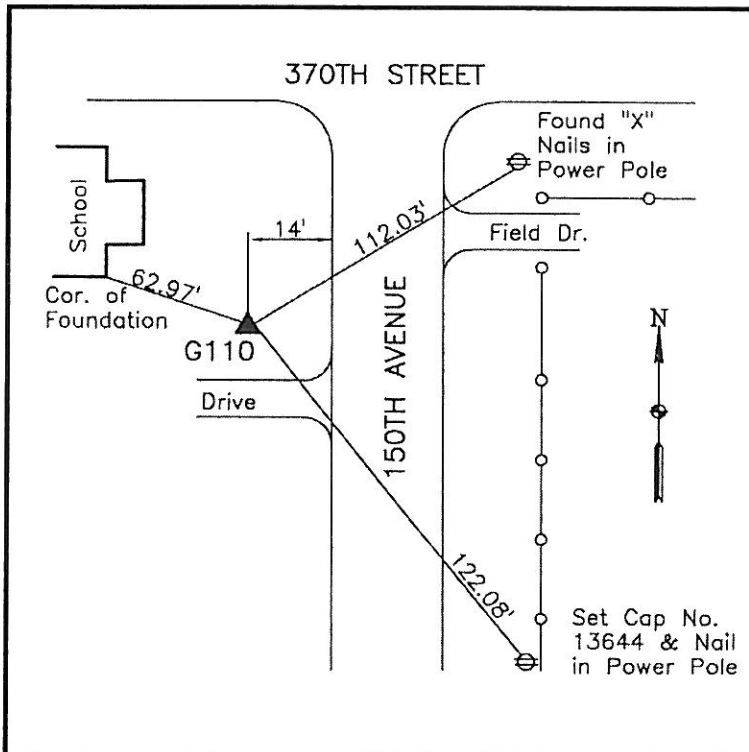
Latitude:	43°17'54.96480"N
Longitude:	93°40'34.36941"W
Scale Factor:	1.0000059913
Convergence:	-0°07'10"
Combined Factor:	0.99995001

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G110 and NGS Style Access Cover 3 " Deep.

Location:

SW Corner of 370th Street and 150th Avenue - SE Corner of school property - near NW Corner of Section 22-T98N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G111**

	US SURVEY FEET	METRIC
Northing:	3936598.809	1199877.717
Easting:	4889711.810	1490387.141
Elevation:	1269.627	386.983
Ellipsoid Height:	1173.138	357.573
Geoid 99 Height:	-96.488	-29.410

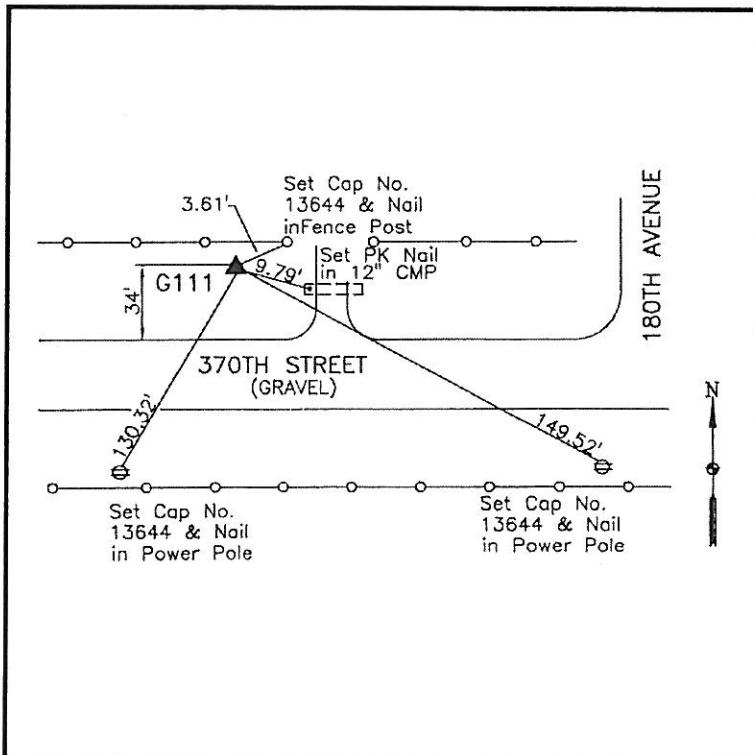
Latitude:	43°17'57.59110"N
Longitude:	93°37'06.47737"W
Scale Factor:	1.0000061318
Convergence:	-0°04'49"
Combined Factor:	0.99995016

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G111 and NGS Style Access Cover 0 " Deep.

Location:

On north side 370th Street - 300'± west of 180th Avenue - 30'± west of field entrance - near NW Corner Section 19-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G112**

	US SURVEY FEET	METRIC
Northing:	3936408.290	1199819.646
Easting:	4906103.492	1495383.335
Elevation:	1232.055	375.531
Ellipsoid Height:	1135.718	346.167
Geoid 99 Height:	-96.338	-29.364

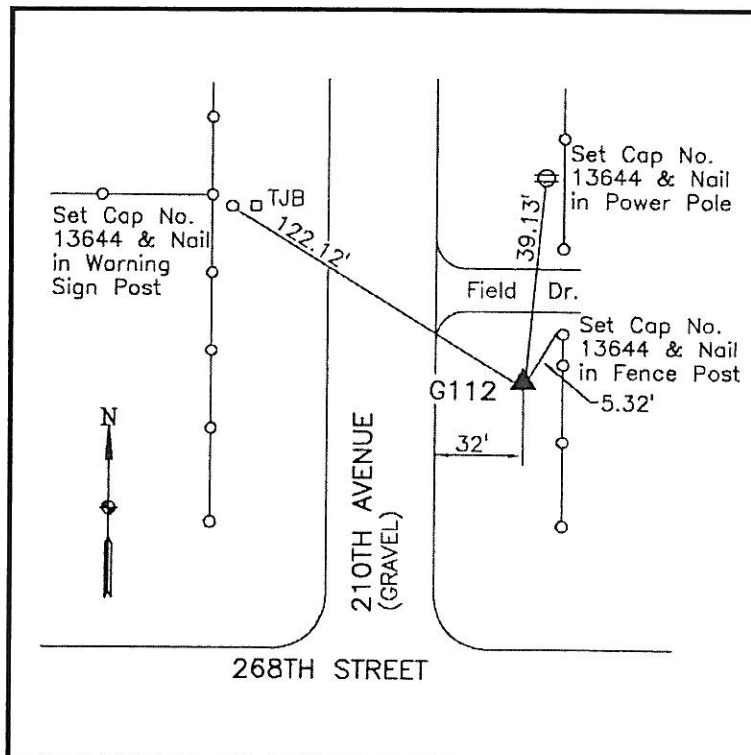
Latitude:	43°17'55.87732"N
Longitude:	93°33'24.81809"W
Scale Factor:	1.0000060401
Convergence:	-0°02'19"
Combined Factor:	0.99995185

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G112 and NGS Style Access Cover 1" Deep.

Location:

On east side 210th Avenue - 20'± south of field entrance - 0.2± mile north of 268th Street - near NW Corner of Section 22-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G113**

	US SURVEY FEET	METRIC
Northing:	3936475.972	1199840.276
Easting:	4921842.155	1500180.489
Elevation:	1221.399	372.283
Ellipsoid Height:	1125.411	343.026
Geoid 99 Height:	-95.989	-29.257

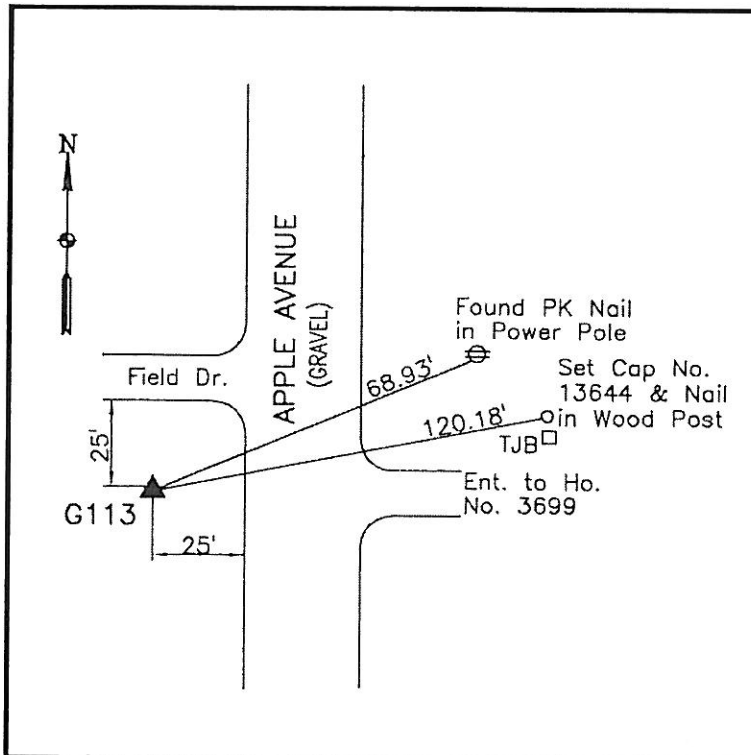
Latitude:	43°17'56.59605"N
Longitude:	93°29'51.99258"W
Scale Factor:	1.0000060785
Convergence:	0°00'05"
Combined Factor:	0.99995238

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G113 and NGS Style Access Cover 2 " Deep.

Location:

On west side Apple Avenue - 30'± south of field entrance - near NE Corner Section 24-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G114**

	US SURVEY FEET	METRIC
Northing:	3952522.123	1204731.152
Easting:	4921847.792	1500182.207
Elevation:	1248.425	380.521
Ellipsoid Height:	1152.210	351.194
Geoid 99 Height:	-96.215	-29.326

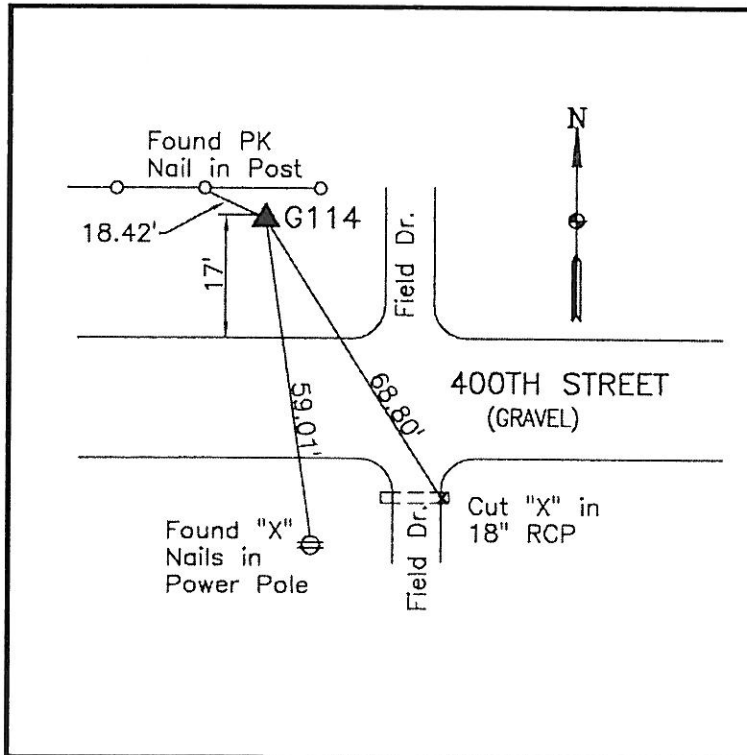
Latitude:	43°20'35.07608"N
Longitude:	93°29'51.91059"W
Scale Factor:	1.0000148566
Convergence:	0°00'05"
Combined Factor:	0.99995988

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G114 and NGS Style Access Cover 2 " Deep.

Location:

On north side 400th Street - 20'± west of field entrance - near NE Corner Section 1-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G115**

	US SURVEY FEET	METRIC
Northing:	3952101.888	1204603.065
Easting:	4905980.963	1495345.988
Elevation:	1276.586	389.104
Ellipsoid Height:	1180.119	359.701
Geoid 99 Height:	-96.467	-29.403

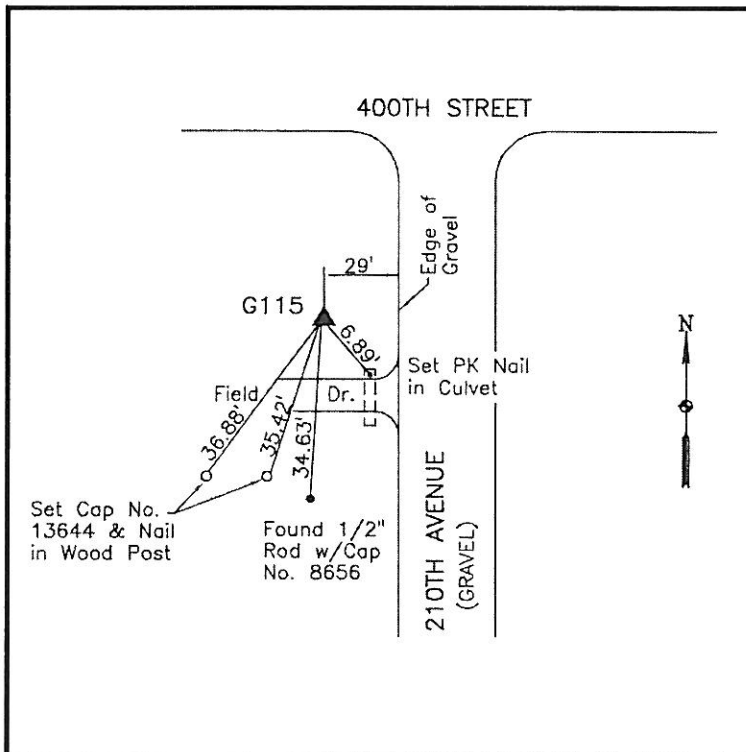
Latitude:	43°20'30.87455"N
Longitude:	93°33'26.61906"W
Scale Factor:	1.0000146162
Convergence:	-0°02'20"
Combined Factor:	0.99995831

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G115 and NGS Style Access Cover 2" Deep.

