12 CAP

Mn/DOT Name: 12 CAP
NGS Name: 12 CAP
County: PINE, MN (Sheet 2)

NGS ACRN: RN0449 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	10	44 N	20 W	461901.62	925042.28	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	CAP OF CAP-AND-BOLT PAIR	MRC

Description: (1971) **Stamping:** PBM 12 MRC

IN WILLOW RIVER, 0.2 MILE SOUTHWEST ALONG WILLOW STREET FROM THE JUNCTION OF COUNTY ROAD 158 (WILLOW STREET) AND CREEK DRIVE, 108.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE, 95.0 FEET WEST OF A POWER POLE WITH TRANSFORMER, 61.0 FEET WEST OF A TOWNSHIP ROAD AT A CURVE, 6.0 FEET WEST OF A GUY POWER POLE, SURROUNDED BY A WOODEN FENCE, MARKED WITH A SIGN CANAL SURVEY MARKER NUMBER 1800, LEADED IN A TILE 3.0 FEET BELOW THE GROUND.

Station Notes

NO FENCE WAS FOUND. THE SET DATE IS UNKNOWN. COVERED WITH A 4.0 INCH IRON PIPE WITH A STANDARD MISSISSIPPI RIVER COMMISSION CAP.
UNCONFIRMED REPORT STATES THAT THIS CAP WAS RESET BY MINNESOTA DEPARTMENT OF TRANSPORTATION 2ND ORDER LEVEL CREW IN 12-01-1971.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1031.002	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1030.638	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1030.631	.007	1				MIXED SURVEY	1974	L3434
1030.638	.016	2				MIXED SURVEY	1972	L22567
1030.631	.007	1				MIXED SURVEY	1891	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1031.396	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1030.651	.262		939.713	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.220 12B = -91.191 09 = -91.089 03 = -90.941

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.62252	92 50 42.28231	513878.757	314119.256	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2979627.748	811520.694	1679547.889	16828358.893	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/12_CAP-RN0449-3N-22JAN2008.jpg	N	Jan 22, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/12_CAP-RN0449-2-22JAN2008.jpg		Jan 22, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/12_CAP-RN0449-1-22JAN2008.jpg		Jan 22, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

14 CAP

Mn/DOT Name: 14 CAP
NGS Name: 14 CAP
County: PINE, MN (Sheet 2)

NGS ACRN: RN0462 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	6	42 N	20 W	460905.00	925519.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=NO Vert=NO	NO		PROJECTS 10 IN.	SEE DESCRIPTION

Monument Type
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)

Disk Type
CAP OF CAP-AND-BOLT PAIR

Mon. Agency
MRC

Description: (1935)

Stamping:

IN GRONIGAN, 0.1 MILE EAST ALONG COUNTY ROAD 28 (GRONINGEN ROAD) FROM THE JUNCTION OF COUNTY ROAD 28 (GRONINGEN ROAD) AND GRONINGEN LOOP, 330.0 FEET SOUTH OF A RAILROAD STATION, 360.0 FEET SOUTH OF A WATER TANK, 170.0 FEET NORTH OF A ROAD CROSSING, 101.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF A SCHOOLHOUSE, 36.0 FEET SOUTH OF A CULVERT, 43.5 FEET EAST OF THE EAST RAIL OF A RAILROAD.

Station Notes
THE SURVEY MARK IS A 4.0-INCH IRON PIPE BEARING A MISSISSIPPI RIVER COMMISSION STANDARD CAP.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.495	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.993	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1132.993	.007	1				MIXED SURVEY	1974	L3434
1132.993	.007	1				MIXED SURVEY	1974	L3440
1132.990	.007	1				MIXED SURVEY	1929	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.718	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -90.410 12B = -90.390 09 = -90.305 03 = -90.161

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 15 RC

NGS Name: 15 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	45 N	21 W	462326.77	925926.07		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092344/
USGS Quad: KETTLE RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** 15 RC 1954 1292

2.9 MILES NORTHWEST OF DENHAM, 1.9 MILES NORTH ALONG COUNTY ROAD 40(DENHAM ROAD) FROM THE JUNCTION OF COUNTY ROAD 40(DENHAM ROAD) AND OLD CREAMERY ROAD IN DENHAM, THEN 2.0 MILES WEST ALONG COUNTY ROAD 46, THEN 266.0 FEET NORTH ALONG BIRCH CREEK ROAD, 110.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE, AT THE NORTHEAST CORNER OF A YARD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1292.159	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -91.266 12B = -91.194 09 = -91.060 03 = -90.971

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/15_RC-3W-11APR2007.jpg	W	Apr 11, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/15_RC-2-11APR2007.jpg		Apr 11, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/15_RC-1-11APR2007.jpg		Apr 11, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 16 RC

NGS Name: 16 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	45 N	21 W	462149.00	925852.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2016	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2008) **Stamping:** 16 RC 1954 1232

1.8 MILES WEST OF DENHAM, 3.5 MILES NORTH ALONG BIRCH CREEK ROAD FROM THE JUNCTION OF COUNTY ROAD 41 AND BIRCH CREEK ROAD IN DENHAM, THEN 0.5 MILE EAST ALONG COUNTY ROAD 159, 29.0 FEET WEST AND 5.3 FEET HIGHER THAN THE CENTER OF A ROAD AT A MINNESOTA AND ST. PAUL AND SOO LINE RAILROAD CROSSING, 1.0 FOOT NORTH AND 1.0 FOOT EAST OF A RIGHT-OF-WAY FENCE CORNER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1231.986	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -91.151 12B = -91.082 09 = -90.948 03 = -90.856

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 17 RC
NGS Name: 17 RC
County: PINE, MN (Sheet 2)

NGS ACRN: DF5952 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	33	45 N	21 W	461957.52	925926.46		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2016	NOT FOUND	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2007) **Stamping:** 17 RC 1954 1303

3.2 MILES SOUTHWEST OF DENHAM, 1.0 MILE WEST ALONG COUNTY ROAD 159 FROM THE JUNCTION OF COUNTY ROAD 159 AND COUNTY ROAD 168 IN DENHAM, THEN 2.5 MILES SOUTH ALONG BIRCH CREEK ROAD, 225.0 FEET NORTH OF BALSAM FIR ROAD AND 33.0 FEET WEST OF THE BIRCH CREEK ROAD, 0.5 FOOT EAST OF A FENCE LINE, 2.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1302.806	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1212.261	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1303.091	.262		1212.363	.197	1996	GPS - RTRN	2009	RTRN2009
			1212.363	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1303.245	.131		1212.468	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1303.245	.131		1212.468	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.020 12B = -90.948 09 = -90.820 03 = -90.728

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 57.52196	92 59 26.45457	477091.041	319790.582	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 57.52202	92 59 26.45526	477090.992	319790.588	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 57.52278	92 59 26.45392	477091.086	319790.665	.131	3	GPS - RTRN	2009	RTRN2009
46 19 57.52194	92 59 26.45500	477091.010	319790.580	.033	C	ADJUSTMENT	2003	GPS1839
46 19 57.52194	92 59 26.45500	477091.011	319790.581	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2942753.510	816563.581	1642769.653	16833981.273	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2942753.462	816563.587	1642769.605	16833981.279	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2942753.554	816563.665	1642769.699	16833981.356	.131	3	GPS - RTRN	2009	RTRN2009
2942753.480	816563.579	1642769.623	16833981.271	.033	C	ADJUSTMENT	2003	GPS1839
2942753.480	816563.579	1642769.624	16833981.271	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/17_RC-DF5952-3W-28MAY2009.jpg	W	May 28, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/17_RC-DF5952-2-28MAY2009.jpg		May 28, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/17_RC-DF5952-1-28MAY2009.jpg		May 28, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

18 RC

Mn/DOT Name: 18 RC

NGS Name: 18 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	10	44 N	21 W	461834.00	925847.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 18 RC 1954 1229

4.5 MILES SOUTHWEST OF DENHAM, 1.5 MILES WEST ALONG ROCKY ROAD FROM THE JUNCTION OF DENHAM ROAD (COUNTY ROAD 40) IN DENHAM, THEN 2.0 MILES SOUTH ALONG BIRCH CREEK ROAD (COUNTY ROAD 156), THEN 0.5 MILE EAST ALONG COUNTY ROAD 41, THEN 0.6 MILE SOUTH ALONG CHOKECHERRY ROAD, NEAR THE CENTER OF SECTION 10, 311.0 FEET SOUTH AND 33.0 FEET EAST OF THE NORTH-SOUTH ROAD AT A PRIVATE ROAD WEST, 2.0 FEET NORTH AND 1.0 FOOT WEST OF A POWER POLE, 1.0 FOOT WEST OF A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1229.013	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.971 12B = -90.915 09 = -90.784 03 = -90.676

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 19 RC

NGS Name: 19 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	44 N	21 W	461628.00	925854.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954)

Stamping: 19 RC 1954 1087

5.5 MILES WEST-NORTHWEST OF RUTLEDGE, 3.7 MILES WEST ALONG COUNTY ROAD 39 FROM THE JUNCTION OF MAIN STREET AND COUNTY ROAD 39 IN RUTLEDGE, THEN 1.0 MILE NORTH ALONG COUNTY ROAD 40(DENHAM ROAD), THEN 0.5 MILE WEST ALONG COUNTY ROAD 40(DENHAM ROAD), THEN 1.1 MILES WEST ALONG COUNTY ROAD 150(WHITE SPRUCE ROAD), 28.0 FEET NORTH AND 377.0 FEET WEST OF COUNTY ROAD 150 AT A TEE-ROAD NORTH, AT THE SOUTHEAST CORNER OF A FIELD, 2.0 FEET EAST AND 1.0 FOOT SOUTH OF A FENCE CORNER.

Station Notes

THE STATION FALLS IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1086.714	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.912 12B = -90.866 09 = -90.738 03 = -90.617

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 20 RC

NGS Name: 20 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	7	44 N	17 W	461809.00	923309.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 20 RC 1954 1229

3.0 MILES SOUTH-SOUTHEAST OF KERRICK, 2.0 MILES SOUTH ALONG SHADY PINE ROAD FROM THE JUNCTION OF SHADY PINE ROAD AND COUNTY ROAD 154(MAIN STREET), THEN 1.0 MILE EAST AND LONG COUNTY ROAD 171/PARK HILLS ROAD, 44.0 FEET NORTH AND 168.0 FEET EAST OF COUNTY ROAD 171 AT A CROSSROADS, 74.0 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A SCHOOLHOUSE, 4.0 FEET NORTH OF AN 8.0 INCH DIAMETER BIRCH TREE.

Station Notes

FOUND THE OLD SCHOOLHOUSE, PULLED THE TIES, IMPROVED POWER LINE AND ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1229.164	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.783 12B = -89.800 09 = -89.659 03 = -89.626

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 21 RC

NGS Name: 21 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	9	44 N	17 W	461808.00	923032.10		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=YES Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007)

Stamping: 21 RC 1954 1235

4.5 MILES SOUTHEAST OF KERRICK, 0.9 MILE SOUTH AND EAST ALONG COUNTY ROAD 46(MAIN STREET) FROM THE JUNCTION OF COUNTY ROAD 46(MAIN STREET) AND OAK LANE IN KERRICK, THEN 2.0 MILES SOUTH ALONG COUNTY ROAD 45(SHADY PINE ROAD), THEN 3.1 MILES EAST ALONG COUNTY ROAD 171(PARK HILLS ROAD), 31.0 FEET NORTH OF COUNTY ROAD 171, 2.0 FEET SOUTH OF A HIGHLINE POLE, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

NO REAL TIME REFERENCE NETWORK (RTRN) CARRIER DETECTED.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1234.732	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.281 12B = -89.327 09 = -89.173 03 = -89.157

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/21_RC-3NW-23APR2007.jpg	NW	Apr 23, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/21_RC-2-23APR2007.jpg		Apr 23, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/21_RC-1-23APR2007.jpg		Apr 23, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

22 RC

Mn/DOT Name: 22 RC

NGS Name: 22 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092243/
USGS Quad: HOLYOKE SW

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	3	44 N	17 W	461907.00	922914.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 22 RC 1954 1238

4.9 MILES EAST-SOUTHEAST OF KERRICK, 4.1 MILES EAST ALONG COUNTY ROAD 154(KERRICK ROAD) FROM THE JUNCTION OF COUNTY ROAD 154 (KERRICK ROAD) AND COUNTY ROAD 45 IN KERRICK, THEN 0.9 MILE SOUTH ALONG COUNTY ROAD 171 (TRAILS END ROAD), 715.0 FEET NORTH OF COUNTY ROAD 171 AT TEE-ROAD EAST, 176.0 FEET NORTH OF A CULVERT, 22.0 FEET EAST OF A ROAD, 1.0 FOOT WEST OF A FENCE LINE.

Station Notes

FOUND THE MARK BROKEN OFF, REMOVED THE DISK AND TURNED IN TO THE CENTRAL OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1238.291	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.380 12B = -89.416 09 = -89.262 03 = -89.265

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 23 RC

NGS Name: 23 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092243/
USGS Quad: HOLYOKE SW

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	45 N	17 W	462046.00	922914.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
ROCK (0 TO 1 METERS)	SEE DESCRIPTION	USGS

Description: (1978)

Stamping: 23 RC 1954 1188

4.7 MILES EAST-NORTHEAST OF KERRICK, 4.1 MILES EAST ALONG COUNTY ROAD 154(KERRICK ROAD) FROM THE JUNCTION OF COUNTY ROAD 154(KERRICK ROAD) AND COUNTY ROAD 45 IN KERRICK, AT THE NORTH EDGE OF A BIG SWAMP, 10.0 FEET EAST OF A ROAD AT THE FOOT OF A SMALL GRADE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1188.292	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.970 12B = -89.980 09 = -89.832 03 = -89.823

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 24 RC

NGS Name: 24 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	36	45 N	16 W	462035.00	921849.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 24 RC 1954 1244

9.3 MILES SOUTH-SOUTHEAST OF HOLYOKE, 0.5 MILE SOUTH ALONG COUNTY ROAD 145 FROM THE JUNCTION OF COUNTY ROAD 145 AND COUNTY ROAD 8 IN HOLYOKE, THEN 0.0.5 MILE EAST ALONG COUNTY ROAD 145, THEN 1.0 MILE SOUTH ALONG COUNTY ROAD 145, THEN 0.8 MILE EAST ALONG HARLIS ROAD(TOWNSHIP ROAD 363), THEN 4.3 MILES SOUTH AND EAST ALONG HARLIS ROAD(TOWNSHIP ROAD 363), THEN 5.2 MILES SOUTH ALONG GANDY DANCER TRAIL, 380.0 FEET NORTH OF A CULVERT, 16.0 FEET EAST OF THE OLD RAILROAD, 2.0 FEET WEST OF A RAILROAD MILEPOST 122.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1243.941	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.248 12B = -88.268 09 = -88.133 03 = -88.205

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 25 RC

NGS Name: 25 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	24	45 N	16 W	462220.00	921848.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 25 RC 1954 1249

19.4 MILES NORTH OF MARKVILLE, 1.7 MILES EAST ALONG MARKVILLE ROAD FROM THE JUNCTION OF MARKVILLE ROAD AND COUNTY ROAD 31 IN MARKVILLE, THEN 4.8 MILES NORTH ALONG STATE LINE ROAD, THEN 5.8 MILES NORTH ALONG SOUTH FIRE LANE ROAD, THEN 1.4 MILES WEST ALONG ROCKY BOULEVARD, THEN 8.5 MILES NORTH ALONG BELDEN ROAD(GANDY DANCER TRAIL), 2.8 MILES SOUTH ALONG THE OLD RAILROAD RIGHT-OF-WAY FROM THE OLD HARLIS SIDING SWITCH, 460.0 FEET NORTH OF THE NORTH END OF ROCK CUT, 28.0 FEET EAST OF THE OLD RAILROAD, 2.0 FEET WEST OF A RAILROAD MILEPOST 124.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1248.725	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.753 12B = -88.786 09 = -88.661 03 = -88.697

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 26 RC

NGS Name: 26 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	27	44 N	16 W	461530.00	922106.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 26 RC 1954 1248

2.4 MILES NORTHWEST OF KINGSDALE, 1.4 MILES NORTH ALONG GANDY DANCER TRAIL FROM THE JUNCTION OF GANDY DANCER TRAIL AND KINGSDALE ROAD IN KINGSDALE, THEN 0.1 MILE WEST ALONG RASH ROAD, THEN 1.7 MILES WEST ALONG PARK TRUCK TRAIL (RASH ROAD), 50.0 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A FARMHOUSE, 35.0 FEET NORTH OF A ROAD, 12.0 FEET EAST OF 3 BIRCH TREES.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1247.862	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.319 12B = -87.336 09 = -87.205 03 = -87.293

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 27 RC **NGS Name:** 27 RC

County: PINE, MN (Sheet 2)

NGS ACRN: DM5866 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	28	43 N	17 W	461020.00	923032.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	POOR	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2007)

Stamping: 27 RC 1954 1138

3.1 MILES NORTH OF DUXBURY, 3.1 MILES NORTH ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 141 IN DUXBURY, 175.0 FEET NORTH OF A SCHOOLHOUSE DRIVE, 27.0 FEET EAST OF COUNTY ROAD 24, 2.0 FEET WEST OF A WITNESS POST.

Station Notes
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) CARRIER DETECTED.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1137.882	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1137.947	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1137.734	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.441 12B = -87.500 09 = -87.382 03 = -87.401

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/27_RC-DM5866-3E-25APR2007.jpg	E	Apr 25, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/27_RC-DM5866-2-25APR2007.jpg		Apr 25, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/27_RC-DM5866-1-25APR2007.jpg		Apr 25, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 28 RC **NGS Name:** 28 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	9	42 N	17 W	460831.00	923029.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 28 RC 1954 1096

1.0 MILE NORTH OF DUXBURY, 1.0 MILE NORTH ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 141 IN DUXBURY, 136.0 FEET SOUTH OF THE TAMARACK PINE DRIVE, 31.0 FEET EAST OF COUNTY ROAD 24, 2.0 FEET WEST OF A TELEPHONE POLE, AT THE SOUTHWEST CORNER OF A CLEARING.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.687	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.208 12B = -87.287 09 = -87.172 03 = -87.162

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 29 RC

NGS Name: 29 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092322/
USGS Quad: WILBUR LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	16	42 N	17 W	460653.00	923030.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** 29 RC 1954 1052

0.9 MILE SOUTH OF DUXBURY, 0.9 MILE SOUTH ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 141 IN DUXBURY, 520.0 FEET NORTH OF COUNTY ROAD 24 AT A TEE-ROAD WEST, 397.0 FEET SOUTH AND 27.0 FEET EAST OF A PRIVATE DRIVE EAST, 27.0 FEET EAST OF THE ROAD AT THE NORTH END OF A CUT.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1047.560	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.044 12B = -87.142 09 = -87.047 03 = -87.001

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 30 RC

NGS Name: 30 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	33	42 N	17 W	460452.00	923031.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092322/
USGS Quad: WILBUR LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 30 RC 1954 1058

3.2 MILES SOUTH OF DUXBURY, 3.2 MILES SOUTH ALONG TAMARACK RIVER ROAD FROM THE JUNCTION OF THE TAMARACK RIVER ROAD AND COUNTY ROAD 141 IN DUXBURY, 620.0 FEET NORTH OF THE RIGHT ANGLE CURVE ON COUNTY ROAD 24, 48.0 FEET SOUTH AND 21.0 FEET EAST OF COUNTY ROAD 24 AT A TEE-ROAD EAST TO THE LITTLE TAMARAC LAKE, 3.0 FEET WEST OF A TELEPHONE POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1058.312	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.906 12B = -87.008 09 = -86.939 03 = -86.863

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 31 RC **NGS Name:** 31 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	31	42 N	17 W	460413.00	923146.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092322/
USGS Quad: WILBUR LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 31 RC 1954 1032

4.1 MILES SOUTH-SOUTHWEST OF DUXBURY, 4.0 MILES SOUTH ALONG COUNTY ROAD 24(TAMARACK RIVER ROAD) FROM THE JUNCTION OF COUNTY ROAD 24(TAMARACK RIVER ROAD) AND COUNTY ROAD 141 IN DUXBURY, THEN 1.0 MILE WEST ALONG COUNTY ROAD 24(TAMARACK RIVER ROAD), 20.0 FEET NORTH AND 12.0 FEET WEST OF COUNTY ROAD 24 CORNER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1032.147	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.981 12B = -87.086 09 = -87.018 03 = -86.932

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 39 MN115 **NGS Name:** 39

County: PINE, MN (Sheet 2)

NGS ACRN: DF5929 Get Map
NGS Quad / Sta Num : 46092233/
USGS Quad: DANBURY WEST

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	42 N	17 W	460504.40	922558.73		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2012	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
UNKNOWN	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 39

4.9 MILES WEST-SOUTHWEST OF SANDSTONE, 5.2 MILES WEST ALONG MARKVILLE ROAD/COUNTY ROAD 25 FROM THE JUNCTION OF MARKVILLE ROAD AND COUNTY ROAD 31 IN MARKVILLE, 25.0 FEET WEST OF THE WEST END OF THE BRIDGE OVER THE TAMARACK RIVER, 23.0 FEET SOUTH OF A POWER POLE, 18.0 FEET NORTH OF COUNTY ROAD 25, 2.0 FEET SOUTH OF A WITNESS POST.

Station Notes

THERE WAS CONCRETE FOUND BROKEN AND THE DISK WAS LOOSE. 5-8-2012

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			916.747	.014	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			916.862	.015	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1003.574	.131		917.003	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1003.574	.131		917.003	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -86.617 12B = -86.696 09 = -86.650 03 = -86.578

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 04.40495	92 25 58.73252	618513.515	229647.926	.026		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 04.40505	92 25 58.73325	618513.463	229647.935	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 04.40504	92 25 58.73330	618513.459	229647.934	.033	C	ADJUSTMENT	2003	GPS1839
46 05 04.40504	92 25 58.73330	618513.458	229647.933	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3085675.449	728856.432	1784243.869	16744056.674	.026		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3085675.398	728856.441	1784243.817	16744056.683	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3085675.394	728856.440	1784243.813	16744056.682	.033	C	ADJUSTMENT	2003	GPS1839
3085675.394	728856.440	1784243.814	16744056.682	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/39-DF5929-3N-17APR2007.jpg	N	Apr 17, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/39-DF5929-2-17APR2007.jpg		Apr 17, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/39-DF5929-1-17APR2007.jpg		Apr 17, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 40 MN115 **NGS Name:** 40

County: PINE, MN (Sheet 2)

NGS ACRN: DF5930 Get Map
NGS Quad / Sta Num : 46092232/
USGS Quad: DANBURY EAST

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	25	42 N	16 W	460530.15	921907.03		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2012) **Stamping:** NO 40

0.6 MILE EAST OF MARKVILLE, 0.5 MILE EAST ALONG COUNTY ROAD 25 (MARKVILLE) ROAD FROM THE JUNCTION OF COUNTY ROAD 25 (MARKVILLE ROAD) AND COUNTY ROAD 31 IN MARKVILLE, 41.5 FEET NORTH OF COUNTY ROAD 25, 18.0 FEET EAST OF THE ENTRANCE, 8.0 FEET SOUTH OF A FENCE, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
997.701	.262		911.212	.197	2011	GPS - OPUS	2020	GPSBM
997.787	.262		911.297	.197	2011	GPS - OPUS	2020	GPSBM
997.839	.262		911.327	.197	2011	GPS - RTRN	2020	RTRN2020
997.642			911.288	.014	2011	HORIZONTAL ADJUSTMENT	2015	GPS3071
997.642			911.274	.014	2011	GPS - STATIC	2015	HCLVR
997.997	.131		911.491	.066	2007	GPS - STATIC	2012	HCLVR
998.062	.131		911.635	.066	1996	GPS - STATIC	2012	HCLVR
			911.288	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
997.925	.262		911.409	.197	2007	GPS - RTRN	2012	RTRN2012
			911.406	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
998.029	.131		911.547	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
998.029	.131		911.547	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -86.486 12B = -86.512 09 = -86.516 03 = -86.440

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 30.15272	92 19 07.03412	647514.844	232447.412	.131	3	GPS - OPUS	2020	GPSBM
46 05 30.15222	92 19 07.03394	647514.857	232447.361	.131	3	GPS - OPUS	2020	GPSBM
46 05 30.15251	92 19 07.03354	647514.885	232447.391	.131	3	GPS - RTRN	2020	RTRN2020
46 05 30.15226	92 19 07.03379	647514.867	232447.365	.020		ADJUSTMENT	2015	GPS3071
46 05 30.15252	92 19 07.03390	647514.859	232447.392	.020	C	GPS - STATIC	2015	HCLVR
46 05 30.15226	92 19 07.03379	647514.867	232447.365	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 30.15236	92 19 07.03453	647514.815	232447.375	.033	C	GPS - STATIC	2012	HCLVR
46 05 30.15248	92 19 07.03436	647514.827	232447.387	.131	3	GPS - RTRN	2012	RTRN2012
46 05 30.15236	92 19 07.03453	647514.815	232447.375	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 30.15235	92 19 07.03469	647514.804	232447.374	.033	C	GPS - STATIC	2012	HCLVR
46 05 30.15235	92 19 07.03469	647514.804	232447.374	.033	C	ADJUSTMENT	2003	GPS1839
46 05 30.15235	92 19 07.03469	647514.804	232447.373	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3114621.539	732150.263	1813229.653	16746891.496	.131	3	GPS - OPUS	2020	GPSBM
3114621.553	732150.213	1813229.666	16746891.445	.131	3	GPS - OPUS	2020	GPSBM
3114621.580	732150.243	1813229.694	16746891.475	.131	3	GPS - RTRN	2020	RTRN2020
3114621.563	732150.217	1813229.677	16746891.449	.020		ADJUSTMENT	2015	GPS3071
3114621.555	732150.243	1813229.669	16746891.475	.020	C	GPS - STATIC	2015	HCLVR
3114621.563	732150.217	1813229.677	16746891.449	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3114621.511	732150.226	1813229.625	16746891.459	.033	C	GPS - STATIC	2012	HCLVR
3114621.523	732150.239	1813229.636	16746891.471	.131	3	GPS - RTRN	2012	RTRN2012
3114621.511	732150.226	1813229.625	16746891.459	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3114621.500	732150.225	1813229.613	16746891.458	.033	C	GPS - STATIC	2012	HCLVR
3114621.500	732150.225	1813229.613	16746891.458	.033	C	ADJUSTMENT	2003	GPS1839
3114621.500	732150.225	1813229.613	16746891.458	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/40-DF5930-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/40-DF5930-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/40-DF5930-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 41 MN115 **NGS Name:** 41

County: PINE, MN (Sheet 2)

NGS ACRN: DF5931 Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	7	42 N	16 W	460740.87	922531.20		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2012	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
UNKNOWN	BENCH MARK DISK	MN-115

Description: (2000) **Stamping:** NO 41

5.7 MILES WEST-NORTHWEST OF MARKVILLE, 0.7 MILE WEST ALONG COUNTY ROAD 25(MARKVILLE ROAD) FROM THE JUNCTION OF COUNTY ROAD 25(MARKVILLE ROAD) AND COUNTY ROAD 31 IN MARKVILLE, THEN 1.8 MILES NORTH ALONG SOUTH ENDERS ROAD, THEN 0.7 MILE NORTH ALONG CONDOR ROAD, THEN 4.0 MILES WEST ALONG COUNTY ROAD 141(DUXBURY ROAD), 39.0 FEET NORTH OF COUNTY ROAD 141, 18.0 FEET EAST OF THE TOWNSHIP ROAD, 2.0 FEET SOUTH OF A WITNESS POST.

Station Notes

PULLED THE CAP OUT OF THE CONCRETE AND THE DISK WAS TURNED IN TO THE OFFICE.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			977.055	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			977.173	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1063.974	.131		977.301	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1063.974	.131		977.301	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -86.719 12B = -86.794 09 = -86.706 03 = -86.670

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 40.86901	92 25 31.19530	620360.029	245509.433	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 40.86910	92 25 31.19603	620359.977	245509.442	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 40.86910	92 25 31.19607	620359.975	245509.442	.033	C	ADJUSTMENT	2003	GPS1839
46 07 40.86910	92 25 31.19607	620359.973	245509.440	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3087250.771	744745.358	1786069.617	16759913.855	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3087250.720	744745.365	1786069.565	16759913.864	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3087250.717	744745.365	1786069.562	16759913.864	.033	C	ADJUSTMENT	2003	GPS1839
3087250.717	744745.365	1786069.562	16759913.864	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/41-DF5931-3N-16APR2007.jpg	N	Apr 16, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/41-DF5931-2-16APR2007.jpg		Apr 16, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/41-DF5931-1-16APR2007.jpg		Apr 16, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 42 MN115 **NGS Name:** 42

County: PINE, MN (Sheet 2)

NGS ACRN: DF5932 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	9	42 N	17 W	460740.47	923024.34		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2000) **Stamping:** NO 42

17.3 MILES EAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 14.2 MILES EAST ALONG COUNTY ROAD 30/DUXBURY ROAD TO COUNTY ROAD 141 AT DUXBURY, THEN 0.1 MILE EAST ALONG COUNTY ROAD 141, 40.0 FEET NORTH OF COUNTY ROAD 141, 24.0 FEET WEST OF THE DRIVEWAY TO THE WILMA TOWN HALL, NEAR THE SOUTHWEST CORNER OF TOWN HALL LOT, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1076.386	.262		989.273	.197	2011	GPS - OPUS	2020	GPSBM
1076.287	.262		989.175	.197	2011	GPS - OPUS	2020	GPSBM
1076.386	.262		989.184	.197	2011	GPS - RTRN	2020	RTRN2020
			989.234	.009	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			989.345	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1076.507	.131		989.470	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1076.507	.131		989.470	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -87.109 12B = -87.201 09 = -87.093 03 = -87.067

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 40.47143	92 30 24.33474	599713.074	245356.523	.131	3	GPS - OPUS	2020	GPSBM
46 07 40.47157	92 30 24.33499	599713.056	245356.537	.131	3	GPS - OPUS	2020	GPSBM
46 07 40.47153	92 30 24.33434	599713.102	245356.533	.131	3	GPS - RTRN	2020	RTRN2020
46 07 40.47149	92 30 24.33458	599713.085	245356.529	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 40.47156	92 30 24.33530	599713.034	245356.536	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 40.47154	92 30 24.33520	599713.041	245356.534	.033	C	ADJUSTMENT	2003	GPS1839
46 07 40.47154	92 30 24.33520	599713.043	245356.534	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3066611.793	744240.139	1765431.581	16759734.941	.131	3	GPS - OPUS	2020	GPSBM
3066611.775	744240.153	1765431.564	16759734.956	.131	3	GPS - OPUS	2020	GPSBM
3066611.821	744240.149	1765431.610	16759734.952	.131	3	GPS - RTRN	2020	RTRN2020
3066611.804	744240.145	1765431.592	16759734.948	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3066611.753	744240.151	1765431.542	16759734.954	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3066611.760	744240.149	1765431.549	16759734.952	.033	C	ADJUSTMENT	2003	GPS1839
3066611.760	744240.149	1765431.549	16759734.952	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/42-DF5932-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/42-DF5932-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/42-DF5932-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 43 MN115 **NGS Name:** 43

County: PINE, MN (Sheet 2)

NGS ACRN: DF5933 Get Map
NGS Quad / Sta Num : 46092323/
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	16	42 N	18 W	460649.70	923735.63		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 43

11.6 MILES EAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 8.6 MILES EAST ALONG COUNTY ROAD 30 TO COUNTY ROAD 22, THEN 1.0 MILE SOUTH ALONG COUNTY ROAD 22, 32.0 FEET EAST OF COUNTY ROAD 22, 13.0 FEET NORTH OF A DRIVEWAY, 2.0 FEET WEST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1065.126	.262		977.298	.197	2011	GPS - OPUS	2020	GPSBM
1065.142	.262		977.314	.197	2011	GPS - OPUS	2020	GPSBM
			977.331	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			977.436	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1065.287	.131		977.580	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1065.319	.131		977.580	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -87.828 12B = -87.920 09 = -87.818 03 = -87.759

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 49.69634	92 37 35.62986	569352.418	240085.568	.131	3	GPS - OPUS	2020	GPSBM
46 06 49.69634	92 37 35.63040	569352.380	240085.568	.131	3	GPS - OPUS	2020	GPSBM
46 06 49.69605	92 37 35.63000	569352.408	240085.539	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 49.69611	92 37 35.63070	569352.359	240085.544	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 49.69605	92 37 35.63036	569352.383	240085.539	.033	C	ADJUSTMENT	2003	GPS1839
46 06 49.69605	92 37 35.63036	569352.382	240085.540	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036348.932	738452.601	1735090.616	16754427.973	.131	3	GPS - OPUS	2020	GPSBM
3036348.894	738452.600	1735090.578	16754427.972	.131	3	GPS - OPUS	2020	GPSBM
3036348.923	738452.571	1735090.606	16754427.943	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036348.873	738452.576	1735090.557	16754427.949	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036348.898	738452.570	1735090.581	16754427.943	.033	C	ADJUSTMENT	2003	GPS1839
3036348.897	738452.570	1735090.581	16754427.943	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/43-DF5933-3S-21NOV2019.jpg	S	Nov 21, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/43-DF5933-2-21NOV2019.jpg		Nov 21, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/43-DF5933-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 44 MN115 **NGS Name:** 44

County: PINE, MN (Sheet 2)

NGS ACRN: DF5934 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	15	42 N	19 W	460742.82	924421.93		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 44

6.1 MILES EAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 AT SANDSTONE, THEN 3.0 MILES EAST ON COUNTY ROAD 30, THEN 0.1 MILE EAST ALONG COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND COUNTY ROAD 21, 157.0 FEET WEST OF A POWER POLE, 32.0 FEET SOUTH OF COUNTY ROAD 30, 2.0 FEET NORTH OF A WITNESS POST.

