
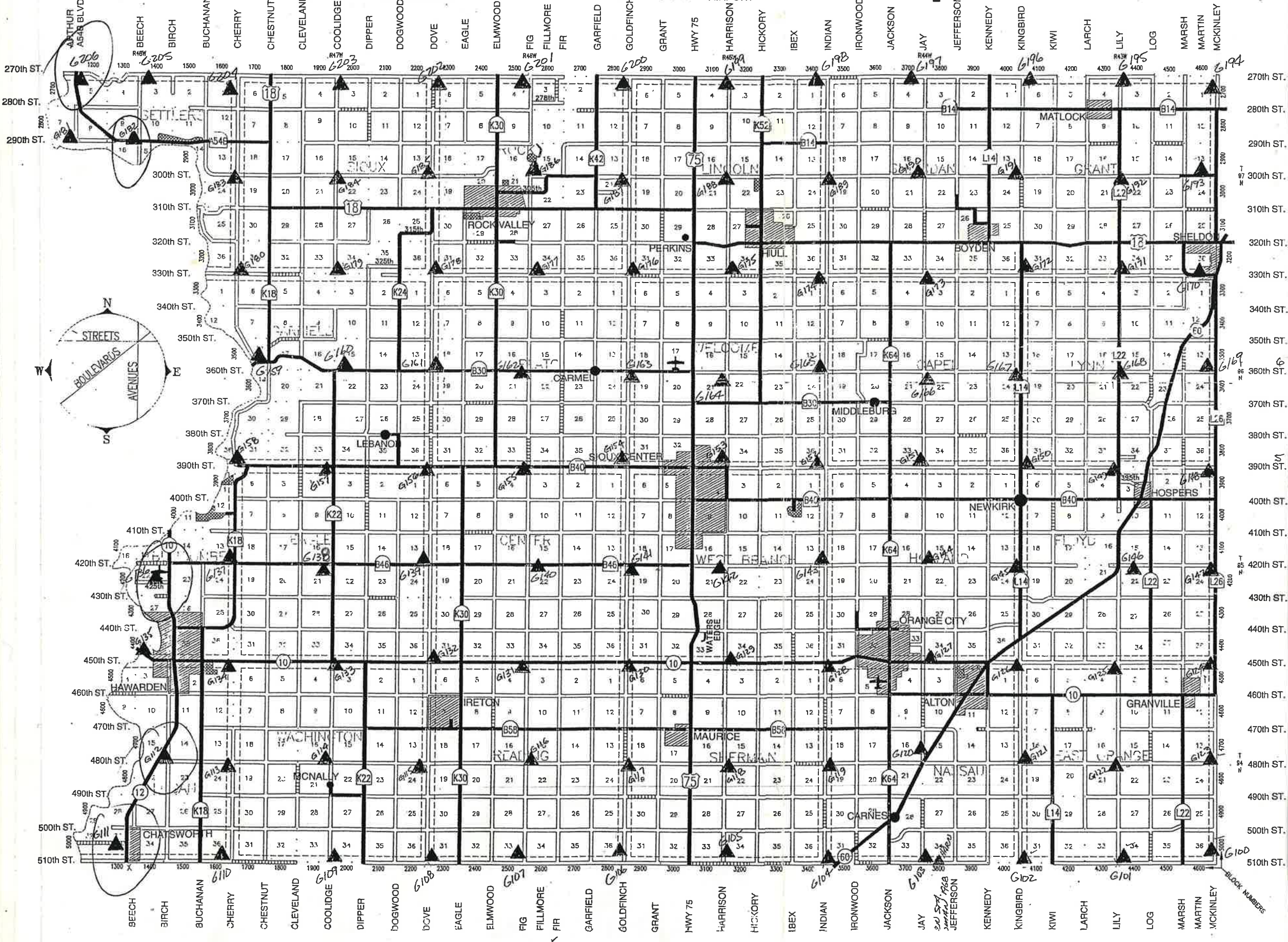


**GPS SURVEY REPORT  
SIOUX COUNTY, IOWA GIS  
APRIL 2002**

Prepared by:

WHKS & Co.  
Engineers, Planners and Land Surveyors  
470 Central Avenue  
Dubuque, IA 52001-7024  
Phone: (563) 582-5481

	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.
	<i>Lawrence A. Boyer</i> _____ June 12, 2002 Lawrence A. Boyer Date
	License Number 9761
	Date of Survey: <i>June 12, 2002</i>
	My license renewal date is December 31, 2002. Sheets covered by this seal: <i>PAGES 1 TO 163</i>



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## GPS SURVEY REPORT SIOUX COUNTY, IOWA GIS

### 1. Introduction

This GPS survey for the Sioux County GIS established horizontal and vertical control at one hundred and seven new locations in the countywide area at approximately three mile intervals. The work was performed for The Sidwell Company and Sioux County as a basis for ground control for aerial photography and mapping. Permanent Bernsten NGS style monuments were placed at the new locations. An additional twenty GPS stations were existing horizontal and vertical control. The total number of GPS stations observed for the Sioux County GIS is one hundred and twenty-seven.

### 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:

Sioux County Network Point	NGS PID	Designation	Use
2001-15	OP0559	BM U16	Horizontal and Vertical
2001-21	NM1615	Homan Reset	Horizontal
2001-24	AE2141	ORC A	Horizontal
2001-26	OQ0592	Garfield	Horizontal
2001-32	NM0034	BM D154	Horizontal and Vertical
2001-34	NM0820	BM A146	Horizontal and Vertical

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

Sioux County Network Point	NGS PID	Designation	Use
2001-16	OP0556	BM R16	Vertical
2001-17	OP0550	BM L16	Vertical (ECC)
2001-18	OP0527	BM F17	Vertical (ECC)
2001-19	OP0544	BM E16	Vertical
2001-20	OP0542	BM C16	Vertical
2001-22	NL0480	BM A25	Vertical
2001-23	NM0021	BM W15	Vertical
2001-25	OQ0123	BM W12	Vertical
2001-27	OQ0177	BM B155	Vertical
2001-28	OQ0180	BM D	Vertical
2001-29	OQ0131	BM G236	Vertical
2001-30	OQ0139	BM E326	Vertical (ECC)
2001-31	OQ0144	BM A326	Vertical
2001-33	NM0809	BM B154	Vertical

Bench marks used as vertical control in obstructed locations required conventional leveling techniques to establish a nearby eccentric pint 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 and instrument person; Nicholas R. Konrady, 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 15 minute fast static observation technique. The sampling rate was 15 seconds and the elevation mask was 15 degrees. The antenna height was two meters utilizing fixed height tripods.

There were 106 sessions observed during the project beginning on November 6, 2001 and ending on December 20, 2001. 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 <sup>TM</sup> software was used for the network adjustment. A free horizontal adjustment was made using the HARN station at 2001-15 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 2001-15 as the only fixed control. The ellipsoidal heights differences from this free adjustment were noted at all of the NGS bench marks. A minimally constrained vertical adjustment was then made one at a time until all seventeen of the NGS bench marks were held as fixed vertical control for ellipsoidal height.

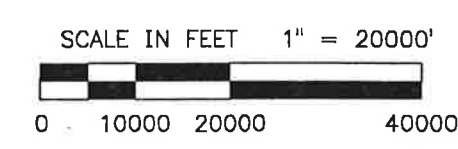
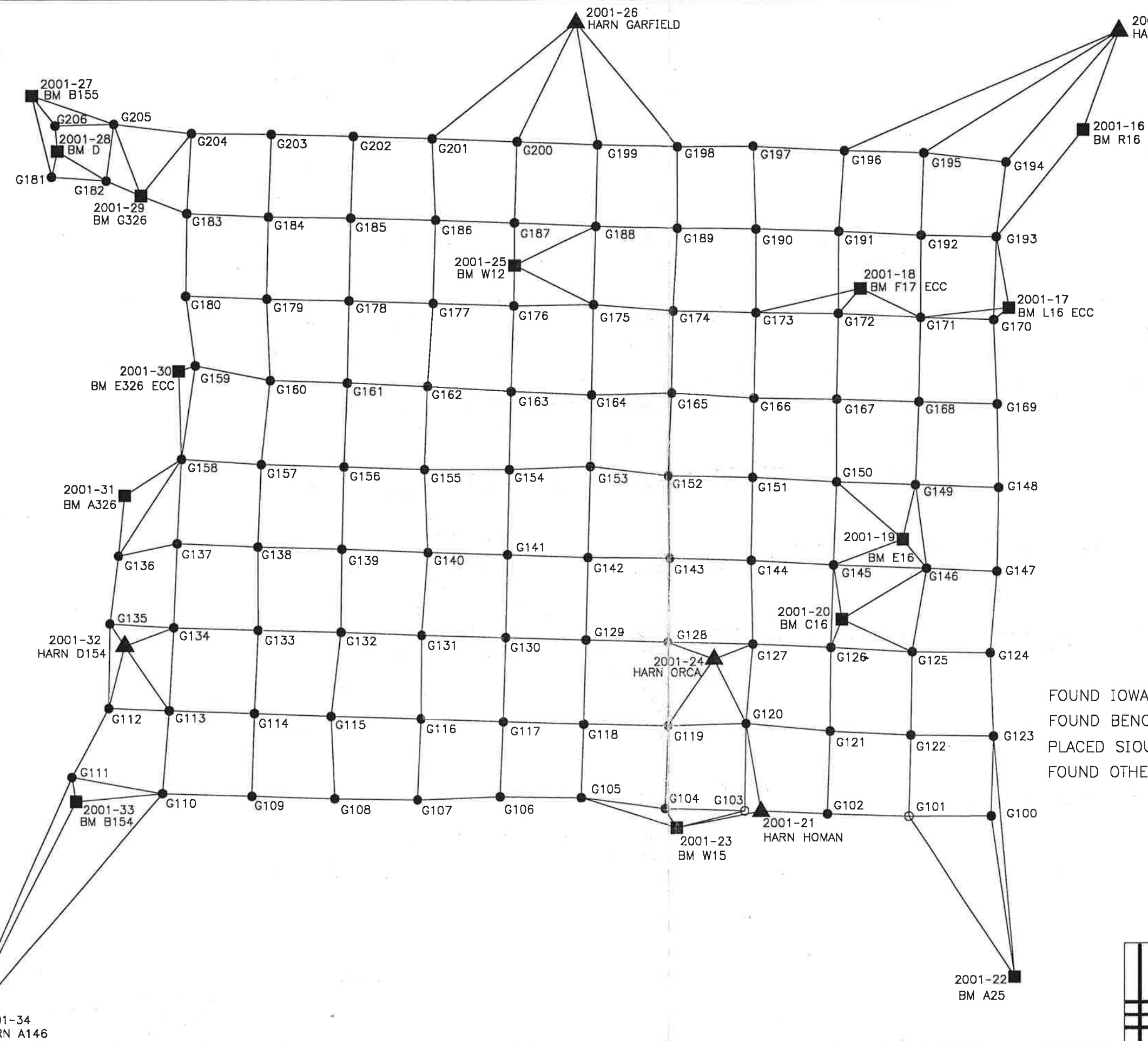
A constrained adjustment modeled with GEOID 99 was made using all seventeen NGS bench marks as fixed vertical control holding the published NAVD 88 elevations one at a time. A final constrained adjustment used six HARN stations as fixed horizontal control and seventeen NGS bench marks as fixed vertical control with GEOID 99 modeled from the bench marks.

**6. Discrepancies**

There were three discrepancies found in this survey. All pertain to NGS data as follows:

- A. Sioux County Network point 2001-21, NGS PID NM1615, is described in the data sheets as being located in Plymouth County, Iowa. The monument was found by this survey to be located in Sioux County, Iowa.
- B. Sioux County Network point 2001-22, NGS PID NL0480, is described in the data sheets as being stamped BM A 25 1934. The monument was found by this survey to be stamped BM A 24 1934.
- C. Sioux County Network point 2001-23, NGS PID NM0021, is described in the data sheets as being located in Sioux County, Iowa. The monument was found by this survey to be located in Plymouth County, Iowa.

**Section 2**  
**Network Map**



### GPS NETWORK MAP FOR SIOUX COUNTY, IOWA JANUARY, 2002

- FOUND IOWA HARN STATION ▲
- FOUND BENCH MARK ■
- PLACED SIOUX COUNTY ALUMINUM MONUMENT ●
- FOUND OTHER CONTROL NETWORK MONUMENT ○

<b>WHKS &amp; CO.</b>		
ENGINEERS	PLANNERS	LAND SURVEYORS
470 CENTRAL AVENUE 563-582-5481 DUBUQUE, IOWA 52001-7024		

**Section 3**  
**Coordinate List**

# Points

## Project : SIOUX COUNTY GIS

<b>User name</b>	WHKS	<b>Date &amp; Time</b>	9:59:33 AM 6/12/02
<b>Coordinate System</b>	US State Plane 1983	<b>Zone</b>	Iowa North 1401
<b>Project Datum</b>	NAD 1983 (Conus)		
<b>Vertical Datum</b>	NAVD 1988	<b>Geoid Model</b>	GEOID99 (Conus)
<b>Coordinate Units</b>	US survey feet		
<b>Distance Units</b>	US survey feet		
<b>Height Units</b>	US survey feet		

### Point listing

Name	Northing	Easting	Elevation	Feature Code
2001-15	3953883.938	4313778.359	1453.035	HARN U16
2001-16	3935032.818	4306869.845	1440.043	BM R16
2001-17	3901103.615	4292575.184	1414.220	BM L16 ECC
2001-18	3904838.008	4264071.460	1439.781	BM F17 ECC
2001-19	3856868.395	4272291.497	1340.939	BM E16
2001-20	3841543.927	4260475.709	1316.402	BM C16
2001-21	3804844.428	4245073.208	1422.812	HARN HOMAN
2001-22	3773194.281	4293646.937	1441.375	BM A25
2001-23	3801669.988	4228684.339	1248.944	BM W15
2001-24	3833957.312	4235830.002	1403.416	HARN ORC A
2001-25	3909226.341	4197154.717	1374.246	BM W12
2001-26	3955557.153	4209065.124	1410.120	HARN GARFIELD
2001-27	3941663.572	4104843.056	1240.093	BM B155
2001-28	3931078.001	4109640.466	1280.526	BM D
2001-29	3922573.095	4125761.517	1213.554	BM G326
2001-30	3889094.437	4132872.244	1221.133	BM E326 ECC
2001-31	3865289.326	4122574.635	1190.719	BM A326
2001-32	3836476.810	4122589.522	1176.559	HARN BM D154
2001-33	3806749.924	4113067.373	1154.292	BM B154
2001-34	3763352.103	4091189.290	1139.092	BM A146
G100	3803854.662	4289232.928	1420.059	ALMON
G101	3803824.821	4273486.813	1433.753	ALMON
G102	3804314.796	4257690.581	1353.479	ALMON
G103	3804930.912	4241868.375	1399.368	ALMON
G104	3805373.809	4226301.224	1363.244	ALMON
G105	3807410.846	4210102.228	1291.716	ALMON
G106	3807622.432	4194376.060	1394.583	ALMON
G107	3807038.829	4178457.824	1432.078	ALMON
G108	3807298.575	4162752.456	1424.589	ALMON
G109	3807781.745	4146863.432	1293.937	ALMON
G110	3808305.137	4129759.673	1366.338	ALMON
G111	3811376.909	4112282.882	1156.463	ALMON
G112	3824580.022	4119440.659	1174.513	ALMON
G113	3824132.738	4131032.873	1211.749	ALMON
G114	3823624.377	4147363.916	1380.421	ALMON
G115	3823044.696	4162063.677	1354.709	ALMON
G116	3822557.782	4179144.336	1402.889	ALMON
G117	3821976.844	4194985.854	1327.588	ALMON
G118	3821511.528	4210561.562	1344.563	ALMON
G119	3821214.754	4226925.899	1393.494	ALMON
G120	3821594.567	4242135.619	1327.198	ALMON
G121	3820158.299	4258214.327	1408.763	ALMON
G122	3819363.751	4273848.414	1398.995	ALMON
G123	3819117.595	4289663.453	1413.621	ALMON

G124	3835069.926	4289060.863	1463.385	ALMON
G125	3835296.148	4274104.231	1430.097	ALMON
G126	3836150.565	4258372.117	1412.168	ALMON
G127	3836790.112	4243485.745	1329.785	ALMON
G128	3837203.006	4226889.175	1387.727	ALMON
G129	3837623.713	4211004.910	1373.834	ALMON
G130	3838090.283	4195460.562	1360.196	ALMON
G131	3838550.420	4179280.456	1448.268	ALMON
G132	3839137.422	4163973.062	1391.934	ALMON
G133	3839526.937	4148074.015	1307.608	ALMON
G134	3840024.863	4131896.635	1291.235	ALMON
G135	3840762.112	4119678.144	1172.653	ALMON
G136	3853743.742	4121369.523	1183.723	ALMON
G137	3856098.152	4132565.942	1239.611	ALMON
G138	3855469.909	4148052.176	1291.956	ALMON
G139	3855033.979	4164147.811	1386.986	ALMON
G140	3854391.723	4180512.584	1390.445	ALMON
G141	3853954.472	4195808.732	1440.145	ALMON
G142	3853405.667	4211395.129	1385.894	ALMON
G143	3853264.578	4227284.375	1399.408	ALMON
G144	3852826.615	4243168.794	1423.443	ALMON
G145	3851923.460	4258874.436	1386.127	ALMON
G146	3851290.801	4276799.134	1376.401	ALMON
G147	3850688.498	4290317.446	1416.751	ALMON
G148	3866758.928	4290655.474	1350.909	ALMON
G149	3867303.456	4274715.184	1349.114	ALMON
G150	3867865.565	4259474.544	1438.081	ALMON
G151	3868739.291	4243430.612	1434.191	ALMON
G152	3869047.222	4226958.233	1365.070	ALMON
G153	3870842.547	4211861.625	1429.134	ALMON
G154	3870245.490	4196185.934	1442.822	ALMON
G155	3870260.312	4179852.423	1379.933	ALMON
G156	3870797.992	4164574.092	1399.444	ALMON
G157	3871257.286	4148701.244	1314.385	ALMON
G158	3872256.727	4133393.693	1196.948	ALMON
G159	3890145.626	4136023.728	1208.416	ALMON
G160	3887306.584	4150464.172	1285.633	ALMON
G161	3886829.711	4165224.169	1417.729	ALMON
G162	3886128.100	4180455.988	1414.698	ALMON
G163	3885161.961	4196511.353	1454.778	ALMON
G164	3884535.522	4212082.257	1411.835	ALMON
G165	3884867.161	4227667.353	1378.669	ALMON
G166	3883859.574	4243683.173	1401.382	ALMON
G167	3883686.480	4259489.801	1420.893	ALMON
G168	3883151.261	4275361.891	1393.180	ALMON
G169	3882719.082	4290365.827	1422.317	ALMON
G170	3898819.891	4289698.315	1379.800	ALMON
G171	3899259.787	4275661.264	1420.379	ALMON
G172	3900077.644	4259803.038	1446.405	ALMON
G173	3900195.205	4244073.704	1380.257	ALMON
G174	3900567.733	4227983.567	1392.882	ALMON
G175	3901774.233	4212445.525	1469.601	ALMON
G176	3901528.209	4197034.637	1444.559	ALMON
G177	3902000.130	4181515.649	1421.633	ALMON
G178	3902528.276	4165562.600	1347.438	ALMON
G179	3902874.556	4149796.131	1212.862	ALMON
G180	3903422.371	4134204.251	1222.877	ALMON
G181	3926187.260	4108540.932	1238.078	ALMON
G182	3925431.131	4119017.270	1260.608	ALMON
G183	3919180.816	4134423.554	1382.301	ALMON
G184	3918515.574	4150120.237	1371.765	ALMON
G185	3918292.075	4165880.138	1282.682	ALMON
G186	3917924.245	4181986.444	1242.189	ALMON
G187	3917404.502	4197153.549	1393.667	ALMON
G188	3916690.827	4212877.448	1420.623	ALMON
G189	3916378.637	4228817.119	1413.266	ALMON

G190	3916154.757	4244062.889	1435.571	ALMON
G191	3915703.413	4259891.596	1405.912	ALMON
G192	3914946.405	4275765.486	1420.008	ALMON
G193	3914673.281	4290176.972	1420.262	ALMON
G194	3928847.279	4292012.119	1412.521	ALMON
G195	3930618.759	4276279.742	1412.743	ALMON
G196	3931097.773	4260978.197	1380.305	ALMON
G197	3931939.241	4243524.635	1400.779	ALMON
G198	3931896.447	4228827.908	1453.051	ALMON
G199	3932308.767	4213220.638	1327.268	ALMON
G200	3932865.665	4197649.450	1348.444	ALMON
G201	3933421.878	4181313.030	1374.154	ALMON
G202	3933900.886	4166403.137	1329.342	ALMON
G203	3934305.927	4150665.955	1322.339	ALMON
G204	3934457.699	4135322.575	1429.392	ALMON
G205	3936244.855	4120510.642	1474.766	ALMON
G206	3935964.633	4109211.339	1246.285	ALMON

**Section 4**  
**NGS Data Sheets**

OP0559 \*\*\*\*\*

OP0559 CBN - This is a Cooperative Base Network Control Station.  
 OP0559 DESIGNATION - U 16  
 OP0559 PID - OP0559  
 OP0559 STATE/COUNTY- IA/OSCEOLA  
 OP0559 USGS QUAD - ASHTON (1972)

OP0559

\*CURRENT SURVEY CONTROL

OP0559

OP0559*	NAD 83(1996)-	43 19 27.50864(N)	095 46 58.89835(W)	ADJUSTED
OP0559*	NAVD 88	- 442.886 (meters)	1453.04 (feet)	ADJUSTED

OP0559

OP0559	X	- 468,300.493 (meters)	COMP
OP0559	Y	- 4,623,956.120 (meters)	COMP
OP0559	Z	- 4,354,067.723 (meters)	COMP
OP0559	LAPLACE CORR-	-3.55 (seconds)	DEFLEC99
OP0559	ELLIP HEIGHT-	416.10 (meters)	GPS OBS
OP0559	GEOID HEIGHT-	-26.81 (meters)	GEOID99
OP0559	DYNAMIC HT -	442.770 (meters)	1452.65 (feet) COMP
OP0559	MODELED GRAV-	980,344.5 (mgal)	NAVD 88

OP0559

OP0559 HORZ ORDER - B  
 OP0559 VERT ORDER - SECOND CLASS 0  
 OP0559 ELLP ORDER - FOURTH CLASS I

OP0559

OP0559.The horizontal coordinates were established by GPS observations  
 OP0559.and adjusted by the National Geodetic Survey in August 1997.

OP0559

OP0559.The orthometric height was determined by differential leveling  
 OP0559.and adjusted by the National Geodetic Survey in June 1991.

OP0559

OP0559.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
 OP0559

OP0559.The Laplace correction was computed from DEFLEC99 derived deflections.  
 OP0559

OP0559.The ellipsoidal height was determined by GPS observations  
 OP0559.and is referenced to NAD 83.

OP0559

OP0559.The geoid height was determined by GEOID99.  
 OP0559

OP0559.The dynamic height is computed by dividing the NAVD 88  
 OP0559.geopotential number by the normal gravity value computed on the  
 OP0559.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 OP0559.degrees latitude (g = 980.6199 gals.).

OP0559

OP0559.The modeled gravity was interpolated from observed gravity values.  
 OP0559

OP0559;	North	East	Units	Scale	Converg.
OP0559;SPC IA N	- 1,205,146.235	1,314,842.273	MT	1.00001104	-1 32 50.3
OP0559;UTM 15	- 4,800,591.323	274,351.376	MT	1.00022638	-1 54 37.1

OP0559

SUPERSEDED SURVEY CONTROL

OP0559

OP0559	NAD 83(1996)-	43 19 27.50693(N)	095 46 58.89152(W)	AD( ) 3
OP0559	NAD 83(1986)-	43 19 27.50927(N)	095 46 58.89036(W)	AD( ) 3
OP0559	NGVD 29	- 442.700 (m)	1452.42 (f)	ADJ UNCH 2 0

OP0559

OP0559. Superseded values are not recommended for survey control.  
 OP0559. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 OP0559. See file dsdata.txt to determine how the superseded data were derived.  
 OP0559

OP0559 MARKER: DB = BENCH MARK DISK  
 OP0559 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 OP0559 STAMPING: U 16 1934  
 OP0559 MAGNETIC: 0 = OTHER; SEE DESCRIPTION  
 OP0559 STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 OP0559 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 OP0559+ SATELLITE: SATELLITE OBSERVATIONS - November 17, 1998

OP0559  

HISTORY	- Date	Condition	Recov. By
HISTORY	- 1934	MONUMENTED	NGS
HISTORY	- 19890601	GOOD	NGS
HISTORY	- 19960820	GOOD	IADT
HISTORY	- 19981117	GOOD	MNDT

OP0559  
 OP0559 STATION DESCRIPTION  
 OP0559

OP0559 DESCRIBED BY NATIONAL GEODETIC SURVEY 1934  
 OP0559 1 MI N FROM ASHTON.  
 OP0559 1 MILE NORTH ALONG THE CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA  
 OP0559 RAILWAY FROM THE STATION AT ASHTON, OSCEOLA COUNTY, 88 YARDS SOUTH OF  
 OP0559 WOODEN TRESTLE 714, 45 FEET EAST OF THE EAST RAIL, AND 2.7 FEET WEST  
 OP0559 OF THE RIGHT-OF-WAY FENCE. A STANDARD DISK, STAMPED U 16 1934 AND SET  
 OP0559 IN THE TOP OF A CONCRETE POST PROJECTING 7 INCHES ABOVE GROUND.

OP0559  
 OP0559 STATION RECOVERY (1989)  
 OP0559

OP0559 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989  
 OP0559 THE STATION IS LOCATED 1.6 KM (1.00 MI) NORTH-NORTHWEST OF ASHTON, IN  
 OP0559 A WIDE GRASSY STRIP BETWEEN THE HIGHWAY AND RAILROAD TRACKS.  
 OP0559 OWNERSHIP--CHICAGO AND NORTHWESTERN RAILROAD, 229 NORTH 3RD STREET,  
 OP0559 LAURENS, IA 50554, PHONE 845-845-4582.  
 OP0559 TO REACH THE STATION FROM THE JUNCTION OF STATE HIGHWAY 60 AND COUNTY  
 OP0559 ROAD A 46, JUST NORTH OF ASHTON, GO NORTHEAST ON HIGHWAY 60 FOR 1.0 KM  
 OP0559 (0.60 MI) TO THE STATION ON THE LEFT.  
 OP0559 THE STATION IS A STANDARD CGS BENCHMARK DISK PROJECTING 6 INCHES ABOVE  
 OP0559 THE GROUND. LOCATED ABOUT 75.0 M (246.1 FT) SOUTH-SOUTHEAST OF A  
 OP0559 SMALL RAILROAD TRESTLE, 30.6 M (100.4 FT) WEST OF THE CENTER OF THE  
 OP0559 HIGHWAY, 25.9 M (85.0 FT) EAST-NORTHEAST OF A UTILITY POLE, 13.7 M  
 OP0559 (44.9 FT) EAST-SOUTHEAST OF THE EAST RAIL OF THE TRACKS AND 0.3 M  
 OP0559 (1.0 FT) SOUTHEAST OF A METAL WITNESS POST.  
 OP0559 DESCRIBED BY M. L. MCCREADY.

OP0559  
 OP0559 STATION RECOVERY (1996)  
 OP0559

OP0559 RECOVERY NOTE BY IOWA DEPARTMENT OF TRANSPORTATION 1996 (SRM)  
 OP0559 RECOVERED AS DESCRIBED BY IOWA DOT. THE STATION IS LOCATED NEAR THE  
 OP0559 EAST 1/4 CORNER OF SECTION 10, T 98 N, R 42 W, ON THE WEST SIDE OF  
 OP0559 STATE HWY 60 AND EAST OF THE RAIROAD. NEW OWNERSHIP--UNION PACIFIC  
 OP0559 RAILROAD, UNION PACIFIC BLDG., 1416 DODGE STREET, OMAHA, NE 68179.  
 OP0559 PHONE-- (402) 271-5000. THE 1989 TO-REACH DESCRIPTION IS ADEQUATE FOR  
 OP0559 RECOVERY. A PINK STATE HARN SURVEY SIGN WAS SET 0.7 M (2.3 FT) WEST  
 OP0559 OF THE MONUMENT.  
 OP0559

OP0559

STATION RECOVERY (1998)

OP0559

OP0559'RECOVERY NOTE BY MN DEPT OF TRANSP 1998 (DKH)

OP0559'RECOVERED AS DESCRIBED, AT TH 60 MILEPOST 42.7.

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

NM1615 \*\*\*\*\*

NM1615 CBN - This is a Cooperative Base Network Control Station.  
 NM1615 DESIGNATION - HOMAN RESET  
 NM1615 PID - NM1615  
 NM1615 STATE/COUNTY- IA/PLYMOUTH  
 NM1615 USGS QUAD - ALTON (1985)

NM1615  
 NM1615 \*CURRENT SURVEY CONTROL

NM1615*	NAD 83(1996)-	42 54 36.71897(N)	096 01 27.73499(W)	ADJUSTED
NM1615*	NAVD 88	- 433.7 (meters)	1423. (feet)	GPS OBS
NM1615	X	- 491,073.145 (meters)		COMP
NM1615	Y	- 4,653,208.708 (meters)		COMP
NM1615	Z	- 4,320,477.616 (meters)		COMP
NM1615	LAPLACE CORR-	-4.67 (seconds)		DEFLEC99
NM1615	ELLIP HEIGHT-	407.18 (meters)		GPS OBS
NM1615	GEOID HEIGHT-	-26.56 (meters)		GEOID99

NM1615 HORZ ORDER - B  
 NM1615 ELLP ORDER - FOURTH CLASS I

NM1615.The horizontal coordinates were established by GPS observations  
 NM1615.and adjusted by the National Geodetic Survey in August 1997.

NM1615.The orthometric height was determined by GPS observations and a  
 NM1615.high-resolution geoid model.

NM1615.The X, Y, and Z were computed from the position and the ellipsoidal ht.

NM1615.The Laplace correction was computed from DEFLEC99 derived deflections.

NM1615.The ellipsoidal height was determined by GPS observations  
 NM1615.and is referenced to NAD 83.

NM1615.The geoid height was determined by GEOID99.

	North	East	Units	Scale	Converg.
NM1615;SPC IA N	- 1,159,718.901	1,293,900.902	MT	0.99995431	-1 42 39.2
NM1615;UTM 14	- 4,755,139.149	742,899.663	MT	1.00032590	+2 01 37.0
NM1615;UTM 15	- 4,755,281.129	253,121.300	MT	1.00034988	-2 03 36.7

	Primary Azimuth Mark	Grid Az
NM1615:SPC IA N	- HOMAN AZ MK 2	093 47 14.2
NM1615:UTM 14	- HOMAN AZ MK 2	090 02 58.0
NM1615:UTM 15	- HOMAN AZ MK 2	094 08 11.7

PID	Reference Object	Distance	Geod. Az
NM1614	ALTON MUNICIPAL STANDPIPE	APPROX. 7.6 KM	0043758.0
NM1616	ALTON ST MARYS CATH CH W SPIRE	APPROX. 8.7 KM	0045136.3
NM1617	ALTON ST MARYS CATH CH E SPIRE	APPROX. 8.7 KM	0045747.3
	HOMAN AZ MK		0515625.0
NL0695	GRANVILLE MUNICIPAL TANK	APPROX.14.7 KM	0555618.7
NL0694	GRANVILLE ST JOSEPH CATH CH	APPROX.14.7 KM	0564626.5
	HOMAN AZ MK 2		0920435.0

NM1615	HOMAN RM 1	33.711 METERS 11910	
NM1615	NL0702 REMSEN ST MARYS CATH CH SPIRE	APPROX.11.6 KM 1580405.5	
NM1615	NM1619 LE MARS MUNICIPAL TANK	APPROX.17.7 KM 2185628.8	
NM1615	NM1620 LE MARS ST JOSEPH CATH CH	APPROX.16.9 KM 2195845.7	
NM1615	HOMAN RM 3	65.178 METERS 25316	
NM1615	HOMAN RM 2	65.950 METERS 25521	
NM1615	OQ0609 SIOUX CENTER FIRST REFORMED CH	APPROX.22.0 KM 3255744.4	
NM1615	OQ0607 SIOUX CENTER MUNICIPAL TANK	APPROX.22.6 KM 3264947.2	
NM1615	OQ0606 ORANGE CITY MUNICIPAL TANK	APPROX.10.9 KM 3433405.0	
NM1615	OQ0605 ORANGE CITY SIOUX CO CTHSE	APPROX.10.9 KM 3450000.3	

NM1615|-----|

NM1615

NM1615

SUPERSEDED SURVEY CONTROL

NM1615

NM1615 NAD 83(1996)- 42 54 36.71741(N) 096 01 27.73126(W) AD( ) 1

NM1615 NAD 83(1986)- 42 54 36.71902(N) 096 01 27.72760(W) AD( ) 1

NM1615 NAD 27 - 42 54 36.76300(N) 096 01 26.66200(W) AD( ) 1

NM1615

NM1615.Superseded values are not recommended for survey control.

NM1615.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

NM1615.See file dsdata.txt to determine how the superseded data were derived.

NM1615

NM1615\_MARKER: DS = TRIANGULATION STATION DISK

NM1615\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

NM1615\_STAMPING: HOMAN 1934 1968

NM1615\_MAGNETIC: N = NO MAGNETIC MATERIAL

NM1615\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

NM1615+STABILITY: SURFACE MOTION

NM1615\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

NM1615+SATELLITE: SATELLITE OBSERVATIONS - August 20, 1996

NM1615

NM1615	HISTORY	- Date	Condition	Recov. By
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NM1615	HISTORY	- 1934	MONUMENTED	CGS
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NM1615	HISTORY	- 1940	GOOD	CGS
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NM1615	HISTORY	- 1957	SEE DESCRIPTION	USGS
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NM1615	HISTORY	- 1962	SEE DESCRIPTION	IACC
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NM1615	HISTORY	- 1968	SEE DESCRIPTION	CGS
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NM1615	HISTORY	- 1969	GOOD	CGS
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NM1615	HISTORY	- 19960820	GOOD	IADT
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NM1615

NM1615

STATION DESCRIPTION

NM1615

NM1615'DESCRIBED BY COAST AND GEODETIC SURVEY 1934 (CIA)

NM1615'STATION IS IN THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER

NM1615'OF SEC. 34, T. 94 N., R. 44 W., ON THE PLYMOUTH-SIOUX COUNTY

NM1615'LINE, ABOUT 5-1/2 MILES SOUTH AND 1 MILE WEST OF ALTON, AND

NM1615'ABOUT 1 MILE SOUTH AND 1-1/2 MILES EAST OF CARNES ON THE HIGHEST

NM1615'POINT IN THE VICINITY.

NM1615'

NM1615'TO REACH FROM CARNES, GO SOUTH FROM RAILROAD DEPOT 1.15 MILES,

NM1615'TURN LEFT, EAST, GO 1.6 MILES TO TOP OF RIDGE AND STATION ON

NM1615'NORTH. MARK IS 30.0 FEET NORTH OF CENTER LINE OF ROAD AND

NM1615'0.8 FOOT SOUTH OF FENCE AT EDGE OF CULTIVATED FIELD.

NM1615'

NM1615'SURFACE, UNDERGROUND, REFERENCE AND AZIMUTH MARKS ARE STANDARD

NM1615'BRONZE DISKS SET AS DESCRIBED.

NM1615'

NM1615'REFERENCE MARK NO. 1 IS EAST BY SOUTH OF STATION, 0.9 FOOT  
 NM1615'NORTH OF FENCE, AND 25.4 FEET SOUTH OF CENTER LINE OF ROAD.  
 NM1615'

NM1615'REFERENCE MARK NO. 2 IS WEST BY SOUTH OF STATION, 0.7 FOOT  
 NM1615'NORTH OF FENCE, AND 24.8 FEET SOUTH OF CENTER LINE OF ROAD.  
 NM1615'

NM1615'AZIMUTH MARK IS NORTHEAST OF STATION. TO REACH, GO EAST  
 NM1615'0.35 MILE, TURN LEFT, NORTH, GO 0.25 MILE TO MARK ON EAST.  
 NM1615'MARK IS 34.1 FEET EAST OF CENTER LINE OF ROAD.

NM1615'  
 NM1615'HEIGHT OF LIGHT ABOVE STATION MARK - 31.7 METERS.

NM1615

STATION RECOVERY (1940)

NM1615

NM1615'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1940 (KBJ)  
 NM1615'STATION RECOVERED AS DESCRIBED BY C.I.A. IN 1934. ALL MARKS  
 NM1615'WERE FOUND IN GOOD CONDITION AND THE DESCRIPTION IS ADEQUATE.  
 NM1615'

NM1615'NOTE--A WHITE REFERENCE POST WAS SET 8 FEET WEST OF THE STATION  
 NM1615'MARK AND A WHITE REFERENCE POST WAS SET 2.3 FEET NORTHWEST OF  
 NM1615'THE AZIMUTH MARK.

NM1615

STATION RECOVERY (1957)

NM1615

NM1615

NM1615'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1957  
 NM1615'STATION HAS BEEN DESTROYED BUT THE UNDERGROUND MARK IS OKAY.  
 NM1615'

NM1615'REFERENCE MARKS 1 AND 2 HAVE BEEN DESTROYED.

NM1615

STATION RECOVERY (1962)

NM1615

NM1615

NM1615'RECOVERY NOTE BY IOWA CONSERVATION COMMISSION 1962 (REF)  
 NM1615'STATION SURFACE MARK FOUND LAYING IN NORTH ROAD DITCH. UNDERGROUND  
 NM1615'MARK RECOVERED BY USING DISTANCE FROM R.M. 1 AND ASSUMED UPRIGHT  
 NM1615'POSITION OF R.M. 2. UNDERGROUND MARK IS 18 INCHES BELOW SURFACE.  
 NM1615'OLD WITNESS POST SET OVER MARK BUT IS RATHER ROTTEN AND WILL  
 NM1615'ONLY LAST A YEAR OR SO.

NM1615'

NM1615'R.M. 1 IS O.K. R.M. 2 IS TILTED SOUTHEAST, ARROW POINTS  
 NM1615'SOUTH.

NM1615'

NM1615'DISTURBANCE OF MARK AND REFERENCE PROBABLY CAUSED BY ROAD  
 NM1615'CONSTRUCTION. CAP REMOVED FROM SURFACE MONUMENT AND IS BEING  
 NM1615'FORWARDED UNDER SEPARATE COVER.

NM1615

STATION RECOVERY (1968)

NM1615

NM1615

NM1615'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1968 (LFS)  
 NM1615'STATION SURFACE MARK AND REFERENCE MARK NO. 2 FOUND DESTROYED.  
 NM1615'REFERENCE MARK NO. 1 WAS FOUND SLIGHTLY EXPOSED BUT IS SOLID  
 NM1615'IN THE GROUND AND DOES NOT APPEAR TO HAVE BEEN DISTURBED.  
 NM1615'AZIMUTH MARK WAS SEARCHED FOR BUT NOT FOUND AND COULD HAVE BEEN  
 NM1615'DESTROYED BY ROAD CONSTRUCTION OR FARM OPERATIONS. UNDERGROUND  
 NM1615'STATION MARK WAS RECOVERED IN GOOD CONDITION. DUE TO THE  
 NM1615'LOCATION OF STATION, THE UNDERGROUND MARK WAS LOWERED ABOUT  
 NM1615'3 FEET AND A NEW SURFACE MARK AND REFERENCE MARK NO 3 WAS  
 NM1615'SET. A NEW AZIMUTH MARK COULD NOT BE SET AT THIS TIME AS THE

NM1615' FIELDS WAS PLANTED TO CORN AND THERE WAS NOTHING VISIBLE  
 NM1615' FROM THE STATION.

NM1615'

NM1615' A NEW DESCRIPTION FOLLOWS--

NM1615'

NM1615' STATION IS LOCATED IN THE SOUTHWEST QUARTER OF THE SOUTHEAST  
 NM1615' 1/4 OF SEC. 34, T. 94 N., R. 44 W., ON THE PLYMOUTH-SIOUX  
 NM1615' COUNTY LINE ABOUT 6 MILES SOUTH-SOUTHWEST OF ALTON, AND ABOUT  
 NM1615' 1.75 MILES SOUTHEAST OF CARNES. STATION, A STANDARD DISK  
 NM1615' SET IN THE TOP OF A ROUND CONCRETE POST AND STAMPED HOMAN  
 NM1615' 1934 1968, IS 28 FEET NORTH OF THE CENTERLINE OF ROAD, 5  
 NM1615' FEET SOUTH OF FENCELINE AND 1 FOOT SOUTH OF A METAL WITNESS  
 NM1615' POST. THE MARK PROJECTS 2 INCHES.

NM1615'

NM1615' TO REACH FROM THE MAIN INTERSECTION IN CARNES, GO SOUTH ON  
 NM1615' STATE HIGHWAY NO. 33 FOR 1.25 MILE TO CROSSROADS. TURN LEFT  
 NM1615' AND GO EAST FOR 1.5 MILES TO STATION ON LEFT (NORTH) SIDE OF  
 NM1615' ROAD AS DESCRIBED.

NM1615'

NM1615' REFERENCE MARK NO. 1, A STANDARD DISK SET IN THE TOP OF A  
 NM1615' SQUARE CONCRETE POST AND STAMPED HOMAN NO 1 1934, IS 28 FEET  
 NM1615' SOUTH OF THE CENTERLINE OF ROAD, AND 7 FEET NORTH OF THE  
 NM1615' FENCE. THE MARK PROJECTS 12 INCHES.

NM1615'

NM1615' REFERENCE MARK NO. 3, A STANDARD DISK SET IN THE TOP OF A  
 NM1615' ROUND CONCRETE POST AND STAMPED HOMAN 1934 NO 3 1968, IS  
 NM1615' 32 FEET SOUTH OF THE CENTERLINE OF ROAD AND 1 FOOT NORTH OF  
 NM1615' FENCE. THE MARK PROJECTS 4 INCHES.

NM1615'

NM1615' AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN--ABOUT 2 MILES  
 NM1615' SE OF CARNES

NM1615'

NM1615'

STATION RECOVERY (1969)

NM1615'

NM1615' RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1969 (LFS)  
 NM1615' STATION MARK AND REFERENCE MARKS NO. 1 AND 3 WERE RECOVERED  
 NM1615' IN GOOD CONDITION. AZIMUTH MARK WAS SEARCHED FOR BUT NOT FOUND  
 NM1615' AND APPEARS DESTROYED BY GRADER OPERATIONS. A NEW AZIMUTH  
 NM1615' MARK WAS SET. THE RAILROAD DEPOT MENTIONED IN THE 1934  
 NM1615' DESCRIPTION HAS BEEN DESTROYED.

NM1615'

NM1615' FOLLOWING IS A NEW DESCRIPTION--

NM1615'

NM1615' STATION IS LOCATED IN THE SW 1/4 OF THE SE 1/4 OF SEC. 34, T.  
 NM1615' 94N., R. 44W., ON THE PLYMOUTH-SIOUX COUNTY LINE ABOUT 6 MILES  
 NM1615' SOUTH-SOUTHWEST OF ALTON AND ABOUT 2 MILES SOUTHEAST OF  
 NM1615' CARNES. STATION, A STANDARD DISK SET IN THE TOP OF A ROUND  
 NM1615' CONCRETE POST AND STAMPED HOMAN 1934 1968, IS 28 FEET NORTH  
 NM1615' OF THE CENTERLINE OF THE ROAD, 5 FEET SOUTH OF FENCELINE AND  
 NM1615' 1 FOOT SOUTH OF A METAL WITNESS POST. THE MARK PROJECTS  
 NM1615' 2 INCHES.

NM1615'

NM1615' TO REACH FROM THE JUNCTION OF STATE HIGHWAY 60 AND COUNTY  
 NM1615' ROAD K 64 AT CARNES, GO SOUTH ON COUNTY ROAD K 64 FOR 1.25  
 NM1615' MILES TO CROSSROADS. TURN LEFT AND GO EAST ON DIRT ROAD FOR  
 NM1615' 1.5 MILES TO STATION ON LEFT (NORTH) SIDE OF ROAD. CONTINUE  
 NM1615' EAST ON DIRT ROAD FOR 0.35 MILE TO AZIMUTH MARK ON RIGHT

NM1615' (SOUTH) SIDE OF ROAD.

NM1615'

NM1615' REFERENCE MARK NO. 1, A STANDARD DISK SET IN THE TOP OF A  
NM1615' SQUARE CONCRETE POST AND STAMPED HOMAN NO 1 1934, IS 28 FEET  
NM1615' SOUTH OF THE CENTERLINE OF ROAD AND 7 FEET NORTH OF A FENCE.  
NM1615' THE MARK PROJECTS 12 INCHES.

NM1615'

NM1615' REFERENCE MARK NO. 3, A STANDARD DISK SET IN THE TOP OF A  
NM1615' SQUARE CONCRETE POST AND STAMPED HOMAN 1934 NO 3 1968, IS  
NM1615' 32 FEET SOUTH OF THE CENTERLINE OF ROAD AND 1 FOOT NORTH OF  
NM1615' A FENCE.

NM1615'

NM1615' AZIMUTH MARK, A STANDARD DISK SET IN THE TOP OF A ROUND  
NM1615' CONCRETE POST AND STAMPED HOMAN 1934 1969, IS 33 FEET SOUTH  
NM1615' OF THE CENTERLINE OF ROAD, 4-1/2 FEET EAST OF GATE POST, 1  
NM1615' FOOT WEST OF A UTILITY POLE, 1 FOOT NORTH OF FENCE AND WITNESS  
NM1615' POST. THE MARK IS FLUSH.

NM1615'

NM1615' AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN--ABOUT  
NM1615' 2 MI. SE OF CARNES

NM1615

NM1615

STATION RECOVERY (1996)

NM1615

NM1615' RECOVERY NOTE BY IOWA DEPARTMENT OF TRANSPORTATION 1996 (SRM)

NM1615' RECOVERED AS DESCRIBED. A HARN STATION WITNESS POST WAS PLACED 0.7 M  
NM1615' (2.3 FT) NORTH OF THE STATION.

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

AE2141 \*\*\*\*\*

AE2141 CBN - This is a Cooperative Base Network Control Station.  
 AE2141 PACS - This is a Primary Airport Control Station.  
 AE2141 DESIGNATION - ORC A  
 AE2141 PID - AE2141  
 AE2141 STATE/COUNTY- IA/SIOUX  
 AE2141 USGS QUAD - ALTON (1985)

AE2141

AE2141 \*CURRENT SURVEY CONTROL

AE2141

AE2141*	NAD 83(1996)-	42 59 21.41031(N)	096 03 43.74197(W)	ADJUSTED
AE2141*	NAVD 88	- 427.78 (meters)	1403.5 (feet)	GPS OBS

AE2141

AE2141	X	- 493,508.625 (meters)	COMP
AE2141	Y	- 4,646,926.813 (meters)	COMP
AE2141	Z	- 4,326,904.374 (meters)	COMP
AE2141	LAPLACE CORR-	-4.02 (seconds)	DEFLEC99
AE2141	ELLIP HEIGHT-	401.28 (meters)	GPS OBS
AE2141	GEOID HEIGHT-	-26.51 (meters)	GEOID99

AE2141

AE2141 HORZ ORDER - B

AE2141 ELLP ORDER - FOURTH CLASS I

AE2141

AE2141.This mark is at Orange City Municipal Airport (ORC)

AE2141

AE2141.The horizontal coordinates were established by GPS observations  
 AE2141.and adjusted by the National Geodetic Survey in August 1997.

AE2141

AE2141.The orthometric height was determined by GPS observations and a  
 AE2141.high-resolution geoid model.

AE2141

AE2141.GPS derived orthometric heights for airport stations designated as  
 AE2141.PACS or SACS are published to 2 decimal places. This maintains  
 AE2141.centimeter relative accuracy between the PACS and SACS. It does  
 AE2141.not indicate centimeter accuracy relative to other marks which are  
 AE2141.part of the NAVD 88 network.

AE2141

AE2141.The X, Y, and Z were computed from the position and the ellipsoidal ht.

AE2141

AE2141.The Laplace correction was computed from DEFLEC99 derived deflections.

AE2141

AE2141.The ellipsoidal height was determined by GPS observations

AE2141.and is referenced to NAD 83.

AE2141

AE2141.The geoid height was determined by GEOID99.

AE2141

AE2141;		North	East	Units	Scale	Converg.
AE2141;SPC IA N	-	1,168,592.526	1,291,083.567	MT	0.99996109	-1 44 11.3
AE2141;UTM 14	-	4,763,813.255	739,508.411	MT	1.00030576	+2 00 15.0
AE2141;UTM 15	-	4,764,175.406	250,357.259	MT	1.00036675	-2 05 20.5

AE2141

AE2141 SUPERSEDED SURVEY CONTROL

AE2141

AE2141.No superseded survey control is available for this station.