Location:

On west side of 210th Avenue - 30'± north of field entrance - 300'± south of 400th street (County Road A38) - near NW Corner Section 3-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G116**

	US SURVEY FEET	METRIC
Northing:	3951624.618	1204457.592
Easting:	4890130.705	1490514.820
Elevation:	1249.327	380.796
Ellipsoid Height:	1152.781	351.368
Geoid 99 Height:	-96.546	-29.427

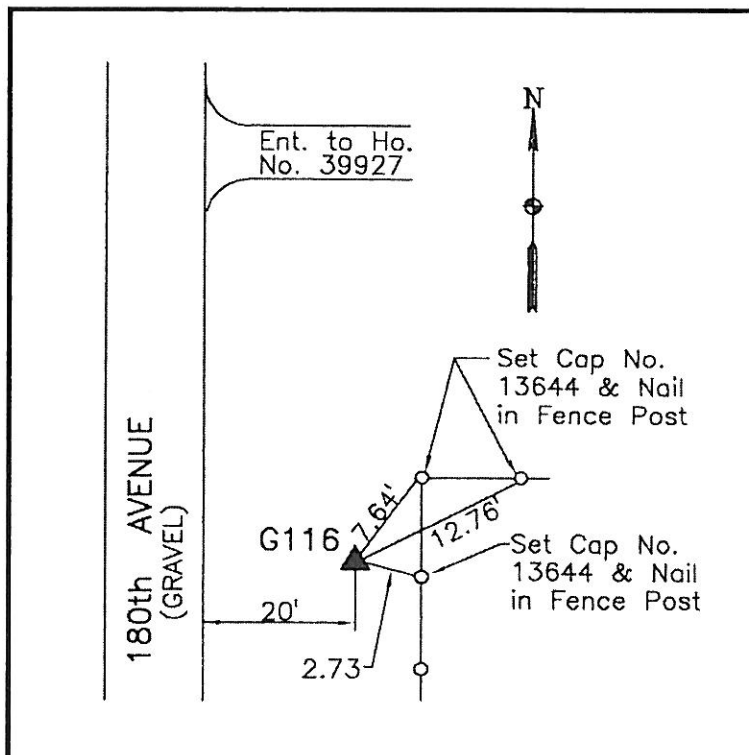
Latitude:	43°20'25.99939"N
Longitude:	93°37'01.09399"W
Scale Factor:	1.0000143378
Convergence:	-0°04'45"
Combined Factor:	0.99995934

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G116 and NGS Style Access Cover 1" Deep.

Location:

On east side 180th Avenue - 10'± south of corner post - 0.1± mile south of 400th Street (County Road A38) - near NW Corner Section 6-T98N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G117**

	US SURVEY FEET	METRIC
Northing:	3952346.600	1204677.653
Easting:	4874255.271	1485675.978
Elevation:	1273.003	388.012
Ellipsoid Height:	1176.567	358.618
Geoid 99 Height:	-96.437	-29.394

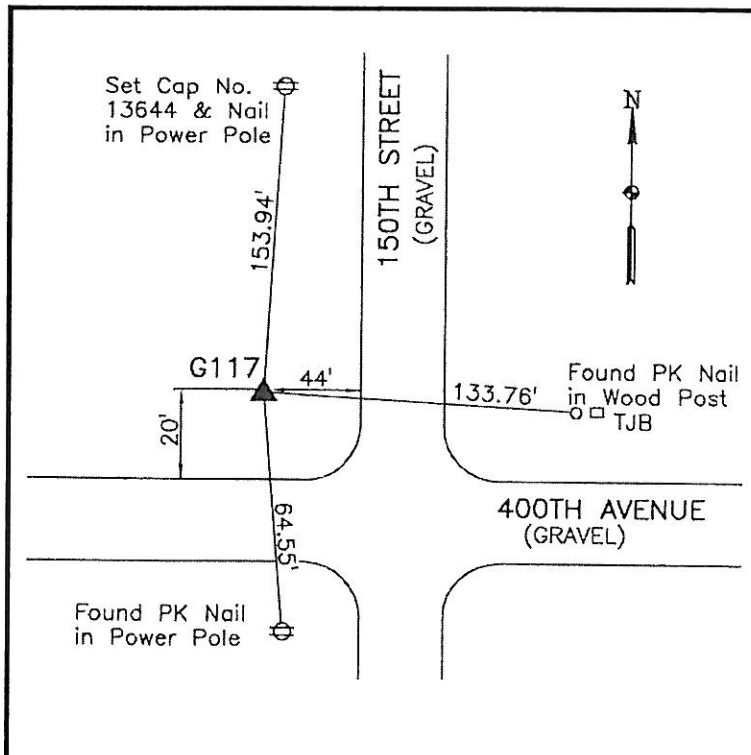
Latitude:	43°20'32.85770"N
Longitude:	93°40'35.93398"W
Scale Factor:	1.0000147296
Convergence:	-0°07'11"
Combined Factor:	0.99995859

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G117 and NGS Style Access Cover 2" Deep.

Location:

NW Corner of 400th Street and 150th Avenue - near NW Corner of Section 3-T98N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G118**

	US SURVEY FEET	METRIC
Northing:	3952299.903	1204663.420
Easting:	4860298.536	1481421.957
Elevation:	1287.982	392.578
Ellipsoid Height:	1191.736	363.242
Geoid 99 Height:	-96.246	-29.336

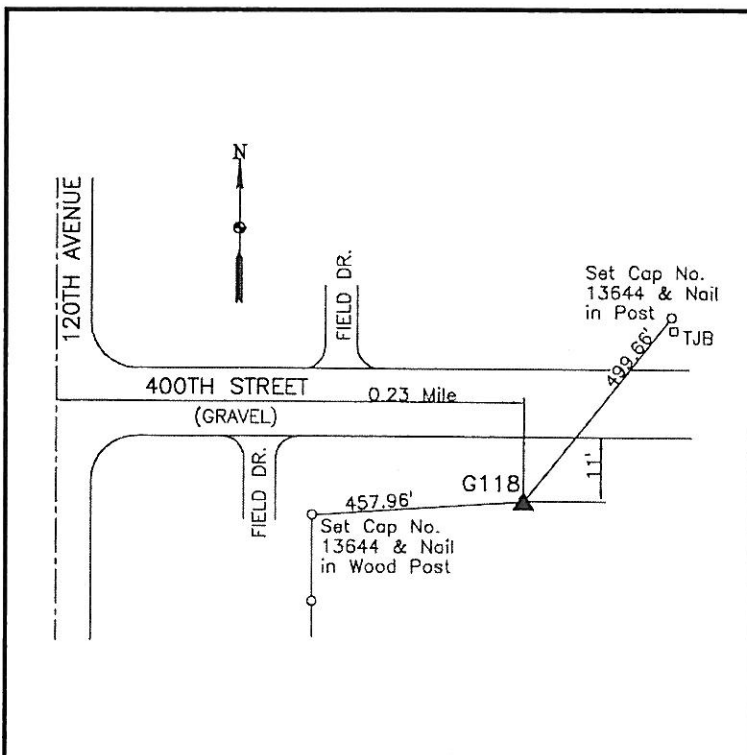
Latitude:	43°20'32.06570"N
Longitude:	93°43'44.79437"W
Scale Factor:	1.0000146843
Convergence:	-0°09'19"
Combined Factor:	0.99995783

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G118 and NGS Style Access Cover 1 " Deep.

Location:

On south side of 400th Street - 0.25± mile east of 120th Avenue - near NW Corner Section 6-T98N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G119**

	US SURVEY FEET	METRIC
Northing:	3952358.680	1204681.335
Easting:	4843187.920	1476206.630
Elevation:	1277.757	389.461
Ellipsoid Height:	1181.828	360.222
Geoid 99 Height:	-95.929	-29.239

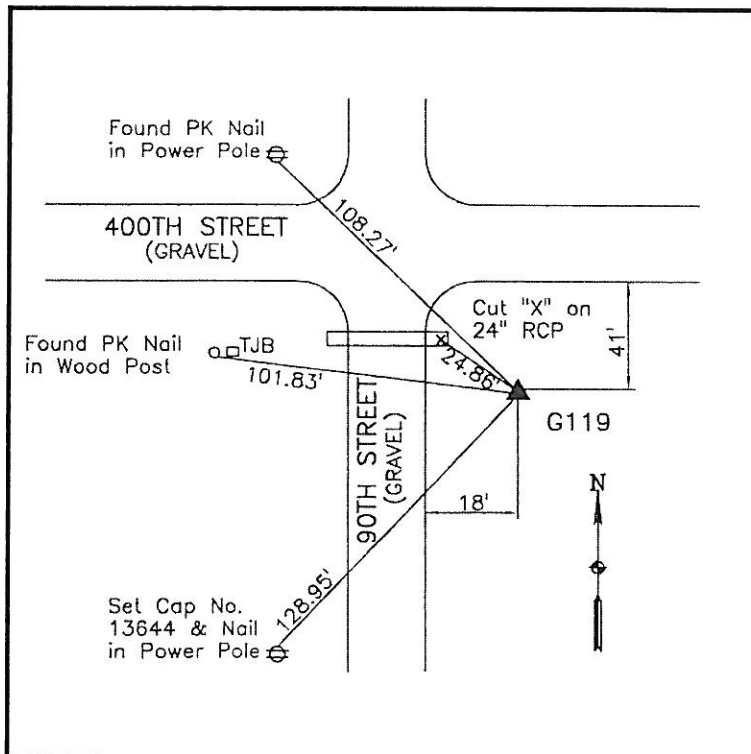
Latitude:	43°20'32.12394"N
Longitude:	93°47'36.33609"W
Scale Factor:	1.0000146876
Convergence:	-0°11'56"
Combined Factor:	0.99995830

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G119 and NGS Style Access Cover 1" Deep.

Location:

SE Corner of 400th Street and 90th Avenue - near NW Corner Section 3-T98N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G120**

	US SURVEY FEET	METRIC
Northing:	3952460.843	1204712.474
Easting:	4827562.984	1471444.140
Elevation:	1204.698	367.193
Ellipsoid Height:	1109.130	338.064
Geoid 99 Height:	-95.568	-29.129

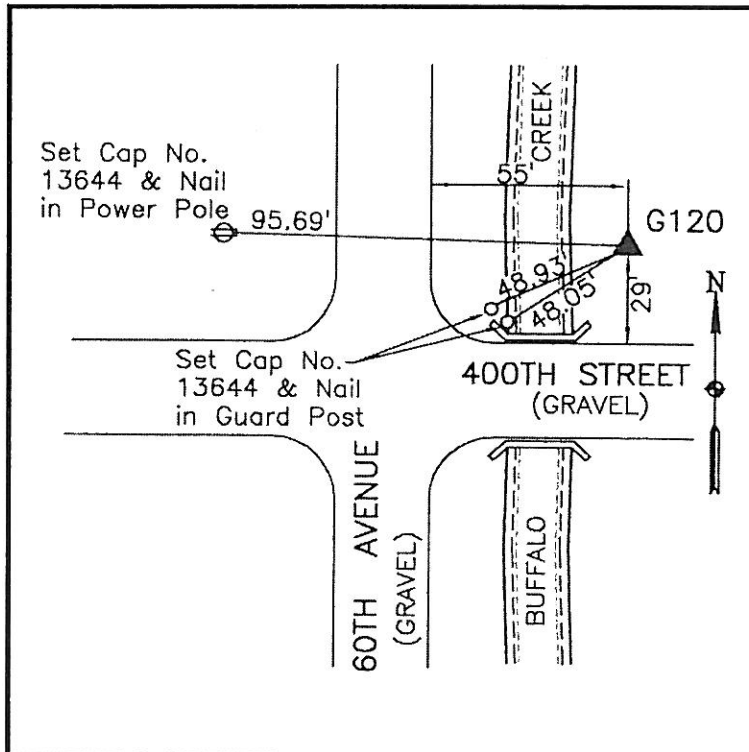
Latitude:	43°20'32.54370"N
Longitude:	93°51'07.77624"W
Scale Factor:	1.0000147116
Convergence:	-0°14'19"
Combined Factor:	0.99996179

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G120 and NGS Style Access Cover 1 " Deep.

Location:

At NE Corner of 400th Street and 60th Avenue - on east side drainage ditch - 25'± north of NE Corner wood bridge - near NW Corner Section 6-T98N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G121**

	US SURVEY FEET	METRIC
Northing:	3952437.540	1204705.372
Easting:	4811727.612	1466617.509
Elevation:	1182.807	360.520
Ellipsoid Height:	1087.649	331.516
Geoid 99 Height:	-95.158	-29.004

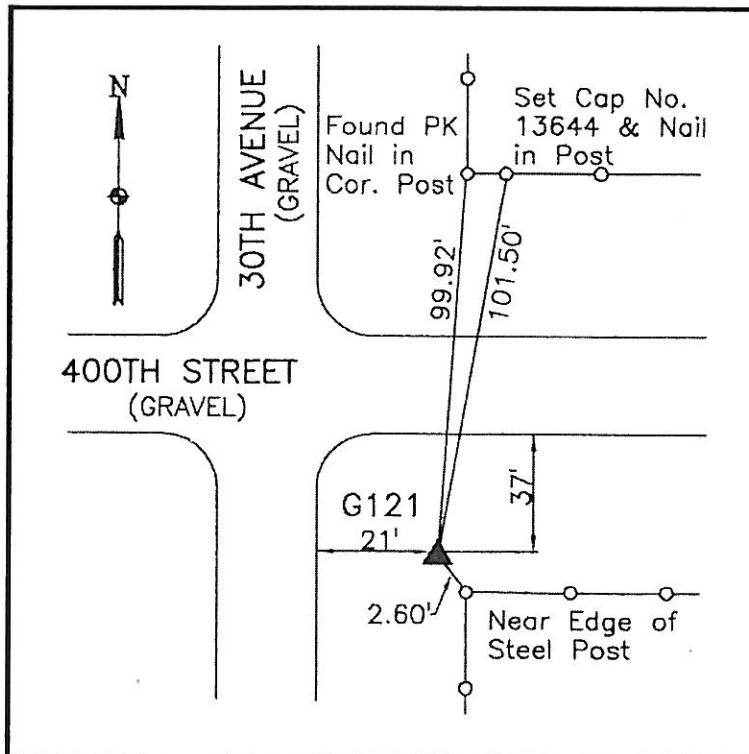
Latitude:	43°20'31.60701"N
Longitude:	93°54'42.05642"W
Scale Factor:	1.0000146581
Convergence:	-0°16'44"
Combined Factor:	0.99996277

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G121 and NGS Style Access Cover 2 " Deep.