Station Notes

IN 10-09-2008 IT WAS DETERMINED THAT THERE IS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.943	.262		1002.957	.197	2011	GPS - OPUS	2020	GPSBM
1091.891	.262		1002.905	.197	2011	GPS - OPUS	2020	GPSBM
1091.953	.262		1002.918	.197	2011	GPS - RTRN	2020	RTRN2020
			1002.925	.009	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1091.993	.131		1003.023	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1091.993	.131		1003.164	.066	1996	GPS - STATIC	2009	HMOOSE
1091.993	.131		1003.023	.066	2007	GPS - STATIC	2009	HMOOSE
			1003.023	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1091.960	.131		1003.164	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1091.960	.131		1003.164	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -88.986 12B = -89.032 09 = -88.901 03 = -88.865

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 42.82226	92 44 21.93302	540716.088	245389.306	.131	3	GPS - OPUS	2020	GPSBM
46 07 42.82208	92 44 21.93302	540716.088	245389.288	.131	3	GPS - OPUS	2020	GPSBM
46 07 42.82268	92 44 21.93301	540716.088	245389.349	.131	3	GPS - RTRN	2020	RTRN2020
46 07 42.82235	92 44 21.93312	540716.080	245389.315	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 42.82266	92 44 21.93416	540716.007	245389.347	.033	C	ADJUSTMENT	2009	GPS2566
46 07 42.82266	92 44 21.93416	540716.007	245389.347	.033	C	GPS - STATIC	2009	HMOOSE
46 07 42.82266	92 44 21.93416	540716.007	245389.347	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 42.82255	92 44 21.93392	540716.024	245389.336	.033	C	GPS - STATIC	2009	HMOOSE
46 07 42.82255	92 44 21.93392	540716.024	245389.336	.033	C	ADJUSTMENT	2003	GPS1839
46 07 42.82255	92 44 21.93392	540716.025	245389.335	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3007629.578	743266.613	1706460.093	16759693.328	.131	3	GPS - OPUS	2020	GPSBM
3007629.579	743266.595	1706460.093	16759693.310	.131	3	GPS - OPUS	2020	GPSBM
3007629.578	743266.656	1706460.093	16759693.370	.131	3	GPS - RTRN	2020	RTRN2020
3007629.571	743266.622	1706460.085	16759693.337	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3007629.497	743266.652	1706460.012	16759693.368	.033	C	ADJUSTMENT	2009	GPS2566
3007629.497	743266.652	1706460.012	16759693.368	.033	C	GPS - STATIC	2009	HMOOSE
3007629.497	743266.652	1706460.012	16759693.368	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3007629.514	743266.641	1706460.029	16759693.357	.033	C	GPS - STATIC	2009	HMOOSE
3007629.514	743266.641	1706460.029	16759693.357	.033	C	ADJUSTMENT	2003	GPS1839
3007629.514	743266.641	1706460.029	16759693.357	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/44-DF5934-3S-05MAY2020.jpg	S	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/44-DF5934-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/44-DF5934-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 45 RC
NGS Name: 45 RC
County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092323/
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	33	42 N	19 W	460416.00	924428.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 45 RC 1954 1042

7.3 MILES SOUTHEAST OF SANDSTONE, 3.1 MILES SOUTH AND EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64 IN SANDSTONE, THEN 3.0 MILES EAST ALONG COUNTY ROAD 30 (DUXBURY ROAD), THEN 4.0 MILES SOUTH ALONG CLOVERDALE ROAD, 181.0 FEET NORTH AND 30.0 FEET WEST OF COUNTY ROAD 21 AT THE FIELD LINES NEAR THE SECTION CORNER, 17.0 FEET SOUTH AND 30.0 FEET WEST OF A PRIVATE DRIVE WEST, 4.0 FEET EAST OF A POWER-POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1042.357	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.500 12B = -88.599 09 = -88.484 03 = -88.373

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 46 MN115 **NGS Name:** 46

County: PINE, MN (Sheet 2)

NGS ACRN: DF5935 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	15	42 N	21 W	460652.83	925907.77		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2000) **Stamping:** NO 46

5.8 MILES WEST-SOUTHWEST OF SANDSTONE, 0.5 MILE WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, THEN 2.0 MILES WEST ALONG COUNTY ROAD 61, THEN 2.8 MILES WEST ALONG COUNTY ROAD 27(GRINDSTONE LAKE ROAD), 33.0 FEET NORTH OF COUNTY ROAD 27, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.693	.262		1044.092	.197	2011	GPS - OPUS	2020	GPSBM
1134.702	.262		1044.102	.197	2011	GPS - OPUS	2019	GPSBM
			1044.122	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1134.676	.131		1044.227	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1134.676	.131		1044.358	.066	1996	GPS - STATIC	2009	HMOOSE
1134.676	.131		1044.227	.066	2007	GPS - STATIC	2009	HMOOSE
			1044.227	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1134.709	.131		1044.358	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1134.709	.131		1044.358	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.603 12B = -90.574 09 = -90.482 03 = -90.321

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 52.82683	92 59 07.76713	478317.001	240295.156	.131	3	GPS - OPUS	2020	GPSBM
46 06 52.82680	92 59 07.76706	478317.006	240295.153	.131	3	GPS - OPUS	2019	GPSBM
46 06 52.82685	92 59 07.76695	478317.014	240295.158	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 52.82658	92 59 07.76766	478316.963	240295.130	.033	C	ADJUSTMENT	2009	GPS2566
46 06 52.82658	92 59 07.76766	478316.963	240295.130	.033	C	GPS - STATIC	2009	HMOOSE
46 06 52.82658	92 59 07.76766	478316.963	240295.130	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 52.82651	92 59 07.76725	478316.992	240295.123	.033	C	GPS - STATIC	2009	HMOOSE
46 06 52.82651	92 59 07.76725	478316.992	240295.123	.033	C	ADJUSTMENT	2003	GPS1839
46 06 52.82651	92 59 07.76725	478316.993	240295.123	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945333.483	737110.270	1644094.981	16754522.934	.131	3	GPS - OPUS	2020	GPSBM
2945333.488	737110.267	1644094.986	16754522.931	.131	3	GPS - OPUS	2019	GPSBM
2945333.496	737110.272	1644094.993	16754522.936	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945333.446	737110.244	1644094.943	16754522.909	.033	C	ADJUSTMENT	2009	GPS2566
2945333.446	737110.244	1644094.943	16754522.909	.033	C	GPS - STATIC	2009	HMOOSE
2945333.446	737110.244	1644094.943	16754522.909	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945333.475	737110.237	1644094.972	16754522.901	.033	C	GPS - STATIC	2009	HMOOSE
2945333.475	737110.237	1644094.972	16754522.901	.033	C	ADJUSTMENT	2003	GPS1839
2945333.475	737110.237	1644094.972	16754522.901	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/46-DF5935-3N-12DEC2019.jpg	N	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/46-DF5935-2-12DEC2019.jpg		Dec 12, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/46-DF5935-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

46 RC

Mn/DOT Name: 46 RC
NGS Name: 46 RC
County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092323/
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	42 N	19 W	460552.00	924429.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** 46 RC 1954 1061

6.4 MILES EAST-SOUTHEAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND ANGLE AVENUE IN SANDSTONE, THEN 3.0 MILES EAST ALONG COUNTY ROAD 30 (DUXBURY ROAD), THEN 2.1 MILES SOUTH ALONG CLOVERDALE ROAD, 0.15 MILE SOUTH OF THE SECTION CORNER, 490.0 FEET NORTH AND 38.0 FEET WEST OF COUNTY ROAD 21 AT THE NORTH END OF A LARGE SWAMP, 3.0 FEET WEST OF A POWER POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.382	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.701 12B = -88.783 09 = -88.665 03 = -88.560

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 47 MN115 **NGS Name:** 47

County: PINE, MN (Sheet 2)

NGS ACRN: DF5936 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	6	42 N	21 W	460903.05	930258.51		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2002) **Stamping:** NO 47

7.3 MILES SOUTHWEST OF FINLAYSON, 3.6 MILES WEST ALONG TRUNK HIGHWAY 18/COUNTY ROAD 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18/COUNTY ROAD 18 AND FRONT STREET IN FINLAYSON, THEN 2.0 MILES SOUTH ALONG COUNTY ROAD 36/NORWAY SPRUCE ROAD, THEN 1.0 MILE WEST ALONG COUNTY ROAD 36/DELL ROAD, THEN 1.5 MILES SOUTH ALONG COUNTY ROAD 36/DELL ROAD, THEN 1.8 MILES WEST ALONG COUNTY ROAD 28(GRONINGEN ROAD), 44.0 FEET NORTH OF COUNTY ROAD 28, 29.0 FEET EAST OF A DRIVEWAY, 7.0 FEET SOUTH OF A FENCE, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1036.845	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1127.340	.262		1036.875	.197	1996	GPS - RTRN	2008	RTRN2008
			1036.953	.008	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1127.590	.131		1037.065	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1924
1127.622	.131		1037.065	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1127.590	.131		1037.065	.066	1996	GPS - STATIC	2003	HKANA
1127.622	.131		1037.065	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.768 12B = -90.735 09 = -90.620 03 = -90.469

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 03.05212	93 02 58.50757	462085.555	253511.448	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 03.05217	93 02 58.50823	462085.509	253511.453	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 03.05285	93 02 58.50702	462085.594	253511.522	.131	3	GPS - RTRN	2008	RTRN2008
46 09 03.05215	93 02 58.50756	462085.556	253511.451	.033	C	ADJUSTMENT	2003	GPS1924
46 09 03.05215	93 02 58.50756	462085.556	253511.451	.033	C	ADJUSTMENT	2003	GPS1839
46 09 03.05215	93 02 58.50756	462085.556	253511.451	.033	C	GPS - STATIC	2003	HKANA
46 09 03.05215	93 02 58.50756	462085.556	253511.451	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2928881.113	750046.622	1627854.133	16767712.972	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2928881.066	750046.626	1627854.087	16767712.977	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2928881.150	750046.696	1627854.172	16767713.046	.131	3	GPS - RTRN	2008	RTRN2008
2928881.113	750046.625	1627854.134	16767712.975	.033	C	ADJUSTMENT	2003	GPS1924
2928881.113	750046.625	1627854.134	16767712.975	.033	C	ADJUSTMENT	2003	GPS1839
2928881.113	750046.625	1627854.134	16767712.974	.033	C	GPS - STATIC	2003	HKANA
2928881.113	750046.625	1627854.134	16767712.975	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/47-DF5936-3N-24JAN2008.jpg	N	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/47-DF5936-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/47-DF5936-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 47 RC
NGS Name: 47 RC
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	15	42 N	19 W	460739.00	924429.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** 47 RC 1954 1106

6.0 MILES EAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND ANGLE AVENUE IN SANDSTONE, THEN 3.0 MILES EAST ALONG COUNTY ROAD 30 (DUXBURY ROAD), THEN 475.0 FEET SOUTH ALONG CLOVERDALE ROAD, 74.0 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A BARN, 31.0 FEET EAST OF CLOVERDALE ROAD, 2.0 FEET WEST OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1106.057	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.993 12B = -89.039 09 = -88.911 03 = -88.871

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 48 MN115 **NGS Name:** 48

County: PINE, MN (Sheet 2)

NGS ACRN: DF5937 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	42 N	21 W	460909.43	925544.01		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 48

3.4 MILES SOUTH-SOUTHWEST OF FINLAYSON, 0.6 MILE WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND FRONT STREET IN FINLAYSON, THEN 3.4 MILES SOUTH ALONG COUNTY ROAD 35 (FINLAYSON ROAD), 34.0 FEET WEST OF COUNTY ROAD 35, 16.0 FEET SOUTH OF A DRIVEWAY, 6.0 FEET NORTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1124.237	.262		1033.787	.197	2011	GPS - OPUS	2020	GPSBM
1124.184	.262		1033.735	.197	2011	GPS - OPUS	2020	GPSBM
1124.204	.262		1033.777	.197	2011	GPS - RTRN	2020	RTRN2020
			1033.735	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1124.145	.131		1033.856	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1124.178	.131		1033.984	.066	1996	GPS - STATIC	2009	HMOOSE
1124.178	.131		1033.856	.066	2007	GPS - STATIC	2009	HMOOSE
			1033.856	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1124.178	.131		1033.984	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1124.178	.131		1033.984	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.449 12B = -90.426 09 = -90.341 03 = -90.193

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 09.43394	92 55 44.00731	492677.438	254123.635	.131	3	GPS - OPUS	2020	GPSBM
46 09 09.43420	92 55 44.00742	492677.430	254123.661	.131	3	GPS - OPUS	2020	GPSBM
46 09 09.43421	92 55 44.00661	492677.487	254123.662	.131	3	GPS - RTRN	2020	RTRN2020
46 09 09.43479	92 55 44.00691	492677.466	254123.721	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 09.43484	92 55 44.00777	492677.405	254123.726	.033	C	ADJUSTMENT	2009	GPS2566
46 09 09.43484	92 55 44.00777	492677.405	254123.726	.033	C	GPS - STATIC	2009	HMOOSE
46 09 09.43484	92 55 44.00777	492677.405	254123.726	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 09.43478	92 55 44.00744	492677.429	254123.720	.033	C	GPS - STATIC	2009	HMOOSE
46 09 09.43478	92 55 44.00744	492677.429	254123.720	.033	C	ADJUSTMENT	2003	GPS1839
46 09 09.43478	92 55 44.00744	492677.430	254123.721	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959454.570	751179.834	1658431.664	16768363.331	.131	3	GPS - OPUS	2020	GPSBM
2959454.562	751179.860	1658431.656	16768363.357	.131	3	GPS - OPUS	2020	GPSBM
2959454.619	751179.862	1658431.713	16768363.358	.131	3	GPS - RTRN	2020	RTRN2020
2959454.597	751179.921	1658431.692	16768363.417	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959454.536	751179.925	1658431.632	16768363.422	.033	C	ADJUSTMENT	2009	GPS2566
2959454.536	751179.925	1658431.632	16768363.422	.033	C	GPS - STATIC	2009	HMOOSE
2959454.536	751179.925	1658431.632	16768363.422	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959454.559	751179.919	1658431.655	16768363.416	.033	C	GPS - STATIC	2009	HMOOSE
2959454.559	751179.919	1658431.655	16768363.416	.033	C	ADJUSTMENT	2003	GPS1839
2959454.559	751179.919	1658431.655	16768363.416	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/48-DF5937-3W-06MAY2020.jpg	W	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/48-DF5937-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/48-DF5937-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

48 RC

Mn/DOT Name: 48 RC
NGS Name: 48 RC
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	34	43 N	19 W	460932.00	924426.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** 48 RC 1954 1098

6.3 MILES EAST-NORTHEAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123/THIRD STREET FROM THE JUNCTION OF TRUNK HIGHWAY 123/THIRD STREET AND ANGLE AVENUE IN SANDSTONE, THEN 3.0 MILES EAST ALONG COUNTY ROAD 30 (DUXBURY ROAD), THEN 2.1 MILES NORTH ALONG COUNTY ROAD 21/CLOVERDALE ROAD, 430.0 FEET NORTH OF KOLAND ROAD, 27.0 FEET EAST OF COUNTY ROAD 21, 18.0 FEET NORTH AND 3.0 FEET WEST OF A TELEPHONE POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1098.157	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.344 12B = -89.360 09 = -89.232 03 = -89.203

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 49 MN115 **NGS Name:** 49

County: PINE, MN (Sheet 2)

NGS ACRN: DF5938 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	16	42 N	20 W	460732.25	925211.45	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2000) **Stamping:** NO 49

IN SANDSTONE, 0.5 MILES EAST AND NORTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 0.5, 108.4 FEET EAST-SOUTHEAST OF TRUNK HIGHWAY 123, 35.0 FEET SOUTH OF MINNESOTA STREET, 53.5 FEET WEST OF AN ENTRANCE, 23.0 FEET EAST-NORTHEAST OF A LIGHT POLE, 4.7 FEET NORTH OF THE BACK OF A CURB, 2.0 FEET SOUTH-SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1070.552	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1070.552	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1070.552	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1070.559	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1070.552	.262		980.553	.197	2011	GPS - RTRN	2017	RTRN2017
			980.553	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1070.569	.131		980.661	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1070.569	.131		980.799	.066	1996	GPS - STATIC	2009	HASKO
1070.569	.131		980.661	.066	2007	GPS - STATIC	2009	HASKO
1070.569	.131		980.661	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1070.569	.131		980.799	.066	1996	GPS - STATIC	2009	HMOOSE
1070.569	.131		980.661	.066	2007	GPS - STATIC	2009	HMOOSE
1070.428	.262		980.657	.197	1996	GPS - RTRN	2008	RTRN2008
			980.661	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1070.536	.131		980.802	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1070.536	.131		980.802	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -89.990 12B = -900000 09 = -89.898 03 = -89.770

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 32.24593	92 52 11.45312	507645.899	244278.242	.131	3	GPS - RTRN	2017	RTRN2017
46 07 32.24648	92 52 11.45407	507645.832	244278.298	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 32.24650	92 52 11.45486	507645.777	244278.300	.033	C	ADJUSTMENT	2010	GPS2619
46 07 32.24650	92 52 11.45486	507645.777	244278.300	.033	C	GPS - STATIC	2009	HASKO
46 07 32.24650	92 52 11.45486	507645.777	244278.300	.033	C	ADJUSTMENT	2009	GPS2566
46 07 32.24650	92 52 11.45486	507645.777	244278.300	.033	C	GPS - STATIC	2009	HMOOSE
46 07 32.24694	92 52 11.45572	507645.716	244278.344	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 32.24647	92 52 11.45443	507645.807	244278.297	.033	C	GPS - STATIC	2009	HASKO
46 07 32.24647	92 52 11.45443	507645.807	244278.297	.033	C	GPS - STATIC	2009	HMOOSE
46 07 32.24637	92 52 11.45487	507645.776	244278.287	.131	3	GPS - RTRN	2008	RTRN2008
46 07 32.24689	92 52 11.45542	507645.737	244278.340	.033	C	ADJUSTMENT	2003	GPS1839
46 07 32.24689	92 52 11.45542	507645.737	244278.340	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974586.915	741592.094	1673405.878	16758541.129	.131	3	GPS - RTRN	2017	RTRN2017
2974586.847	741592.148	1673405.810	16758541.184	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974586.792	741592.149	1673405.755	16758541.186	.033	C	ADJUSTMENT	2010	GPS2619
2974586.792	741592.149	1673405.755	16758541.186	.033	C	GPS - STATIC	2009	HASKO
2974586.792	741592.149	1673405.755	16758541.186	.033	C	ADJUSTMENT	2009	GPS2566
2974586.792	741592.149	1673405.755	16758541.186	.033	C	GPS - STATIC	2009	HMOOSE
2974586.730	741592.193	1673405.694	16758541.231	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974586.822	741592.147	1673405.785	16758541.183	.033	C	GPS - STATIC	2009	HASKO
2974586.822	741592.147	1673405.785	16758541.183	.033	C	GPS - STATIC	2009	HMOOSE
2974586.791	741592.136	1673405.754	16758541.173	.131	3	GPS - RTRN	2008	RTRN2008
2974586.751	741592.188	1673405.715	16758541.226	.033	C	ADJUSTMENT	2003	GPS1839
2974586.751	741592.188	1673405.715	16758541.226	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/49-DF5938-3S-21NOV2019.jpg	S	Nov 21, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/49-DF5938-2-21NOV2019.jpg		Nov 21, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/49-DF5938-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 49 RC **NGS Name:** 49 RC

County: PINE, MN (Sheet 2)

NGS ACRN: DF5940 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	43 N	19 W	461059.14	924427.64	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2008) **Stamping:** 1141 49 RC 1954 TT

2.0 MILES EAST OF ASKOV, 1.7 MILES EAST ALONG EAST COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF EAST COUNTY ROAD 32 AND PIONERVEJ IN ASKOV, THEN 0.2 MILE SOUTH ALONG COUNTY ROAD 21 (CLOVERDALE ROAD), 29.0 FEET WEST OF COUNTY ROAD 21, 13.0 FEET NORTH OF A FIELD ENTRANCE WEST, 1.0 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1141.359	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1141.366	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1141.018	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1141.366	.262		1051.747	.197	2011	GPS - OPUS	2020	GPSBM
			1051.750	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1141.369	.131		1051.858	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1141.369	.131		1051.996	.066	1996	GPS - STATIC	2009	HASKO
1141.369	.131		1051.858	.066	2007	GPS - STATIC	2009	HASKO
1141.435	.131		1051.858	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1141.435	.131		1051.996	.066	1996	GPS - STATIC	2009	HMOOSE
1141.435	.131		1051.858	.066	2007	GPS - STATIC	2009	HMOOSE
			1051.858	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1141.402	.131		1051.996	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1141.369	.131		1051.996	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -89.619 12B = -89.642 09 = -89.521 03 = -89.455

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 59.13959	92 44 27.63866	540274.464	265276.211	.131	3	GPS - OPUS	2020	GPSBM
46 10 59.13982	92 44 27.63867	540274.463	265276.235	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 59.13968	92 44 27.63967	540274.393	265276.220	.033	C	ADJUSTMENT	2010	GPS2619
46 10 59.13968	92 44 27.63967	540274.393	265276.220	.033	C	GPS - STATIC	2009	HASKO
46 10 59.13968	92 44 27.63967	540274.393	265276.220	.033	C	ADJUSTMENT	2009	GPS2566
46 10 59.13968	92 44 27.63967	540274.393	265276.220	.033	C	GPS - STATIC	2009	HMOOSE
46 10 59.13968	92 44 27.63967	540274.393	265276.220	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 59.13959	92 44 27.63938	540274.413	265276.211	.033	C	GPS - STATIC	2009	HASKO
46 10 59.13959	92 44 27.63938	540274.413	265276.211	.033	C	GPS - STATIC	2009	HMOOSE
46 10 59.13959	92 44 27.63938	540274.413	265276.211	.033	C	ADJUSTMENT	2003	GPS1839
46 10 59.13959	92 44 27.63938	540274.415	265276.212	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3006848.992	763140.779	1705993.587	16779570.940	.131	3	GPS - OPUS	2020	GPSBM
3006848.990	763140.802	1705993.586	16779570.963	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3006848.920	763140.787	1705993.515	16779570.949	.033	C	ADJUSTMENT	2010	GPS2619
3006848.920	763140.787	1705993.515	16779570.949	.033	C	GPS - STATIC	2009	HASKO
3006848.920	763140.787	1705993.515	16779570.949	.033	C	ADJUSTMENT	2009	GPS2566
3006848.920	763140.787	1705993.515	16779570.949	.033	C	GPS - STATIC	2009	HMOOSE
3006848.920	763140.787	1705993.515	16779570.949	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3006848.941	763140.779	1705993.536	16779570.939	.033	C	GPS - STATIC	2009	HASKO
3006848.941	763140.779	1705993.536	16779570.939	.033	C	GPS - STATIC	2009	HMOOSE
3006848.941	763140.779	1705993.536	16779570.939	.033	C	ADJUSTMENT	2003	GPS1839
3006848.941	763140.779	1705993.536	16779570.940	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/49_RC-DF5940-3W-12DEC2019.jpg	W	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/49_RC-DF5940-2-12DEC2019.jpg		Dec 12, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/49_RC-DF5940-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 50 MN115 **NGS Name:** 50

County: PINE, MN (Sheet 2)

NGS ACRN: DF5939 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	30	43 N	19 W	461111.83	924809.64	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2007) **Stamping:** NO 50

1.0 MILE WEST OF ASKOV, 1.2 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 33 IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 293.05, 48.0 FEET SOUTH OF TRUNK HIGHWAY 23, 22.0 FEET EAST OF A DRIVEWAY, 49.1 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1164.056	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1164.056	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1164.059	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO
1164.059	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1164.154	.262		1074.125	.197	2011	GPS - OPUS	2020	GPSBM
1164.302	.262		1074.243	.197	2011	GPS - RTRN	2020	RTRN2020
			1074.056	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1164.072	.131		1074.128	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1164.072	.131		1074.273	.066	1996	GPS - STATIC	2009	HASKO
1164.072	.131		1074.128	.066	2007	GPS - STATIC	2009	HASKO
1164.105	.131		1074.128	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1164.105	.131		1074.273	.066	1996	GPS - STATIC	2009	HMOOSE
1164.105	.131		1074.128	.066	2007	GPS - STATIC	2009	HMOOSE
1163.971	.262		1074.138	.197	1996	GPS - RTRN	2008	RTRN2008
			1074.128	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1164.072	.131		1074.273	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1164.072	.131		1074.273	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.029 12B = -90.059 09 = -89.931 03 = -89.836

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.83452	92 48 09.63882	524651.759	266537.100	.131	3	GPS - OPUS	2020	GPSBM
46 11 11.83478	92 48 09.63848	524651.783	266537.127	.131	3	GPS - RTRN	2020	RTRN2020
46 11 11.83462	92 48 09.63862	524651.774	266537.111	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.83475	92 48 09.63929	524651.726	266537.124	.033	C	ADJUSTMENT	2010	GPS2619
46 11 11.83475	92 48 09.63929	524651.726	266537.124	.033	C	GPS - STATIC	2009	HASKO
46 11 11.83475	92 48 09.63929	524651.726	266537.124	.033	C	ADJUSTMENT	2009	GPS2566
46 11 11.83475	92 48 09.63929	524651.726	266537.124	.033	C	GPS - STATIC	2009	HMOOSE
46 11 11.83475	92 48 09.63929	524651.726	266537.124	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.83463	92 48 09.63903	524651.745	266537.112	.033	C	GPS - STATIC	2009	HASKO
46 11 11.83463	92 48 09.63903	524651.745	266537.112	.033	C	GPS - STATIC	2009	HMOOSE
46 11 11.83505	92 48 09.63824	524651.800	266537.154	.131	3	GPS - RTRN	2008	RTRN2008
46 11 11.83463	92 48 09.63903	524651.745	266537.112	.033	C	ADJUSTMENT	2003	GPS1839
46 11 11.83463	92 48 09.63903	524651.746	266537.111	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991208.918	764134.990	1690376.184	16780811.560	.131	3	GPS - OPUS	2020	GPSBM
2991208.941	764135.017	1690376.208	16780811.586	.131	3	GPS - RTRN	2020	RTRN2020
2991208.931	764135.001	1690376.198	16780811.570	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991208.884	764135.013	1690376.151	16780811.583	.033	C	ADJUSTMENT	2010	GPS2619
2991208.884	764135.013	1690376.151	16780811.583	.033	C	GPS - STATIC	2009	HASKO
2991208.884	764135.013	1690376.151	16780811.583	.033	C	ADJUSTMENT	2009	GPS2566
2991208.884	764135.013	1690376.151	16780811.583	.033	C	GPS - STATIC	2009	HMOOSE
2991208.884	764135.013	1690376.151	16780811.583	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991208.903	764135.001	1690376.169	16780811.571	.033	C	GPS - STATIC	2009	HASKO
2991208.903	764135.001	1690376.169	16780811.571	.033	C	GPS - STATIC	2009	HMOOSE
2991208.958	764135.045	1690376.225	16780811.614	.131	3	GPS - RTRN	2008	RTRN2008
2991208.903	764135.001	1690376.169	16780811.571	.033	C	ADJUSTMENT	2003	GPS1839
2991208.903	764135.001	1690376.169	16780811.571	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/50-DF5939-3S-05MAY2020.jpg	S	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/50-DF5939-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/50-DF5939-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 50 RC

NGS Name: 50 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	20	43 N	19 W	461152.00	924609.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2008	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (2002) **Stamping:** 50 RC 1954

0.8 MILE NORTHEAST OF ASKOV, 0.8 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 33 IN ASKOV, 50.0 FEET NORTHEAST OF THE ROADSIDE PARK SIGN, 47.0 FEET EAST OF TRUNK HIGHWAY 23, OPPOSITE SMALL ROADSIDE PARK, 16.0 FEET NORTHWEST OF A 6.0 INCH DIAMETER BIRCH TREE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1152.531	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.964 12B = -900000 09 = -89.869 03 = -89.773

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 51 RC

NGS Name: 51 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	43 N	19 W	461327.00	924411.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	1961	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1954)

Stamping: 51 RC 1954 1188

3.4 MILES NORTHEAST OF ASKOV, 3.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 33 IN ASKOV, 400.0 FEET SOUTHWEST OF THE RAILROAD MILEPOST 54, 70.0 FEET WEST OF THE CENTERLINE OF TRUNK HIGHWAY 23 AT A FIELD DRIVE AND A TIMBERLINE WEST, 25.0 FEET EAST OF THE SOUTHEAST CORNER OF A FIELD, 4.0 FEET NORTH OF A CLUSTER OF BIRCH TREES.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1187.649	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.085 12B = -90.124 09 = -89.997 03 = -89.882

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 52 MN115 **NGS Name:** 52

County: PINE, MN (Sheet 2)

NGS ACRN: DF5941 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	43 N	18 W	461112.64	924010.30	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2004) **Stamping:** NO 52

5.4 MILES EAST OF ASKOV, 0.2 MILE EAST ALONG BRIDGE STREET/BROGADE FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND BRIDGE STREET/BROGADE IN ASKOV, THEN 5.5 MILES EAST ALONG COUNTY ROAD 32/RUTABAGA ROAD, 48.0 FEET NORTH OF COUNTY ROAD 32, 2.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1164.194	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1164.223	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1164.243	.262		1075.231	.197	2011	GPS - OPUS	2019	GPSBM
			1075.201	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1164.243	.262		1075.352	.197	1996	GPS - RTRN	2008	RTRN2008
			1075.300	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1164.269	.131		1075.434	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1164.269	.131		1075.434	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -89.016 12B = -89.078 09 = -88.943 03 = -88.891

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.64117	92 40 10.30026	558378.191	266688.305	.131	3	GPS - OPUS	2019	GPSBM
46 11 12.64095	92 40 10.29999	558378.210	266688.283	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.64095	92 40 10.30082	558378.152	266688.283	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.64132	92 40 10.30098	558378.140	266688.320	.131	3	GPS - RTRN	2008	RTRN2008
46 11 12.64087	92 40 10.30052	558378.173	266688.275	.033	C	ADJUSTMENT	2003	GPS1839
46 11 12.64087	92 40 10.30052	558378.171	266688.276	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3024923.855	764861.209	1724087.589	16781005.286	.131	3	GPS - OPUS	2019	GPSBM
3024923.875	764861.187	1724087.608	16781005.264	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3024923.816	764861.186	1724087.549	16781005.264	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3024923.804	764861.224	1724087.538	16781005.301	.131	3	GPS - RTRN	2008	RTRN2008
3024923.838	764861.179	1724087.570	16781005.256	.033	C	ADJUSTMENT	2003	GPS1839
3024923.838	764861.179	1724087.571	16781005.256	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/52-DF5941-3N-09JUL2007.jpg	N	Jul 9, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/52-DF5941-2-21NOV2019.jpg		Nov 21, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/52-DF5941-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

52 RC

Mn/DOT Name: 52 RC

NGS Name: 52 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	14	42 N	20 W	460742.00	924933.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	1961	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1954) **Stamping:** 52 RC 1954 1132

2.0 MILES EAST OF SANDSTONE, 2.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND ANGLE AVENUE IN SANDSTONE, 26.0 FEET SOUTH AND 377.0 FEET WEST OF A TEE-ROAD NORTH, 8.0 FEET NORTH OF A POWER POLE, 3.0 FEET NORTH OF A FENCE, NEAR THE CROWN OF A HILL.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.212	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.701 12B = -89.714 09 = -89.609 03 = -89.518

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 53 MN115 **NGS Name:** 53

County: PINE, MN (Sheet 2)

NGS ACRN: DF5942 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	19	43 N	17 W	461110.35	923152.60	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2013	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type: CONCRETE MONUMENT (CAST-IN-PLACE)
Disk Type: HORIZONTAL CONTROL DISK
Mon. Agency: MN-115

Description: (2007) **Stamping:** NO 53

12.0 MILES EAST OF ASKOV, 12.3 MILES EAST ALONG COUNTY ROAD 32/RUTABAGA ROAD FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32/RUTABAGA ROAD IN ASKOV, 1.05 MILES WEST FROM THE JUNCTION OF COUNTY ROAD 32 AND COUNTY ROAD 24, 45.0 FEET WEST OF DRIVEWAY NUMBER 58931, 31.0 FEET NORTH OF COUNTY ROAD 32, 2.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height Height	Acc	Order (/Class)	Ellipsoid (NAD83) Height	Acc	Adj	Determination Method	Project Info Year	Reference
1125.549	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1125.608	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height Height	Acc	Order (/Class)	Ellipsoid (NAD83) Height	Acc	Adj	Determination Method	Project Info Year	Reference
			1037.652	.026	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1037.760	.032	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1125.555	.131		1037.879	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1125.555	.131		1037.879	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -87.726 12B = -87.785 09 = -87.667 03 = -87.690

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position Latitude	Longitude	Pine County X	Y	Acc	Order	Determination Method	Project Info Year	Reference
46 11 10.34614	92 31 52.59978	593397.581	266587.695	.052		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position Latitude	Longitude	Pine County X	Y	Acc	Order	Determination Method	Project Info Year	Reference
46 11 10.34623	92 31 52.60055	593397.527	266587.704	.069		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position Latitude	Longitude	Pine County X	Y	Acc	Order	Determination Method	Project Info Year	Reference
46 11 10.34619	92 31 52.60036	593397.540	266587.700	.033	C	ADJUSTMENT	2003	GPS1839
46 11 10.34619	92 31 52.60036	593397.540	266587.702	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone X	Y	UTM - Zone 15 X	Y	Acc	Order	Determination Method	Project Info Year	Reference
3059935.700	765357.986	1759091.932	16780949.053	.052		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone X	Y	UTM - Zone 15 X	Y	Acc	Order	Determination Method	Project Info Year	Reference
3059935.646	765357.994	1759091.878	16780949.062	.069		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone X	Y	UTM - Zone 15 X	Y	Acc	Order	Determination Method	Project Info Year	Reference
3059935.659	765357.990	1759091.891	16780949.058	.033	C	ADJUSTMENT	2003	GPS1839
3059935.659	765357.990	1759091.891	16780949.058	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/53-DF5942-3N-09OCT2008.jpg	N	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/53-DF5942-2-09JUL2007.jpg		Jul 9, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/53-DF5942-1-09JUL2007.jpg		Jul 9, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

53 RC

Mn/DOT Name: 53 RC
NGS Name: 53 RC
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	42 N	19 W	460742.15	924642.84		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** 53 RC 1954 1062

4.25 MILES EAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND ANGLE AVENUE IN SANDSTONE, THEN 1.2 MILES EAST ALONG COUNTY ROAD 30/DUXBURY ROAD, 1125.0 FEET EAST ON COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND COUNTY ROAD 142.0 NORTH AND TOWNSHIP ROAD BEAR LANE SOUTH, 655.0 FEET EAST OF BEAR CREEK BRIDGE, 3.0 FEET WEST AND 1.0 FOOT NORTH OF A POWER POLE, 40.0 FEET SOUTH OF COUNTY ROAD 30 AT A PRIVATE DRIVE, 0.9 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.668	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.340 12B = -89.360 09 = -89.249 03 = -89.193

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/53_RC-3S-16APR2007.jpg	S	Apr 16, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/53_RC-2-16APR2007.jpg		Apr 16, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/53_RC-1-16APR2007.jpg		Apr 16, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

54 RC

Mn/DOT Name: 54 RC

NGS Name: 54 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	14	42 N	19 W	460740.00	924205.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 54 RC 1954 1102

7.9 MILES EAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND ANGLE AVENUE IN SANDSTONE, THEN 4.9 MILES EAST ALONG COUNTY ROAD 30/DUXBURY ROAD, AT THE END OF A CUT, 64.0 FEET SOUTH OF COUNTY ROAD 30/DUXBURY ROAD, 435.0 FEET WEST OF LARSON ROAD, 10.0 FEET NORTH OF THE CORNER FENCE POST AT A FENCE SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1101.829	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.602 12B = -88.684 09 = -88.556 03 = -88.471

*** No Horizontal Positions in the Database ***

55 RC

Mn/DOT Name: 55 RC

NGS Name: 55 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	7	42 N	18 W	460741.53	923928.16		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007)

Stamping: 55 RC 1954 1102

7.1 MILES WEST OF DUXBURY, 7.1 MILES WEST ALONG COUNTY ROAD 30/DUXBURY ROAD FROM THE JUNCTION OF COUNTY ROAD 30/DUXBURY ROAD IN DUXBURY,169.0 FEET WEST OF TAUER HORBACZ LANE, 46.0 FEET NORTH OF COUNTY ROAD 30 AT A PRIVATE DRIVE SOUTH, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1102.524	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.192 12B = -88.291 09 = -88.176 03 = -88.103

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/55_RC-3N-16APR2007.jpg	N	Apr 16, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/55_RC-2-16APR2007.jpg		Apr 16, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/55_RC-1-16APR2007.jpg		Apr 16, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

56 RC

Mn/DOT Name: 56 RC

NGS Name: 56 RC

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	42 N	18 W	460742.00	923708.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 56 RC 1954 1068

5.3 MILES WEST OF DUXBURY, 5.3 MILES WEST ALONG COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND COUNTY ROAD 24 IN DUXBURY, 0.2 MILE WEST OF THE SECTION CORNER, 0.7 MILE WEST ON COUNTY ROAD 30 FROM THE EAGLEHEAD LOOKOUT TOWER, 0.3 MILE EAST OF COUNTY ROAD 22, 35.0 FEET NORTH OF COUNTY ROAD 30 AT THE SOUTHEAST CORNER OF THE FIELD, 3.0 FEET SOUTH OF THE CORNER FENCE POST AT A TEE FENCE NORTH.