AE2141

AE2141\_MARKER: I = METAL ROD

AE2141\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)

AE2141\_STAMPING: ORC A 1996  
 AE2141\_PROJECTION: FLUSH  
 AE2141\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 AE2141\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 AE2141\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 AE2141+SATELLITE: SATELLITE OBSERVATIONS - 1996  
 AE2141\_ROD/PIPE-DEPTH: 4.8 meters  
 AE2141\_SLEEVE-DEPTH : 0.9 meters

AE2141  
 AE2141 HISTORY - Date Condition Recov. By  
 AE2141 HISTORY - 1996 MONUMENTED NGS

AE2141  
 AE2141 STATION DESCRIPTION

AE2141'DESCRIBED BY NATIONAL GEODETIC SURVEY 1996 (CFS)  
 AE2141'THE STATION IS 1 MI (1.6 KM) SOUTH OF ORANGE CITY AT THE ORANGE CITY  
 AE2141'MUNICIPAL AIRPORT, NORTH-NORTHEAST OF THE JUNCTION OF TAXIWAY AND  
 AE2141'RUNWAY. OWNERSHIP--CITY OF ORANGE CITY--204 14TH STREET SW ORANGE  
 AE2141'CITY, IA 51041. AIRPORT MANAGER IS FRED VAN SCHEPEN, PHONE  
 AE2141'712-737-4215. TO REACH THE STATION FROM THE JUNCTION OF STATE HIGHWAY  
 AE2141'10 (8TH STREET SE) AND ALBANY PL SE GO SOUTH-SOUTHEAST ON ALBANY PL SE  
 AE2141'0.5 MI (0.8 KM) TO 14TH STREET ON THE RIGHT. TURN RIGHT, WEST, ON  
 AE2141'14TH STREET SE AND GO 0.15 MI (0.24 KM) TO A ROAD ON THE LEFT. TURN  
 AE2141'LEFT, SOUTH, AND GO 0.1 MI (0.2 KM) TO A METAL HANGAR AND A ROAD/APRON  
 AE2141'ON THE RIGHT. TURN RIGHT, WEST, AND GO 0.05 MI (0.08 KM) TO THE  
 AE2141'APRON. BEAR RIGHT, NORTHWEST, AND GO 0.1 MI (0.2 KM) ACROSS APRON TO  
 AE2141'THE JUNCTION OF THE CONNECTOR TAXIWAY AND RUNWAY AND THE STATION ON  
 AE2141'THE RIGHT. THE STATION IS 144.7 FT (44.1 M) NORTHWEST OF THE  
 AE2141'CENTERLINE OF THE CONNECTOR TAXIWAY, 128.0 FT (39.0 M) EAST-NORTHEAST  
 AE2141'OF THE CENTERLINE OF THE RUNWAY, 46.7 FT (14.2 M) NORTH OF THE CENTER  
 AE2141'OF A SQUARE CONCRETE DRAIN AND 1.3 FT (0.4 M) SOUTHEAST OF A CARSONITE  
 AE2141'WITNESS POST. THE STATION IS A 1/2 IN STAINLESS STEEL ROD DRIVEN TO  
 AE2141'REFUSAL ENCASED IN A 5-INCH PVC PIPE WITH LOGO CAP. NOTE--ACCESS TO  
 AE2141'DATUM POINT IS THRU A 5-INCH NGS LOGO CAP STAMPED ORC A 1996.  
 AE2141'NOTE--THIS IS THE PRIMARY AIRPORT CONTROL STATION.

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

QQ0592 \*\*\*\*\*

QQ0592 FBN - This is a Candidate for Federal Base Network Control.  
 QQ0592 DESIGNATION - GARFIELD  
 QQ0592 PID - QQ0592  
 QQ0592 STATE/COUNTY- IA/LYON  
 QQ0592 USGS QUAD - DOON (1971)

QQ0592  
 QQ0592 \*CURRENT SURVEY CONTROL

QQ0592*	NAD 83(1996)-	43 19 13.69521(N)	096 10 35.47469(W)	ADJUSTED
QQ0592*	NAVD 88	- 429.8 (meters)	1410. (feet)	GPS OBS
QQ0592	X	- 500,075.867 (meters)		COMP
QQ0592	Y	- 4,620,912.441 (meters)		COMP
QQ0592	Z	- 4,353,748.763 (meters)		COMP
QQ0592	LAPLACE CORR-	-0.56 (seconds)		DEFLEC99
QQ0592	ELLIP HEIGHT-	403.26 (meters)		GPS OBS
QQ0592	GEOID HEIGHT-	-26.56 (meters)		GEOID99

QQ0592  
 QQ0592 HORZ ORDER - B  
 QQ0592 ELLP ORDER - FOURTH CLASS I

QQ0592.The horizontal coordinates were established by GPS observations  
 QQ0592.and adjusted by the National Geodetic Survey in August 1997.

QQ0592.The orthometric height was determined by GPS observations and a  
 QQ0592.high-resolution geoid model.

QQ0592.The X, Y, and Z were computed from the position and the ellipsoidal ht.

QQ0592.The Laplace correction was computed from DEFLEC99 derived deflections.

QQ0592.The ellipsoidal height was determined by GPS observations  
 QQ0592.and is referenced to NAD 83.

QQ0592.The geoid height was determined by GEOID99.

QQ0592;	North	East	Units	Scale	Converg.
QQ0592;SPC IA N	- 1,205,656.232	1,282,925.616	MT	1.00001027	-1 48 50.4
QQ0592;UTM 14	- 4,800,275.365	728,943.056	MT	1.00024481	+1 56 16.7

QQ0592:	Primary Azimuth Mark	Grid Az
QQ0592:SPC IA N	- GARFIELD AZ MK	000 55 36.8
QQ0592:UTM 14	- GARFIELD AZ MK	357 10 29.7

QQ0592	PID	Reference Object	Distance	Geod. Az
QQ0592				dddmmss.s
QQ0592		GARFIELD RM 1	18.358 METERS	00223
QQ0592		GARFIELD RM 2	14.021 METERS	17852
QQ0592		GARFIELD AZ MK		3590646.4

QQ0592  
 QQ0592 SUPERSEDED SURVEY CONTROL

QQ0592	NAD 83(1996)-	43 19 13.69352(N)	096 10 35.46530(W)	AD( ) 3
QQ0592	NAD 83(1986)-	43 19 13.69657(N)	096 10 35.46360(W)	AD( ) 3

QQ0592 NAD 27 - 43 19 13.77000(N) 096 10 34.38500(W) AD( ) 3  
 QQ0592 NGVD 29 - 429.6 (m) 1409. (f) GPS OBS  
 QQ0592  
 QQ0592.Superseded values are not recommended for survey control.  
 QQ0592.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 QQ0592.See file dsdata.txt to determine how the superseded data were derived.  
 QQ0592  
 QQ0592\_MARKER: DH = HORIZONTAL CONTROL DISK  
 QQ0592\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 QQ0592\_STAMPING: GARFIELD 1949  
 QQ0592\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 QQ0592\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 QQ0592+STABILITY: SURFACE MOTION  
 QQ0592\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 QQ0592+SATELLITE: SATELLITE OBSERVATIONS - June 01, 1989  
 QQ0592  

HISTORY	- Date	Condition	Recov. By
QQ0592 HISTORY	- 1949	MONUMENTED	CGS
QQ0592 HISTORY	- 1949	GOOD	CGS
QQ0592 HISTORY	- 19890601	GOOD	NGS
QQ0592 HISTORY	- 19960805	GOOD	IADT

 QQ0592  
 QQ0592 STATION DESCRIPTION  
 QQ0592  
 QQ0592'DESCRIBED BY COAST AND GEODETIC SURVEY 1949 (MEW)  
 QQ0592'STATION IS LOCATED ABOUT 8 MILES SOUTH OF ROCK RAPIDS ON THE  
 QQ0592'RIGHT OF WAY OF U.S. HIGHWAY 75. STATION IS 62 FEET EAST OF THE  
 QQ0592'CENTERLINE OF HIGHWAY, 6 FEET SOUTHWEST OF WITNESS POST AND 3 FEET  
 QQ0592'WEST OF FENCE. THE MARK IS FLUSH WITH THE GROUND AND THE DISK  
 QQ0592'IS STAMPED GARFIELD 1949.  
 QQ0592'  
 QQ0592'REFERENCE MARK NO. 1 IS 64 FEET EAST OF THE CENTERLINE OF  
 QQ0592'HIGHWAY AND 0.5 FOOT WEST OF FENCE. THE MARK IS FLUSH WITH THE  
 QQ0592'GROUND AND THE DISK IS STAMPED GARFIELD NO 1 1949.  
 QQ0592'  
 QQ0592'REFERENCE MARK NO. 2 IS 64 FEET EAST OF THE CENTERLINE OF HIGHWAY  
 QQ0592'AND 1.0 FOOT WEST OF FENCE. THE MARK IS FLUSH WITH THE GROUND AND  
 QQ0592'THE DISK IS STAMPED GARFIELD NO 2 1949.  
 QQ0592'  
 QQ0592'AZIMUTH MARK IS 50 FEET WEST OF THE CENTERLINE OF U.S. HIGHWAY  
 QQ0592'75, 37 FEET SOUTH OF THE APPROXIMATE CENTERLINE OF A GRAVEL  
 QQ0592'ROAD, 5.5 FEET NORTH OF WITNESS POST AND 1.5 FEET SOUTHEAST OF  
 QQ0592'FENCECORNER. THE MARK PROJECTS ABOUT 6 INCHES AND THE DISK IS  
 QQ0592'STAMPED GARFIELD 1949.  
 QQ0592'  
 QQ0592'TO REACH FROM THE CAUTION LIGHT AT THE JUNCTION OF U.S. HIGHWAY  
 QQ0592'75 AND STATE HIGHWAY 9 IN ROCK RAPIDS GO SOUTH ON U.S. HIGHWAY  
 QQ0592'75 FOR 7.05 MILES TO CROSSROADS AND AZIMUTH MARK IN SOUTHWEST  
 QQ0592'CORNER ON THE RIGHT SIDE OF HIGHWAY AS DESCRIBED. CONTINUE SOUTH  
 QQ0592'FOR 0.7 MILE TO TOP OF RISE AND STATION ON LEFT OR EAST SIDE OF  
 QQ0592'HIGHWAY AS DESCRIBED.  
 QQ0592'  
 QQ0592'HEIGHT OF LIGHT ABOVE STATION MARK 1 METERS.  
 QQ0592  
 QQ0592 STATION RECOVERY (1949)  
 QQ0592  
 QQ0592'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1949

QQ0592'RECOVERED IN GOOD CONDITION.

QQ0592

QQ0592 STATION RECOVERY (1989)

QQ0592

QQ0592'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989

QQ0592'THE STATION IS LOCATED ABOUT 12.5 KM (7.75 MI) SOUTH OF ROCK RAPIDS,

QQ0592'ALONG THE EAST SIDE OF US HIGHWAY 75 ON TOP OF A LOW CUT BANK AND AT

QQ0592'THE EDGE OF A CUTIVATED FIELD. OWNERSHIP--DEPARTMENT OF

QQ0592'TRANSPORTATION, 800 LINCOLN WAY, AMES, IA 50010, PHONE (515) 239-1101.

QQ0592'TO REACH THE STATION FROM THE JUNCTION OF US HIGHWAY 75 AND STATE

QQ0592'HIGHWAY 9 IN ROCK RAPIDS, GO SOUTH ON US HIGHWAY 75 FOR 12.55 KM

QQ0592'(7.80 MI) TO THE STATION ON THE LEFT.

QQ0592'THE STATION IS A STANDARD CGS HORIZONTAL STATION MARK DISK ABOUT FLUSH

QQ0592'WITH THE GROUND. LOCATED 1.1 KM (0.70 MI) SOUTH OF THE INTERSECTION

QQ0592'OF A GRAVEL ROAD, 45.6 M (149.6 FT) NORTH OF HIGHWAY SURVEY STATION

QQ0592'1230 (A 6-INCH WOODEN POST PROJECTING 12-INCHES ABOVE THE GROUND),

QQ0592'19.1 M (62.7 FT) EAST OF THE CENTER OF THE HIGHWAY AND 0.7 M (2.3 FT)

QQ0592'WEST OF A FIBERGLASS WITNESS POST.

QQ0592'DESCRIBED BY M. L. MCCREADY.

QQ0592

QQ0592

STATION RECOVERY (1996)

QQ0592

QQ0592'RECOVERY NOTE BY IOWA DEPARTMENT OF TRANSPORTATION 1996 (SRM)

QQ0592'RECOVERED AS DESCRIBED BY IOWA DOT. LOCATED IN THE NORTHWEST QUARTER

QQ0592'OF SECTION 9, T 98 N, R 45 W. A PINK STATE HARN SURVEY SIGN WAS SET

QQ0592'0.6 M (2.0 FT) EAST OF THE MONUMENT.

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

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NM0034 *****
NM0034 CBN - This is a Cooperative Base Network Control Station.
NM0034 DESIGNATION - D 154
NM0034 PID - NM0034
NM0034 STATE/COUNTY- IA/SIOUX
NM0034 USGS QUAD - HAWARDEN SOUTH (1969)
NM0034
NM0034 *CURRENT SURVEY CONTROL
NM0034
NM0034 * NAD 83(1996)- 42 59 09.58955(N) 096 29 07.64656(W) ADJUSTED
NM0034 * NAVD 88 - 358.616 (meters) 1176.56 (feet) ADJUSTED
NM0034
NM0034 X - -527,849.221 (meters) COMP
NM0034 Y - -4,643,351.216 (meters) COMP
NM0034 Z - 4,326,590.750 (meters) COMP
NM0034 LAPLACE CORR- -3.14 (seconds) DEFLEC99
NM0034 ELLIP HEIGHT- 332.68 (meters) GPS OBS
NM0034 GEOID HEIGHT- -25.92 (meters) GEOID99
NM0034 DYNAMIC HT - 358.521 (meters) 1176.25 (feet) COMP
NM0034 MODELED GRAV- 980,343.2 (mgal) NAVD 88
NM0034
NM0034 HORZ ORDER - B
NM0034 VERT ORDER - FIRST CLASS II
NM0034 ELLP ORDER - FOURTH CLASS I
NM0034
NM0034.This mark is at Hawarden Municipal Airport (2Y2)
NM0034
NM0034.The horizontal coordinates were established by GPS observations
NM0034.and adjusted by the National Geodetic Survey in August 1997.
NM0034
NM0034.The orthometric height was determined by differential leveling
NM0034.and adjusted by the National Geodetic Survey in June 1991.
NM0034
NM0034.The X, Y, and Z were computed from the position and the ellipsoidal ht.
NM0034
NM0034.The Laplace correction was computed from DEFLEC99 derived deflections.
NM0034
NM0034.The ellipsoidal height was determined by GPS observations
NM0034.and is referenced to NAD 83.
NM0034
NM0034.The geoid height was determined by GEOID99.
NM0034
NM0034.The dynamic height is computed by dividing the NAVD 88
NM0034.geopotential number by the normal gravity value computed on the
NM0034.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
NM0034.degrees latitude (g = 980.6199 gals.).
NM0034
NM0034.The modeled gravity was interpolated from observed gravity values.
NM0034
NM0034;
NM0034;          North          East          Units          Scale          Converg.
NM0034;SPC IA N - 1,169,360.470 1,256,567.799 MT 0.99996077 -2 01 24.2
NM0034;SPC SD S - 79,773.790 913,708.272 MT 0.99996735 +2 39 16.1
NM0034;UTM 14 - 4,762,328.050 705,007.491 MT 1.00011706 +1 42 54.2
NM0034
NM0034
NM0034 SUPERSEDED SURVEY CONTROL
NM0034
NM0034 NAD 83(1996)- 42 59 09.59059(N) 096 29 07.64196(W) AD( ) 2

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NM0034 NAD 83(1986)- 42 59 09.59371(N) 096 29 07.63719(W) AD( ) 2  
 NM0034 NAD 27 - 42 59 09.63600(N) 096 29 06.52800(W) AD( ) 2  
 NM0034 NGVD 29 - 358.42 (m) 1175.9 (f) COMPUTED 1 2  
 NM0034

NM0034.Superseded values are not recommended for survey control.

NM0034.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

NM0034.See file dsdata.txt to determine how the superseded data were derived.

NM0034

NM0034 MARKER: DB = BENCH MARK DISK

NM0034 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

NM0034 STAMPING: D 154 1949

NM0034 MAGNETIC: N = NO MAGNETIC MATERIAL

NM0034 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

NM0034+STABILITY: SURFACE MOTION

NM0034 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

NM0034+SATELLITE: SATELLITE OBSERVATIONS - September 17, 1996

NM0034

NM0034	HISTORY	- Date	Condition	Recov. By
NM0034	HISTORY	- 1949	MONUMENTED	CGS
NM0034	HISTORY	- 1949	GOOD	CGS
NM0034	HISTORY	- 19960917	GOOD	NGS

NM0034

NM0034 STATION DESCRIPTION

NM0034

NM0034'DESCRIBED BY COAST AND GEODETIC SURVEY 1949 (MEW)

NM0034'THIS STATION IS LOCATED ON THE GROUNDS OF THE HAWARDEN AIRPORT,

NM0034'AT THE SOUTH EDGE OF HAWARDEN. A TRAVERSE CONNECTION WAS MADE

NM0034'TO THIS MARK FROM TRIANGULATION STATION HAWARDEN, AND IS

NM0034'INCLUDED IN THE DESCRIPTION FOR THAT STATION. IT IS EAST

NM0034'OF THE HANGAR, AT THE ENTRANCE TO THE AIRPORT, 23 FEET WEST

NM0034'OF THE CENTERLINE OF THE DRIVE LEADING INTO THE AIRPORT, 11

NM0034'FEET WEST OF A GATE POST, 34 FEET EAST-SOUTHEAST OF THE

NM0034'SOUTHEAST CORNER OF A HOUSE, 4 FEET EAST OF A POWER POLE,

NM0034'2 FEET WEST OF A WITNESS POST, AND 1 FOOT SOUTH OF A

NM0034'FENCELINE. IT IS A USC AND GS BENCH MARK DISK, SET IN THE TOP

NM0034'OF A CONCRETE POST, 10 INCHES IN DIAMETER, AND

NM0034'PROJECTS 4 INCHES. THE DISK IS STAMPED D 154 1949.

NM0034' ~

NM0034'THE TRAVERSE DISTANCE IS 78.087 METERS OR 256.19 FEET.

NM0034

NM0034 STATION RECOVERY (1949)

NM0034

NM0034'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1949

NM0034'0.8 MI SE FROM HAWARDEN.

NM0034'0.65 MILE SOUTH ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND

NM0034'PACIFIC RAILROAD FROM THE RAILROAD STATION AT HAWARDEN, THENCE

NM0034'0.2 MILE EAST ALONG A GRADED DIRT ROAD, AT THE HAWARDEN AIRPORT,

NM0034'25.0 FEET WEST OF THE CENTER LINE OF THE MAIN GATE, 4.4 FEET

NM0034'EAST OF A LIGHT POLE, 1.6 FEET SOUTH OF A FENCE, 1.6 FEET WEST

NM0034'OF A REFERENCE POST, AND SET IN THE TOP OF A CONCRETE POST

NM0034'PROJECTING 0.5 FOOT ABOVE THE GROUND.

NM0034

NM0034 STATION RECOVERY (1996)

NM0034

NM0034'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (SFH)

NM0034'THE STATION IS LOCATED ON THE SOUTH SIDE OF HAWARDEN, IA., ALONG THE

NM0034'WEST SIDE OF THE ROAD LEADING SOUTH TO THE BALL PARK AND FAIR GROUNDS,

NM0034'IN BACK OF AND SOUTH-SOUTHEAST OF A HOUSE (624 1ST. STREET) ON THE  
NM0034'SOUTHWEST CORNER OF 1ST. STREET AND THE BALL PARK ROAD. NOTE--THIS  
NM0034'STATION IS A (CBN/HARN FIRST ORDER VERTICAL BENCH MARK TIE) TO ORANGE  
NM0034'CITY MUNICIPAL AIRPORT, (ORC) . TO REACH THE STATION FROM THE  
NM0034'JUNCTION OF STATE HIGHWAYS 10 AND 12 IN HAWARDEN, GO SOUTH, 1.1 KM  
NM0034'(0.70 MI) ALONG HIGHWAY 12 CROSSING A RAILROAD TRACK AND THEN A  
NM0034'CONCRETE BRIDGE, TO 1ST. STREET ON THE LEFT. TURN LEFT, 0.24 KM  
NM0034'(0.15 MI) ALONG 1ST. STREET TO THE BALL PARK ROAD ON THE RIGHT. TURN  
NM0034'RIGHT, 64.0 M (210.0 FT) TO THE STATION ON THE RIGHT IN THE GRASS.  
NM0034'STATION IS 64.0 M (210.0 FT) SOUTH OF 1ST. STREET CENTER, 10.4 M  
NM0034'(34.1 FT) EAST-SOUTHEAST OF THE SOUTHEAST CORNER OF A HOUSE, 8.2 M  
NM0034'(26.9 FT) WEST OF THE BALL PARK ROAD CENTER, 0.4 M (1.3 FT) NORTH OF A  
NM0034'WITNESS POST, AND THE MONUMENT IS PROJECTING ABOUT 7-CM ABOVE THE  
NM0034'GROUND SURFACE. BY R.G. HAYES

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

NM0820 \*\*\*\*\*

NM0820 CBN - This is a Cooperative Base Network Control Station.

NM0820 DESIGNATION - A 146

NM0820 PID - NM0820

NM0820 STATE/COUNTY- IA/PLYMOUTH

NM0820 USGS QUAD - JEFFERSON (1994)

NM0820

NM0820 \*CURRENT SURVEY CONTROL

NM0820

NM0820*	NAD 83(1996)-	42 46 56.59429(N)	096 35 33.84753(W)	ADJUSTED
NM0820*	NAVD 88	- 347.196 (meters)	1139.09 (feet)	ADJUSTED
NM0820	X	- 538,308.704 (meters)		COMP
NM0820	Y	- 4,657,638.374 (meters)		COMP
NM0820	Z	- 4,310,008.617 (meters)		COMP
NM0820	LAPLACE CORR-	-2.40 (seconds)		DEFLEC99
NM0820	ELLIP HEIGHT-	321.55 (meters)		GPS OBS
NM0820	GEOID HEIGHT-	-25.66 (meters)		GEOID99
NM0820	DYNAMIC HT -	347.099 (meters)	1138.77 (feet)	COMP
NM0820	MODELED GRAV-	980,331.7 (mgal)		NAVD 88

NM0820

NM0820 HORZ ORDER - B

NM0820 VERT ORDER - FIRST CLASS II

NM0820 ELLP ORDER - FOURTH CLASS I

NM0820

NM0820.The horizontal coordinates were established by GPS observations  
 NM0820.and adjusted by the National Geodetic Survey in August 1997.

NM0820

NM0820.The orthometric height was determined by differential leveling  
 NM0820.and adjusted by the National Geodetic Survey in June 1991.

NM0820

NM0820.The X, Y, and Z were computed from the position and the ellipsoidal ht.

NM0820

NM0820.The Laplace correction was computed from DEFLEC99 derived deflections.

NM0820

NM0820.The ellipsoidal height was determined by GPS observations  
 NM0820.and is referenced to NAD 83.

NM0820

NM0820.The geoid height was determined by GEOID99.

NM0820

NM0820.The dynamic height is computed by dividing the NAVD 88  
 NM0820.geopotential number by the normal gravity value computed on the  
 NM0820.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 NM0820.degrees latitude (g = 980.6199 gals.).

NM0820

NM0820.The modeled gravity was interpolated from observed gravity values.

NM0820

	North	East	Units	Scale	Converg.
NM0820;SPC IA N	- 1,147,072.015	1,246,996.990	MT	0.99994737	-2 05 45.9
NM0820;UTM 14	- 4,739,460.184	696,907.758	MT	1.00007703	+1 38 08.1

NM0820

NM0820 SUPERSEDED SURVEY CONTROL

NM0820

NM0820	NGVD 29	- 347.006 (m)	1138.47 (f)	ADJ UNCH	1 2
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NM0820

NM0820.Superseded values are not recommended for survey control.

NM0820.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

NM0820. See file dsdata.txt to determine how the superseded data were derived.  
 NM0820  
 NM0820 MARKER: DB = BENCH MARK DISK  
 NM0820 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 NM0820 STAMPING: A 146 1948  
 NM0820 MAGNETIC: N = NO MAGNETIC MATERIAL  
 NM0820 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 NM0820+STABILITY: SURFACE MOTION  
 NM0820 SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 NM0820+SATELLITE: SATELLITE OBSERVATIONS - September 17, 1996  
 NM0820  
 NM0820 HISTORY - Date Condition Recov. By  
 NM0820 HISTORY - 1948 MONUMENTED CGS  
 NM0820 HISTORY - 19930908 GOOD NGS  
 NM0820 HISTORY - 19960917 GOOD NGS  
 NM0820  
 NM0820 STATION DESCRIPTION  
 NM0820  
 NM0820 DESCRIBED BY COAST AND GEODETIC SURVEY 1948  
 NM0820 2 MI N FROM WESTFIELD.  
 NM0820 2.0 MILES NORTH ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND  
 NM0820 PACIFIC RAILROAD FROM THE STATION AT WESTFIELD, 3.5 MILES  
 NM0820 SOUTHWEST OF THE STATION AT AKRON, 0.25 MILE SOUTHWEST OF MILEPOST  
 NM0820 9, AT A PRIVATE ROAD CROSSING, 46.0 FEET NORTHWEST OF THE  
 NM0820 NORTHWEST RAIL OF THE TRACK, 52.0 FEET NORTHEAST OF THE CENTER  
 NM0820 LINE OF THE ROAD, 66.5 FEET SOUTHWEST OF THE 8TH. POLE SOUTHWEST  
 NM0820 OF THE MILEPOST, 1.2 FEET SOUTHWEST OF THE NORTHWEST RIGHT-OF-WAY  
 NM0820 FENCE, 1.7 FEET SOUTHWEST OF A REFERENCE POST, SET IN THE TOP  
 NM0820 OF A CONCRETE POST PROJECTING 0.5 FOOT ABOVE THE GROUND.  
 NM0820  
 NM0820 STATION RECOVERY (1993)  
 NM0820  
 NM0820 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993  
 NM0820 2.5 KM (1.55 MI) NORTHERLY ALONG STATE HIGHWAY 12 FROM THE JUNCTION  
 NM0820 OF STATE HIGHWAY 3 IN WESTFIELD, 45.5 M (149.3 FT) NORTHWEST OF THE  
 NM0820 HIGHWAY CENTERLINE, 14.4 M (47.2 FT) NORTHEAST OF THE CENTER OF A  
 NM0820 FIELD ROAD, 14.0 M (45.9 FT) NORTHWEST OF THE NEAR RAIL OF THE  
 NM0820 BURLINGTON NORTHERN RAILROAD, 8.1 M (26.6 FT) NORTH OF UNDERGROUND  
 NM0820 CABLE WARNING SIGN NUMBER 4 42 40, 2.0 M (6.6 FT) BELOW THE LEVEL OF  
 NM0820 THE HIGHWAY, 0.4 M (1.3 FT) SOUTHWEST OF A FENCE, AND THE MONUMENT  
 NM0820 PROJECTS 0.15 M (0.49 FT) ABOVE THE GROUND SURFACE.  
 NM0820  
 NM0820 STATION RECOVERY (1996)  
 NM0820  
 NM0820 RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (SFH)  
 NM0820 THE STATION IS LOCATED ABOUT 3.2 KM (2.00 MI) NORTH-NORTHEAST OF  
 NM0820 WESTFIELD, IA., ABOUT 5.6 KM (3.45 MI) SOUTH-SOUTHWEST OF AKRON, IA.,  
 NM0820 AT A FIELD ENTRANCE ROAD ON THE NORTHWEST SIDE OF STATE HIGHWAY 12,  
 NM0820 NORTH-NORTHWEST OF AND ACROSS THE ROAD AND TRACKS FROM MILEPOST NUMBER  
 NM0820 3, JUST SOUTHWEST OF A RIGHT-OF-WAY FENCE AND WITNESS POST. NOTE--THIS  
 NM0820 STATION IS A (CBN/HARN FIRST ORDER VERTICAL BENCH MARK TIE) TO ORANGE  
 NM0820 CITY MUNICIPAL AIRPORT, (ORC) . TO REACH THE STATION FROM THE  
 NM0820 JUNCTION OF STATE HIGHWAYS 3 AND 12 ON THE NORTHWEST SIDE OF  
 NM0820 WESTFIELD, GO NORTHERLY, 2.5 KM (1.55 MI) ALONG HIGHWAY 12 TO MILEPOST  
 NM0820 3 ON THE RIGHT AND THE FIELD ENTRANCE ON THE LEFT. TURN LEFT,  
 NM0820 NORTHWEST, 45.5 M (149.3 FT) TO THE RIGHT-OF-WAY FENCE AND THE STATION  
 NM0820 ON THE RIGHT, JUST SOUTHWEST OF THE FENCE. STATION IS 45.5 M (149.3

NM0820'FT) NORTHWEST OF THE HIGHWAY CENTERLINE, 14.4 M (47.2 FT) NORTHEAST OF  
NM0820'THE FIELD ENTRANCE CENTER, 14.0 M (45.9 FT) NORTHWEST OF THE NEAR  
NM0820'RAIL, 8.1 M (26.6 FT) NORTH-NORTHEAST OF AN UNDERGROUND CABLE WARNING  
NM0820'SIGN NUMBER 4 42 40, 2.0 M (6.6 FT) BELOW THE HIGHWAY LEVEL, 0.4 M  
NM0820'(1.3 FT) SOUTH OF A (PINK) STATE GEODETIC SURVEY HARN STATION  
NM0820'MARKER/WITNESS POST, 0.3 M (1.0 FT) SOUTHEAST OF A FENCE, AND THE  
NM0820'MONUMENT PROJECTS 7-CM ABOVE THE GROUND SURFACE. BY R.G. HAYES  
1 National Geodetic Survey, Retrieval Date = OCTOBER 3, 2000

OP0556 \*\*\*\*\*

OP0556 DESIGNATION - R 16

OP0556 PID - OP0556

OP0556 STATE/COUNTY- IA/OSCEOLA

OP0556 USGS QUAD - ASHTON (1972)

OP0556

OP0556 \*CURRENT SURVEY CONTROL

OP0556

OP0556*	NAD 83(1986)-	43 16 18.	(N)	095 48 24.	(W)	SCALED
OP0556*	NAVD 88	-	438.926	(meters)	1440.04	(feet) ADJUSTED
OP0556	GEOID HEIGHT-	-26.87	(meters)			GEOID99
OP0556	DYNAMIC HT -	438.809	(meters)	1439.66	(feet)	COMP
OP0556	MODELED GRAV-	980,338.8	(mgal)			NAVD 88

OP0556

OP0556 VERT ORDER - SECOND CLASS 0

OP0556

OP0556.The horizontal coordinates were scaled from a topographic map and have  
OP0556.an estimated accuracy of +/- 6 seconds.

OP0556

OP0556.The orthometric height was determined by differential leveling  
OP0556.and adjusted by the National Geodetic Survey in June 1991.

OP0556

OP0556.The geoid height was determined by GEOID99.

OP0556

OP0556.The dynamic height is computed by dividing the NAVD 88  
OP0556.geopotential number by the normal gravity value computed on the  
OP0556.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
OP0556.degrees latitude (g = 980.6199 gals.).

OP0556

OP0556.The modeled gravity was interpolated from observed gravity values.

OP0556

OP0556;	North	East	Units	Estimated Accuracy
OP0556;SPC IA N	- 1,199,350.	1,312,770.	MT	(+/- 180 meters Scaled)

OP0556

OP0556 SUPERSEDED SURVEY CONTROL

OP0556

OP0556	*NGVD 29	-	438.741	(m)	1439.44	(f) ADJ UNCH	2 0
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OP0556

OP0556.Superseded values are not recommended for survey control.  
OP0556.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
OP0556.See file dsdata.txt to determine how the superseded data were derived.

OP0556

OP0556\_MARKER: DB = BENCH MARK DISK

OP0556\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

OP0556\_STAMPING: R 16 1934

OP0556\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

OP0556+STABILITY: SURFACE MOTION

OP0556

OP0556	HISTORY	- Date	Condition	Recov. By
OP0556	HISTORY	- 1934	MONUMENTED	CGS

OP0556

OP0556 STATION DESCRIPTION

OP0556

OP0556'DESCRIBED BY COAST AND GEODETIC SURVEY 1934

OP0556'2 MI N FROM RITTER.

OP0556'IN OSCEOLA COUNTY, 2 MILES NORTH ALONG THE CHICAGO, ST. PAUL,

OP0556'MINNEAPOLIS AND OMAHA RAILWAY FROM THE STATION AT RITTER, OBRIEN  
OP0556'COUNTY, 30 YARDS SOUTH OF A SECTION-LINE ROAD CROSSING, 45.3 FEET WEST  
OP0556'OF THE WEST RAIL, AND 1.3 FEET EAST OF THE RIGHT-OF-WAY FENCE. A  
OP0556'STANDARD DISK, STAMPED R 16 1934 AND SET IN THE TOP OF A CONCRETE POST  
OP0556'PROJECTING 2 INCHES ABOVE GROUND.

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

OP0550 \*\*\*\*\*

OP0550 DESIGNATION - L 16  
 OP0550 PID - OP0550  
 OP0550 STATE/COUNTY- IA/O BRIEN  
 OP0550 USGS QUAD - SHELDON (1964)

\*CURRENT SURVEY CONTROL

OP0550*	NAD 83(1986)-	43 10 38.	(N)	095 51 31.	(W)	SCALED
OP0550*	NAVD 88	-	430.976	(meters)	1413.96	(feet) ADJUSTED

OP0550	GEOID HEIGHT-	-26.91	(meters)			GEOID99
OP0550	DYNAMIC HT -	430.856	(meters)	1413.57	(feet)	COMP
OP0550	MODELED GRAV-	980,327.8	(mgal)			NAVD 88

OP0550 VERT ORDER - SECOND CLASS 0

OP0550.The horizontal coordinates were scaled from a topographic map and have  
 OP0550.an estimated accuracy of +/- 6 seconds.

OP0550.The orthometric height was determined by differential leveling  
 OP0550.and adjusted by the National Geodetic Survey in June 1991.

OP0550.The geoid height was determined by GEOID99.

OP0550.The dynamic height is computed by dividing the NAVD 88  
 OP0550.geopotential number by the normal gravity value computed on the  
 OP0550.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 OP0550.degrees latitude (g = 980.6199 gals.).

OP0550.The modeled gravity was interpolated from observed gravity values.

	North	East	Units	Estimated Accuracy
OP0550; SPC IA N	- 1,188,980.	1,308,260.	MT	(+/- 180 meters Scaled)

SUPERSEDED SURVEY CONTROL

OP0550 \*NGVD 29 - 430.789 (m) 1413.35 (f) ADJ UNCH 2 0

OP0550.Superseded values are not recommended for survey control.  
 OP0550.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 OP0550.See file dsdata.txt to determine how the superseded data were derived.

OP0550\_MARKER: DB = BENCH MARK DISK  
 OP0550\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 OP0550\_STAMPING: L 16 1934  
 OP0550\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 OP0550+STABILITY: SURFACE MOTION

HISTORY	Date	Condition	Recov. By
OP0550	- 1934	MONUMENTED	CGS
OP0550	- 1934	GOOD	NGS

STATION DESCRIPTION

OP0550'DESCRIBED BY NATIONAL GEODETIC SURVEY 1934  
 OP0550'IN SHELDON.

OP0550'AT SHELDON, OBRIEN COUNTY, AT THE JUNCTION OF THE CHICAGO, ST. PAUL,  
OP0550'MINNEAPOLIS AND OMAHA RAILWAY AND THE CHICAGO, MILWAUKEE, ST. PAUL AND  
OP0550'PACIFIC RAILROAD, 63.6 FEET WEST OF THE WEST CORNER OF THE STATION,  
OP0550'30.8 FEET NORTH OF THE NORTH RAIL OF THE C.M.ST.P. AND P.R.R., 25.7  
OP0550'FEET WEST OF THE WEST RAIL OF THE C.ST.P.M. AND O.RY., AND IN LINE  
OP0550'WITH A ROW OF POLES. A STANDARD DISK, STAMPED L 16 1934 AND SET IN  
OP0550'THE TOP OF A CONCRETE POST PROJECTING 1 INCH ABOVE GROUND.

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

OP0527 \*\*\*\*\*

OP0527 DESIGNATION - F 17  
 OP0527 PID - OP0527  
 OP0527 STATE/COUNTY- IA/SIOUX  
 OP0527 USGS QUAD - MATLOCK (1964)

OP0527  
 OP0527 \*CURRENT SURVEY CONTROL

OP0527*	NAD 83(1986)-	43 11 09.	(N)	095 57 50.	(W)	SCALED
OP0527*	NAVD 88	-	438.611	(meters)	1439.01	(feet) ADJUSTED
OP0527	GEOID HEIGHT-	-26.74	(meters)			GEOID99
OP0527	DYNAMIC HT -	438.489	(meters)	1438.61	(feet)	COMP
OP0527	MODELED GRAV-	980,328.4	(mgal)			NAVD 88

OP0527  
 OP0527 VERT ORDER - SECOND CLASS 0

OP0527 The horizontal coordinates were scaled from a topographic map and have  
 OP0527 an estimated accuracy of +/- 6 seconds.

OP0527 The orthometric height was determined by differential leveling  
 OP0527 and adjusted by the National Geodetic Survey in June 1991.

OP0527 The geoid height was determined by GEOID99.

OP0527 The dynamic height is computed by dividing the NAVD 88  
 OP0527 geopotential number by the normal gravity value computed on the  
 OP0527 Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 OP0527 degrees latitude (g = 980.6199 gals.).

OP0527 The modeled gravity was interpolated from observed gravity values.

OP0527;	North	East	Units	Estimated Accuracy
OP0527; SPC IA N	- 1,190,180.	1,299,730.	MT	(+/- 180 meters Scaled)

OP0527  
 OP0527 SUPERSEDED SURVEY CONTROL

OP0527 \*NGVD 29 - 438.416 (m) 1438.37 (f) ADJ UNCH 2 0

OP0527 Superseded values are not recommended for survey control.  
 OP0527 NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 OP0527 See file dsdata.txt to determine how the superseded data were derived.

OP0527  
 OP0527 MARKER: DB = BENCH MARK DISK  
 OP0527 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 OP0527 STAMPING: F 17 1934  
 OP0527 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 OP0527 STABILITY: SURFACE MOTION

OP0527	HISTORY	- Date	Condition	Recov. By
OP0527	HISTORY	- 1934	MONUMENTED	CGS
OP0527	HISTORY	- 1973	GOOD	NGS

OP0527  
 OP0527 STATION DESCRIPTION

OP0527 DESCRIBED BY COAST AND GEODETIC SURVEY 1934  
 OP0527 2.2 MI E FROM BOYDEN.

OP0527'2.2 MILES EAST ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC  
OP0527'RAILROAD FROM THE STATION AT BOYDEN, SIOUX COUNTY, 275 YARDS WEST OF  
OP0527'THE COUNTRY ROAD CROSSING, 45.6 FEET NORTH OF THE NORTH RAIL, AND 1.2  
OP0527'FEET SOUTH OF THE RIGHT-OF-WAY FENCE. A STANDARD DISK, STAMPED F 17  
OP0527'1934 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 5 INCHES ABOVE  
OP0527'GROUND. NOTE-- U.S. HIGHWAY 18 HAS BEEN RELOCATED IN THIS AREA.

OP0527

OP0527

STATION RECOVERY (1973)

OP0527

OP0527'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1973

OP0527'RECOVERED IN GOOD CONDITION.

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

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OP0544 *****
OP0544 DESIGNATION - E 16
OP0544 PID - OP0544
OP0544 STATE/COUNTY- IA/SIOUX
OP0544 USGS QUAD - HOSPERS (1964)
OP0544
OP0544 *CURRENT SURVEY CONTROL
OP0544
OP0544* NAD 83(1986)- 43 03 17. (N) 095 55 41. (W) SCALED
OP0544* NAVD 88 - 408.719 (meters) 1340.94 (feet) ADJUSTED
OP0544
OP0544 GEOID HEIGHT- -26.79 (meters) GEOID99
OP0544 DYNAMIC HT - 408.602 (meters) 1340.56 (feet) COMP
OP0544 MODELED GRAV- 980,321.4 (mgal) NAVD 88
OP0544
OP0544 VERT ORDER - SECOND CLASS 0
OP0544
OP0544.The horizontal coordinates were scaled from a topographic map and have
OP0544.an estimated accuracy of +/- 6 seconds.
OP0544
OP0544.The orthometric height was determined by differential leveling
OP0544.and adjusted by the National Geodetic Survey in June 1991.
OP0544
OP0544.The geoid height was determined by GEOID99.
OP0544
OP0544.The dynamic height is computed by dividing the NAVD 88
OP0544.geopotential number by the normal gravity value computed on the
OP0544.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
OP0544.degrees latitude (g = 980.6199 gals.).
OP0544
OP0544.The modeled gravity was interpolated from observed gravity values.
OP0544
OP0544; North East Units Estimated Accuracy
OP0544;SPC IA N - 1,175,540. 1,302,220. MT (+/- 180 meters
Scaled)
OP0544
OP0544 SUPERSEDED SURVEY CONTROL
OP0544 *
OP0544 NGVD 29 - 408.529 (m) 1340.32 (f) ADJ UNCH 2 0
OP0544
OP0544.Superseded values are not recommended for survey control.
OP0544.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
OP0544.See file dsdata.txt to determine how the superseded data were derived.
OP0544
OP0544 MARKER: DB = BENCH MARK DISK
OP0544 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
OP0544 STAMPING: E 16 1934
OP0544 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
OP0544+STABILITY: SURFACE MOTION
OP0544
OP0544 HISTORY - Date Condition Recov. By
OP0544 HISTORY - 1934 MONUMENTED CGS
OP0544
OP0544 STATION DESCRIPTION
OP0544
OP0544'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
OP0544'1.5 MI SW FROM HOSPERS.

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OP0544'1.5 MILES SOUTHWEST ALONG THE CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA  
OP0544'RAILWAY FROM THE STATION AT HOSPERS, SIOUX COUNTY, 110 YARDS SOUTHWEST  
OP0544'OF MILEPOST 221, 48 YARDS NORTHEAST OF A SECTION-LINE ROAD CROSSING,  
OP0544'45.6 FEET NORTHWEST OF THE NORTHWEST RAIL, AND 1.8 FEET SOUTHEAST OF  
OP0544'THE RIGHT-OF-WAY FENCE. A STANDARD DISK, STAMPED E 16 1934 AND SET IN  
OP0544'THE TOP OF A CONCRETE POST PROJECTING 2 INCHES ABOVE GROUND.

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

OP0542 \*\*\*\*\*

OP0542 DESIGNATION - C 16  
 OP0542 PID - OP0542  
 OP0542 STATE/COUNTY- IA/SIOUX  
 OP0542 USGS QUAD - HOSPERS (1964)

OP0542 \*CURRENT SURVEY CONTROL

OP0542*	NAD 83(1986)-	43 00 42.	(N)	095 58 15.	(W)	SCALED
OP0542*	NAVD 88	-	401.240	(meters)	1316.40	(feet) ADJUSTED

OP0542	GEOID HEIGHT-	-26.69	(meters)			GEOID99
OP0542	DYNAMIC HT -	401.125	(meters)	1316.02	(feet)	COMP
OP0542	MODELED GRAV-	980,323.0	(mgal)			NAVD 88

OP0542 VERT ORDER - SECOND CLASS 0

OP0542.The horizontal coordinates were scaled from a topographic map and have  
 OP0542.an estimated accuracy of +/- 6 seconds.

OP0542.The orthometric height was determined by differential leveling  
 OP0542.and adjusted by the National Geodetic Survey in June 1991.

OP0542.The geoid height was determined by GEOID99.

OP0542.The dynamic height is computed by dividing the NAVD 88  
 OP0542.geopotential number by the normal gravity value computed on the  
 OP0542.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 OP0542.degrees latitude (g = 980.6199 gals.).

OP0542.The modeled gravity was interpolated from observed gravity values.

OP0542;	North	East	Units	Estimated Accuracy
OP0542;SPC IA N	- 1,170,860.	1,298,600.	MT	(+/- 180 meters

Scaled)

OP0542 SUPERSEDED SURVEY CONTROL

OP0542	NGVD 29	-	401.050	(m)	1315.78	(f) ADJ UNCH	2 0
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OP0542.Superseded values are not recommended for survey control.  
 OP0542.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 OP0542.See file dsdata.txt to determine how the superseded data were derived.

OP0542\_MARKER: DB = BENCH MARK DISK  
 OP0542\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 OP0542\_STAMPING: C 16 1934  
 OP0542\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 OP0542+STABILITY: SURFACE MOTION

OP0542	HISTORY	- Date	Condition	Recov. By
OP0542	HISTORY	- 1934	MONUMENTED	CGS

OP0542 STATION DESCRIPTION

OP0542'DESCRIBED BY COAST AND GEODETIC SURVEY 1934  
 OP0542'2.6 MI NE FROM ALTON.

OP0542'2.6 MILES NORTHEAST ALONG THE CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA  
OP0542'RAILWAY FROM THE STATION AT ALTON, SIOUX COUNTY, 44 YARDS SOUTHWEST OF  
OP0542'MILEPOST 225, 31 YARDS SOUTHEAST OF IRON CULVERT 763, 39 YARDS NORTH  
OP0542'OF A ROAD CROSSING, 47.1 FEET NORTHWEST OF THE NORTHWEST RAIL, AND 1.7  
OP0542'FEET SOUTHEAST OF THE RIGHT-OF-WAY FENCE. A STANDARD DISK, STAMPED C  
OP0542'16 1934 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 4 INCHES  
OP0542'ABOVE GROUND.

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

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NL0480 *****
NL0480 DESIGNATION - A 25
NL0480 PID - NL0480
NL0480 STATE/COUNTY- IA/CHEROKEE
NL0480 USGS QUAD - MARCUS (1969)
NL0480
NL0480 *CURRENT SURVEY CONTROL
NL0480
NL0480* NAD 83(1986)- 42 49 37. (N) 095 50 24. (W) SCALED
NL0480* NAVD 88 - 439.332 (meters) 1441.38 (feet) ADJUSTED
NL0480
NL0480 GEOID HEIGHT- -27.00 (meters) GEOID99
NL0480 DYNAMIC HT - 439.195 (meters) 1440.93 (feet) COMP
NL0480 MODELED GRAV- 980,295.8 (mgal) NAVD 88
NL0480
NL0480 VERT ORDER - SECOND CLASS 0
NL0480
NL0480.The horizontal coordinates were scaled from a topographic map and have
NL0480.an estimated accuracy of +/- 6 seconds.
NL0480
NL0480.The orthometric height was determined by differential leveling
NL0480.and adjusted by the National Geodetic Survey in June 1991.
NL0480
NL0480.The geoid height was determined by GEOID99.
NL0480
NL0480.The dynamic height is computed by dividing the NAVD 88
NL0480.geopotential number by the normal gravity value computed on the
NL0480.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
NL0480.degrees latitude (g = 980.6199 gals.).
NL0480
NL0480.The modeled gravity was interpolated from observed gravity values.
NL0480
NL0480; North East Units Estimated Accuracy
NL0480;SPC IA N - 1,150,040. 1,308,690. MT (+/- 180 meters Scaled)
NL0480
NL0480 SUPERSEDED SURVEY CONTROL
NL0480
NL0480 *NGVD 29 - 439.142 (m) 1440.75 (f) ADJ UNCH 2 0
NL0480
NL0480.Superseded values are not recommended for survey control.
NL0480.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
NL0480.See file dsdata.txt to determine how the superseded data were derived.
NL0480
NL0480_MARKER: DB = BENCH MARK DISK
NL0480_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
NL0480_STAMPING: A 25 1934
NL0480_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
NL0480+STABILITY: SURFACE MOTION
NL0480
NL0480 HISTORY - Date Condition Recov. By
NL0480 HISTORY - 1934 MONUMENTED CGS
NL0480
NL0480 STATION DESCRIPTION
NL0480
NL0480'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
NL0480'1.6 MI W FROM MARCUS.
NL0480'1.6 MILES WEST ALONG THE ILLINOIS CENTRAL RAILROAD FROM THE

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NL0480'STATION AT MARCUS, CHEROKEE COUNTY, 80 YARDS WEST OF A ROAD  
NL0480'CROSSING, 43.2 FEET SOUTHEAST OF THE THIRD POLE WEST OF THE  
NL0480'CROSSING, 44.3 FEET SOUTH OF THE SOUTH RAIL, AND 3.1 FEET  
NL0480'NORTH OF THE RIGHT-OF-WAY FENCE. A STANDARD DISK, STAMPED  
NL0480'A 25 1934 AND SET IN THE TOP OF A CONCRETE POST PROJECTING  
NL0480'6 INCHES ABOVE GROUND.