Location:

SE Corner of 400th Street and 30th Avenue - near NW Corner Section 3-T98N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G122**

	US SURVEY FEET	METRIC
Northing:	3952580.873	1204749.060
Easting:	4796221.745	1461891.312
Elevation:	1192.205	363.385
Ellipsoid Height:	1097.457	334.506
Geoid 99 Height:	-94.748	-28.879

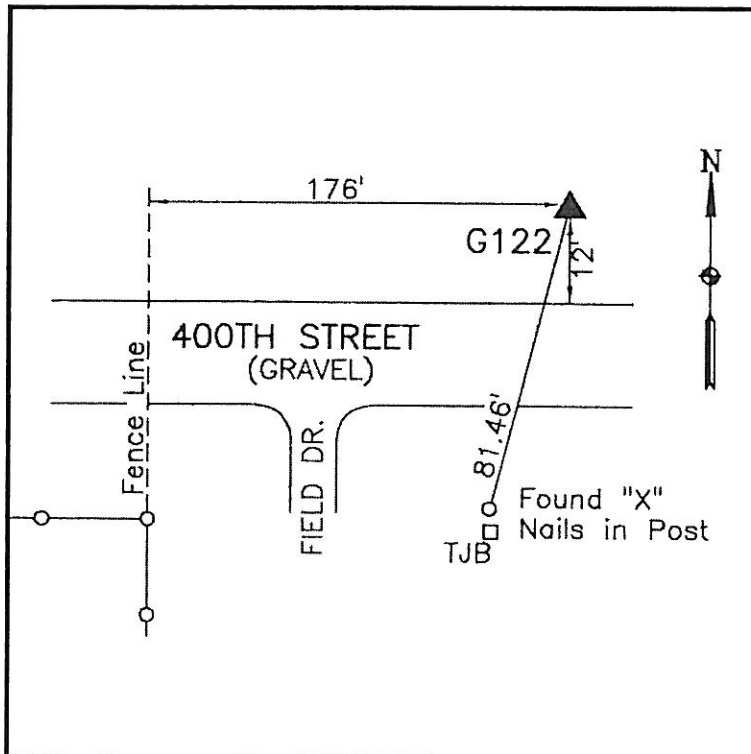
Latitude:	43°20'32.22405"N
Longitude:	93°58'11.88847"W
Scale Factor:	1.0000146933
Convergence:	-0°19'07"
Combined Factor:	0.99996233

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G122 and NGS Style Access Cover 1 " Deep.

Location:

On north side 400th Street - 175'± east of county line - near NW Corner Section 6-T98N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G123**

	US SURVEY FEET	METRIC
Northing:	3968437.863	1209582.280
Easting:	4796407.591	1461947.958
Elevation:	1173.901	357.806
Ellipsoid Height:	1079.356	328.988
Geoid 99 Height:	-94.545	-28.817

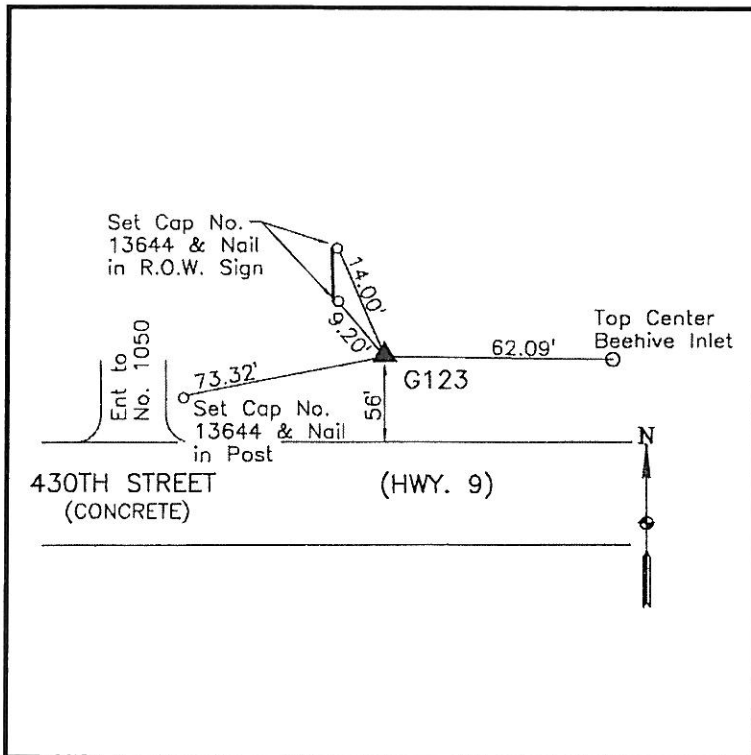
Latitude:	43°23'08.84105"N
Longitude:	93°58'10.56557"W
Scale Factor:	1.0000239421
Convergence:	-0°19'06"
Combined Factor:	0.99997244

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G123 and NGS Style Access Cover 2 " Deep.

Location:

On north side 430th Street (Highway 9) - near SE Corner of Ron's LP Tank Service - near NW Corner Section 19-T99N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G124**

	US SURVEY FEET	METRIC
Northing:	3968485.996	1209596.951
Easting:	4811723.960	1466616.396
Elevation:	1191.555	363.187
Ellipsoid Height:	1096.573	334.236
Geoid 99 Height:	-94.983	-28.951

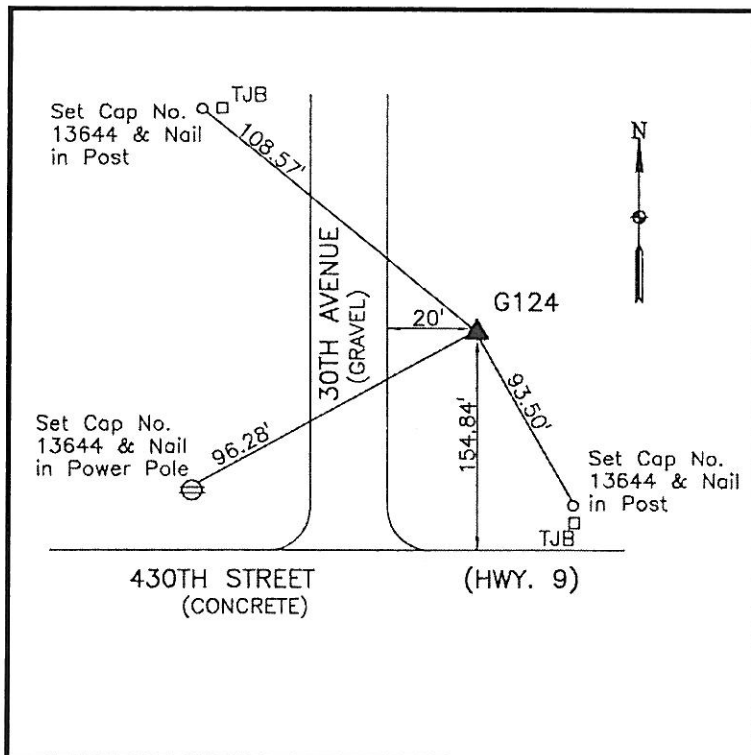
Latitude:	43°23'10.10515"N
Longitude:	93°54'43.16417"W
Scale Factor:	1.0000240191
Convergence:	-0°16'45"
Combined Factor:	0.99997170

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G124 and NGS Style Access Cover 1 " Deep.

Location:

NE Corner 430th Street (Highway 9) and 30th Avenue - 30'± south of field entrance - 5'± south of ROW sign - near NW Corner Section 22-T99N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G125**

	US SURVEY FEET	METRIC
Northing:	3968148.110	1209493.963
Easting:	4827601.677	1471455.934
Elevation:	1202.798	366.614
Ellipsoid Height:	1107.355	337.523
Geoid 99 Height:	-95.443	-29.091

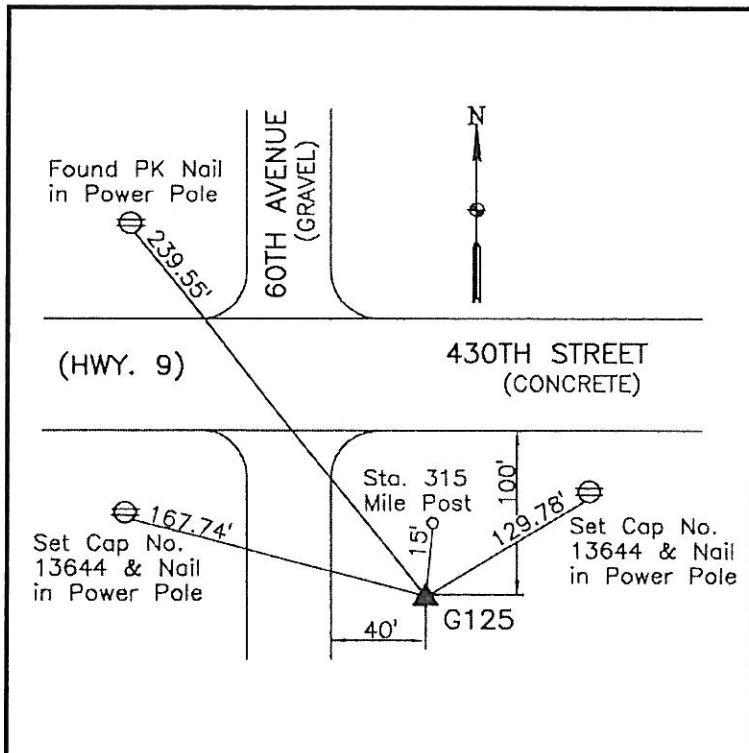
Latitude:	43°23'07.47693"N
Longitude:	93°51'08.13719"W
Scale Factor:	1.0000238590
Convergence:	-0°14'19"
Combined Factor:	0.99997103

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G125 and NGS Style Access Cover 1 " Deep.

Location:

SE Corner 430th Street (Highway 9) and 60th Avenue - 15'± west and 15'± south of Station 315 sign - near NW Corner Section 19-T99N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G126**

	US SURVEY FEET	METRIC
Northing:	3968042.815	1209461.869
Easting:	4843249.131	1476225.287
Elevation:	1237.189	377.096
Ellipsoid Height:	1141.355	347.886
Geoid 99 Height:	-95.834	-29.210

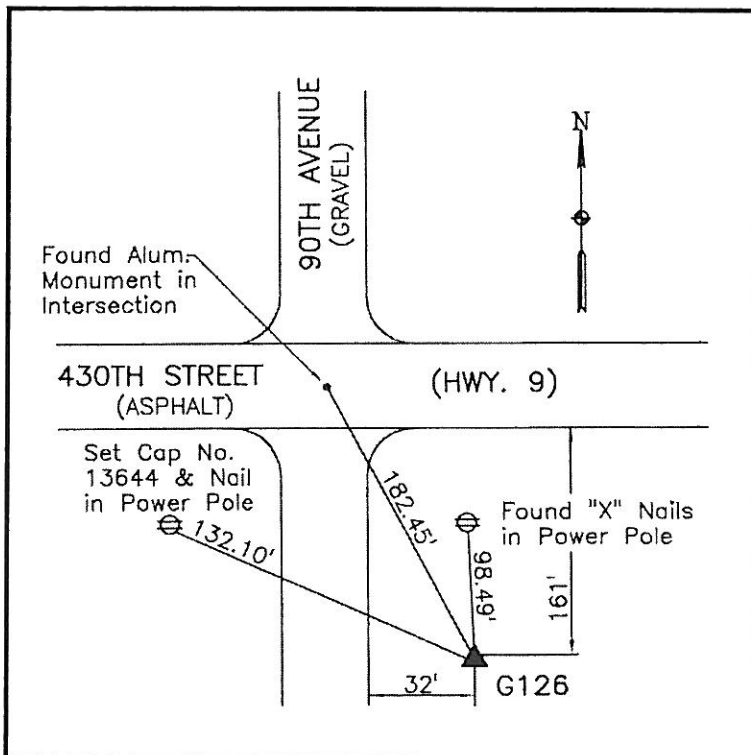
Latitude:	43°23'07.02716"N
Longitude:	93°47'36.24438"W
Scale Factor:	1.0000238317
Convergence:	-0°11'56"
Combined Factor:	0.99996938

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G126 and NGS Style Access Cover 2 " Deep.

Location:

SE Corner 430th Street (Highway 9) and 90th Avenue - 40± north of field entrance - 5± north of ROW sign - near NW Corner of Section 22-T99N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G127**

	US SURVEY FEET	METRIC
Northing:	3968148.321	1209494.027
Easting:	4859081.086	1481050.877
Elevation:	1255.027	382.533
Ellipsoid Height:	1158.871	353.225
Geoid 99 Height:	-96.155	-29.308

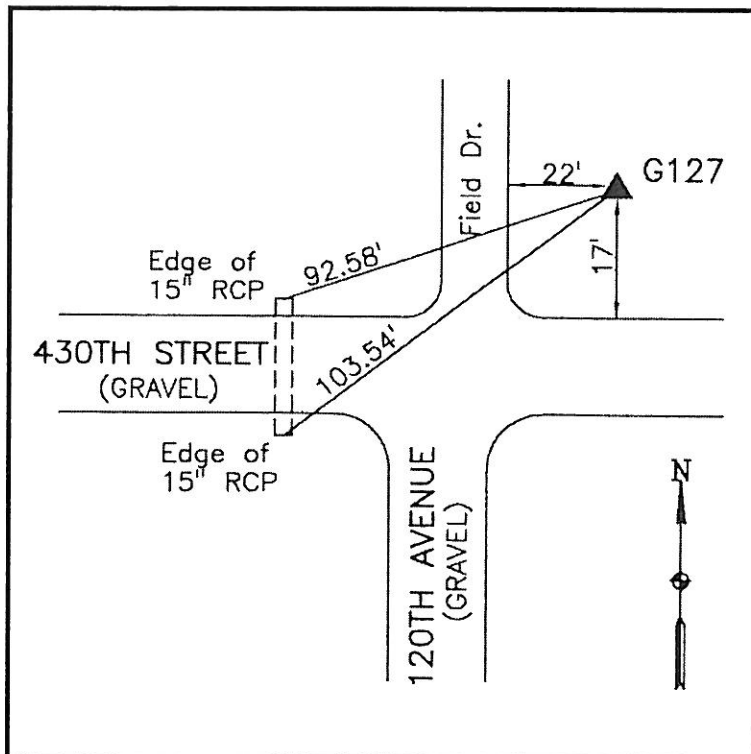
Latitude:	43°23'08.55675"N
Longitude:	93°44'01.86204"W
Scale Factor:	1.0000239248
Convergence:	-0°09'31"
Combined Factor:	0.99996863

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G127 and NGS Style Access Cover 1" Deep.

Location:

NE Corner 430th Street and 120th Avenue - near NW Corner Section 19-T99N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G128**

	US SURVEY FEET	METRIC
Northing:	3967827.251	1209396.165
Easting:	4874378.680	1485713.593
Elevation:	1238.143	377.387
Ellipsoid Height:	1141.746	348.005
Geoid 99 Height:	-96.397	-29.382

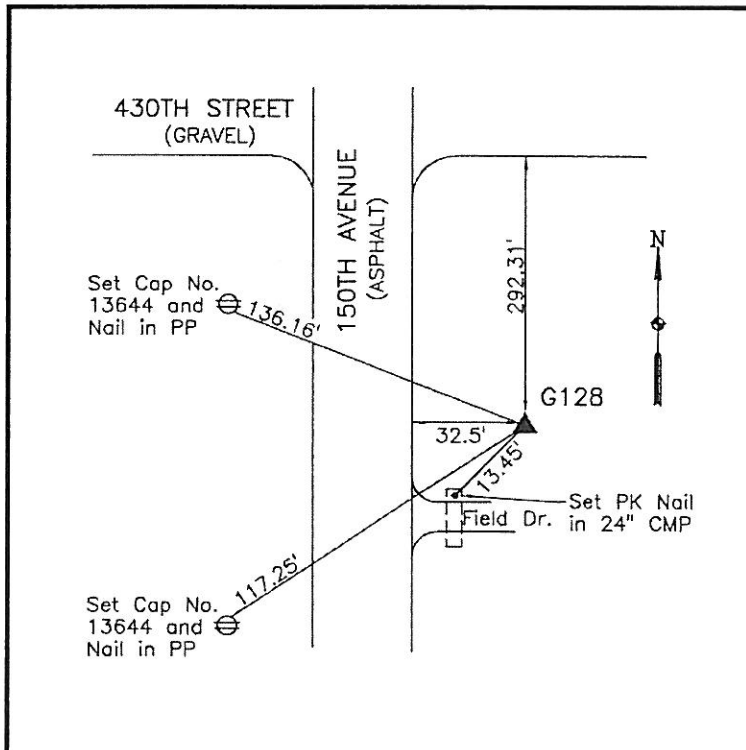
Latitude:	43°23'05.75230"N
Longitude:	93°40'34.70088"W
Scale Factor:	1.0000237541
Convergence:	-0°07'10"
Combined Factor:	0.99996928

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G128 and NGS Style Access Cover 1 " Deep.