Station Notes

THE CONCRETE WAS FOUND WITH THE POST OUT OF THE GROUND WITH THE TOP BROKEN OFF, THE DISK WAS GONE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1068.325	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.880 12B = -87.969 09 = -87.861 03 = -87.815

*** No Horizontal Positions in the Database ***

57 RC

Mn/DOT Name: 57 RC
NGS Name: 57 RC
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	12	42 N	18 W	460742.00	923351.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** 57 RC 1954 1072

2.7 MILES WEST OF DUXBURY, 2.6 MILES WEST ALONG COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND COUNTY ROAD 24, 191.0 FEET WEST AND 34.0 FEET NORTH OF COUNTY ROAD 30 AT THE TIMBERLINE NORTH, AT THE SOUTHWEST CORNER OF A FIELD, NEAR THE EAST END OF A LARGE SWAMP, AT THE WEST END OF A CUT BANK THROUGH THE HILL.

Station Notes
THERE ARE SPOIL BANKS IN THIS AREA FOR IMPROVED DRAINAGE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.865	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.477 12B = -87.562 09 = -87.464 03 = -87.431

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 58 MN115 **NGS Name:** 58

County: PINE, MN (Sheet 2)

NGS ACRN: DF5945 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	5	43 N	21 W	461441.83	930157.41		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 58

6.3 MILES WEST-NORTHWEST OF FINLAYSON, 6.6 MILES WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND FRONT STREET IN FINLAYSON, TO MILEPOINT 69.95, THEN 1.6 MILES NORTH ON RHINE LAKE ROAD, 116.0 FEET SOUTH OF THE JUNCTION OF RHINE LAKE ROAD AND RHINE LAKE ROAD WEST, 31.0 FEET EAST OF RHINE LAKE ROAD, 18.0 FEET SOUTH OF A DRIVEWAY, 2.0 FEET WEST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1154.158	.262		1063.403	.197	2011	GPS - OPUS	2020	GPSBM
1154.227	.262		1063.472	.197	2011	GPS - OPUS	2020	GPSBM
1154.207	.262		1063.505	.197	2011	GPS - RTRN	2020	RTRN2020
			1063.430	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1063.551	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1154.230	.131		1063.663	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1154.230	.131		1063.663	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.754 12B = -90.705 09 = -90.574 03 = -90.469

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 41.82864	93 01 57.41130	466444.340	287823.524	.131	3	GPS - OPUS	2020	GPSBM
46 14 41.82875	93 01 57.41144	466444.330	287823.536	.131	3	GPS - OPUS	2020	GPSBM
46 14 41.82791	93 01 57.41005	466444.428	287823.451	.131	3	GPS - RTRN	2020	RTRN2020
46 14 41.82862	93 01 57.41115	466444.350	287823.522	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 41.82881	93 01 57.41180	466444.305	287823.542	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 41.82872	93 01 57.41127	466444.342	287823.533	.033	C	ADJUSTMENT	2003	GPS1839
46 14 41.82872	93 01 57.41127	466444.343	287823.532	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932654.276	784423.854	1632167.898	16802015.235	.131	3	GPS - OPUS	2020	GPSBM
2932654.266	784423.865	1632167.889	16802015.246	.131	3	GPS - OPUS	2020	GPSBM
2932654.365	784423.782	1632167.986	16802015.161	.131	3	GPS - RTRN	2020	RTRN2020
2932654.287	784423.852	1632167.909	16802015.233	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932654.241	784423.871	1632167.863	16802015.252	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932654.278	784423.862	1632167.900	16802015.243	.033	C	ADJUSTMENT	2003	GPS1839
2932654.278	784423.862	1632167.900	16802015.243	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/58-DF5945-3E-06MAY2020.jpg	E	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/58-DF5945-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/58-DF5945-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 58 RC
NGS Name: 58 RC
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	42 N	17 W	460741.00	923109.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** 58 RC 1954 1088

0.5 MILE WEST OF DUXBURY, 0.5 MILE WEST ALONG COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND COUNTY ROAD 24 IN DUXBURY, 65.0 FEET WEST AND 32.0 FEET NORTH ON COUNTY ROAD 30 AT TIMBERLINE SOUTH AT THE NORTHWEST CORNER OF A FIELD, 32.0 FEET NORTH AND 43.0 FEET WEST OF COUNTY ROAD 30 AT A DRIVE NORTH AND SOUTH, 3.0 FEET SOUTH AND 3.0 FEET EAST OF A TELEPHONE POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1088.469	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.185 12B = -87.273 09 = -87.168 03 = -87.139

*** No Horizontal Positions in the Database ***

5802 A

Mn/DOT Name: 5802 A

NGS Name: 5802 A

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	20 W	460742.00	925124.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1947	1998	DESTROYED	Horz=NO Vert=NO	NO	5718		SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (1974) **Stamping:** 5802 A 1947

IN SANDSTONE, 0.4 MILE SOUTHEAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF MAIN STREET AND THIRD STREET IN SANDSTONE, IN THE NORTHWEST CORNER OF TRUNK HIGHWAY 123 A BRIDGE NUMBER 5718 OVER THE KETTLE RIVER, 17.3 FEET NORTH OF TRUNK HIGHWAY 123.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1004.690	.033	3				VERTICAL CONTROL SURVEY	1947	CS5802

Geoid Separations(ft): GEOID18 = -89.915 12B = -89.931 09 = -89.823 03 = -89.705

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 5802 B

NGS Name: 5802 B

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	15	42 N	20 W	460744.00	925120.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1947	2008	DESTROYED	Horz=NO Vert=NO	NO	5718	FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2008) **Stamping:** 5802 B 1947 1929 ADJ

0.6 MILE EAST ALONG HIGHWAY 123 FROM SANDSTONE, AT THE SOUTHEAST CORNER OF THE BRIDGE (BRIDGE NUMBER 5718) OVER THE KETTLE RIVER, 21.0 FEET SOUTH OF THE CENTERLINE OF THE EAST END OF THE BRIDGE, IN THE CONCRETE WING WALL OF THE ABUTMENT.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1006.786	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.908 12B = -89.924 09 = -89.816 03 = -89.701

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 5802 C
NGS Name: 5802 C
County: PINE, MN (Sheet 2)

NGS ACRN: DL6283 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	31	43 N	19 W	461020.08	924812.69	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 17 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** 5802 C 2009

1.4 MILES SOUTHWEST OF ASKOV, 1.0 MILE SOUTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23, AT TRUNK HIGHWAY 123 MILEPOINT 7.05, 44.0 FEET EAST OF TRUNK HIGHWAY 123, 42.0 FEET SOUTH OF THE EXTENDED GALE ROAD, 2.0 FEET WEST OF A FENCE CORNER, 1.5 FEET WEST OF A WITNESS CORNER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1142.747	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1142.754	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1052.865	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1142.747	.131		1052.944	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1142.747	.131		1053.088	.066	1996	GPS - STATIC	2009	HASKO
1142.747	.131		1052.944	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.895 12B = -89.921 09 = -89.796 03 = -89.708

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 20.08216	92 48 12.69093	524443.368	261294.091	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 20.08218	92 48 12.69175	524443.310	261294.093	.033	C	ADJUSTMENT	2010	GPS2619
46 10 20.08218	92 48 12.69175	524443.310	261294.093	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 20.08208	92 48 12.69146	524443.331	261294.083	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991089.958	758889.811	1690174.496	16775570.605	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991089.901	758889.812	1690174.438	16775570.607	.033	C	ADJUSTMENT	2010	GPS2619
2991089.901	758889.812	1690174.438	16775570.607	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991089.921	758889.802	1690174.458	16775570.597	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_C-DL6283-3E-23JUN2009.jpg	E	Jun 23, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_C-DL6283-2-23JUN2009.jpg		Jun 23, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_C-DL6283-1-23JUN2009.jpg		Jun 23, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 D **NGS Name:** 5802 D

County: PINE, MN (Sheet 2)

NGS ACRN: DL6284 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	31	43 N	19 W	460937.73	924812.90	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)

Disk Type
METAL ROD (WITH REMOVABLE ID DISK)

Mon. Agency
MNDT

Description: (2009)

Stamping: 5802 D 2009

2.0 MILES SOUTHWEST OF ASKOV, 1.8 MILES SOUTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 (THE JUNCTION IS 1.0 MILE WEST OF ASKOV), AT TRUNK HIGHWAY 123 MILEPOINT 6.25, 50.0 FEET EAST OF TRUNK HIGHWAY 123, 30.0 FEET SOUTH OF DRIVEWAY NUMBER 59400, 10.0 FEET SOUTH OF A POWER POLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1126.858	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1126.865	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1037.071	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1126.868	.131		1037.137	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1126.868	.131		1037.285	.066	1996	GPS - STATIC	2009	HASKO
1126.868	.131		1037.137	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.790 12B = -89.813 09 = -89.695 03 = -89.609

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 37.72556	92 48 12.89507	524434.202	257003.170	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 37.72554	92 48 12.89596	524434.139	257003.168	.033	C	ADJUSTMENT	2010	GPS2619
46 09 37.72554	92 48 12.89596	524434.139	257003.168	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 37.72547	92 48 12.89564	524434.162	257003.161	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991153.941	754599.861	1690170.741	16771281.568	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991153.879	754599.858	1690170.678	16771281.566	.033	C	ADJUSTMENT	2010	GPS2619
2991153.879	754599.858	1690170.678	16771281.566	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991153.901	754599.851	1690170.701	16771281.559	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_D-DL6284-3E-23JUN2009.jpg	E	Jun 23, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_D-DL6284-2-23JUN2009.jpg		Jun 23, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_D-DL6284-1-23JUN2009.jpg		Jun 23, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 E
NGS Name: 5802 E
County: PINE, MN (Sheet 2)

NGS ACRN: DL6285 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	7	42 N	19 W	460831.00	924813.06	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** 5802 E 2009

3.3 MILES SOUTHWEST OF ASKOV, 3.1 MILES SOUTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 (THE JUNCTION IS 1.0 MILE WEST OF ASKOV), AT TRUNK HIGHWAY 123 MILEPOINT 4.95, 50.0 FEET EAST OF TRUNK HIGHWAY 123, 8.0 FEET WEST OF THE NORTH SOUTH FENCE LINE, 1.2 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1120.024	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1120.034	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1119.975	.262		1030.336	.197	2011	GPS - OPUS	2020	GPSBM
			1030.369	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1120.044	.131		1030.431	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1120.044	.131		1030.572	.066	1996	GPS - STATIC	2009	HASKO
1120.044	.131		1030.431	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.639 12B = -89.655 09 = -89.550 03 = -89.472

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 30.99523	92 48 13.05803	524430.920	250243.111	.131	3	GPS - OPUS	2020	GPSBM
46 08 30.99463	92 48 13.05825	524430.905	250243.051	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 30.99462	92 48 13.05917	524430.840	250243.049	.033	C	ADJUSTMENT	2010	GPS2619
46 08 30.99462	92 48 13.05917	524430.840	250243.049	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 30.99455	92 48 13.05884	524430.863	250243.042	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991265.898	747841.514	1690175.976	16764524.488	.131	3	GPS - OPUS	2020	GPSBM
2991265.884	747841.453	1690175.961	16764524.427	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991265.819	747841.451	1690175.896	16764524.426	.033	C	ADJUSTMENT	2010	GPS2619
2991265.819	747841.451	1690175.896	16764524.426	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991265.843	747841.444	1690175.919	16764524.419	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_E-DL6285-3E-21NOV2019.jpg	E	Nov 21, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_E-DL6285-2-21NOV2019.jpg		Nov 21, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_E-DL6285-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 F
NGS Name: 5802 F
County: PINE, MN (Sheet 2)

NGS ACRN: DL6286 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	13	42 N	20 W	460742.92	924927.69	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)
Disk Type: METAL ROD (WITH REMOVABLE ID DISK)
Mon. Agency: MNDT

Description: (2009)
Stamping: 5802 F 2008

2.3 MILES EAST OF SANDSTONE, 2.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23, AT TRUNK HIGHWAY 123 MILEPOINT 3.0, 70.0 FEET EAST OF EXTENDED TENQUIST ROAD, 40.0 FEET SOUTH OF TRUNK HIGHWAY 123.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1129.342	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1129.351	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1129.315	.262		1039.624	.197	2011	GPS - OPUS	2020	GPSBM
1129.384	.262		1039.676	.197	2011	GPS - RTRN	2020	RTRN2020
			1039.634	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1129.361	.131		1039.699	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1129.361	.131		1039.840	.066	1996	GPS - STATIC	2009	HASKO
1129.361	.131		1039.699	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.691 12B = -89.708 09 = -89.600 03 = -89.508

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 42.91788	92 49 27.69150	519180.022	245367.018	.131	3	GPS - OPUS	2020	GPSBM
46 07 42.91799	92 49 27.69150	519180.022	245367.030	.131	3	GPS - RTRN	2020	RTRN2020
46 07 42.91832	92 49 27.69188	519179.995	245367.063	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 42.91831	92 49 27.69281	519179.929	245367.062	.033	C	ADJUSTMENT	2010	GPS2619
46 07 42.91831	92 49 27.69281	519179.929	245367.062	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 42.91824	92 49 27.69247	519179.953	245367.055	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986099.486	742877.181	1684933.533	16759643.936	.131	3	GPS - OPUS	2020	GPSBM
2986099.486	742877.192	1684933.533	16759643.947	.131	3	GPS - RTRN	2020	RTRN2020
2986099.459	742877.225	1684933.506	16759643.980	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986099.393	742877.223	1684933.441	16759643.979	.033	C	ADJUSTMENT	2010	GPS2619
2986099.393	742877.223	1684933.441	16759643.979	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986099.417	742877.216	1684933.465	16759643.972	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_F-DL6286-3S-05MAY2020.jpg	S	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_F-DL6286-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_F-DL6286-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 G
NGS Name: 5802 G
County: PINE, MN (Sheet 2)

NGS ACRN: DL6287 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	11	42 N	20 W	460744.07	925041.94	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** 5802 G 2009

1.3 MILES EAST OF SANDSTONE, 1.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 AND COUNTY ROAD 64 IN SANDSTONE, AT TRUNK HIGHWAY 123 MILEPOINT 2.05, 100.0 FEET EAST OF POPLAR ROAD, 60.0 FEET NORTH OF TRUNK HIGHWAY 123.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1072.701	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1072.714	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1072.682	.262		982.846	.197	2011	GPS - OPUS	2020	GPSBM
1072.941	.262		983.085	.197	2011	GPS - RTRN	2020	RTRN2020
			982.872	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1072.701	.131		982.948	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1072.701	.131		983.085	.066	1996	GPS - STATIC	2009	HASKO
1072.701	.131		982.948	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.839 12B = -89.855 09 = -89.747 03 = -89.639

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 44.06707	92 50 41.93747	513950.435	245479.141	.131	3	GPS - OPUS	2020	GPSBM
46 07 44.06784	92 50 41.93723	513950.452	245479.219	.131	3	GPS - RTRN	2020	RTRN2020
46 07 44.06735	92 50 41.93773	513950.416	245479.169	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 44.06734	92 50 41.93864	513950.352	245479.168	.033	C	ADJUSTMENT	2010	GPS2619
46 07 44.06734	92 50 41.93864	513950.352	245479.168	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 44.06729	92 50 41.93828	513950.378	245479.163	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980869.346	742900.135	1679706.115	16759749.428	.131	3	GPS - OPUS	2020	GPSBM
2980869.362	742900.213	1679706.131	16759749.506	.131	3	GPS - RTRN	2020	RTRN2020
2980869.327	742900.163	1679706.096	16759749.456	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980869.263	742900.161	1679706.032	16759749.455	.033	C	ADJUSTMENT	2010	GPS2619
2980869.263	742900.161	1679706.032	16759749.455	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980869.289	742900.156	1679706.058	16759749.450	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_G-DL6287-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_G-DL6287-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_G-DL6287-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 H **NGS Name:** 5802 H

County: PINE, MN (Sheet 2)

NGS ACRN: DO7750 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	15	42 N	20 W	460743.90	925121.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=NO Vert=YES	YES	5718	FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2009) **Stamping:** 5802 H 2009

0.8 MILE EAST OF SANDSTONE, 0.6 MILE EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 (COUNTY ROAD 64) IN SANDSTONE, AT TRUNK HIGHWAY 123 MILEPOINT 1.55, IN AN ABUTMENT IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 123 BRIDGE NUMBER 5718 OVER THE KETTLE RIVER, 15.0 FEET SOUTH OF TRUNK HIGHWAY 123.

Station Notes
THE DISK WAS SET IN A DRILL HOLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1007.455	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1007.462	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Geoid Separations(ft): GEOID18 = -89.911 12B = -89.928 09 = -89.819 03 = -89.705

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_H-DO7750-3W-22JUN2009.jpg	W	Jun 22, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_H-DO7750-2-22JUN2009.jpg		Jun 22, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_H-DO7750-1-22JUN2009.jpg		Jun 22, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 J **NGS Name:** 5802 J

County: PINE, MN (Sheet 2)

NGS ACRN: DO7749 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	15	42 N	20 W	460744.10	925126.80	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=NO Vert=YES	YES	5718	FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2010) **Stamping:** 5802 J 2009

0.75 MILE EAST OF SANDSTONE, 0.55 MILE EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 (COUNTY ROAD 64) IN SANDSTONE, AT TRUNK HIGHWAY 123 MILEPOINT 1.50, IN AN ABUTMENT IN THE SOUTHWEST CORNER OF TRUNK HIGHWAY 123 BRIDGE NUMBER 5718 OVER THE KETTLE RIVER, 15.0 FEET SOUTH OF TRUNK HIGHWAY 123.

Station Notes
THE DISK WAS SET IN A DRILL HOLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1005.369	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1005.379	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Geoid Separations(ft): GEOID18 = -89.924 12B = -89.941 09 = -89.832 03 = -89.714

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_J-DO7749-3E-22JUN2009.jpg	E	Jun 22, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_J-DO7749-2-22JUN2009.jpg		Jun 22, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_J-DO7749-1-22JUN2009.jpg		Jun 22, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5802 K **NGS Name:** 5802 K

County: PINE, MN (Sheet 2)

NGS ACRN: DL6288 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	42 N	20 W	460752.04	925205.10	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** 5802 K 2009

IN SANDSTONE, AT THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64 IN SANDSTONE, AT TRUNK HIGHWAY 123 MILEPOINT 0.9, 58.2 FEET WEST-NORTHWEST OF TRUNK HIGHWAY 123 SOUTH (COUNTY ROAD 64 EXTENDED), 89.3 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 123 EAST EXTENDED, 2.0 FEET EAST OF A CHAIN LINK FENCE CORNER, 2.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1087.816	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1087.816	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1087.816	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1087.823	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1087.806	.262		997.803	.197	2011	GPS - OPUS	2019	GPSBM
1087.819	.262		997.806	.197	2011	GPS - RTRN	2017	RTRN2017
			997.839	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1087.826	.131		997.911	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1087.826	.131		998.043	.066	1996	GPS - STATIC	2009	HASKO
1087.826	.131		997.911	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -90.003 12B = -90.013 09 = -89.908 03 = -89.783

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 52.03837	92 52 05.10197	508092.462	246283.461	.131	3	GPS - OPUS	2019	GPSBM
46 07 52.03851	92 52 05.10240	508092.431	246283.475	.131	3	GPS - RTRN	2017	RTRN2017
46 07 52.03782	92 52 05.10249	508092.425	246283.405	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 52.03783	92 52 05.10337	508092.363	246283.406	.033	C	ADJUSTMENT	2010	GPS2619
46 07 52.03783	92 52 05.10337	508092.363	246283.406	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 52.03777	92 52 05.10300	508092.389	246283.400	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974999.185	743604.403	1673849.720	16760546.022	.131	3	GPS - OPUS	2019	GPSBM
2974999.155	743604.417	1673849.689	16760546.037	.131	3	GPS - RTRN	2017	RTRN2017
2974999.150	743604.347	1673849.683	16760545.967	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974999.088	743604.347	1673849.621	16760545.968	.033	C	ADJUSTMENT	2010	GPS2619
2974999.088	743604.347	1673849.621	16760545.968	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974999.114	743604.341	1673849.647	16760545.961	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_K-DL6288-3W-30MAY2017.jpg	W	May 30, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_K-DL6288-2-30MAY2017.jpg		May 30, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5802_K-DL6288-1-30MAY2017.jpg		May 30, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A
NGS Name: 5803 A
County: PINE, MN (Sheet 2)

NGS ACRN: DL6289 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	19	43 N	19 W	461112.92	924713.48	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 23 FT)

Disk Type
SURVEY DISK

Mon. Agency
MNDT

Description: (2009)

Stamping: 5803 A 2007

IN ASKOV, AT THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 293.85, 71.7 FEET NORTH OF EXTENDED COUNTY ROAD 32 EAST/WEST, 68.9 FEET SOUTHWEST OF COUNTY ROAD 32 (RUTABAGA ROAD), 61.2 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 9.4 FEET WEST OF A POWER POLE WITH 2 LIGHTS, 2.0 FEET NORTH OF A WITNESS POST.

Station Notes
NEED A RECOVERY NOTE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.260	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1160.260	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1160.263	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO
1160.263	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.313	.262		1070.365	.197	2011	GPS - OPUS	2020	GPSBM
1160.257	.262		1070.280	.197	2011	GPS - RTRN	2020	RTRN2020
			1070.339	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1160.267	.131		1070.421	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1160.267	.131		1070.565	.066	1996	GPS - STATIC	2009	HASKO
1160.267	.131		1070.421	.066	2007	GPS - STATIC	2009	HASKO
1160.122	.262		1070.362	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.947 12B = -89.980 09 = -89.846 03 = -89.757

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.91956	92 47 13.48026	528602.973	266652.242	.131	3	GPS - OPUS	2020	GPSBM
46 11 12.91964	92 47 13.48088	528602.929	266652.250	.131	3	GPS - RTRN	2020	RTRN2020
46 11 12.91990	92 47 13.48022	528602.976	266652.276	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.91987	92 47 13.48105	528602.917	266652.273	.033	C	ADJUSTMENT	2010	GPS2619
46 11 12.91987	92 47 13.48105	528602.917	266652.273	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.91978	92 47 13.48076	528602.938	266652.264	.033	C	GPS - STATIC	2009	HASKO
46 11 12.92003	92 47 13.48062	528602.947	266652.289	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995157.124	764317.459	1694325.506	16780931.634	.131	3	GPS - OPUS	2020	GPSBM
2995157.080	764317.466	1694325.462	16780931.642	.131	3	GPS - RTRN	2020	RTRN2020
2995157.126	764317.493	1694325.508	16780931.668	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995157.068	764317.489	1694325.450	16780931.665	.033	C	ADJUSTMENT	2010	GPS2619
2995157.068	764317.489	1694325.450	16780931.665	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995157.088	764317.480	1694325.470	16780931.656	.033	C	GPS - STATIC	2009	HASKO
2995157.098	764317.506	1694325.480	16780931.682	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A-DL6289-3S-05MAY2020.jpg	S	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A-DL6289-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A-DL6289-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 1 **NGS Name:** 5803 A 1

County: PINE, MN (Sheet 2)

NGS ACRN: DM5859 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	21	43 N	19 W	461112.00	924504.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2007) **Stamping:** 5803 A 1 2007

1.75 MILES EAST OF ASKOV, 1.75 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 57.8 FEET NORTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 16.0 FEET WEST OF MAPLE HILL LANE, 10.6 FEET NORTH OF A POWER POLE, 2.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1162.307	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1162.314	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -89.731 12B = -89.760 09 = -89.639 03 = -89.560

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_1-DM5859-3N-21MAY2009.jpg	N	May 21, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_1-DM5859-2-21MAY2009.jpg		May 21, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_1-DM5859-1-21MAY2009.jpg		May 21, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 10 **NGS Name:** 5803 A 10

County: PINE, MN (Sheet 2)

NGS ACRN: DM5870 Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	21	43 N	16 W	461109.85	922242.93	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 10 2007

3.1 MILES NORTHWEST OF CLOVERTON, 3.8 MILES WEST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND COUNTY ROAD 31 (CLOVERTON ROAD) IN ASKOV, 33.9 FEET NORTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 30.8 FEET WEST OF DRIVEWAY NUMBER 73510, 15.7 FEET WEST OF A WOODED ENTRANCE, 4.2 FEET SOUTH OF A GATE POST, 1.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1144.597	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1144.679	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1144.574	.262		1057.741	.197	2011	GPS - OPUS	2020	GPSBM
1144.706	.262		1057.872	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -86.834 12B = -86.880 09 = -86.771 03 = -86.788

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.85729	92 22 42.93282	632072.705	266754.554	.131	3	GPS - OPUS	2020	GPSBM
46 11 09.85722	92 22 42.93271	632072.713	266754.547	.131	3	GPS - OPUS	2020	GPSBM

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3098597.744	766184.828	1797750.477	16781164.935	.131	3	GPS - OPUS	2020	GPSBM
3098597.752	766184.821	1797750.485	16781164.928	.131	3	GPS - OPUS	2020	GPSBM

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_10-DM5870-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_10-DM5870-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_10-DM5870-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 11 **NGS Name:** 5803 A 11

County: PINE, MN (Sheet 2)

NGS ACRN: DM5871 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	22	43 N	16 W	461107.40	922032.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 11 2007

1.65 MILES NORTHWEST OF CLOVERTON, 2.0 MILES WEST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND COUNTY ROAD 31 (CLOVERTON ROAD) IN ASKOV, 38.0 FEET NORTHEAST OF COUNTY ROAD 32 (RUTABAGA ROAD), 16.7 FEET SOUTHEAST OF A WHITETAIL LANE, 3.0 FEET NORTHWEST OF A WITNESS POST.

Station Notes
TREES

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1090.667	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1090.749	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.712 12B = -86.745 09 = -86.657 03 = -86.660

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_11-DM5871-3NE-05MAY2020.jpg	NE	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_11-DM5871-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_11-DM5871-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 12 **NGS Name:** 5803 A 12

County: PINE, MN (Sheet 2)

NGS ACRN: DM5872 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	26	43 N	16 W	461018.90	922028.50	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 12 2007

1.05 MILES NORTHWEST OF CLOVERTON, 1.1 MILES WEST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND COUNTY ROAD 31 (CLOVERTON ROAD) IN ASKOV, 71.7 FEET NORTH OF THE EXTENDED COUNTY ROAD 32 EAST/WEST, 42.9 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 2.0 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1097.012	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1097.098	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.644 12B = -86.676 09 = -86.598 03 = -86.591

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_12-DM5872-3SW-05MAY2020.jpg	SW	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_12-DM5872-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_12-DM5872-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 13 **NGS Name:** 5803 A 13

County: PINE, MN (Sheet 2)

NGS ACRN: DM5873 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	24	43 N	16 W	461132.00	921857.30	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	POOR	Horz=NO Vert=NO	YES		PROJECTS 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 13 2007

1.65 MILES NORTH OF CLOVERTON, 1.7 MILES NORTH ALONG COUNTY ROAD 31 (KINGSDALE ROAD) FROM THE JUNCTION OF COUNTY ROAD 31 (KINGSDALE ROAD) AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, 71.7 FEET NORTH OF THE EXTENDED COUNTY ROAD 32 EAST/WEST, 21.3 FEET EAST OF COUNTY ROAD 31 (KINGSDALE ROAD), 2.4 FEET NORTH OF A WITNESS POST.

Station Notes
THE SURVEY MARK HAS BEEN HIT AND IS LEANING TO THE EAST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1116.806	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1116.891	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.676 12B = -86.703 09 = -86.621 03 = -86.624

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_13-DM5873-3E-05MAY2020.jpg	E	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_13-DM5873-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_13-DM5873-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 14 **NGS Name:** 5803 A 14

County: PINE, MN (Sheet 2)

NGS ACRN: DM5874 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	12	43 N	16 W	461252.00	921850.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2009	GOOD	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 14 2007

3.25 MILES NORTH OF CLOVERTON, 3.2 MILES NORTH ALONG COUNTY ROAD 31 (KINGSDALE ROAD) FROM THE JUNCTION OF COUNTY ROAD 31 (KINGSDALE ROAD) AND COUNTY ROAD 32 IN ASKOV, 58.0 FEET EAST OF A DIRT TRAIL, 16.6 FEET WEST OF COUNTY ROAD 31 (KINGSDALE ROAD), 15.5 FEET NORTH OF DRIVEWAY NUMBER 66941 66933, 1.2 FEET SOUTH OF A WITNESS POST.

Station Notes

THE DISK WAS FOUND LOOSE AND PULLED OFF, IT WAS POUNDED BACK ON, AND IT APPEARS TO BE STABLE.
FOUND CAP LOOSE. USE WITH CAUTION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1141.983	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1142.068	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.804 12B = -86.831 09 = -86.722 03 = -86.745

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_14-DM5874-3NW-01JUN2009.jpg	NW	Jun 1, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_14-DM5874-2-01JUN2009.jpg		Jun 1, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_14-DM5874-1-01JUN2009.jpg		Jun 1, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5803 A 15

Mn/DOT Name: 5803 A 15 **NGS Name:** 5803 A 15

County: PINE, MN (Sheet 2)

NGS ACRN: DM5875 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	1	43 N	16 W	461344.00	921848.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 15 2007

4.25 MILES NORTH OF CLOVERTON, 4.2 MILES NORTH ALONG COUNTY ROAD 31 (KINGSDALE ROAD), FROM THE JUNCTION OF COUNTY ROAD 31 (KINGSDALE ROAD), AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, 14.7 FEET NORTH OF THE EXTENDED ADOLPHS DRIVE, 8.1 FEET EAST OF COUNTY ROAD 31 (KINGSDALE ROAD), 2.5 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1174.443	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1174.528	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.899 12B = -86.929 09 = -86.811 03 = -86.847

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_15-DM5875-3N-01JUN2009.jpg	N	Jun 1, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_15-DM5875-2-01JUN2009.jpg		Jun 1, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_15-DM5875-1-01JUN2009.jpg		Jun 1, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5803 A 16

Mn/DOT Name: 5803 A 16 **NGS Name:** 5803 A 16

County: PINE, MN (Sheet 2)

NGS ACRN: DM5876 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	1	43 N	16 W	461418.71	921840.55	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 16 2007

4.9 MILES NORTH OF CLOVERTON, 4.2 MILES NORTH ALONG COUNTY ROAD 31 (KINGSDALE ROAD) FROM THE JUNCTION OF COUNTY ROAD 31 (KINGSDALE ROAD) AND COUNTY ROAD 32 (RUTABAGA ROAD), IN ASKOV, 31.2 FEET WEST OF, 17.6 FEET SOUTH OF OMANS DRIVE, 3.4 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.521	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1163.603	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.968 12B = -86.995 09 = -86.870 03 = -86.913

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_16-DM5876-3W-01JUN2009.jpg	W	Jun 1, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_16-DM5876-2-01JUN2009.jpg		Jun 1, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_16-DM5876-1-25JUL2007.jpg		Jul 25, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 2 **NGS Name:** 5803 A 2

County: PINE, MN (Sheet 2)

NGS ACRN: DM5860 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	23	43 N	19 W	461112.06	924256.63	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2007) **Stamping:** 5803 A 2 2007

3.45 MILES EAST OF ASKOV, 3.45 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 43.6 FEET NORTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 20.5 FEET EAST OF A CABLE BOX, 9.4 FEET WEST OF ENTRANCE NUMBER 41407, 2.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.236	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1128.249	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.357	.262		1038.886	.197	2011	GPS - OPUS	2020	GPSBM
1128.098	.262		1038.604	.197	2011	GPS - RTRN	2020	RTRN2020
1128.318	.262		1038.994	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.472 12B = -89.495 09 = -89.370 03 = -89.324

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.05736	92 42 56.62699	546675.499	266598.655	.131	3	GPS - OPUS	2020	GPSBM
46 11 12.05815	92 42 56.62585	546675.579	266598.736	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.05816	92 42 56.62677	546675.515	266598.737	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3013225.787	764572.018	1712390.138	16780900.886	.131	3	GPS - OPUS	2020	GPSBM
3013225.865	764572.100	1712390.218	16780900.966	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3013225.800	764572.099	1712390.153	16780900.967	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_2-DM5860-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_2-DM5860-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_2-DM5860-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 3 **NGS Name:** 5803 A 3

County: PINE, MN (Sheet 2)

NGS ACRN: DM5861 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	25	43 N	19 W	461111.70	924049.72	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		PROJECTS 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2007) **Stamping:** 5803 A 3 2007

5.15 MILES EAST OF ASKOV, 5.15 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 31.9 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 23.8 FEET NORTHWEST OF A POWER POLE, 2.1 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1098.981	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1099.004	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1098.928	.262		1009.798	.197	2011	GPS - OPUS	2020	GPSBM
1098.889	.262		1009.758	.197	2011	GPS - OPUS	2020	GPSBM
1099.069	.262		1009.886	.197	2011	GPS - RTRN	2020	RTRN2020
1098.961	.262		1009.959	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.130 12B = -89.183 09 = -89.052 03 = -89.002

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.69628	92 40 49.71641	555605.117	266584.740	.131	3	GPS - OPUS	2020	GPSBM
46 11 11.69660	92 40 49.71659	555605.105	266584.772	.131	3	GPS - OPUS	2020	GPSBM
46 11 11.69636	92 40 49.71598	555605.148	266584.748	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.69831	92 40 49.71673	555605.094	266584.945	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022153.281	764710.379	1721315.859	16780898.260	.131	3	GPS - OPUS	2020	GPSBM
3022153.268	764710.412	1721315.846	16780898.292	.131	3	GPS - OPUS	2020	GPSBM
3022153.311	764710.388	1721315.889	16780898.268	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022153.255	764710.584	1721315.836	16780898.466	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_3-DM5861-3S-05MAY2020.jpg	S	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_3-DM5861-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_3-DM5861-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 4 **NGS Name:** 5803 A 4