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

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NM0021 *****
NM0021 DESIGNATION - W 15
NM0021 PID - NM0021
NM0021 STATE/COUNTY- IA/SIOUX
NM0021 USGS QUAD - ALTON (1985)
NM0021
NM0021 *CURRENT SURVEY CONTROL
NM0021
NM0021* NAD 83(1986)- 42 54 01. (N) 096 05 06. (W) SCALED
NM0021* NAVD 88 - 380.679 (meters) 1248.94 (feet) ADJUSTED
NM0021
NM0021 GEOID HEIGHT- -26.43 (meters) GEOID99
NM0021 DYNAMIC HT - 380.572 (meters) 1248.59 (feet) COMP
NM0021 MODELED GRAV- 980,329.8 (mgal) NAVD 88
NM0021
NM0021 VERT ORDER - SECOND CLASS 0
NM0021
NM0021.The horizontal coordinates were scaled from a topographic map and have
NM0021.an estimated accuracy of +/- 6 seconds.
NM0021
NM0021.The orthometric height was determined by differential leveling
NM0021.and adjusted by the National Geodetic Survey in June 1991.
NM0021
NM0021.The geoid height was determined by GEOID99.
NM0021
NM0021.The dynamic height is computed by dividing the NAVD 88
NM0021.geopotential number by the normal gravity value computed on the
NM0021.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
NM0021.degrees latitude (g = 980.6199 gals.).
NM0021
NM0021.The modeled gravity was interpolated from observed gravity values.
NM0021
NM0021; North East Units Estimated Accuracy
NM0021;SPC IA N - 1,158,770. 1,288,920. MT (+/- 180 meters Scaled)
NM0021
NM0021 SUPERSEDED SURVEY CONTROL
NM0021
NM0021 NGVD 29 - 380.494 (m) 1248.34 (f) ADJ UNCH 2 0
NM0021
NM0021.Superseded values are not recommended for survey control.
NM0021.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
NM0021.See file dsdata.txt to determine how the superseded data were derived.
NM0021
NM0021_MARKER: DB = BENCH MARK DISK
NM0021_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
NM0021_STAMPING: W 15 1934
NM0021_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
NM0021+STABILITY: SURFACE MOTION
NM0021
NM0021 HISTORY - Date Condition Recov. By
NM0021 HISTORY - 1934 MONUMENTED CGS
NM0021 HISTORY - 1962 MARK NOT FOUND NGS
NM0021
NM0021 STATION DESCRIPTION
NM0021
NM0021'DESCRIBED BY NATIONAL GEODETIC SURVEY 1962
NM0021'4 MI N FROM SENEY.

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NM0021'IN SIOUX COUNTY, 4 MILES NORTH ALONG THE SOO LINE RAILROAD,  
NM0021'FORMERLY, (C.ST.P.M. AND O.RWY.) FROM THE STATION AT SENEY,  
NM0021'PLYMOUTH COUNTY, 119 YARDS SOUTH OF MILEPOST 235, 20 YARDS  
NM0021'SOUTHEAST OF IRON CULVERT 786-1/2, 46.6 FEET EAST OF THE EAST  
NM0021'RAIL, AND 1.7 FEET WEST OF THE RIGHT-OF-WAY FENCE. A STANDARD  
NM0021'DISK, STAMPED W 15 1934 AND SET IN THE TOP OF A CONCRETE POST  
NM0021'PROJECTING 6 INCHES ABOVE GROUND.

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

OQ0123 \*\*\*\*\*

OQ0123 DESIGNATION - W 12  
 OQ0123 PID - OQ0123  
 OQ0123 STATE/COUNTY- IA/SIOUX  
 OQ0123 USGS QUAD - HULL (1964)

OQ0123  
 OQ0123 \*CURRENT SURVEY CONTROL

OQ0123*	NAD 83(1986)-	43 11 30.	(N)	096 12 57.	(W)	SCALED
OQ0123*	NAVD 88	-	418.871	(meters)	1374.25	(feet) ADJUSTED

OQ0123	GEOID HEIGHT-	-26.47	(meters)			GEOID99
OQ0123	DYNAMIC HT -	418.752	(meters)	1373.86	(feet)	COMP
OQ0123	MODELED GRAV-	980,324.2	(mgal)			NAVD 88

OQ0123 VERT ORDER - SECOND CLASS 0

OQ0123.The horizontal coordinates were scaled from a topographic map and have  
 OQ0123.an estimated accuracy of +/- 6 seconds.

OQ0123.The orthometric height was determined by differential leveling  
 OQ0123.and adjusted by the National Geodetic Survey in June 1991.

OQ0123.The geoid height was determined by GEOID99.

OQ0123.The dynamic height is computed by dividing the NAVD 88  
 OQ0123.geopotential number by the normal gravity value computed on the  
 OQ0123.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 OQ0123.degrees latitude (g = 980.6199 gals.).

OQ0123.The modeled gravity was interpolated from observed gravity values.

OQ0123;		North	East	Units	Estimated Accuracy
OQ0123;SPC IA N	-	1,191,460.	1,279,280.	MT	(+/- 180 meters

Scaled)

OQ0123 SUPERSEDED SURVEY CONTROL

OQ0123	NGVD 29	-	418.656	(m)	1373.54	(f) ADJ UNCH	2 0
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OQ0123.Superseded values are not recommended for survey control.  
 OQ0123.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 OQ0123.See file dsdata.txt to determine how the superseded data were derived.

OQ0123\_MARKER: DB = BENCH MARK DISK  
 OQ0123\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 OQ0123\_STAMPING: W 12 1934  
 OQ0123\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 OQ0123+STABILITY: SURFACE MOTION

OQ0123	HISTORY	- Date	Condition	Recov. By
OQ0123	HISTORY	- 1934	MONUMENTED	CGS
OQ0123	HISTORY	- 1973	GOOD	IAHD

OQ0123 STATION DESCRIPTION

OQ0123'DESCRIBED BY COAST AND GEODETIC SURVEY 1934

QQ0123'4.2 MI E FROM ROCK VALLEY.  
QQ0123'4.2 MILES EAST ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC  
QQ0123'RAILROAD FROM THE STATION AT ROCK VALLEY, 1.4 MILES WEST OF THE  
QQ0123'CROSSING OF THE GREAT NORTHERN RAILWAY, 58.0 FEET SOUTHEAST OF  
QQ0123'THE CROSSING OF A NORTH-AND-SOUTH SECTION ROAD, 49.0 FEET EAST  
QQ0123'OF THE CENTERLINE OF THE ROAD, 44.5 FEET SOUTH OF THE SOUTH  
QQ0123'RAIL, AND 13.5 FEET EAST OF A RIGHT-OF-WAY FENCE CORNER. A  
QQ0123'STANDARD DISK, STAMPED W 12 1934 AND SET IN THE TOP OF A CONCRETE  
QQ0123'POST PROJECTING 5 INCHES ABOVE GROUND.

QQ0123

STATION RECOVERY (1973)

QQ0123

QQ0123

QQ0123'RECOVERY NOTE BY IOWA HIGHWAY DEPARTMENT 1973

QQ0123'RECOVERED IN GOOD CONDITION.

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

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OQ0177 *****
OQ0177 DESIGNATION - B 155
OQ0177 PID - OQ0177
OQ0177 STATE/COUNTY- IA/LYON
OQ0177 USGS QUAD - CANTON (1978)
OQ0177
OQ0177 *CURRENT SURVEY CONTROL
OQ0177
OQ0177* NAD 83(1986)- 43 16 20. (N) 096 33 57. (W) SCALED
OQ0177* NAVD 88 - 377.981 (meters) 1240.09 (feet) ADJUSTED
OQ0177
OQ0177 GEOID HEIGHT- -26.34 (meters) GEOID99
OQ0177 DYNAMIC HT - 377.878 (meters) 1239.75 (feet) COMP
OQ0177 MODELED GRAV- 980,335.6 (mgal) NAVD 88
OQ0177
OQ0177 VERT ORDER - FIRST CLASS II
OQ0177
OQ0177.The horizontal coordinates were scaled from a topographic map and have
OQ0177.an estimated accuracy of +/- 6 seconds.
OQ0177
OQ0177.The orthometric height was determined by differential leveling
OQ0177.and adjusted by the National Geodetic Survey in June 1991.
OQ0177
OQ0177.The geoid height was determined by GEOID99.
OQ0177
OQ0177.The dynamic height is computed by dividing the NAVD 88
OQ0177.geopotential number by the normal gravity value computed on the
OQ0177.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
OQ0177.degrees latitude (g = 980.6199 gals.).
OQ0177
OQ0177.The modeled gravity was interpolated from observed gravity values.
OQ0177
OQ0177; North East Units Estimated Accuracy
OQ0177;SPC IA N - 1,201,370. 1,251,170. MT (+/- 180 meters Scaled)
OQ0177
OQ0177 SUPERSEDED SURVEY CONTROL
OQ0177
OQ0177 NGVD 29 - 377.748 (m) 1239.33 (f) ADJ UNCH 1 2
OQ0177
OQ0177.Superseded values are not recommended for survey control.
OQ0177.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
OQ0177.See file dsdata.txt to determine how the superseded data were derived.
OQ0177
OQ0177_MARKER: DB = BENCH MARK DISK
OQ0177_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
OQ0177_STAMPING: B 155 1949
OQ0177_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
OQ0177+STABILITY: SURFACE MOTION
OQ0177
OQ0177 HISTORY - Date Condition Recov. By
OQ0177 HISTORY - 1949 MONUMENTED CGS
OQ0177
OQ0177 STATION DESCRIPTION
OQ0177
OQ0177'DESCRIBED BY COAST AND GEODETIC SURVEY 1949
OQ0177'2.6 MI SE FROM CANTON.
OQ0177'2.65 MILES SOUTH ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND

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QQ0177'PACIFIC RAILROAD FROM THE RAILROAD STATION AT CANTON, 126.0  
QQ0177'FEET SOUTHWEST OF BRIDGE T-646, 46.0 FEET WEST OF THE WEST RAIL,  
QQ0177'16.0 FEET NORTHWEST OF THE 10TH POLE NORTH OF MILEPOST 47,  
QQ0177'2.0 FEET EAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTH OF A  
QQ0177'REFERENCE POST, AND SET IN THE TOP OF A CONCRETE POST PROJECTING  
QQ0177'0.5 FOOT ABOVE THE GROUND.

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

QQ0180 \*\*\*\*\*  
 QQ0180 DESIGNATION - D  
 QQ0180 PID - QQ0180  
 QQ0180 STATE/COUNTY- IA/SIOUX  
 QQ0180 USGS QUAD - ALCESTER NE (1978)  
 QQ0180  
 QQ0180 \*CURRENT SURVEY CONTROL  
 QQ0180  

QQ0180*	NAD 83(1986)-	43 14 38.	(N)	096 32 46.	(W)	SCALED
QQ0180*	NAVD 88	-	390.305	(meters)	1280.53	(feet) ADJUSTED

QQ0180	GEOID HEIGHT-	-26.32	(meters)			GEOID99
QQ0180	DYNAMIC HT -	390.197	(meters)	1280.17	(feet)	COMP
QQ0180	MODELED GRAV-	980,332.4	(mgal)			NAVD 88

  
 QQ0180 VERT ORDER - FIRST CLASS II  
 QQ0180  
 QQ0180.The horizontal coordinates were scaled from a topographic map and have  
 QQ0180.an estimated accuracy of +/- 6 seconds.  
 QQ0180  
 QQ0180.The orthometric height was determined by differential leveling  
 QQ0180.and adjusted by the National Geodetic Survey in June 1991.  
 QQ0180  
 QQ0180.The geoid height was determined by GEOID99.  
 QQ0180  
 QQ0180.The dynamic height is computed by dividing the NAVD 88  
 QQ0180.geopotential number by the normal gravity value computed on the  
 QQ0180.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 QQ0180.degrees latitude (g = 980.6199 gals.).  
 QQ0180  
 QQ0180.The modeled gravity was interpolated from observed gravity values.  
 QQ0180  

QQ0180;	North	East	Units	Estimated Accuracy
QQ0180;SPC IA N	- 1,198,170.	1,252,660.	MT	(+/- 180 meters Scaled)

  
 QQ0180  
 QQ0180 SUPERSEDED SURVEY CONTROL  
 QQ0180  

QQ0180	NGVD 29	-	390.072	(m)	1279.76	(f) ADJ UNCH	1 2
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 QQ0180  
 QQ0180.Superseded values are not recommended for survey control.  
 QQ0180.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 QQ0180.See file dsdata.txt to determine how the superseded data were derived.  
 QQ0180  
 QQ0180 MARKER: P = PIPE CAP  
 QQ0180 SETTING: 17 = SET INTO TOP OF METAL PIPE DRIVEN INTO GROUND  
 QQ0180 STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY  
 QQ0180  

QQ0180	HISTORY	- Date	Condition	Recov. By
QQ0180	HISTORY	- UNK	MONUMENTED	CGS
QQ0180	HISTORY	- 1949	GOOD	NGS

  
 QQ0180  
 QQ0180 STATION DESCRIPTION  
 QQ0180  
 QQ0180'DESCRIBED BY NATIONAL GEODETIC SURVEY 1949  
 QQ0180'3.6 MI NW FROM FAIRVIEW.  
 QQ0180'3.6 MILES NORTHWEST ALONG THE CHICAGO, MILWAUKEE, ST. PAUL  
 QQ0180'AND PACIFIC RAILROAD FROM THE RAILROAD STATION AT FAIRVIEW,

QQ0180'2 POLES NORTH OF MILEPOST 45, 45.0 FEET WEST OF THE WEST  
QQ0180'RAIL, 26.0 FEET NORTH OF THE CENTER LINE OF AN EAST-WEST  
QQ0180'ROAD, 3.0 FEET EAST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT EAST  
QQ0180'OF A REFERENCE POST, A 3-INCH RED METAL CAP SCREWED ON THE  
QQ0180'TOP OF A 3-INCH IRON PIPE PROJECTING 0.2 FOOT ABOVE THE  
QQ0180'GROUND.

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

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OQ0131 *****
OQ0131 DESIGNATION - G 326
OQ0131 PID - OQ0131
OQ0131 STATE/COUNTY- SD/LINCOLN
OQ0131 USGS QUAD - FAIRVIEW (1968)
OQ0131
OQ0131 *CURRENT SURVEY CONTROL
OQ0131
OQ0131* NAD 83(1986)- 43 13 19. (N) 096 29 05. (W) SCALED
OQ0131* NAVD 88 - 369.892 (meters) 1213.55 (feet) ADJUSTED
OQ0131
OQ0131 GEOID HEIGHT- -26.33 (meters) GEOID99
OQ0131 DYNAMIC HT - 369.791 (meters) 1213.22 (feet) COMP
OQ0131 MODELED GRAV- 980,335.6 (mgal) NAVD 88
OQ0131
OQ0131 VERT ORDER - FIRST CLASS II
OQ0131
OQ0131.The horizontal coordinates were scaled from a topographic map and have
OQ0131.an estimated accuracy of +/- 6 seconds.
OQ0131
OQ0131.The orthometric height was determined by differential leveling
OQ0131.and adjusted by the National Geodetic Survey in June 1991.
OQ0131
OQ0131.The geoid height was determined by GEOID99.
OQ0131
OQ0131.The dynamic height is computed by dividing the NAVD 88
OQ0131.geopotential number by the normal gravity value computed on the
OQ0131.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
OQ0131.degrees latitude (g = 980.6199 gals.).
OQ0131
OQ0131.The modeled gravity was interpolated from observed gravity values.
OQ0131
OQ0131; North East Units Estimated Accuracy
OQ0131;SPC SD S - 105,960. 912,550. MT (+/- 180 meters Scaled)
OQ0131
OQ0131 SUPERSEDED SURVEY CONTROL
OQ0131
OQ0131 NGVD 29 - 369.663 (m) 1212.80 (f) ADJ UNCH 1 2
OQ0131
OQ0131.Superseded values are not recommended for survey control.
OQ0131.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
OQ0131.See file dsdata.txt to determine how the superseded data were derived.
OQ0131
OQ0131_MARKER: DB = BENCH MARK DISK
OQ0131_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
OQ0131_STAMPING: G 326 1949
OQ0131_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
OQ0131+STABILITY: SURFACE MOTION
OQ0131
OQ0131 HISTORY - Date Condition Recov. By
OQ0131 HISTORY - 1949 MONUMENTED CGS
OQ0131
OQ0131 STATION DESCRIPTION
OQ0131
OQ0131'DESCRIBED BY COAST AND GEODETIC SURVEY 1949
OQ0131'AT FAIRVIEW.
OQ0131'AT FAIRVIEW, 123.7 FEET NORTH OF THE NORTH CORNER OF THE RAILROAD

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QQ0131'STATION, 190.0 FEET EAST OF THE EAST CORNER OF THE ELEVATOR, 96.6  
QQ0131'FEET NORTHEAST OF THE NORTHEAST RAIL OF THE TRACK, 23.0 FEET  
QQ0131'NORTHWEST OF THE CENTER OF AN IRON FRAME GATE, 9.6 FEET SOUTH  
QQ0131'OF A POLE, 1.7 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.4 FEET  
QQ0131'NORTHWEST OF A REFERENCE POST, AND SET IN THE TOP OF A CONCRETE  
QQ0131'POST PROJECTING 0.5 FOOT ABOVE THE GROUND.

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

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OQ0139 *****
OQ0139 DESIGNATION - E 326
OQ0139 PID - OQ0139
OQ0139 STATE/COUNTY- SD/LINCOLN
OQ0139 USGS QUAD - FAIRVIEW (1968)
OQ0139
OQ0139 *CURRENT SURVEY CONTROL
OQ0139
OQ0139* NAD 83(1986)- 43 07 36. (N) 096 27 16. (W) SCALED
OQ0139* NAVD 88 - 373.154 (meters) 1224.26 (feet) ADJUSTED
OQ0139
OQ0139 GEOID HEIGHT- -26.21 (meters) GEOID99
OQ0139 DYNAMIC HT - 373.049 (meters) 1223.91 (feet) COMP
OQ0139 MODELED GRAV- 980,329.3 (mgal) NAVD 88
OQ0139
OQ0139 VERT ORDER - FIRST CLASS II
OQ0139
OQ0139.The horizontal coordinates were scaled from a topographic map and have
OQ0139.an estimated accuracy of +/- 6 seconds.
OQ0139
OQ0139.The orthometric height was determined by differential leveling
OQ0139.and adjusted by the National Geodetic Survey in June 1991.
OQ0139
OQ0139.The geoid height was determined by GEOID99.
OQ0139
OQ0139.The dynamic height is computed by dividing the NAVD 88
OQ0139.geopotential number by the normal gravity value computed on the
OQ0139.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
OQ0139.degrees latitude (g = 980.6199 gals.).
OQ0139
OQ0139.The modeled gravity was interpolated from observed gravity values.
OQ0139
OQ0139; North East Units Estimated Accuracy
OQ0139;SPC SD S - 95,500. 915,510. MT (+/- 180 meters Scaled)
OQ0139
OQ0139 SUPERSEDED SURVEY CONTROL
OQ0139
OQ0139 NGVD 29 - 372.928 (m) 1223.51 (f) ADJ UNCH 1 2
OQ0139
OQ0139.Superseded values are not recommended for survey control.
OQ0139.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
OQ0139.See file dsdata.txt to determine how the superseded data were derived.
OQ0139
OQ0139 MARKER: DB = BENCH MARK DISK
OQ0139 SETTING: 36 = BUILDING
OQ0139 STAMPING: E 326 1949
OQ0139 STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
OQ0139
OQ0139 HISTORY - Date Condition Recov. By
OQ0139 HISTORY - 1949 MONUMENTED CGS
OQ0139
OQ0139 STATION DESCRIPTION
OQ0139
OQ0139'DESCRIBED BY COAST AND GEODETIC SURVEY 1949
OQ0139'AT HUDSON.
OQ0139'AT HUDSON, AT THE NORTHWEST CORNER OF THE INTERSECTION OF FOURTH
OQ0139'AND WHELLOCK STREET, 1.4 FEET EAST OF THE SOUTHWEST CORNER OF AND

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QQ0139'SET VERTICALLY 3.2 FEET ABOVE THE SIDEWALK IN THE SOUTH BRICK  
QQ0139'WALL OF A BUILDING OWNED BY C.O. BEMISS AND OCCUPIED BY THE  
QQ0139'HUDSON OFFICE OF THE FAIRVIEW STATE BANK, 0.7 FOOT WEST OF THE  
QQ0139'WEST END OF THE BOTTOM OF THE WEST WINDOW SILL.

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

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QQ0144 *****
QQ0144 DESIGNATION - A 326
QQ0144 PID - QQ0144
QQ0144 STATE/COUNTY- SD/UNION
QQ0144 USGS QUAD - HAWARDEN NORTH (1968)
QQ0144
QQ0144 *CURRENT SURVEY CONTROL
QQ0144
QQ0144* NAD 83(1986)- 43 03 52. (N) 096 29 21. (W) SCALED
QQ0144* NAVD 88 - 362.932 (meters) 1190.72 (feet) ADJUSTED
QQ0144
QQ0144 GEOID HEIGHT- -26.07 (meters) GEOID99
QQ0144 DYNAMIC HT - 362.831 (meters) 1190.39 (feet) COMP
QQ0144 MODELED GRAV- 980,331.5 (mgal) NAVD 88
QQ0144
QQ0144 VERT ORDER - FIRST CLASS II
QQ0144
QQ0144.The horizontal coordinates were scaled from a topographic map and have
QQ0144.an estimated accuracy of +/- 6 seconds.
QQ0144
QQ0144.The orthometric height was determined by differential leveling
QQ0144.and adjusted by the National Geodetic Survey in June 1991.
QQ0144
QQ0144.The geoid height was determined by GEOID99.
QQ0144
QQ0144.The dynamic height is computed by dividing the NAVD 88
QQ0144.geopotential number by the normal gravity value computed on the
QQ0144.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
QQ0144.degrees latitude (g = 980.6199 gals.).
QQ0144
QQ0144.The modeled gravity was interpolated from observed gravity values.
QQ0144
QQ0144; North East Units Estimated Accuracy
QQ0144;SPC SD S - 88,470. 913,000. MT (+/- 180 meters Scaled)
QQ0144
QQ0144 SUPERSEDED SURVEY CONTROL
QQ0144
QQ0144 NGVD 29 - 362.716 (m) 1190.01 (f) ADJ UNCH 1 2
QQ0144
QQ0144.Superseded values are not recommended for survey control.
QQ0144.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
QQ0144.See file dsdata.txt to determine how the superseded data were derived.
QQ0144
QQ0144 MARKER: DB = BENCH MARK DISK
QQ0144 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
QQ0144 STAMPING: A 326 1949
QQ0144 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
QQ0144+STABILITY: SURFACE MOTION
QQ0144
QQ0144 HISTORY - Date Condition Recov. By
QQ0144 HISTORY - 1949 MONUMENTED CGS
QQ0144
QQ0144 STATION DESCRIPTION
QQ0144
QQ0144'DESCRIBED BY COAST AND GEODETIC SURVEY 1949
QQ0144'4.9 MI N FROM HAWARDEN.
QQ0144'4.9 MILES NORTH ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND

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QQ0144'PACIFIC RAILROAD FROM THE RAILROAD STATION AT HAWARDEN, 3 POLES  
QQ0144'SOUTH OF MILE POST 30, 130.0 FEET SOUTH OF THE CENTER OF A WOODEN  
QQ0144'GATE, 124.0 FEET EAST OF THE CENTER LINE OF STATE HIGHWAY 46,  
QQ0144'46.0 FEET EAST OF THE EAST RAIL, 1.0 FOOT WEST OF THE  
QQ0144'RIGHT-OF-WAY FENCE, 1.4 FEET NORTH OF A REFERENCE POST, AND SET  
QQ0144'IN THE TOP OF A CONCRETE POST PROJECTING 0.5 FOOT ABOVE THE  
QQ0144'GROUND. 1.1 MILES SOUTH OF BENCH MARK C 326 WHICH IS DESCRIBED  
QQ0144'FROM HUDSON, SOUTH DAKOTA.

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

NM0809 \*\*\*\*\*

NM0809 DESIGNATION - B 154  
 NM0809 PID - NM0809  
 NM0809 STATE/COUNTY- IA/PLYMOUTH  
 NM0809 USGS QUAD - CHATSWORTH (1969)

NM0809 \*CURRENT SURVEY CONTROL

NM0809*	NAD 83(1986)-	42 54 12.	(N)	096 30 59.	(W)	SCALED
NM0809*	NAVD 88	- 351.829	(meters)	1154.29	(feet)	ADJUSTED

NM0809	GEOID HEIGHT-	-25.77	(meters)			GEOID99
NM0809	DYNAMIC HT -	351.736	(meters)	1153.99	(feet)	COMP
NM0809	MODELED GRAV-	980,345.8	(mgal)			NAVD 88

NM0809 VERT ORDER - FIRST CLASS II

NM0809.The horizontal coordinates were scaled from a topographic map and have  
 NM0809.an estimated accuracy of +/- 6 seconds.

NM0809.The orthometric height was determined by differential leveling  
 NM0809.and adjusted by the National Geodetic Survey in June 1991.

NM0809.The geoid height was determined by GEOID99.

NM0809.The dynamic height is computed by dividing the NAVD 88  
 NM0809.geopotential number by the normal gravity value computed on the  
 NM0809.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 NM0809.degrees latitude (g = 980.6199 gals.).

NM0809.The modeled gravity was interpolated from observed gravity values.

	North	East	Units	Estimated Accuracy
NM0809; SPC IA N	- 1,160,270.	1,253,720.	MT	(+/- 180 meters Scaled)

NM0809 SUPERSEDED SURVEY CONTROL

NM0809	NGVD 29	- 351.632	(m)	1153.65	(f)	ADJ UNCH	1 2
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NM0809.Superseded values are not recommended for survey control.  
 NM0809.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 NM0809.See file dsdata.txt to determine how the superseded data were derived.

NM0809\_MARKER: DB = BENCH MARK DISK  
 NM0809\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 NM0809\_STAMPING: B 154 1949  
 NM0809\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 NM0809\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 NM0809+STABILITY: SURFACE MOTION

HISTORY	Date	Condition	Recov. By
NM0809	- 1949	MONUMENTED	CGS
NM0809	- 1952	GOOD	NGS
NM0809	- 19641014	GOOD	LOCENG

NM0809 STATION DESCRIPTION

NM0809

NM0809'DESCRIBED BY COAST AND GEODETIC SURVEY 1949

NM0809'0.8 MI S FROM CHATSWORTH.

NM0809'0.75 MILE SOUTH ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC

NM0809'RAILROAD FROM THE RAILROAD STATION AT CHATSWORTH, 0.4 MILE SOUTH

NM0809'OF THE COUNTY LINE, 19 RAILS NORTH OF A 24-INCH CONCRETE (TWIN)

NM0809'TUBE CULVERT, 8 POLES NORTH OF MILEPOST 18, 45.8 FEET EAST OF THE

NM0809'EAST RAIL, 1.3 FEET WEST OF A RIGHT-OF-WAY FENCE, 1.6 FEET NORTH

NM0809'OF A REFERENCE POST, AND SET IN THE TOP OF A CONCRETE POST

NM0809'PROJECTING 0.5 FOOT ABOVE THE GROUND.

NM0809

STATION RECOVERY (1952)

NM0809

NM0809

NM0809'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1952

NM0809'RECOVERED IN GOOD CONDITION.

NM0809

NM0809

STATION RECOVERY (1964)

NM0809

NM0809'RECOVERY NOTE BY LOCAL ENGINEER (INDIVIDUAL OR FIRM) 1964

NM0809'RECOVERED IN GOOD CONDITION. NOTE--REMOVE FROM DESCRIPTION 19 RAILS

NM0809'NORTH OF A 24 INCH CONCRETE TWIN TUBE CULVERT, REPLACE AS FOLLOWS, 20

NM0809'RAILS NORTH OF A 36 INCH CAST IRON TWIN TUBE CULVERT.

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

**Section 5**  
**Sioux County Monument**  
**Data Sheets**

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

GPS POINT NUMBER      **G100**

	US SURVEY FEET	METRIC
Northing:	3803854.662	1159417.220
Easting:	4289232.928	1307360.811
Elevation:	1420.059	432.835
Ellipsoid Height:	1331.789	405.930
Geoid 99 Height:	-88.270	-26.905

Latitude:                      42° 54' 39.54438" N

Longitude:                    95° 51' 34.18141" W

Scale Factor:                0.9999543654

Convergence:               -1° 35' 56.9"

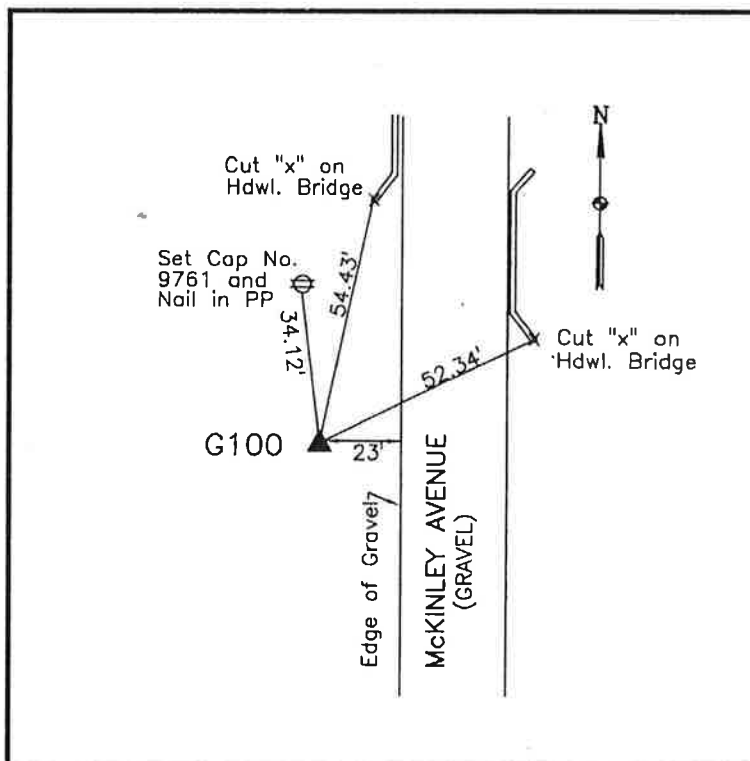
Combined Factor:           0.99989083

Description:

Placed 3/4" X 6" - 0" Long  
Aluminum Rod with Cap  
Stamped G100 and NGS Style  
Access Cover 1" Deep

Location:

West side of McKinley Avenue  
0.1 mile north of 510th Street in  
Section 36, T94N, R43W near  
culvert under McKinley Avenue.



**WHKS & CO.**

G100

**SIOUX 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:	3803824.821	1159408.124
Easting:	4273486.813	1302561.386
Elevation:	1433.753	437.009
Ellipsoid Height:	1345.908	410.234
Geoid 99 Height:	-87.844	-26.775

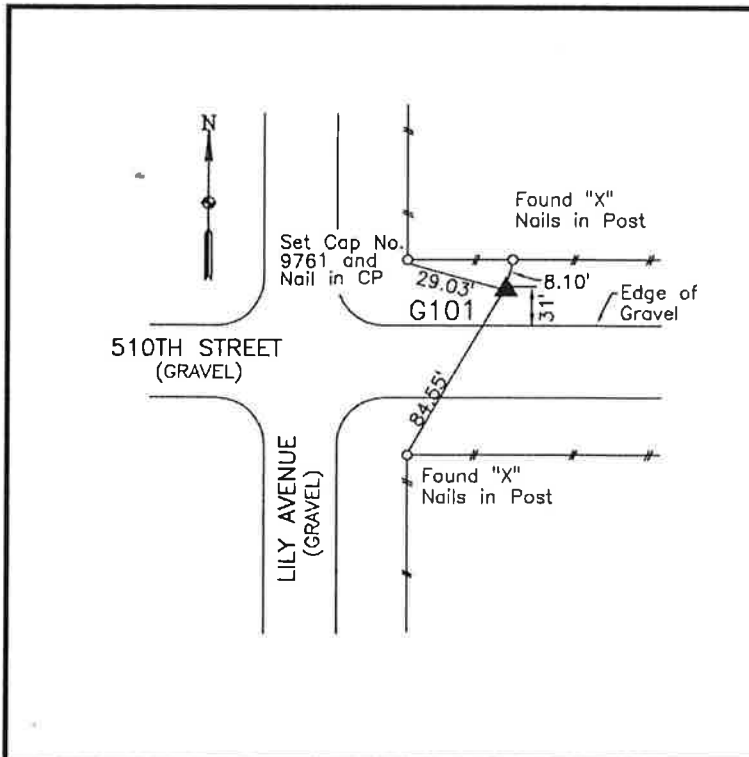
Latitude:	42° 54' 34.85522" N
Longitude:	95° 55' 05.68051" W
Scale Factor:	0.9999542693
Convergence:	-1° 38' 20.2"
Combined Factor:	0.99989006

Description:

Found Plymouth County GPS Monument 116 with NGS style access cover in Sioux County

Location:

Northeast corner of intersection of Lily Avenue and 510th Street in Section 34, T94N, R43W.



**WHKS & CO.**

**SIOUX 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:	3804314.796	1159557.469
Easting:	4257690.581	1297746.685
Elevation:	1353.479	412.541
Ellipsoid Height:	1266.032	385.887
Geoid 99 Height:	-87.447	-26.654

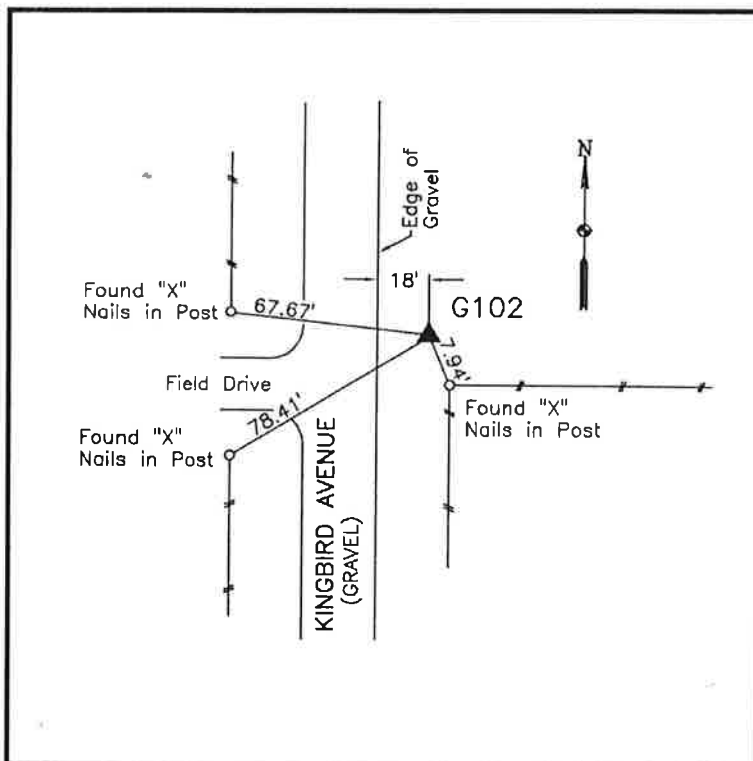
Latitude:	42° 54' 35.17595" N
Longitude:	95° 58' 38.04846" W
Scale Factor:	0.9999542758
Convergence:	-1° 40' 44.2"
Combined Factor:	0.99989387

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G102 and NGS Style Access Cover 4" Deep

**Location:**

East side Kingbird Avenue at south county line in Section 31, T94N, R43W.



**WHKS & CO.**

**SIOUX 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:	3804930.912	1159745.262
Easting:	4241868.375	1292924.067
Elevation:	1399.368	426.528
Ellipsoid Height:	1312.315	399.994
Geoid 99 Height:	-87.053	-26.534

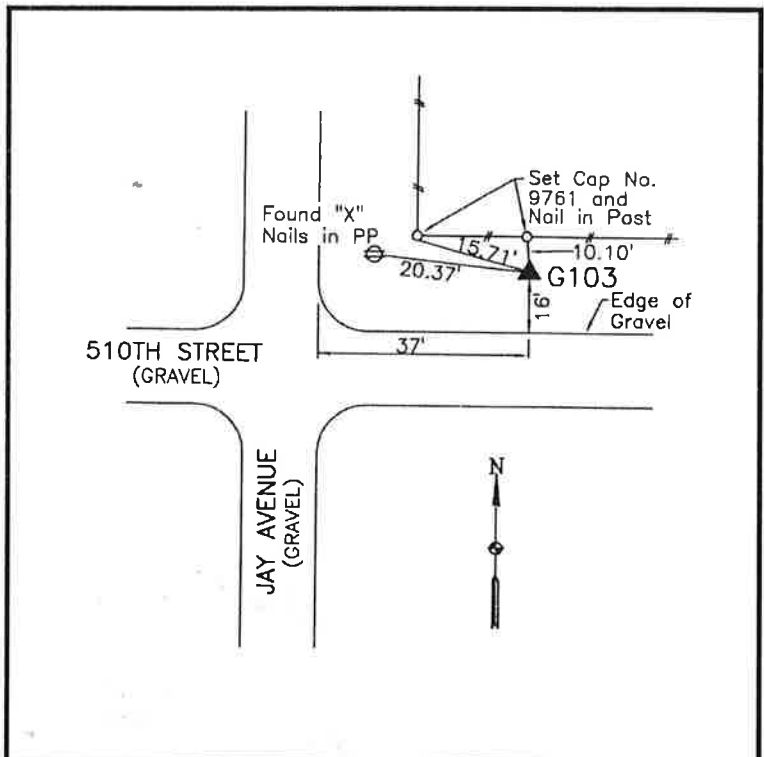
Latitude:	42° 54' 36.62548" N
Longitude:	96° 02' 10.81664" W
Scale Factor:	0.9999543055
Convergence:	-1° 43' 08.4"
Combined Factor:	0.99989170

Description:

Found Plymouth County GPS Monument 98 with NGS style access cover in Sioux County

Location:

Northeast corner of intersection Jay Avenue and 510th Street in Section 34, T94N, R44W.



**WHKS & CO.**

**SIOUX 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:	3805373.809	1159880.257
Easting:	4226301.224	1288179.189
Elevation:	1363.244	415.518
Ellipsoid Height:	1276.573	389.100
Geoid 99 Height:	-86.671	-26.417

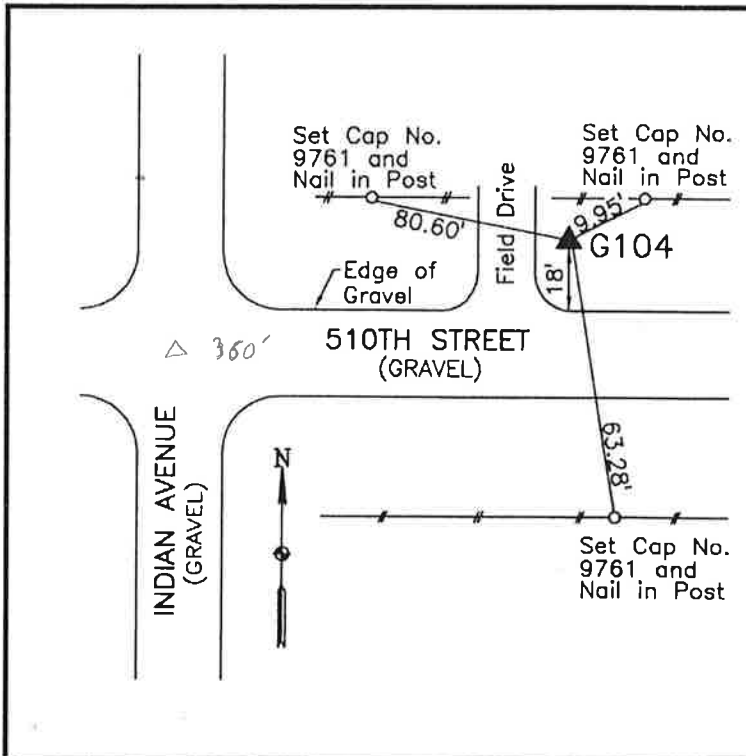
Latitude:	42° 54' 36.33277" N
Longitude:	96° 05' 40.09024" W
Scale Factor:	0.9999542995
Convergence:	-1° 45' 30.2"
Combined Factor:	0.99989340

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G104 and NGS Style Access Cover 1" Deep

**Location:**

North side 510th Street 0.1 mile east of Indian Avenue near field entrance in Section 31, T94N, R44W.



**WHKS & CO.**

**SIOUX 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:	3807410.846	1160501.147
Easting:	4210102.228	1283241.725
Elevation:	1291.716	393.716
Ellipsoid Height:	1205.408	367.409
Geoid 99 Height:	-86.308	-26.307

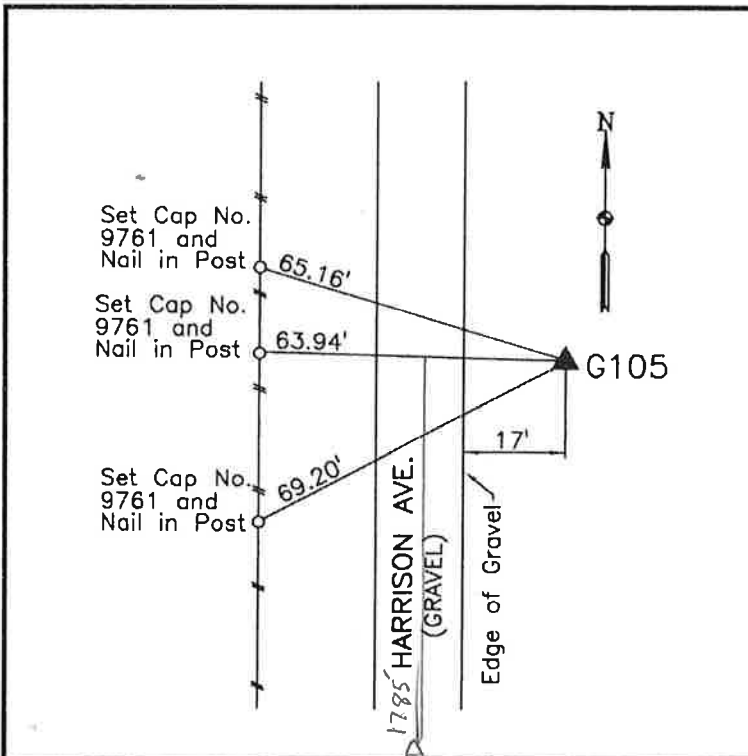
Latitude:	42° 54' 51.47719" N
Longitude:	96° 09' 18.52233" W
Scale Factor:	0.9999546124
Convergence:	-1° 47' 58.2"
Combined Factor:	0.99989710

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G105 and NGS Style  
Access Cover 2" Deep

**Location:**

East side Harrison Avenue 0.3  
mile north of 510th Street in  
Section 34, T94N, R45W.



**WHKS & CO.**

**SIOUX 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:	3807622.432	1160565.638
Easting:	4194376.060	1278448.380
Elevation:	1394.583	425.070
Ellipsoid Height:	1308.636	398.873
Geoid 99 Height:	-85.947	-26.197

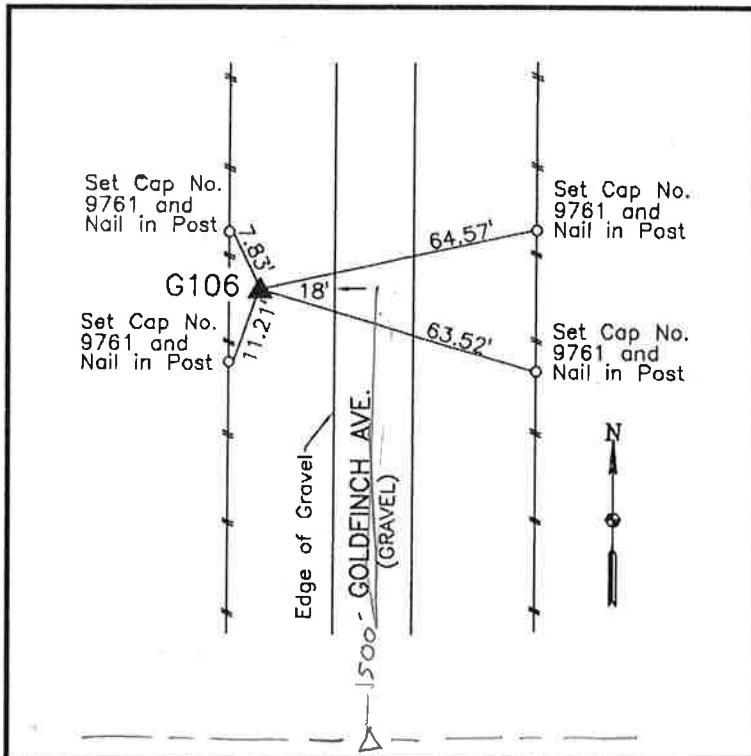
Latitude:	42° 54' 48.63422" N
Longitude:	96° 12' 49.84507" W
Scale Factor:	0.9999545532
Convergence:	-1° 50' 21.5"
Combined Factor:	0.99989212

Description:

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G106 and NGS Style Access Cover 4" Deep

Location:

West side Goldfinch Avenue  
0.3 mile north of 510th Street in  
Section 36, T94N, R46W.



**WHKS & CO.**

**SIoux 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:	3807038.829	1160387.756
Easting:	4178457.824	1273596.492
Elevation:	1432.078	436.498
Ellipsoid Height:	1346.426	410.392
Geoid 99 Height:	-85.651	-26.107

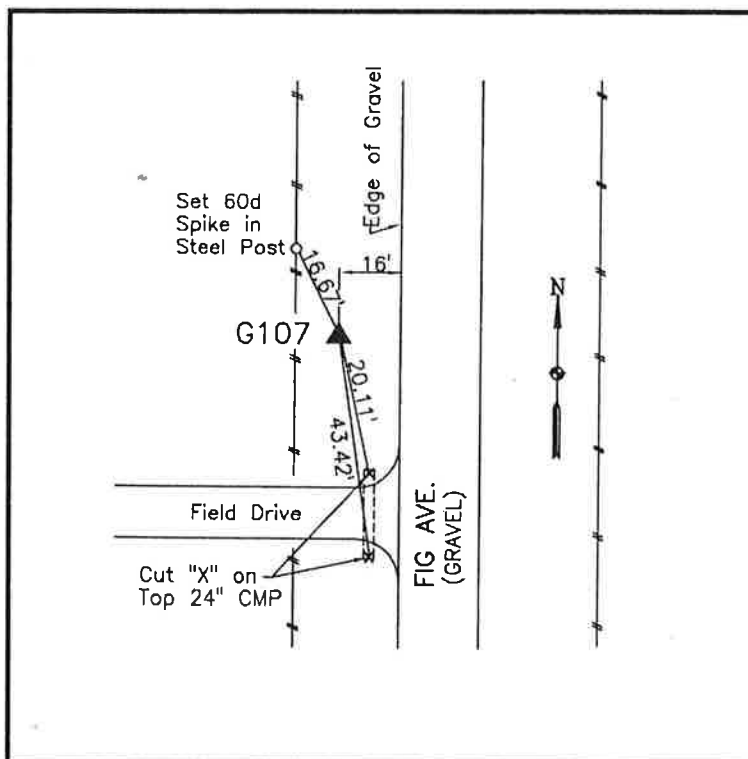
Latitude:	42° 54' 37.77072" N
Longitude:	96° 16' 23.39156" W
Scale Factor:	0.9999543290
Convergence:	-1° 52' 46.2"
Combined Factor:	0.99989009

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G107 and NGS Style Access Cover 1" Deep

**Location:**

West side Fig Avenue 0.1 mile north of 510th Street in Section 33, T94N, R46W.