Location:

On east side 150th Avenue (County Road R50) - 300'± south of 430th Street - 20'± north of field entrance - near NW Corner Section 22-T99N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G129**

	US SURVEY FEET	METRIC
Northing:	3968089.853	1209476.206
Easting:	4890054.910	1490491.718
Elevation:	1264.155	385.315
Ellipsoid Height:	1167.610	355.888
Geoid 99 Height:	-96.545	-29.427

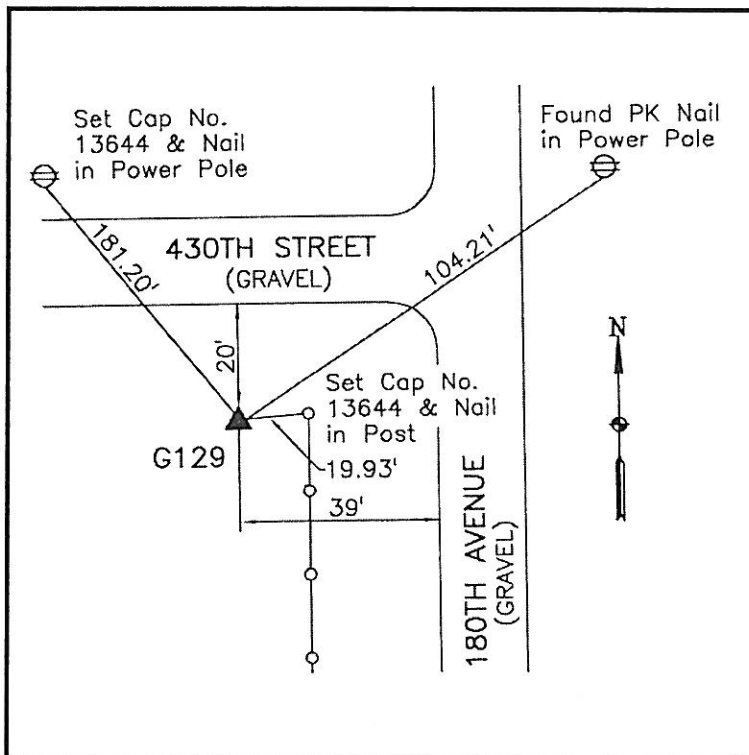
Latitude:	43°23'08.61470"N
Longitude:	93°37'02.42886"W
Scale Factor:	1.0000239283
Convergence:	-0°04'46"
Combined Factor:	0.99996822

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G129 and NGS Style Access Cover 1 " Deep.

Location:

SW Corner of 430th Street and 180th Avenue - near NW Corner Section 19-T99N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G130**

	US SURVEY FEET	METRIC
Northing:	3968253.186	1209525.990
Easting:	4906037.882	1495363.337
Elevation:	1290.109	393.226
Ellipsoid Height:	1193.570	363.801
Geoid 99 Height:	-96.540	-29.425

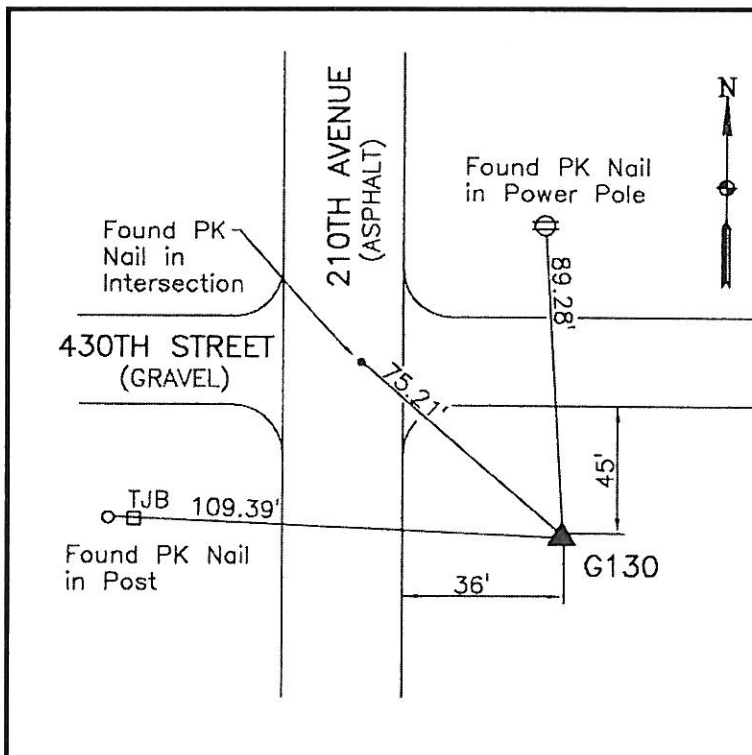
Latitude:	43°23'10.39080"N
Longitude:	93°33'25.99676"W
Scale Factor:	1.0000240365
Convergence:	-0°02'20"
Combined Factor:	0.99996709

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G130 and NGS Style Access Cover 2 " Deep.

Location:

SE Corner of 430th Street and 210th Avenue (County Road R72) - near NW Corner Section 22-T99N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G131**

	US SURVEY FEET	METRIC
Northing:	3965670.690	1208738.844
Easting:	4920743.118	1499845.502
Elevation:	1244.980	379.471
Ellipsoid Height:	1148.608	350.097
Geoid 99 Height:	-96.372	-29.374

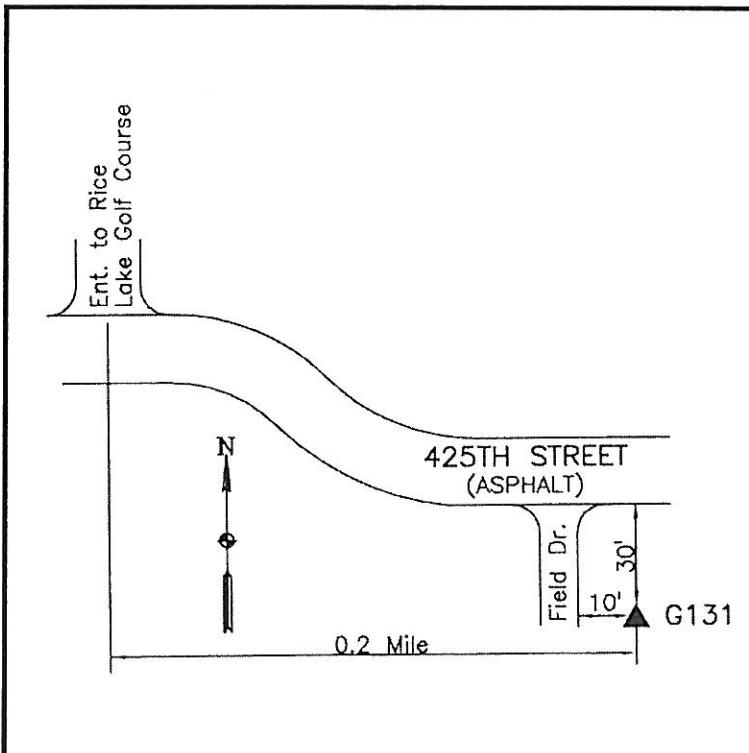
Latitude:	43°22'44.93613"N
Longitude:	93°30'06.86322"W
Scale Factor:	1.0000224929
Convergence:	-0°00'05"
Combined Factor:	0.99996769

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G131 and NGS Style Access Cover 2 " Deep.

Location:

On south side 425th Street (County Road A34) - at end of curve - 0.2± mile east of entrance to Rice Lake Golf Course (235th Avenue) east of center Section 24-T99N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G132**

	US SURVEY FEET	METRIC
Northing:	3984250.395	1214401.949
Easting:	4921826.841	1500175.821
Elevation:	1294.698	394.625
Ellipsoid Height:	1198.236	365.223
Geoid 99 Height:	-96.462	-29.402

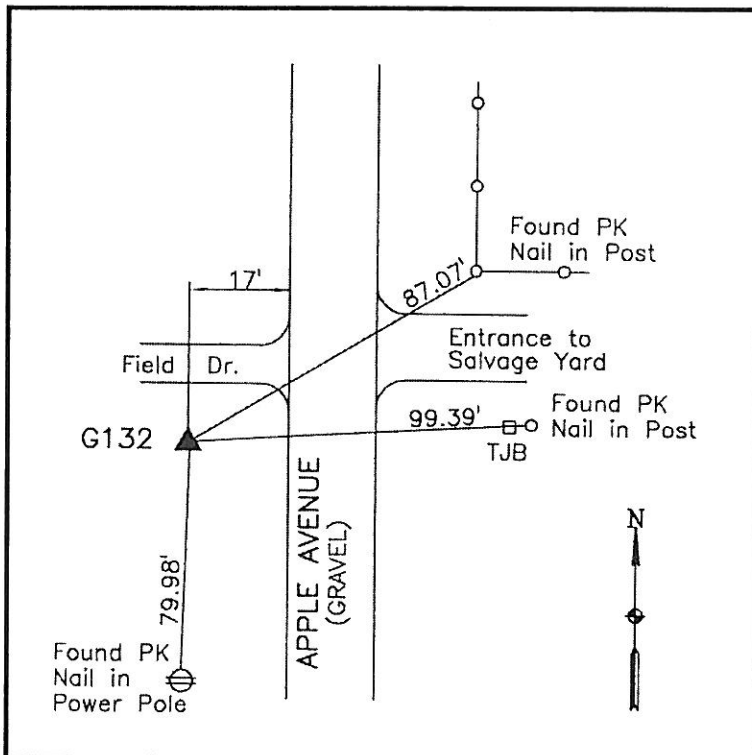
Latitude:	43°25'48.43289"N
Longitude:	93°29'52.18308"W
Scale Factor:	1.0000339647
Convergence:	0°00'05"
Combined Factor:	0.99997679

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G132 and NGS Style Access Cover 2 " Deep.

Location:

On west side Apple Avenue - 30'± south of field entrance - SW Corner intersection with entrance to salvage yard - near NE Corner Section 1-T99N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G133**

	US SURVEY FEET	METRIC
Northing:	3984263.937	1214406.077
Easting:	4906032.293	1495361.634
Elevation:	1262.919	384.938
Ellipsoid Height:	1166.359	355.507
Geoid 99 Height:	-96.560	-29.432

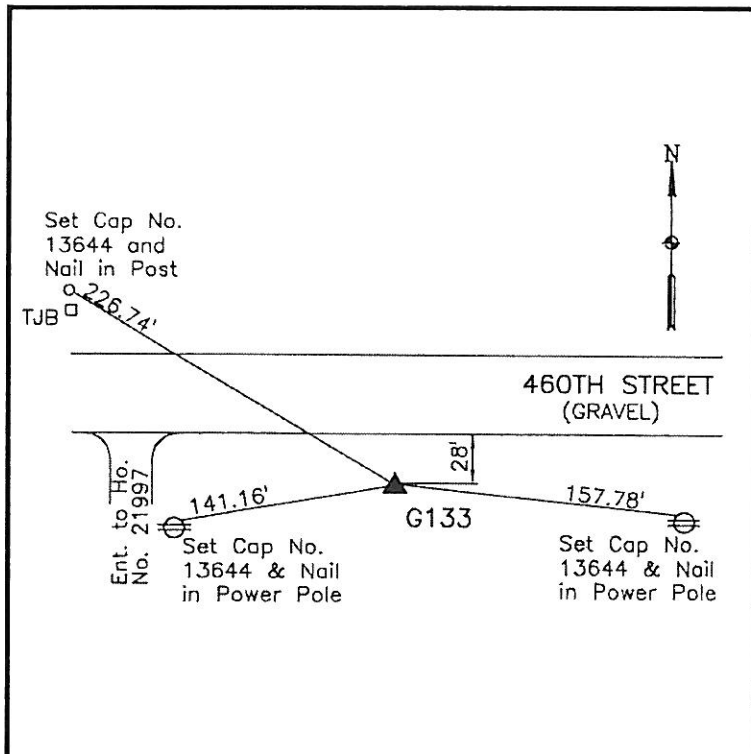
Latitude:	43°25'48.51578"N
Longitude:	93°33'26.21935"W
Scale Factor:	1.0000339701
Convergence:	-0°02'20"
Combined Factor:	0.99997832

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G133 and NGS Style Access Cover 1" Deep.

Location:

On south side 460th Street - NE Corner of Acreage No. 21997 (Raymond Peterson) - near NW Corner Section 3-T99N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G134**

	US SURVEY FEET	METRIC
Northing:	3984234.322	1214397.050
Easting:	4890056.244	1490492.124
Elevation:	1288.435	392.716
Ellipsoid Height:	1191.935	363.302
Geoid 99 Height:	-96.501	-29.413

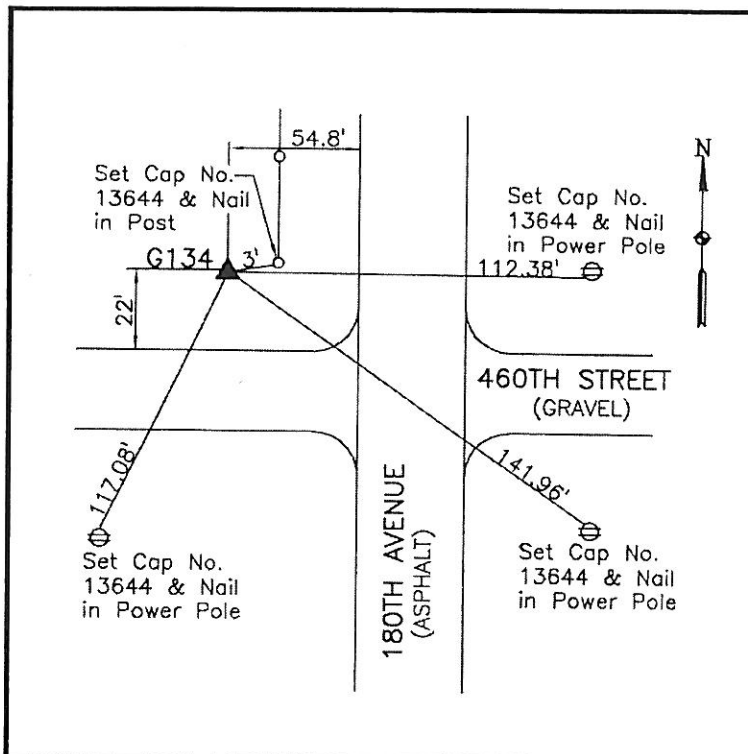
Latitude:	43°25'48.06027"N
Longitude:	93°37'02.71445"W
Scale Factor:	1.0000339406
Convergence:	-0°04'46"
Combined Factor:	0.99997707

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G134 and NGS Style Access Cover 2" Deep.