County: PINE, MN (Sheet 2)

NGS ACRN: DM5862 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	43 N	18 W	461112.00	923840.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2007) **Stamping:** 5803 A 4 2007

6.5 MILES EAST OF ASKOV, 6.85 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 41.7 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 14.4 FEET WEST OF ENTRANCE NUMBER 48238, 2.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1152.340	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1152.376	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1152.321	.262		1063.695	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -88.743 12B = -88.829 09 = -88.678 03 = -88.625

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.37747	92 38 40.50843	564696.065	266680.886	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3031240.186	764961.542	1730402.714	16781005.860	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_4-DM5862-3S-24JUL2007.jpg	S	Jul 24, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_4-DM5862-2-24JUL2007.jpg		Jul 24, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_4-DM5862-1-24JUL2007.jpg		Jul 24, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 5 **NGS Name:** 5803 A 5

County: PINE, MN (Sheet 2)

NGS ACRN: DM5863 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	27	43 N	18 W	461111.00	923637.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 5 2007

8.55 MILES EAST OF ASKOV, 8.55 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 33.4 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 2.7 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1199.469	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1199.515	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1199.456	.262		1111.156	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -88.382 12B = -88.481 09 = -88.333 03 = -88.300

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.07907	92 36 37.06268	573382.237	266579.112	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3039925.796	765007.951	1739085.237	16780915.121	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_5-DM5863-3S-24JUL2007.jpg	S	Jul 24, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_5-DM5863-2-24JUL2007.jpg		Jul 24, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_5-DM5863-1-24JUL2007.jpg		Jul 24, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 6 **NGS Name:** 5803 A 6

County: PINE, MN (Sheet 2)

NGS ACRN: DM5864 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	43 N	18 W	461110.00	923420.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 42 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 6 2007

10.35 MILES EAST OF ASKOV, 10.35 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 29.6 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 8.5 FEET WEST OF ENTRANCE NUMBER 55038, 2.1 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.262	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1163.311	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.669	.262		1075.670	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -88.048 12B = -88.126 09 = -87.992 03 = -87.995

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 10.34645	92 34 20.65355	582980.390	266542.135	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3049522.042	765134.713	1748679.282	16780890.312	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_6-DM5864-3S-24JUL2007.jpg	S	Jul 24, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_6-DM5864-2-24JUL2007.jpg		Jul 24, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_6-DM5864-1-24JUL2007.jpg		Jul 24, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 7 **NGS Name:** 5803 A 7

County: PINE, MN (Sheet 2)

NGS ACRN: DM5865 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	30	43 N	17 W	461109.80	923208.60	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 7 2007

12.0 MILES EAST OF ASKOV, 12.0 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 27.8 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 17.6 FEET EAST OF DRIVEWAY NUMBER 58484, 5.5 FEET NORTHEAST OF A FENCE POST, 2.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1129.050	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1129.109	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.984	.262		1041.225	.197	2011	GPS - OPUS	2019	GPSBM
1128.974	.262		1041.215	.197	2011	GPS - OPUS	2019	GPSBM
1129.020	.262		1041.300	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -87.759 12B = -87.821 09 = -87.700 03 = -87.720

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.79886	92 32 08.59729	592272.237	266527.068	.131	3	GPS - OPUS	2019	GPSBM
46 11 09.79922	92 32 08.59747	592272.225	266527.105	.131	3	GPS - OPUS	2019	GPSBM

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.79969	92 32 08.59858	592272.146	266527.152	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3058811.688	765278.174	1757967.148	16780887.025	.131	3	GPS - OPUS	2019	GPSBM
3058811.675	765278.211	1757967.136	16780887.062	.131	3	GPS - OPUS	2019	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3058811.596	765278.257	1757967.057	16780887.109	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_7-DM5865-3S-12DEC2019.jpg	S	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_7-DM5865-2-12DEC2019.jpg		Dec 12, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_7-DM5865-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 8 **NGS Name:** 5803 A 8

County: PINE, MN (Sheet 2)

NGS ACRN: DM5868 Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	23	43 N	17 W	461110.20	922759.22	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 8 2007

15.35 MILES EAST OF ASKOV, 15.35 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 IN ASKOV, 50.6 FEET NORTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 16.6 FEET EAST OF THE ENTRANCE TO THE GRAVEL PIT, 4.9 FEET SOUTH OF A GATE POST, 1.1 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1150.365	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1150.437	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1150.329	.262		1063.049	.197	2011	GPS - OPUS	2019	GPSBM
1150.391	.262		1063.111	.197	2011	GPS - OPUS	2019	GPSBM

Geoid Separations(ft): GEOID18 = -87.283 12B = -87.336 09 = -87.211 03 = -87.244

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 10.20534	92 27 59.21838	609818.523	266656.236	.131	3	GPS - OPUS	2019	GPSBM
46 11 10.20458	92 27 59.21867	609818.503	266656.159	.131	3	GPS - OPUS	2019	GPSBM

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3076351.128	765706.708	1775505.780	16781038.392	.131	3	GPS - OPUS	2019	GPSBM
3076351.110	765706.631	1775505.761	16781038.315	.131	3	GPS - OPUS	2019	GPSBM

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_8-DM5868-3N-01JUN2009.jpg	N	Jun 1, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_8-DM5868-2-01JUN2009.jpg		Jun 1, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_8-DM5868-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 A 9 **NGS Name:** 5803 A 9

County: PINE, MN (Sheet 2)

NGS ACRN: DM5869 Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	30	43 N	16 W	461109.00	922437.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 A 9 2007

4.5 MILES NORTHWEST OF CLOVERTON, 5.3 MILES NORTHWEST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND COUNTY ROAD 31 IN CLOVERTON, 58.8 FEET SOUTH OF A POWER POLE, 25.5 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 1.3 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1142.002	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1142.081	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -86.968 12B = -87.021 09 = -86.903 03 = -86.926

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_9-DM5869-3S-24JUL2007.jpg	S	Jul 24, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_9-DM5869-2-24JUL2007.jpg		Jul 24, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_A_9-DM5869-1-24JUL2007.jpg		Jul 24, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 B **NGS Name:** 5803 B

County: PINE, MN (Sheet 2)

NGS ACRN: DM5878 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	43 N	19 W	461132.00	924652.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 27 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 B 2007

IN ASKOV, 0.45 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 294.65, 68.7 FEET WEST-SOUTHWEST OF A CABLE BOX NUMBER A 11, 34.3 FEET WEST OF KOBMAGERGADE EXTENSION ROAD, 32.3 FEET NORTH OF TRUNK HIGHWAY 23, 1.9 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1150.966	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1150.969	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1150.926	.262		1061.143	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.974 12B = -90.006 09 = -89.872 03 = -89.780

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 32.47452	92 46 52.19312	530097.788	268635.433	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2996617.734	766325.609	1695817.159	16782915.835	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_B-DM5878-3N-25JUL2007.jpg	N	Jul 25, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_B-DM5878-2-25JUL2007.jpg		Jul 25, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_B-DM5878-1-25JUL2007.jpg		Jul 25, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5803 C

Mn/DOT Name: 5803 C **NGS Name:** 5803 C

County: PINE, MN (Sheet 2)

NGS ACRN: DM5879 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	20	43 N	19 W	461204.00	924553.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	POOR	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)

Disk Type
SURVEY DISK

Mon. Agency
MNDT

Description: (2007)

Stamping: 5803 C 2007

1.1 MILES NORTHEAST OF ASKOV, 1.5 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 295.70, 63.0 FEET EAST-SOUTHEAST OF TRUNK HIGHWAY 23, 65.2 FEET WEST OF THE WEST RAIL OF THE RAILROAD TRACKS, 29.9 FEET SOUTHWEST OF PARTRIDGE DRIVE, 25.7 FEET WEST OF A POWER POLE WITH 2 GUY WIRES, 2.0 FEET NORTHEAST OF A WITNESS POST.

Station Notes
FOUND CAP LOOSE. USE WITH CAUTION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1168.561	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1168.564	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1168.525	.262		1078.738	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -89.980 12B = -90.013 09 = -89.885 03 = -89.787

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 04.44150	92 45 53.47905	534223.034	271880.436	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000686.564	769640.081	1699936.486	16786164.612	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_C-DM5879-3SE-28MAY2009.jpg	SE	May 28, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_C-DM5879-2-28MAY2009.jpg		May 28, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_C-DM5879-1-25JUL2007.jpg		Jul 25, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 D **NGS Name:** 5803 D

County: PINE, MN (Sheet 2)

NGS ACRN: DM5880 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	16	43 N	19 W	461240.00	924508.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 D 2007

2.4 MILES NORTHEAST OF ASKOV, 2.4 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 296.70, 27.8 FEET EAST-SOUTHEAST OF TRUNK HIGHWAY 23, 1.2 FEET NORTH OF A WOODED ENTRANCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1180.985	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1180.988	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1180.887	.262		1091.064	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.026 12B = -90.059 09 = -89.934 03 = -89.826

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 40.70951	92 45 08.22946	537399.171	275560.225	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3003799.119	773373.043	1703106.572	16789846.789	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_D-DM5880-3SE-25JUL2007.jpg	SE	Jul 25, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_D-DM5880-2-25JUL2007.jpg		Jul 25, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_D-DM5880-1-25JUL2007.jpg		Jul 25, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 E **NGS Name:** 5803 E

County: PINE, MN (Sheet 2)

NGS ACRN: DM5881 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	43 N	19 W	461322.80	924416.73	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 E 2007

3.5 MILES NORTHEAST OF ASKOV, 3.45 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 297.65, 67.6 FEET NORTHWEST OF TRUNK HIGHWAY 23, 11.7 FEET NORTHEAST OF A FIELD ENTRANCE, 6.4 FEET SOUTHWEST OF A FENCE LINE, 3.1 FEET SOUTHWEST OF A WITNESS POST.

Station Notes
TREES

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1186.461	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1186.464	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1186.677	.262		1096.559	.197	2011	GPS - RTRN	2020	RTRN2020
1186.422	.262		1096.546	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.082 12B = -90.118 09 = -89.990 03 = -89.875

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 22.80095	92 44 16.73425	541012.115	279831.357	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 22.80207	92 44 16.73578	541012.008	279831.471	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3007338.277	777704.636	1706712.522	16794120.603	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3007338.167	777704.748	1706712.414	16794120.716	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_E-DM5881-3NW-06MAY2020.jpg	NW	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_E-DM5881-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_E-DM5881-1-25JUL2007.jpg		Jul 25, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 F **NGS Name:** 5803 F

County: PINE, MN (Sheet 2)

NGS ACRN: DM5882 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	3	43 N	19 W	461400.14	924327.81	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 F 2007

4.0 MILES NORTHEAST OF ASKOV, 4.45 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 298.7, 24.7 EAST-SOUTHEAST OF TRUNK HIGHWAY 23, 99.1 FEET NORTHWEST OF THE RAILROAD TRACKS, 3.0 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1201.156	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1201.159	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1201.202	.262		1111.035	.197	2011	GPS - RTRN	2020	RTRN2020
1201.143	.262		1111.225	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.128 12B = -90.167 09 = -90.039 03 = -89.918

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 00.14422	92 43 27.81093	544443.784	283621.733	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 00.14471	92 43 27.81191	544443.715	283621.782	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010704.398	781552.509	1710137.880	16797913.646	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010704.328	781552.558	1710137.810	16797913.696	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_F-DM5882-3SE-06MAY2020.jpg	SE	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_F-DM5882-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_F-DM5882-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 G **NGS Name:** 5803 G

County: PINE, MN (Sheet 2)

NGS ACRN: DM5883 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	2	43 N	19 W	461441.00	924246.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 G 2007

5.0 MILES NORTHEAST OF ASKOV, 4.5 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 299.65, 57.6 SOUTHEAST OF TRUNK HIGHWAY 23, 54.9 FEET SOUTH OF COUNTY ROAD 148 (STARCH ROAD), 21.6 FEET WEST-NORTHWEST OF THE WEST RAIL OF THE RAILROAD TRACKS, 3.8 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1199.925	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1199.925	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1199.837	.262		1109.850	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.207 12B = -90.243 09 = -90.111 03 = -89.990

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 41.03596	92 42 46.08168	547367.655	287770.985	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3013556.734	785750.505	1713055.206	16802064.769	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G-DM5883-3E-26JUL2007.jpg	E	Jul 26, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G-DM5883-2-26JUL2007.jpg		Jul 26, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G-DM5883-1-26JUL2007.jpg		Jul 26, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 G 1 **NGS Name:** 5803 G 1

County: PINE, MN (Sheet 2)

NGS ACRN: DM5884 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	43 N	19 W	461440.00	924042.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 G 1 2007

7.0 MILES NORTHEAST OF ASKOV, 5.5 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, THEN 1.7 MILES EAST ON COUNTY ROAD 148 (STARCH ROAD), 35.5 FEET SOUTH OF COUNTY ROAD 148 (STARCH ROAD), 31.7 FEET WEST OF (BAKKEN ROAD), 7.4 FEET EAST OF A POWER POLE, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1211.635	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1211.638	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1211.530	.262		1121.756	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.964 12B = -89.997 09 = -89.865 03 = -89.773

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 40.91019	92 40 42.40082	556060.819	287780.578	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022247.396	785908.337	1721744.526	16802085.376	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G_1-DM5884-3S-26JUL2007.jpg	S	Jul 26, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G_1-DM5884-2-26JUL2007.jpg		Jul 26, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G_1-DM5884-1-26JUL2007.jpg		Jul 26, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 G 2 **NGS Name:** 5803 G 2

County: PINE, MN (Sheet 2)

NGS ACRN: DM5885 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	44 N	18 W	461531.00	923927.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 G 2 2007

1.5 MILES SOUTH OF BRUNO, 0.35 MILE EAST ALONG MAIN STREET FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND MAIN STREET IN BRUNO, THEN 1.4 MILES SOUTH ON COUNTY ROAD 22 (FLEMING ROAD), 39.8 FEET EAST OF COUNTY ROAD 22 (FLEMING ROAD), 10.5 FEET NORTH OF A FIELD ENTRANCE, 1.8 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1182.675	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1182.675	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1182.649	.262		1092.823	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.016 12B = -90.046 09 = -89.908 03 = -89.823

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 31.77228	92 39 27.15193	561334.114	292948.624	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3027431.133	791164.922	1727008.943	16807257.840	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G_2-DM5885-3E-26JUL2007.jpg	E	Jul 26, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G_2-DM5885-2-26JUL2007.jpg		Jul 26, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_G_2-DM5885-1-26JUL2007.jpg		Jul 26, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 H **NGS Name:** 5803 H

County: PINE, MN (Sheet 2)

NGS ACRN: DM5886 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	44 N	19 W	461507.00	924215.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 H 2007

3.0 MILES SOUTHWEST OF BRUNO, 2.6 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET) IN BRUNO, AT TRUNK HIGHWAY 23 MILEPOINT 299.9, 71.9 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD, 53.3 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 9.5 FEET SOUTHWEST OF A FIELD ENTRANCE, 2.2 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1184.640	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1184.637	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1184.519	.262		1094.489	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.285 09 = -90.154 03 = -90.029

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 07.19090	92 42 15.60573	549503.195	290425.787	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3015646.429	788441.007	1715186.439	16804721.105	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_H-DM5886-3SE-30JUL2007.jpg	SE	Jul 30, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_H-DM5886-2-30JUL2007.jpg		Jul 30, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_H-DM5886-1-30JUL2007.jpg		Jul 30, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 J **NGS Name:** 5803 J

County: PINE, MN (Sheet 2)

NGS ACRN: DM5887 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	25	44 N	19 W	461538.57	924132.49	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 J 2007

2.5 MILES SOUTHWEST OF BRUNO, 1.8 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET) IN BRUNO, AT TRUNK HIGHWAY 23 MILEPOINT 300.7, 80.5 FEET NORTHWEST OF TRUNK HIGHWAY 23, 28.8 FEET SOUTHWEST OF ENTRANCE NUMBER 73189, 12.7 FEET SOUTHWEST OF A POWER POLE NUMBER 527, 1.6 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.475	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1163.472	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.548	.262		1073.479	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.295 12B = -90.331 09 = -90.193 03 = -90.069

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 38.57264	92 41 32.49340	552524.725	293612.625	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3018612.799	791678.509	1718202.593	16807910.367	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_J-DM5887-3NW-06MAY2020.jpg	NW	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_J-DM5887-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_J-DM5887-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 K **NGS Name:** 5803 K

County: PINE, MN (Sheet 2)

NGS ACRN: DM5888 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	25	44 N	19 W	461610.00	924043.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 K 2007

1.0 MILE SOUTHWEST OF BRUNO, 0.9 MILE SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET) IN BRUNO, AT TRUNK HIGHWAY 23 MILEPOINT 301.6, 87.9 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD TRACKS, 35.1 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 12.2 FEET NORTHEAST OF A FIELD ENTRANCE, 2.1 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1154.584	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1154.578	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1154.538	.262		1064.434	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.331 12B = -90.367 09 = -90.220 03 = -90.105

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 10.75549	92 40 43.26298	555974.898	296882.271	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022006.281	795006.107	1721647.094	16811182.948	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_K-DM5888-3SE-26JUL2007.jpg	SE	Jul 26, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_K-DM5888-2-26JUL2007.jpg		Jul 26, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_K-DM5888-1-26JUL2007.jpg		Jul 26, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 L
NGS Name: 5803 L
County: PINE, MN (Sheet 2)

NGS ACRN: DM5889 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	19	44 N	18 W	461643.40	923955.02	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 L 2007

IN BRUNO, AT THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET) IN BRUNO, AT TRUNK HIGHWAY 23 MILEPOINT 302.5, 63.6 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 73.8 FEET SOUTH OF COUNTY ROAD 44 (MAIN STREET), 59.6 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD TRACKS, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1148.554	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1148.548	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1148.725	.262		1058.354	.197	2011	GPS - OPUS	2020	GPSBM
1148.630	.262		1058.259	.197	2011	GPS - OPUS	2020	GPSBM
1148.649	.262		1058.243	.197	2011	GPS - RTRN	2020	RTRN2020
1148.466	.262		1058.321	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.371 12B = -90.403 09 = -90.252 03 = -90.147

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 43.40305	92 39 55.02456	559354.129	300199.388	.131	3	GPS - OPUS	2020	GPSBM
46 16 43.40284	92 39 55.02452	559354.132	300199.366	.131	3	GPS - OPUS	2020	GPSBM
46 16 43.40248	92 39 55.02444	559354.137	300199.330	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 43.40409	92 39 55.02439	559354.140	300199.493	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3025328.025	798379.953	1725020.619	16814502.894	.131	3	GPS - OPUS	2020	GPSBM
3025328.028	798379.932	1725020.621	16814502.873	.131	3	GPS - OPUS	2020	GPSBM
3025328.035	798379.895	1725020.627	16814502.836	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3025328.035	798380.059	1725020.630	16814502.999	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_L-DM5889-3SE-06MAY2020.jpg	SE	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_L-DM5889-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_L-DM5889-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 M **NGS Name:** 5803 M

County: PINE, MN (Sheet 2)

NGS ACRN: DM5890 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	17	44 N	18 W	461720.55	923901.13	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 M 2007

1.0 MILE NORTHEAST OF BRUNO, 1.0 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET) IN BRUNO, AT TRUNK HIGHWAY 23 MILEPOINT 303.5, 47.8 SOUTHEAST OF TRUNK HIGHWAY 23, 1.9 FEET NORTHWEST OF A WITNESS POST.

Station Notes
TREES TO THE SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1145.444	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1145.437	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1145.234	.262		1055.041	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.420 12B = -90.453 09 = -90.295 03 = -90.193

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 20.54976	92 39 01.12752	563128.228	303974.116	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3029036.720	802218.021	1728788.252	16818280.755	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_M-DM5890-3SE-30JUL2007.jpg	SE	Jul 30, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_M-DM5890-2-30JUL2007.jpg		Jul 30, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_M-DM5890-1-30JUL2007.jpg		Jul 30, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 N **NGS Name:** 5803 N

County: PINE, MN (Sheet 2)

NGS ACRN: DM5891 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	16	44 N	18 W	461755.00	923809.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 N 2007

2.0 MILES NORTHEAST OF BRUNO, 2.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET) IN BRUNO, AT TRUNK HIGHWAY 23 MILEPOINT 304.5, 48.7 SOUTHEAST OF TRUNK HIGHWAY 23, 73.9 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD TRACKS, 7.7 FEET SOUTHWEST OF A FIELD ENTRANCE, 1.8 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.810	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1163.803	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.725	.262		1073.489	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.466 12B = -90.492 09 = -90.338 03 = -90.236

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 55.93268	92 38 09.47349	566744.003	307570.354	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3032590.174	805874.946	1732397.855	16821880.010	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_N-DM5891-3SE-13AUG2007.jpg	SE	Aug 13, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_N-DM5891-2-13AUG2007.jpg		Aug 13, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_N-DM5891-1-13AUG2007.jpg		Aug 13, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 P **NGS Name:** 5803 P

County: PINE, MN (Sheet 2)

NGS ACRN: DM5892 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	3	44 N	18 W	461911.00	923630.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 23 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 P 2007

2.0 MILES SOUTHWEST OF KERRICK, 1.75 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46 (DEERFIELD ROAD) IN KERRICK, AT TRUNK HIGHWAY 23 MILEPOINT 306.45, 34.4 NORTHWEST OF TRUNK HIGHWAY 23, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Station Notes
TREES TO THE SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1171.225	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1171.218	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -90.587 12B = -90.597 09 = -90.446 03 = -90.354

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_P-DM5892-3W-28MAY2009.jpg	W	May 28, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_P-DM5892-2-28MAY2009.jpg		May 28, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_P-DM5892-1-30JUL2007.jpg		Jul 30, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 Q
NGS Name: 5803 Q
County: PINE, MN (Sheet 2)

NGS ACRN: DM5893 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	44 N	18 W	461944.85	923603.77	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 Q 2007

1.0 MILE SOUTHWEST OF KERRICK, 1.0 MILE SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46 (DEERFIELD) IN KERRICK, AT TRUNK HIGHWAY 23 MILEPOINT 307.2, 37.2 NORTHWEST OF TRUNK HIGHWAY 23, 8.5 FEET SOUTHWEST OF A FIELD ENTRANCE, 4.8 FEET EAST OF A GATE POST, 2.1 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.614	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1160.605	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.575	.262		1069.903	.197	2011	GPS - OPUS	2020	GPSBM
1160.611	.262		1069.939	.197	2011	GPS - OPUS	2020	GPSBM
1160.759	.262		1070.077	.197	2011	GPS - RTRN	2020	RTRN2020
1160.477	.262		1070.041	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.672 12B = -90.686 09 = -90.525 03 = -90.436

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 44.84971	92 36 03.77262	575528.952	318635.643	.131	3	GPS - OPUS	2020	GPSBM
46 19 44.84993	92 36 03.77266	575528.949	318635.666	.131	3	GPS - OPUS	2020	GPSBM
46 19 44.84940	92 36 03.77136	575529.041	318635.612	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 44.85032	92 36 03.77239	575528.968	318635.705	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041183.972	817087.041	1741164.810	16832951.623	.131	3	GPS - OPUS	2020	GPSBM
3041183.969	817087.063	1741164.807	16832951.646	.131	3	GPS - OPUS	2020	GPSBM
3041184.062	817087.011	1741164.899	16832951.593	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041183.988	817087.103	1741164.826	16832951.685	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_Q-DM5893-3NW-06MAY2020.jpg	NW	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_Q-DM5893-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_Q-DM5893-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 R **NGS Name:** 5803 R

County: PINE, MN (Sheet 2)

NGS ACRN: DM5894 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	35	45 N	18 W	462026.49	923511.63	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2014	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
UNKNOWN	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 R 2007

IN KERRICK, AT THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46/ MAIN STREET, AT TRUNK HIGHWAY 23 MILEPOINT 308.25, 50.7 FEET NORTHEAST OF COUNTY ROAD 46/ MAIN STREET IN KERRICK, 43.0 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 2.3 FEET NORTHWEST OF A WITNESS POST.

Station Notes

THE MARK WILL BE RESET AS 5803 R RESET.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1174.581	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1174.568	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1174.469	.262		1083.961	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.745 12B = -90.754 09 = -90.594 03 = -90.508

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 26.48761	92 35 11.62624	579171.913	322867.959	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3044753.732	821380.329	1744800.750	16837186.729	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_R-DM5894-3SE-31JUL2007.jpg	SE	Jul 31, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_R-DM5894-2-31JUL2007.jpg		Jul 31, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_R-DM5894-1-31JUL2007.jpg		Jul 31, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 S
NGS Name: 5803 S
County: PINE, MN (Sheet 2)

NGS ACRN: DM5895 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	45 N	18 W	462108.20	923431.50	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2019	GOOD	Horz=NO Vert=NO	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 S 2007

1.0 MILE NORTHEAST OF KERRICK, 0.95 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46 (MAIN STREET) IN KERRICK, AT TRUNK HIGHWAY 23 MILEPOINT 309.2, 86.8 SOUTHEAST OF TRUNK HIGHWAY 23, 36.4 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD TRACKS, 8.1 FEET NORTHEAST OF ENTRANCE NUMBER 85908, 2.2 FEET SOUTHWEST OF A WITNESS POST.

Station Notes
THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1172.101	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1172.088	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -90.836 12B = -90.846 09 = -90.686 03 = -90.600

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_S-DM5895-3E-28MAY2009.jpg	E	May 28, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_S-DM5895-2-28MAY2009.jpg		May 28, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_S-DM5895-1-28MAY2009.jpg		May 28, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 T **NGS Name:** 5803 T

County: PINE, MN (Sheet 2)

NGS ACRN: DM5896 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	45 N	18 W	462149.00	923346.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 T 2007

0.5 MILE SOUTHWEST OF DUQUETTE, 0.5 MILE SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47 (MAIN STREET) IN DUQUETTE, AT TRUNK HIGHWAY 23 MILEPOINT 310.2, 25.8 FEET NORTHEAST OF TRUNK HIGHWAY 23, 11.7 FEET NORTH OF THE EXTENDED DRIVEWAY NUMBER 87431, 2.7 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1152.921	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1152.905	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -90.922 12B = -90.928 09 = -90.768 03 = -90.682

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_T-DM5896-3E-28MAY2009.jpg	E	May 28, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_T-DM5896-2-28MAY2009.jpg		May 28, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_T-DM5896-1-01JUN2009.jpg		Jun 1, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 U **NGS Name:** 5803 U

County: PINE, MN (Sheet 2)

NGS ACRN: DM5897 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	18	45 N	17 W	462252.50	923219.09	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)

Disk Type
SURVEY DISK

Mon. Agency
MNDT

Description: (2007)

Stamping: 5803 U 2007

1.0 MILE NORTHEAST OF DUQUETTE, 1.05 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47 IN DUQUETTE, AT TRUNK HIGHWAY 23 MILEPOINT 313.85, 51.8 FEET NORTHWEST OF TRUNK HIGHWAY 23, 1.5 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1156.185	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1156.166	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1156.264	.262		1065.250	.197	2011	GPS - OPUS	2020	GPSBM
1156.251	.262		1065.237	.197	2011	GPS - OPUS	2020	GPSBM
1156.254	.262		1065.231	.197	2011	GPS - RTRN	2020	RTRN2020
1156.071	.262		1065.293	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.014 12B = -91.020 09 = -90.853 03 = -90.774

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 52.50328	92 32 19.09010	591210.571	337711.841	.131	3	GPS - OPUS	2020	GPSBM
46 22 52.50299	92 32 19.08989	591210.585	337711.812	.131	3	GPS - OPUS	2020	GPSBM
46 22 52.50326	92 32 19.08959	591210.606	337711.839	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 52.50365	92 32 19.09039	591210.550	337711.878	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3056535.805	836425.458	1756815.046	16852039.499	.131	3	GPS - OPUS	2020	GPSBM
3056535.821	836425.429	1756815.061	16852039.470	.131	3	GPS - OPUS	2020	GPSBM
3056535.841	836425.457	1756815.082	16852039.497	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3056535.784	836425.495	1756815.025	16852039.536	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_U-DM5897-3NW-06MAY2020.jpg	NW	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_U-DM5897-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_U-DM5897-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 V **NGS Name:** 5803 V

County: PINE, MN (Sheet 2)

NGS ACRN: DM5898 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	8	45 N	17 W	462347.00	923059.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 V 2007

1.05 MILES SOUTHWEST OF NICKERSON, 1.4 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND MAIN STREET IN NICKERSON, AT TRUNK HIGHWAY 23 MILEPOINT 313.4, 84.7 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 20.6 SOUTH OF ENTRANCE NUMBER 92112, 35.8 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD TRACKS, 2.4 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1164.407	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1164.391	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1164.302	.262		1073.449	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.089 12B = -91.096 09 = -90.922 03 = -90.853

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 47.19895	92 30 59.32156	596776.617	343279.162	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3062005.303	842086.184	1762371.463	16857611.527	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_V-DM5898-3SE-31JUL2007.jpg	SE	Jul 31, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_V-DM5898-2-31JUL2007.jpg		Jul 31, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_V-DM5898-1-31JUL2007.jpg		Jul 31, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5803 W
NGS Name: 5803 W
County: PINE, MN (Sheet 2)

NGS ACRN: DM5899 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	45 N	17 W	462435.21	923024.16	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 50 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5803 W 2007

0.5 MILE SOUTHWEST OF NICKERSON, 0.4 MILE SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND MAIN STREET IN NICKERSON, AT TRUNK HIGHWAY 23 MILEPOINT 314.4, 76.5 FEET NORTHWEST OF TRUNK HIGHWAY 23, 71.8 FEET NORTH OF A POWER POLE, 14.9 FEET SOUTHWEST OF A FIELD ENTRANCE, 2.2 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1161.422	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1161.402	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1161.513	.262		1070.300	.197	2011	GPS - OPUS	2020	GPSBM
1161.389	.262		1070.175	.197	2011	GPS - OPUS	2020	GPSBM
1161.366	.262		1070.388	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.214 12B = -91.220 09 = -91.043 03 = -90.978

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 35.20490	92 30 24.16331	599216.919	348154.620	.131	3	GPS - OPUS	2020	GPSBM
46 24 35.20490	92 30 24.16385	599216.881	348154.620	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 35.20577	92 30 24.16469	599216.822	348154.708	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3064361.729	847001.907	1764804.394	16862487.978	.131	3	GPS - OPUS	2020	GPSBM
3064361.691	847001.906	1764804.356	16862487.978	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3064361.630	847001.993	1764804.297	16862488.066	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_W-DM5899-3NW-31JUL2007.jpg	NW	Jul 31, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_W-DM5899-2-31JUL2007.jpg		Jul 31, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5803_W-DM5899-1-22NOV2019.jpg		Nov 22, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5806 H

Mn/DOT Name: 5806 H

NGS Name: 5806 H

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	31	42 N	20 W	460441.00	925544.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1950	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1950) **Stamping:** 5806 H 1950

IN FRIESLAND, 50.0 FEET RIGHT OF COUNTY ROAD 61 (OLD TRUNK HIGHWAY 61), AT THE OLD TRUNK HIGHWAY 61 STATION 3815+28, 130.0 FEET SOUTH OF A TOWNSHIP ROAD EAST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.699	.033	3				VERTICAL CONTROL SURVEY	1950	CS5806

Geoid Separations(ft): GEOID18 = -90.223 12B = -90.226 09 = -90.111 03 = -89.977

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 5806 I

NGS Name: 5806 I

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	42 N	21 W	460508.00	925547.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1950	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1950) **Stamping:** 5806 I 1950

IN FRIESLAND, 49.0 FEET LEFT OF COUNTY ROAD 61 (OLD TRUNK HIGHWAY 61), AT THE OLD TRUNK HIGHWAY 61 STATION 3842+40, 33.0 FEET SOUTH OF A TOWNSHIP ROAD, 95.0 FEET SOUTH OF THE SOUTHEAST CORNER OF A STORE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1140.969	.033	3				VERTICAL CONTROL SURVEY	1950	CS5806

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.246 09 = -90.138 03 = -900000

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 5807 A
NGS Name: 5807 A
County: PINE, MN (Sheet 2)

NGS ACRN: DR2720 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	16	42 N	20 W	460731.54	925240.30	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 26 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) **Stamping:** 5807 A 2017

IN SANDSTONE, AT THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 285.75, 35.6 FEET SOUTH OF TRUNK HIGHWAY 23, 146.2 FEET EAST-NORTHEAST OF TRUNK HIGHWAY 123, 151.8 FEET WEST-SOUTHWEST OF THE CASEY'S GAS STATION ENTRANCE, 1.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.073	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1080.073	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.172	.262		990.123	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -90.039 12B = -90.049 09 = -89.947 03 = -89.816

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 31.54124	92 52 40.30184	505613.853	244206.187	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2972556.624	741485.425	1671374.821	16758466.549	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_A-DR2720-3S-15JUN2017.jpg	S	Jun 15, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_A-DR2720-2-15JUN2017.jpg		Jun 15, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_A-DR2720-1-15JUN2017.jpg		Jun 15, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5807 B **NGS Name:** 5807 B

County: PINE, MN (Sheet 2)

NGS ACRN: DR2721 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	9	42 N	20 W	460808.32	925158.47	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) **Stamping:** 5807 B 2017

IN SANDSTONE, 0.9 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 286.65, 85.0 FEET WEST OF TRUNK HIGHWAY 23 EAST (COUNTY ROAD 64 EXTENDED), 40.6 FEET NORTHWEST OF TRUNK HIGHWAY 23 WEST, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.268	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1091.268	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.215	.262		1001.192	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -90.013 12B = -90.023 09 = -89.918 03 = -89.793

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 08.32137	92 51 58.47430	508558.559	247933.181	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975437.046	745261.638	1674313.536	16762195.599	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_B-DR2721-3NW-15JUN2017.jpg	NW	Jun 15, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_B-DR2721-2-15JUN2017.jpg		Jun 15, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_B-DR2721-1-15JUN2017.jpg		Jun 15, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5807 C **NGS Name:** 5807 C

County: PINE, MN (Sheet 2)

NGS ACRN: DR2722 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	4	42 N	20 W	460902.79	925158.34	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) **Stamping:** 5807 C 2017

1.5 MILES NORTH OF SANDSTONE, 1.95 MILES NORTHEAST AND NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 287.7, 67.2 FEET WEST OF TRUNK HIGHWAY 23, 80.0 FEET NORTH OF JOHNSON DRIVE, 6.8 FEET EAST OF A FENCE LINE, 1.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1098.620	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1098.620	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1098.626	.262		1008.522	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -90.095 12B = -90.105 09 = -89.997 03 = -89.878

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 02.79172	92 51 58.34464	508565.347	253451.241	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975349.784	750778.374	1674313.376	16767711.225	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_C-DR2722-3W-15JUN2017.jpg	W	Jun 15, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_C-DR2722-2-15JUN2017.jpg		Jun 15, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_C-DR2722-1-15JUN2017.jpg		Jun 15, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5807 D **NGS Name:** 5807 D

County: PINE, MN (Sheet 2)

NGS ACRN: DR2723 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	34	43 N	20 W	460954.77	925157.21	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) **Stamping:** 5807 D 2017