**WHKS & CO.**

**SIOUX 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:	3807298.575	1160466.927
Easting:	4162752.456	1268809.486
Elevation:	1424.589	434.216
Ellipsoid Height:	1339.161	408.177
Geoid 99 Height:	-85.428	-26.039

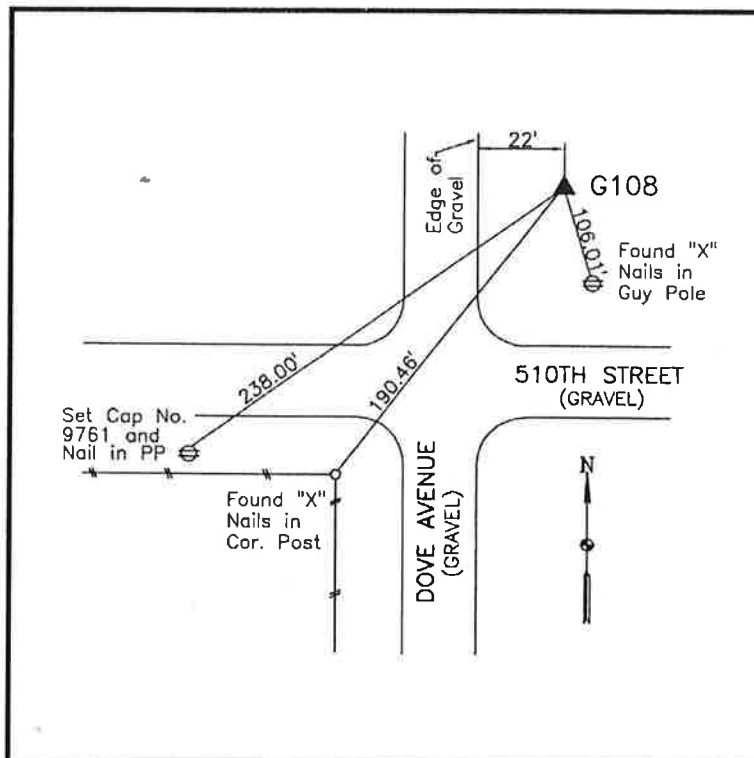
Latitude:	42° 54' 35.19325" N
Longitude:	96° 19' 54.43798" W
Scale Factor:	0.9999542762
Convergence:	-1° 55' 09.2"
Combined Factor:	0.99989039

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G108 and NGS Style Access Cover 1" Deep

**Location:**

East side Dove Avenue just north of 510th Street in Section 31, T94N, R46W.



**WHKS & CO.**

**SIOUX 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:	3807781.745	1160614.197
Easting:	4146863.432	1263966.502
Elevation:	1293.937	394.393
Ellipsoid Height:	1208.752	368.428
Geoid 99 Height:	-85.185	-25.964

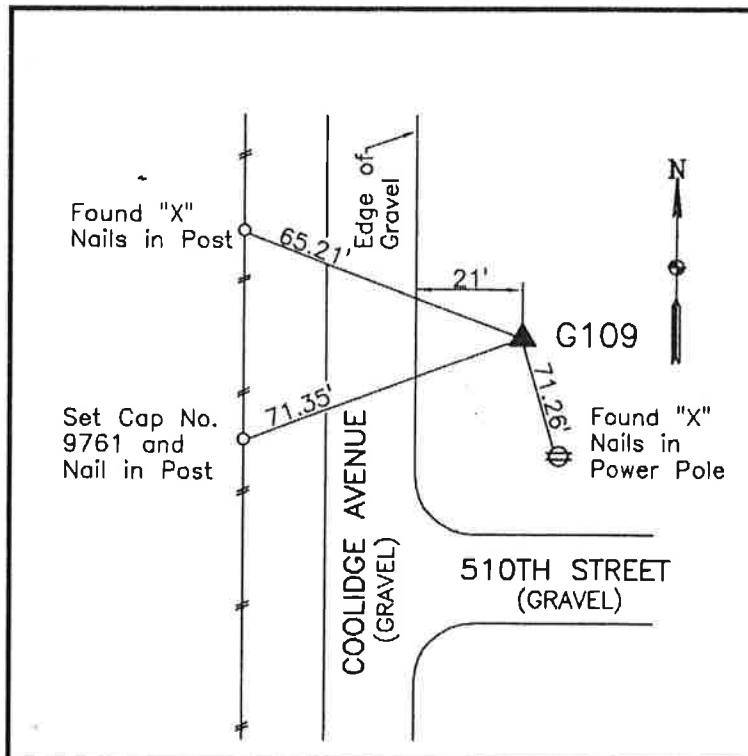
Latitude:	42° 54' 34.65182" N
Longitude:	96° 23' 28.04853" W
Scale Factor:	0.9999542651
Convergence:	-1° 57' 34.0"
Combined Factor:	0.99989660

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G109 and NGS Style Access Cover 2" Deep

**Location:**

East side Coolidge Avenue just north of 510th Street in Section 34, T94N, R47W.



**WHKS & CO.**

**SIOUX 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:	3808305.137	1160773.727
Easting:	4129759.673	1258753.266
Elevation:	1366.338	416.461
Ellipsoid Height:	1281.476	390.595
Geoid 99 Height:	-84.862	-25.866

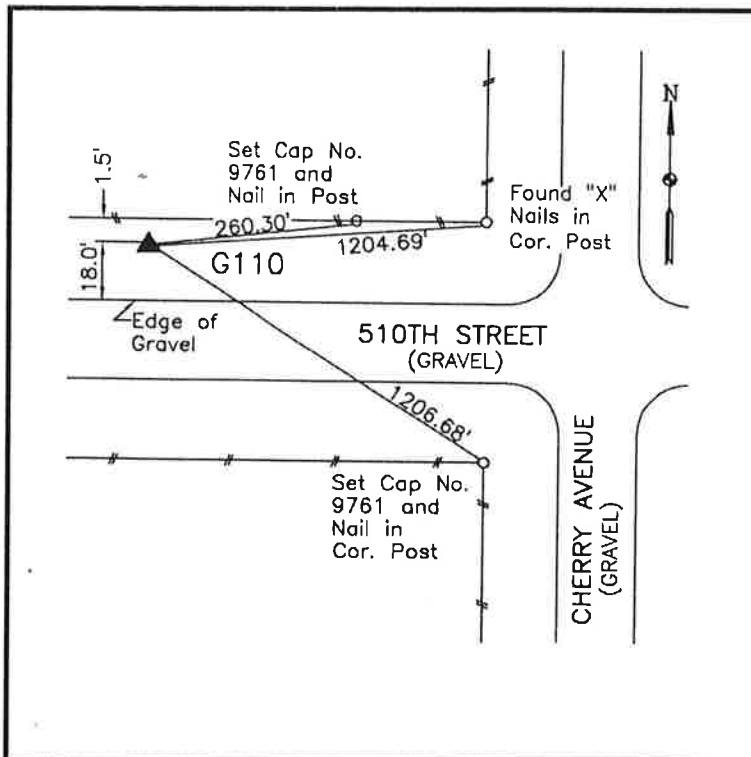
Latitude:	42° 54' 33.97823" N
Longitude:	96° 27' 17.99014" W
Scale Factor:	0.9999542513
Convergence:	-2° 00' 09.8"
Combined Factor:	0.99989311

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G110 and NGS Style Access Cover 1" Deep

**Location:**

North side of 510th Street 0.25 mile west of Cherry Avenue in Section 36, T94N, R48W.



**WHKS & CO.**

**SIoux 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:	3811376.909	1161710.005
Easting:	4112282.882	1253426.329
Elevation:	1156.463	352.491
Ellipsoid Height:	1071.911	326.719
Geoid 99 Height:	-84.553	-25.772

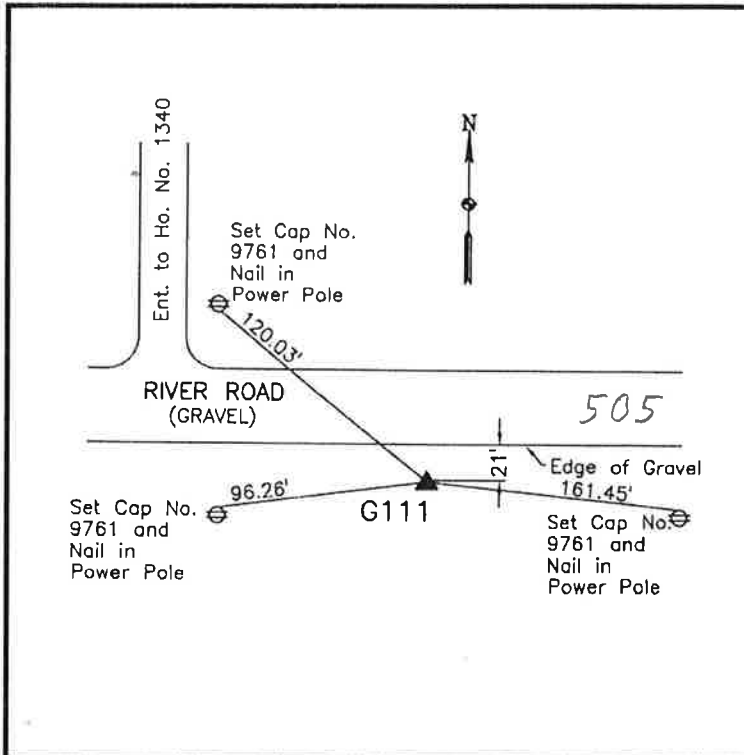
Latitude:	42° 54' 58.20163" N
Longitude:	96° 31' 14.16301" W
Scale Factor:	0.9999547530
Convergence:	-2° 02' 49.9"
Combined Factor:	0.99990361

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G111 and NGS Style Access Cover 2" Deep

**Location:**

South side of River Road across from farm at 1340 River Road address in Section 33, T94N, R48W.



**WHKS & CO.**

**SIOUX 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:	3824580.022	1165734.322
Easting:	4119440.659	1255608.024
Elevation:	1174.513	357.992
Ellipsoid Height:	1089.685	332.137
Geoid 99 Height:	-84.828	-25.856

Latitude:                      42° 57' 11.05097" N

Longitude:                    96° 29' 44.31504" W

Scale Factor:                0.9999577496

Convergence:                -2° 01' 49.0"

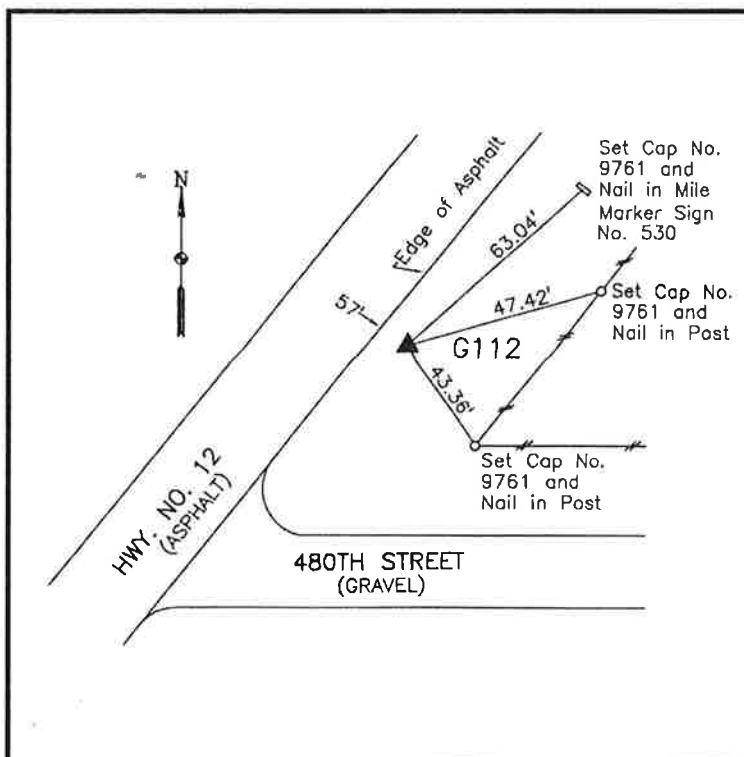
Combined Factor:            0.99990576

Description:

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G112 and NGS Style  
Access Cover 2" Deep

Location:

Northeast side of intersection  
of Iowa Highway 12 and 480th  
Street in Section 15, T94N,  
R48W. Station 529+40.



**WHKS & CO.**

**SIOUX 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:	3824132.738	1165597.990
Easting:	4131032.873	1259141.338
Elevation:	1211.749	369.342
Ellipsoid Height:	1126.713	343.423
Geoid 99 Height:	-85.036	-25.919

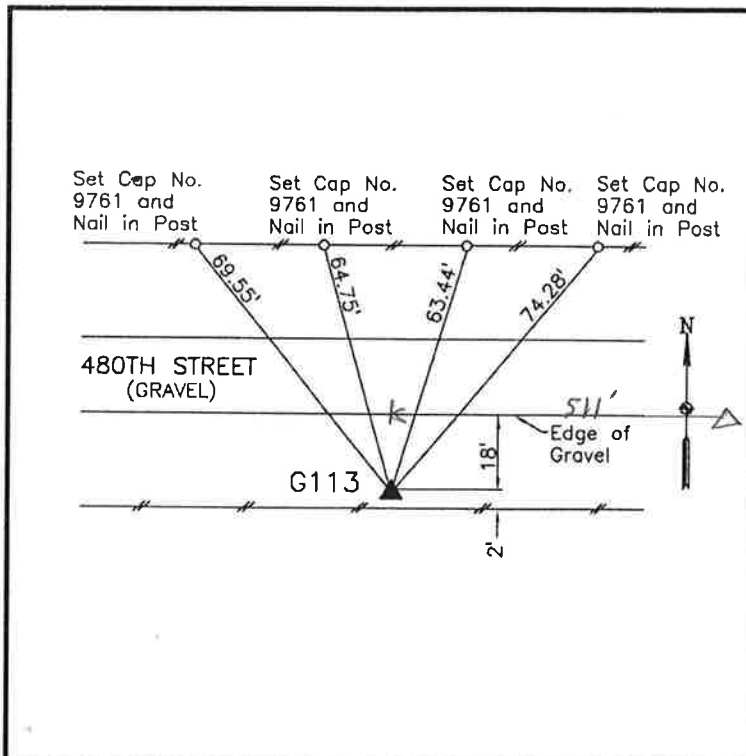
Latitude:	42° 57' 10.66286" N
Longitude:	96° 27' 08.31772" W
Scale Factor:	0.9999577403
Convergence:	-2° 00' 03.3"
Combined Factor:	0.99990399

Description:

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G113 and NGS Style Access Cover 2" Deep

Location:

South side 480th Street 0.1 mile west of Cherry Avenue in Section 24, T94N, R48W.



**WHKS & CO.**

**SIOUX 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:	3823624.377	1165443.041
Easting:	4147363.916	1264119.050
Elevation:	1380.421	420.753
Ellipsoid Height:	1295.109	394.750
Geoid 99 Height:	-85.312	-26.003

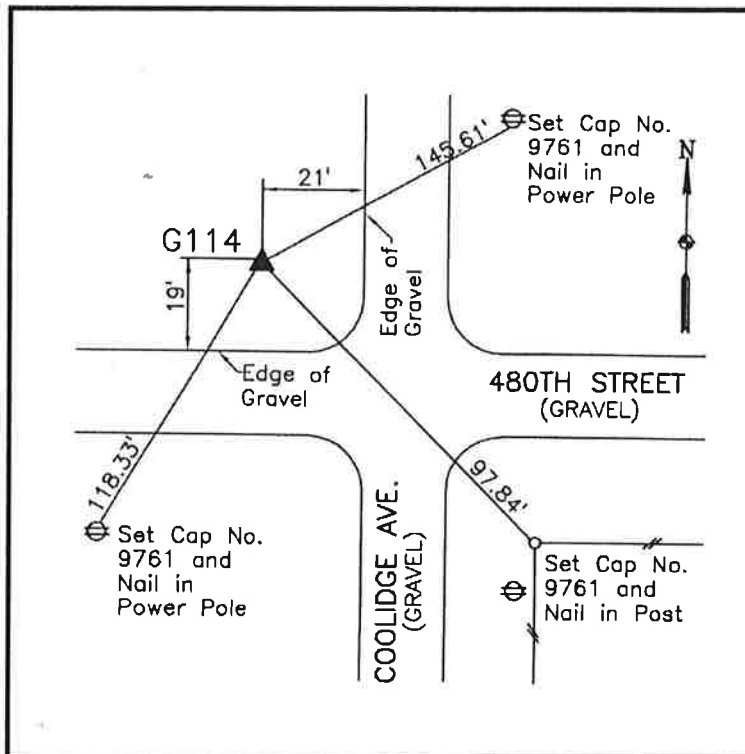
Latitude:                    42° 57' 11.21855" N  
Longitude:                  96° 23' 28.60660" W  
Scale Factor:                0.9999577537  
Convergence:                -1° 57' 34.4"  
Combined Factor:            0.99989597

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G114 and NGS Style  
Access Cover 2" Deep

**Location:**

Northwest side of intersection  
of Coolidge Avenue and 480th  
Street in Section 15, T94N,  
R47W.



**WHKS & CO.**

**SIOUX 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:	3823044.696	1165266.354
Easting:	4162063.677	1268599.546
Elevation:	1354.709	412.916
Ellipsoid Height:	1269.172	386.845
Geoid 99 Height:	-85.537	-26.072

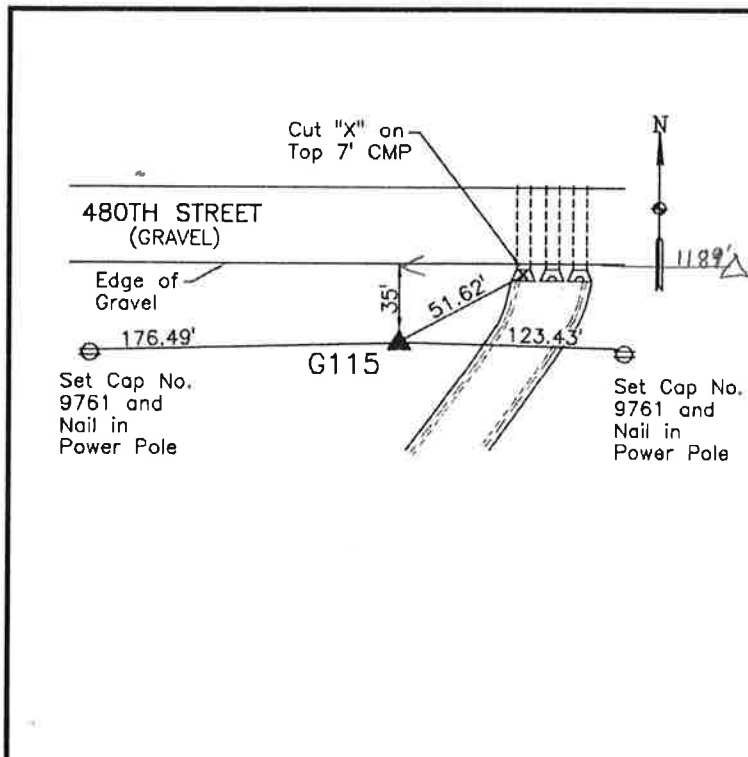
Latitude:	42° 57' 10.41370" N
Longitude:	96° 20' 10.78617" W
Scale Factor:	0.9999577343
Convergence:	-1° 55' 20.3"
Combined Factor:	0.99989718

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G115 and NGS Style Access Cover 1" Deep

**Location:**

South side 480th Street 0.2 mile west of Dove Avenue in Section 24, T94N, R47W.



**WHKS & CO.**

**SIoux 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:	3822557.782	1165117.942
Easting:	4179144.336	1273805.741
Elevation:	1402.889	427.602
Ellipsoid Height:	1317.123	401.460
Geoid 99 Height:	-85.766	-26.142

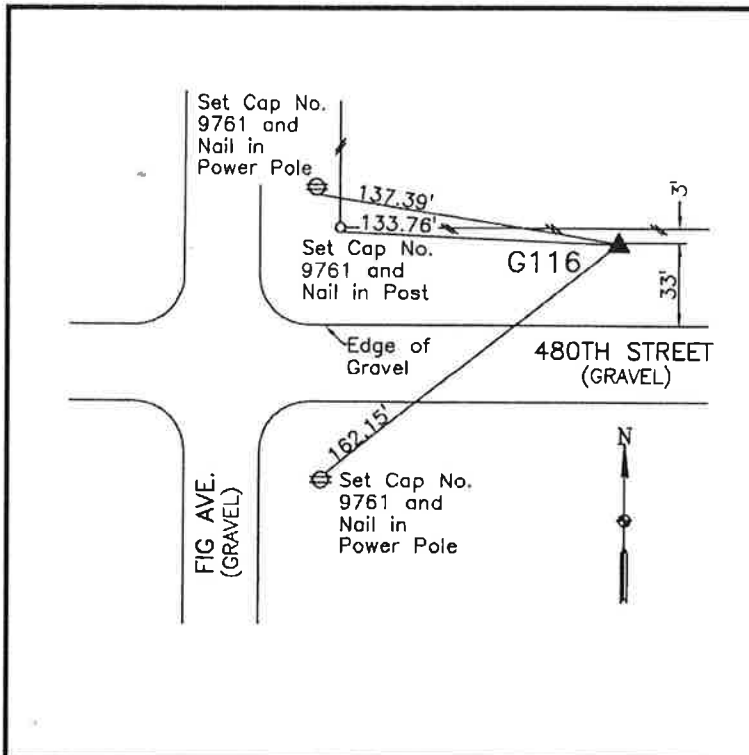
Latitude:	42° 57' 11.20262" N
Longitude:	96° 16' 21.00926" W
Scale Factor:	0.9999577533
Convergence:	-1° 52' 44.6"
Combined Factor:	0.99989491

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G116 and NGS Style Access Cover 2" Deep

**Location:**

Northeast side of intersection of Fig Avenue and 480th Street in Section 15, T94N, R46W.



**WHKS & CO.**

**SIoux 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:	3821976.844	1164940.872
Easting:	4194985.854	1278634.246
Elevation:	1327.588	404.650
Ellipsoid Height:	1241.547	378.424
Geoid 99 Height:	-86.041	-26.225

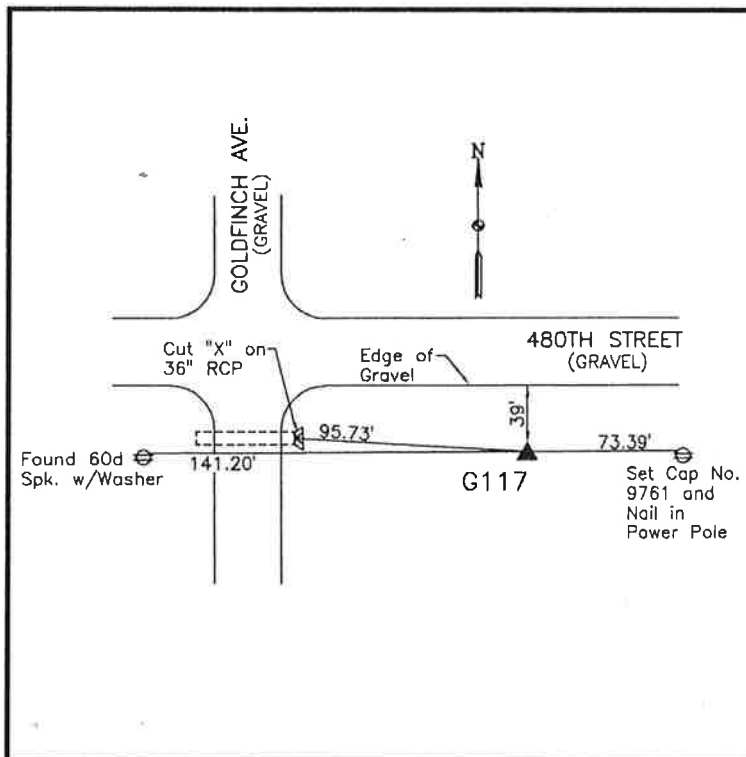
Latitude:	42° 57' 10.54339" N
Longitude:	96° 12' 47.84470" W
Scale Factor:	0.9999577374
Convergence:	-1° 50' 20.1"
Combined Factor:	0.99989850

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G117 and NGS Style Access Cover 2" Deep

**Location:**

Southeast side of intersection of Goldfinch Avenue and 480th Street in Section 19, T94N, R45W.



*North 19 5th Street*

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

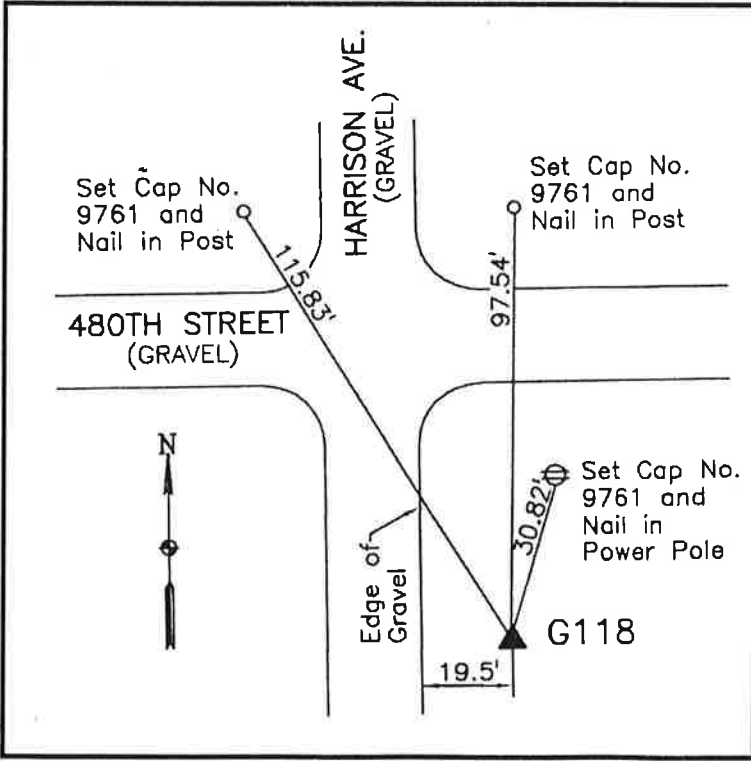
GPS POINT NUMBER      **G118**

	US SURVEY FEET	METRIC
Northing:	3821511.528	1164799.043
Easting:	4210561.562	1283381.731
Elevation:	1344.563	409.824
Ellipsoid Height:	1258.182	383.495
Geoid 99 Height:	-86.380	-26.329

Latitude:	42° 57' 10.83358" N
Longitude:	96° 09' 18.30294" W
Scale Factor:	0.9999577444
Convergence:	-1° 47' 58.1"
Combined Factor:	0.99989772

**Description:**  
 Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G118 and NGS Style  
 Access Cover 1" Deep

**Location:**  
 Southeast side of intersection  
 of Harrison Avenue and 480th  
 Street in Section 22, T94N,  
 R45W.



**WHKS & CO.**

**SIOUX 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:	3821214.754	1164708.586
Easting:	4226925.899	1288369.591
Elevation:	1393.494	424.738
Ellipsoid Height:	1306.768	398.304
Geoid 99 Height:	-86.726	-26.434

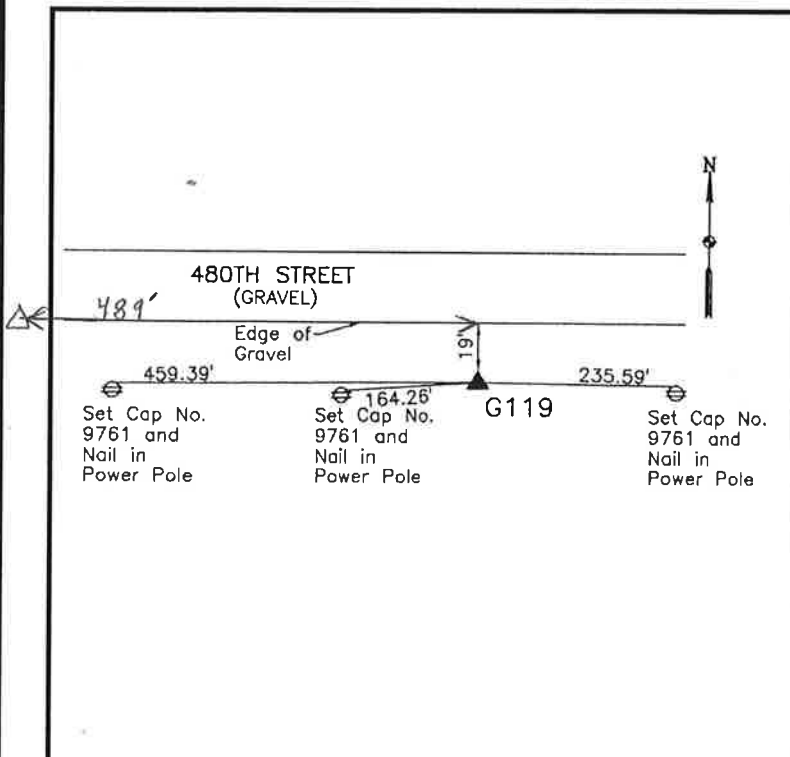
Latitude:	42° 57' 12.92093" N
Longitude:	96° 05' 38.23042" W
Scale Factor:	0.9999577948
Convergence:	-1° 45' 28.9"
Combined Factor:	0.99989545

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G119 and NGS Style Access Cover 2" Deep

**Location:**

South side 480th Street 0.1 mile east of Indian Avenue in Section 19, T94N, R44W.



**WHKS & CO.**

**SIOUX 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:	3821594.567	1164824.354
Easting:	4242135.619	1293005.523
Elevation:	1327.198	404.531
Ellipsoid Height:	1240.122	377.990
Geoid 99 Height:	-87.076	-26.541

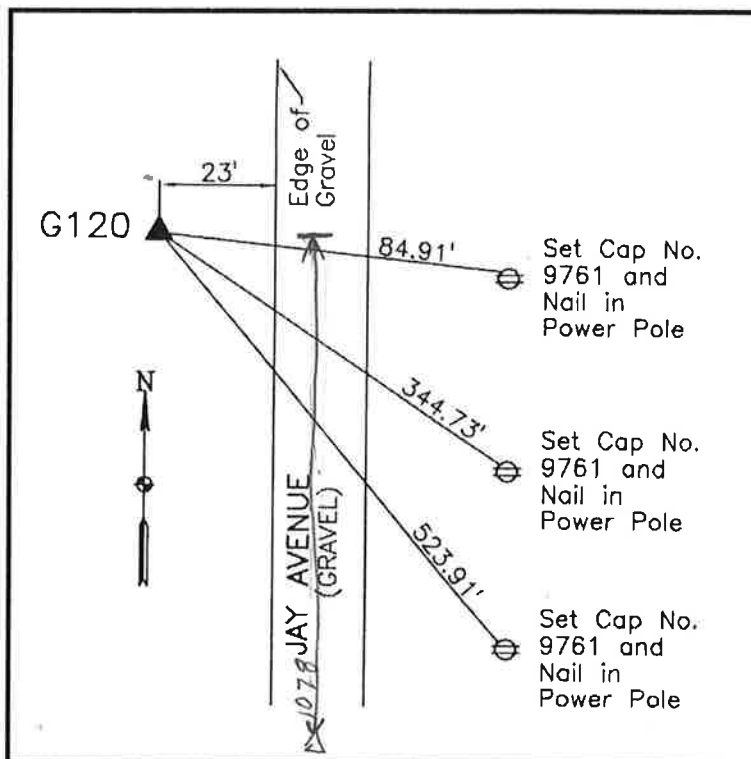
Latitude:	42° 57' 21.22954" N
Longitude:	96° 02' 13.94653" W
Scale Factor:	0.9999579963
Convergence:	-1° 43' 10.5"
Combined Factor:	0.99989883

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G120 and NGS Style  
Access Cover 4" Deep

**Location:**

West side of Jay Avenue 0.2  
miles north of 480th Street in  
Section 16, T94N, R44W.



**WHKS & CO.**

**SIOUX 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:	3820158.299	1164386.578
Easting:	4258214.327	1297906.323
Elevation:	1408.763	429.392
Ellipsoid Height:	1321.316	402.738
Geoid 99 Height:	-87.446	-26.654

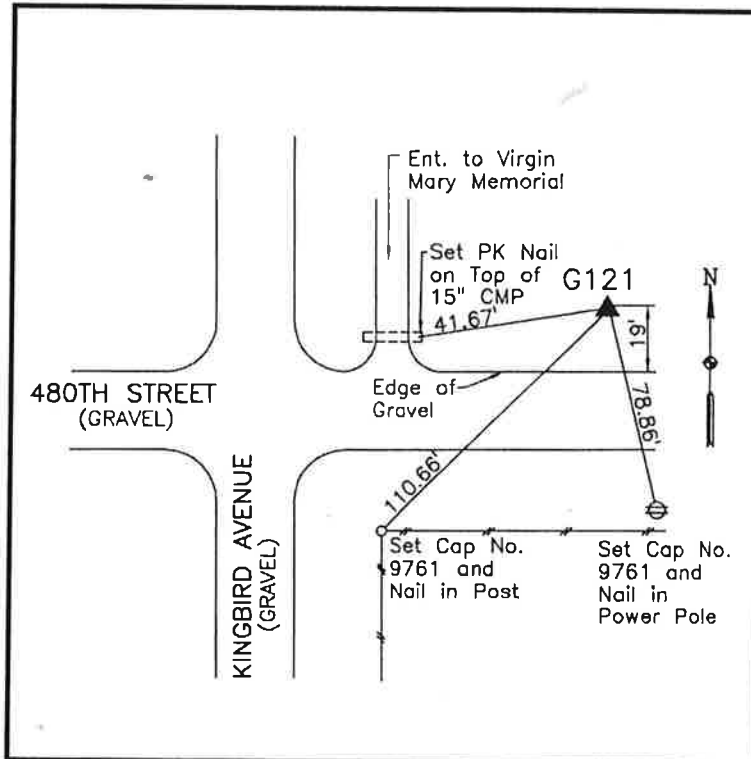
Latitude:	42° 57' 11.75813" N
Longitude:	95° 58' 37.25069" W
Scale Factor:	0.9999577667
Convergence:	-1° 40' 43.6"
Combined Factor:	0.99989473

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G121 and NGS Style Access Cover 4" Deep

**Location:**

Northeast side of intersection of Kingbird Avenue and 480th Street in Section 18, T94N, R43W.



**SIOUX 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:	3819363.751	1164144.400
Easting:	4273848.414	1302671.602
Elevation:	1398.995	426.415
Ellipsoid Height:	1311.175	399.647
Geoid 99 Height:	-87.820	-26.768

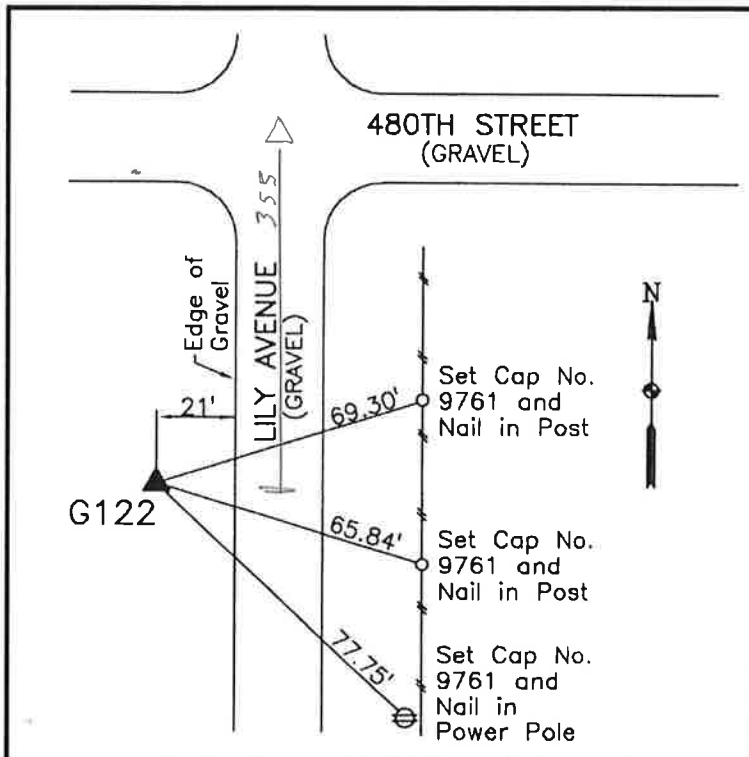
Latitude:	42° 57' 08.38391" N
Longitude:	95° 55' 06.79634" W
Scale Factor:	0.9999576854
Convergence:	-1° 38' 21.0"
Combined Factor:	0.99989513

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G122 and NGS Style Access Cover 1" Deep

**Location:**

West side Lily Avenue 0.05 mile south of 480th Street in Section 21, T94N, R43W.



**WHKS & CO.**

**SIoux 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:	3819117.595	1164069.371
Easting:	4289663.453	1307492.035
Elevation:	1413.621	430.873
Ellipsoid Height:	1325.394	403.981
Geoid 99 Height:	-88.227	-26.892

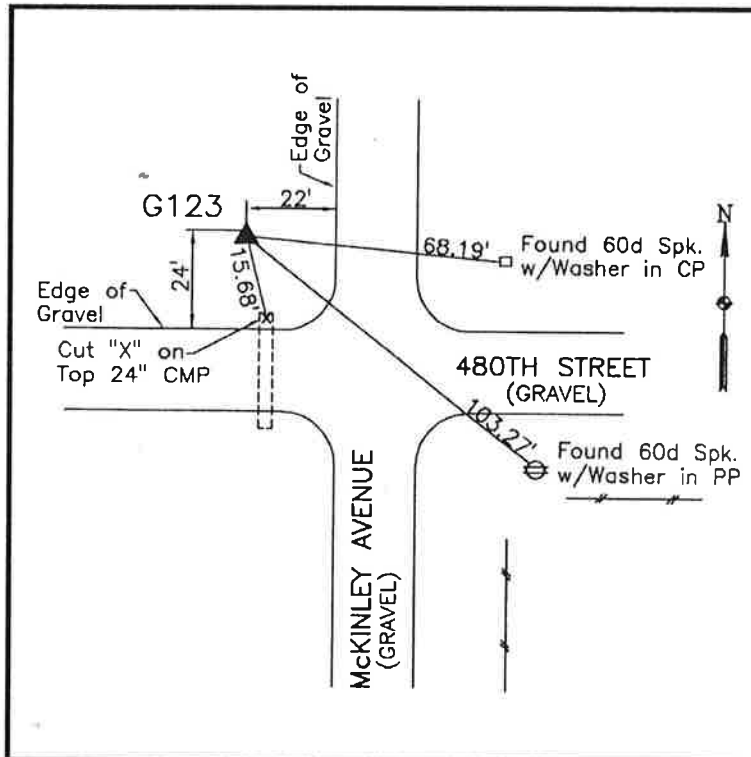
Latitude:	42° 57' 10.36740" N
Longitude:	95° 51' 34.12195" W
Scale Factor:	0.9999577331
Convergence:	-1° 35' 56.8"
Combined Factor:	0.99989450

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G123 and NGS Style Access Cover 2" Deep

**Location:**

Northwest side of intersection of McKinley Avenue and 480th Street east county line in Section 13, T94N, R43W.



**WHKS & CO.**

**SIOUX 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:	3835069.926	1168931.651
Easting:	4289060.863	1307308.366
Elevation:	1463.385	446.040
Ellipsoid Height:	1375.199	419.161
Geoid 99 Height:	-88.186	-26.879

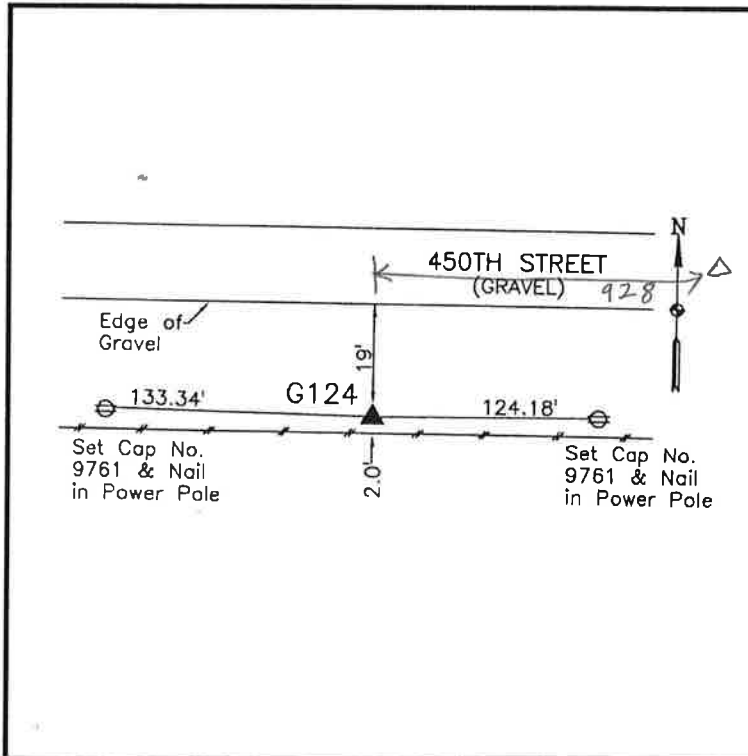
Latitude:	42° 59' 47.71067" N
Longitude:	95° 51' 48.21809" W
Scale Factor:	0.9999618169
Convergence:	-1° 36' 06.4"
Combined Factor:	0.99989621

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G124 and NGS Style Access Cover 1" Deep

**Location:**

South side 450th Street 0.15 mile west of McKinley Avenue east county line in Section 1, T94N, R43W.



**WHKS & CO.**

**SIoux 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:	3835296.148	1169000.604
Easting:	4274104.231	1302749.575
Elevation:	1430.097	435.895
Ellipsoid Height:	1342.267	409.124
Geoid 99 Height:	-87.830	-26.771

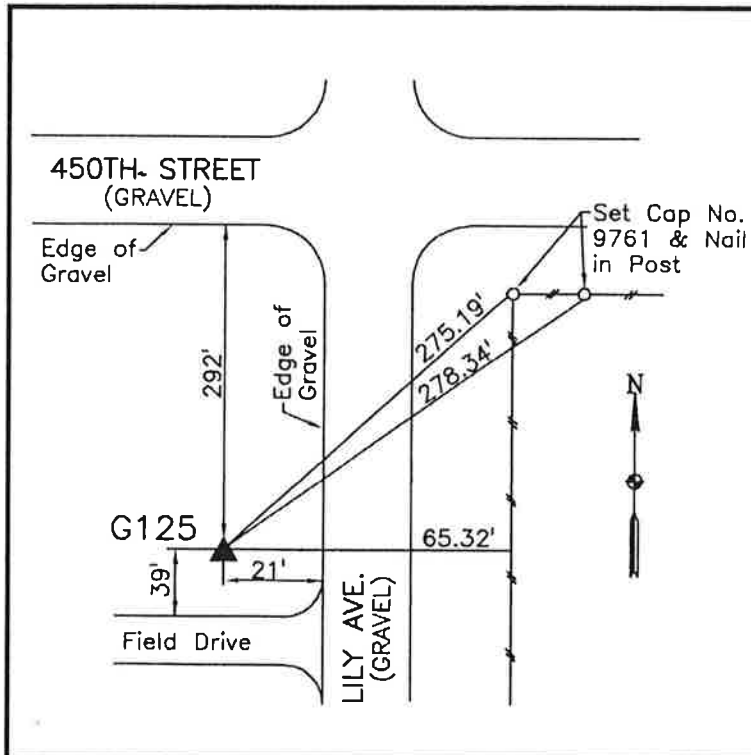
Latitude:	42° 59' 45.76588" N
Longitude:	95° 55' 09.48807" W
Scale Factor:	0.9999617629
Convergence:	-1° 38' 22.8"
Combined Factor:	0.99989772

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G125 and NGS Style  
 Access Cover 2" Deep

**Location:**

West side Lily Avenue 0.05  
 mile south of 450th Street in  
 Section 4, T94N, R43W.



**WHKS & CO.**

**SIoux 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:	3836150.565	1169261.031
Easting:	4258372.117	1297954.417
Elevation:	1412.168	430.430
Ellipsoid Height:	1324.681	403.763
Geoid 99 Height:	-87.487	-26.666

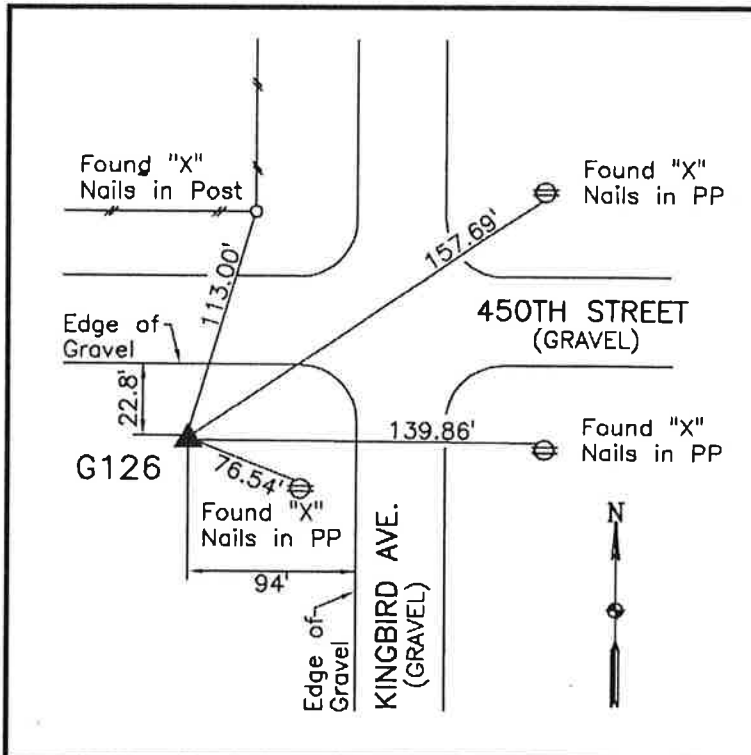
Latitude:	42° 59' 49.70138" N
Longitude:	95° 58' 41.43288" W
Scale Factor:	0.9999618723
Convergence:	-1° 40' 46.5"
Combined Factor:	0.99989867

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G126 and NGS Style Access Cover 1" Deep

**Location:**

Southwest side of intersection of Kingbird Avenue and 450th Street in Section 1, T94N, R44W.



**WHKS & CO.**

**SIoux 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:	3836790.112	1169455.965
Easting:	4243485.745	1293417.042
Elevation:	1329.785	405.319
Ellipsoid Height:	1242.625	378.753
Geoid 99 Height:	-87.160	-26.566

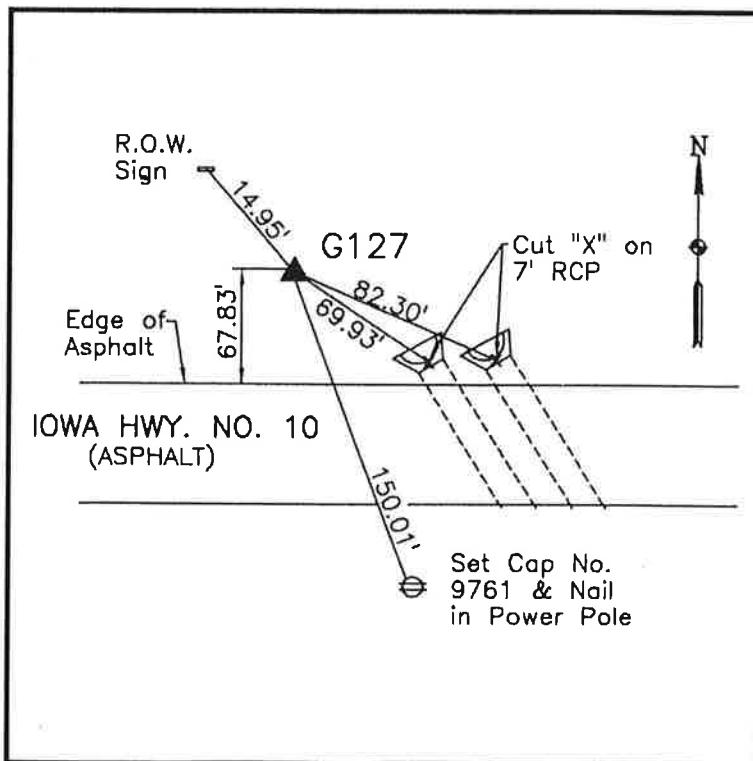
Latitude:	42° 59' 51.65762" N
Longitude:	96° 02' 01.92242" W
Scale Factor:	0.9999619269
Convergence:	-1° 43' 02.3"
Combined Factor:	0.99990264

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G127 and NGS Style Access Cover 2" Deep

**Location:**

North side Iowa Highway 10  
0.15 mile east of Jay Avenue  
Station 68+80 in Section 34,  
T95N, R44W.