Location:

NW Corner of 460th Street and 180th Avenue (County Road R60) - near NW Corner Section 6-T99N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G135**

	US SURVEY FEET	METRIC
· Northing:	3984205.750	1214388.342
Easting:	4873783.980	1485532.328
Elevation:	1275.592	388.801
Ellipsoid Height:	1179.279	359.445
Geoid 99 Height:	-96.314	-29.357

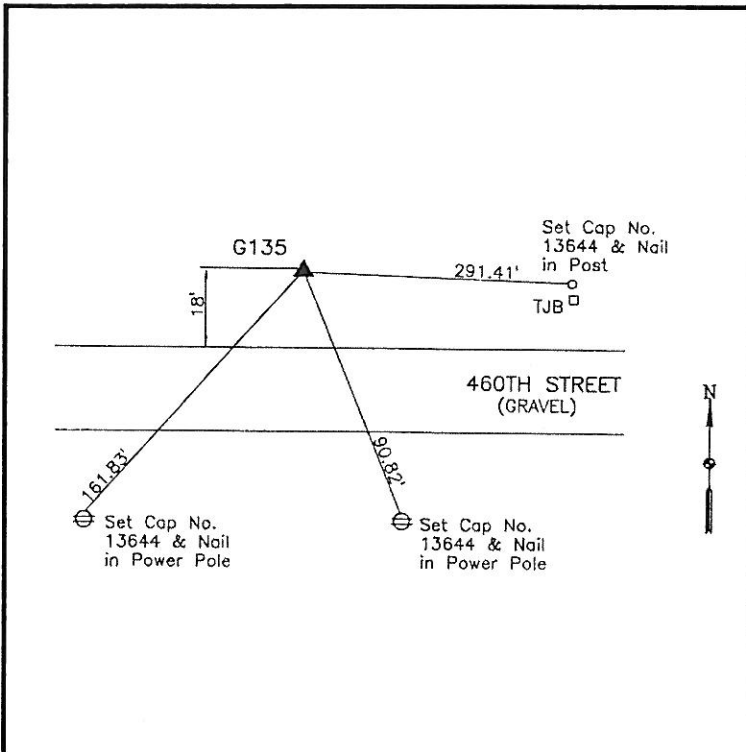
Latitude:	43°25'47.49666"N
Longitude:	93°40'43.22264"W
Scale Factor:	1.0000339042
Convergence:	-0°07'16"
Combined Factor:	0.99997764

Description:

Placed 5/8" X 6" - 0" Long Aluminum Rod with Cap Stamped G135 and NGS Style Access Cover 1" Deep.

Location:

On north side 460th Street - 400'± west of 150th Avenue (County Road R50) - near NW Corner Section 3-T99N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G136**

	US SURVEY FEET	METRIC
Northing:	3984248.983	1214401.519
Easting:	4859054.030	1481042.631
Elevation:	1237.688	377.248
Ellipsoid Height:	1141.622	347.967
Geoid 99 Height:	-96.066	-29.281

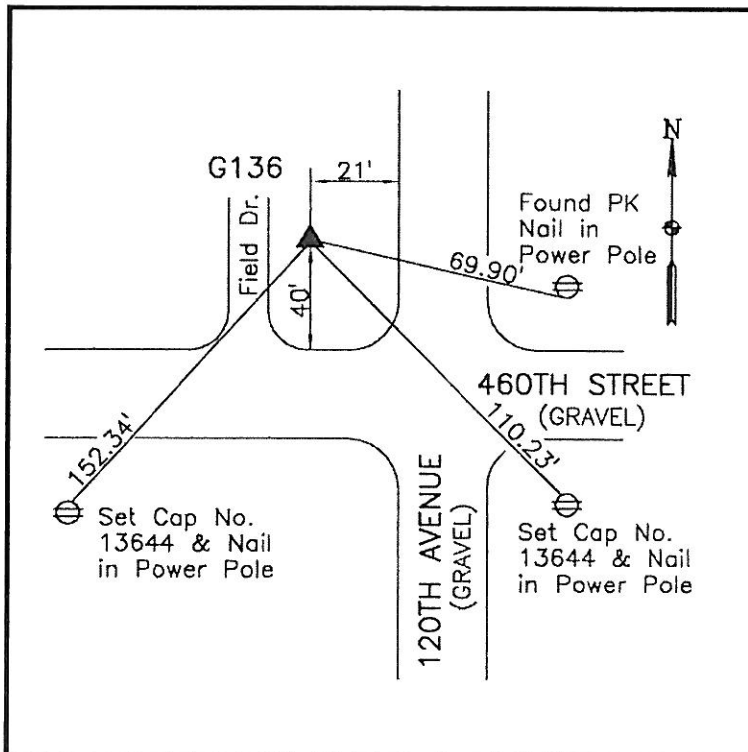
Latitude:	43°25'47.56846"N
Longitude:	93°44'02.83221"W
Scale Factor:	1.0000339088
Convergence:	-0°09'31"
Combined Factor:	0.99997944

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G136 and NGS Style Access Cover 3" Deep.

Location:

NW Corner of 460th Street and 120th Avenue - near NW Corner Section 6-T99N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G137**

	US SURVEY FEET	METRIC
Northing:	3984284.165	1214412.242
Easting:	4844161.384	1476503.343
Elevation:	1234.321	376.222
Ellipsoid Height:	1138.576	347.039
Geoid 99 Height:	-95.745	-29.183

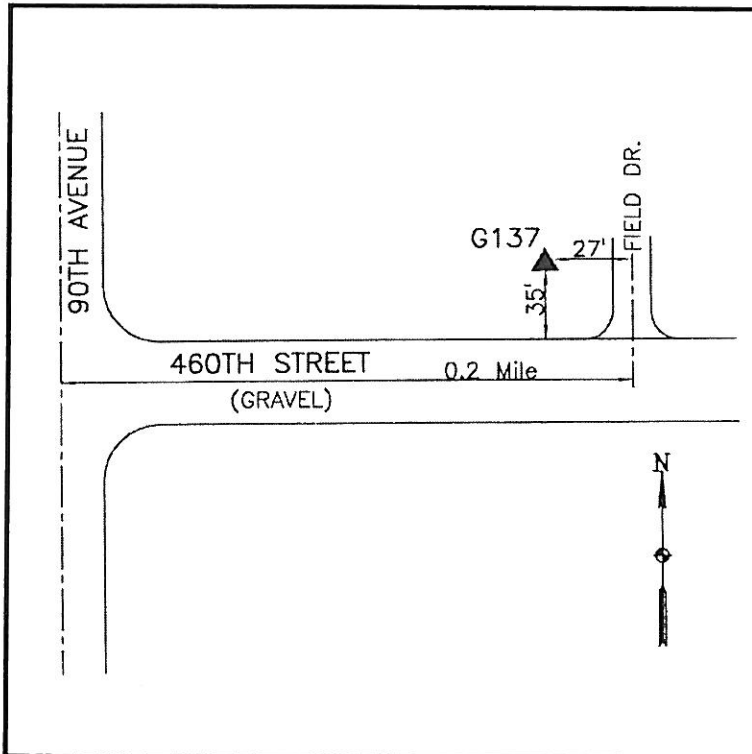
Latitude:	43°25'47.45983"N
Longitude:	93°47'24.64616"W
Scale Factor:	1.0000339018
Convergence:	-0°11'48"
Combined Factor:	0.99997958

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G137 and NGS Style Access Cover 3" Deep.

Location:

On north side 460th Street - 0.2± mile east of 90th Avenue - 30'± west of field entrance - near NW Corner Section 3-T99N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G138**

	US SURVEY FEET	METRIC
Northing:	3984354.398	1214433.650
Easting:	4827736.387	1471496.994
Elevation:	1199.450	365.593
Ellipsoid Height:	1104.142	336.543
Geoid 99 Height:	-95.308	-29.050

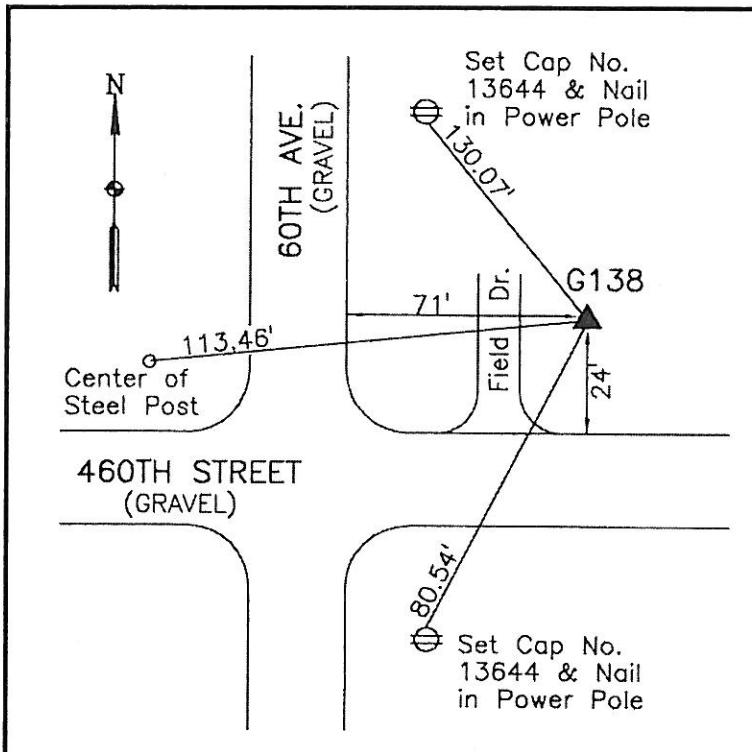
Latitude:	43°25'47.53734"N
Longitude:	93°51'07.22682"W
Scale Factor:	1.0000339068
Convergence:	-0°14'19"
Combined Factor:	0.99998123

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G138 and NGS Style Access Cover 1" Deep.

Location:

NE Corner of 460th Street and 60th Avenue - 10'± east of field entrance - near NW Corner Section 6-T99N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G139**

	US SURVEY FEET	METRIC
Northing:	3984342.011	1214429.874
Easting:	4811824.315	1466646.985
Elevation:	1196.259	364.620
Ellipsoid Height:	1101.441	335.720
Geoid 99 Height:	-94.818	-28.901

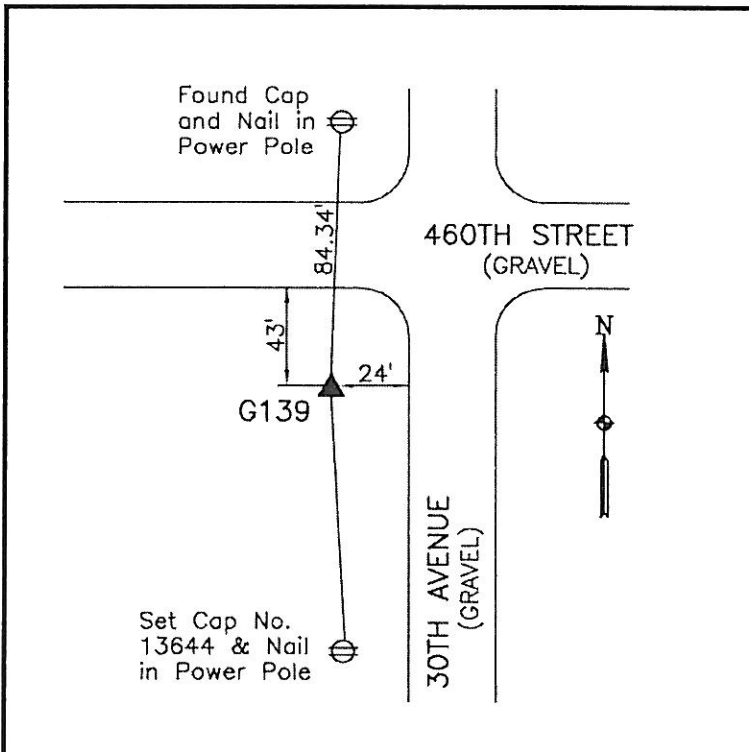
Latitude:	43°25'46.70499"N
Longitude:	93°54'42.85138"W
Scale Factor:	1.0000338530
Convergence:	-0°16'45"
Combined Factor:	0.99998130

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G139 and NGS Style Access Cover 1" Deep.

Location:

SW Corner of 460th Street and 30th Avenue - near NW Corner Section 3-T99N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G140**

	US SURVEY FEET	METRIC
Northing:	3983918.097	1214300.664
Easting:	4796279.053	1461908.779
Elevation:	1178.236	359.127
Ellipsoid Height:	1083.898	330.373
Geoid 99 Height:	-94.339	-28.754

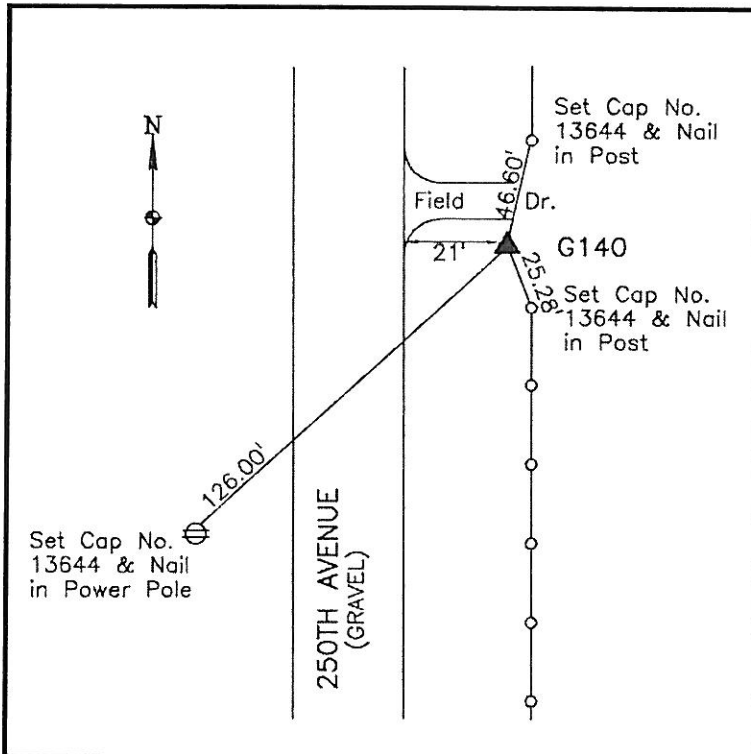
Latitude:	43°25'41.71727"N
Longitude:	93°58'13.47258"W
Scale Factor:	1.0000335308
Convergence:	-0°19'08"
Combined Factor:	0.99998182

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G140 and NGS Style Access Cover 2" Deep.