2.5 MILES NORTH OF SANDSTONE, 2.95 MILES NORTHEAST AND NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 288.7, 56.7 FEET EAST OF TRUNK HIGHWAY 23, 34.8 FEET SOUTHWEST OF A STATE PARK/RESTRICTED AREA SIGN, 65.4 FEET SOUTHWEST OF A POWER POLE, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.460	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1094.456	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.552	.262		1004.358	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -90.187 12B = -90.193 09 = -90.088 03 = -89.970

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 54.77495	92 51 57.21302	508642.763	258717.391	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975337.426	756044.464	1674384.128	16772975.140	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_D-DR2723-3E-15JUN2017.jpg	E	Jun 15, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_D-DR2723-2-15JUN2017.jpg		Jun 15, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_D-DR2723-1-15JUN2017.jpg		Jun 15, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5807 E **NGS Name:** 5807 E

County: PINE, MN (Sheet 2)

NGS ACRN: DR2724 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	43 N	20 W	461013.23	925157.69	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 31 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) **Stamping:** 5807 E 2017

2.8 MILES NORTH OF SANDSTONE, 3.3 MILES NORTHEAST AND NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 289.05, 27.1 FEET EAST OF TRUNK HIGHWAY 23, 40.1 FEET NORTH-NORTHWEST OF A TRAIL, 5.2 FEET EAST OF THE SOUTH END OF A GUARDRAIL, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1116.139	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1116.139	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1116.185	.262		1025.956	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -90.226 12B = -90.229 09 = -90.124 03 = -90.006

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 13.23158	92 51 57.69326	508608.161	260587.113	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975270.967	757913.106	1674347.187	16774843.990	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_E-DR2724-3E-15JUN2017.jpg	E	Jun 15, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_E-DR2724-2-15JUN2017.jpg		Jun 15, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5807_E-DR2724-1-15JUN2017.jpg		Jun 15, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 A **NGS Name:** 5808 A

County: PINE, MN (Sheet 2)

NGS ACRN: AF9140 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	43 N	20 W	461126.47	925158.11	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 46 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** 5808 A 1991

2.5 MILES EAST-SOUTHEAST OF FINLAYSON, 2.0 MILES EAST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 35 AND COUNTY ROAD 34 IN FINLAYSON, THEN 1.0 MILE SOUTH ON TRUNK HIGHWAY 18, AT TRUNK HIGHWAY 18 MILEPOINT 79.7, 73.0 FEET EAST OF TRUNK HIGHWAY 18, 39.5 FEET SOUTH-SOUTHWEST OF A POWER POLE, 7.5 FEET SOUTHWEST OF A FENCE CORNER, 4.0 FEET WEST OF A FENCE, 2.1 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.739	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1099.739	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1099.739	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1099.739	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.358	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.785	.262		1009.401	.197	2011	GPS - RTRN	2017	RTRN2017
1099.703	.262		1009.545	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.390 12B = -90.384 09 = -90.285 03 = -90.161

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 26.47042	92 51 58.10603	508575.951	268006.533	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 26.47016	92 51 58.10724	508575.866	268006.506	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975112.313	765330.019	1674305.647	16782260.078	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975112.229	765329.991	1674305.562	16782260.051	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_A-AF9140-3E-25MAY2017.jpg	E	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_A-AF9140-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_A-AF9140-1-25MAY2017.jpg		May 25, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 B **NGS Name:** 5808 B

County: PINE, MN (Sheet 2)

NGS ACRN: AF9141 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	20	43 N	20 W	461205.66	925356.96	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2017	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 33 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** 5808 B 1991

1.5 MILES EAST OF FINLAYSON, 0.4 MILE EAST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 34 IN FINLAYSON, AT TRUNK HIGHWAY 18 MILEPOINT 77.35, 58.0 FEET SOUTH OF TRUNK HIGHWAY 18, 149.0 FEET SOUTHEAST OF A POWER POLE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1104.489	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1104.489	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1104.489	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1104.486	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1104.105	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1104.666	.262		1014.322	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.597 12B = -90.574 09 = -90.482 03 = -90.348

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.65993	92 53 56.96310	500213.622	271974.800	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2966684.570	769154.720	1665942.036	16786216.049	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_B-AF9141-3S-30MAY2017.jpg	S	May 30, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_B-AF9141-2-30MAY2017.jpg		May 30, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_B-AF9141-1-30MAY2017.jpg		May 30, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 C
NGS Name: 5808 C
County: PINE, MN (Sheet 2)

NGS ACRN: AF9142 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	18	43 N	20 W	461207.46	925456.54	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2017	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** 5808 C 1991

IN FINLAYSON, 0.35 MILE WEST ON TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 34 IN FINLAYSON, AT COUNTY ROAD 18 MILEPOINT 76.55, 82.3 FEET NORTH OF TRUNK HIGHWAY 18, 77.2 FEET WEST-NORTHWEST OF A GAS PIPELINE VENT, 62.6 FEET EAST-NORTHEAST OF A GAS PIPELINE VENT, 31.0 FEET WEST OF A STATE TRAIL, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.677	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1110.677	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1110.677	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1110.674	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.293	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.578	.262		1020.192	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.649 12B = -90.617 09 = -90.531 03 = -90.390

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.46197	92 54 56.53741	496023.083	272157.747	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2962492.026	769266.207	1661753.133	16786393.639	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_C-AF9142-3N-30MAY2017.jpg	N	May 30, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_C-AF9142-2-30MAY2017.jpg		May 30, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_C-AF9142-1-30MAY2017.jpg		May 30, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 D **NGS Name:** 5808 D

County: PINE, MN (Sheet 2)

NGS ACRN: AF9143 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	24	43 N	21 W	461205.80	925636.21	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2009	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** 5808 D 1991

1.0 MILE WEST OF FINLAYSON, 0.7 MILE WEST OF COUNTY ROAD 35, AT TRUNK HIGHWAY 18 MILEPOINT 75.25, 73.5 FEET SOUTH OF TRUNK HIGHWAY 18, 3.9 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1127.153	.016	2/1				VERTICAL ADJUSTMENT	2011	00000681
1127.153	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMATT
1127.153	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1127.147	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1126.766	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1127.015	.262		1036.583	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.708 12B = -90.672 09 = -90.581 03 = -90.436

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.80005	92 56 36.21165	489011.774	271991.990	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2955485.402	768981.022	1654745.153	16786219.133	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_D-AF9143-3S-24JAN2008.jpg	S	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_D-AF9143-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_D-AF9143-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 E **NGS Name:** 5808 E

County: PINE, MN (Sheet 2)

NGS ACRN: AF9144 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	22	43 N	21 W	461207.48	925851.15	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2003) **Stamping:** 5808 E 1991

3.1 MILES WEST OF FINLAYSON, 3.0 MILES EAST ALONG COUNTY ROAD 18 FROM THE JUNCTION OF COUNTY ROAD 36 (NORWAY SPRUCE ROAD) AND COUNTY ROAD 16 IN FINLAYSON, 53.5 FEET SOUTH OF TRUNK HIGHWAY 18, AT TRUNK HIGHWAY 18 MILEPOINT 73.45, 21.9 FEET WEST-SOUTHWEST OF A POWER POLE, 20.5 FEET EAST OF A DRIVEWAY, 6.7 FEET SOUTH-SOUTHWEST OF A FENCE POST, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.117	.016	2/1				VERTICAL ADJUSTMENT	2011	00000681
1132.117	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMATT
1132.117	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1132.114	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1131.733	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1131.809	.262		1041.340	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.751 12B = -90.712 09 = -90.610 03 = -90.469

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.47739	92 58 51.14746	479520.306	272169.327	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945993.431	768996.594	1645257.691	16786384.455	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_E-AF9144-3S-24JAN2008.jpg	S	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_E-AF9144-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_E-AF9144-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 F

NGS Name: 5808 F

County: PINE, MN (Sheet 2)

NGS ACRN: AF9145 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	43 N	21 W	461208.60	925930.40	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** 5808 F 1991

3.55 MILES WEST OF FINLAYSON, 3.5 MILES EAST ALONG COUNTY ROAD 18 FROM THE JUNCTION OF COUNTY ROAD 18 AND COUNTY ROAD 36 (NORWAY SPRUCE ROAD), AT TRUNK HIGHWAY 18 MILEPOINT 72.95, 99.0 FEET WEST OF COUNTY ROAD 36, 64.0 FEET NORTH OF TRUNK HIGHWAY 18, 9.0 FEET NORTH OF A BURIED CABLE POST, 1.3 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1114.873	.016	2/1				VERTICAL ADJUSTMENT	2011	00000681
1114.873	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMATT
1114.873	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1114.870	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1114.489	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Geoid Separations(ft): GEOID18 = -90.758 12B = -90.718 09 = -90.610 03 = -90.472

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_F-AF9145-3N-02APR2007.jpg	N	Apr 2, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_F-AF9145-2-02APR2007.jpg		Apr 2, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_F-AF9145-1-02APR2007.jpg		Apr 2, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 G **NGS Name:** 5808 G

County: PINE, MN (Sheet 2)

NGS ACRN: AF9146 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	16	43 N	21 W	461208.25	930030.55	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** 5808 G 1991

4.5 MILES WEST OF FINLAYSON, 4.4 MILES WEST ALONG COUNTY ROAD 18 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 18 IN FINLAYSON, TO TRUNK HIGHWAY 18 MILEPOINT 72.15, 0.85 MILE WEST OF COUNTY ROAD 36, 69.2 FEET NORTH OF TRUNK HIGHWAY 18, 34.8 FEET NORTH OF THE WEST LEG OF A WOOD SIGN, 18.5 FEET EAST OF AN ENTRANCE, 3.0 FEET WEST-NORTHWEST OF A WITNESS POST.

Station Notes
THE TREE CLEARING IS GOING ON IN MAY. THE MARK WILL BE SUITABLE FOR GPS OBSERVATIONS IN THE FUTURE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1114.125	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1114.115	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.735	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Geoid Separations(ft): GEOID18 = -90.758 12B = -90.718 09 = -90.603 03 = -90.472

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_G-AF9146-3N-03APR2007.jpg	N	Apr 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_G-AF9146-2-03APR2007.jpg		Apr 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_G-AF9146-1-03APR2007.jpg		Apr 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 H
NGS Name: 5808 H
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	43 N	21 W	461310.00	930144.00	2	

NGS ACRN: DO1206 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1956	2007	GOOD	Horz=NO Vert=YES	YES	8921	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	MNDT

Description: (2006) **Stamping:** 5808 H 2006

5.5 MILES NORTHWEST OF FINLAYSON, IN THE HEADWALL OF A BOX CULVERT IN THE SOUTHWEST CORNER OF A TRUNK HIGHWAY 18 BOX CULVERT OVER THE PINE RIVER, 5.5 MILES WEST ALONG COUNTY ROAD 18 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 18 IN FINLAYSON, AT TRUNK HIGHWAY 18 MILEPOINT 70.15, 17.0 FEET WEST OF TRUNK HIGHWAY 18.

Station Notes
THE DISK WAS SET IN THE BRIDGE WHEN IT WAS BUILT IN 1956 THAN IT WAS STAMPED WHEN IT WAS USED IN 2006.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.016	.016	2/1				VERTICAL ADJUSTMENT	2013	00000795
1092.019	.016	2/1				VERTICAL CONTROL SURVEY	2010	VNABE

Geoid Separations(ft): GEOID18 = -90.751 12B = -90.705 09 = -90.584 03 = -90.466

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_H-DO1206-3N-03APR2007.jpg	N	Apr 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_H-DO1206-2-03APR2007.jpg		Apr 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_H-DO1206-1-03APR2007.jpg		Apr 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5808 J **NGS Name:** 5808 J

County: PINE, MN (Sheet 2)

NGS ACRN: DO1205 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	7	43 N	21 W	461259.48	930249.60	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 52 FT)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** 5808 J 2007

8.0 MILES NORTHWEST OF FINLAYSON, 6.8 MILES WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35 IN FINLAYSON, AT TRUNK HIGHWAY 18 MILEPOINT 69.15, 0.35 MILE EAST OF THE PINE AND AITKIN COUNTY LINE, 56.5 FEET NORTH OF TRUNK HIGHWAY 18, 2.0 SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1143.131	.016	2/1				VERTICAL ADJUSTMENT	2013	00000795
1143.134	.016	2/1				VERTICAL CONTROL SURVEY	2010	VNABE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1143.233	.262		1052.511	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -90.722 12B = -90.672 09 = -90.544 03 = -90.436

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 59.47675	93 02 49.59609	462757.273	277461.160	.131	3	GPS - RTRN	2023	RTRN2023

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2929144.707	774001.457	1628495.485	16791652.872	.131	3	GPS - RTRN	2023	RTRN2023

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_J-DO1205-3N-31AUG2023.jpg	N	Aug 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_J-DO1205-2-31AUG2023.jpg		Aug 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5808_J-DO1205-1-31AUG2023.jpg		Aug 31, 2023

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5809 B **NGS Name:** 5809 B

County: PINE, MN (Sheet 2)

NGS ACRN: DM5858 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	43 N	20 W	461112.00	924928.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2007) **Stamping:** 5809 B 2007

2.1 MILES WEST OF ASKOV, 1.8 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 (RUTABAGA ROAD) IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 292.01, 47.2 FEET SOUTH OF TRUNK HIGHWAY 23, 35.7 FEET WEST OF THE BANNING LINE ROAD, 32.1 FEET NORTH OF A POWER POLE WITH A GUY WIRE, 2.2 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1130.296	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1130.300	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1130.185	.262		1040.241	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.151 12B = -90.167 09 = -90.046 03 = -89.944

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.05917	92 49 28.77072	519083.941	266553.816	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985642.286	764056.791	1684810.809	16780821.248	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5809_B-DM5858-3W-21MAY2009.jpg	W	May 21, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5809_B-DM5858-2-21MAY2009.jpg		May 21, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5809_B-DM5858-1-21MAY2009.jpg		May 21, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 DD

Mn/DOT Name: 5880 DD **NGS Name:** 5880 DD

County: PINE, MN (Sheet 2)

NGS ACRN: RN0586 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	32	42 N	20 W	460504.90	925350.10	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL ROD IMBED IN MON

Monument Type
CONCRETE POST (PREFABRICATED)

Disk Type
BENCH MARK DISK

Mon. Agency
MNDT

Description: (1961) **Stamping:** 5880 DD 1961

3.4 MILES SOUTH-SOUTHWEST OF SANDSTONE, 2.85 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 188.5, 150.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, IN THE MEDIAN, 0.7 FOOT NORTH OF A WITNESS POST.

Station Notes
THERE IS NO REAL TIME REFERENCE NETWORK (RTRN), DUE TO THE TREES IN AREA.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.987	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1093.991	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1093.722	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.403	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1093.403	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1093.403	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1093.456	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.036 12B = -90.036 09 = -89.928 03 = -89.806

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD-RN0586-3S-13NOV2008.jpg	S	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD-RN0586-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD-RN0586-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 DD 2

Mn/DOT Name: 5880 DD 2 **NGS Name:** 5880 DD 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0584 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	42 N	20 W	460552.40	925326.30	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	STEEL ROD IMBED IN MON

Monument Type
CONCRETE POST (PREFABRICATED)

Disk Type
BENCH MARK DISK

Mon. Agency
MNDT

Description: (1970) **Stamping:** 5880 DD 2 1970

2.4 MILES SOUTH-SOUTHWEST OF SANDSTONE, 1.95 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 189.4, 150.0 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, IN THE MEDIAN, 150.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.2 FEET SOUTH OF A WITNESS POST.

Station Notes
THERE IS NO REAL TIME REFERENCE NETWORK (RTRN), DUE TO THE TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.588	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1080.595	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1080.654	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.319	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1080.319	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1080.319	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1080.372	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.026 12B = -90.033 09 = -89.924 03 = -89.803

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_2-RN0584-3W-13NOV2008.jpg	W	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_2-RN0584-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_2-RN0584-1-12DEC2007.jpg		Dec 12, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 DD 3

Mn/DOT Name: 5880 DD 3 **NGS Name:** 5880 DD 3

County: PINE, MN (Sheet 2)

NGS ACRN: RN0580 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	20	42 N	20 W	460638.50	925317.70	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - SMALL	BENCH MARK DISK	MNDT

Description: (1970) **Stamping:** 5880 DD 3 1970

1.0 MILE SOUTHWEST OF SANDSTONE, 1.0 MILE SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, 56.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 190.35, IN THE EAST BASE OF THE HIGHWAY SIGN, 2.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1082.488	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1082.481	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1082.488	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1082.144	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1082.144	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1082.144	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1082.193	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.052 12B = -90.062 09 = -89.957 03 = -89.829

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_3-RN0580-3W-13NOV2008.jpg	W	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_3-RN0580-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_3-RN0580-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 DD 4 **NGS Name:** 5880 DD 4

County: PINE, MN (Sheet 2)

NGS ACRN: RN0579 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	16	42 N	20 W	460707.85	925315.17	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - SMALL	BENCH MARK DISK	MNDT

Description: (2009) **Stamping:** 5880 DD 4 1971

1.2 MILES SOUTHWEST OF SANDSTONE, 0.5 MILE SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 (COUNTY ROAD 61) IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 190.90, 50.4 FEET EAST OF THE NORTHBOUND LANE, 1.3 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.624	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1089.624	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1089.624	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1089.624	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1089.624	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.266	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1089.266	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1089.266	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1089.315	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.634	.262		999.549	.197	2011	GPS - RTRN	2017	RTRN2017
			999.552	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1089.630	.131		999.637	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1089.630	.131		999.772	.066	1996	GPS - STATIC	2009	HMOOSE
1089.630	.131		999.637	.066	2007	GPS - STATIC	2009	HMOOSE
1089.568	.262		999.716	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.079 12B = -90.085 09 = -89.983 03 = -89.852

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 07.84548	92 53 15.16931	503158.202	241805.191	.131	3	GPS - RTRN	2017	RTRN2017
46 07 07.84588	92 53 15.17081	503158.096	241805.231	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 07.84587	92 53 15.17166	503158.036	241805.230	.033	C	ADJUSTMENT	2009	GPS2566
46 07 07.84587	92 53 15.17166	503158.036	241805.230	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 07.84586	92 53 15.17119	503158.069	241805.229	.033	C	GPS - STATIC	2009	HMOOSE
46 07 07.84549	92 53 15.17059	503158.111	241805.192	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970142.528	739043.200	1668923.276	16756063.528	.131	3	GPS - RTRN	2017	RTRN2017
2970142.422	739043.239	1668923.170	16756063.568	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970142.362	739043.237	1668923.110	16756063.567	.033	C	ADJUSTMENT	2009	GPS2566
2970142.362	739043.237	1668923.110	16756063.567	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970142.395	739043.236	1668923.143	16756063.566	.033	C	GPS - STATIC	2009	HMOOSE
2970142.438	739043.200	1668923.186	16756063.528	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_4-RN0579-3E-25MAY2017.jpg	E	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_4-RN0579-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_DD_4-RN0579-1-25MAY2017.jpg		May 25, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 EE

Mn/DOT Name: 5880 EE
NGS Name: 5880 EE
County: PINE, MN (Sheet 2)

NGS ACRN: RN0577 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	17	42 N	20 W	460729.00	925312.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	1990	DESTROYED	Horz=NO Vert=NO	NO	9786		SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1990) **Stamping:** 5880 EE 1961

1.0 MILE WEST-SOUTHWEST OF SANDSTONE, 0.3 MILE WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 23 BRIDGE NUMBER 9786 OVER INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 191.35, 19.3 FEET SOUTH OF TRUNK HIGHWAY 23.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.839	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.488	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1092.488	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1092.537	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.092 12B = -90.098 09 = -900000 03 = -89.865

*** No Horizontal Positions in the Database ***

5880 EE 2

Mn/DOT Name: 5880 EE 2 **NGS Name:** 5880 EE 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0569 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	33	43 N	20 W	460948.00	925237.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1970) **Stamping:** 5880 EE2 1970

2.4 MILES NORTH-NORTHWEST OF SANDSTONE, 3.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 1.5 MILES SOUTH ON INTERSTATE HIGHWAY 35, 270.0 FEET SOUTHWEST OF INTERSTATE HIGHWAY 35 MILEPOST 194, 52.7 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 46.7 FEET EAST OF A FENCE, IN THE WEST SIDE OF THE EAST CONCRETE BASE OF AN ABANDONED SIGN, 2.0 FEET SOUTH OF A WITNESS POST.

Station Notes

THE SIGNPOST WAS FOUND BUT NO FOUNDATION (11-17-2008).

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1123.328	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1122.957	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1122.957	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1122.957	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1123.000	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.233 12B = -90.233 09 = -90.134 03 = -90.006

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 5880 EE RESET
NGS Name: 5880 EE RESET
County: PINE, MN (Sheet 2)

NGS ACRN: DO7255 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	17	42 N	20 W	460730.50	925314.90	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1990	2017	GOOD	Horz=NO Vert=NO	YES	9786	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1990) **Stamping:** 5880 EE RESET 1990

IN SANDSTONE, AT THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23/COUNTY ROAD 61 IN SANDSTONE, IN THE SOUTHEAST ABUTMENT OF TRUNK HIGHWAY 23/COUNTY ROAD 61 BRIDGE NUMBER 9786 OVER INTERSTATE HIGHWAY 35 (THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23), AT INTERSTATE HIGHWAY 35 MILEPOINT 191.35, 26.0 FEET SOUTH OF TRUNK HIGHWAY 23.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.773	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1092.777	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO
1092.777	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.439	.033	3				VERTICAL CONTROL SURVEY	1990	CS5800

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.829	.262		1002.724	.197	2011	GPS - RTRN	2017	RTRN2017
1092.645	.262		1002.774	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.098 12B = -90.105 09 = -90.006 03 = -89.872

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 30.42431	92 53 14.85889	503179.710	244092.507	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 30.42400	92 53 14.85934	503179.678	244092.476	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970125.049	741330.291	1668941.898	16758349.859	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970125.018	741330.259	1668941.866	16758349.827	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_EE_RESET-DO7255-3S-25MAY2017.jpg	S	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_EE_RESET-DO7255-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_EE_RESET-DO7255-1-25MAY2017.jpg		May 25, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 FF
NGS Name: 5880 FF
County: PINE, MN (Sheet 2)

NGS ACRN: RN0568 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	43 N	20 W	461014.49	925157.82	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2017	GOOD	Horz=NO Vert=NO	YES	9791	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1961) **Stamping:** 5880 FF 1961

2.7 MILES NORTH OF SANDSTONE, 2.5 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 289.05, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 23 BRIDGE NUMBER 9791 OVER INTERSTATE HIGHWAY 35, 19.3 FEET EAST OF TRUNK HIGHWAY 23.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1119.834	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1119.834	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1119.834	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1119.821	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1119.821	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1119.821	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1119.821	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1119.821	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN
1119.821	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1119.443	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1119.443	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN
1119.443	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1119.443	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1119.483	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1119.827	.262		1029.594	.197	2011	GPS - RTRN	2017	RTRN2017
1119.702	.262		1029.696	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.229 12B = -90.233 09 = -90.128 03 = -90.006

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 14.48648	92 51 57.81553	508599.501	260714.236	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 14.48600	92 51 57.81524	508599.521	260714.188	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975260.143	758040.048	1674338.371	16774971.046	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975260.164	758039.999	1674338.391	16774970.997	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_FF-RN0568-3E-30MAY2017.jpg	E	May 30, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_FF-RN0568-2-30MAY2017.jpg		May 30, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_FF-RN0568-1-30MAY2017.jpg		May 30, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 GG **NGS Name:** 5880 GG

County: PINE, MN (Sheet 2)

NGS ACRN: RN0567 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	27	43 N	20 W	461046.88	925122.18	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2017	DESTROYED	Horz=NO Vert=NO	YES	9792	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2007) **Stamping:** 5880 GG 1961

3.6 MILES NORTH-NORTHEAST OF SANDSTONE, 3.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 64 (MAIN STREET) IN SANDSTONE, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 23 BRIDGE NUMBER 9792 OVER INTERSTATE HIGHWAY 35, 19.2 FEET SOUTH OF TRUNK HIGHWAY 23, 13.9 SOUTHWEST OF A WITNESS POST.

Station Notes
THE DISK WAS REMOVED FROM THE ABUTMENT WHEN THE BRIDGE WAS RE-DECKED IN 2011.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.417	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1134.410	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1134.410	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1134.410	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1134.410	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1134.410	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN
1134.410	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.030	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN
1134.030	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1134.069	.016	2				VERTICAL CONTROL SURVEY	1975	L23805
1134.030	.016	2				VERTICAL CONTROL SURVEY	1971	L23306

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.256	.262		1044.227	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.252 09 = -90.147 03 = -90.029

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 46.87867	92 51 22.18392	511105.491	263996.937	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977709.524	761364.595	1676839.116	16778255.447	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_GG-RN0567-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_GG-RN0567-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_GG-RN0567-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 HH

Mn/DOT Name: 5880 HH **NGS Name:** 5880 HH

County: PINE, MN (Sheet 2)

NGS ACRN: RN0565 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	22	43 N	20 W	461139.70	925052.50	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1993) **Stamping:** 5880 HH 1970

4.7 MILES NORTH-NORTHEAST OF SANDSTONE, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 64 (MAIN STREET) IN SANDSTONE, THEN 1.0 MILE NORTH ON INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 196.65, IN THE MEDIAN, 150.0 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 150.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 100.0 FEET NORTH OF THE NORTH EDGE OF TREES, 1.2 FEET SOUTH OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1144.889	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1144.889	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1144.889	.016	2/0				VERTICAL ADJUSTMENT	1998	00000288
1144.889	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN
1144.889	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1144.509	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1144.509	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN
1144.509	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1144.509	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1144.545	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.338 12B = -90.338 09 = -90.233 03 = -90.115

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_HH-RN0565-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_HH-RN0565-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_HH-RN0565-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 JJ
NGS Name: 5880 JJ
County: PINE, MN (Sheet 2)

NGS ACRN: RN0563 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	14	43 N	20 W	461227.70	925027.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	STEEL ROD IMBED IN MON

Monument Type
CONCRETE POST (PREFABRICATED)

Disk Type
BENCH MARK DISK

Mon. Agency
MNDT

Description: (2008)

Stamping: 5880 JJ 1970

5.5 MILES NORTH OF SANDSTONE, 3.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 64 (MAIN STREET) IN SANDSTONE, THEN 2.0 MILES NORTH ON INTERSTATE HIGHWAY 35, 149.5 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 197.6, 200.0 FEET SOUTH OF NORTHBOUND REST AREA EXIT RAMP, 150.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, IN THE MEDIAN, 100.0 FEET SOUTH OF THE SOUTH END OF TREES, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.107	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1107.104	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1106.838	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1106.458	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1106.458	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1106.458	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1106.494	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.436 12B = -90.433 09 = -90.325 03 = -90.207

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_JJ-RN0563-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_JJ-RN0563-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_JJ-RN0563-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 KK

Mn/DOT Name: 5880 KK
NGS Name: 5880 KK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0562 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	43 N	20 W	461311.00	924952.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	1979	DESTROYED	Horz=NO Vert=NO	NO	55808		SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1979) **Stamping:** 5880 KK 1970

3.3 MILES SOUTH-SOUTHEAST OF RUTLEDGE, 6.0 MILES SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND MAIN STREET IN RUTLEDGE, THEN 0.5 MILE EAST ON TRUNK HIGHWAY 23 EAST, THEN 3.0 MILES NORTH ON INTERSTATE HIGHWAY 35.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.594	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.204	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1029.204	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1029.237	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.515 12B = -90.515 09 = -90.397 03 = -90.275

*** No Horizontal Positions in the Database ***

5880 KK RESET

Mn/DOT Name: 5880 KK RESET **NGS Name:** 5880 KK RESET

County: PINE, MN (Sheet 2)

NGS ACRN: RN1746 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	43 N	20 W	461311.31	924957.02	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1979	2008	GOOD	Horz=NO Vert=YES	YES	55808	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1979) **Stamping:** 5880 KK RESET 1970 1979

3.3 MILES SOUTH-SOUTHEAST OF RUTLEDGE, 6.0 MILES SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND MAIN STREET IN RUTLEDGE, THEN 0.5 MILE EAST ON TRUNK HIGHWAY 23 EAST, THEN 3.0 MILES NORTH ON INTERSTATE HIGHWAY 35, 27.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35 AT STATION 1959+65, IN THE SOUTHEAST CORNER OF NORTHBOUND INTERSTATE HIGHWAY 35 BRIDGE NUMBER 55808 OVER THE KETTLE RIVER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.604	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1029.598	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.224	.016	2				VERTICAL CONTROL SURVEY	1979	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.512	.262		939.230	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.521 12B = -90.521 09 = -90.403 03 = -90.282

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 11.30870	92 49 57.01748	517086.224	278632.613	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983439.210	776098.328	1682798.744	16792892.167	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_KK_RESET-RN1746-3E-17NOV2008.jpg	E	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_KK_RESET-RN1746-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_KK_RESET-RN1746-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 LL **NGS Name:** 5880 LL

County: PINE, MN (Sheet 2)

NGS ACRN: RN0561 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	43 N	20 W	461314.44	924959.29	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES	58807	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2008) **Stamping:** 5880 LL 1970

3.3 MILES SOUTH-SOUTHEAST OF RUTLEDGE, 4.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND MAIN STREET IN RUTLEDGE, THEN 0.5 MILE EAST ON COUNTY ROAD 43, THEN 7.0 MILES SOUTH ON INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 198.6, 19.5 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, IN THE SOUTHEAST CORNER OF SOUTHBOUND INTERSTATE HIGHWAY 35 BRIDGE NUMBER 58807 OVER THE KETTLE RIVER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.788	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1029.781	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1029.788	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.394	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1029.394	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1029.404	.016	2				VERTICAL CONTROL SURVEY	1974	L23306

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.647	.262		939.352	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.531 12B = -90.531 09 = -90.413 03 = -90.292

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 14.44294	92 49 59.29327	516925.926	278949.994	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983273.546	776412.891	1682638.117	16793209.205	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_LL-RN0561-3E-17NOV2008.jpg	E	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_LL-RN0561-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_LL-RN0561-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 MM

Mn/DOT Name: 5880 MM
NGS Name: 5880 MM
County: PINE, MN (Sheet 2)

NGS ACRN: RN0556 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	2	43 N	20 W	461416.40	924929.80	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	MNDT

Description: (1970) **Stamping:** 5880 MM 1970

2.6 MILES SOUTHEAST OF RUTLEDGE, 1.5 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 33, AT INTERSTATE HIGHWAY 35 MILEPOINT 199.9, IN THE SOUTHEAST CORNER OF NORTHBOUND INTERSTATE HIGHWAY 35 CULVERT AT CANE CREEK, 60.2 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1060.851	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1060.438	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1060.438	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1060.438	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1060.470	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.663 12B = -90.669 09 = -90.548 03 = -90.413

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_MM-RN0556-3E-17NOV2008.jpg	E	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_MM-RN0556-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_MM-RN0556-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 NN

Mn/DOT Name: 5880 NN **NGS Name:** 5880 NN

County: PINE, MN (Sheet 2)

NGS ACRN: RN0548 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	44 N	20 W	461617.10	924932.60	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	STEEL ROD IMBED IN MON

Monument Type
CONCRETE POST (PREFABRICATED)

Disk Type
BENCH MARK DISK

Mon. Agency
MNDT

Description: (2008)

Stamping: 5880 NN 1970

2.1 MILES EAST-NORTHEAST OF RUTLEDGE, 4.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND MAIN STREET IN RUTLEDGE, THEN 0.5 MILE EAST ON COUNTY ROAD 43, THEN 3.0 MILES SOUTH ON INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 202.2, 178.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35 AT STATION 2150+50, 4.0 FEET EAST OF THE RIGHT-OF-WAY FENCE, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes
THERE IS NO REAL TIME REFERENCE NETWORK (RTRN).

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1059.998	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1059.998	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1059.998	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1059.571	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1059.571	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1059.571	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -90.948 12B = -90.941 09 = -90.830 03 = -90.679

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_NN-RN0548-3W-18NOV2008.jpg	W	Nov 18, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_NN-RN0548-2-18NOV2008.jpg		Nov 18, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_NN-RN0548-1-18NOV2008.jpg		Nov 18, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 PP

Mn/DOT Name: 5880 PP
NGS Name: 5880 PP
County: PINE, MN (Sheet 2)

NGS ACRN: RN0547 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	24	44 N	20 W	461649.00	924918.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (2000) **Stamping:** 5880 PP 1970

2.6 MILES NORTHEAST OF RUTLEDGE, 7.2 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 IN RUTLEDGE, 52.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 202.9.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.639	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.216	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1057.216	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.010 12B = -910000 09 = -90.889 03 = -90.741

*** No Horizontal Positions in the Database ***

Mn/DOT Name: 5880 QQ **NGS Name:** 5880 QQ

County: PINE, MN (Sheet 2)

NGS ACRN: RN0542 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	44 N	20 W	461901.01	924939.21	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES	58812	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1970) **Stamping:** 5880 QQ 1970

0.6 MILE EAST OF WILLOW RIVER, 0.6 MILE EAST ON COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 43 AND COUNTY ROAD 61 IN RUTLEDGE, IN THE SOUTHEAST CORNER OF COUNTY ROAD 43 BRIDGE NUMBER 58812 OVER INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 205.4.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1076.468	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1076.487	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1076.487	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1076.090	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1076.090	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1076.090	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1076.340	.262		985.388	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.227 12B = -91.197 09 = -91.102 03 = -90.951

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.00788	92 49 39.21198	518306.022	314060.533	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984054.799	811537.449	1683973.236	16828305.795	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_QQ-RN0542-3W-18NOV2008.jpg	W	Nov 18, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_QQ-RN0542-2-18NOV2008.jpg		Nov 18, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_QQ-RN0542-1-22JAN2008.jpg		Jan 22, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 RR **NGS Name:** 5880 RR

County: PINE, MN (Sheet 2)

NGS ACRN: RN0538 Get Map
NGS Quad / Sta Num : 46092342/1057
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	1	44 N	20 W	461951.60	924914.23	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES	58812	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1993) **Stamping:** 5880 RR 1970

1.0 MILE NORTHEAST OF WILLOW RIVER, 1.0 MILE NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 206.40, IN THE SOUTHEAST CORNER OF NORTHBOUND INTERSTATE HIGHWAY 35 BRIDGE NUMBER 58812 OVER THE WILLOW RIVER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1052.495	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1052.495	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1052.495	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1052.091	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1052.091	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1052.091	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.279 12B = -91.260 09 = -91.155 03 = -91.279

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 51.60350	92 49 14.23394	520054.241	319187.942	.066	2	ADJUSTMENT	1999	17648
46 19 51.59959	92 49 14.22826	520054.640	319187.546	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 51.59949	92 49 14.22815	520054.648	319187.536	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 51.79100	92 49 13.50700			.100	2	CLASSICAL SURVEY	1982	17020
46 19 51.79068	92 49 13.50707			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985715.138	816693.247	1685714.178	16833433.108	.066	2	ADJUSTMENT	1999	17648
2985715.543	816692.858	1685714.577	16833432.713	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985715.551	816692.848	1685714.585	16833432.703	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2361110.100	488626.658			.100	2	CLASSICAL SURVEY	1982	17020
2361110.090	488626.630			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_RR-RN0538-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_RR-RN0538-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_RR-RN0538-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 SS **NGS Name:** 5880 SS

County: PINE, MN (Sheet 2)

NGS ACRN: RN0532 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	45 N	20 W	462045.93	924840.66	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES	58810	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1971) **Stamping:** 5880 SS RM2 1970

2.3 MILES NORTH-NORTHEAST OF WILLOW RIVER, 2.3 MILES NORTH-NORTHEAST OF THE JUNCTION OF INTERSTATE HIGHWAY 35 AND DAGO LAKE ROAD, IN THE SOUTHEAST CORNER OF TOWNSHIP ROAD (DAGO LAKE ROAD) BRIDGE NUMBER 58810 OVER INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 205.4.