**WHKS & CO.**

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

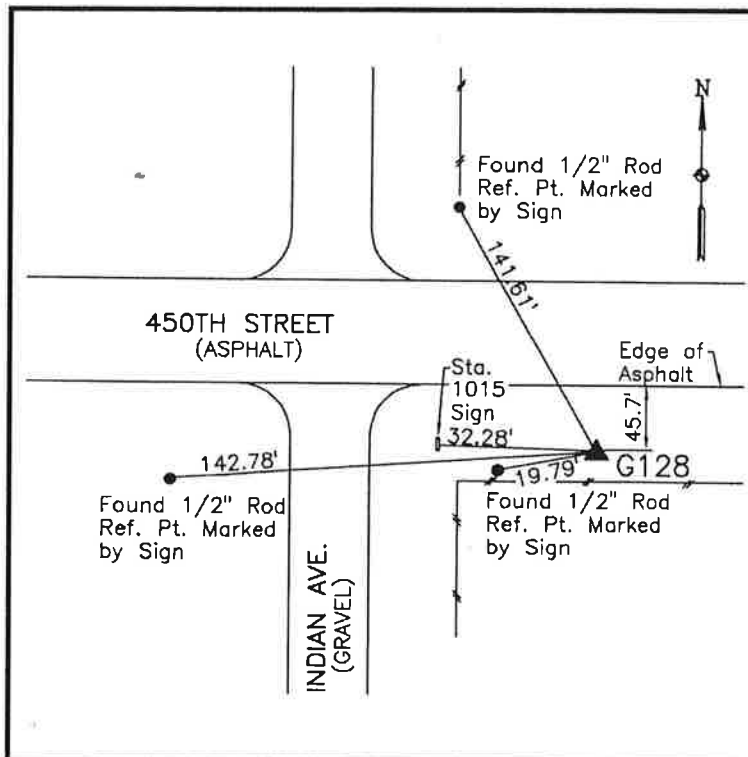
GPS POINT NUMBER **G128**

	US SURVEY FEET	METRIC
Northing:	3837203.006	1169581.815
Easting:	4226889.175	1288358.397
Elevation:	1387.727	422.980
Ellipsoid Height:	1300.900	396.515
Geoid 99 Height:	-86.827	-26.465

Latitude:	42° 59' 50.76117" N
Longitude:	96° 05' 45.32493" W
Scale Factor:	0.9999619019
Convergence:	-1° 45' 33.7"
Combined Factor:	0.99989984

**Description:**  
Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G128 and NGS Style  
Access Cover 1" Deep

**Location:**  
Southeast side of intersection  
of Iowa Highway 10 and Indian  
Avenue Station 1015+30 in  
Section 6, T94N, R44W.



**WHKS & CO.**

**SIOUX 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:	3837623.713	1169710.047
Easting:	4211004.910	1283516.863
Elevation:	1373.834	418.745
Ellipsoid Height:	1287.313	392.374
Geoid 99 Height:	-86.521	-26.372

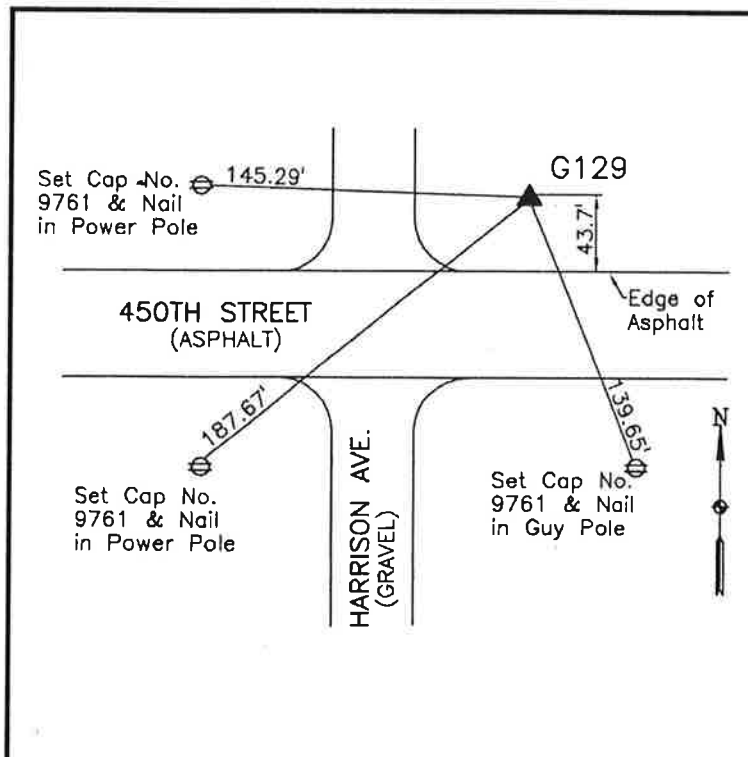
Latitude:	42° 59' 50.04255" N
Longitude:	96° 09' 19.14826" W
Scale Factor:	0.9999618818
Convergence:	-1° 47' 58.7"
Combined Factor:	0.99990047

Description:

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G129 and NGS Style Access Cover 1" Deep

Location:

Northeast side of intersection of Iowa Highway 10 and Harrison Avenue Station 856+35 in Section 34, T95N, R45W.



**WHKS & CO.**

**SIoux 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:	3838090.283	1169852.258
Easting:	4195460.562	1278778.937
Elevation:	1360.196	414.589
Ellipsoid Height:	1273.981	388.310
Geoid 99 Height:	-86.215	-26.278

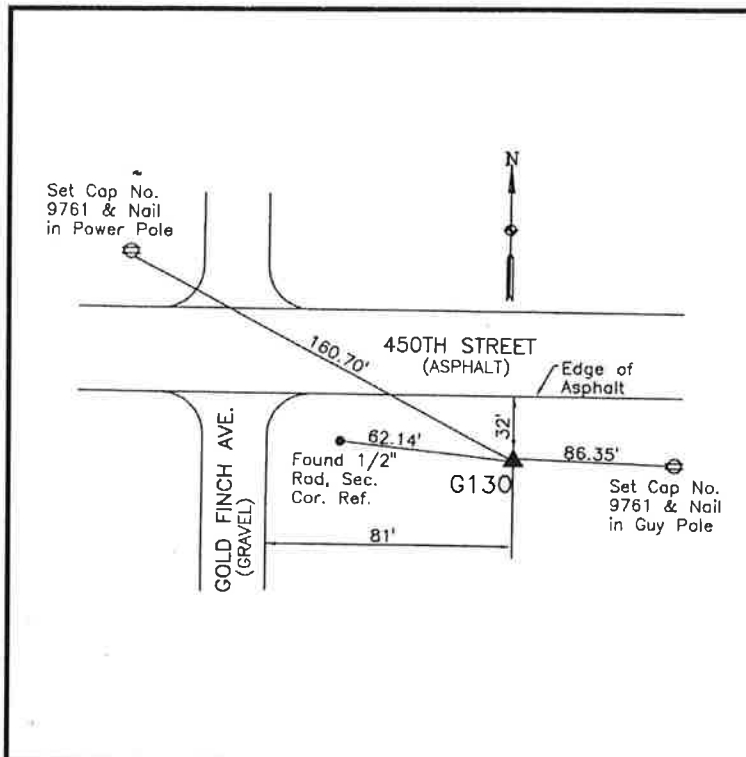
Latitude:	42° 59' 49.77423" N
Longitude:	96° 12' 48.41812" W
Scale Factor:	0.9999618744
Convergence:	-1° 50' 20.5"
Combined Factor:	0.99990109

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G130 and NGS Style Access Cover 1" Deep

**Location:**

Southeast side of intersection of Iowa Highway 10 and Goldfinch Avenue Station 700+55 in Section 6, T94N, R45W.



**WHKS & CO.**

**SIOUX 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:	3838550.420	1169992.508
Easting:	4179280.456	1273847.231
Elevation:	1448.268	441.433
Ellipsoid Height:	1362.332	415.240
Geoid 99 Height:	-85.937	-26.194

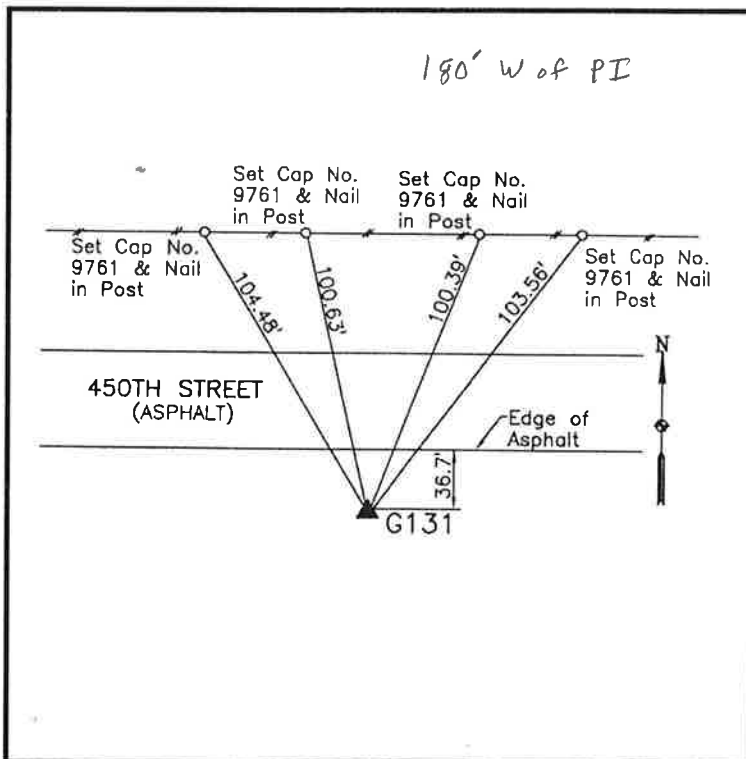
Latitude:	42° 59' 49.13083" N
Longitude:	96° 16' 26.23513" W
Scale Factor:	0.9999618564
Convergence:	-1° 52' 48.1"
Combined Factor:	0.99989686

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G131 and NGS Style  
Access Cover 3" Deep

**Location:**

Southwest side of intersection  
of Iowa Highway 10 and Fig  
Avenue Station 539+05 in  
Section 4 of T94N, R46W.



**WHKS & CO.**

**SIoux 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:	3839137.422	1170171.426
Easting:	4163973.062	1269181.528
Elevation:	1391.934	424.262
Ellipsoid Height:	1306.211	398.134
Geoid 99 Height:	-85.723	-26.128

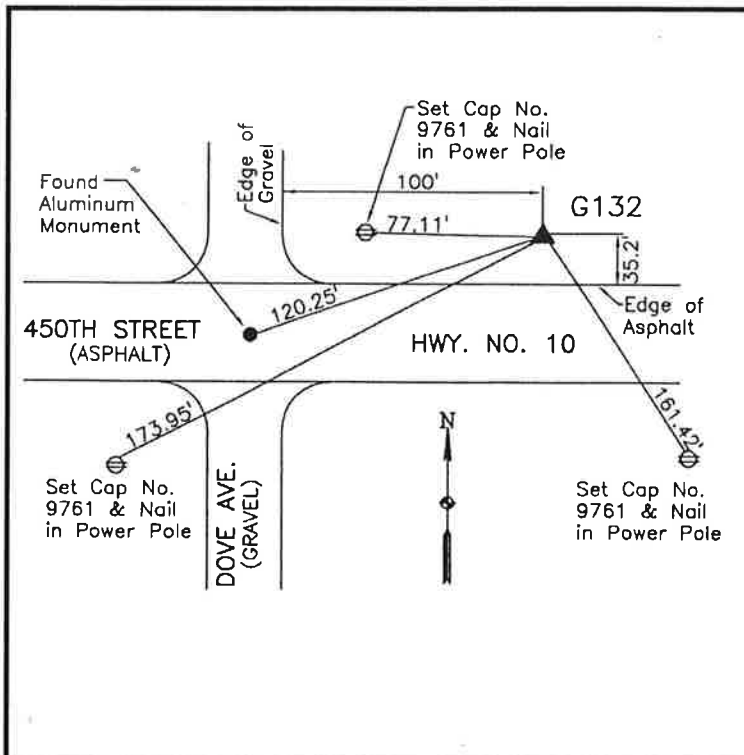
Latitude:	42° 59' 49.91422" N
Longitude:	96° 19' 52.37077" W
Scale Factor:	0.9999618783
Convergence:	-1° 55' 07.8"
Combined Factor:	0.99989956

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G132 and NGS Style Access Cover 1" Deep

**Location:**

Northeast side of intersection of Iowa Highway 10 and Dove Avenue Station 385+80 in Section 31, T95N, R46W.



**WHKS & CO.**

**SIOUX 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:	3839526.937	1170290.151
Easting:	4148074.015	1264335.488
Elevation:	1307.608	398.560
Ellipsoid Height:	1222.109	372.500
Geoid 99 Height:	-85.499	-26.060

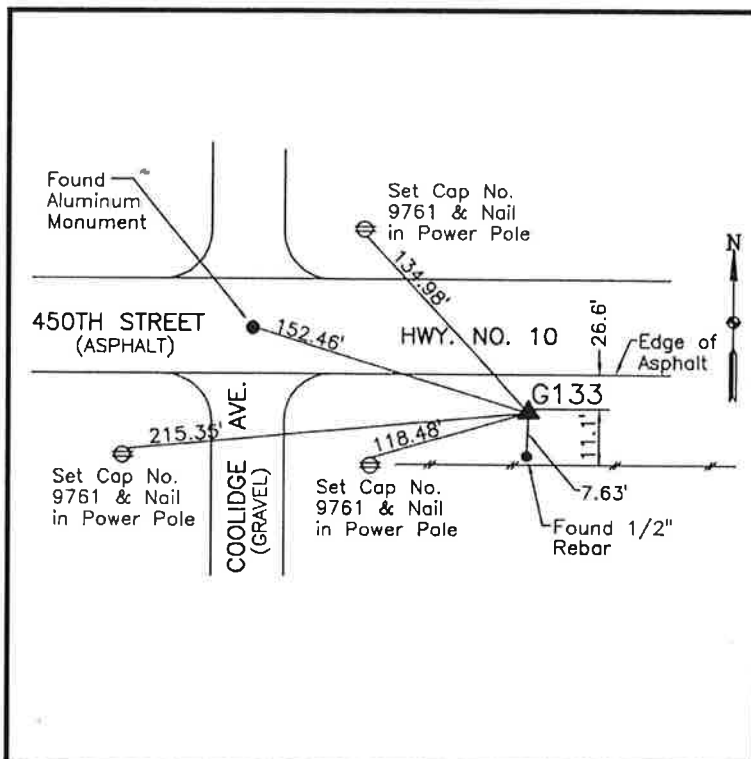
Latitude:	42° 59' 48.44587" N
Longitude:	96° 23' 26.37398" W
Scale Factor:	0.9999618374
Convergence:	-1° 57' 32.9"
Combined Factor:	0.99990353

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G133 and NGS Style Access Cover 1" Deep

**Location:**

Southeast side of intersection of Iowa Highway 10 and Coolidge Avenue Station 226+90 in Section 3, T94N, R47W.



**WHKS & CO.**

**SIOUX 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:	3840024.863	1170441.919
Easting:	4131896.635	1259404.613
Elevation:	1291.235	393.569
Ellipsoid Height:	1205.984	367.585
Geoid 99 Height:	-85.250	-25.984

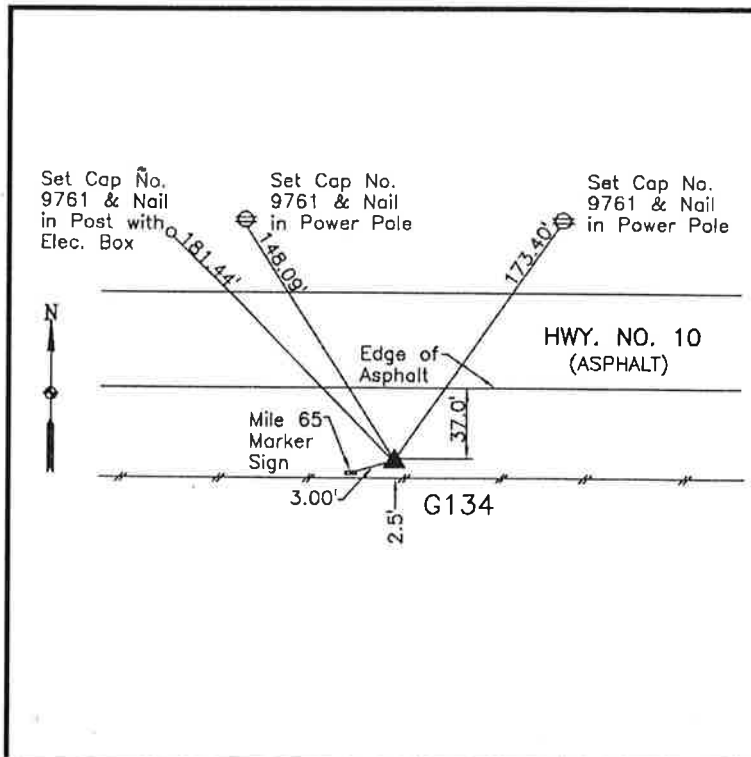
Latitude:	42° 59' 47.84131" N
Longitude:	96° 27' 04.16830" W
Scale Factor:	0.9999618206
Convergence:	-2° 00' 00.5"
Combined Factor:	0.99990428

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G134 and NGS Style Access Cover 1" Deep

**Location:**

South side Iowa Highway 10  
1.0 mile west of Chestnut Avenue Station 65+02 in Section 1, T94N, R48W (200 feet west of section line fence).



**WHKS & CO.**

**SIOUX 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:	3840762.112	1170666.633
Easting:	4119678.144	1255680.410
Elevation:	1172.653	357.425
Ellipsoid Height:	1087.602	331.502
Geoid 99 Height:	-85.051	-25.924

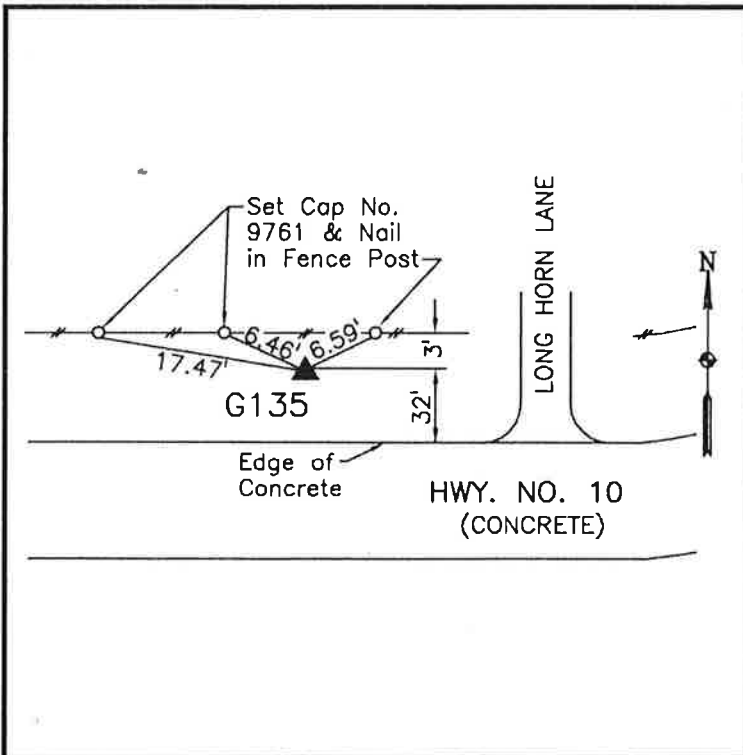
Latitude:	42° 59' 50.87413" N
Longitude:	96° 29' 48.83595" W
Scale Factor:	0.9999619050
Convergence:	-2° 01' 52.1"
Combined Factor:	0.99991002

Description:

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G135 and NGS Style Access Cover 4" Deep

Location:

North side 450th Street 100 feet east of east end of bridge over Big Sioux River (west county line) and 200 feet west of 10th Street in Haywarden (old route) in Section 34, T95N, R48W.



**WHKS & CO.**

**SIOUX 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:	3853743.742	1174623.442
Easting:	4121369.523	1256195.943
Elevation:	1183.723	360.800
Ellipsoid Height:	1098.427	334.801
Geoid 99 Height:	-85.296	-25.998

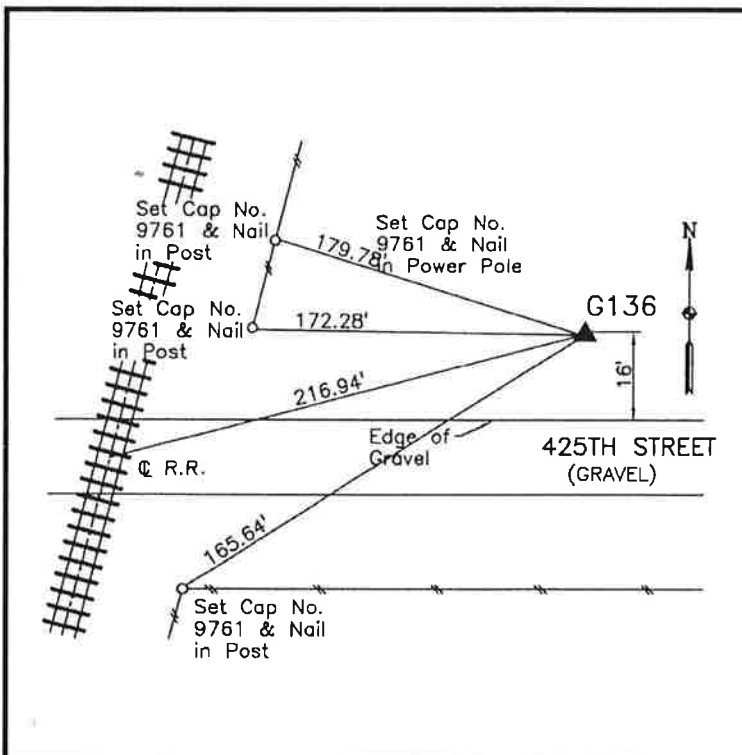
Latitude:	43° 01' 59.61147" N
Longitude:	96° 29' 32.27168" W
Scale Factor:	0.9999656895
Convergence:	-2° 01' 40.8"
Combined Factor:	0.99991328

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G136 and NGS Style  
Access Cover 1" Deep

**Location:**

North side of 425th Street at  
south end of runway 34 at  
Haywarden airport in Section  
22, T95N, R48W.



**WHKS & CO.**

**SIOUX 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:	3856098.152	1175341.067
Easting:	4132565.942	1259608.618
Elevation:	1239.611	377.834
Ellipsoid Height:	1154.114	351.775
Geoid 99 Height:	-85.497	-26.060

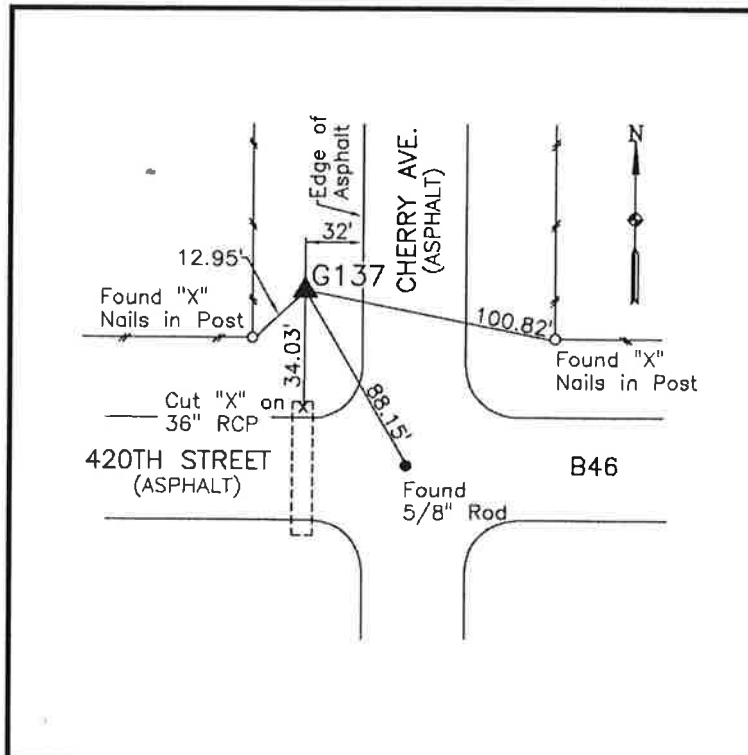
Latitude:	43° 02' 26.73915" N
Longitude:	96° 27' 02.71513" W
Scale Factor:	0.9999665368
Convergence:	-1° 59' 59.5"
Combined Factor:	0.99991147

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G137 and NGS Style  
Access Cover 1" Deep

**Location:**

Northwest corner of  
intersection of 420th Street and  
Cherry Avenue in Section 13,  
T95N, R48W.



**WHKS & CO.**

**SIOUX 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:	3855469.909	1175149.579
Easting:	4148052.176	1264328.832
Elevation:	1291.956	393.789
Ellipsoid Height:	1206.247	367.665
Geoid 99 Height:	-85.709	-26.124

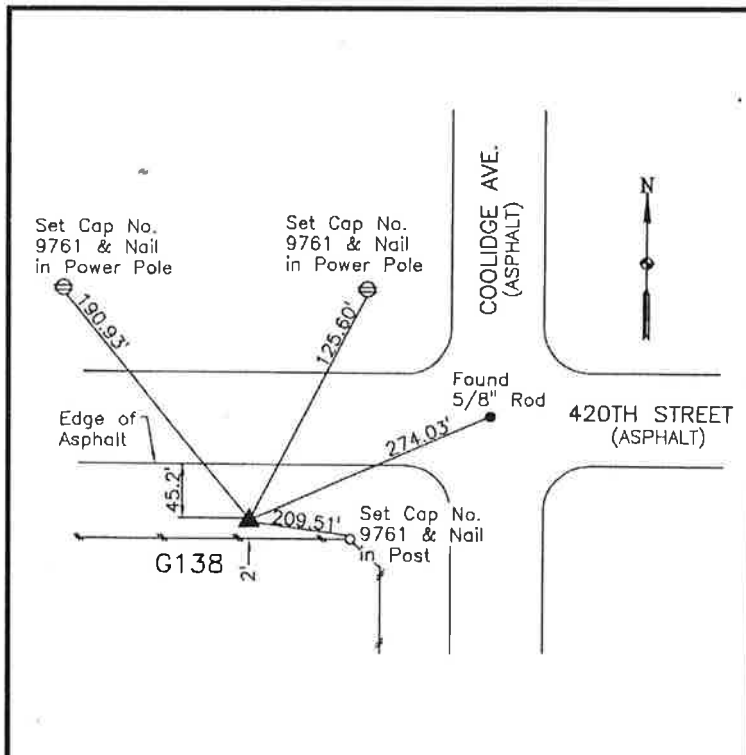
Latitude:	43° 02' 25.82301" N
Longitude:	96° 23' 34.00741" W
Scale Factor:	0.9999665079
Convergence:	-1° 57' 38.0"
Combined Factor:	0.99990896

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G138 and NGS Style  
Access Cover 1" Deep

**Location:**

South side 420th Street just  
west of Coolidge Avenue in  
Section 21, T95N, R47W.



**WHKS & CO.**

**SIOUX 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:	3855033.979	1175016.707
Easting:	4164147.811	1269234.791
Elevation:	1386.986	422.754
Ellipsoid Height:	1301.065	396.566
Geoid 99 Height:	-85.920	-26.189

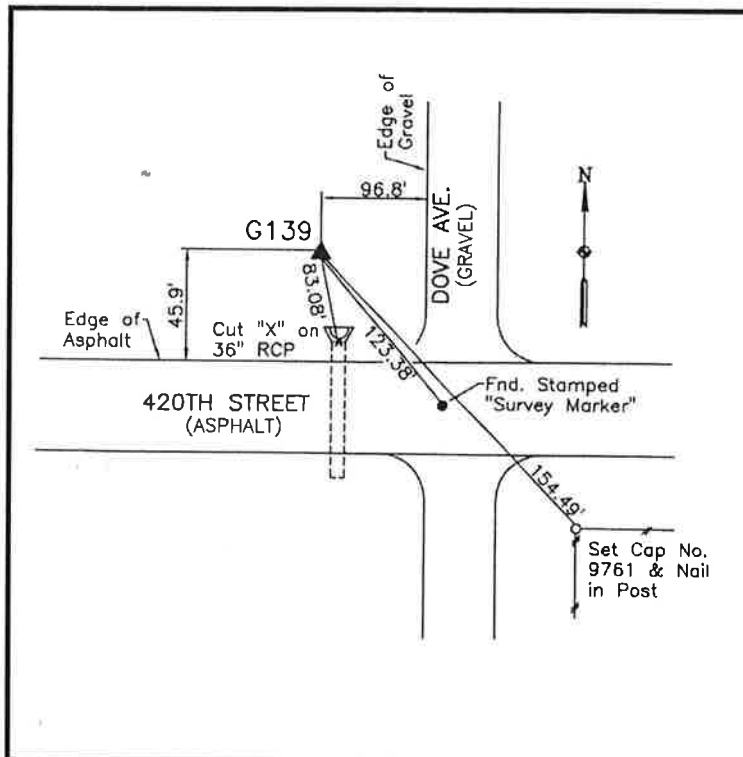
Latitude:	43° 02' 26.90210" N
Longitude:	96° 19' 57.18662" W
Scale Factor:	0.9999665419
Convergence:	-1° 55' 11.1"
Combined Factor:	0.99990447

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G139 and NGS Style Access Cover 1" Deep

**Location:**

North side 420th Street just west of Dove Avenue in Section 13, T95N, R47W.



**SIoux 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:	3854391.723	1174820.947
Easting:	4180512.584	1274222.784
Elevation:	1390.445	423.808
Ellipsoid Height:	1304.303	397.552
Geoid 99 Height:	-86.142	-26.256

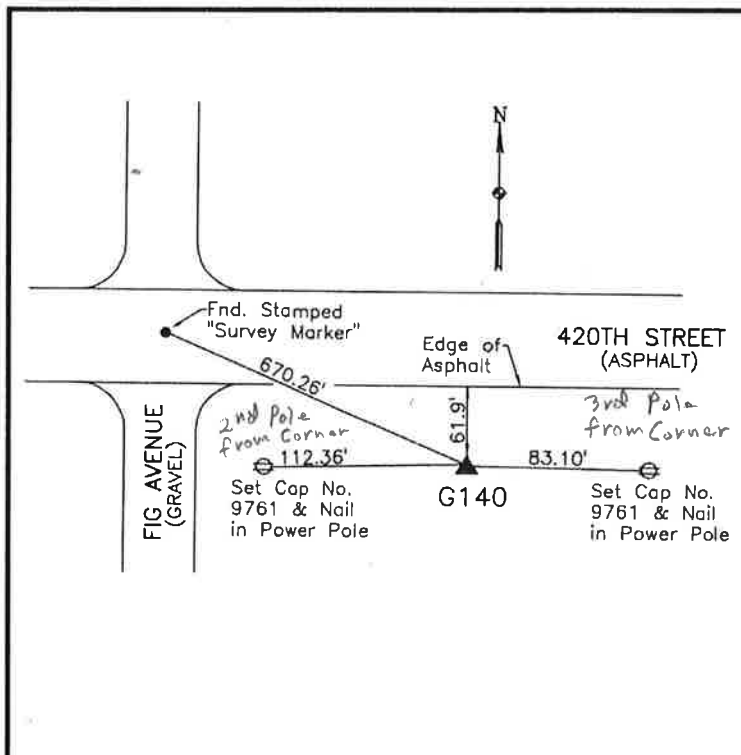
Latitude:                    43° 02' 25.91815" N  
Longitude:                    96° 16' 16.65047" W  
Scale Factor:                0.9999665109  
Convergence:                -1° 52' 41.6"  
Combined Factor:            0.99990428

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G140 and NGS Style  
Access Cover 1" Deep

**Location:**

South side of 420th Street 0.15  
mile east of Fig Avenue in  
Section 22, T95N, R46W.



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

**SIoux 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:	3853954.472	1174687.672
Easting:	4195808.732	1278885.059
Elevation:	1440.145	438.957
Ellipsoid Height:	1353.766	412.629
Geoid 99 Height:	-86.379	-26.328

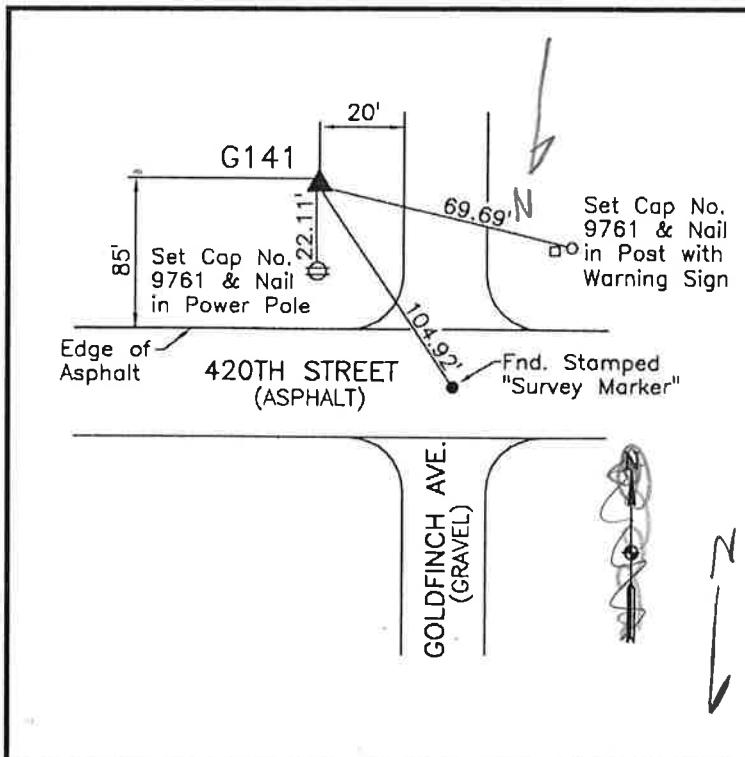
Latitude:	43° 02' 26.50231" N
Longitude:	96° 12' 50.58773" W
Scale Factor:	0.9999665293
Convergence:	-1° 50' 22.0"
Combined Factor:	0.99990194

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G141 and NGS Style Access Cover 1" Deep

**Location:**

Southeast corner of the intersection 420th Street and Goldfinch Avenue in Section 19, T95N, R45W.



**WHKS & CO.**

**SIoux 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:	3853405.667	1174520.396
Easting:	4211395.129	1283635.803
Elevation:	1385.894	422.421
Ellipsoid Height:	1299.228	396.005
Geoid 99 Height:	-86.666	-26.416

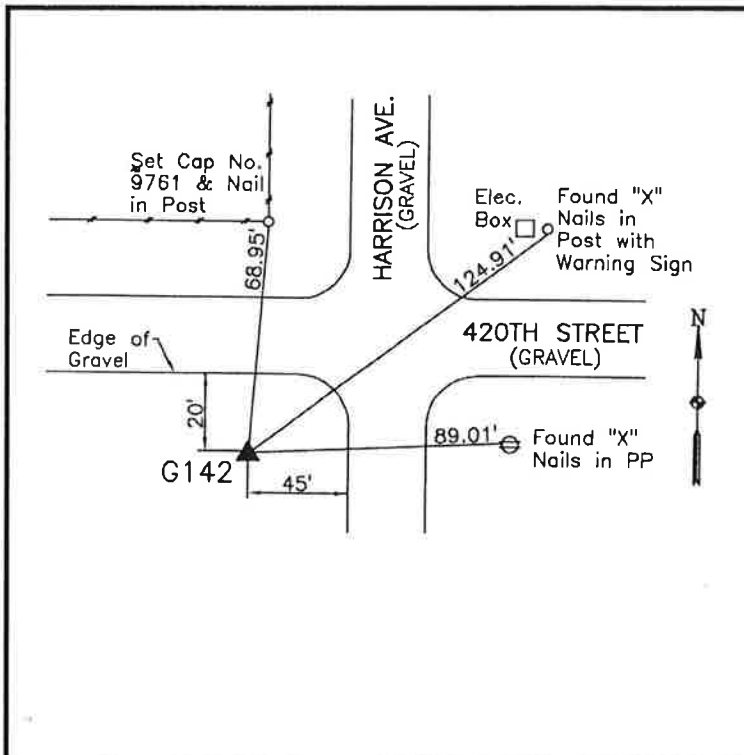
Latitude:	43° 02' 25.97287" N
Longitude:	96° 09' 20.57020" W
Scale Factor:	0.9999665126
Convergence:	-1° 47' 59.6"
Combined Factor:	0.99990453

Description:

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G142 and NGS Style Access Cover 1" Deep

Location:

Southwest corner of intersection of 420th Street and Harrison Avenue in Section 21, T95N, R45W.



**WHKS & CO.**

**SIoux 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:	3853264.578	1174477.392
Easting:	4227284.375	1288478.854
Elevation:	1399.408	426.540
Ellipsoid Height:	1312.455	400.037
Geoid 99 Height:	-86.953	-26.503

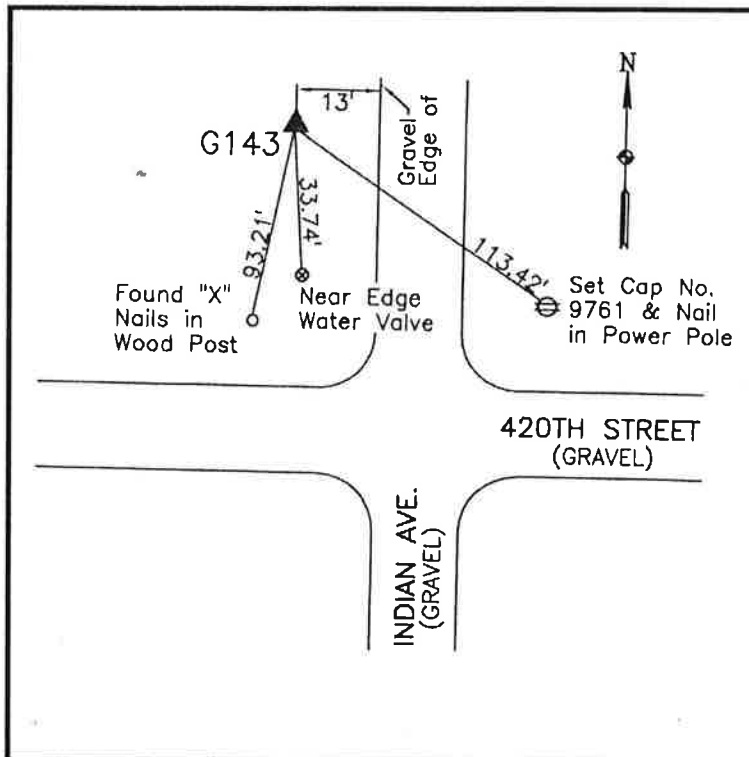
Latitude:	43° 02' 29.45429" N
Longitude:	96° 05' 46.64610" W
Scale Factor:	0.9999666226
Convergence:	-1° 45' 34.6"
Combined Factor:	0.99990401

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G143 and NGS Style Access Cover 1" Deep

**Location:**

West side of Indian Avenue just north of 420th Street in Section 13, T95N, R45W.



**WHKS & CO.**

**SIoux 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:	3852826.615	1174343.901
Easting:	4243168.794	1293320.435
Elevation:	1423.443	433.866
Ellipsoid Height:	1336.202	407.275
Geoid 99 Height:	-87.240	-26.591

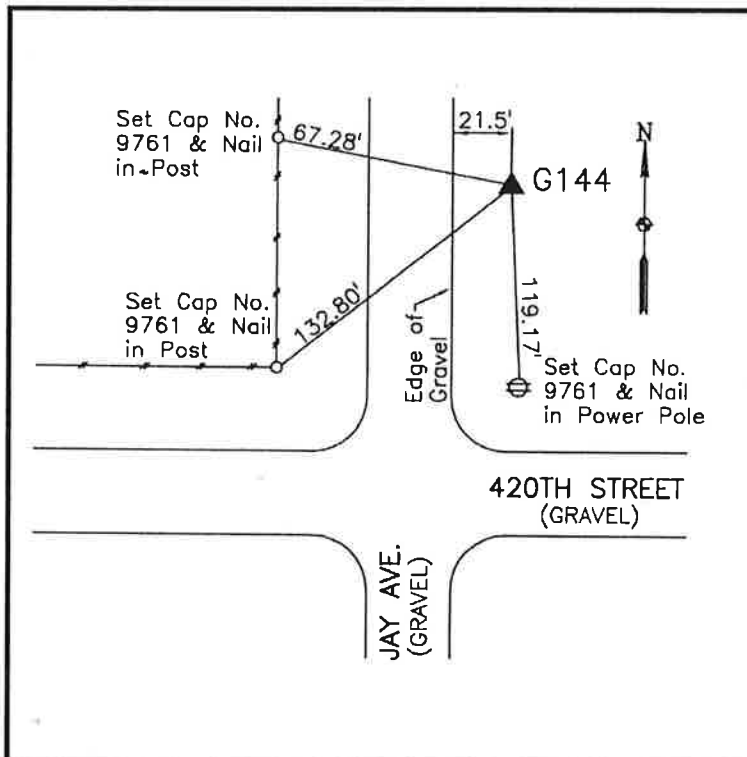
Latitude:	43° 02' 29.89295" N
Longitude:	96° 02' 12.66044" W
Scale Factor:	0.9999666364
Convergence:	-1° 43' 09.6"
Combined Factor:	0.99990289

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G144 and NGS Style  
Access Cover 1" Deep

**Location:**

Northeast side of intersection  
of Jay Avenue and 420th  
Street in Section 15, T95N,  
R44W.



**WHKS & CO.**

**SIOUX 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:	3851923.460	1174068.619
Easting:	4258874.436	1298107.524
Elevation:	1386.127	422.492
Ellipsoid Height:	1298.557	395.801
Geoid 99 Height:	-87.570	-26.691

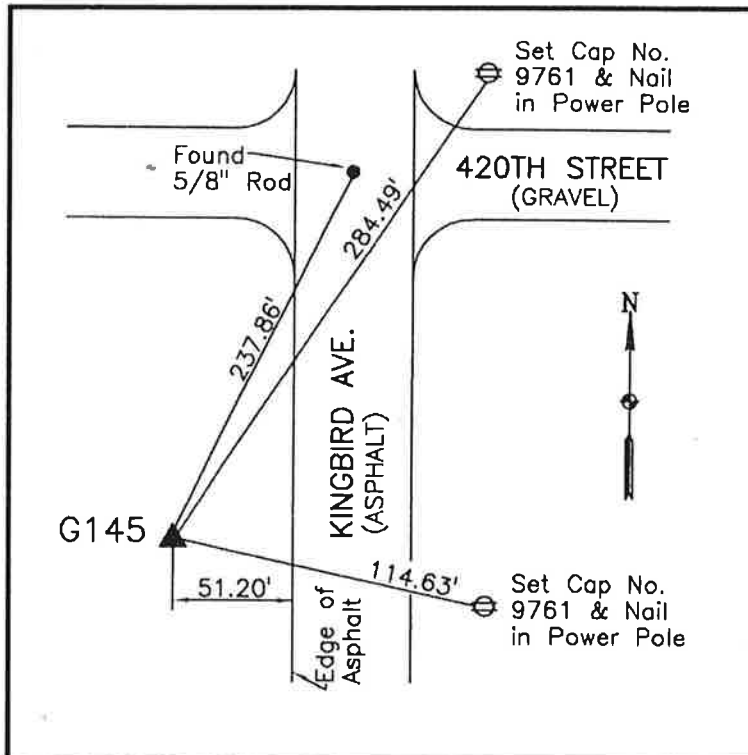
Latitude:	43° 02' 25.57656" N
Longitude:	95° 58' 40.89690" W
Scale Factor:	0.9999665001
Convergence:	-1° 40' 46.1"
Combined Factor:	0.99990455

Description:

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G145 and NGS Style  
Access Cover 2" Deep

Location:

Southwest side of intersection  
of Kingbird Avenue and 420th  
Street in Section 24, T95N,  
R44W.



**WHKS & CO.**

**SIOUX 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:	3851290.801	1173875.784
Easting:	4276799.134	1303570.983
Elevation:	1376.401	419.528
Ellipsoid Height:	1288.434	392.715
Geoid 99 Height:	-87.967	-26.812

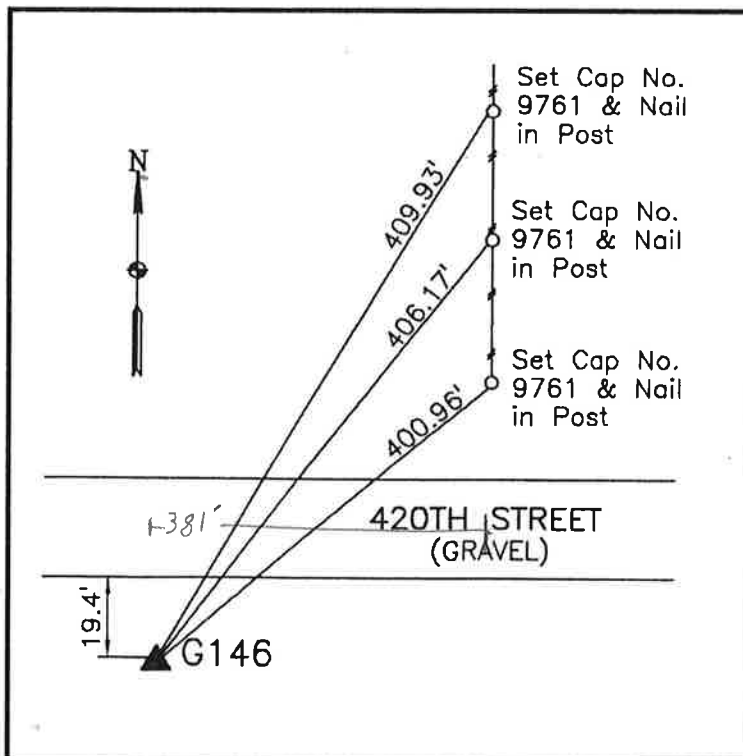
Latitude:                    43° 02' 24.44890" N  
Longitude:                 95° 54' 39.37621" W  
Scale Factor:             0.9999664646  
Convergence:            -1° 38' 02.4"  
Combined Factor:        0.99990499

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G146 and NGS Style  
Access Cover 4" Deep

**Location:**

South side 420th Street 0.4  
mile east of U.S. 60 in Section  
22, T95N, R43W.



**WHKS & CO.**

**SIOUX 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:	3850688.498	1173692.202
Easting:	4290317.446	1307691.373
Elevation:	1416.751	431.827
Ellipsoid Height:	1328.471	404.919
Geoid 99 Height:	-88.280	-26.908

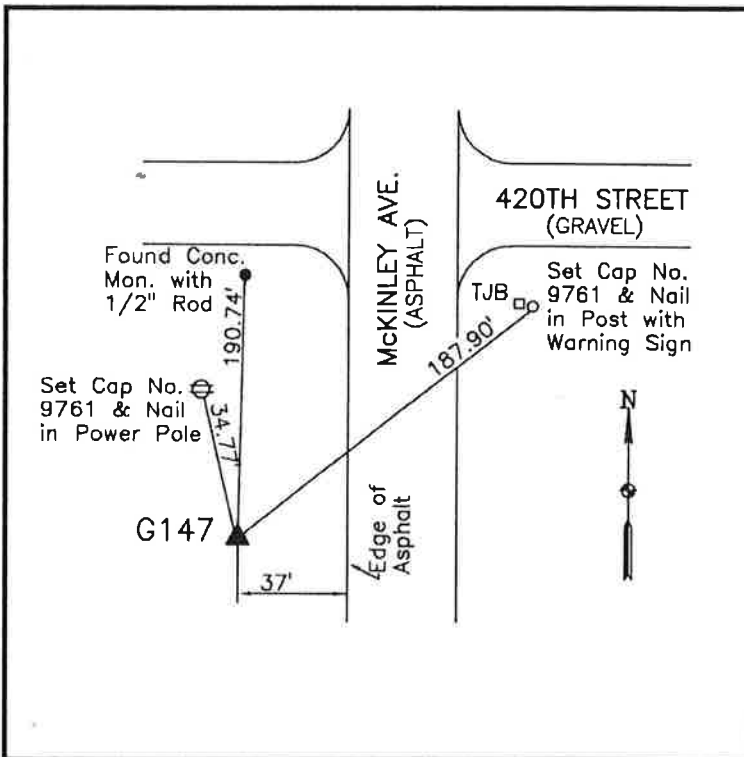
Latitude:	43° 02' 22.26959" N
Longitude:	95° 51' 37.18262" W
Scale Factor:	0.9999663960
Convergence:	-1° 35' 58.9"
Combined Factor:	0.99990302

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G147 and NGS Style Access Cover 2" Deep

**Location:**

West side McKinley Avenue  
0.05 mile south of 420th Street  
east county line in Section 24,  
T95N, R43W.