Location:

On east side 250th Avenue - 0.1± mile south of 460th Street - 15'± south of field entrance - near NW Corner Section 6-T99N-R26W.



WHKS & co.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G141**

	US SURVEY FEET	METRIC
Northing:	4000214.984	1219267.966
Easting:	4797299.226	1462219.728
Elevation:	1140.907	347.749
Ellipsoid Height:	1046.734	319.045
Geoid 99 Height:	-94.173	-28.704

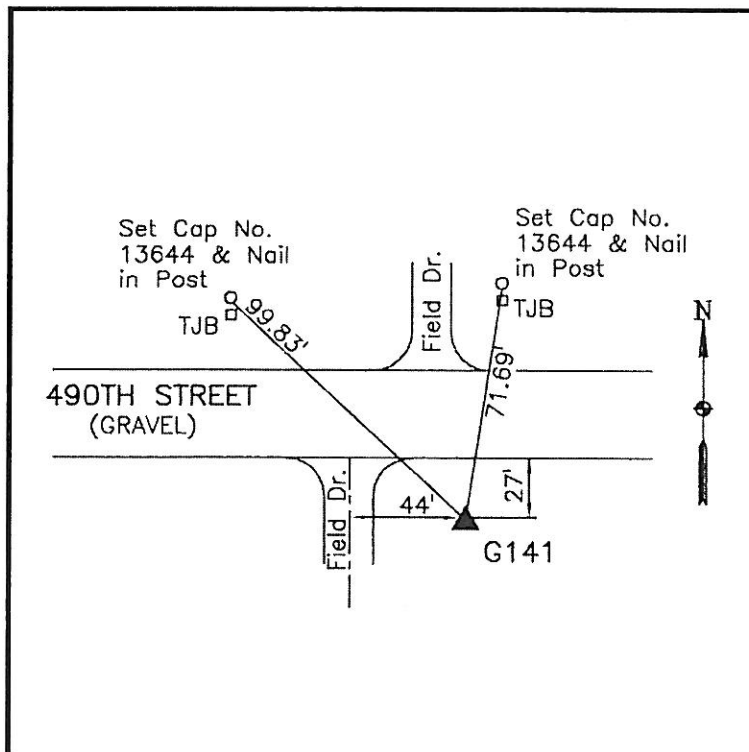
Latitude:	43°28'22.71886"N
Longitude:	93°58'00.86825"W
Scale Factor:	1.0000442286
Convergence:	-0°18'59"
Combined Factor:	0.99999429

Description:

Placed 5/8" X 6' - 0" Long
Aluminum Rod with Cap
Stamped G141 and NGS Style
Access Cover 1 " Deep.

Location:

On south side 490th Street -
30'± east of field entrance -
0.75± mile west of 10th
Avenue - 0.2± mile east of NW
Corner Section 19-T100N-
R26W.



=====**WHKS & CO.**=====

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G142**

	US SURVEY FEET	METRIC
Northing:	4000311.391	1219297.350
Easting:	4811788.343	1466636.020
Elevation:	1167.648	355.900
Ellipsoid Height:	1072.992	327.049
Geoid 99 Height:	-94.656	-28.851

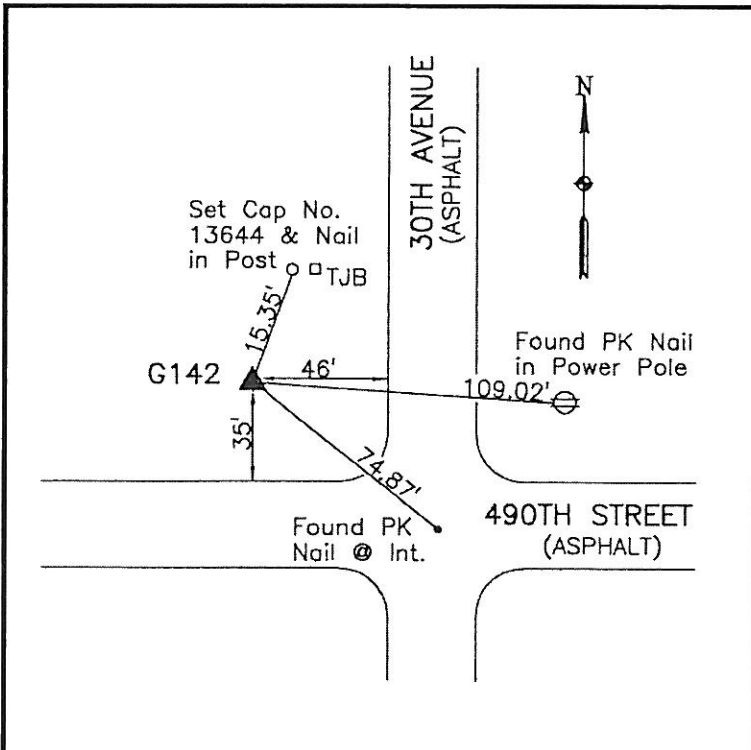
Latitude:	43°28'24.41506"N
Longitude:	93°54'44.39433"W
Scale Factor:	1.0000443446
Convergence:	-0°16'46"
Combined Factor:	0.99999315

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G142 and NGS Style Access Cover 2 " Deep.

Location:

NW Corner of 490th Street (County Road A16) and 30th Avenue - near NW Corner of Section 22-T100N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G143**

	US SURVEY FEET	METRIC
Northing:	4000226.526	1219271.484
Easting:	4827694.401	1471484.196
Elevation:	1193.068	363.648
Ellipsoid Height:	1097.889	334.637
Geoid 99 Height:	-95.180	-29.011

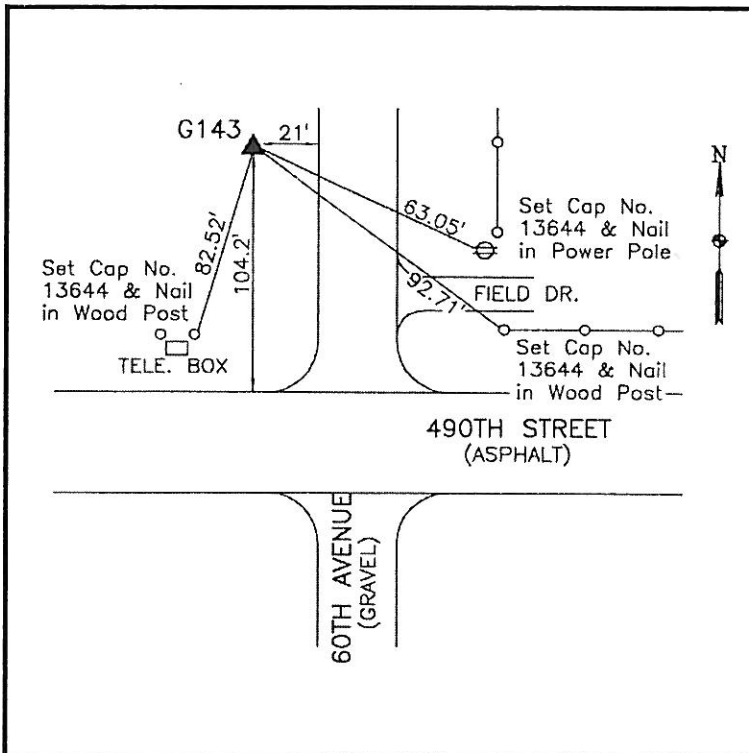
Latitude:	43°28'24.28746"N
Longitude:	93°51'08.69240"W
Scale Factor:	1.0000443358
Convergence:	-0°14'20"
Combined Factor:	0.99999195

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G143 and NGS Style Access Cover 3 " Deep.

Location:

NW Corner of 490th Street (County Road A16) and 60th Avenue - near NW Corner Section 19-T100N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G144**

	US SURVEY FEET	METRIC
Northing:	4000006.693	1219204.478
Easting:	4843409.382	1476274.132
Elevation:	1238.853	377.603
Ellipsoid Height:	1143.231	348.457
Geoid 99 Height:	-95.622	-29.146

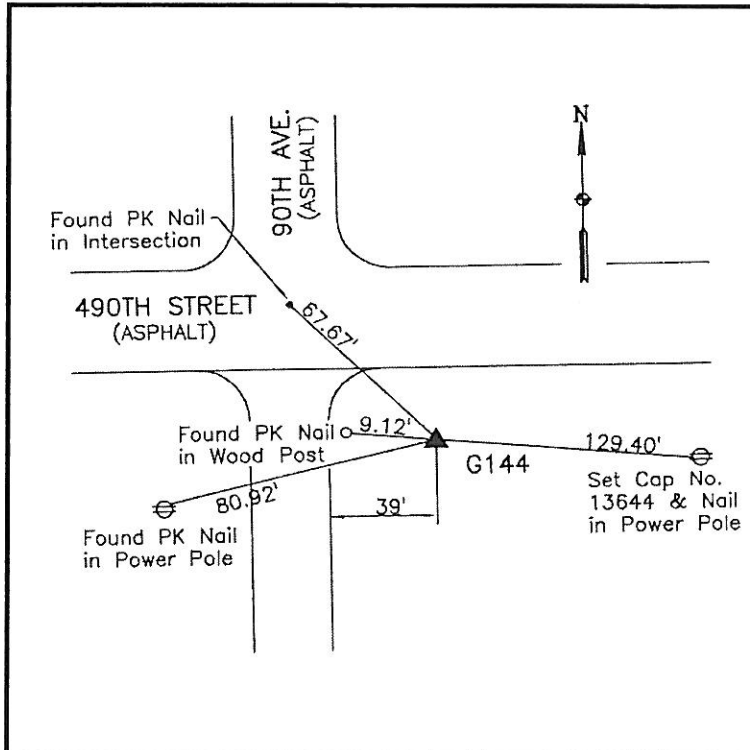
Latitude:	43°28'22.70905"N
Longitude:	93°47'35.57561"W
Scale Factor:	1.0000442279
Convergence:	-0°11'55"
Combined Factor:	0.99998968

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G144 and NGS Style Access Cover 2" Deep.

Location:

SE Corner of 490th Street (County Road A16) and 90th Avenue - near NW Corner Section 22-T100N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G145**

	US SURVEY FEET	METRIC
Northing:	3999888.170	1219168.352
Easting:	4859126.196	1481064.627
Elevation:	1244.530	379.334
Ellipsoid Height:	1148.558	350.081
Geoid 99 Height:	-95.973	-29.252

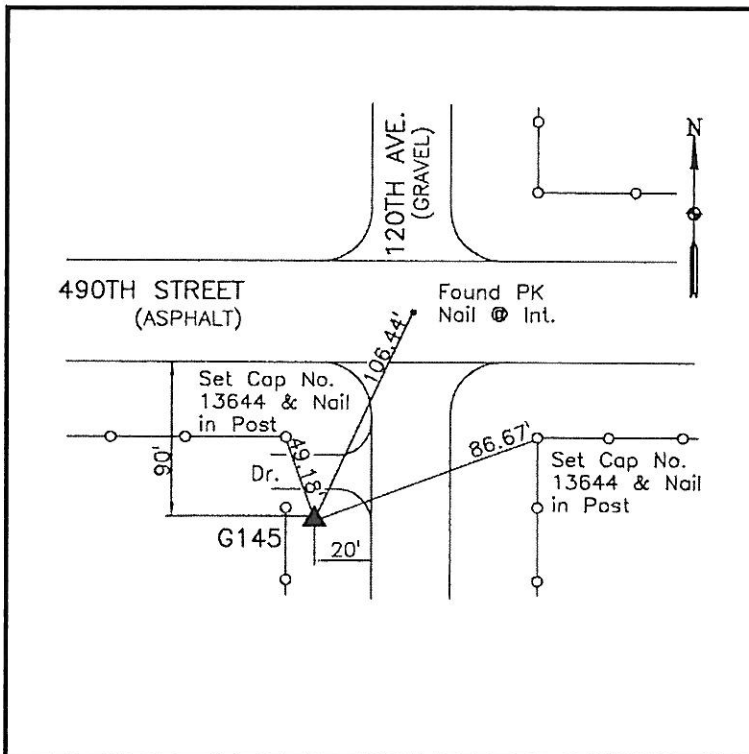
Latitude:	43°28'22.02254"N
Longitude:	93°44'02.44093"W
Scale Factor:	1.0000441810
Convergence:	-0°09'31"
Combined Factor:	0.99998938

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G145 and NGS Style Access Cover 2" Deep.

Location:

SW Corner of 490th Street (County Road A16) and 120th Avenue - near NW Corner Section 19-T100N-R24W.



**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G146**

	US SURVEY FEET	METRIC
Northing:	3999905.022	1219173.489
Easting:	4874422.963	1485727.091
Elevation:	1264.771	385.503
Ellipsoid Height:	1168.537	356.171
Geoid 99 Height:	-96.234	-29.332

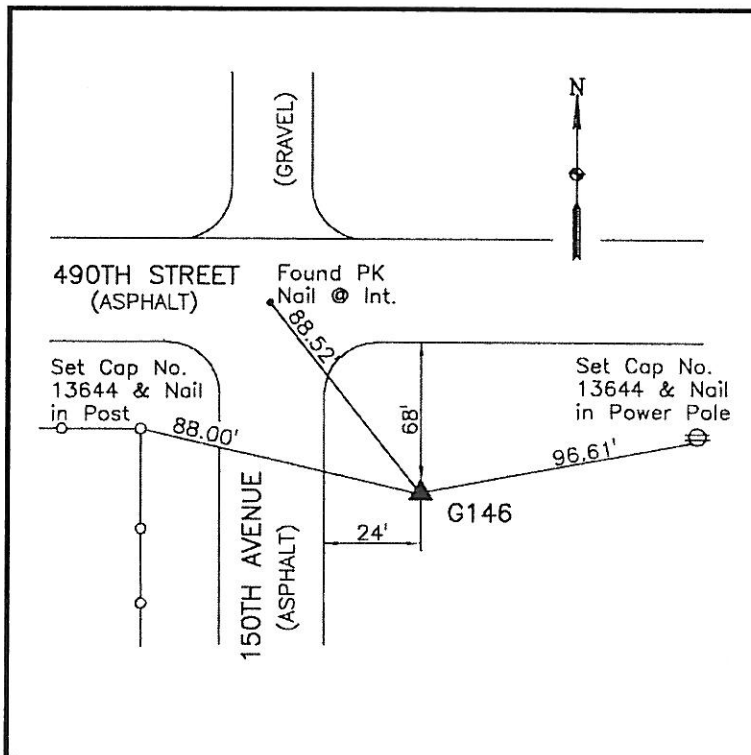
Latitude:	43°28'22.55566"N
Longitude:	93°40'35.00756"W
Scale Factor:	1.0000442174
Convergence:	-0°07'10"
Combined Factor:	0.99998846

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G146 and NGS Style Access Cover 2" Deep.