Station Notes
THE STATION IS REFERENCE MARK 2 FOR STATION DAGO MNDT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.830	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1094.830	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1094.830	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.417	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1094.417	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1094.417	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.696	.262		1003.643	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.335 12B = -91.325 09 = -91.217 03 = -91.056

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 45.93362	92 48 40.66056	522404.186	324694.521	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987970.568	822238.361	1688056.087	16838940.179	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_SS-RN0532-3W-03DEC2008.jpg	W	Dec 3, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_SS-RN0532-2-03DEC2008.jpg		Dec 3, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_SS-RN0532-1-03DEC2008.jpg		Dec 3, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 TT

Mn/DOT Name: 5880 TT **NGS Name:** 5880 TT

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	25	45 N	20 W	462116.09	924821.07	2	

NGS ACRN: RN0531 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2007) **Stamping:** 5880 TT 1970

2.8 MILES NORTHEAST OF WILLOW RIVER, 3.0 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 208.25, 0.1 MILE NORTH OF EXIT TO REST AREA, 150.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35 AT STATION 2466+00, IN THE MEDIAN, NEAR A CULVERT UNDER NORTHBOUND INTERSTATE HIGHWAY 35, 10.0 FEET SOUTHEAST OF TRIPLE 10.0 INCH DIAMETER OAK TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1082.045	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1082.045	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1082.045	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.628	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1081.628	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1081.628	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.371 12B = -91.361 09 = -91.256 03 = -91.089

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_TT-RN0531-3W-03DEC2008.jpg	W	Dec 3, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_TT-RN0531-2-03DEC2008.jpg		Dec 3, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_TT-RN0531-1-03DEC2008.jpg		Dec 3, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 5880 UU
NGS Name: 5880 UU
County: PINE, MN (Sheet 2)

NGS ACRN: RN0529 Get Map
NGS Quad / Sta Num : 46092342/1062
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	45 N	19 W	462226.92	924724.91	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES	58814	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2007) **Stamping:** 5880 UU 1970

2.0 MILES EAST-SOUTHEAST OF TOWN OF STURGEON LAKE, IN THE SOUTHEAST CORNER OF COUNTY ROAD 46 BRIDGE NUMBER 58814 OVER INTERSTATE HIGHWAY 35 AT INTERSTATE 35 MILEPOINT 209.9 AT THE EXIT FROM NORTHBOUND INTERSTATE HIGHWAY 35 TO STURGEON LAKE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.913	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1095.897	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1095.913	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.487	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1095.487	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1095.487	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.463 12B = -91.460 09 = -91.358 03 = -91.463

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 26.92228	92 47 24.91245	527704.397	334932.189	.066	2	ADJUSTMENT	1999	17648
46 22 26.91779	92 47 24.90868	527704.662	334931.735	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 26.91759	92 47 24.90866	527704.663	334931.714	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 27.11100	92 47 24.19200			.100	2	CLASSICAL SURVEY	1982	17020
46 22 27.11099	92 47 24.19161			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2993094.787	832563.535	1693340.913	16849179.936	.066	2	ADJUSTMENT	1999	17648
2993095.059	832563.086	1693341.178	16849179.482	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2993095.061	832563.066	1693341.179	16849179.462	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2368489.479	504497.001			.100	2	CLASSICAL SURVEY	1982	17020
2368489.500	504497.000			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_UU-RN0529-3S-04JUN2007.jpg	S	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_UU-RN0529-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_UU-RN0529-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

5880 VV

Mn/DOT Name: 5880 VV **NGS Name:** 5880 VV

County: PINE, MN (Sheet 2)

NGS ACRN: RN0521 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	45 N	19 W	462505.85	924517.78	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2008	GOOD	Horz=NO Vert=YES	YES	58816	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2008) **Stamping:** 5880 VV 1970

2.5 MILES SOUTH OF MOOSE LAKE, 1.5 MILES SOUTHEAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 73 IN MOOSE LAKE, AT INTERSTATE HIGHWAY 35 MILEPOINT 213.30, IN THE SOUTHEAST CORNER OF COUNTY ROAD 10 (CARLTON-PINE COUNTY LINE ROAD) BRIDGE NUMBER 58816 OVER INTERSTATE HIGHWAY 35, 17.0 FEET SOUTH-SOUTHWEST OF COUNTY ROAD 10.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.185	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1135.175	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1135.185	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.762	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1134.762	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1134.762	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.017	.262		1043.623	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.683 12B = -91.680 09 = -91.575 03 = -91.394

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 05.84972	92 45 17.78192	536589.697	351047.359	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3001702.856	848825.658	1702201.671	16865299.072	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_VV-RN0521-3W-02DEC2008.jpg	W	Dec 2, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_VV-RN0521-2-02DEC2008.jpg		Dec 2, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/5880_VV-RN0521-1-02DEC2008.jpg		Dec 2, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 60 MN115 **NGS Name:** 60

County: PINE, MN (Sheet 2)

NGS ACRN: DF5946 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	7	43 N	20 W	461350.79	925536.52		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2000) **Stamping:** NO 60

3.0 MILES WEST-NORTHWEST OF FINLAYSON, 2.0 MILES NORTH ALONG COUNTY ROAD 34 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 34 EAST OF FINLAYSON, THEN 0.95 MILE WEST ON LEWIS ROAD, 28.0 FEET SOUTH OF A TOWNSHIP ROAD 307, 2.0 FEET NORTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1007.160	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1097.898	.131		1007.301	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1097.898	.131		1007.409	.066	1996	GPS - STATIC	2009	HMOOSE
1097.898	.131		1007.301	.066	2007	GPS - STATIC	2009	HMOOSE
			1007.301	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1097.996	.131		1007.409	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1097.996	.131		1007.409	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.820 12B = -90.784 09 = -90.686 03 = -90.541

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 50.78775	92 55 36.52104	493214.110	282625.957	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 50.78760	92 55 36.52147	493214.080	282625.941	.033	C	ADJUSTMENT	2009	GPS2566
46 13 50.78760	92 55 36.52147	493214.080	282625.941	.033	C	GPS - STATIC	2009	HMOOSE
46 13 50.78760	92 55 36.52147	493214.080	282625.941	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 50.78744	92 55 36.52105	493214.109	282625.925	.033	C	GPS - STATIC	2009	HMOOSE
46 13 50.78744	92 55 36.52105	493214.109	282625.925	.033	C	ADJUSTMENT	2003	GPS1839
46 13 50.78744	92 55 36.52105	493214.109	282625.924	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959505.419	779683.761	1658932.233	16796853.646	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959505.389	779683.745	1658932.203	16796853.630	.033	C	ADJUSTMENT	2009	GPS2566
2959505.389	779683.745	1658932.203	16796853.630	.033	C	GPS - STATIC	2009	HMOOSE
2959505.389	779683.745	1658932.203	16796853.630	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959505.419	779683.729	1658932.232	16796853.614	.033	C	GPS - STATIC	2009	HMOOSE
2959505.419	779683.729	1658932.232	16796853.614	.033	C	ADJUSTMENT	2003	GPS1839
2959505.419	779683.729	1658932.232	16796853.614	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/60-DF5946-3S-15APR2007.jpg	S	Apr 15, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/60-DF5946-2-15APR2007.jpg		Apr 15, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/60-DF5946-1-15APR2007.jpg		Apr 15, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 62 MN115 **NGS Name:** 62

County: PINE, MN (Sheet 2)

NGS ACRN: DF5948 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	15	44 N	21 W	461805.75	925848.98		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 62

8.3 MILES WEST-SOUTHWEST OF WILLOW RIVER, 7.3 MILES WEST ALONG COUNTY ROAD 41 FROM THE JUNCTION OF COUNTY ROAD 41 AND COUNTY ROAD 61 IN THE WILLOW RIVER, THEN 1.1 MILES SOUTH ALONG CHOKE CHERRY ROAD, 30.0 FEET WEST OF THE CHOKE CHERRY ROAD, 2.0 FEET EAST OF A FENCE CORNER, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1209.706	.262		1118.748	.197	2011	GPS - OPUS	2020	GPSBM
1209.794	.262		1118.836	.197	2011	GPS - OPUS	2020	GPSBM
1209.617	.262		1118.715	.197	2011	GPS - RTRN	2020	RTRN2020
			1118.722	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1118.827	.013	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1209.643	.131		1118.931	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1209.643	.131		1118.931	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.958 12B = -90.902 09 = -90.771 03 = -90.663

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 05.74592	92 58 48.97787	479709.542	308463.980	.131	3	GPS - OPUS	2020	GPSBM
46 18 05.74546	92 58 48.97816	479709.521	308463.933	.131	3	GPS - OPUS	2020	GPSBM
46 18 05.74568	92 58 48.97824	479709.516	308463.955	.131	3	GPS - RTRN	2020	RTRN2020
46 18 05.74581	92 58 48.97755	479709.564	308463.968	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 05.74587	92 58 48.97816	479709.521	308463.974	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 05.74574	92 58 48.97788	479709.541	308463.961	.033	C	ADJUSTMENT	2003	GPS1839
46 18 05.74574	92 58 48.97788	479709.543	308463.960	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945564.261	805284.698	1645401.211	16822663.083	.131	3	GPS - OPUS	2020	GPSBM
2945564.241	805284.651	1645401.191	16822663.037	.131	3	GPS - OPUS	2020	GPSBM
2945564.235	805284.673	1645401.185	16822663.059	.131	3	GPS - RTRN	2020	RTRN2020
2945564.283	805284.687	1645401.233	16822663.072	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945564.241	805284.693	1645401.191	16822663.078	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2945564.260	805284.680	1645401.211	16822663.065	.033	C	ADJUSTMENT	2003	GPS1839
2945564.260	805284.680	1645401.211	16822663.065	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/62-DF5948-3W-07MAY2020.jpg	W	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/62-DF5948-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/62-DF5948-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 63 MN115 **NGS Name:** 63

County: PINE, MN (Sheet 2)

NGS ACRN: DF5949 Get Map
NGS Quad / Sta Num : 46093212/
USGS Quad: ARTHYDE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	7	44 N	21 W	461903.38	930201.42		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2014	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
UNKNOWN	HORIZONTAL CONTROL DISK	MN-115

Description: (2007) **Stamping:** NO 63

9.7 MILES WEST OF WILLOW RIVER, 9.7 MILES WEST ALONG COUNTY ROAD 41 FROM THE JUNCTION OF COUNTY ROAD 41 AND COUNTY ROAD 61 IN THE WILLOW RIVER, AT THE JUNCTION OF COUNTY ROAD 41 AND MAPLE ROAD, 33.0 FEET SOUTH OF COUNTY ROAD 41, 19.0 FEET NORTH OF A POWER POLE, 2.0 FEET WEST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1172.740	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1172.842	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1263.646	.131		1172.934	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1263.646	.131		1172.934	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.912 12B = -90.827 09 = -90.702 03 = -90.620

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 03.38027	93 02 01.42060	466207.083	314320.943	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 03.38035	93 02 01.42132	466207.032	314320.951	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 03.38030	93 02 01.42106	466207.051	314320.946	.033	C	ADJUSTMENT	2003	GPS1839
46 19 03.38030	93 02 01.42106	466207.050	314320.946	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2931965.722	810910.036	1631897.492	16828500.441	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2931965.671	810910.044	1631897.441	16828500.450	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2931965.690	810910.039	1631897.460	16828500.444	.033	C	ADJUSTMENT	2003	GPS1839
2931965.690	810910.039	1631897.460	16828500.444	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/63-DF5949-3S-03APR2007.jpg	S	Apr 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/63-DF5949-2-03APR2007.jpg		Apr 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/63-DF5949-1-03APR2007.jpg		Apr 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

63 RC

Mn/DOT Name: 63 RC
NGS Name: 63RC
County: PINE, MN (Sheet 2)

NGS ACRN: CJ3841 Get Map
NGS Quad / Sta Num : 46092243/
USGS Quad: HOLYOKE SW

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	21	45 N	17 W	462227.00	922953.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
ROCK (0 TO 1 METERS)	BENCH MARK DISK	USGS

Description: (2007)
Stamping: 63 RC 1952 1184

0.5 MILE NORTHEAST OF DUQUETTE, 2.4 MILES EAST ERICKSON ROAD FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND ERICKSON ROAD IN DUQUETTE, 30.0 FEET SOUTH OF ERICKSON ROAD, ON THE GRAVEL RIDGE. 0.4 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47 IN DUQUETTE, TO THE TRUNK HIGHWAY 23 MILEPOINT 311.25, THEN 2.4 MILES EAST ON ERICKSON ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1184.240	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.620 12B = -90.617 09 = -90.449 03 = -90.403

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/63RC-CJ3841-3SE-22APR2007.jpg	SE	Apr 22, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/63RC-CJ3841-2-22APR2007.jpg		Apr 22, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/63RC-CJ3841-1-22APR2007.jpg		Apr 22, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 64 MN115 **NGS Name:** 64

County: PINE, MN (Sheet 2)

NGS ACRN: DF5950 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	7	44 N	20 W	461903.80	925540.07		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2010) **Stamping:** NO 64

4.7 MILES WEST OF WILLOW RIVER, 4.7 MILES WEST ALONG COUNTY ROAD 41 FROM THE JUNCTION OF COUNTY ROAD 41 AND COUNTY ROAD 61 AT WILLOW RIVER, 32.0 FEET WEST-NORTHWEST OF A POWER POLE, 24.7 FEET SOUTH-SOUTHEAST OF A NORTHWEST CORNER OF SECTION 7, 24.0 FEET SOUTH OF COUNTY ROAD 41, 13.0 FEET WEST OF A DRIVEWAY, 2.0 FEET NORTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1101.523	.262		1010.421	.197	2011	GPS - OPUS	2019	GPSBM
1101.468	.262		1010.365	.197	2011	GPS - OPUS	2019	GPSBM
			1010.411	.009	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1101.474	.131		1010.507	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1101.474	.131		1010.628	.066	1996	GPS - STATIC	2009	HMOOSE
1101.474	.131		1010.507	.066	2007	GPS - STATIC	2009	HMOOSE
			1010.507	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1101.409	.131		1010.628	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1101.409	.131		1010.628	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.102 12B = -91.060 09 = -90.935 03 = -90.800

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 03.80298	92 55 40.06765	492975.847	314336.590	.131	3	GPS - OPUS	2019	GPSBM
46 19 03.80363	92 55 40.06776	492975.839	314336.656	.131	3	GPS - OPUS	2019	GPSBM
46 19 03.80324	92 55 40.06760	492975.850	314336.616	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 03.80325	92 55 40.06800	492975.822	314336.617	.033	C	ADJUSTMENT	2009	GPS2566
46 19 03.80325	92 55 40.06800	492975.822	314336.617	.033	C	GPS - STATIC	2009	HMOOSE
46 19 03.80325	92 55 40.06800	492975.822	314336.617	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 03.80305	92 55 40.06779	492975.837	314336.597	.033	C	GPS - STATIC	2009	HMOOSE
46 19 03.80305	92 55 40.06779	492975.837	314336.597	.033	C	ADJUSTMENT	2003	GPS1839
46 19 03.80305	92 55 40.06779	492975.838	314336.596	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2958726.873	811381.738	1658654.135	16828549.743	.131	3	GPS - OPUS	2019	GPSBM
2958726.864	811381.803	1658654.128	16828549.809	.131	3	GPS - OPUS	2019	GPSBM
2958726.876	811381.764	1658654.139	16828549.769	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2958726.848	811381.765	1658654.111	16828549.770	.033	C	ADJUSTMENT	2009	GPS2566
2958726.848	811381.765	1658654.111	16828549.770	.033	C	GPS - STATIC	2009	HMOOSE
2958726.848	811381.765	1658654.111	16828549.770	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2958726.863	811381.745	1658654.126	16828549.750	.033	C	GPS - STATIC	2009	HMOOSE
2958726.863	811381.745	1658654.126	16828549.750	.033	C	ADJUSTMENT	2003	GPS1839
2958726.863	811381.744	1658654.126	16828549.750	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/64-DF5950-3S-12DEC2019.jpg	S	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/64-DF5950-2-12DEC2019.jpg		Dec 12, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/64-DF5950-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 67 MN115 **NGS Name:** 67

County: PINE, MN (Sheet 2)

NGS ACRN: DF5951 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	45 N	20 W	462231.70	925101.46		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2008) **Stamping:** NO 67

2.05 MILES WEST-SOUTHWEST OF STURGEON LAKE, 1.1 MILES WEST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 61 AT STURGEON LAKE, THEN 0.8 MILE SOUTH AND WEST ON MOOSE HORN LANE, 32.0 FEET NORTH OF MOOSE HORN ROAD, 50.0 FEET WEST OF A POWER POLE, AT THE CREST OF A HILL, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.945	.262		992.531	.197	2011	GPS - OPUS	2020	GPSBM
1083.889	.262		992.475	.197	2011	GPS - OPUS	2020	GPSBM
1083.941	.262		992.528	.197	2011	GPS - OPUS	2020	GPSBM
			992.341	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1083.758	.131		992.386	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1083.758	.131		992.524	.066	1996	GPS - STATIC	2009	HMOOSE
1083.758	.131		992.386	.066	2007	GPS - STATIC	2009	HMOOSE
			992.386	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1083.594	.131		992.524	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1083.594	.131		992.524	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.414 12B = -91.391 09 = -91.283 03 = -91.115

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 31.70082	92 51 01.46426	512519.015	335401.091	.131	3	GPS - OPUS	2020	GPSBM
46 22 31.70039	92 51 01.46416	512519.022	335401.048	.131	3	GPS - OPUS	2020	GPSBM
46 22 31.70050	92 51 01.46390	512519.041	335401.059	.131	3	GPS - OPUS	2020	GPSBM
46 22 31.70086	92 51 01.46363	512519.059	335401.096	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 31.70089	92 51 01.46447	512519.001	335401.099	.033	C	ADJUSTMENT	2009	GPS2566
46 22 31.70089	92 51 01.46447	512519.001	335401.099	.033	C	GPS - STATIC	2009	HMOOSE
46 22 31.70089	92 51 01.46447	512519.001	335401.099	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 31.70064	92 51 01.46430	512519.012	335401.073	.033	C	GPS - STATIC	2009	HMOOSE
46 22 31.70064	92 51 01.46430	512519.012	335401.073	.033	C	ADJUSTMENT	2003	GPS1839
46 22 31.70064	92 51 01.46430	512519.011	335401.075	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977905.651	832773.462	1678161.838	16849629.373	.131	3	GPS - OPUS	2020	GPSBM
2977905.659	832773.418	1678161.845	16849629.329	.131	3	GPS - OPUS	2020	GPSBM
2977905.676	832773.430	1678161.863	16849629.340	.131	3	GPS - OPUS	2020	GPSBM
2977905.695	832773.467	1678161.882	16849629.377	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977905.636	832773.469	1678161.823	16849629.380	.033	C	ADJUSTMENT	2009	GPS2566
2977905.636	832773.469	1678161.823	16849629.380	.033	C	GPS - STATIC	2009	HMOOSE
2977905.636	832773.469	1678161.823	16849629.380	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977905.648	832773.443	1678161.835	16849629.354	.033	C	GPS - STATIC	2009	HMOOSE
2977905.648	832773.443	1678161.835	16849629.354	.033	C	ADJUSTMENT	2003	GPS1839
2977905.648	832773.443	1678161.835	16849629.354	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/67-DF5951-3N-09DEC2008.jpg	N	Dec 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/67-DF5951-2-09DEC2008.jpg		Dec 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/67-DF5951-1-09DEC2008.jpg		Dec 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 69 MN115 **NGS Name:** 69

County: PINE, MN (Sheet 2)

NGS ACRN: DF5953 Get Map
NGS Quad / Sta Num : 46092344/
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	45 N	21 W	462404.51	925926.13		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2000) **Stamping:** NO 69

9.5 MILES WEST-NORTHWEST OF STURGEON LAKE, 8.75 MILES WEST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 61 AT (MAIN STREET) TO THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 169, NORTH ON COUNTY ROAD 169 0.75 MI, 32.0 FEET EAST OF COUNTY ROAD 169, 4.0 FEET SOUTHWEST OF A POWER POLE, 2.0 FEET WEST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1250.634	.262		1159.312	.197	2011	GPS - OPUS	2020	GPSBM
1250.739	.262		1159.417	.197	2011	GPS - OPUS	2020	GPSBM
1250.519	.262		1159.269	.197	2011	GPS - RTRN	2020	RTRN2020
			1159.309	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1159.407	.013	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1250.588	.131		1159.492	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1250.588	.131		1159.492	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.322 12B = -91.250 09 = -91.115 03 = -91.027

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 04.51069	92 59 26.13242	477142.143	344812.740	.131	3	GPS - OPUS	2020	GPSBM
46 24 04.51019	92 59 26.13185	477142.183	344812.690	.131	3	GPS - OPUS	2020	GPSBM
46 24 04.51075	92 59 26.13140	477142.215	344812.746	.131	3	GPS - RTRN	2020	RTRN2020
46 24 04.51053	92 59 26.13212	477142.164	344812.724	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 04.51059	92 59 26.13282	477142.115	344812.730	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 04.51053	92 59 26.13259	477142.131	344812.724	.033	C	ADJUSTMENT	2003	GPS1839
46 24 04.51053	92 59 26.13259	477142.130	344812.726	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2942378.311	841579.646	1642789.278	16858992.081	.131	3	GPS - OPUS	2020	GPSBM
2942378.352	841579.596	1642789.318	16858992.030	.131	3	GPS - OPUS	2020	GPSBM
2942378.383	841579.653	1642789.349	16858992.087	.131	3	GPS - RTRN	2020	RTRN2020
2942378.333	841579.630	1642789.299	16858992.064	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2942378.284	841579.635	1642789.250	16858992.071	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2942378.300	841579.630	1642789.266	16858992.064	.033	C	ADJUSTMENT	2003	GPS1839
2942378.300	841579.630	1642789.266	16858992.064	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/69-DF5953-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/69-DF5953-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/69-DF5953-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 74 MN115 **NGS Name:** 74

County: PINE, MN (Sheet 2)

NGS ACRN: DF5954 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	15	45 N	18 W	462229.21	923628.58		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2022	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 74

2.75 MILES WEST-NORTHWEST OF DUQUETTE, 2.75 MILES WEST-NORTHWEST ALONG COUNTY ROAD 47 FROM THE JUNCTION OF COUNTY ROAD 47 AND TRUNK HIGHWAY 23 IN DUQUETTE, 195.0 FEET EAST OF SHADY OAK LANE, 33.0 FEET NORTH OF COUNTY ROAD 47, 5.0 FEET SOUTH OF A GUY POLE, 2.0 FEET SOUTH OF A WITNESS A POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1140.050	.262		1048.777	.197	2011	GPS - OPUS	2022	GPSBM
1140.257	.262		1048.981	.197	2011	GPS - RTRN	2022	RTRN2022
			1048.840	.016	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1048.941	.018	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1140.024	.131		1049.063	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1140.024	.131		1049.063	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.276 12B = -91.286 09 = -91.122 03 = -91.014

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 29.20814	92 36 28.58483	573726.523	335279.998	.131	3	GPS - OPUS	2022	GPSBM
46 22 29.20874	92 36 28.58465	573726.535	335280.059	.131	3	GPS - RTRN	2022	RTRN2022
46 22 29.20875	92 36 28.58533	573726.488	335280.059	.026		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 29.20875	92 36 28.58580	573726.455	335280.059	.030		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 29.20851	92 36 28.58557	573726.471	335280.035	.033	C	ADJUSTMENT	2003	GPS1839
46 22 29.20851	92 36 28.58557	573726.471	335280.035	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3039098.132	833696.031	1739341.882	16849586.289	.131	3	GPS - OPUS	2022	GPSBM
3039098.143	833696.092	1739341.894	16849586.350	.131	3	GPS - RTRN	2022	RTRN2022
3039098.095	833696.092	1739341.846	16849586.351	.026		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3039098.063	833696.091	1739341.813	16849586.351	.030		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3039098.079	833696.068	1739341.830	16849586.327	.033	C	ADJUSTMENT	2003	GPS1839
3039098.079	833696.068	1739341.830	16849586.327	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/74-DF5954-3N-24APR2007.jpg	N	Apr 24, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/74-DF5954-2-24APR2007.jpg		Apr 24, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/74-DF5954-1-12DEC2022.jpg		Dec 12, 2022

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 76 MN115 **NGS Name:** 76

County: PINE, MN (Sheet 2)

NGS ACRN: DF5955 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	44 N	19 W	461809.45	924436.21		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2000) **Stamping:** NO 76

4.7 MILES EAST-SOUTHEAST OF WILLOW RIVER, 4.8 MILES ALONG COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 43 AND COUNTY ROAD 61 IN THE WILLOW RIVER, 0.1 MILE WEST OF THE STEVENS LAKE ROAD, 32.0 FEET NORTH OF COUNTY ROAD 43, 12.0 FEET WEST OF A DRIVEWAY, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1139.059	.262		1048.046	.197	2011	GPS - OPUS	2020	GPSBM
1139.050	.262		1048.036	.197	2011	GPS - OPUS	2020	GPSBM
1139.056	.262		1048.033	.197	2011	GPS - RTRN	2020	RTRN2020
			1047.947	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1138.941	.131		1048.059	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1138.941	.131		1048.177	.066	1996	GPS - STATIC	2009	HMOOSE
1138.941	.131		1048.059	.066	2007	GPS - STATIC	2009	HMOOSE
			1048.052	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1138.908	.131		1048.177	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1138.908	.131		1048.177	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.014 12B = -91.020 09 = -90.905 03 = -90.748

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 09.44770	92 44 36.21322	539585.292	308867.725	.131	3	GPS - OPUS	2020	GPSBM
46 18 09.44780	92 44 36.21325	539585.290	308867.735	.131	3	GPS - OPUS	2020	GPSBM
46 18 09.44754	92 44 36.21285	539585.318	308867.709	.131	3	GPS - RTRN	2020	RTRN2020
46 18 09.44809	92 44 36.21290	539585.315	308867.764	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 09.44809	92 44 36.21380	539585.251	308867.764	.033	C	ADJUSTMENT	2009	GPS2566
46 18 09.44809	92 44 36.21380	539585.251	308867.764	.033	C	GPS - STATIC	2009	HMOOSE
46 18 09.44779	92 44 36.21289	539585.315	308867.734	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 09.44781	92 44 36.21378	539585.253	308867.736	.033	C	GPS - STATIC	2009	HMOOSE
46 18 09.44751	92 44 36.21264	539585.333	308867.706	.033	C	ADJUSTMENT	2003	GPS1839
46 18 09.44751	92 44 36.21264	539585.332	308867.706	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3005416.763	806708.826	1705249.549	16823142.279	.131	3	GPS - OPUS	2020	GPSBM
3005416.761	806708.836	1705249.547	16823142.288	.131	3	GPS - OPUS	2020	GPSBM
3005416.790	806708.810	1705249.575	16823142.262	.131	3	GPS - RTRN	2020	RTRN2020
3005416.785	806708.866	1705249.571	16823142.318	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3005416.722	806708.865	1705249.508	16823142.318	.033	C	ADJUSTMENT	2009	GPS2566
3005416.722	806708.865	1705249.508	16823142.318	.033	C	GPS - STATIC	2009	HMOOSE
3005416.786	806708.836	1705249.572	16823142.288	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3005416.724	806708.837	1705249.509	16823142.289	.033	C	GPS - STATIC	2009	HMOOSE
3005416.804	806708.808	1705249.589	16823142.259	.033	C	ADJUSTMENT	2003	GPS1839
3005416.804	806708.808	1705249.589	16823142.259	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/76-DF5955-3N-06MAY2020.jpg	N	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/76-DF5955-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/76-DF5955-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 77 MN115 **NGS Name:** 77

County: PINE, MN (Sheet 2)

NGS ACRN: DF5956 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	12	44 N	19 W	461901.27	924118.18		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 77

8.5 MILES EAST OF WILLOW RIVER, 6.7 MILES EAST ALONG COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 43 AND COUNTY ROAD 61 IN WILLOW RIVER, THEN 1.0 MILE NORTH ON COUNTY ROAD 155 TO THE RIVER ROAD, 0.55 MILE EAST ON THE RIVER ROAD, 32.0 FEET SOUTH OF THE RIVER ROAD, 2.0 FEET NORTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1114.450	.262		1023.482	.197	2011	GPS - OPUS	2020	GPSBM
1114.430	.262		1023.463	.197	2011	GPS - OPUS	2020	GPSBM
1114.338	.262		1023.371	.197	2011	GPS - OPUS	2020	GPSBM
			1023.400	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1023.505	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1114.302	.131		1023.633	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1114.302	.131		1023.633	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.968 12B = -90.994 09 = -90.846 03 = -90.715

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.26498	92 41 18.17520	553476.188	314149.372	.131	3	GPS - OPUS	2020	GPSBM
46 19 01.26534	92 41 18.17538	553476.176	314149.409	.131	3	GPS - OPUS	2020	GPSBM
46 19 01.26520	92 41 18.17567	553476.155	314149.395	.131	3	GPS - OPUS	2020	GPSBM
46 19 01.26529	92 41 18.17521	553476.188	314149.404	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.26515	92 41 18.17548	553476.169	314149.389	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.26487	92 41 18.17524	553476.185	314149.361	.033	C	ADJUSTMENT	2003	GPS1839
46 19 01.26487	92 41 18.17524	553476.186	314149.362	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3019213.792	812225.886	1719127.543	16828439.221	.131	3	GPS - OPUS	2020	GPSBM
3019213.779	812225.922	1719127.531	16828439.258	.131	3	GPS - OPUS	2020	GPSBM
3019213.759	812225.908	1719127.510	16828439.244	.131	3	GPS - OPUS	2020	GPSBM
3019213.791	812225.918	1719127.542	16828439.253	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3019213.772	812225.903	1719127.523	16828439.238	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3019213.790	812225.875	1719127.540	16828439.210	.033	C	ADJUSTMENT	2003	GPS1839
3019213.790	812225.875	1719127.540	16828439.210	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/77-DF5956-3S-23APR2007.jpg	S	Apr 23, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/77-DF5956-2-23APR2007.jpg		Apr 23, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/77-DF5956-1-23APR2007.jpg		Apr 23, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 79 MN115 **NGS Name:** 79

County: PINE, MN (Sheet 2)

NGS ACRN: DF5957 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	31	44 N	17 W	461530.42	923202.92		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 79

6.85 MILES EAST-SOUTHEAST OF BRUNO, 6.85 MILES EAST-SOUTHEAST ALONG COUNTY ROAD 153 FROM THE JUNCTION OF COUNTY ROAD 153 AND COUNTY ROAD 22 SOUTHEAST OF BRUNO, 32.0 FEET SOUTH OF COUNTY ROAD 153, 4.5 FEET NORTH OF A FENCE LINE, 2.0 FEET NORTH OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) CARRIER DETECTED. DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1147.839	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1147.950	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1236.677	.131		1148.072	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1236.677	.131		1148.072	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -88.733 12B = -88.789 09 = -88.638 03 = -88.628

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 30.42458	92 32 02.92247	592550.095	292931.447	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 30.42462	92 32 02.92316	592550.047	292931.451	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 30.42453	92 32 02.92289	592550.066	292931.442	.033	C	ADJUSTMENT	2003	GPS1839
46 15 30.42453	92 32 02.92289	592550.065	292931.442	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3058638.974	791680.235	1758211.326	16807280.383	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3058638.925	791680.238	1758211.278	16807280.387	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3058638.944	791680.229	1758211.297	16807280.378	.033	C	ADJUSTMENT	2003	GPS1839
3058638.944	791680.229	1758211.297	16807280.378	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/79-DF5957-3S-23APR2007.jpg	S	Apr 23, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/79-DF5957-2-23APR2007.jpg		Apr 23, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/79-DF5957-1-23APR2007.jpg		Apr 23, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 80 MN115 **NGS Name:** 80

County: PINE, MN (Sheet 2)

NGS ACRN: DF5958 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	44 N	18 W	461808.23	923457.94		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 80

5.6 MILES EAST-NORTHEAST OF BRUNO, 1.6 MILES NORTH ALONG COUNTY ROAD 44 FROM THE JUNCTION OF COUNTY ROAD 44 AND COUNTY ROAD 153 (SAND CREEK ROAD) IN BRUNO, 30.0 FEET NORTH OF COUNTY ROAD 44, 4.0 FEET SOUTH OF A POWER POLE, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1200.815	.262		1110.726	.197	2011	GPS - OPUS	2019	GPSBM
			1110.657	.016	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1110.759	.018	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1200.719	.131		1110.880	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1200.719	.131		1110.880	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.088 12B = -90.102 09 = -89.957 03 = -89.901

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 08.22816	92 34 57.94428	580187.755	308865.103	.131	3	GPS - OPUS	2019	GPSBM
46 18 08.22856	92 34 57.94410	580187.768	308865.143	.030		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 08.22858	92 34 57.94458	580187.734	308865.145	.033		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 08.22834	92 34 57.94432	580187.752	308865.121	.033	C	ADJUSTMENT	2003	GPS1839
46 18 08.22834	92 34 57.94432	580187.754	308865.120	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3046008.164	807398.655	1745834.043	16823191.331	.131	3	GPS - OPUS	2019	GPSBM
3046008.176	807398.696	1745834.055	16823191.372	.030		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3046008.142	807398.697	1745834.022	16823191.374	.033		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3046008.161	807398.673	1745834.040	16823191.349	.033	C	ADJUSTMENT	2003	GPS1839
3046008.161	807398.673	1745834.040	16823191.349	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/80-DF5958-3S-23APR2007.jpg	S	Apr 23, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/80-DF5958-2-23APR2007.jpg		Apr 23, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/80-DF5958-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 81 MN115 **NGS Name:** 81

County: PINE, MN (Sheet 2)

NGS ACRN: DF5959 Get Map
NGS Quad / Sta Num : 46092243/
USGS Quad: HOLYOKE SW

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	44 N	17 W	461840.70	922916.12		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 81

10.6 MILES EAST-NORTHEAST OF BRUNO, 4.1 MILES EAST ALONG COUNTY ROAD 154 FROM THE JUNCTION OF COUNTY ROAD 154 AND TRUNK HIGHWAY 23 IN BRUNO, THEN 1.5 MILES SOUTH ON COUNTY ROAD 171, 4.6 MILES EAST-NORTHEAST ON COUNTY ROAD 171, 32.0 FEET EAST OF COUNTY ROAD 171, 4.5 FEET WEST OF A POWER POLE, 2.0 FEET WEST OF A WITNESS POST.