**WHKS & CO.**

**SIOUX 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:	3866758.928	1178590.479
Easting:	4290655.474	1307794.404
Elevation:	1350.909	411.758
Ellipsoid Height:	1262.559	384.829
Geoid 99 Height:	-88.350	-26.929

Latitude:                    43° 05' 01.03456" N

Longitude:                 95° 51' 38.67480" W

Scale Factor:             0.9999716858

Convergence:            -1° 35' 59.9"

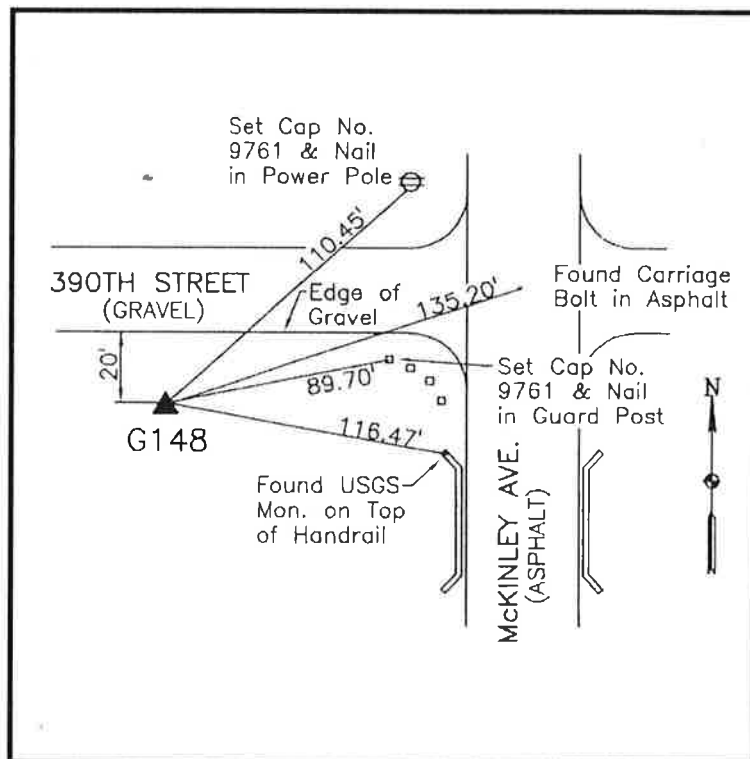
Combined Factor:        0.99991145

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G148 and NGS Style  
 Access Cover 2" Deep

**Location:**

Southwest side of intersection  
 of McKinley Avenue and 390th  
 Street east county line in  
 Section 1, T95N, R43W.



**WHKS & CO.**

**SIoux 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:	3867303.456	1178756.451
Easting:	4274715.184	1302935.794
Elevation:	1349.114	411.211
Ellipsoid Height:	1261.121	384.390
Geoid 99 Height:	-87.992	-26.820

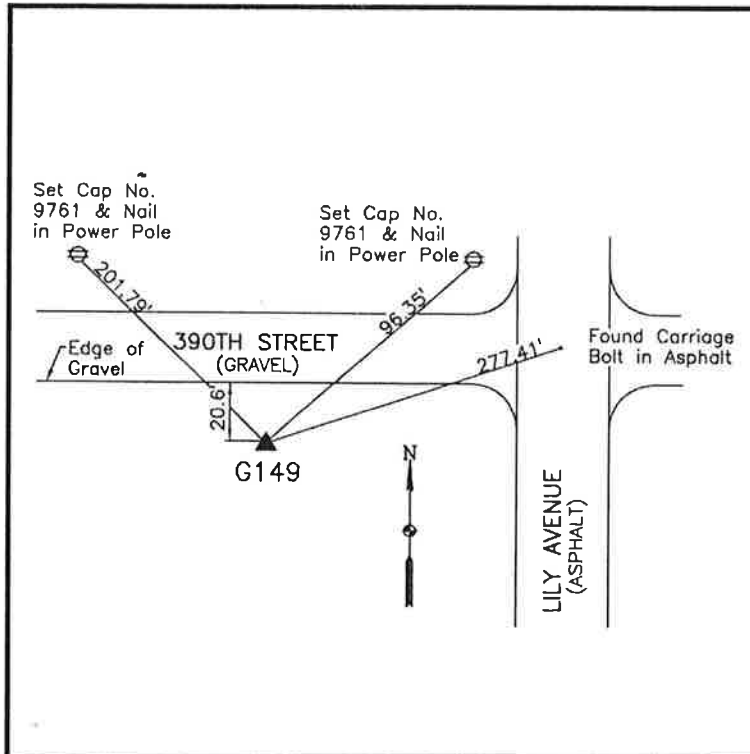
Latitude:	43° 05' 01.95917" N
Longitude:	95° 55' 13.60006" W
Scale Factor:	0.9999717183
Convergence:	-1° 38' 25.6"
Combined Factor:	0.99991155

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G149 and NGS Style  
Access Cover 1" Deep

**Location:**

South side 390th Street 0.05  
mile west of Lily Avenue in  
Section 4, T95N, R43W.



**WHKS & CO.**

**SIOUX 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:	3867865.565	1178927.782
Easting:	4259474.544	1298290.438
Elevation:	1438.081	438.328
Ellipsoid Height:	1350.434	411.613
Geoid 99 Height:	-87.647	-26.715

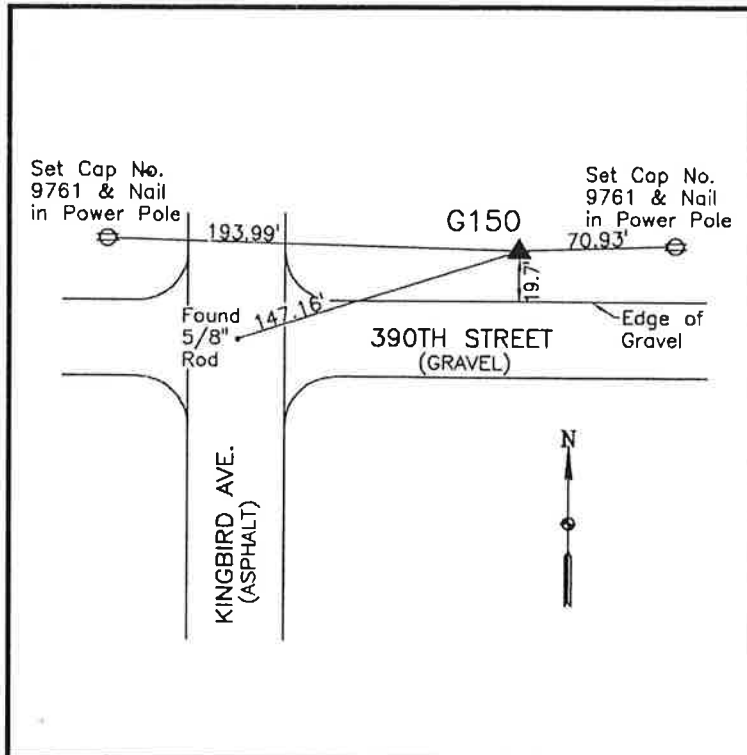
Latitude:	43° 05' 03.14872" N
Longitude:	95° 58' 39.10979" W
Scale Factor:	0.9999717602
Convergence:	-1° 40' 44.9"
Combined Factor:	0.99990733

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G150 and NGS Style  
Access Cover 2" Deep

**Location:**

Northeast side of intersection  
of Kingbird Avenue and 390th  
Street in Section 31, T96N,  
R43W.



**WHKS & CO.**

**SIOUX 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:	3868739.291	1179194.094
Easting:	4243430.612	1293400.237
Elevation:	1434.191	437.142
Ellipsoid Height:	1346.864	410.525
Geoid 99 Height:	-87.327	-26.617

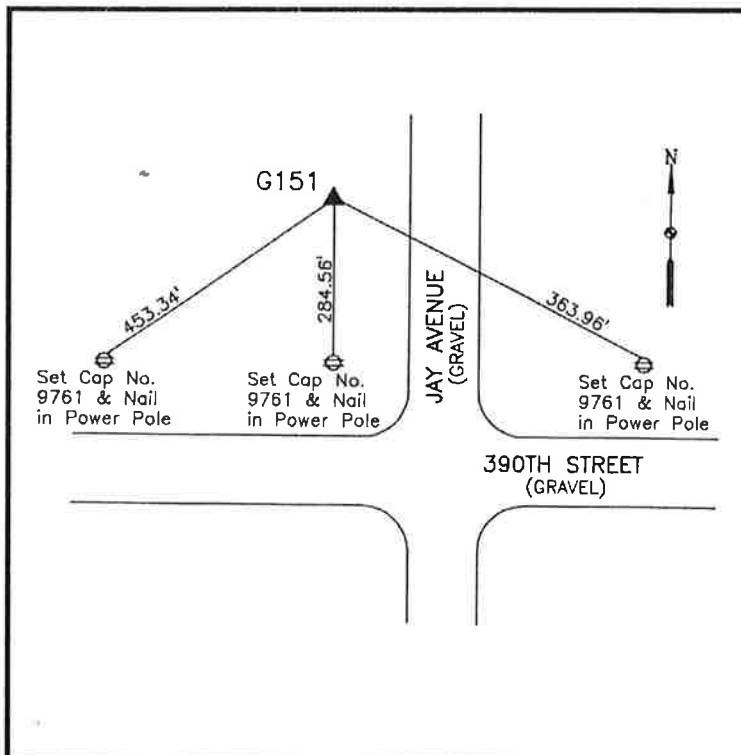
Latitude:                    43° 05' 07.07511" N  
Longitude:                   96° 02' 15.56768" W  
Scale Factor:                0.9999718988  
Convergence:               -1° 43' 11.6"  
Combined Factor:           0.99990764

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G151 and NGS Style  
Access Cover 1" Deep

**Location:**

West side Jay Avenue 0.05  
mile north of 390th Street in  
Section 33, T96N, R44W.



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

**SIOUX 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:	3869047.222	1179287.952
Easting:	4226958.233	1288379.446
Elevation:	1365.070	416.074
Ellipsoid Height:	1278.024	389.543
Geoid 99 Height:	-87.046	-26.532

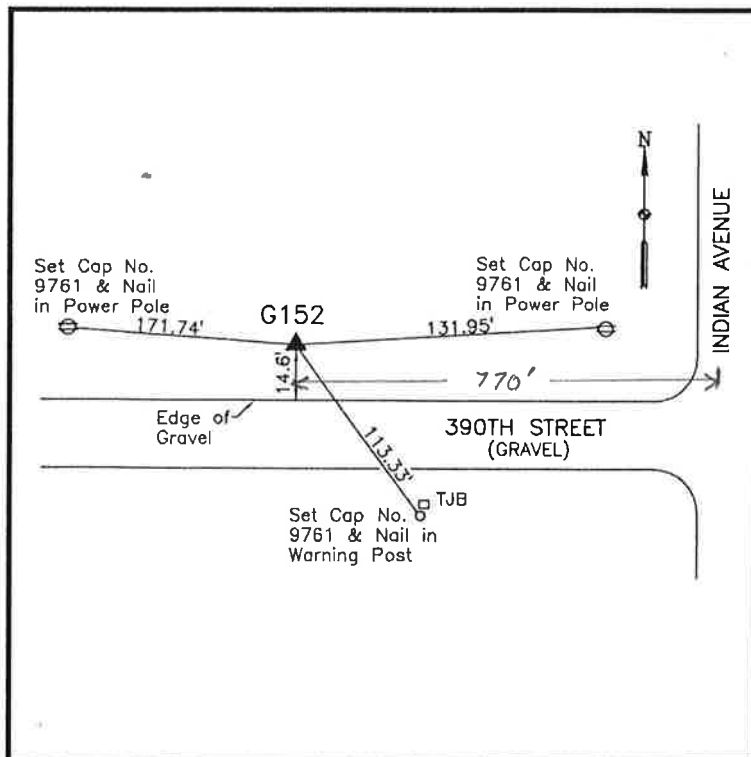
Latitude:	43° 05' 05.17270" N
Longitude:	96° 05' 57.56974" W
Scale Factor:	0.9999718316
Convergence:	-1° 45' 42.0"
Combined Factor:	0.99991086

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G152 and NGS Style Access Cover 1" Deep

**Location:**

North side 390th Street 0.15 mile west of Indian Avenue in Section 36, T96N, R45W.



**WHKS & CO.**

**SIOUX 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:	3870842.547	1179835.168
Easting:	4211861.625	1283777.991
Elevation:	1429.134	435.601
Ellipsoid Height:	1342.333	409.144
Geoid 99 Height:	-86.801	-26.457

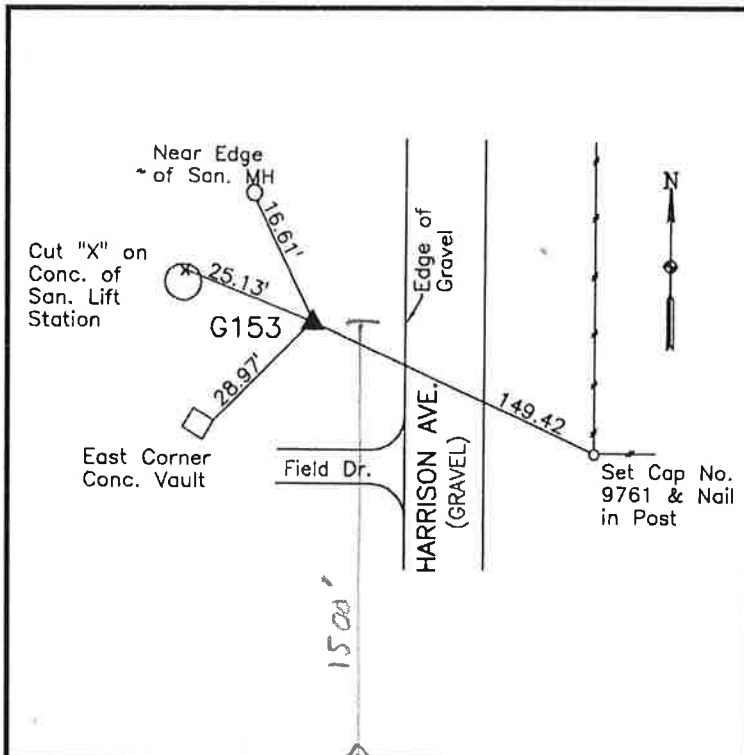
Latitude:	43° 05' 18.26304" N
Longitude:	96° 09' 21.66729" W
Scale Factor:	0.9999722956
Convergence:	-1° 48' 00.4"
Combined Factor:	0.99990825

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G153 and NGS Style  
Access Cover 6" Deep

**Location:**

West side Harrison Avenue 0.3  
mile north of 390th Street in  
Section 33, T96N, R45W.



**WHKS & CO.**

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

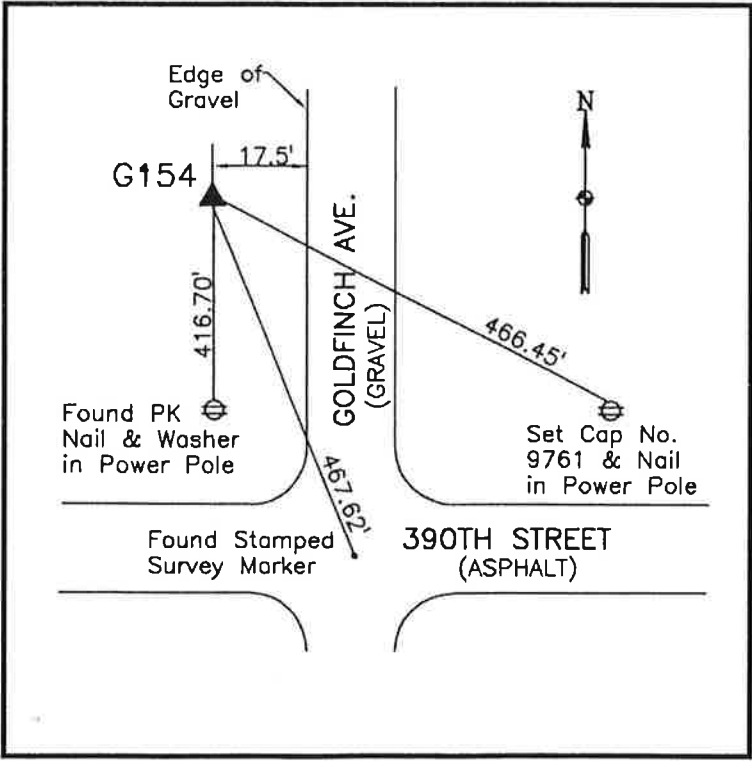
GPS POINT NUMBER **G154**

	US SURVEY FEET	METRIC
Northing:	3870245.490	1179653.185
Easting:	4196185.934	1279000.031
Elevation:	1442.822	439.773
Ellipsoid Height:	1356.287	413.397
Geoid 99 Height:	-86.535	-26.376

Latitude:	43° 05' 07. <sup>37228</sup> 45136" N
Longitude:	96° 12' 52. <sup>66371</sup> 55403" W
Scale Factor:	0.9999719121
Convergence:	-1° 50' 23.3"
Combined Factor:	0.99990720

**Description:**  
Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G154 and NGS Style  
Access Cover 1" Deep

**Location:**  
West side Goldfinch Avenue  
0.1 mile north of 390th Street in  
Section 36, T96N, R46W.



**WHKS & CO.**

**SIOUX 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:	3870260.312	1179657.702
Easting:	4179852.423	1274021.567
Elevation:	1379.933	420.604
Ellipsoid Height:	1293.632	394.300
Geoid 99 Height:	-86.301	-26.305

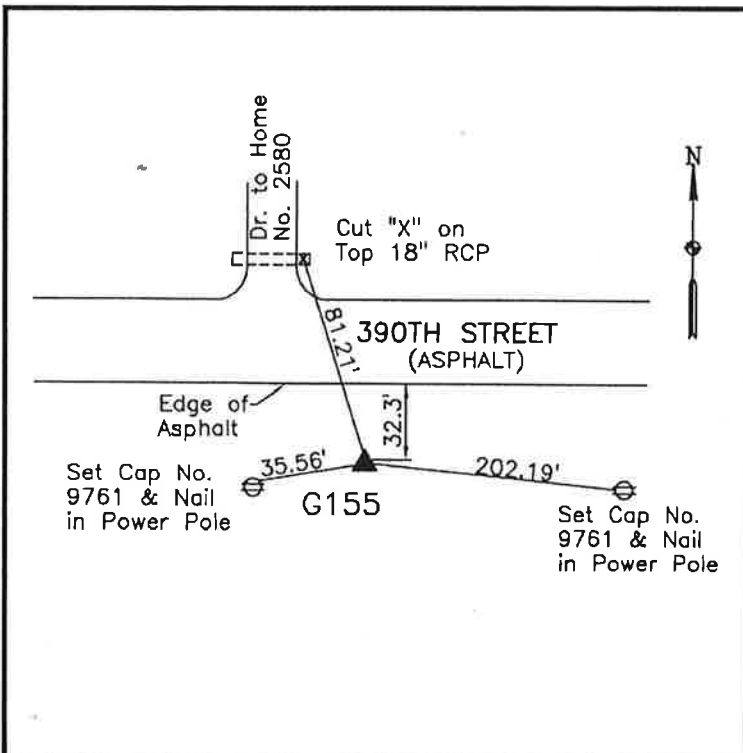
Latitude:	43° 05' 02.35985" N
Longitude:	96° 16' 32.55037" W
Scale Factor:	0.9999717324
Convergence:	-1° 52' 52.4"
Combined Factor:	0.99991001

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G155 and NGS Style  
Access Cover 1" Deep

**Location:**

South side 390th Street 0.1  
mile west of Fig Avenue in  
Section 4, T95N, R46W.



**WHKS & CO.**

**SIOUX 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:	3870797.992	1179821.588
Easting:	4164574.092	1269364.722
Elevation:	1399.444	426.551
Ellipsoid Height:	1313.335	400.305
Geoid 99 Height:	-86.109	-26.246

Latitude:                      43° 05' 02.66275" N

Longitude:                    96° 19' 58.56177" W

Scale Factor:                0.9999717431

Convergence:                -1° 55' 12.0"

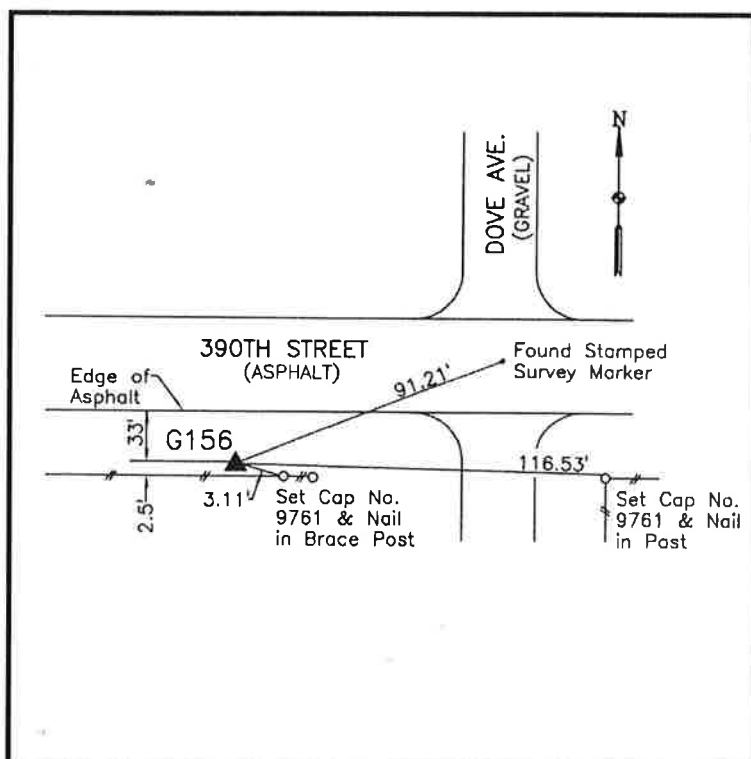
Combined Factor:            0.99990908

Description:

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G156 and NGS Style  
 Access Cover 3" Deep

Location:

Southwest side of intersection  
 of Dove Avenue and 390th  
 Street in Section 1, T95N,  
 R47W.



**WHKS & CO.**

**SIOUX 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:	3871257.286	1179961.581
Easting:	4148701.244	1264526.668
Elevation:	1314.385	400.625
Ellipsoid Height:	1228.453	374.433
Geoid 99 Height:	-85.931	-26.192

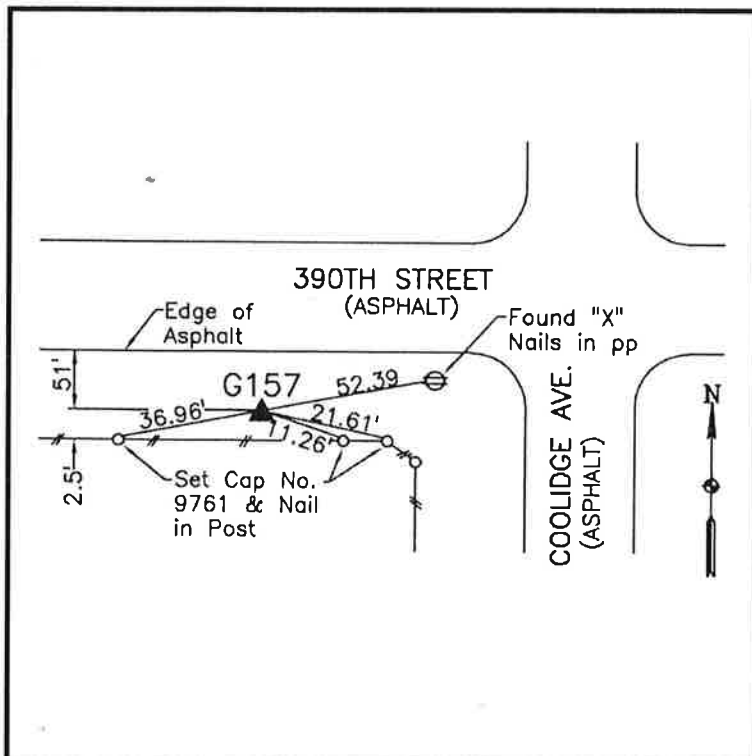
Latitude:	43° 05' 01.88884" N
Longitude:	96° 23' 32.54429" W
Scale Factor:	0.9999717159
Convergence:	-1° 57' 37.0"
Combined Factor:	0.99991311

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G157 and NGS Style Access Cover 1" Deep

**Location:**

Southwest side of intersection of Coolidge Avenue and 390th Street in Section 4, T95N, R47W.



**WHKS & CO.**

**SIoux 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:	3872256.727	1180266.211
Easting:	4133393.693	1259860.917
Elevation:	1196.948	364.830
Ellipsoid Height:	1111.175	338.687
Geoid 99 Height:	-85.772	-26.143

Latitude:                      43° 05' 06.53144" N

Longitude:                    96° 26' 59.16613" W

Scale Factor:                0.9999718796

Convergence:               -1° 59' 57.1"

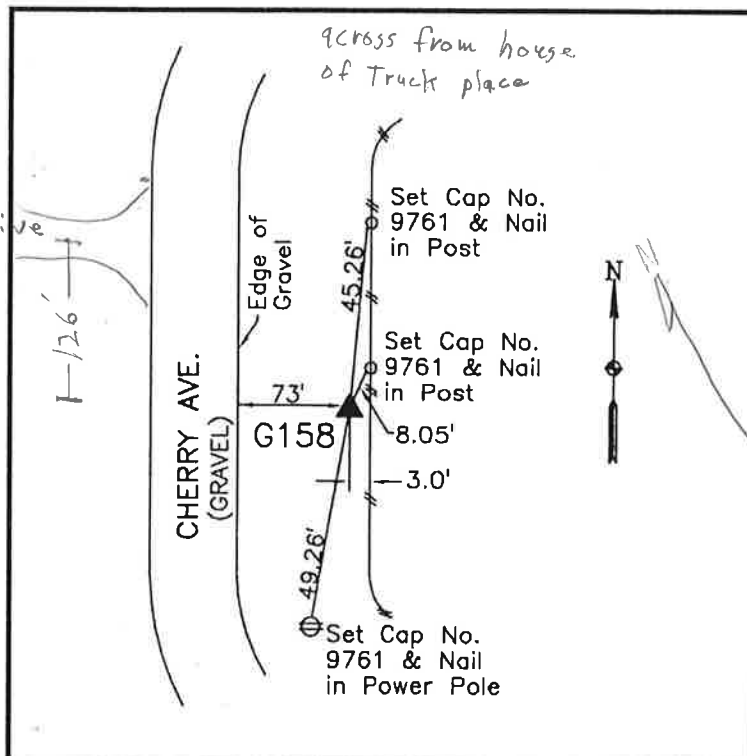
Combined Factor:           0.99991887

Description:

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G158 and NGS Style  
 Access Cover 3" Deep

Location:

East side of Cherry Avenue  
 0.35 mile northwesterly of "T"  
 intersection of Cherry Avenue  
 and 390th Street in Section 31,  
 T96N, R47W.



**WHKS & CO.**

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

GPS POINT NUMBER **G159**

	US SURVEY FEET	METRIC
NORTHING:	3890161.054	
EASTING:	4136027.861	RELOCATION COORDINATES
ELEVATION:	1208.926	
Ellipsoid Height:	1122.338	342.089
Geoid 99 Height:	-86.078	-26.237

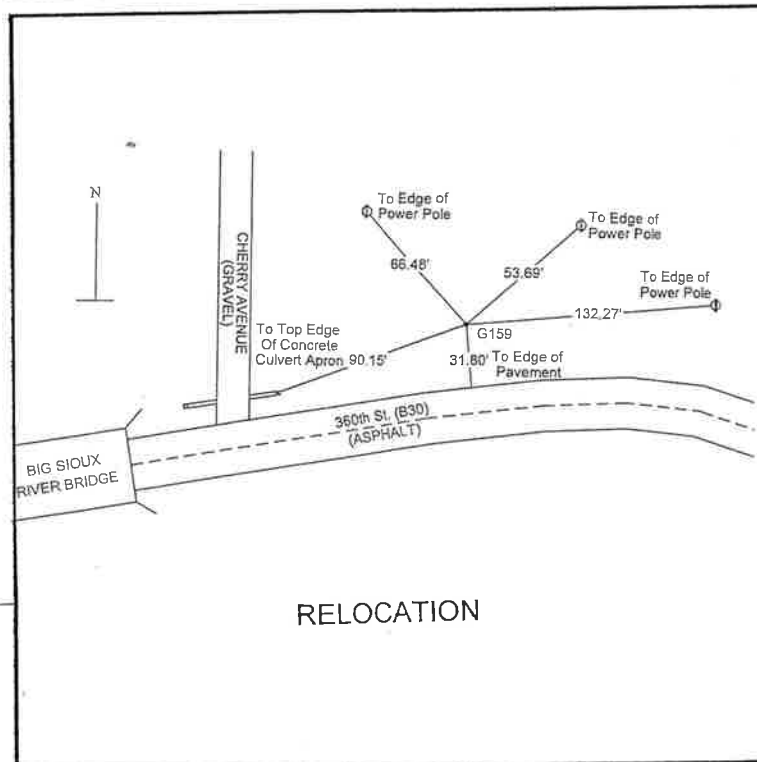
LATITUDE:	43° 08' 04.17571" N
LONGITUDE:	96° 26' 32.08558" W
Scale Factor:	0.9999785200
Convergence:	-1° 59' 38.8"
Combined Factor:	0.99992497

Description:

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G159 and NGS Style Access Cover 1" Deep

Location:

Northeast corner of intersection of 360th Street and Cherry Avenue in Section 18, T96N, R47W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G160**

	US SURVEY FEET	METRIC
Northing:	3887306.584	1184853.416
Easting:	4150464.172	1265064.010
Elevation:	1285.633	391.862
Ellipsoid Height:	1199.455	365.595
Geoid 99 Height:	-86.178	-26.267

Latitude:                      43° 07' 40.91415" N

Longitude:                    96° 23' 16.18814" W

Scale Factor:                0.9999776134

Convergence:                -1° 57' 26.0"

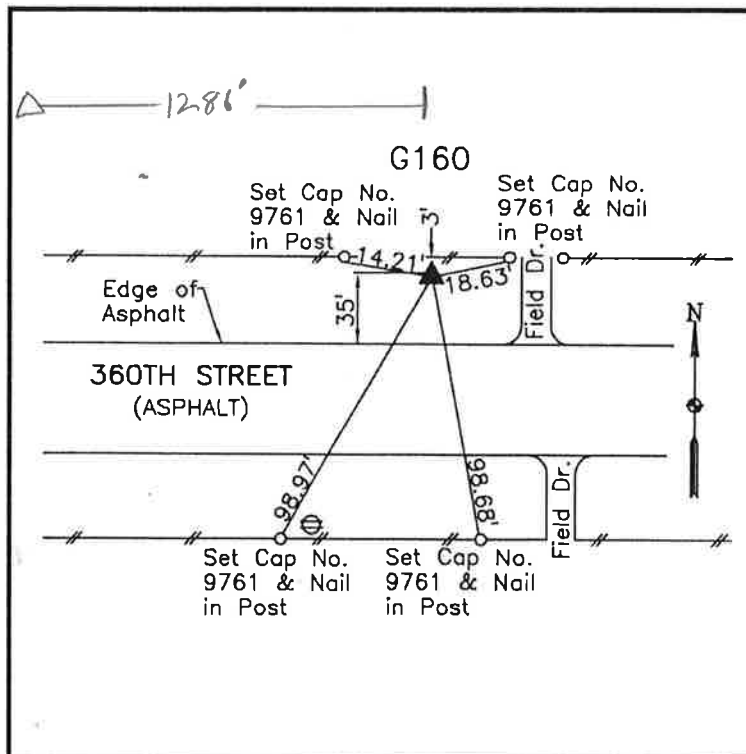
Combined Factor:            0.99992039

Description:

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G160 and NGS Style  
 Access Cover 2" Deep

Location:

North side of 360th Street 0.2  
 mile east of Coolidge Avenue  
 near driveway and gate in  
 Section 15, T96N, R47W.



**WHKS & CO.**

G160

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

GPS POINT NUMBER **G161**

	US SURVEY FEET	METRIC
Northing:	3886829.711	1184708.065
Easting:	4165224.169	1269562.866
Elevation:	1417.729	432.125
Ellipsoid Height:	1331.415	405.816
Geoid 99 Height:	-86.313	-26.308

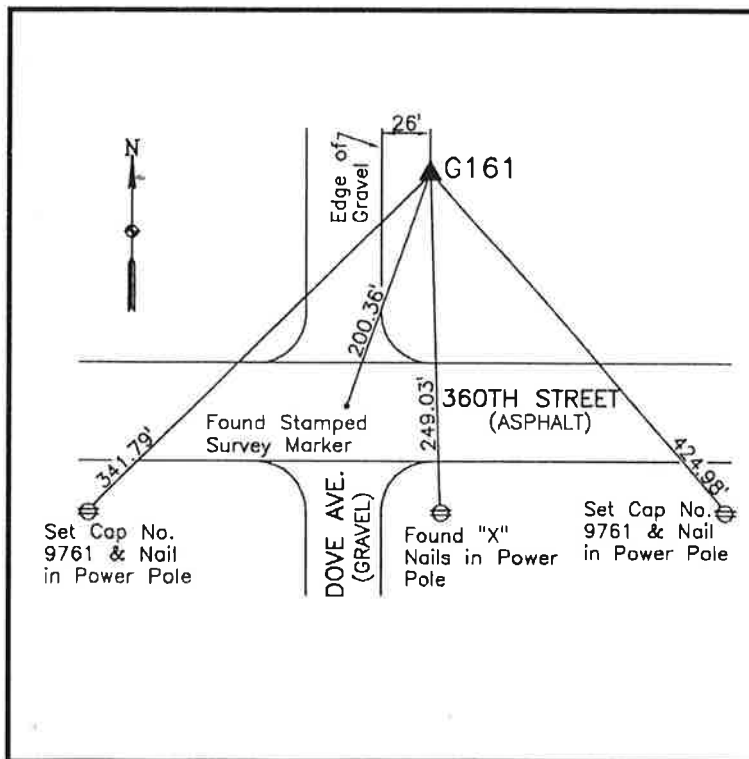
Latitude:	43° 07' 41.13811" N
Longitude:	96° 19' 57.04357" W
Scale Factor:	0.9999776221
Convergence:	-1° 55' 11.0"
Combined Factor:	0.99991410

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G161 and NGS Style Access Cover 2" Deep

**Location:**

East side of Dove Avenue just north of 360th Street in Section 18, T96N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER **G162**

	US SURVEY FEET	METRIC
Northing:	3886128.100	1184494.214
Easting:	4180455.988	1274205.534
Elevation:	1414.698	431.201
Ellipsoid Height:	1328.227	404.844
Geoid 99 Height:	-86.471	-26.356

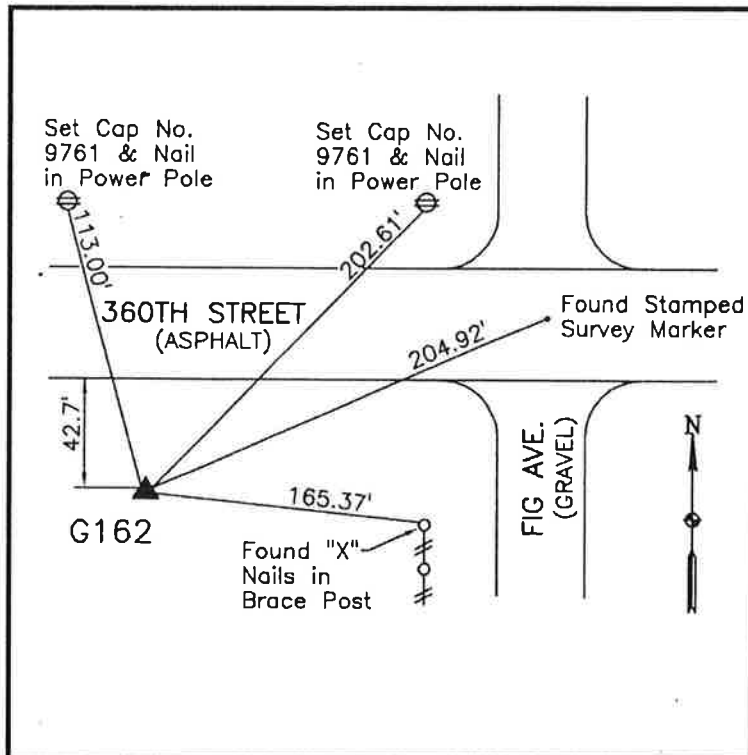
Latitude:	43° 07' 39.20105" N
Longitude:	96° 16' 31.44003" W
Scale Factor:	0.9999775467
Convergence:	-1° 52' 51.6"
Combined Factor:	0.99991418

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G162 and NGS Style Access Cover 3" Deep

**Location:**

South side of 360th Street just west of Fig Avenue in Section 21, T96N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER **G163**

	US SURVEY FEET	METRIC
Northing:	3885161.961	1184199.734
Easting:	4196511.353	1279099.218
Elevation:	1454.778	443.417
Ellipsoid Height:	1368.114	417.002
Geoid 99 Height:	-86.664	-26.415

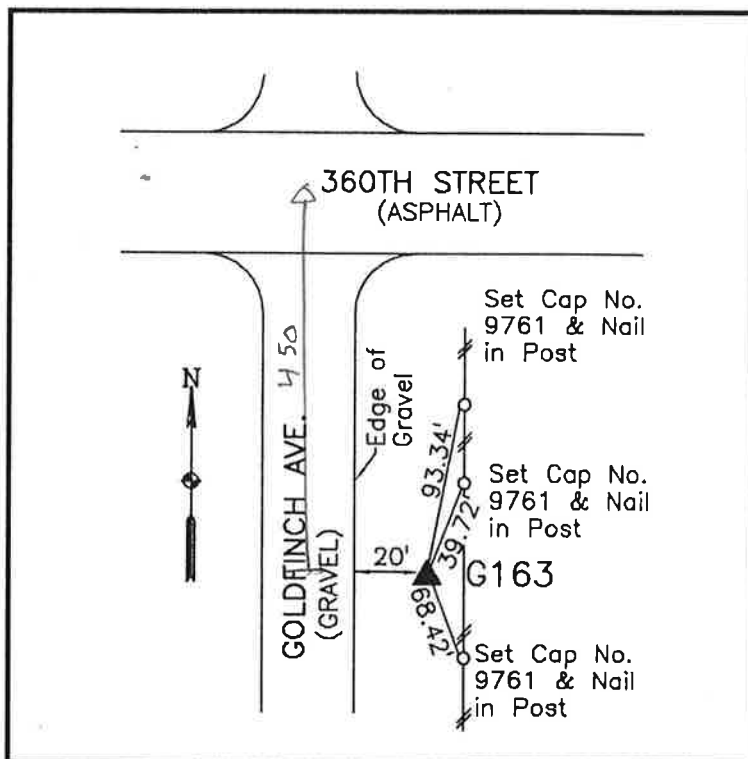
Latitude:	43° 07' 34.81217" N
Longitude:	96° 12' 54.62588" W
Scale Factor:	0.9999773761
Convergence:	-1° 50' 24.7"
Combined Factor:	0.99991210

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G163 and NGS Style  
Access Cover 3" Deep

**Location:**

East side of Goldfinch Avenue  
0.1 mile south of 360th Street  
in Section 19, T96N, R45W.



**WHKS & CO.**

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

GPS POINT NUMBER **G164**

	US SURVEY FEET	METRIC
Northing:	3884535.522	1184008.795
Easting:	4212082.257	1283845.240
Elevation:	1411.835	430.328
Ellipsoid Height:	1324.951	403.846
Geoid 99 Height:	-86.884	-26.482

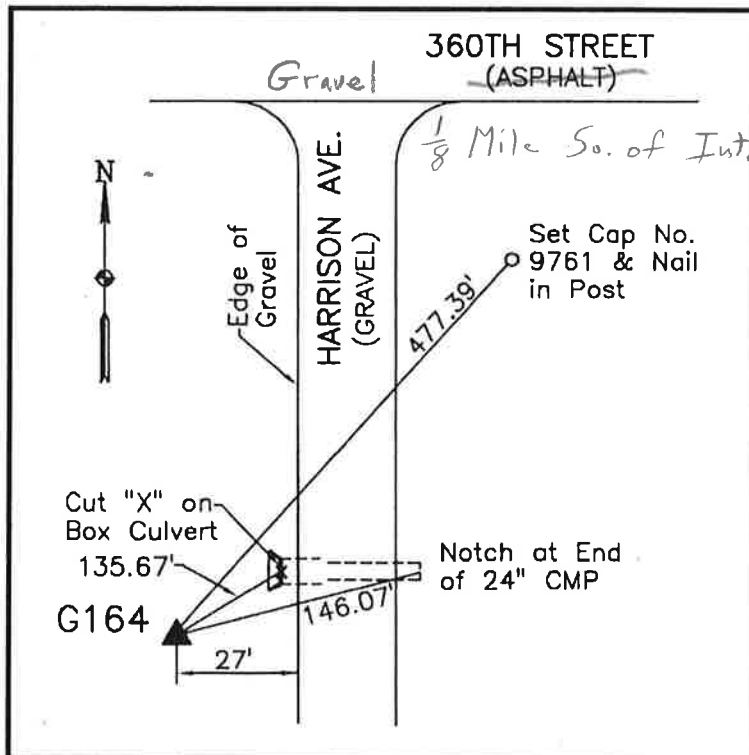
Latitude:	43° 07' 33.51349" N
Longitude:	96° 09' 24.49380" W
Scale Factor:	0.9999773257
Convergence:	-1° 48' 02.3"
Combined Factor:	0.99991411

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G164 and NGS Style Access Cover 2" Deep

**Location:**

West side of Harrison Avenue  
0.15 mile south of 360th Street  
in Section 21, T96N, R45W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G165**

	US SURVEY FEET	METRIC
Northing:	3884867.161	1184109.879
Easting:	4227667.353	1288595.586
Elevation:	1378.669	420.219
Ellipsoid Height:	1291.539	393.662
Geoid 99 Height:	-87.130	-26.557

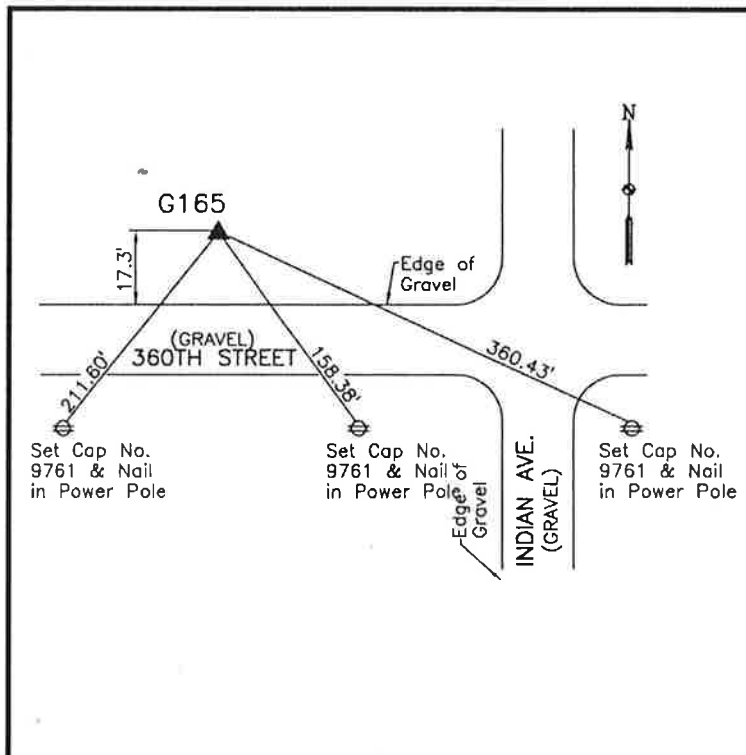
Latitude:	43° 07' 41.57147" N
Longitude:	96° 05' 54.57003" W
Scale Factor:	0.9999776390
Convergence:	-1° 45' 40.0"
Combined Factor:	0.99991602

**Description:**

Placed 3/4" X 6" - 0" Long  
Aluminum Rod with Cap  
Stamped G165 and NGS Style  
Access Cover 1" Deep

**Location:**

North side of 360th Street 0.1  
mile west of Indian Avenue in  
Section 13, T96N, R45W.