Location:

SE Corner of 490th Street (County Road A16) and 150th Avenue (County Road R50) - near NW Corner Section 22-T100N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G147**

	US SURVEY FEET	METRIC
Northing:	4000001.892	1219203.015
Easting:	4889434.896	1490302.737
Elevation:	1276.455	389.064
Ellipsoid Height:	1180.032	359.675
Geoid 99 Height:	-96.423	-29.390

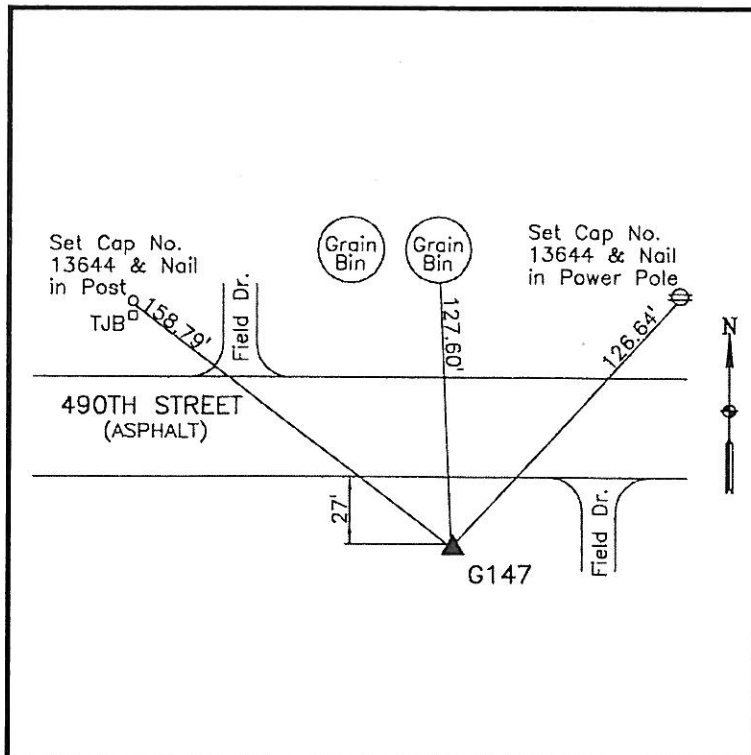
Latitude:	43°28'23.77210"N
Longitude:	93°37'11.43739"W
Scale Factor:	1.0000443006
Convergence:	-0°04'52"
Combined Factor:	0.99998800

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G147 and NGS Style Access Cover 2 " Deep.

Location:

On south side 490th Street (County Road A16) - 600'± west of 180th Avenue (County Road R60) - 30'± west of field entrance - near NW Corner Section 19-T100N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G148**

	US SURVEY FEET	METRIC
Northing:	3999580.613	1219074.609
Easting:	4906180.306	1495406.748
Elevation:	1277.268	389.312
Ellipsoid Height:	1180.741	359.891
Geoid 99 Height:	-96.527	-29.422

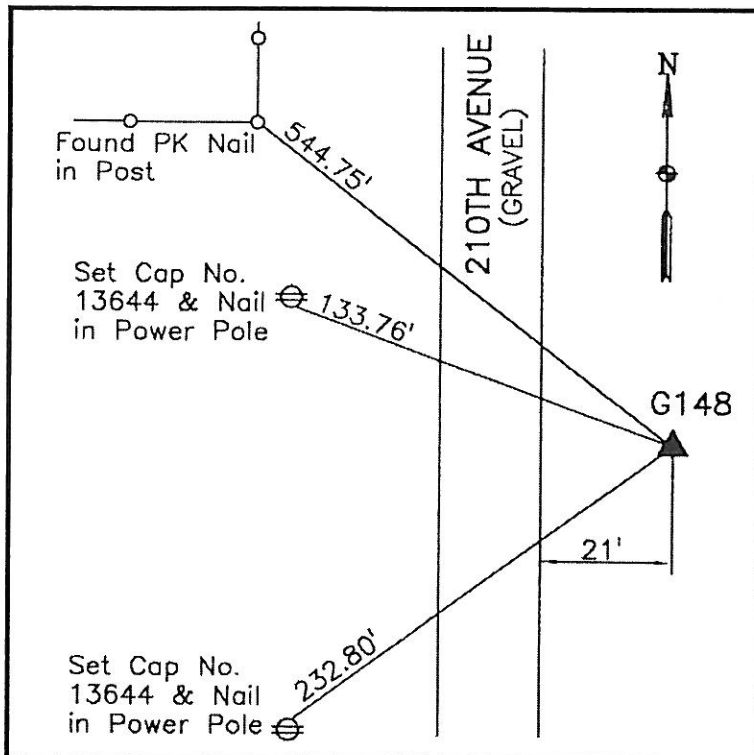
Latitude:	43°28'19.78432"N
Longitude:	93°33'24.35296"W
Scale Factor:	1.0000440281
Convergence:	-0°02'18"
Combined Factor:	0.99998769

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G148 and NGS Style Access Cover 1 " Deep.

Location:

On east side of 210th Avenue - 400'± south of NW Corner Section 22-T100N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G149**

	US SURVEY FEET	METRIC
Northing:	4000250.732	1219278.862
Easting:	4921914.874	1500202.654
Elevation:	1303.436	397.288
Ellipsoid Height:	1206.959	367.882
Geoid 99 Height:	-96.477	-29.406

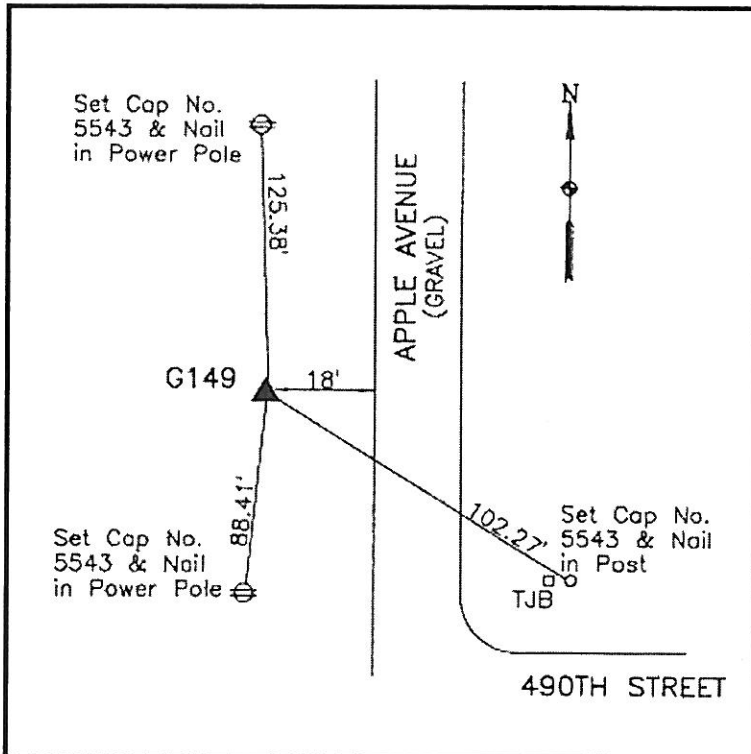
Latitude:	43°28'26.45223"N
Longitude:	93°29'50.98369"W
Scale Factor:	1.0000444840
Convergence:	0°00'06"
Combined Factor:	0.99998690

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G149 and NGS Style Access Cover 1 " Deep.

Location:

West side Apple Avenue - 150'± north of 490th Street - near NE Corner Section 24-T100N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G150**

	US SURVEY FEET	METRIC
Northing:	4009523.996	1222105.358
Easting:	4921303.552	1500016.323
Elevation:	1273.144	388.055
Ellipsoid Height:	1176.672	358.650
Geoid 99 Height:	-96.472	-29.405

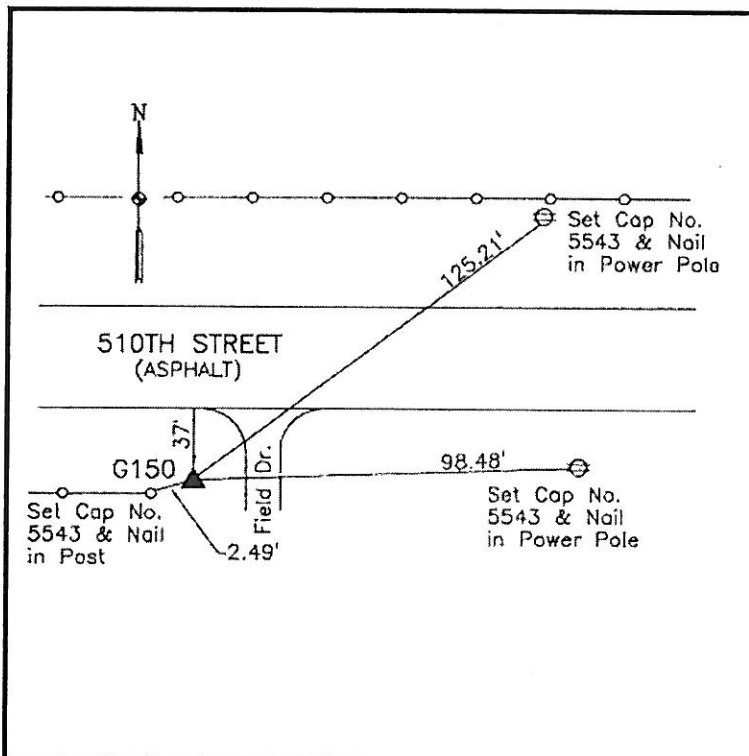
Latitude:	43°29'58.03378"N
Longitude:	93°29'59.27348"W
Scale Factor:	1.0000508518
Convergence:	0°00'00"
Combined Factor:	0.99999471

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G150 and NGS Style Access Cover 2 " Deep.

Location:

On south side 510th Street (County Road A14) - 0.2± mile west of Apple Avenue - 2'± east of end wood post - near NE Corner Section 12-T100N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G151**

	US SURVEY FEET	METRIC
Northing:	4009554.059	1222114.521
Easting:	4906168.138	1495403.039
Elevation:	1236.602	376.917
Ellipsoid Height:	1140.108	347.506
Geoid 99 Height:	-96.494	-29.412

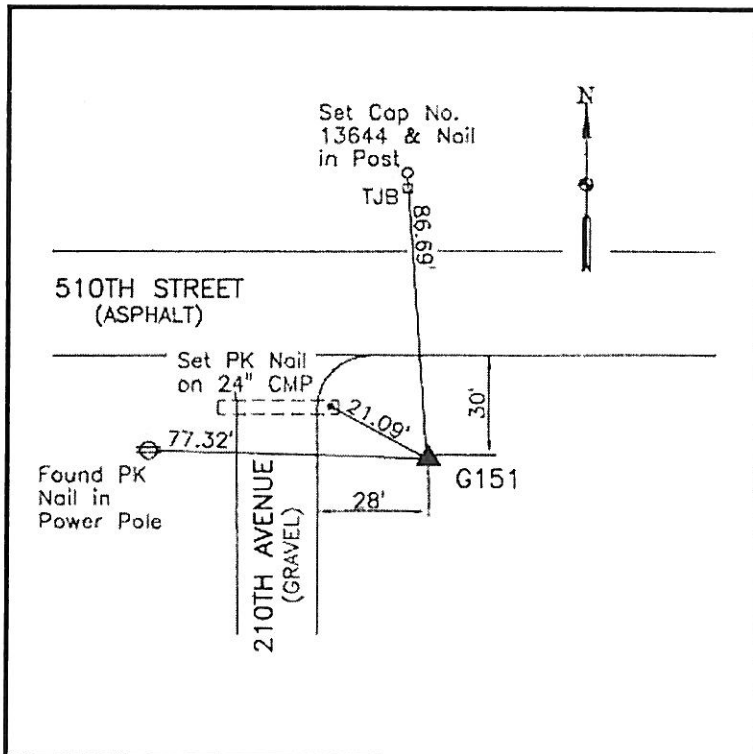
Latitude:	43°29'58.28060"N
Longitude:	93°33'24.60889"W
Scale Factor:	1.0000508692
Convergence:	-0°02'19"
Combined Factor:	0.99999647

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G151 and NGS Style Access Cover 3 " Deep.

Location:

SE Corner of 510th Street (County Road A14) and 210th Avenue - near NW Corner Section 10-T100N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G152**

	US SURVEY FEET	METRIC
Northing:	4009590.981	1222125.775
Easting:	4889758.018	1490401.225
Elevation:	1286.805	392.219
Ellipsoid Height:	1190.430	362.844
Geoid 99 Height:	-96.375	-29.375

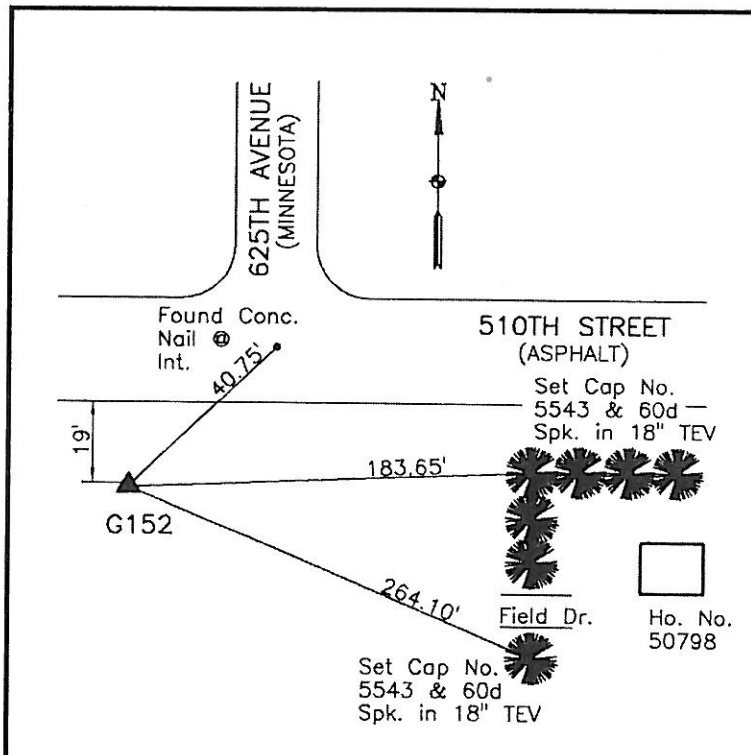
Latitude:	43°29'58.47701"N
Longitude:	93°37'07.23816"W
Scale Factor:	1.0000508831
Convergence:	-0°04'50"
Combined Factor:	0.99999409

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G152 and NGS Style Access Cover 1" Deep.