Station Notes

THERE WAS NO INTERNET CONNECTION FOR REAL TIME REFERENCE NETWORK (RTRN).

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1253.902	.262		1164.670	.197	2011	GPS - OPUS	2019	GPSBM
1253.813	.262		1164.581	.197	2011	GPS - OPUS	2019	GPSBM
			1164.588	.019	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1164.693	.020	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1253.869	.131		1164.814	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1253.869	.131		1164.814	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -89.232 12B = -89.278 09 = -89.117 03 = -89.114

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 40.70416	92 29 16.11974	604171.223	312265.158	.131	3	GPS - OPUS	2019	GPSBM
46 18 40.70452	92 29 16.12007	604171.199	312265.194	.131	3	GPS - OPUS	2019	GPSBM
46 18 40.70415	92 29 16.11906	604171.271	312265.157	.036		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 40.70421	92 29 16.11958	604171.234	312265.163	.039		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 40.70400	92 29 16.11932	604171.252	312265.142	.033	C	ADJUSTMENT	2003	GPS1839
46 18 40.70400	92 29 16.11932	604171.252	312265.143	.033	C	GPS - STATIC	2002	HPINE

81 MN115

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3069927.050	811206.969	1769802.714	16826620.587	.131	3	GPS - OPUS	2019	GPSBM
3069927.026	811207.005	1769802.690	16826620.624	.131	3	GPS - OPUS	2019	GPSBM
3069927.098	811206.969	1769802.762	16826620.587	.036		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3069927.062	811206.975	1769802.725	16826620.592	.039		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3069927.080	811206.954	1769802.744	16826620.571	.033	C	ADJUSTMENT	2003	GPS1839
3069927.080	811206.954	1769802.744	16826620.571	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/81-DF5959-3E-22APR2007.jpg	E	Apr 22, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/81-DF5959-2-22APR2007.jpg		Apr 22, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/81-DF5959-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 83 MN115 **NGS Name:** 83

County: PINE, MN (Sheet 2)

NGS ACRN: DF5960 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	45 N	17 W	462438.11	923001.22	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type: CONCRETE MONUMENT (CAST-IN-PLACE)
Disk Type: SURVEY DISK
Mon. Agency: MN-115

Description: (2000) **Stamping:** NO 83

IN NICKERSON, 0.3 MILE SOUTHEAST ALONG MAIN STREET FROM THE JUNCTION OF MAIN STREET AND TRUNK HIGHWAY 23, 67.0 FEET EAST OF MAIN TRACK OF A RAILROAD, 32.0 FEET NORTH OF MAIN STREET, 2.0 FEET SOUTH OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1156.195	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1156.179	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1065.011	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1156.166	.131		1065.136	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2699
1156.166	.131		1065.136	.066	2007	GPS - STATIC	2009	HGARY
1156.166	.131		1065.250	.066	1996	GPS - STATIC	2009	HGARY
1156.146	.262		1065.188	.197	1996	GPS - RTRN	2008	RTRN2008
			1065.136	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1156.166	.131		1065.250	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1156.133	.131		1065.250	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.187 12B = -91.194 09 = -91.020 03 = -90.958

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 38.10826	92 30 01.22180	600823.089	348456.769	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 38.10823	92 30 01.22240	600823.047	348456.766	.033	C	ADJUSTMENT	2010	GPS2699
46 24 38.10823	92 30 01.22240	600823.047	348456.766	.033	C	GPS - STATIC	2009	HGARY
46 24 38.10823	92 30 01.22240	600823.047	348456.766	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 38.10798	92 30 01.22212	600823.066	348456.741	.033	C	GPS - STATIC	2009	HGARY
46 24 38.10783	92 30 01.22259	600823.034	348456.726	.131	3	GPS - RTRN	2008	RTRN2008
46 24 38.10798	92 30 01.22212	600823.066	348456.741	.033	C	ADJUSTMENT	2003	GPS1839
46 24 38.10798	92 30 01.22212	600823.067	348456.741	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3065962.290	847331.377	1766409.463	16862792.068	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3065962.248	847331.373	1766409.421	16862792.065	.033	C	ADJUSTMENT	2010	GPS2699
3065962.248	847331.373	1766409.421	16862792.065	.033	C	GPS - STATIC	2009	HGARY
3065962.248	847331.373	1766409.421	16862792.065	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3065962.269	847331.348	1766409.441	16862792.039	.033	C	GPS - STATIC	2009	HGARY
3065962.236	847331.332	1766409.408	16862792.024	.131	3	GPS - RTRN	2008	RTRN2008
3065962.269	847331.348	1766409.441	16862792.039	.033	C	ADJUSTMENT	2003	GPS1839
3065962.269	847331.348	1766409.441	16862792.039	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/83-DF5960-3NE-22APR2007.jpg	NE	Apr 22, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/83-DF5960-2-22APR2007.jpg		Apr 22, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/83-DF5960-1-22APR2007.jpg		Apr 22, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 84 MN115 **NGS Name:** 84

County: PINE, MN (Sheet 2)

NGS ACRN: DF5961 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	6	45 N	17 W	462504.79	923252.12		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MN-115

Description: (2010) **Stamping:** NO 84

2.35 MILES NORTHWEST OF NICKERSON, 1.9 MILES WEST ALONG COUNTY ROAD 164 (COUNTY LINE ROAD) FROM THE JUNCTION OF COUNTY ROAD 164 AND TRUNK HIGHWAY 23 IN NICKERSON (WHICH IS OPPOSITE OF MAIN STREET), APPROXIMATELY 110.0 FEET EAST OF FIRE NUMBER 2456, 32.0 FEET SOUTH OF COUNTY ROAD 164, 2.0 FEET NORTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.836	.262		1022.344	.197	2011	GPS - OPUS	2020	GPSBM
1113.994	.262		1022.491	.197	2011	GPS - RTRN	2020	RTRN2020
			1022.285	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1113.777	.131		1022.383	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2699
1113.777	.131		1022.383	.066	2007	GPS - STATIC	2009	HGARY
1113.777	.131		1022.505	.066	1996	GPS - STATIC	2009	HGARY
			1022.383	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1113.679	.131		1022.505	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1113.679	.131		1022.505	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.493 12B = -91.499 09 = -91.332 03 = -91.240

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 04.79183	92 32 52.12061	588835.386	351103.472	.131	3	GPS - OPUS	2020	GPSBM
46 25 04.79084	92 32 52.12051	588835.394	351103.372	.131	3	GPS - RTRN	2020	RTRN2020
46 25 04.79211	92 32 52.11998	588835.430	351103.501	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 04.79226	92 32 52.12035	588835.404	351103.515	.033	C	ADJUSTMENT	2010	GPS2699
46 25 04.79226	92 32 52.12035	588835.404	351103.515	.033	C	GPS - STATIC	2009	HGARY
46 25 04.79226	92 32 52.12035	588835.404	351103.515	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 04.79200	92 32 52.12006	588835.424	351103.489	.033	C	GPS - STATIC	2009	HGARY
46 25 04.79200	92 32 52.12006	588835.424	351103.489	.033	C	ADJUSTMENT	2003	GPS1839
46 25 04.79200	92 32 52.12006	588835.423	351103.491	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3053932.817	849772.799	1754423.671	16865422.124	.131	3	GPS - OPUS	2020	GPSBM
3053932.826	849772.699	1754423.678	16865422.023	.131	3	GPS - RTRN	2020	RTRN2020
3053932.860	849772.828	1754423.715	16865422.152	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3053932.834	849772.843	1754423.689	16865422.167	.033	C	ADJUSTMENT	2010	GPS2699
3053932.834	849772.843	1754423.689	16865422.167	.033	C	GPS - STATIC	2009	HGARY
3053932.834	849772.843	1754423.689	16865422.167	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3053932.855	849772.817	1754423.709	16865422.141	.033	C	GPS - STATIC	2009	HGARY
3053932.855	849772.817	1754423.709	16865422.141	.033	C	ADJUSTMENT	2003	GPS1839
3053932.855	849772.817	1754423.709	16865422.141	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/84-DF5961-3S-06MAY2020.jpg	S	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/84-DF5961-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/84-DF5961-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 85 MN115 **NGS Name:** 85

County: PINE, MN (Sheet 2)

NGS ACRN: DF5962 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	19	45 N	17 W	462228.13	923228.99	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2000) **Stamping:** NO 85

0.75 MILE NORTHEAST OF DUQUETTE, 0.45 MILE NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47 IN DUQUETTE, THEN 0.3 MILE EAST ON ERICKSON ROAD, 28.0 FEET SOUTH OF ERICKSON ROAD, 5.0 FEET NORTH OF A POWER POLE, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1158.764	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1158.748	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1158.735	.262		1067.796	.197	2011	GPS - OPUS	2019	GPSBM
			1067.800	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1158.679	.262		1067.977	.197	1996	GPS - RTRN	2008	RTRN2008
			1067.905	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1158.659	.131		1068.026	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1158.659	.131		1068.026	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.941 12B = -90.945 09 = -90.774 03 = -90.702

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 28.13225	92 32 28.98967	590527.618	335239.712	.131	3	GPS - OPUS	2019	GPSBM
46 22 28.13211	92 32 28.98885	590527.676	335239.698	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 28.13219	92 32 28.98934	590527.641	335239.706	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 28.13171	92 32 28.99020	590527.581	335239.657	.131	3	GPS - RTRN	2008	RTRN2008
46 22 28.13194	92 32 28.98911	590527.657	335239.680	.033	C	ADJUSTMENT	2003	GPS1839
46 22 28.13194	92 32 28.98911	590527.658	335239.681	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3055895.221	833942.368	1756135.574	16849567.584	.131	3	GPS - OPUS	2019	GPSBM
3055895.279	833942.355	1756135.631	16849567.569	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3055895.244	833942.363	1756135.597	16849567.577	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3055895.185	833942.313	1756135.537	16849567.528	.131	3	GPS - RTRN	2008	RTRN2008
3055895.261	833942.338	1756135.613	16849567.552	.033	C	ADJUSTMENT	2003	GPS1839
3055895.261	833942.337	1756135.613	16849567.552	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/85-DF5962-3S-22NOV2019.jpg	S	Nov 22, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/85-DF5962-2-22APR2007.jpg		Apr 22, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/85-DF5962-1-22NOV2019.jpg		Nov 22, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 86 MN115 **NGS Name:** 86

County: PINE, MN (Sheet 2)

NGS ACRN: DF5963 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	44 N	18 W	461952.04	923320.31		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MN-115

Description: (2010) **Stamping:** NO 86

2.0 MILES SOUTHEAST OF KERRICK, 2.0 MILES SOUTHEAST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND TRUNK HIGHWAY 23 IN KERRICK, 70.0 FEET EAST OF A DRIVEWAY, 33.0 FEET SOUTH OF COUNTY ROAD 154, 2.0 FEET EAST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1199.246	.262		1108.892	.197	2011	GPS - OPUS	2020	GPSBM
1199.197	.262		1108.843	.197	2011	GPS - OPUS	2020	GPSBM
1199.043	.262		1108.685	.197	2011	GPS - RTRN	2020	RTRN2020
			1108.607	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1108.712	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1198.915	.131		1108.830	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1198.915	.131		1108.830	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.354 12B = -90.354 09 = -90.210 03 = -90.157

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 52.03567	92 33 20.31041	586997.408	319410.018	.131	3	GPS - OPUS	2020	GPSBM
46 19 52.03560	92 33 20.31001	586997.436	319410.011	.131	3	GPS - OPUS	2020	GPSBM
46 19 52.03571	92 33 20.30938	586997.480	319410.022	.131	3	GPS - RTRN	2020	RTRN2020
46 19 52.03627	92 33 20.31006	586997.432	319410.079	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 52.03633	92 33 20.31056	586997.397	319410.085	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 52.03610	92 33 20.31032	586997.414	319410.061	.033	C	ADJUSTMENT	2003	GPS1839
46 19 52.03610	92 33 20.31032	586997.415	319410.060	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3052636.055	818056.842	1752627.227	16833740.328	.131	3	GPS - OPUS	2020	GPSBM
3052636.083	818056.835	1752627.255	16833740.321	.131	3	GPS - OPUS	2020	GPSBM
3052636.127	818056.847	1752627.300	16833740.332	.131	3	GPS - RTRN	2020	RTRN2020
3052636.078	818056.903	1752627.251	16833740.389	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3052636.043	818056.909	1752627.216	16833740.394	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3052636.060	818056.886	1752627.233	16833740.371	.033	C	ADJUSTMENT	2003	GPS1839
3052636.060	818056.886	1752627.233	16833740.371	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/86-DF5963-3S-06MAY2020.jpg	S	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/86-DF5963-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/86-DF5963-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

90 RC

Mn/DOT Name: 90 RC
NGS Name: 90 RC
County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	42 N	16 W	460740.80	921929.60		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2008) **Stamping:** 90 RC 1954 1046

2.8 MILES SOUTH OF CLOVERTON, 2.5 MILES SOUTH ALONG COUNTY ROAD 31 (CLOVERTON ROAD) FROM THE JUNCTION OF COUNTY ROAD 31 AND COUNTY ROAD 32, 157.0 FEET NORTH OF COUNTY ROAD 141, 46.0 FEET WEST OF COUNTY ROAD 31, 36.0 FEET EAST OF THE OLD RAILROAD GRADE.

Station Notes

THE RAILROAD NOW AND THE ALL-TERRAIN VEHICLE (ATV)/ SNOWMOBILE TRAIL TIES GOOD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1046.389	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.486 12B = -86.516 09 = -86.486 03 = -86.443

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/90_RC-3N-16APR2007.jpg	N	Apr 16, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/90_RC-2-16APR2007.jpg		Apr 16, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/90_RC-1-16APR2007.jpg		Apr 16, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

91 RC

Mn/DOT Name: 91 RC
NGS Name: 91 RC
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	42 N	16 W	460532.15	921947.50		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092232/
USGS Quad: DANBURY EAST

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=YES Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2008) **Stamping:** 91 RC 1954 1005

IN MARKVILLE, NEAR THE CENTER OF SECTION 26, 81.0 FEET WEST OF RAILROAD STREET, 36.0 FEET SOUTH OF BERGMAN STREET, 29.5 FEET EAST OF AN ALL-TERRAIN VEHICLE AN ALL-TERRAIN VEHICLE (ATV))/SNOWMOBILE TRAIL IN MARKVILLE, 8.0 FEET WEST OF A POWER POLE. 0.6 FOOT NORTH OF A WITNESS POST.

Station Notes
29.5 FEET EAST OF THE ALL-TERRAIN VEHICLE (ATV)/SNOWMOBILE TRAIL IN MARKVILLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1005.372	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.479 12B = -86.509 09 = -86.512 03 = -86.437

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/91_RC-3S-17APR2007.jpg	S	Apr 17, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/91_RC-2-17APR2007.jpg		Apr 17, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/91_RC-1-17APR2007.jpg		Apr 17, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: 92 RC

NGS Name: 92 RC

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	13	43 N	16 W	461251.00	921848.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** 92 RC 1954 1151

3.2 MILES NORTH OF CLOVERTON, 2.0 MILES SOUTH ALONG COUNTY ROAD 31 (KINGSDALE ROAD), 131.0 FEET SOUTH AND 26.0 FEET EAST OF A NORTH-SOUTH ROAD AT A TEE-ROAD WEST, AT THE FEET OF A STEEP CUT BANK.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1150.555	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.798 12B = -86.827 09 = -86.719 03 = -86.739

*** No Horizontal Positions in the Database ***

Mn/DOT Name: A 155 **NGS Name:** A 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0486 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	44 N	18 W	461929.00	923613.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2003) **Stamping:** A-155 1935

1.4 MILES SOUTHWEST OF KERRICK, 1.4 MILES SOUTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46 (DEERFIELD ROAD), 360.0 FEET SOUTH OF THE STATION 1.0 MILE SIGN, 39.0 FEET EAST OF A RAILROAD, 45.0 FEET WEST OF TRUNK HIGHWAY 23.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1157.147	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1156.737	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1156.737	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.623 12B = -90.636 09 = -90.479 03 = -90.390

*** No Horizontal Positions in the Database ***

Mn/DOT Name: A 158 **NGS Name:** A 158

County: PINE, MN (Sheet 2)

NGS ACRN: RN0511 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	6	45 N	18 W	462504.69	923928.20	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2019	POOR	Horz=NO Vert=NO	YES		PROJECTS 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2008) **Stamping:** A 158 1935

5.6 MILES EAST-SOUTHEAST OF MOOSE LAKE, NEAR THE CARLTON-PINE COUNTY LINE, 3.6 MILES EAST ALONG A COUNTY LINE ROAD FROM THE JUNCTION OF A COUNTY LINE ROAD AND INTERSTATE HIGHWAY 35, 90.0 FEET SOUTH OF COUNTY ROAD 10/48, 30.0 FEET WEST OF WILLOW HAY ROAD, 1.0 FOOT NORTH OF A WITNESS POST.

Station Notes
THE CONCRETE IS BROKEN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1153.315	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1152.921	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1152.921	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1061.743	.013	2011	HORIZONTAL ADJUSTMENT	2014	GPS3014
			1061.747	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1153.475	.131		1061.842	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1153.475	.131		1061.986	.066	1996	GPS - STATIC	2009	HMOOSE
1153.475	.131		1061.842	.066	2007	GPS - STATIC	2009	HMOOSE
			1061.842	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1153.311	.131		1061.966	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1153.311	.131		1061.966	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.703 12B = -91.699 09 = -91.568 03 = -91.430

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 04.68676	92 39 28.19853	561083.881	350989.154	.013		ADJUSTMENT	2014	GPS3014
46 25 04.68690	92 39 28.19843	561083.889	350989.168	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 04.68695	92 39 28.19857	561083.879	350989.173	.033	C	ADJUSTMENT	2009	GPS2566
46 25 04.68695	92 39 28.19857	561083.879	350989.173	.033	C	GPS - STATIC	2009	HMOOSE
46 25 04.68695	92 39 28.19857	561083.879	350989.173	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 04.68681	92 39 28.19925	561083.831	350989.159	.033	C	GPS - STATIC	2009	HMOOSE
46 25 04.68670	92 39 28.19830	561083.898	350989.148	.033	C	ADJUSTMENT	2003	GPS1839
46 25 04.68670	92 39 28.19830	561083.898	350989.147	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3026191.109	849185.141	1726684.790	16865272.190	.013		ADJUSTMENT	2014	GPS3014
3026191.116	849185.155	1726684.797	16865272.205	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3026191.106	849185.160	1726684.787	16865272.210	.033	C	ADJUSTMENT	2009	GPS2566
3026191.106	849185.160	1726684.787	16865272.210	.033	C	GPS - STATIC	2009	HMOOSE
3026191.106	849185.160	1726684.787	16865272.210	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3026191.058	849185.145	1726684.740	16865272.195	.033	C	GPS - STATIC	2009	HMOOSE
3026191.125	849185.135	1726684.806	16865272.184	.033	C	ADJUSTMENT	2003	GPS1839
3026191.125	849185.135	1726684.806	16865272.184	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/A_158-RN0511-3W-09DEC2008.jpg	W	Dec 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/A_158-RN0511-2-09DEC2008.jpg		Dec 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/A_158-RN0511-1-09DEC2008.jpg		Dec 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

A T ROAD

Mn/DOT Name: A T ROAD
NGS Name: A T ROAD
County: PINE, MN (Sheet 2)

NGS ACRN: CO8984 Get Map
NGS Quad / Sta Num : 46093222/
USGS Quad: KROSCHEL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	42 N	21 W	460633.50	930200.80		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
UNKNOWN	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

5.25 MILES NORTHWEST OF FRIESLAND, AT THE NORTH JUNCTION OF COUNTY ROAD 27 AND SJODAHL ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.741 12B = -90.712 09 = -90.617 03 = -90.449

ADOR

Mn/DOT Name: ADOR
NGS Name: ADOR
County: PINE, MN (Sheet 2)

NGS ACRN: DL4719 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	45 N	19 W	462318.92	924646.81	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** ADOR 2008

2.2 MILES EAST-NORTHEAST OF STURGEON LAKE, 1.05 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, AT INTERSTATE HIGHWAY 35 MILEPOINT 210.95, 46.6 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 43.8 FEET NORTHWEST OF A FENCE LINE.

Station Notes
THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1078.863	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1078.859	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1078.840	.262		987.304	.197	2011	GPS - OPUS	2020	GPSBM
1078.846	.262		987.311	.197	2011	GPS - RTRN	2020	RTRN2020
			987.275	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1078.869	.131		987.377	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1078.869	.131		987.511	.066	1996	GPS - STATIC	2009	HMOOSE
1078.869	.131		987.377	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.539 12B = -91.535 09 = -91.430 03 = -91.240

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 18.92321	92 46 46.81312	530368.034	340204.233	.131	3	GPS - OPUS	2020	GPSBM
46 23 18.92294	92 46 46.81233	530368.090	340204.205	.131	3	GPS - RTRN	2020	RTRN2020
46 23 18.92377	92 46 46.81265	530368.067	340204.290	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 18.92386	92 46 46.81344	530368.011	340204.299	.033	C	ADJUSTMENT	2009	GPS2566
46 23 18.92386	92 46 46.81344	530368.011	340204.299	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 18.92365	92 46 46.81343	530368.012	340204.277	.033	C	GPS - STATIC	2009	HMOOSE

ADOR

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995667.803	837879.513	1695996.642	16854452.970	.131	3	GPS - OPUS	2020	GPSBM
2995667.859	837879.487	1695996.698	16854452.942	.131	3	GPS - RTRN	2020	RTRN2020
2995667.835	837879.571	1695996.675	16854453.026	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995667.779	837879.579	1695996.620	16854453.035	.033	C	ADJUSTMENT	2009	GPS2566
2995667.779	837879.579	1695996.620	16854453.035	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995667.781	837879.558	1695996.620	16854453.014	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ADOR-DL4719-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ADOR-DL4719-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ADOR-DL4719-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: AIGG **NGS Name:** AIGG

County: PINE, MN (Sheet 2)

NGS ACRN: DL4721 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	43 N	19 W	461112.58	924751.97	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	SURVEY DISK	MNDT

Description: (2009) **Stamping:** AIGG 2008

1.0 MILE WEST OF ASKOV, 0.5 MILE WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 IN ASKOV, AT TRUNK HIGHWAY 23 MILEPOINT 293.3, 30.0 FEET NORTH OF TRUNK HIGHWAY 23, 10.0 FEET EAST OF A FIELD ENTRANCE, 2.8 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1161.139	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1161.143	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1071.169	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1161.153	.131		1071.258	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1161.153	.131		1071.399	.066	1996	GPS - STATIC	2009	HASKO
1161.153	.131		1071.258	.066	2007	GPS - STATIC	2009	HASKO
1161.218	.131		1071.258	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1161.218	.131		1071.399	.066	1996	GPS - STATIC	2009	HMOOSE
1161.218	.131		1071.258	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.006 12B = -90.036 09 = -89.905 03 = -89.813

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.58021	92 47 51.96823	525894.982	266614.202	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.58025	92 47 51.96900	525894.928	266614.206	.033	C	ADJUSTMENT	2010	GPS2619
46 11 12.58025	92 47 51.96900	525894.928	266614.206	.033	C	GPS - STATIC	2009	HASKO
46 11 12.58025	92 47 51.96900	525894.928	266614.206	.033	C	ADJUSTMENT	2009	GPS2566
46 11 12.58025	92 47 51.96900	525894.928	266614.206	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.58013	92 47 51.96872	525894.947	266614.194	.033	C	GPS - STATIC	2009	HASKO
46 11 12.58013	92 47 51.96872	525894.947	266614.194	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2992450.497	764233.265	1691618.759	16780890.195	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2992450.443	764233.267	1691618.705	16780890.199	.033	C	ADJUSTMENT	2010	GPS2619
2992450.443	764233.267	1691618.705	16780890.199	.033	C	GPS - STATIC	2009	HASKO
2992450.443	764233.267	1691618.705	16780890.199	.033	C	ADJUSTMENT	2009	GPS2566
2992450.443	764233.267	1691618.705	16780890.199	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2992450.463	764233.256	1691618.725	16780890.187	.033	C	GPS - STATIC	2009	HASKO
2992450.463	764233.256	1691618.725	16780890.187	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AIGG-DL4721-3N-08JUN2009.jpg	N	Jun 8, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AIGG-DL4721-2-08JUN2009.jpg		Jun 8, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AIGG-DL4721-1-08JUN2009.jpg		Jun 8, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AMES MNDT

Mn/DOT Name: AMES MNDT **NGS Name:** AMES

County: PINE, MN (Sheet 2)

NGS ACRN: RN0553 Get Map
NGS Quad / Sta Num : 46092331/1051
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	2	43 N	20 W	461437.16	924935.93	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2020	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** AMES 1966

2.2 MILES SOUTHEAST OF RUTLEDGE, 5.2 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN THE WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 200.25, AT INTERSTATE HIGHWAY 35 STATION 2049+38, 1.0 MILE SOUTH OF COUNTY ROAD 33, 134.35 FEET WEST OF AMES MNDT RM 1, 74.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 47.7 FEET SOUTH OF AMES MNDT RM 2, 6.2 FEET WEST-SOUTHWEST OF A WITNESS POST.

Station Notes

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.578	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1094.578	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1094.578	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.161	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1094.161	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1094.161	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1094.191	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.660	.262		1003.935	.197	2011	GPS - RTRN	2020	RTRN2020
			1003.896	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1094.584	.131		1003.994	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1094.584	.131		1004.102	.066	1996	GPS - STATIC	2009	HMOOSE
1094.584	.131		1003.994	.066	2007	GPS - STATIC	2009	HMOOSE
1094.506	.262		1004.040	.197	1996	GPS - RTRN	2008	RTRN2008
1094.489	.262		1004.024	.197	1996	GPS - RTRN	2008	RTRN2008
			1003.974	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1004.112	.066	1996	GPS - STATIC	1999	GPS917
1094.584	.131		1004.112	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.718 12B = -90.725 09 = -90.603 03 = -90.466

AMES MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.15562	92 49 35.92823	518561.173	287330.707	.131	3	GPS - RTRN	2020	RTRN2020
46 14 37.15600	92 49 35.92853	518561.152	287330.746	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.15595	92 49 35.92938	518561.092	287330.741	.033	C	ADJUSTMENT	2009	GPS2566
46 14 37.15595	92 49 35.92938	518561.092	287330.741	.033	C	GPS - STATIC	2009	HMOOSE
46 14 37.15626	92 49 35.92947	518561.086	287330.772	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.15575	92 49 35.92915	518561.109	287330.721	.033	C	GPS - STATIC	2009	HMOOSE
46 14 37.15788	92 49 35.92936	518561.093	287330.936	.131	3	GPS - RTRN	2008	RTRN2008
46 14 37.15626	92 49 35.92832	518561.167	287330.772	.131	3	GPS - RTRN	2008	RTRN2008
46 14 37.15585	92 49 35.92933	518561.095	287330.731	.033	C	GPS - STATIC	1999	GPS917
46 14 37.15585	92 49 35.92933	518561.096	287330.731	.033	C	ADJUSTMENT	1999	17648
46 14 37.14639	92 49 35.92418	518561.459	287329.773	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.15016	92 49 35.92257	518561.571	287330.154	.033	C	GPS - STATIC	1994	HI35N
46 14 37.14632	92 49 35.92411	518561.464	287329.766	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.33700	92 49 35.21300			.100	2	CLASSICAL SURVEY	1982	17020
46 14 37.33668	92 49 35.21272			.100	C	CLASSICAL SURVEY	1950	UNK

AMES MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984765.503	784819.234	1684262.059	16801588.254	.131	3	GPS - RTRN	2020	RTRN2020
2984765.481	784819.272	1684262.038	16801588.293	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984765.421	784819.266	1684261.979	16801588.288	.033	C	ADJUSTMENT	2009	GPS2566
2984765.421	784819.266	1684261.979	16801588.288	.033	C	GPS - STATIC	2009	HMOOSE
2984765.414	784819.297	1684261.972	16801588.319	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984765.438	784819.246	1684261.995	16801588.267	.033	C	GPS - STATIC	2009	HMOOSE
2984765.419	784819.462	1684261.980	16801588.483	.131	3	GPS - RTRN	2008	RTRN2008
2984765.495	784819.299	1684262.053	16801588.319	.131	3	GPS - RTRN	2008	RTRN2008
2984765.425	784819.256	1684261.982	16801588.278	.033	C	GPS - STATIC	1999	GPS917
2984765.425	784819.256	1684261.982	16801588.277	.033	C	ADJUSTMENT	1999	17648
2984765.804	784818.304	1684262.346	16801587.320	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984765.910	784818.688	1684262.458	16801587.702	.033	C	GPS - STATIC	1994	HI35N
2984765.809	784818.297	1684262.351	16801587.313	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2360159.686	456752.182			.100	2	CLASSICAL SURVEY	1982	17020
2360159.700	456752.150			.100	C	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES-RN0553-3W-07MAY2020.jpg	W	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES-RN0553-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES-RN0553-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AMES MNDT RM 1

Mn/DOT Name: AMES MNDT RM 1 **NGS Name:** AMES RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0555 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	2	43 N	20 W	461438.48	924936.02	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1966) **Stamping:** AMES NO 1 1966

2.2 MILES SOUTHEAST OF RUTLEDGE, 5.2 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 200.25, 1.0 MILE SOUTH OF COUNTY ROAD 33, 144.5 FEET SOUTHEAST OF AMES MNDT RM 2, 134.35 FEET EAST OF STATION AMES MNDT, 128.7 FEET EAST OF A WITNESS POST, 60.2 FEET EAST OF THE SOUTHBOUND INTERSTATE HIGHWAY 35, 2.4 FEET WEST OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) (TREES).

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.699	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1094.699	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1094.660	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.243	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1094.243	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1094.243	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1094.273	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.653	.262		1004.188	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.718 12B = -90.725 09 = -90.600 03 = -90.466

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.16128	92 49 34.01802	518695.438	287331.405	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984899.719	784822.220	1684396.264	16801589.121	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES_RM_1-RN0555-3E-17NOV2008.jpg	E	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES_RM_1-RN0555-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES_RM_1-RN0555-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AMES MNDT RM 2

Mn/DOT Name: AMES MNDT RM 2 **NGS Name:** AMES RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0554 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	2	43 N	20 W	461437.16	924935.25	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2008) **Stamping:** AMES NO 2 1966

2.2 MILES SOUTHEAST OF RUTLEDGE, 5.2 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 200.25, 2.4 MILES SOUTHEAST OF RUTLEDGE, 1.0 MILE SOUTH OF COUNTY ROAD 33, 144.5 FEET NORTHWEST OF AMES MNDT RM 1.77 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 47.7 FEET NORTH OF STATION AMES MNDT, 46.5 FEET NORTH OF A 6.0 INCH DIAMETER OAK TREE, 22.2 FEET EAST OF A FENCE, 2.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.538	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1094.538	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1094.538	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.125	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1094.125	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1094.125	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1094.155	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.420	.262		1003.951	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.722 12B = -90.725 09 = -90.603 03 = -90.466

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 37.62671	92 49 35.96107	518558.821	287378.430	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984762.337	784866.903	1684259.648	16801635.952	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES_RM_2-RN0554-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES_RM_2-RN0554-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AMES_RM_2-RN0554-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

ANDREWS

Mn/DOT Name: ANDREWS
NGS Name: ANDREWS
County: PINE, MN (Sheet 2)

NGS ACRN: DL4723 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	45 N	20 W	462110.60	924823.52	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** ANDREWS 2008

3.0 MILES NORTH-NORTHEAST OF WILLOW RIVER, 2.95 MILES NORTH-NORTHEAST ALONG INTERSTATE 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 208.15, 200.0 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 52.0 FEET NORTHWEST OF THE NORTHBOUND INTERSTATE HIGHWAY 35, 2.7 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1082.353	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1082.357	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1082.337	.262		990.972	.197	2011	GPS - OPUS	2020	GPSBM
1082.390	.262		991.035	.197	2011	GPS - RTRN	2020	RTRN2020
			990.976	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1082.347	.131		991.071	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1082.347	.131		991.189	.066	1996	GPS - STATIC	2009	HMOOSE
1082.347	.131		991.071	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.365 12B = -91.355 09 = -91.250 03 = -91.082

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 10.59527	92 48 23.51542	523604.117	327194.334	.131	3	GPS - OPUS	2020	GPSBM
46 21 10.59476	92 48 23.51457	523604.177	327194.282	.131	3	GPS - RTRN	2020	RTRN2020
46 21 10.59527	92 48 23.51528	523604.127	327194.334	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 10.59521	92 48 23.51610	523604.070	327194.328	.033	C	ADJUSTMENT	2009	GPS2566
46 21 10.59521	92 48 23.51610	523604.070	327194.328	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 10.59484	92 48 23.51606	523604.072	327194.290	.033	C	GPS - STATIC	2009	HMOOSE

ANDREWS

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2989127.554	824757.936	1689252.307	16841440.383	.131	3	GPS - OPUS	2020	GPSBM
2989127.615	824757.886	1689252.367	16841440.331	.131	3	GPS - RTRN	2020	RTRN2020
2989127.564	824757.936	1689252.317	16841440.383	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2989127.507	824757.929	1689252.259	16841440.377	.033	C	ADJUSTMENT	2009	GPS2566
2989127.507	824757.929	1689252.259	16841440.377	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2989127.510	824757.892	1689252.262	16841440.339	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ANDREWS-DL4723-3NW-07MAY2020.jpg	NW	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ANDREWS-DL4723-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ANDREWS-DL4723-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

ASKOV

Mn/DOT Name: ASKOV **NGS Name:** ASKOV

County: PINE, MN (Sheet 2)

NGS ACRN: RN1619 Get Map
NGS Quad / Sta Num : 46092324/1011
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	43 N	19 W	461428.47	924314.70	2	1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (2007) **Stamping:** ASKOV 1952

5.0 MILES SOUTHWEST OF BRUNO, 3.35 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 IN BRUNO, TO TRUNK HIGHWAY 23 MILEPOINT 299.20, THEN 0.25 MILE SOUTH ON ELWELL ROAD (ENTRANCE NUMBER 70707, FIRE NUMBER 70707), 38.65 FEET WEST-NORTHWEST OF THE ASKOV LOOKOUT TOWER, 38.0 FEET NORTHWEST OF THE SOUTHWEST LEG OF A TOWER, 24.0 FEET WEST-NORTHWEST OF THE NORTHWEST LEG OF A TOWER, 65.69 FEET WEST OF ASKOV RM 1, 80.43 FEET NORTH-NORTHWEST OF ASKOV RM 2, 10.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1271.913	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1271.920	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1271.477	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1272.963	.131		1183.023	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.210 12B = -90.246 09 = -90.118 03 = -89.993

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 28.47367	92 43 14.70032	545359.010	286493.720	.033	1	ADJUSTMENT	1999	17648
46 14 28.46781	92 43 14.69396	545359.458	286493.128	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 28.46715	92 43 14.69346	545359.494	286493.061	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position				Project Info				
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 28.66000	92 43 13.98600			.100	1	CLASSICAL SURVEY	1954	10724

ASKOV

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3011570.408	784439.332	1711049.065	16800785.524	.033	1	ADJUSTMENT	1999	17648
3011570.866	784438.747	1711049.514	16800784.932	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3011570.902	784438.681	1711049.550	16800784.866	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2386965.306	456372.867			.100	1	CLASSICAL SURVEY	1954	10724

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV-RN1619-3NW-09OCT2008.jpg	NW	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV-RN1619-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV-RN1619-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

ASKOV AZ MK

Mn/DOT Name: ASKOV AZ MK **NGS Name:** ASKOV AZ MK

County: PINE, MN (Sheet 2)

NGS ACRN: RN1620 Get Map
NGS Quad / Sta Num : 46092324/1011
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	43 N	19 W	461439.10	924312.44		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
UNKNOWN	TRIANGULATION STATION DISK	NGS

Description: (2003) **Stamping:** ASKOV 1952

5.0 MILES SOUTHWEST OF BRUNO, 3.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 IN BRUNO, THEN 0.35 MILE WEST ON COUNTY ROAD 149 THEN 150.0 FEET SOUTH ON A GRAVEL ROAD, 0.25 MILE NORTH OF THE ASKOV LOOKOUT TOWER, 22.0 FEET WEST OF A ROAD, 18.0 FEET NORTHWEST OF A TELEPHONE POLE, 3.0 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1215.700	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1217.517	.197		1127.544	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.246 12B = -90.282 09 = -90.151 03 = -90.023

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 39.10132	92 43 12.43680	545515.681	287570.721	.066	2	ADJUSTMENT	1999	17648
46 14 39.09604	92 43 12.43033	545516.137	287570.187	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 39.09539	92 43 12.42982	545516.173	287570.122	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 39.28613	92 43 11.72261			.100	2	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3011708.672	785518.715	1711204.303	16801862.248	.066	2	ADJUSTMENT	1999	17648
3011709.137	785518.189	1711204.760	16801861.715	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3011709.174	785518.124	1711204.796	16801861.649	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2387103.567	457452.090			.100	2	CLASSICAL SURVEY	1977	15955

ASKOV BETHLEHEM LUTHERAN CH

Mn/DOT Name: ASKOV BETHLEHEM LUTHERAN CH **NGS Name:** ASKOV BETHLEHEM LUTHERAN CH

County: PINE, MN (Sheet 2)

NGS ACRN: RN1624 Get Map
NGS Quad / Sta Num : 46092331/1022
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	20	43 N	19 W	461117.02	924641.03		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=NO	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
BLANK	CHURCH CROSS	NGS

Description: (1952)

Stamping:

IN ASKOV, 0.2 MILE EAST ALONG BREGNEDALGADE STREET FROM THE JUNCTION OF BREGNEDLAGADE STREET AND COUNTY ROAD 66, 1.5 BLOCKS EAST OF THE RAILROAD DEPOT, IN THE SOUTHEAST CORNER OF THE JUNCTION OF FERNOALR STREET AND CHURCH AVENUE.