**WHKS & CO.**

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

GPS POINT NUMBER **G166**

	US SURVEY FEET	METRIC
Northing:	3883859.574	1183802.766
Easting:	4243683.173	1293477.218
Elevation:	1401.382	427.142
Ellipsoid Height:	1313.992	400.506
Geoid 99 Height:	-87.390	-26.637

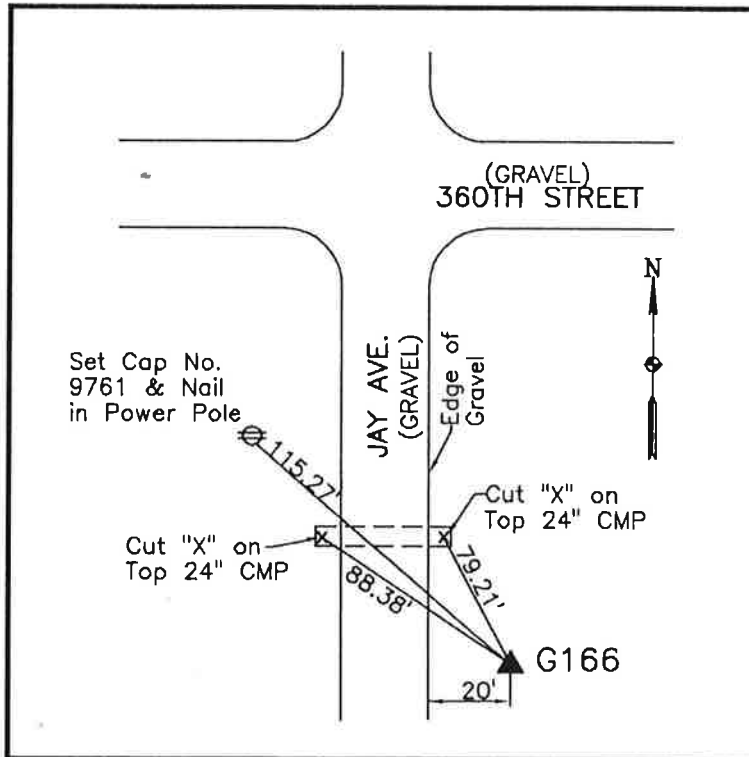
Latitude:	43° 07' 36.42936" N
Longitude:	96° 02' 18.28299" W
Scale Factor:	0.9999774389
Convergence:	-1° 43' 13.4"
Combined Factor:	0.99991475

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G166 and NGS Style Access Cover 2" Deep

**Location:**

East side of Jay Avenue 0.1 mile south of 360th Street in Section 22, T96N, R44W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G167**

	US SURVEY FEET	METRIC
Northing:	3883686.480	1183750.006
Easting:	4259489.801	1298295.088
Elevation:	1420.893	433.089
Ellipsoid Height:	1333.216	406.365
Geoid 99 Height:	-87.677	-26.724

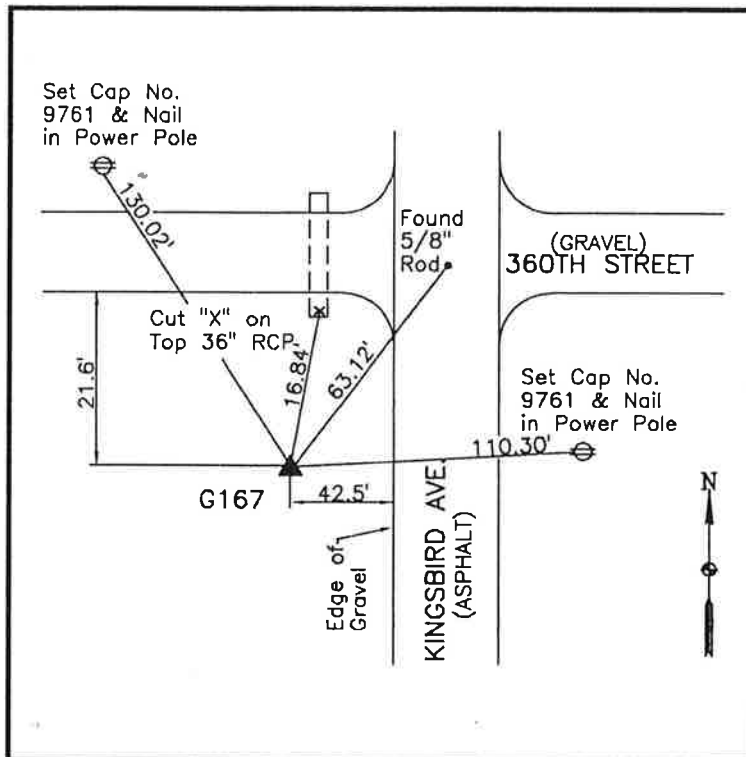
Latitude:	43° 07' 39.35297" N
Longitude:	95° 58' 45.15565" W
Scale Factor:	0.9999775526
Convergence:	-1° 40' 49.0"
Combined Factor:	0.99991395

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G167 and NGS Style Access Cover 2" Deep

**Location:**

Southwest corner of intersection of 360th street and Kingbird Avenue in Section 24, T96N, R44W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G168**

	US SURVEY FEET	METRIC
Northing:	3883151.261	1183586.871
Easting:	4275361.891	1303132.911
Elevation:	1393.180	424.642
Ellipsoid Height:	1305.180	397.820
Geoid 99 Height:	-88.000	-26.823

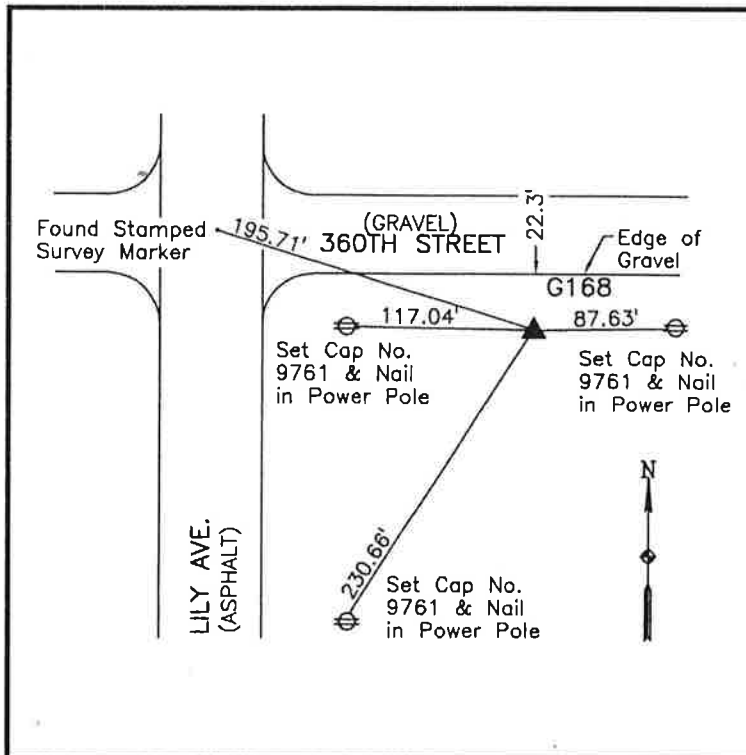
Latitude:	43° 07' 38.61047" N
Longitude:	95° 55' 11.00064" W
Scale Factor:	0.9999775237
Convergence:	-1° 38' 23.8"
Combined Factor:	0.99991525

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G168 and NGS Style  
Access Cover 1" Deep

**Location:**

South side of 360th Street just  
east of Lily Avenue in Section  
22, T96N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G169**

	US SURVEY FEET	METRIC
Northing:	3882719.082	1183455.143
Easting:	4290365.827	1307706.119
Elevation:	1422.317	433.523
Ellipsoid Height:	1333.985	406.599
Geoid 99 Height:	-88.333	-26.924

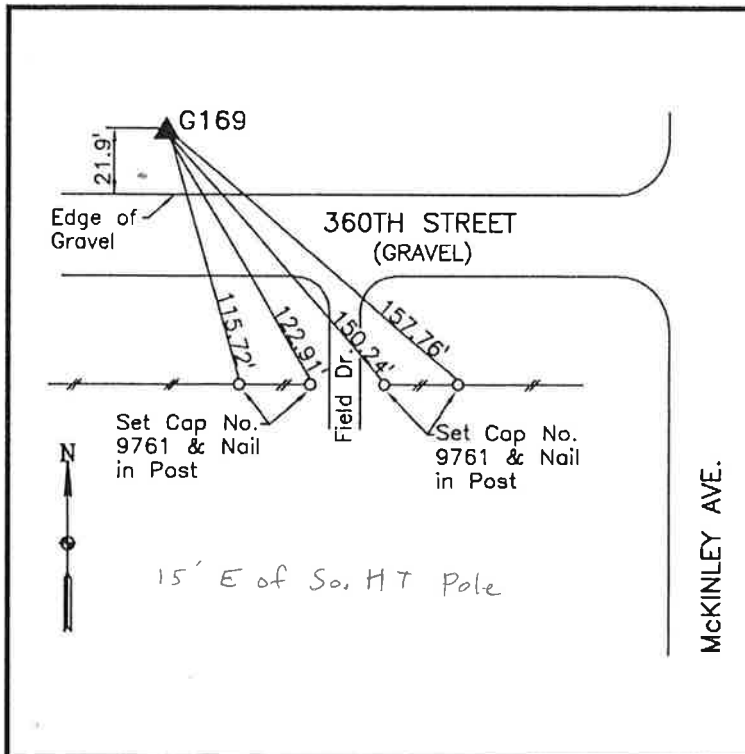
Latitude:	43° 07' 38.53540" N
Longitude:	95° 51' 48.58848" W
Scale Factor:	0.9999775208
Convergence:	-1° 36' 06.6"
Combined Factor:	0.99991388

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G169 and NGS Style Access Cover 1" Deep

**Location:**

North side of 360th Street 0.1 mile west of McKinley Avenue in Section 13, T96N, R43W.



**WHKS & CO.**

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

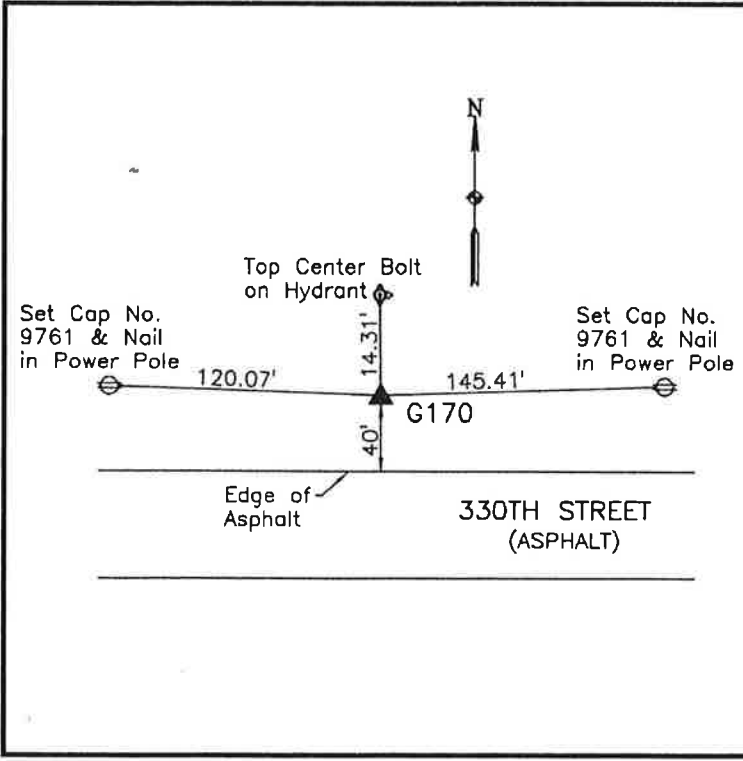
GPS POINT NUMBER **G170**

	US SURVEY FEET	METRIC
Northing:	3898819.891	1188362.680
Easting:	4289698.315	1307502.661
Elevation:	1379.800	420.564
Ellipsoid Height:	1291.563	393.669
Geoid 99 Height:	-88.237	-26.895

Latitude:	43° 10' 17.31805" N
Longitude:	95° 52' 03.66644" W
Scale Factor:	0.9999839958
Convergence:	-1° 36' 16.9"
Combined Factor:	0.99992238

**Description:**  
Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G170 and NGS Style Access Cover 1" Deep

**Location:**  
North side 330th Street 0.35 mile west of McKinley Avenue east county line in Section 36, T97N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER **G171**

	US SURVEY FEET	METRIC
Northing:	3899259.787	1188496.760
Easting:	4275661.264	1303224.160
Elevation:	1420.379	432.932
Ellipsoid Height:	1332.431	406.126
Geoid 99 Height:	-87.947	-26.806

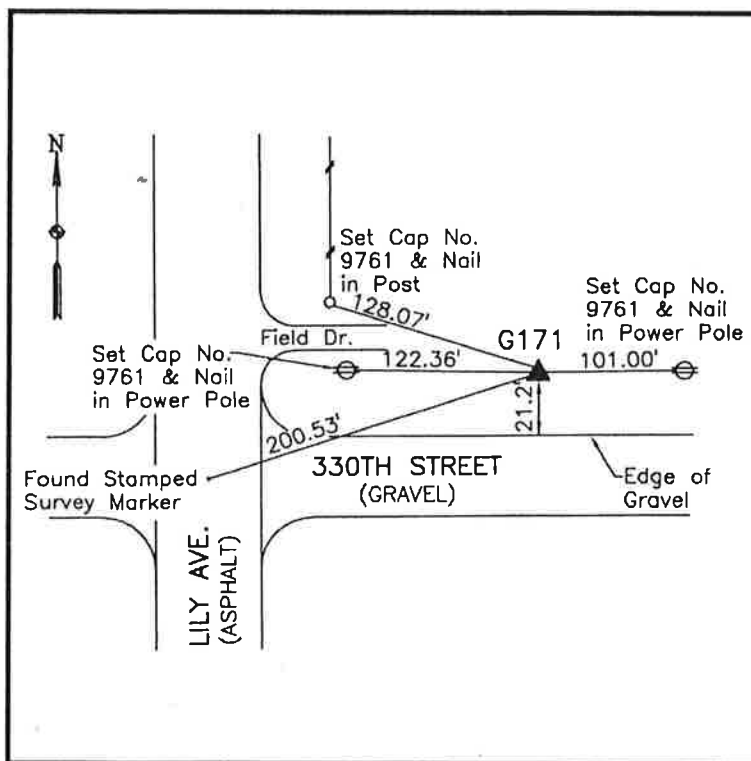
Latitude:	43° 10' 17.73551" N
Longitude:	95° 55' 13.18346" W
Scale Factor:	0.9999840136
Convergence:	-1° 38' 25.3"
Combined Factor:	0.99992044

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G171 and NGS Style Access Cover 3" Deep

**Location:**

Northeast side of intersection of Lily Avenue and 330th Street in Section 34, T97N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER **G172**

	US SURVEY FEET	METRIC
Northing:	3900077.644	1188746.043
Easting:	4259803.038	1298390.563
Elevation:	1446.405	440.865
Ellipsoid Height:	1358.739	414.145
Geoid 99 Height:	-87.666	-26.721

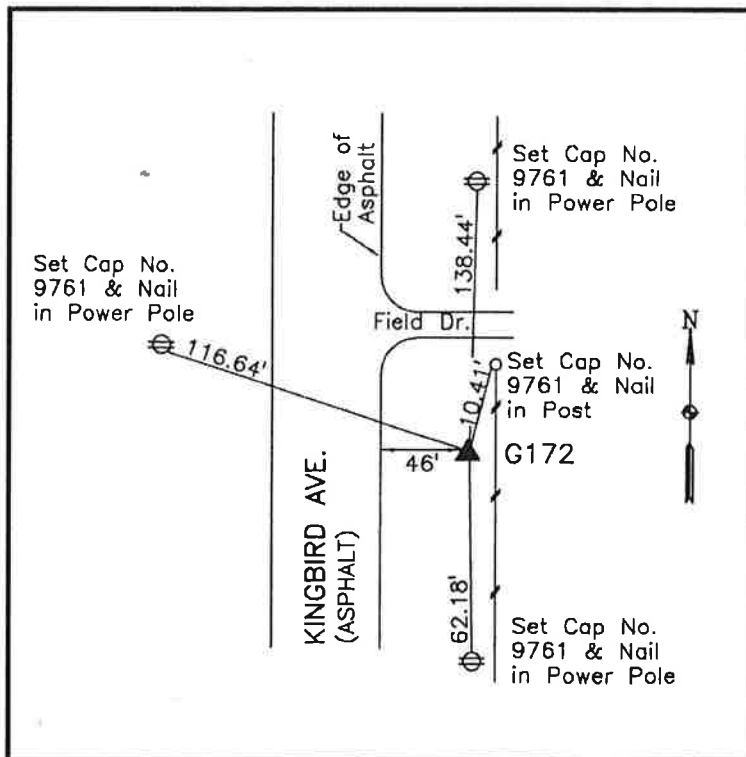
Latitude:	43° 10' 21.27128" N
Longitude:	95° 58' 47.41631" W
Scale Factor:	0.9999841646
Convergence:	-1° 40' 50.5"
Combined Factor:	0.99991934

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G172 and NGS Style Access Cover 2" Deep

**Location:**

East side of Kingbird Avenue  
0.05 mile north of 330th Street  
in Section 31, T97N, R44W.



**WHKS & CO.**

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

GPS POINT NUMBER **G173**

	US SURVEY FEET	METRIC
Northing:	3900195.205	1188781.876
Easting:	4244073.704	1293596.252
Elevation:	1380.257	420.703
Ellipsoid Height:	1292.823	394.053
Geoid 99 Height:	-87.434	-26.650

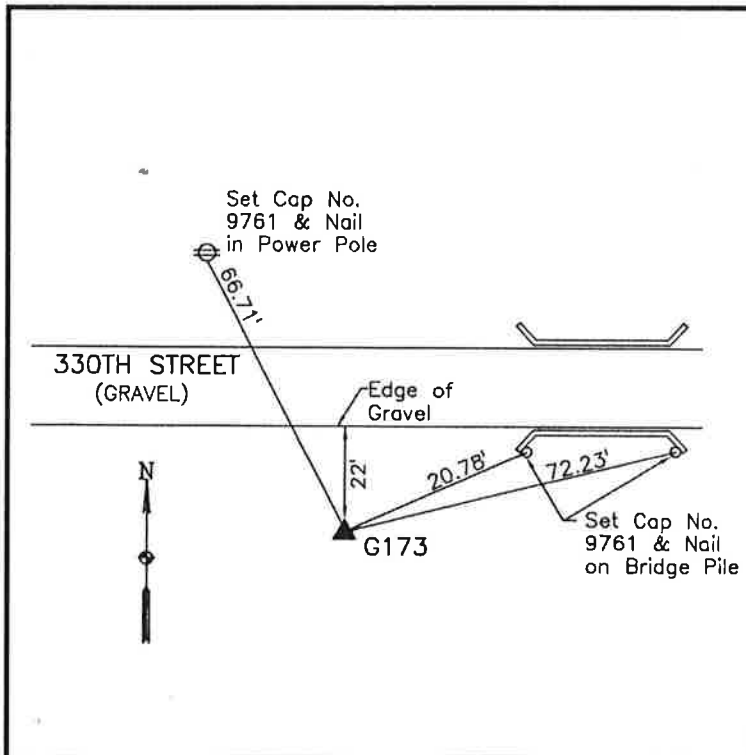
Latitude:	43° 10' 17.82118" N
Longitude:	96° 02' 19.63345" W
Scale Factor:	0.9999840173
Convergence:	-1° 43' 14.3"
Combined Factor:	0.99992234

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G173 and NGS Style Access Cover 1" Deep

**Location:**

Southeast side of intersection of Jay Avenue and 330th Street in Section 3, T96N, R44W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G174**

	US SURVEY FEET	METRIC
Northing:	3900567.733	1188895.423
Easting:	4227983.567	1288691.969
Elevation:	1392.882	424.551
Ellipsoid Height:	1305.695	397.976
Geoid 99 Height:	-87.188	-26.575

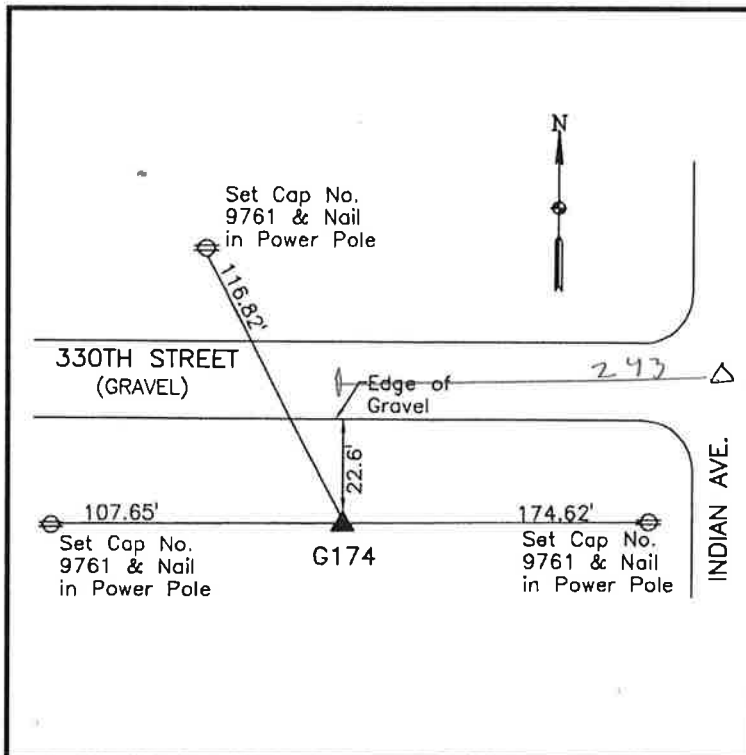
Latitude:	43° 10' 16.67038" N
Longitude:	96° 05' 56.81623" W
Scale Factor:	0.9999839682
Convergence:	-1° 45' 41.5"
Combined Factor:	0.99992167

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G174 and NGS Style  
Access Cover 1" Deep

**Location:**

South side of 330th Street 0.05  
mile west of Indian Avenue in  
Section 1, T97N, R45W.



**WHKS & CO.**

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

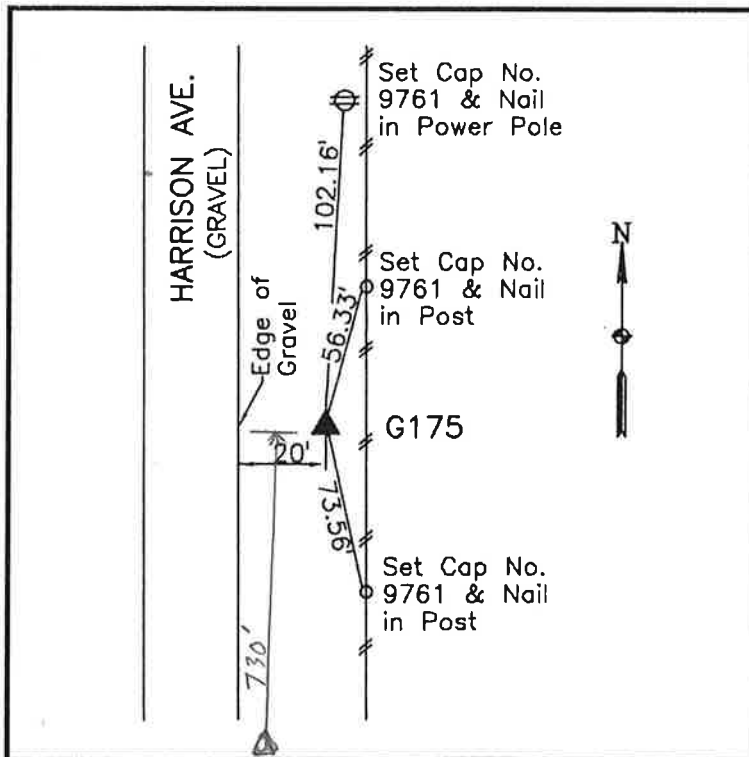
GPS POINT NUMBER **G175**

	US SURVEY FEET	METRIC
Northing:	3901774.233	1189263.165
Easting:	4212445.525	1283955.964
Elevation:	1469.601	447.935
Ellipsoid Height:	1382.632	421.427
Geoid 99 Height:	-86.969	-26.508

Latitude:	43° 10' 23.81070" N
Longitude:	96° 09' 26.90378" W
Scale Factor:	0.9999842733
Convergence:	-1° 48' 03.9"
Combined Factor:	0.99991831

Description:  
Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G175 and NGS Style  
Access Cover 1" Deep

Location:  
East side of Harrison Avenue  
0.15 mile north of 330th Street  
in Section 34, T97N, R45W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G176**

	US SURVEY FEET	METRIC
Northing:	3901528.209	1189188.177
Easting:	4197034.637	1279258.716
Elevation:	1444.559	440.302
Ellipsoid Height:	1357.759	413.846
Geoid 99 Height:	-86.799	-26.456

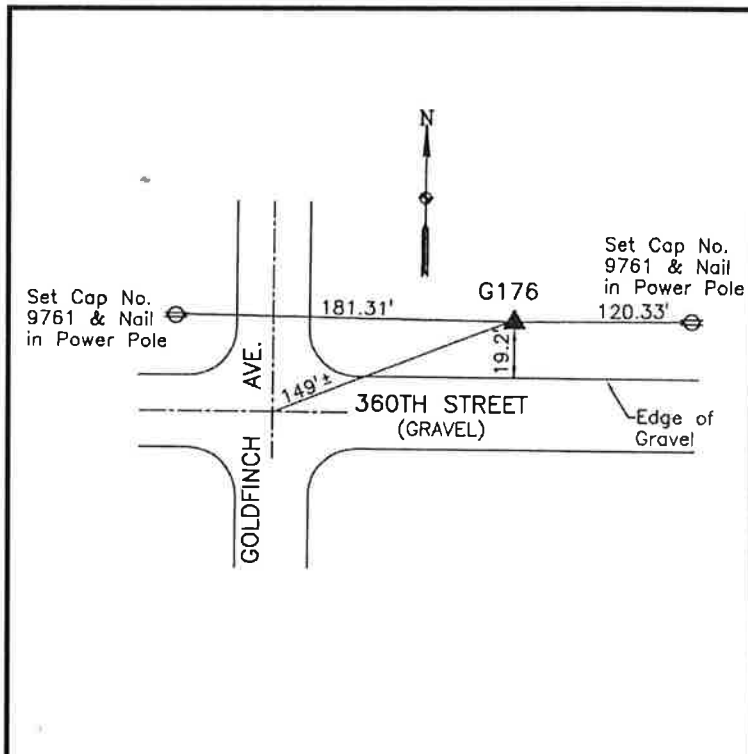
Latitude:	43° 10' 16.54596" N
Longitude:	96° 12' 54.66013" W
Scale Factor:	0.9999839629
Convergence:	-1° 50' 24.7"
Combined Factor:	0.99991918

**Description:**

Placed 3/4" X 6" - 0" Long  
Aluminum Rod with Cap  
Stamped G176 and NGS Style  
Access Cover 2" Deep

**Location:**

Northeast side of intersection  
of Goldfinch Avenue and 330th  
Street in Section 31, T97N,  
R45W.



**WHKS & CO.**

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

GPS POINT NUMBER **G177**

	US SURVEY FEET	METRIC
Northing:	3902000.130	1189332.018
Easting:	4181515.649	1274528.519
Elevation:	1421.633	433.315
Ellipsoid Height:	1334.977	406.902
Geoid 99 Height:	-86.656	-26.413

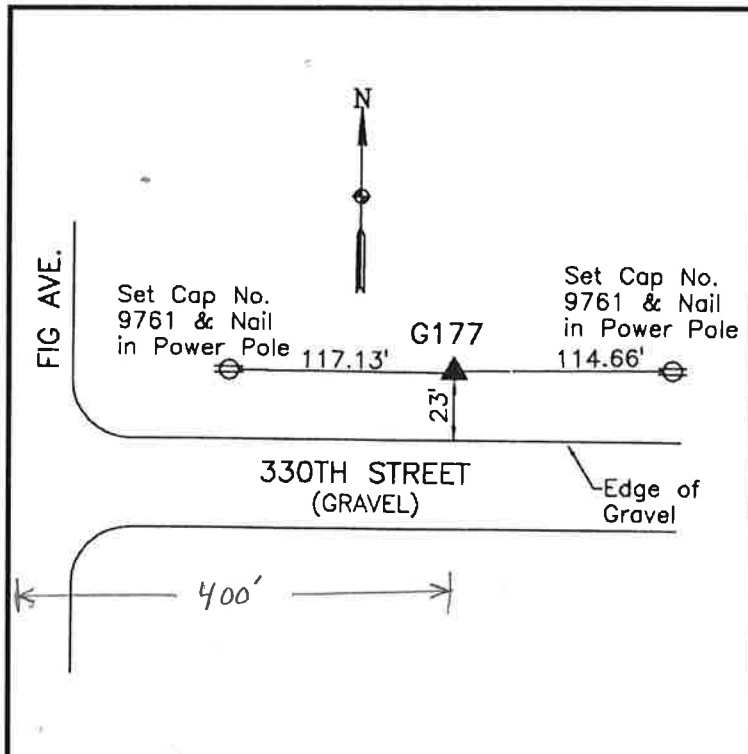
Latitude:	43° 10' 16.22977" N
Longitude:	96° 16' 24.17851" W
Scale Factor:	0.9999839494
Convergence:	-1° 52' 46.7"
Combined Factor:	0.99992026

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G177 and NGS Style Access Cover 1" Deep

**Location:**

North side 330th Street 0.05 mile east of Fig Avenue in Section 34, T97N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G178**

	US SURVEY FEET	METRIC
Northing:	3902528.276	1189492.998
Easting:	4165562.600	1269666.020
Elevation:	1347.438	410.700
Ellipsoid Height:	1260.916	384.328
Geoid 99 Height:	-86.522	-26.372

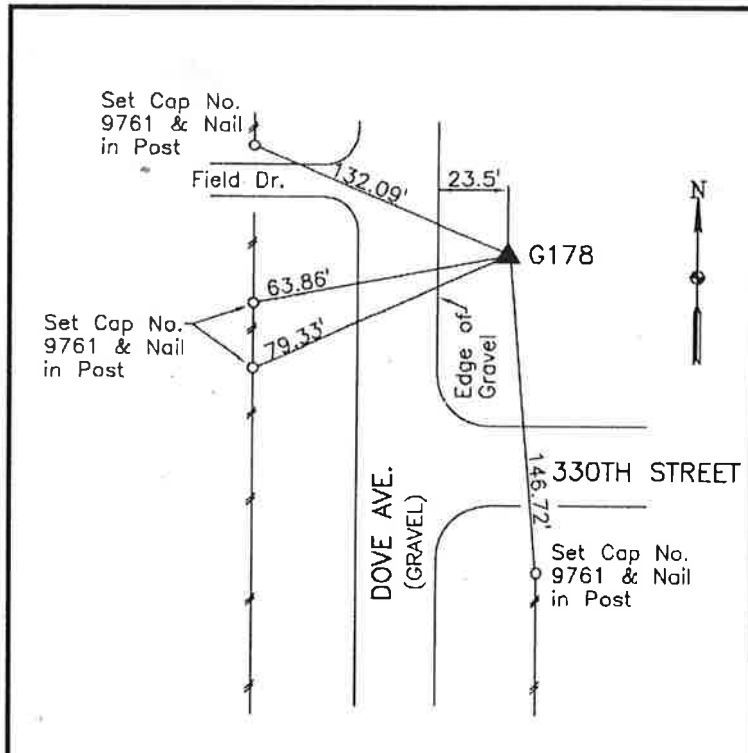
Latitude:	43° 10' 16.21941" N
Longitude:	96° 19' 59.57580" W
Scale Factor:	0.9999839490
Convergence:	-1° 55' 12.7"
Combined Factor:	0.99992379

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G178 and NGS Style Access Cover 1" Deep

**Location:**

Northeast side of intersection of Dove Avenue and 330th Street in Section 31, T97N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G179**

	US SURVEY FEET	METRIC
Northing:	3902874.556	1189598.544
Easting:	4149796.131	1264860.390
Elevation:	1212.862	369.681
Ellipsoid Height:	1126.476	343.351
Geoid 99 Height:	-86.386	-26.331

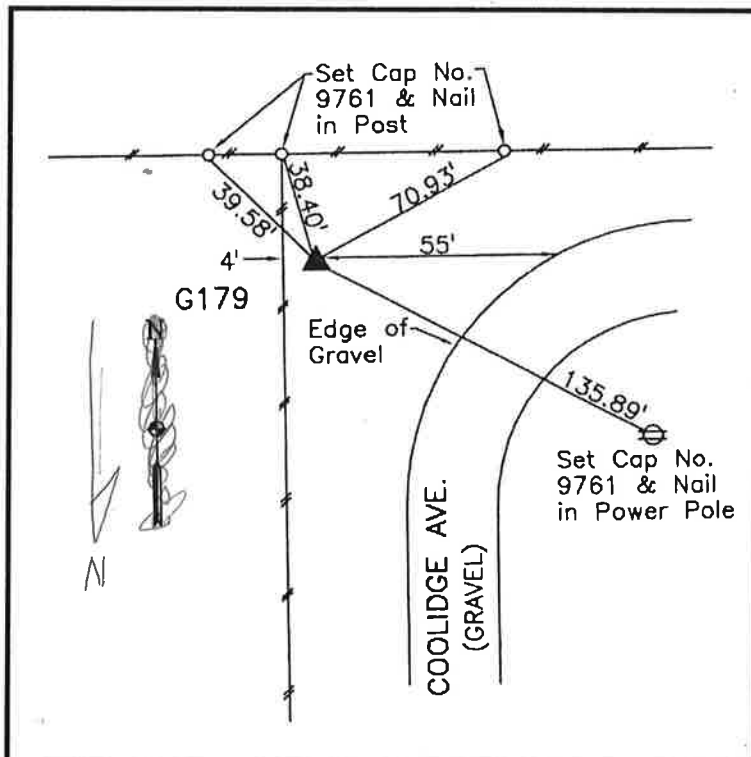
Latitude:	43° 10' 14.36528" N
Longitude:	96° 23' 32.37265" W
Scale Factor:	0.9999838700
Convergence:	-1° 57' 36.9"
Combined Factor:	0.99993013

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G179 and NGS Style  
Access Cover 1" Deep

**Location:**

East side of Coolidge Avenue  
1.0 mile south of 320th Street  
in Section 34, T97N, R47W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G180**

	US SURVEY FEET	METRIC
Northing:	3903422.371	1189765.518
Easting:	4134204.251	1260107.976
Elevation:	1222.877	372.734
Ellipsoid Height:	1136.638	346.448
Geoid 99 Height:	-86.240	-26.286

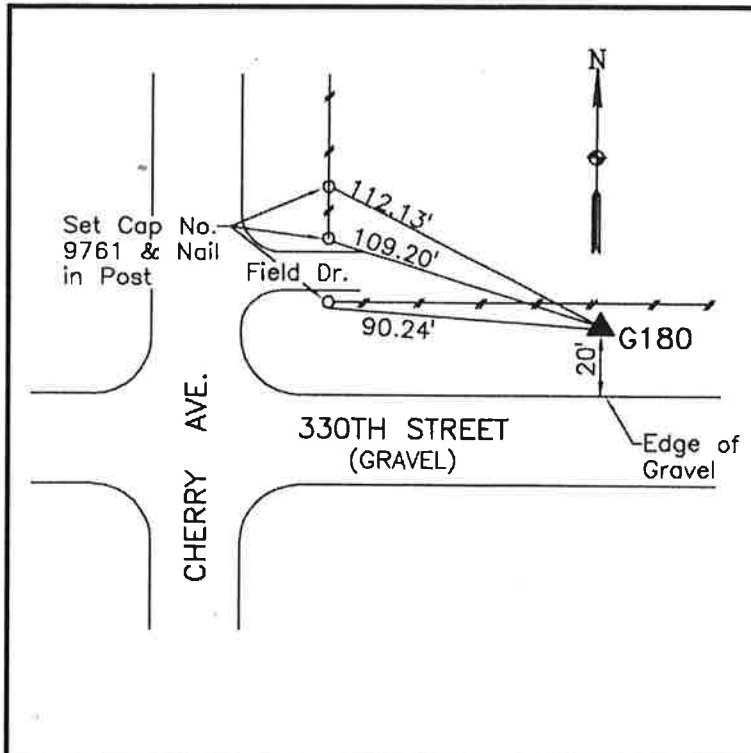
Latitude:	43° 10' 14.45177" N
Longitude:	96° 27' 02.90625" W
Scale Factor:	0.9999838737
Convergence:	-1° 59' 59.6"
Combined Factor:	0.99992964

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G180 and NGS Style  
Access Cover 1" Deep

**Location:**

Northeast side of intersection  
of Cherry Avenue and 330th  
Street in Section 31, T97N,  
R47W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G181**

	US SURVEY FEET	METRIC
Northing:	3926187.260	1196704.270
Easting:	4108540.932	1252285.781
Elevation:	1238.078	377.367
Ellipsoid Height:	1151.785	351.065
Geoid 99 Height:	-86.294	-26.302

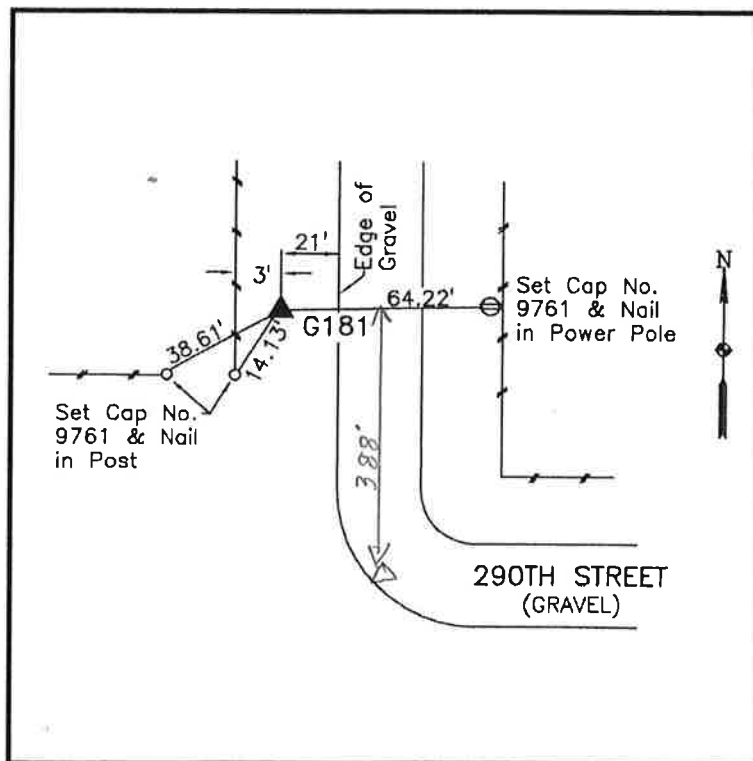
Latitude:	43° 13' 50.16328" N
Longitude:	96° 33' 00.07418" W
Scale Factor:	0.9999936096
Convergence:	-2° 04' 01.7"
Combined Factor:	0.99993866

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G181 and NGS Style Access Cover 1" Deep

**Location:**

West side of Arthur Avenue  
0.05 mile north of 290th Street  
in Section 7, T97N, R48W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G182**

	US SURVEY FEET	METRIC
Northing:	3925431.131	1196473.802
Easting:	4119017.270	1255478.975
Elevation:	1260.608	384.234
Ellipsoid Height:	1174.260	357.915
Geoid 99 Height:	-86.349	-26.319

Latitude:                      43° 13' 46.40815" N

Longitude:                    96° 30' 38.29080" W

Scale Factor:                0.9999934308

Convergence:                -2° 02' 25.6"

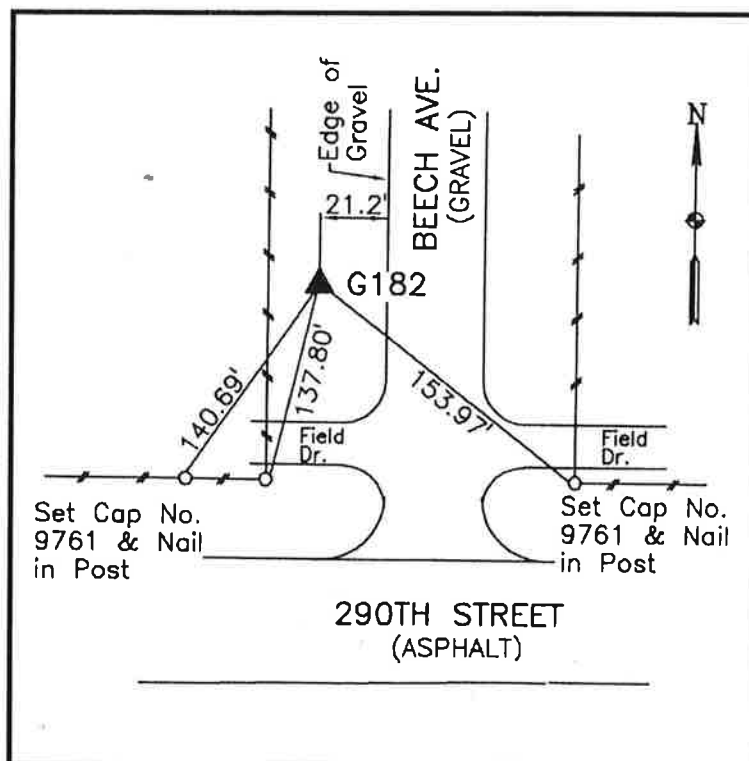
Combined Factor:            0.99993741

Description:

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G182 and NGS Style  
 Access Cover 1" Deep

Location:

Northwest side of intersection  
 of Beech avenue and 290th  
 street in Section 9, T97N,  
 R48W.



**WHKS & CO.**

G182

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

GPS POINT NUMBER **G183**

	US SURVEY FEET	METRIC
Northing:	3919180.816	1194568.702
Easting:	4134423.554	1260174.820
Elevation:	1382.301	421.326
Ellipsoid Height:	1295.898	394.990
Geoid 99 Height:	-86.403	-26.336

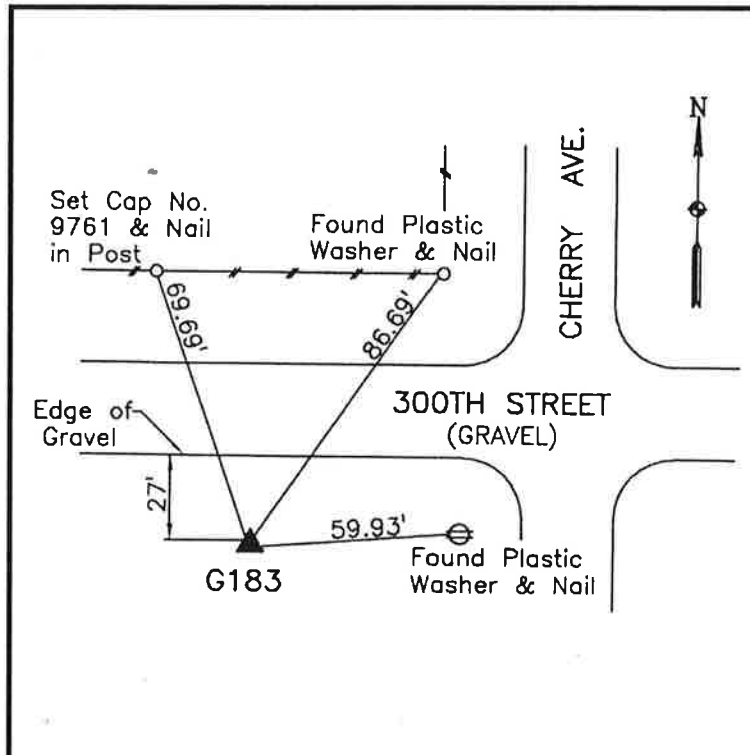
Latitude:	43° 12' 50.07816" N
Longitude:	96° 27' 07.37284" W
Scale Factor:	0.9999907873
Convergence:	-2° 00' 02.6"
Combined Factor:	0.99992896

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G183 and NGS Style Access Cover 1" Deep

**Location:**

Southwest side of intersection of Cherry Avenue and 300th Street in Section 24, T97N, R48W.



**WHKS & CO.**

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

GPS POINT NUMBER **G184**

	US SURVEY FEET	METRIC
Northing:	3918515.574	1194365.936
Easting:	4150120.237	1264959.178
Elevation:	1371.765	418.115
Ellipsoid Height:	1285.210	391.733
Geoid 99 Height:	-86.555	-26.382

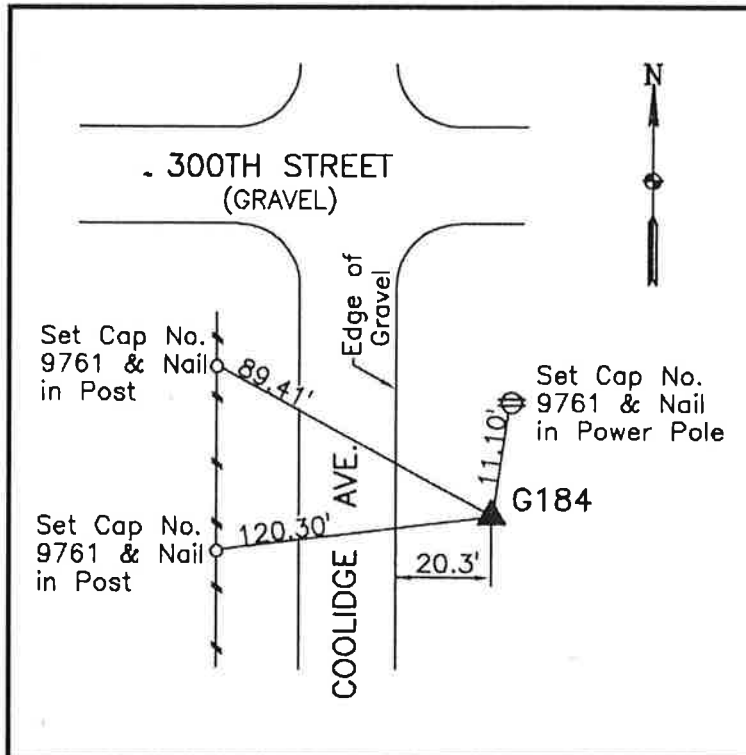
Latitude:	43° 12' 48.87017" N
Longitude:	96° 23' 35.22337" W
Scale Factor:	0.9999907314
Convergence:	-1° 57' 38.9"
Combined Factor:	0.99992941

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G184 and NGS Style Access Cover 1" Deep

**Location:**

Southeast side of intersection of Coolidge Avenue and 300th Street in Section 22, T97N, R47W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G185**

	US SURVEY FEET	METRIC
Northing:	3918292.075	1194297.813
Easting:	4165880.138	1269762.806
Elevation:	1282.682	390.962
Ellipsoid Height:	1195.979	364.535
Geoid 99 Height:	-86.703	-26.427

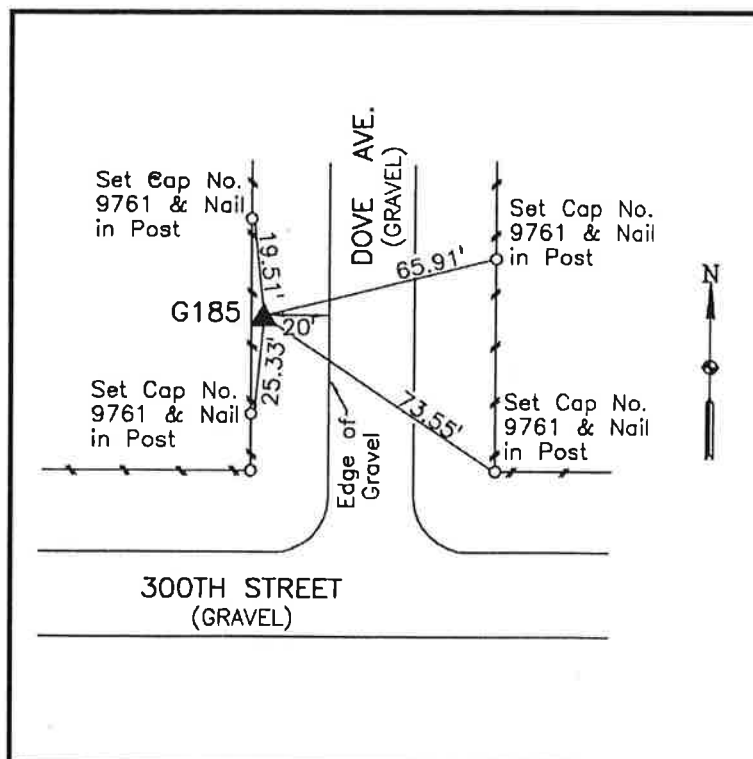
Latitude:	43° 12' 51.93553" N
Longitude:	96° 20' 02.42305" W
Scale Factor:	0.9999908732
Convergence:	-1° 55' 14.6"
Combined Factor:	0.99993381

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G185 and NGS Style  
 Access Cover 1" Deep

**Location:**

Northwest side of intersection  
 of Dove Avenue and 300th  
 Street in Section 13, T97N,  
 R47W.