Location:

On south side 510th Street - 300'± west of 180th Avenue (County Road R60) - near NW Corner - Section 7-T100N-R23W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G153**

	US SURVEY FEET	METRIC
Northing:	4009567.434	1222118.598
Easting:	4874491.426	1485747.958
Elevation:	1260.563	384.220
Ellipsoid Height:	1164.387	354.906
Geoid 99 Height:	-96.177	-29.315

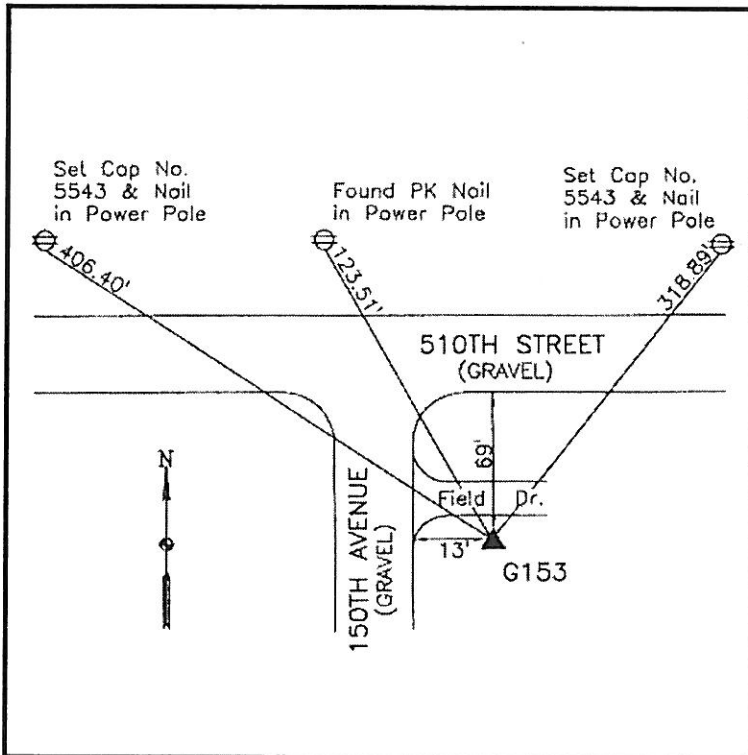
Latitude:	43°29'57.98151"N
Longitude:	93°40'34.35226"W
Scale Factor:	1.0000508481
Convergence:	-0°07'10"
Combined Factor:	0.99999529

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G153 and NGS Style Access Cover 2" Deep.

Location:

SE Corner of 510th Street and 150th Avenue - near NW Corner Section 10-T100N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G154**

	US SURVEY FEET	METRIC
Northing:	4009617.640	1222133.901
Easting:	4859142.095	1481069.473
Elevation:	1242.373	378.676
Ellipsoid Height:	1146.454	349.440
Geoid 99 Height:	-95.919	-29.236

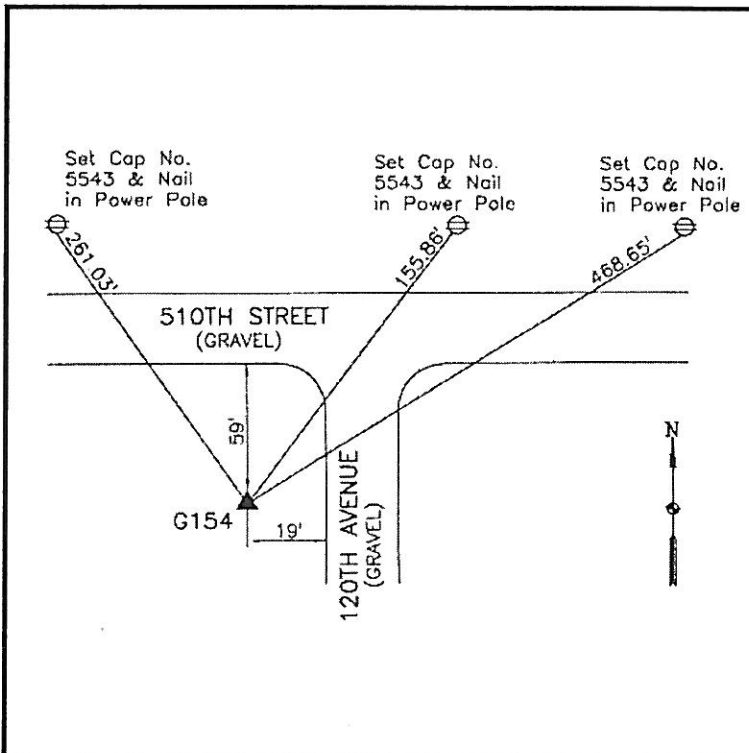
Latitude:	43°29'58.10951"N
Longitude:	93°44'02.59060"W
Scale Factor:	1.0000508572
Convergence:	-0°09'31"
Combined Factor:	0.99999616

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G154 and NGS Style Access Cover 1" Deep.

Location:

SW Corner of 510th Street and 120th Avenue - near NW Corner Section 7-T100N-R24W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G155**

	US SURVEY FEET	METRIC
Northing:	4009621.512	1222135.081
Easting:	4843085.160	1476175.309
Elevation:	1224.181	373.131
Ellipsoid Height:	1128.619	344.004
Geoid 99 Height:	-95.562	-29.127

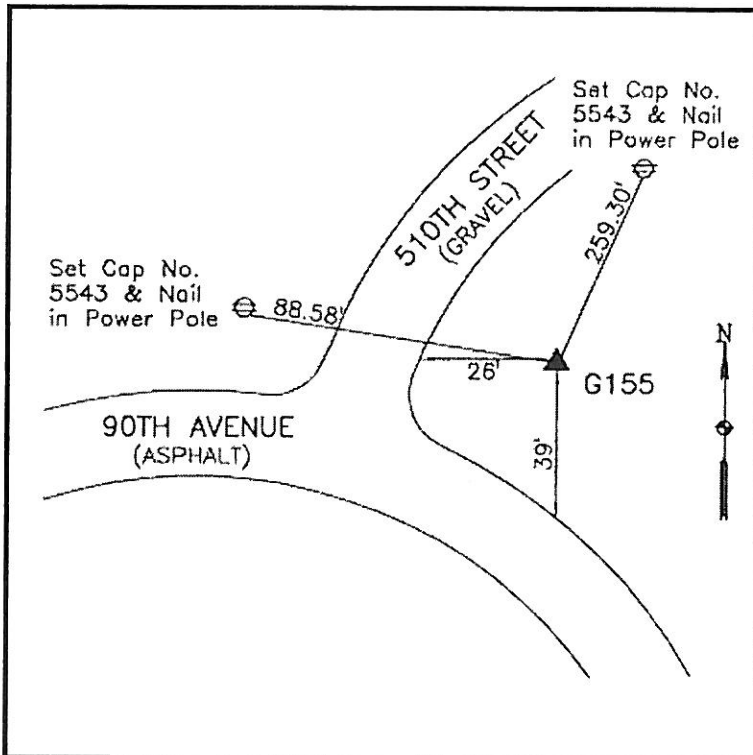
Latitude:	43°29'57.65197"N
Longitude:	93°47'40.42657"W
Scale Factor:	1.0000508249
Convergence:	-0°11'59"
Combined Factor:	0.99999698

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G155 and NGS Style Access Cover 2 " Deep.

Location:

NE Corner at 510th Street and 90th Avenue - 5'± south of street sign - near NW Corner Section 10-T100N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G156**

	US SURVEY FEET	METRIC
Northing:	4009778.732	1222183.002
Easting:	4827747.629	1471500.420
Elevation:	1181.190	360.027
Ellipsoid Height:	1086.067	331.034
Geoid 99 Height:	-95.123	-28.994

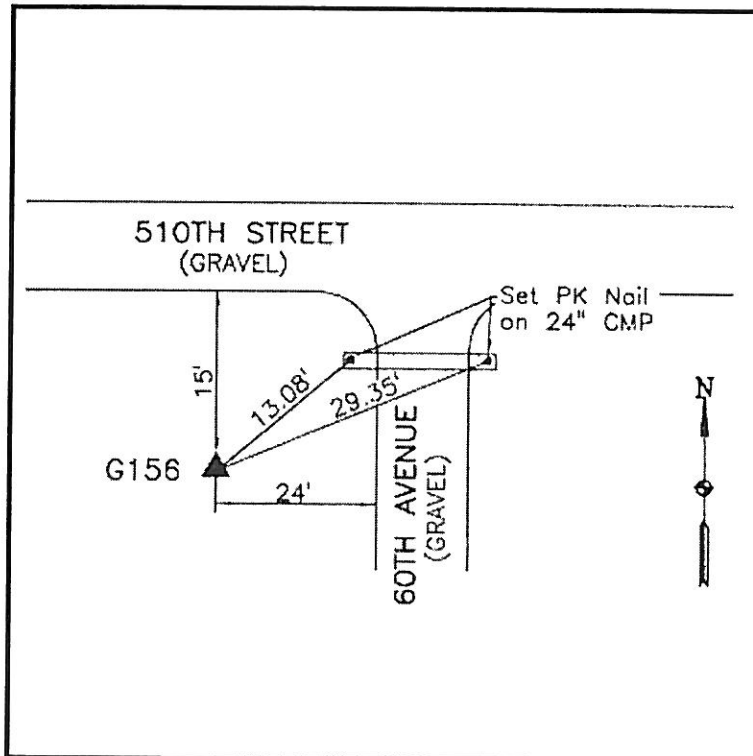
Latitude:	43°29'58.62508"N
Longitude:	93°51'08.51050"W
Scale Factor:	1.0000508936
Convergence:	-0°14'20"
Combined Factor:	0.99999907

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G156 and NGS Style Access Cover 1 " Deep.

Location:

SW Corner of 510th Street and 60th Avenue - near NW Corner of Section 7-T100N-R25W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G157**

	US SURVEY FEET	METRIC
Northing:	4009846.480	1222203.651
Easting:	4811909.473	1466672.941
Elevation:	1141.810	348.024
Ellipsoid Height:	1047.233	319.197
Geoid 99 Height:	-94.578	-28.827

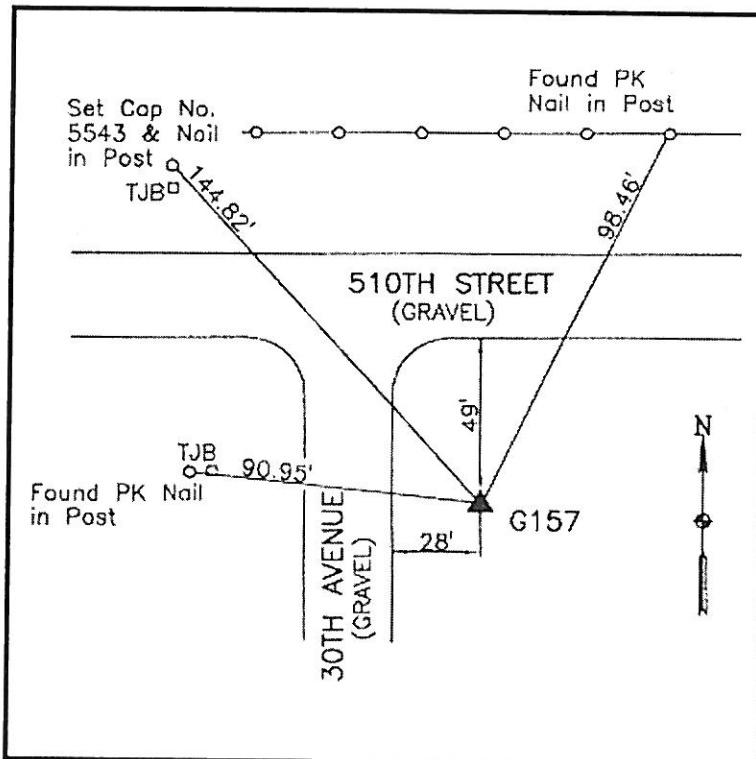
Latitude:	43°29'58.58697"N
Longitude:	93°54'43.38197"W
Scale Factor:	1.0000508909
Convergence:	-0°16'45"
Combined Factor:	1.00000092

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G157 and NGS Style Access Cover 3 " Deep.

Location:

SE Corner of 510th Street and 30th Avenue - near NW Corner Section 10-T100N-R26W.



WHKS & CO.

**WINNEBAGO COUNTY, IOWA
GPS CONTROL MONUMENT
IOWA NORTH ZONE (1401)
HORIZONTAL DATUM - NAD 83 (1996)
VERTICAL DATUM - NAVD 1988**

GPS POINT NUMBER **G158**

	US SURVEY FEET	METRIC
Northing:	4009983.404	1222245.386
Easting:	4796480.590	1461970.208
Elevation:	1136.475	346.398
Ellipsoid Height:	1042.440	317.736
Geoid 99 Height:	-94.036	-28.662

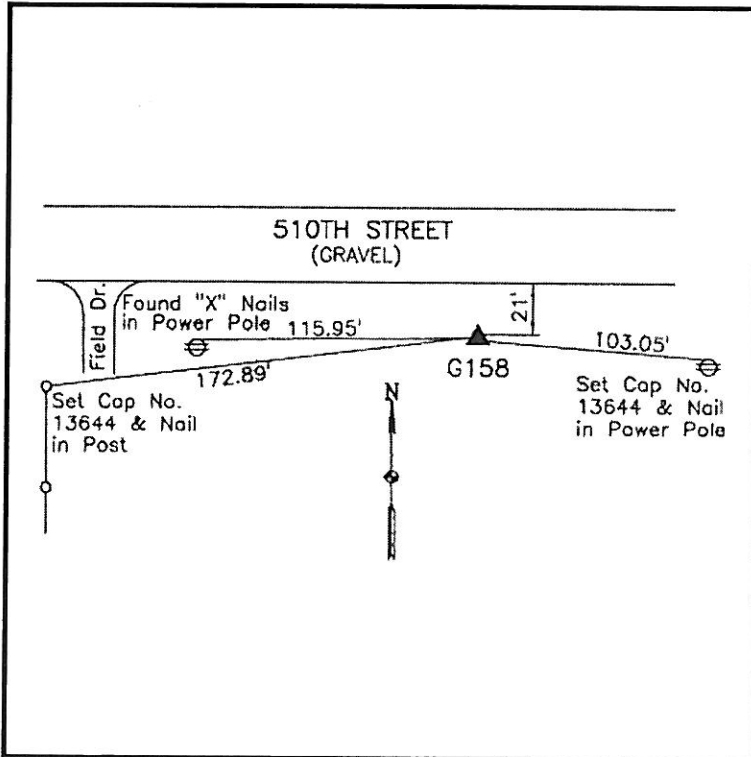
Latitude:	43°29'59.14412"N
Longitude:	93°58'12.70611"W
Scale Factor:	1.0000509302
Convergence:	-0°19'07"
Combined Factor:	1.00000119

Description:

Placed 5/8" X 6' - 0" Long Aluminum Rod with Cap Stamped G158 and NGS Style Access Cover 3 " Deep.

Location:

On south side 510th Street - 150'± east of Section line fence - near NW Corner Section 7-T100N-R26W.



WHKS & CO.