**WHKS & CO.**

G185

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

GPS POINT NUMBER **G186**

	US SURVEY FEET	METRIC
Northing:	3917924.245	1194185.698
Easting:	4181986.444	1274672.018
Elevation:	1242.189	378.620
Ellipsoid Height:	1155.360	352.154
Geoid 99 Height:	-86.829	-26.465

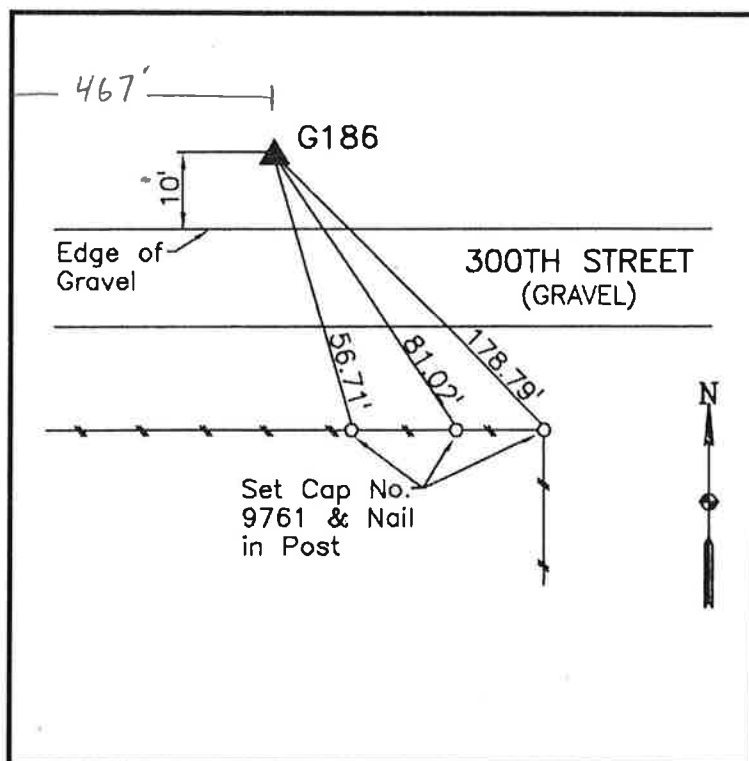
Latitude:	43° 12' 53.57955" N
Longitude:	96° 16' 24.87763" W
Scale Factor:	0.9999909494
Convergence:	-1° 52' 47.2"
Combined Factor:	0.99993583

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G186 and NGS Style Access Cover 4" Deep

**Location:**

North side 300th Street 0.1 mile east of Fig Avenue in Section 15, T97N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G187**

	US SURVEY FEET	METRIC
Northing:	3917404.502	1194027.280
Easting:	4197153.549	1279294.960
Elevation:	1393.667	424.791
Ellipsoid Height:	1306.746	398.297
Geoid 99 Height:	-86.921	-26.494

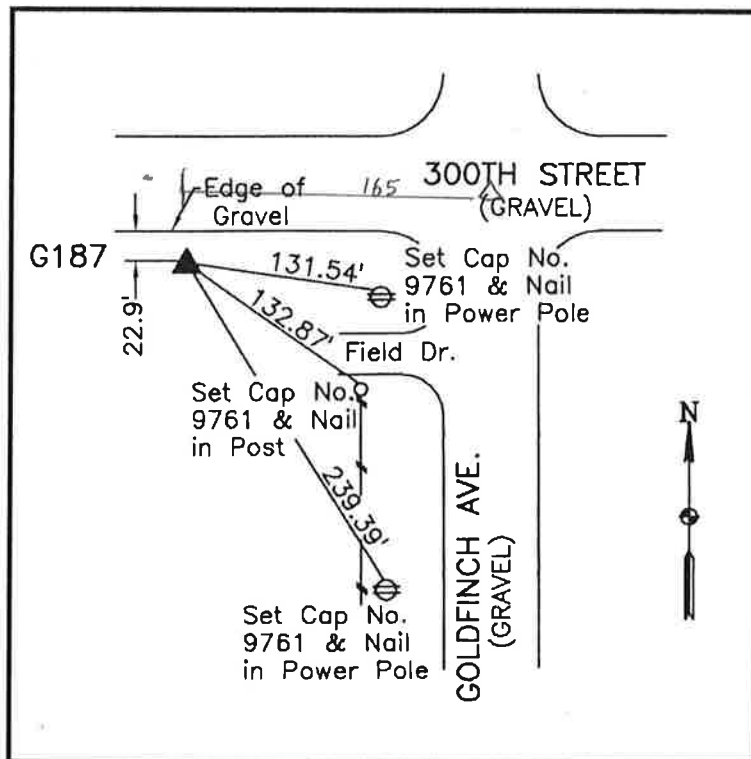
Latitude:	43° 12' 53.31234" N
Longitude:	96° 12' 59.93980" W
Scale Factor:	0.9999909370
Convergence:	-1° 50' 28.3"
Combined Factor:	0.99992859

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G187 and NGS Style Access Cover 1" Deep

**Location:**

Southwest side of intersection of Goldfinch Avenue and 300th Street in Section 24, T97N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G188**

	US SURVEY FEET	METRIC
Northing:	3916690.827	1193809.752
Easting:	4212877.448	1284087.614
Elevation:	1420.623	433.007
Ellipsoid Height:	1333.578	406.475
Geoid 99 Height:	-87.044	-26.531

Latitude:                      43° 12' 51.20260" N

Longitude:                    96° 09' 27.40498" W

Scale Factor:                0.9999908393

Convergence:                -1° 48' 04.3"

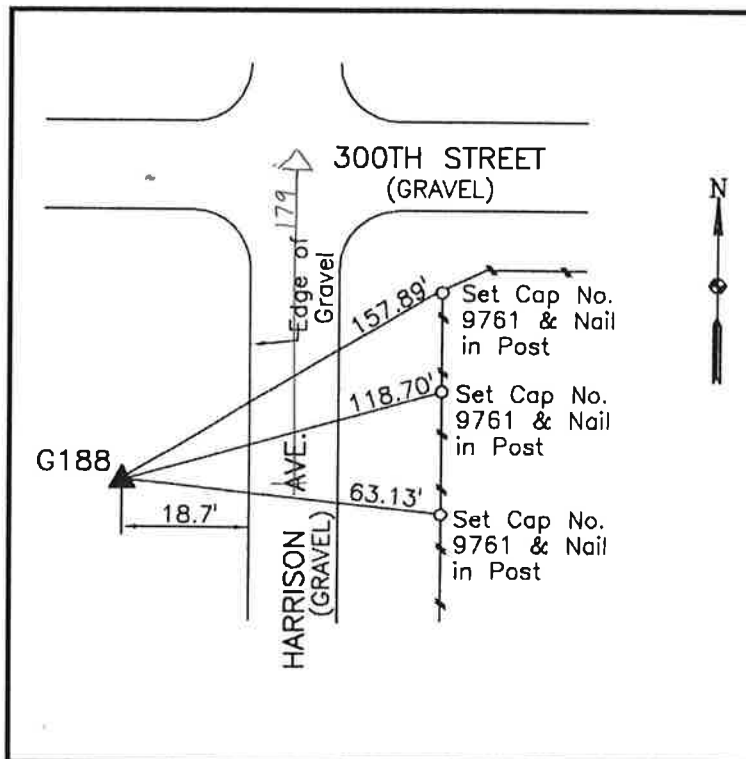
Combined Factor:            0.99992721

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G188 and NGS Style  
 Access Cover 1" Deep

**Location:**

Southwest side of intersection  
 of Harrison Avenue and 300th  
 Street in Section 21, T97N,  
 R45W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G189**

	US SURVEY FEET	METRIC
Northing:	3916378.637	1193714.596
Easting:	4228817.119	1288946.036
Elevation:	1413.266	430.764
Ellipsoid Height:	1326.048	404.180
Geoid 99 Height:	-87.218	-26.584

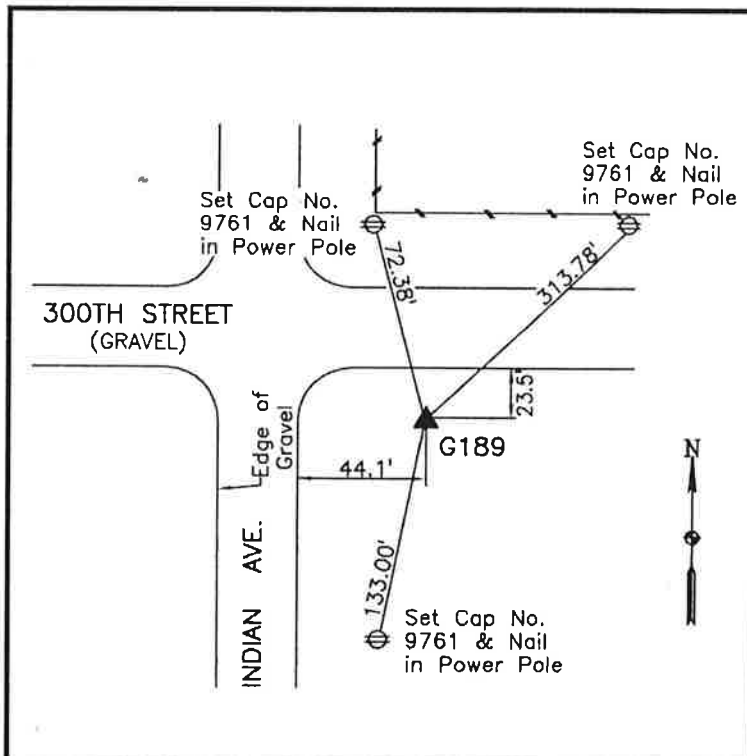
Latitude:	43° 12' 53.01335" N
Longitude:	96° 05' 52.12850" W
Scale Factor:	0.9999909232
Convergence:	-1° 45' 38.4"
Combined Factor:	0.99992766

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G189 and NGS Style  
Access Cover 1" Deep

**Location:**

Southeast side of intersection  
of Indian Avenue and 300th  
Street in Section 19, T97N,  
R44W.



**WHKS & CO.**

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

GPS POINT NUMBER **G190**

	US SURVEY FEET	METRIC
Northing:	3916154.757	1193646.357
Easting:	4244062.889	1293592.956
Elevation:	1435.571	437.563
Ellipsoid Height:	1348.164	410.921
Geoid 99 Height:	-87.406	-26.641

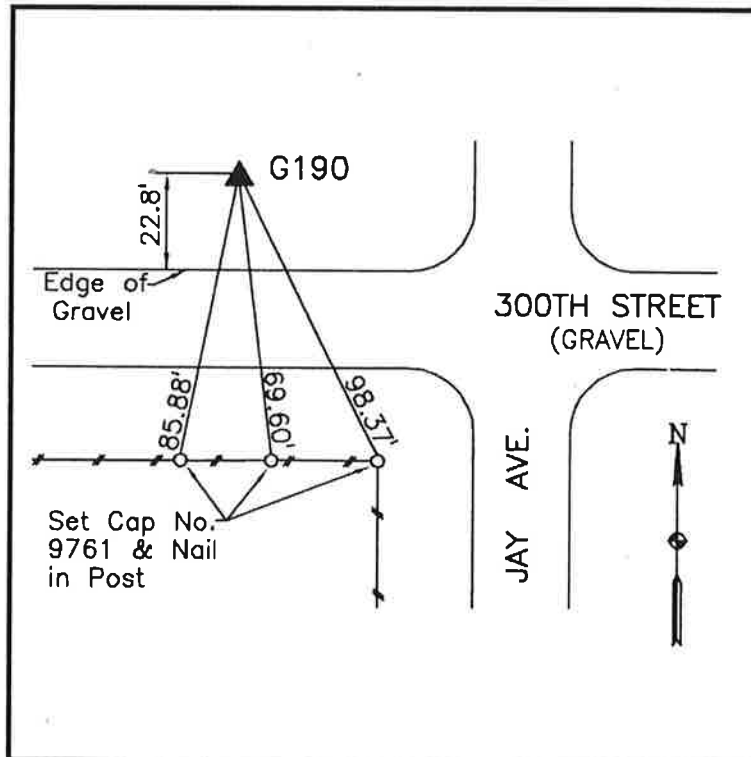
Latitude:	43° 12' 55.37873" N
Longitude:	96° 02' 26.25078" W
Scale Factor:	0.9999910328
Convergence:	-1° 43' 18.8"
Combined Factor:	0.99992671

Description:

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G190 and NGS Style  
Access Cover 1" Deep

Location:

Northwest side of intersection  
of Jay Avenue and 300th  
Street in Section 19, T97N,  
R44W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G191**

	US SURVEY FEET	METRIC
Northing:	3915703.413	1193508.787
Easting:	4259891.596	1298417.555
Elevation:	1405.912	428.523
Ellipsoid Height:	1318.302	401.819
Geoid 99 Height:	-87.610	-26.704

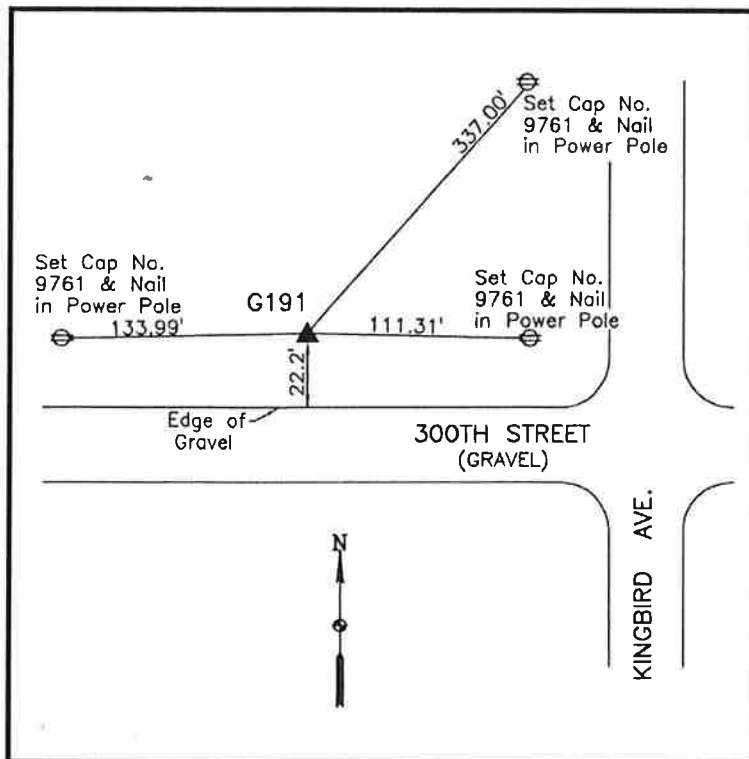
Latitude:	43° 12' 55.56560" N
Longitude:	95° 58' 52.40984" W
Scale Factor:	0.9999910415
Convergence:	-1° 40' 53.9"
Combined Factor:	0.99992815

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G191 and NGS Style Access Cover 2" Deep

**Location:**

Northwest side of intersection of Kingbird avenue and 300th Street in Section 13, T97N, R44W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G192**

	US SURVEY FEET	METRIC
Northing:	3914946.405	1193278.051
Easting:	4275765.486	1303255.927
Elevation:	1420.008	432.819
Ellipsoid Height:	1332.162	406.044
Geoid 99 Height:	-87.846	-26.775

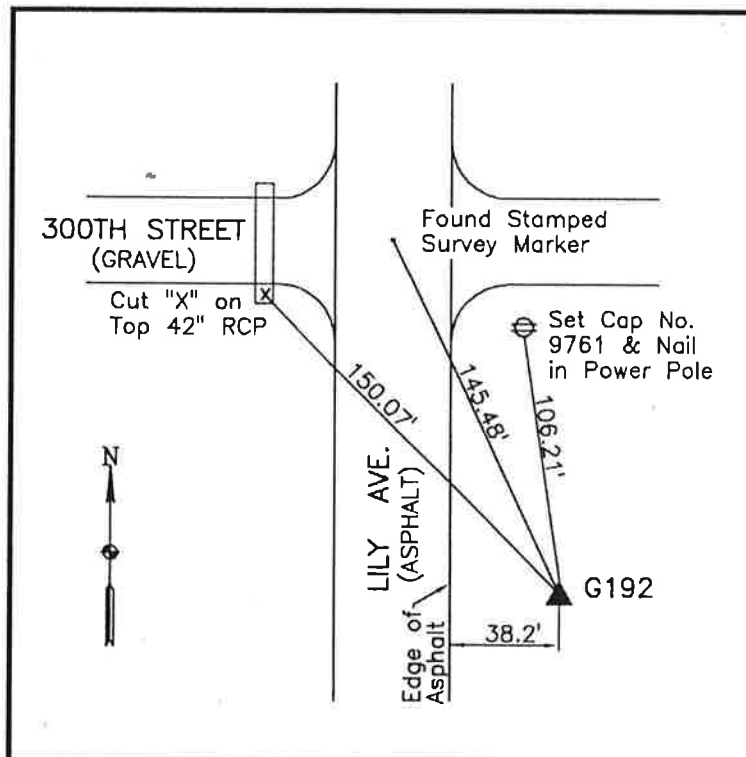
Latitude:                    43° 12' 52.63761" N  
Longitude:                    95° 55' 17.84052" W  
Scale Factor:                0.9999909057  
Convergence:                -1° 38' 28.5"  
Combined Factor:            0.99992735

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G192 and NGS Style  
Access Cover 2" Deep

**Location:**

Southeast side of intersection  
of Lily Avenue and 300th Street  
in Section 22, T97N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G193**

	US SURVEY FEET	METRIC
Northing:	3914673.281	1193194.802
Easting:	4290176.972	1307648.556
Elevation:	1420.262	432.897
Ellipsoid Height:	1332.161	406.043
Geoid 99 Height:	-88.101	-26.853

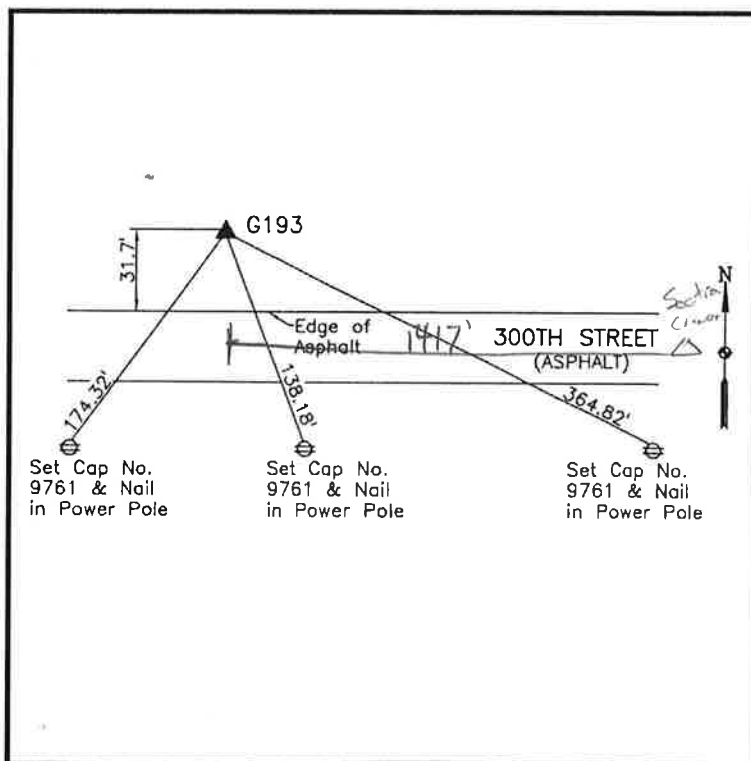
Latitude:	43° 12' 53.97237" N
Longitude:	95° 52' 03.20026" W
Scale Factor:	0.9999909676
Convergence:	-1° 36' 16.6"
Combined Factor:	0.99992741

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G193 and NGS Style Access Cover 1" Deep

**Location:**

North side 300th Street 0.3 mile west of McKinley Avenue east county line in Section 13, T97N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER **G194**

	US SURVEY FEET	METRIC
Northing:	3928847.279	1197515.046
Easting:	4292012.119	1308207.910
Elevation:	1412.521	430.537
Ellipsoid Height:	1324.550	403.724
Geoid 99 Height:	-87.971	-26.814

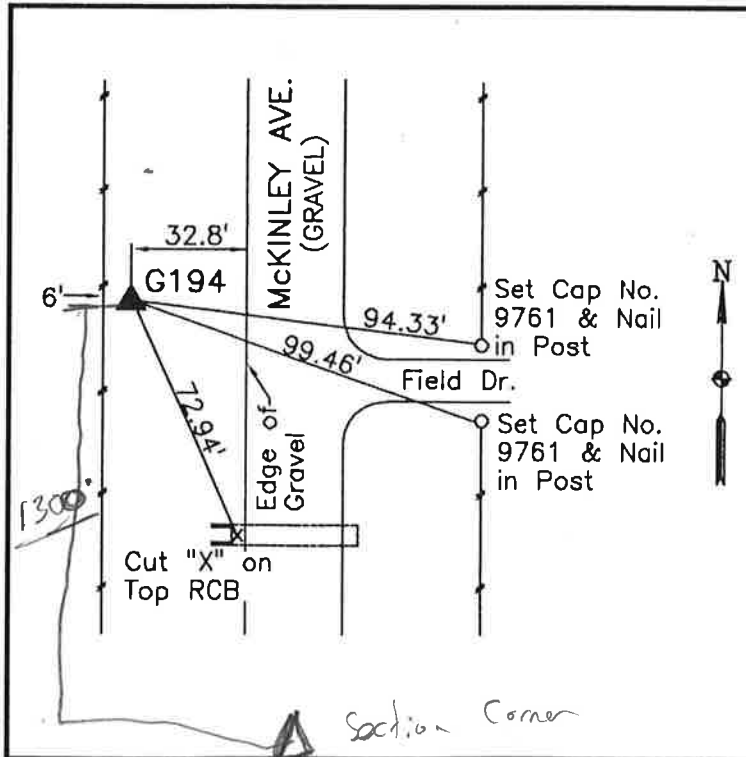
Latitude:	43° 15' 14.41864" N
Longitude:	95° 51' 43.77544" W
Scale Factor:	0.9999977111
Convergence:	-1° 36' 03.4"
Combined Factor:	0.99993452

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G194 and NGS Style  
Access Cover 2" Deep

**Location:**

West side McKinley Avenue  
0.8 mile north of 280th Street  
east county line in Section 1,  
T97N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G195**

	US SURVEY FEET	METRIC
Northing:	3930618.759	1198054.994
Easting:	4276279.742	1303412.672
Elevation:	1412.743	430.605
Ellipsoid Height:	1325.022	403.868
Geoid 99 Height:	-87.721	-26.737

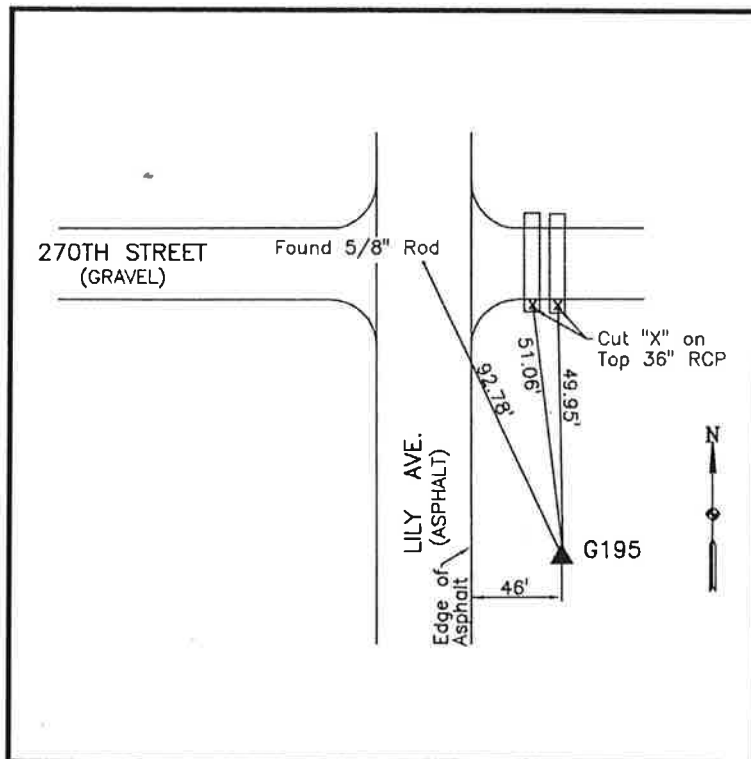
Latitude:	43° 15' 27.51256" N
Longitude:	95° 55' 16.95983" W
Scale Factor:	0.9999983636
Convergence:	-1° 38' 27.9"
Combined Factor:	0.99993515

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G195 and NGS Style  
 Access Cover 2" Deep

**Location:**

Southeast side of intersection  
 Lily Avenue and 270th Street  
 north county line in Section 3,  
 T97N, R43W.



**WHKS & CO.**

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

GPS POINT NUMBER     **G196**

	US SURVEY FEET	METRIC
Northing:	3931097.773	1198200.998
Easting:	4260978.197	1298748.752
Elevation:	1380.305	420.718
Ellipsoid Height:	1292.770	394.037
Geoid 99 Height:	-87.536	-26.681

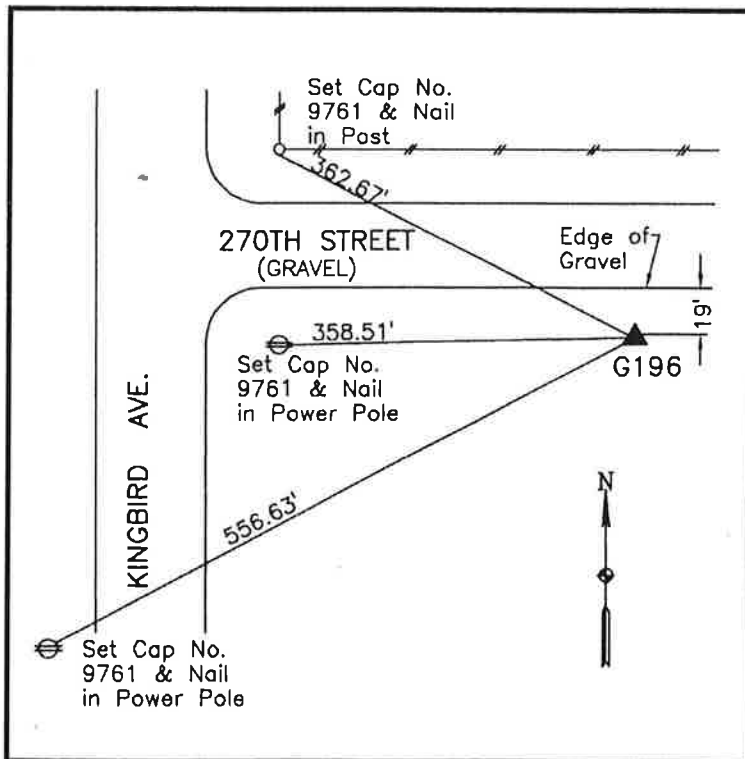
Latitude:	43° 15' 27.86224" N
Longitude:	95° 58' 43.83728" W
Scale Factor:	0.9999983811
Convergence:	-1° 40' 48.1"
Combined Factor:	0.99993670

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G196 and NGS Style Access Cover 2" Deep

**Location:**

South side 270th Street 0.1 mile east of Kingbird Avenue north county line in Section 6, T97N, R43W.



**WHKS & CO.**

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

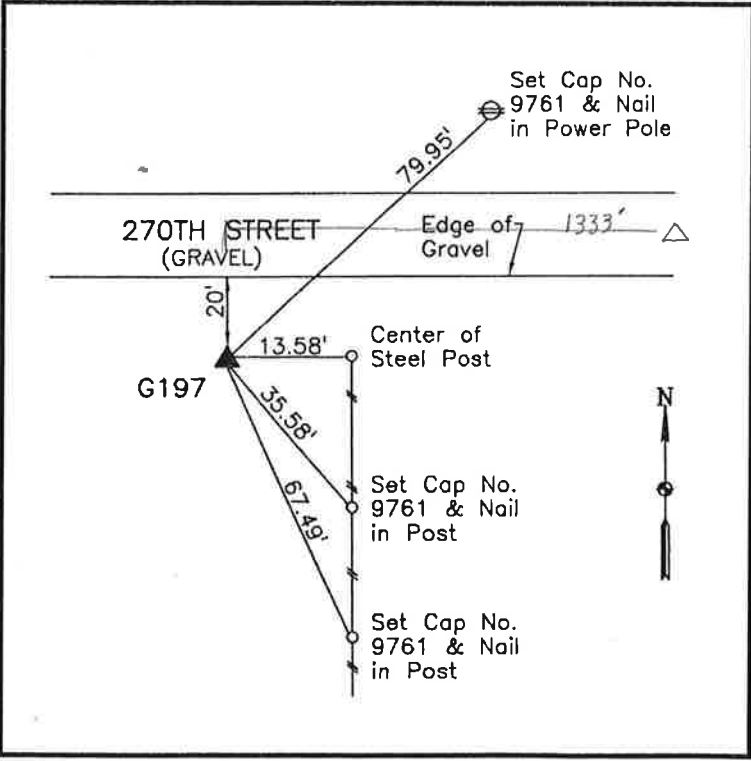
GPS POINT NUMBER     **G197**

	US SURVEY FEET	METRIC
Northing:	3931939.241	1198457.478
Easting:	4243524.635	1293428.896
Elevation:	1400.779	426.958
Ellipsoid Height:	1313.424	400.332
Geoid 99 Height:	-87.355	-26.626

Latitude:	43° 15' 31.04878" N
Longitude:	96° 02' 39.93074" W
Scale Factor:	0.9999985405
Convergence:	-1° 43' 28.1"
Combined Factor:	0.99993588

**Description:**  
Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G197 and NGS Style  
Access Cover 1" Deep

**Location:**  
South side 270th Street 0.3  
mile west of Jay Avenue north  
county line in Section 4, T97N,  
R44W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G198**

	US SURVEY FEET	METRIC
Northing:	3931896.447	1198444.434
Easting:	4228827.908	1288949.324
Elevation:	1453.051	442.891
Ellipsoid Height:	1365.831	416.306
Geoid 99 Height:	-87.220	-26.585

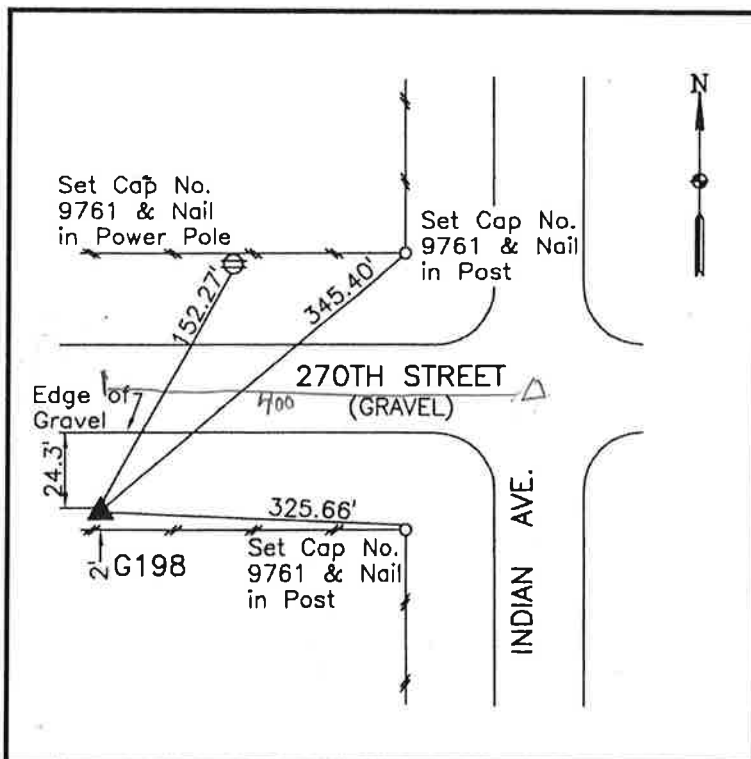
Latitude:	43° 15' 26.21081" N
Longitude:	96° 05' 58.42560" W
Scale Factor:	0.9999982986
Convergence:	-1° 45' 42.6"
Combined Factor:	0.99993313

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G198 and NGS Style  
 Access Cover 1" Deep

**Location:**

South side 270th Street 0.1  
 west of Indian Avenue north  
 county line in Section 1, T97N,  
 R45W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G199**

	US SURVEY FEET	METRIC
Northing:	3932308.767	1198570.109
Easting:	4213220.638	1284192.219
Elevation:	1327.268	404.552
Ellipsoid Height:	1240.155	378.000
Geoid 99 Height:	-87.113	-26.552

Latitude:                    43° 15' 25.48850" N

Longitude:                 96° 09' 29.40324" W

Scale Factor:             0.9999982625

Convergence:            -1° 48' 05.6"

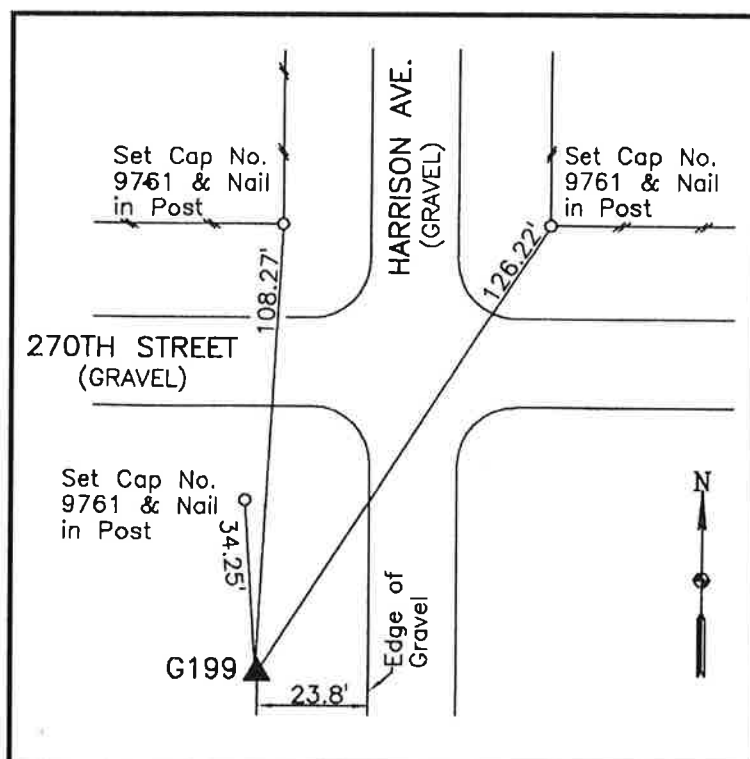
Combined Factor:        0.99993909

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G199 and NGS Style  
 Access Cover 2" Deep

**Location:**

Southwest side of intersection  
 of Harrison Avenue and 270th  
 Street in Section 4, T97N,  
 R45W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G200**

	US SURVEY FEET	METRIC
Northing:	3932865.665	1198739.852
Easting:	4197649.450	1279446.111
Elevation:	1348.444	411.007
Ellipsoid Height:	1261.415	384.480
Geoid 99 Height:	-87.029	-26.527

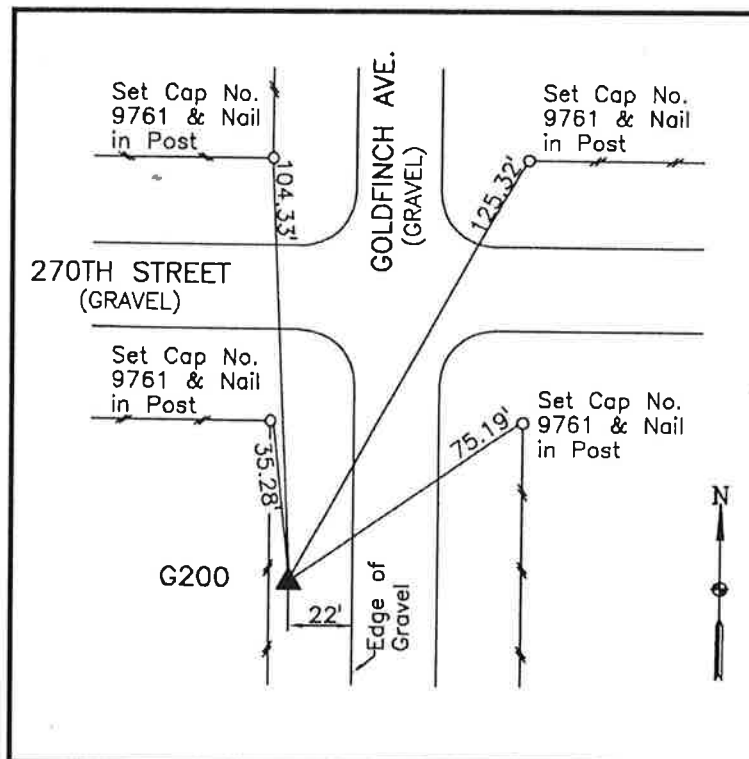
Latitude:                    43° 15' 26.09796" N  
Longitude:                   96° 12' 59.95484" W  
Scale Factor:                0.9999982929  
Convergence:               -1° 50' 28.3"  
Combined Factor:           0.99993811

**Description:**

Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G200 and NGS Style  
Access Cover 1" Deep

**Location:**

Southwest side of intersection  
of Goldfinch Avenue and 270th  
Street in Section 1, T97N,  
R46W.



**WHKS & CO.**

G200

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

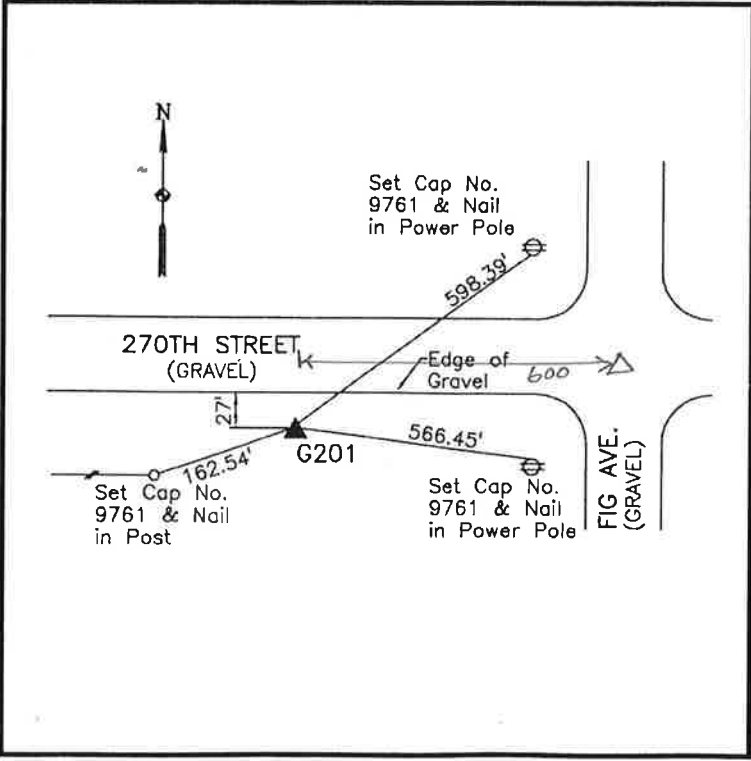
GPS POINT NUMBER      **G201**

	US SURVEY FEET	METRIC
Northing:	3933421.878	1198909.386
Easting:	4181313.030	1274466.761
Elevation:	1374.154	418.843
Ellipsoid Height:	1287.235	392.350
Geoid 99 Height:	-86.919	-26.493

Latitude:	43° 15' 26.34600" N
Longitude:	96° 16' 40.84248" W
Scale Factor:	0.9999983053
Convergence:	-1° 52' 58.0"
Combined Factor:	0.99993689

**Description:**  
Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G201 and NGS Style  
Access Cover 3" Deep

**Location:**  
South side 270th street 0.1  
mile west of Fig Avenue in  
Section 4, T97N, R46W.



**WHKS & CO.**

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

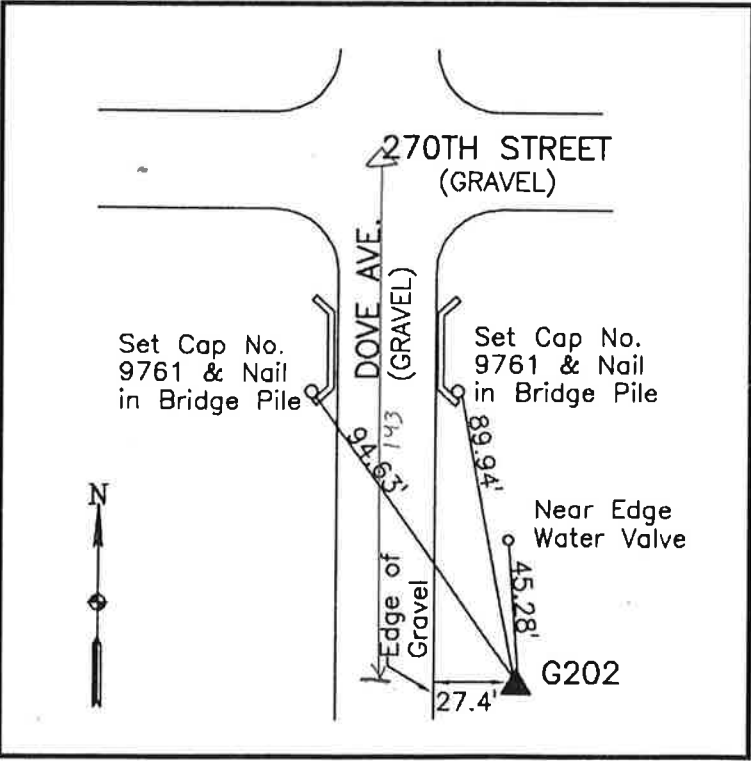
GPS POINT NUMBER      **G202**

	US SURVEY FEET	METRIC
Northing:	3933900.886	1199055.388
Easting:	4166403.137	1269922.216
Elevation:	1329.342	405.184
Ellipsoid Height:	1242.532	378.724
Geoid 99 Height:	-86.810	-26.460

Latitude:	43° 15' 26.18745" N
Longitude:	96° 20' 02.42916" W
Scale Factor:	0.9999982974
Convergence:	-1° 55' 14.6"
Combined Factor:	0.99993902

**Description:**  
Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G202 and NGS Style Access Cover 1" Deep

**Location:**  
East side Dove Avenue just south of 270th Street in Section 6, T97N, R46W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G203**

	US SURVEY FEET	METRIC
Northing:	3934305.927	1199178.845
Easting:	4150665.955	1265125.513
Elevation:	1322.339	403.050
Ellipsoid Height:	1235.661	376.630
Geoid 99 Height:	-86.679	-26.420

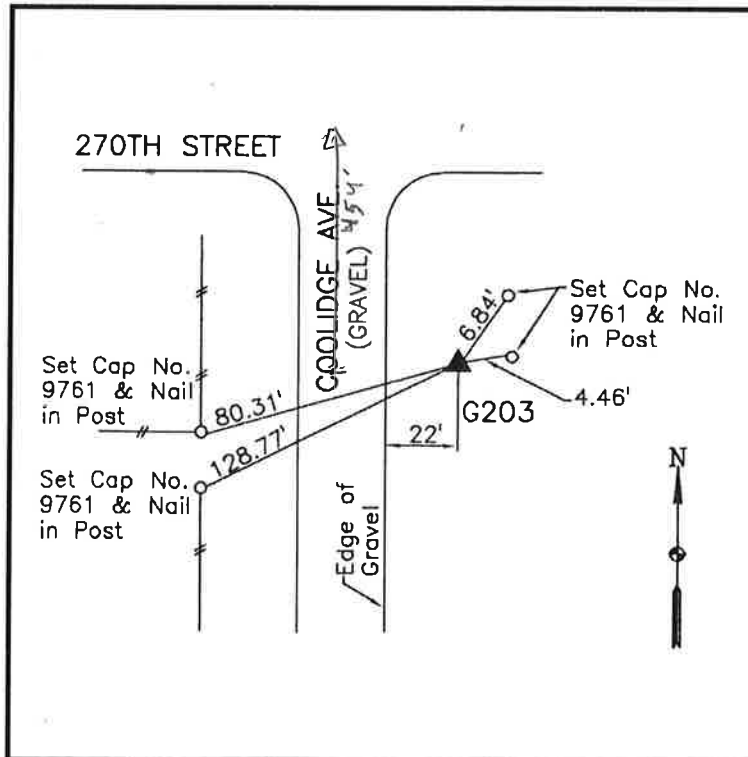
Latitude:	43° 15' 24.92176" N
Longitude:	96° 23' 35.15416" W
Scale Factor:	0.9999982342
Convergence:	-1° 57' 38.8"
Combined Factor:	0.99993928

**Description:**

Placed 3/4" X 6' - 0" Long Aluminum Rod with Cap Stamped G203 and NGS Style Access Cover 2" Deep

**Location:**

East side Coolidge Avenue 0.1 mile south of 270th Street in Section 3, T97N, R47W.



**WHKS & CO.**

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

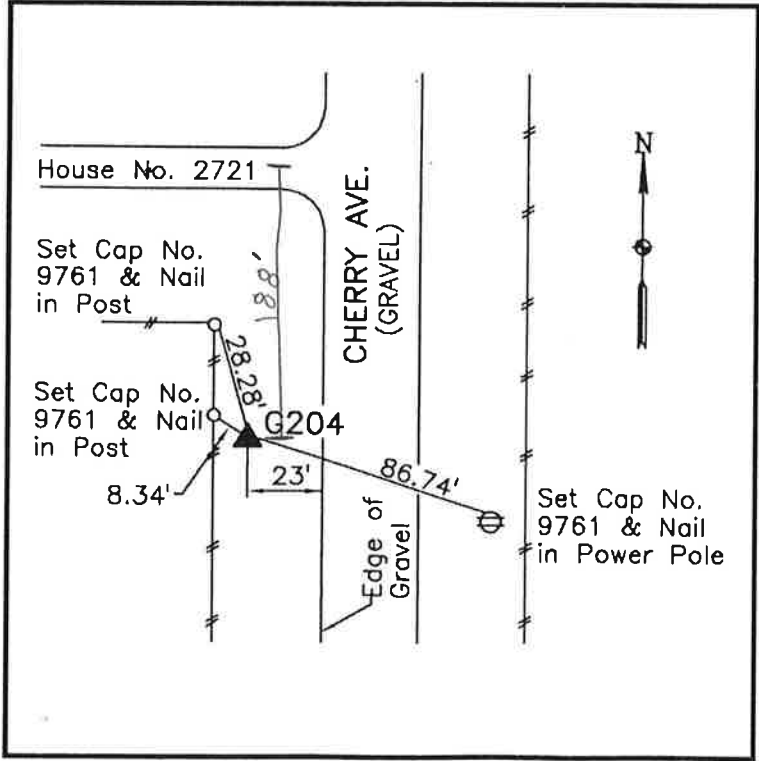
GPS POINT NUMBER      **G204**

	US SURVEY FEET	METRIC
Northing:	3934457.699	1199225.105
Easting:	4135322.575	1260448.842
Elevation:	1429.392	435.680
Ellipsoid Height:	1342.865	409.306
Geoid 99 Height:	-86.528	-26.374

Latitude:	43° 15' 21.18320" N
Longitude:	96° 27' 02.43892" W
Scale Factor:	0.9999980477
Convergence:	-1° 59' 59.3"
Combined Factor:	0.99993398

**Description:**  
Placed 3/4" X 6' - 0" Long  
Aluminum Rod with Cap  
Stamped G204 and NGS Style  
Access Cover 1" Deep

**Location:**  
West side Cherry Avenue 0.2  
mile south of 270th Street just  
south of farmstead at address  
2721 Cherry Avenue in Section  
2, T97N, R48W.



**WHKS & CO.**

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

GPS POINT NUMBER      **G205**

	US SURVEY FEET	METRIC
Northing:	3936244.855	1199769.831
Easting:	4120510.642	1255934.155
Elevation:	1474.766	449.510
Ellipsoid Height:	1388.326	423.163
Geoid 99 Height:	-86.440	-26.347

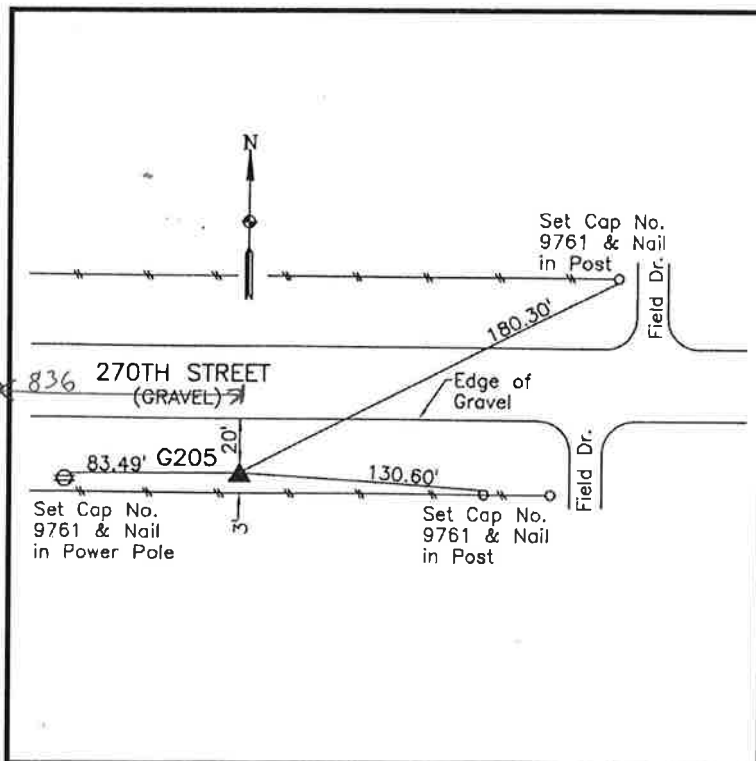
Latitude:	43° 15' 33.67019" N
Longitude:	96° 30' 23.32556" W
Scale Factor:	0.9999986719
Convergence:	-2° 02' 15.5"
Combined Factor:	0.99993243

**Description:**

Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G205 and NGS Style  
 Access Cover 1" Deep

**Location:**

South side of 270th Street 0.2  
 mile east of Beech Avenue in  
 Section 3, T97N, R48W.



**WHKS & CO.**

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

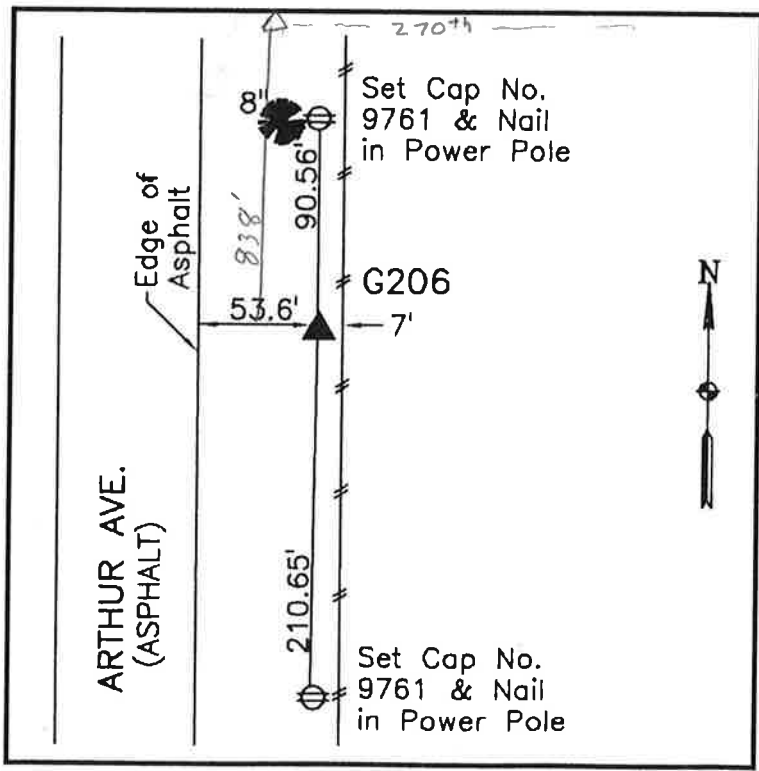
GPS POINT NUMBER      **G206**

	US SURVEY FEET	METRIC
Northing:	3935964.633	1199684.419
Easting:	4109211.339	1252490.121
Elevation:	1246.285	379.869
Ellipsoid Height:	1159.891	353.536
Geoid 99 Height:	-86.394	-26.333

Latitude:	43° 15' 26.90832" N
Longitude:	96° 32' 55.78643" W
Scale Factor:	0.9999983334
Convergence:	-2° 03' 58.8"
Combined Factor:	0.99994299

**Description:**  
 Placed 3/4" X 6' - 0" Long  
 Aluminum Rod with Cap  
 Stamped G206 and NGS Style  
 Access Cover 1" Deep

**Location:**  
 East side A54B Boulevard 0.2  
 mile south of 270th Street in  
 Section 5, T97N, R48W.



**WHKS & CO.**