Station Notes

IN 10-09-2008 IT WAS DETERMINED THAT THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.908 12B = -89.941 09 = -89.810 03 = -89.721

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 17.01998	92 46 41.03124	530885.467	267071.004	.328	4	ADJUSTMENT	1999	17648
46 11 17.01532	92 46 41.02368	530886.000	267070.532	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 17.01511	92 46 41.02361	530886.004	267070.511	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 17.20500	92 46 40.31400			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2997431.875	764775.022	1696606.463	16781353.091	.328	4	ADJUSTMENT	1999	17648
2997432.416	764774.560	1696606.996	16781352.620	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2997432.421	764774.539	1696607.001	16781352.599	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2372826.603	436708.493			.100	4	CLASSICAL SURVEY	1954	10724

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_BETHLEHEM_LUTHERAN_CH-RN1624-3SE-09OCT2008.jpg	SE	Oct 9, 2008
Monument:			
Disk:			

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

ASKOV LOT

Mn/DOT Name: ASKOV LOT
NGS Name: ASKOV LOOKOUT TOWER
County: PINE, MN (Sheet 2)

NGS ACRN: RN1618 Get Map
NGS Quad / Sta Num : 46092324/1023
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	43 N	19 W	461428.28	924314.22		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	LOOKOUT TOWER	NGS

Description: (1974)

Stamping:

5.0 MILES SOUTHWEST OF BRUNO, 3.3 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43, THEN 0.3 MILE EAST ALONG COUNTY ROAD 149, THEN 0.2 MILE SOUTH ON ELWELL ROAD, 38.65 FEET EAST-SOUTHEAST OF STATION ASKOV.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1272.963	.328		1183.023	.328	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.210 12B = -90.246 09 = -90.115 03 = -89.990

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 28.28458	92 43 14.22268	545392.627	286474.640	.328	4	ADJUSTMENT	1999	17648
46 14 28.28077	92 43 14.21460	545393.196	286474.255	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 28.28011	92 43 14.21411	545393.230	286474.189	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 28.47500	92 43 13.50400			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3011604.341	784420.830	1711082.692	16800766.495	.328	4	ADJUSTMENT	1999	17648
3011604.916	784420.455	1711083.261	16800766.111	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3011604.952	784420.389	1711083.296	16800766.045	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2386999.539	456354.786			.100	4	CLASSICAL SURVEY	1954	10724

ASKOV RM 1

Mn/DOT Name: ASKOV RM 1 **NGS Name:** ASKOV RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ1813 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	43 N	19 W	461428.50	924313.77	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2007) **Stamping:** ASKOV NO 1 1952

5.0 MILES SOUTHWEST OF BRUNO, 3.35 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 IN BRUNO, TO TRUNK HIGHWAY 23 MILEPOINT 299.20, THEN 0.35 MILE WEST ON COUNTY ROAD 149, THEN 0.25 MILE SOUTH ON ELWELL ROAD (ENTRANCE NUMBER 70707, FIRE NUMBER 70707), 65.69 FEET EAST OF STATION ASKOV, 26.3 FEET NORTH-NORTHEAST OF THE NORTHEAST LEG OF THE ASKOV LOOKOUT TOWER, 18.6 FEET WEST-NORTHWEST OF THE NORTHWEST CORNER OF A TELEPHONE PEDESTAL, BOX NUMBER A361, 1.0 FOOT SOUTHWEST OF A WITNESS POST.

Station Notes

IN 10-09-2008 IT WAS DETERMINED THAT THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1270.365	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1270.368	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1270.237	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.210 12B = -90.246 09 = -90.115 03 = -89.990

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_RM_1-CJ1813-3N-09OCT2008.jpg	N	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_RM_1-CJ1813-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_RM_1-CJ1813-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

ASKOV RM 2

Mn/DOT Name: ASKOV RM 2 **NGS Name:** ASKOV RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ1814 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	3	43 N	19 W	461427.74	924314.25	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2007) **Stamping:** ASKOV NO 2 1952

5.0 MILES SOUTHWEST OF BRUNO, 3.35 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 IN BRUNO, TO TRUNK HIGHWAY 23 MILEPOINT 299.20, THEN 0.35 MILE WEST ON COUNTY ROAD 149, THEN 0.25 MILE SOUTH ON ELWELL ROAD (ENTRANCE NUMBER 70707, FIRE NO. 70707), 80.43 FEET SOUTH-SOUTHWEST OF STATION ASKOV, 44.9 FEET SOUTH-SOUTHEAST OF THE SOUTHWEST LEG OF A FIRE TOWER, 47.2 FEET SOUTH OF SOUTHEAST LEG OF A FIRE TOWER, 1.1 FEET NORTHEAST OF A WITNESS POST.

Station Notes

IN 10-09-2008 IT WAS DETERMINED THAT THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1268.515	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1268.521	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Geoid Separations(ft): GEOID18 = -90.210 12B = -90.246 09 = -90.115 03 = -89.990

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_RM_2-CJ1814-3S-09OCT2008.jpg	S	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_RM_2-CJ1814-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ASKOV_RM_2-CJ1814-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AYERS MNDT

Mn/DOT Name: AYERS MNDT **NGS Name:** AYERS

County: PINE, MN (Sheet 2)

NGS ACRN: RN0559 Get Map
NGS Quad / Sta Num : 46092331/1049
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	43 N	20 W	461337.35	924942.74	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1995) **Stamping:** AYERS 1966

3.0 MILES SOUTHEAST OF RUTLEDGE, 6.5 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 199.2, AT INTERSTATE HIGHWAY 35 STATION 1987+45, 2.2 MILES SOUTH OF COUNTY ROAD 33, 129.08 FEET EAST OF AYERS MNDT RM 2, 62.08 FEET SOUTH OF AYERS MNDT RM 1, 52.0 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 5.0 FEET WEST OF A WITNESS POST.

Station Notes

THERE IS A LINE OF TREES 50.0 FEET EAST (GPS IN WINTER).

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.678	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1062.675	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1062.636	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.239	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1062.239	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1062.239	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1062.268	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.554	.262		971.980	.197	2011	GPS - OPUS	2020	GPSBM
1062.646	.262		972.068	.197	2011	GPS - RTRN	2020	RTRN2020
			972.137	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1062.662	.131		972.196	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1062.662	.131		972.304	.066	1996	GPS - STATIC	2009	HMOOSE
1062.662	.131		972.196	.066	2007	GPS - STATIC	2009	HMOOSE
1062.609	.262		972.278	.197	1996	GPS - RTRN	2008	RTRN2008
			972.196	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1062.629	.131		972.304	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1062.629	.131		972.304	.066	1996	GPS - STATIC	2002	HPINE
1062.629	.131		972.304	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1062.629	.131		972.304	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899
1062.636	.131		972.304	.066	1996	GPS - STATIC	1997	GPS805-C

Geoid Separations(ft): GEOID18 = -90.574 12B = -90.577 09 = -90.459 03 = -90.331

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 37.35487	92 49 42.74047	518087.794	281272.110	.131	3	GPS - OPUS	2020	GPSBM
46 13 37.35465	92 49 42.73983	518087.839	281272.088	.131	3	GPS - RTRN	2020	RTRN2020
46 13 37.35486	92 49 42.74013	518087.818	281272.109	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 37.35468	92 49 42.74106	518087.753	281272.091	.033	C	ADJUSTMENT	2009	GPS2566
46 13 37.35468	92 49 42.74106	518087.753	281272.091	.033	C	GPS - STATIC	2009	HMOOSE
46 13 37.35468	92 49 42.74106	518087.753	281272.091	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 37.35465	92 49 42.74081	518087.770	281272.088	.033	C	GPS - STATIC	2009	HMOOSE
46 13 37.35545	92 49 42.74143	518087.727	281272.169	.131	3	GPS - RTRN	2008	RTRN2008
46 13 37.35465	92 49 42.74081	518087.770	281272.088	.033	C	ADJUSTMENT	2003	GPS1839
46 13 37.35465	92 49 42.74081	518087.770	281272.088	.033	C	GPS - STATIC	2002	HPINE
46 13 37.35465	92 49 42.74081	518087.770	281272.088	.033	C	ADJUSTMENT	1999	17648
46 13 37.35465	92 49 42.74081	518087.770	281272.088	.033	C	ADJUSTMENT	1998	GPS899
46 13 37.35465	92 49 42.74081	518087.770	281272.088	.033	C	GPS - STATIC	1997	GPS805-C
46 13 37.34486	92 49 42.73649	518088.075	281271.097	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 37.34900	92 49 42.73381	518088.262	281271.518	.033	C	GPS - STATIC	1994	HI35N
46 13 37.34485	92 49 42.73641	518088.081	281271.096	.066	2	GPS - STATIC	1991	HFIN
46 13 37.34485	92 49 42.73641	518088.081	281271.096	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 37.53419	92 49 42.02544			.100	2	CLASSICAL SURVEY	1982	17020

AYERS MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984395.522	778754.192	1683796.539	16795531.755	.131	3	GPS - OPUS	2020	GPSBM
2984395.568	778754.171	1683796.584	16795531.733	.131	3	GPS - RTRN	2020	RTRN2020
2984395.546	778754.192	1683796.563	16795531.754	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984395.481	778754.172	1683796.498	16795531.736	.033	C	ADJUSTMENT	2009	GPS2566
2984395.481	778754.172	1683796.498	16795531.736	.033	C	GPS - STATIC	2009	HMOOSE
2984395.481	778754.172	1683796.498	16795531.736	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984395.499	778754.170	1683796.515	16795531.733	.033	C	GPS - STATIC	2009	HMOOSE
2984395.453	778754.250	1683796.471	16795531.814	.131	3	GPS - RTRN	2008	RTRN2008
2984395.499	778754.170	1683796.515	16795531.733	.033	C	ADJUSTMENT	2003	GPS1839
2984395.499	778754.170	1683796.515	16795531.733	.033	C	GPS - STATIC	2002	HPINE
2984395.499	778754.170	1683796.515	16795531.733	.033	C	ADJUSTMENT	1999	17648
2984395.499	778754.170	1683796.515	16795531.733	.033	C	ADJUSTMENT	1998	GPS899
2984395.499	778754.170	1683796.515	16795531.733	.033	C	GPS - STATIC	1997	GPS805-C
2984395.820	778753.184	1683796.821	16795530.743	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984396.001	778753.606	1683797.008	16795531.162	.033	C	GPS - STATIC	1994	HI35N
2984395.826	778753.183	1683796.827	16795530.742	.066	2	GPS - STATIC	1991	HFIN
2984395.826	778753.183	1683796.827	16795530.742	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2359789.696	450686.964			.100	2	CLASSICAL SURVEY	1982	17020

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS-RN0559-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS-RN0559-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS-RN0559-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AYERS MNDT AZ MK

Mn/DOT Name: AYERS MNDT AZ MK
NGS Name: AYERS AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0557 Get Map
NGS Quad / Sta Num : 46092331/1050
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	43 N	20 W	461409.25	924934.06	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2009) **Stamping:** AYERS 1966

2.4 MILES SOUTHEAST OF RUTLEDGE, 5.9 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT THE WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 199.75, AT INTERSTATE HIGHWAY 35 STATION 2021+28, 1.6 MILES SOUTH OF COUNTY ROAD 33, 67.6 FEET EAST OF THE SOUTHBOUND INTERSTATE HIGHWAY 35, 3.4 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1070.316	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1070.316	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1070.316	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1069.909	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1069.909	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1069.942	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1070.306	.197		979.919	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.646 12B = -90.653 09 = -90.535 03 = -90.400

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 09.24518	92 49 34.06314	518694.893	284503.337	.066	2	ADJUSTMENT	1999	17648
46 14 09.23532	92 49 34.05831	518695.233	284502.339	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 09.23528	92 49 34.05824	518695.238	284502.335	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position				Project Info				
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 09.42500	92 49 33.34700			.100	2	CLASSICAL SURVEY	1982	17020
46 14 09.42511	92 49 33.34729			.100	2	CLASSICAL SURVEY	1950	UNK

AYERS MNDT AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984947.380	781994.902	1684399.289	16798762.312	.066	2	ADJUSTMENT	1999	17648
2984947.738	781993.910	1684399.631	16798761.314	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984947.743	781993.906	1684399.636	16798761.310	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2360341.642	453927.710			.100	2	CLASSICAL SURVEY	1982	17020
2360341.620	453927.720			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_AZ_MK-RN0557-3E-17NOV2008.jpg	E	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_AZ_MK-RN0557-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_AZ_MK-RN0557-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AYERS MNDT RM 1

Mn/DOT Name: AYERS MNDT RM 1 **NGS Name:** AYERS RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0558 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	43 N	20 W	461337.95	924942.51	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 6 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2008) **Stamping:** AYERS NO 1 1966

2.9 MILES SOUTHEAST OF RUTLEDGE, 6.4 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT THE WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 199.1, AT INTERSTATE HIGHWAY 35 STATION 1993+01, 2.1 MILES SOUTH OF COUNTY ROAD 33, 140.5 FEET NORTH-NORTHEAST OF AYERS MNDT RM 2, 62.08 FEET NORTH OF STATION AYERS MNDT, 54.2 FEET EAST OF THE SOUTHBOUND INTERSTATE HIGHWAY 35, 2.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.636	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1062.632	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1062.193	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.796	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1061.796	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1061.796	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1061.829	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.501	.262		972.167	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.574 12B = -90.581 09 = -90.459 03 = -90.334

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 37.94671	92 49 42.51192	518103.810	281332.082	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984410.511	778814.420	1683812.472	16795591.720	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_RM_1-RN0558-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_RM_1-RN0558-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_RM_1-RN0558-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

AYERS MNDT RM 2

Mn/DOT Name: AYERS MNDT RM 2 **NGS Name:** AYERS RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0560 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	43 N	20 W	461337.74	924944.49	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1966) **Stamping:** AYERS NO 2 1966

3.0 MILES SOUTHEAST OF RUTLEDGE, 6.5 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT THE WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 199.2, AT INTERSTATE HIGHWAY 35 STATION 1987+45, 2.2 MILES SOUTH OF COUNTY ROAD 33, 140.5 FEET SOUTH-SOUTHWEST OF AYERS MNDT RM 1, 129.08 FEET WEST OF STATION AYERS MNDT, 76.2 FEET WEST OF THE SOUTHBOUND INTERSTATE HIGHWAY 35, 62.08 FEET SOUTH OF AYERS MNDT RM 1, 22.8 FEET EAST OF A FENCE, 1.4 FEET WEST OF A WITNESS POST.

Station Notes
THERE IS NO REAL TIME REFERENCE NETWORK (RTRN) POSITION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.875	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1062.872	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1062.878	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.485	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1062.485	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1062.485	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1062.514	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.577 12B = -90.581 09 = -90.462 03 = -90.334

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_RM_2-RN0560-3W-13NOV2008.jpg	W	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_RM_2-RN0560-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/AYERS_RM_2-RN0560-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: B 154 **NGS Name:** B 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0443 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	12	45 N	20 W	462338.00	924848.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1970) **Stamping:** B 154 1935

1.0 MILE NORTH OF STURGEON LAKE, 1.0 MILE NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 46E IN STURGEON LAKE, 69.0 FEET SOUTH OF THE STATION 1.0 MILE SIGN, 84.0 FEET NORTH OF A RAILROAD MILEPOST NUMBER 103, 30.0 FEET EAST OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.188	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.771	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1094.771	.007	1				VERTICAL CONTROL SURVEY	1935	L30 MINN

Geoid Separations(ft): GEOID18 = -91.535 12B = -91.522 09 = -91.424 03 = -91.237

*** No Horizontal Positions in the Database ***

B 155

Mn/DOT Name: B 155 **NGS Name:** B 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0487 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	35	45 N	18 W	462024.00	923509.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2002) **Stamping:** B 155 1935

AT THE RAILROAD STATION AT KERRICK, 60.0 FEET EAST OF THE RAILROAD TRACKS, PULLED THE TIES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1178.144	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1177.731	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1177.731	.016	2				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.728 12B = -90.738 09 = -90.577 03 = -90.495

*** No Horizontal Positions in the Database ***

Mn/DOT Name: B 158 **NGS Name:** B 158

County: PINE, MN (Sheet 2)

NGS ACRN: RN0512 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	45 N	18 W	462321.00	923923.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** B 158 1935

5.1 MILES NORTHWEST OF DUQUETTE, 5.3 MILES WEST ALONG COUNTY ROAD 47 (OAK LEAF ROAD) FROM THE JUNCTION OF COUNTY ROAD 47 AND TRUNK HIGHWAY 23, THEN 1.0 MILE NORTH ON COUNTY ROAD 49 (WILLOW HAY ROAD), 51.0 FEET SOUTH AND 39.0 FEET EAST OF THE JUNCTION OF COUNTY ROAD 49 AND TOWNSHIP ROAD WEST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1112.645	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1112.248	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1112.248	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.516 12B = -91.525 09 = -91.381 03 = -91.247

*** No Horizontal Positions in the Database ***

BALUT

Mn/DOT Name: BALUT **NGS Name:** BALUT

County: PINE, MN (Sheet 2)

NGS ACRN: DL4724 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	17	42 N	20 W	460730.99	925317.87	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** BALUT 2008

0.6 MILE WEST OF SANDSTONE, AT THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 191.70, 120.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 30.2 FEET NORTH OF TRUNK HIGHWAY 23 (COUNTY ROAD 61), 1.2 FEET SOUTH OF A WITNESS POST.

Station Pair: BUGA MNDT - PINE, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.005	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1091.005	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1091.005	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1091.005	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO
1091.005	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1090.976	.262		1000.871	.197	2011	GPS - OPUS	2020	GPSBM
1091.100	.262		1000.989	.197	2011	GPS - RTRN	2020	RTRN2020
1090.976	.262		1000.864	.197	2011	GPS - RTRN	2017	RTRN2017
			1000.894	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1091.008	.131		1000.995	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1091.008	.131		1001.133	.066	1996	GPS - STATIC	2009	HASKO
1091.008	.131		1000.995	.066	2007	GPS - STATIC	2009	HASKO
1091.008	.131		1000.995	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1091.008	.131		1001.133	.066	1996	GPS - STATIC	2009	HMOOSE
1091.008	.131		1000.995	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.105 12B = -90.111 09 = -90.010 03 = -89.878

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 30.98964	92 53 17.87467	502967.272	244149.745	.131	3	GPS - OPUS	2020	GPSBM
46 07 30.98990	92 53 17.87455	502967.280	244149.771	.131	3	GPS - RTRN	2020	RTRN2020
46 07 30.99009	92 53 17.87343	502967.359	244149.791	.131	3	GPS - RTRN	2017	RTRN2017
46 07 30.98968	92 53 17.87460	502967.277	244149.749	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 30.98979	92 53 17.87552	502967.212	244149.760	.033	C	ADJUSTMENT	2010	GPS2619
46 07 30.98979	92 53 17.87552	502967.212	244149.760	.033	C	GPS - STATIC	2009	HASKO
46 07 30.98979	92 53 17.87552	502967.212	244149.760	.033	C	ADJUSTMENT	2009	GPS2566
46 07 30.98979	92 53 17.87552	502967.212	244149.760	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 30.98976	92 53 17.87508	502967.243	244149.757	.033	C	GPS - STATIC	2009	HASKO
46 07 30.98976	92 53 17.87508	502967.243	244149.757	.033	C	GPS - STATIC	2009	HMOOSE

BALUT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969911.691	741383.893	1668729.482	16758406.803	.131	3	GPS - OPUS	2020	GPSBM
2969911.699	741383.919	1668729.490	16758406.830	.131	3	GPS - RTRN	2020	RTRN2020
2969911.777	741383.940	1668729.569	16758406.849	.131	3	GPS - RTRN	2017	RTRN2017
2969911.696	741383.897	1668729.487	16758406.808	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969911.631	741383.907	1668729.422	16758406.819	.033	C	ADJUSTMENT	2010	GPS2619
2969911.631	741383.907	1668729.422	16758406.819	.033	C	GPS - STATIC	2009	HASKO
2969911.631	741383.907	1668729.422	16758406.819	.033	C	ADJUSTMENT	2009	GPS2566
2969911.631	741383.907	1668729.422	16758406.819	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969911.662	741383.904	1668729.453	16758406.815	.033	C	GPS - STATIC	2009	HASKO
2969911.662	741383.904	1668729.453	16758406.815	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BALUT-DL4724-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BALUT-DL4724-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BALUT-DL4724-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BANNING MNDT

Mn/DOT Name: BANNING MNDT **NGS Name:** BANNING

County: PINE, MN (Sheet 2)

NGS ACRN: RN0571 Get Map
NGS Quad / Sta Num : 46092334/1045
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	42 N	20 W	460915.84	925257.58	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** BANNING 1964

2.0 MILES NORTHWEST OF SANDSTONE, 2.0 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 193.4, AT THE TOP OF A FILL IN MEDIAN, 79.6 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 53.38 FEET NORTHEAST OF BANNING MNDT RM 1, 23.81 FEET EAST-SOUTHEAST OF BANNING MNDT RM 2, 3.5 FEET SOUTH OF A WITNESS POST.

Station Notes
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1136.933	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1136.933	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1136.933	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1136.563	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1136.563	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1136.563	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1136.605	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1136.940	.197		1046.930	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.213 12B = -90.213 09 = -90.115 03 = -89.983

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 15.84054	92 52 57.58449	504394.179	254771.799	.066	2	ADJUSTMENT	1999	17648
46 09 15.83430	92 52 57.58569	504394.095	254771.166	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 15.83430	92 52 57.58569	504394.095	254771.166	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 16.02000	92 52 56.86500			.100	2	CLASSICAL SURVEY	1982	17020
46 09 16.01994	92 52 56.86549			.100	2	CLASSICAL SURVEY	1950	UNK

BANNING MNDT

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2971157.201	752027.497	1670142.394	16769025.948	.066	2	ADJUSTMENT	1999	17648
2971157.128	752026.864	1670142.310	16769025.316	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2971157.128	752026.864	1670142.310	16769025.316	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2346551.350	423960.398			.100	2	CLASSICAL SURVEY	1982	17020
2346551.310	423960.390			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING-RN0571-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING-RN0571-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING-RN0571-1-13DEC2007.jpg		Dec 13, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BANNING MNDT AZ MK

Mn/DOT Name: BANNING MNDT AZ MK
NGS Name: BANNING AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0573 Get Map
NGS Quad / Sta Num : 46092334/1046
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	42 N	20 W	460859.63	925312.73	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type: CONCRETE MONUMENT (CAST-IN-PLACE)
Disk Type: AZIMUTH MARK DISK
Mon. Agency: MNDT

Description: (1993)
Stamping: BANNING 1964

2.0 MILES NORTHWEST OF SANDSTONE, 1.75 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 193.05, 78.6 FEET SOUTHWEST OF A DELINEATOR POST, 70.0 FEET WEST OF THE SOUTHBOUND INTERSTATE HIGHWAY 35, 29.0 FEET EAST OF A RIGHT-OF-WAY FENCE, 2.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.129	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1135.129	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1135.129	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.768	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1134.768	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1134.814	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.136	.197		1045.126	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.210 12B = -90.210 09 = -90.115 03 = -89.980

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 59.62766	92 53 12.73387	503327.903	253129.164	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 59.62148	92 53 12.73527	503327.805	253128.538	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 59.80700	92 53 12.01500			.100	2	CLASSICAL SURVEY	1982	17020
46 08 59.80652	92 53 12.01452			.100	2	CLASSICAL SURVEY	1950	UNK

BANNING MNDT AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970119.198	750367.120	1669078.657	16767382.700	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970119.111	750366.493	1669078.560	16767382.074	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2345513.277	422300.015			.100	2	CLASSICAL SURVEY	1982	17020
2345513.310	422299.970			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_AZ_MK-RN0573-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_AZ_MK-RN0573-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_AZ_MK-RN0573-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BANNING MNDT RM 1

Mn/DOT Name: BANNING MNDT RM 1 **NGS Name:** BANNING RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0572 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	42 N	20 W	460915.38	925257.95	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 3 IN.	STEEL SPIKE ADJ TO MON

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
REFERENCE MARK DISK

Mon. Agency
MNDT

Description: (1964) **Stamping:** BANNING NO 1 1964

2.0 MILES NORTHWEST OF SANDSTONE, 2.0 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 193.45, 0.1 MILE NORTH OF PIPELINE CROSSING, 77.5 FEET NORTHWEST OF THE NORTHBOUND INTERSTATE HIGHWAY 35, 60.0 FEET SOUTH OF BANNING MNDT RM 2, 56.8 FEET SOUTHWEST OF A WITNESS POST, 53.38 FEET SOUTHWEST OF STATION BANNING MNDT, 1.1 FEET EAST OF A WITNESS POST.

Station Notes
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) POSITION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1136.208	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1136.208	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1136.208	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.841	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1135.841	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1135.841	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1135.884	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.213 12B = -90.213 09 = -90.115 03 = -89.983

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_RM_1-RN0572-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_RM_1-RN0572-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_RM_1-RN0572-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BANNING MNDT RM 2

Mn/DOT Name: BANNING MNDT RM 2 **NGS Name:** BANNING RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0570 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	42 N	20 W	460915.97	925257.87	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1964) **Stamping:** BANNING NO 2 1964

2.0 MILES NORTHWEST OF SANDSTONE, 2.0 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 193.45, 0.1 MILE NORTH OF PIPELINE CROSSING, 104.0 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 23.81 FEET WEST-NORTHWEST OF STATION BANNING MNDT, 60.0 FEET NORTH OF BANNING MNDT RM 1, 24.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1136.943	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1136.950	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1136.950	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1136.582	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1136.582	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1136.582	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1136.625	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.213 12B = -90.213 09 = -90.115 03 = -89.983

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_RM_2-RN0570-3W-17NOV2008.jpg	W	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_RM_2-RN0570-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BANNING_RM_2-RN0570-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: BECKER **NGS Name:** BECKER

County: PINE, MN (Sheet 2)

NGS ACRN: DL6290 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	1	42 N	20 W	460901.08	924838.25	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)

Disk Type
METAL ROD (WITH REMOVABLE ID DISK)

Mon. Agency
MNDT

Description: (2009)

Stamping: BECKER 2009

2.9 MILES SOUTH OF ASKOV, 2.55 MILES SOUTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 TO TRUNK HIGHWAY 123 MILEPOINT 5.5, THEN 0.3 MILE WEST ON THE TENQUIST TRAIL, 20.0 FEET SOUTH OF THE TENQUIST TRAIL, 50.0 FEET EAST OF A FIELD ENTRANCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1117.252	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1117.258	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1027.485	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1117.255	.131		1027.554	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1117.255	.131		1027.698	.066	1996	GPS - STATIC	2009	HASKO
1117.255	.131		1027.554	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.750 12B = -89.770 09 = -89.659 03 = -89.570

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 01.08000	92 48 38.24480	522653.898	253288.743	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 01.07999	92 48 38.24570	522653.834	253288.742	.033	C	ADJUSTMENT	2010	GPS2619
46 09 01.07999	92 48 38.24570	522653.834	253288.742	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 01.07992	92 48 38.24538	522653.857	253288.736	.033	C	GPS - STATIC	2009	HASKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2989437.422	750856.059	1688395.902	16767566.538	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2989437.358	750856.056	1688395.839	16767566.537	.033	C	ADJUSTMENT	2010	GPS2619
2989437.358	750856.056	1688395.839	16767566.537	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2989437.381	750856.050	1688395.861	16767566.530	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BECKER-DL6290-3S-22JUN2009.jpg	S	Jun 22, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BECKER-DL6290-2-22JUN2009.jpg		Jun 22, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BECKER-DL6290-1-22JUN2009.jpg		Jun 22, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BENSON MNDT

Mn/DOT Name: BENSON MNDT **NGS Name:** BENSON

County: PINE, MN (Sheet 2)

NGS ACRN: RN0539 Get Map
NGS Quad / Sta Num : 46092342/1056
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	44 N	20 W	461901.82	924944.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	DESTROYED	Horz=NO Vert=NO	YES			STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1993) **Stamping:** BENSON 1966

0.5 MILE EAST OF WILLOW RIVER, NEAR THE NORTHWEST RAMP AT THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, 244.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35 AT STATION 2319+00, 84.4 FEET WEST-NORTHWEST OF BENSON RM 2, 77.96 FEET SOUTH-SOUTHWEST OF BENSON RM 1, 62.8 FEET NORTH OF COUNTY ROAD 43, 15.0 FEET WEST OF THE NORTHWEST RAMP, 1.0 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.717	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.320	.016	2				VERTICAL CONTROL SURVEY	1975	L133 MINN
1071.320	.016	2				VERTICAL CONTROL SURVEY	1972	L22567

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			980.493	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			980.598	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			980.766	.066	1996	GPS - STATIC	1999	GPS917
1071.717	.131		980.766	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.227 12B = -91.201 09 = -91.102 03 = -90.951

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.82449	92 49 44.73083	517918.553	314142.912	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.82446	92 49 44.73162	517918.498	314142.909	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.82406	92 49 44.73153	517918.505	314142.869	.033	C	GPS - STATIC	1999	GPS917
46 19 01.82406	92 49 44.73153	517918.504	314142.869	.033	C	ADJUSTMENT	1999	17648
46 19 01.81937	92 49 44.72561	517918.920	314142.394	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.81926	92 49 44.72549	517918.928	314142.383	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position				Project Info				
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 02.01100	92 49 44.00500			.100	2	CLASSICAL SURVEY	1982	17020
46 19 02.01058	92 49 44.00459			.100	C	CLASSICAL SURVEY	1950	UNK

BENSON MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983666.032	811613.201	1683585.837	16828387.648	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983665.977	811613.197	1683585.782	16828387.645	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983665.983	811613.157	1683585.788	16828387.604	.033	C	GPS - STATIC	1999	GPS917
2983665.984	811613.157	1683585.788	16828387.604	.033	C	ADJUSTMENT	1999	17648
2983666.408	811612.689	1683586.204	16828387.130	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983666.416	811612.678	1683586.213	16828387.119	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2359060.868	483546.532			.100	2	CLASSICAL SURVEY	1982	17020
2359060.900	483546.490			.100	C	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BENSON-RN0539-3N-04MAY2020.jpg	N	May 4, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BENSON-RN0539-2-04MAY2020.jpg		May 4, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BENSON-RN0539-1-04MAY2020.jpg		May 4, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BENSON RM 1

Mn/DOT Name: BENSON RM 1 **NGS Name:** BENSON RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0540 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	44 N	20 W	461902.39	924943.97	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1966) **Stamping:** BENSON-RM 1 - 1966

0.5 MILE EAST OF WILLOW RIVER, NEAR THE NORTHWEST RAMP AT THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, 134.0 FEET NORTH OF COUNTY ROAD 43, 98.0 FEET NORTH OF BENSON RM 2, 78.0 FEET NORTH-NORTHEAST OF STATION BENSON MNDOT, 15.0 FEET WEST OF INTERSTATE HIGHWAY 35 SOUTHBOUND EXIT RAMP TO COUNTY ROAD 43.

Station Notes

THE TIES TO MONUMENT NOW FALL UNDER A BITUMINOUS SHOULDER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.074	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1070.680	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1070.680	.016	2				VERTICAL CONTROL SURVEY	1975	L133 MINN
1070.680	.016	2				VERTICAL CONTROL SURVEY	1972	L22567

Geoid Separations(ft): GEOID18 = -91.227 12B = -91.201 09 = -91.105 03 = -90.951

*** No Horizontal Positions in the Database ***

BENSON RM 2

Mn/DOT Name: BENSON RM 2 **NGS Name:** BENSON RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0541 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	44 N	20 W	461901.44	924943.66	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2007) **Stamping:** BENSON NO 2 1966

0.5 MILE EAST OF WILLOW RIVER, 104.0 FEET WEST OF THE NORTHWEST CORNER OF COUNTY ROAD 43 BRIDGE NUMBER 58810 OVER INTERSTATE HIGHWAY 35, 98.0 FEET SOUTH OF BENSON RM 1, 84.4 FEET EAST-SOUTHEAST OF STATION BENSON MNDT, 78.0 FEET EAST OF INTERSTATE HIGHWAY 35 SOUTHBOUND EXIT RAMP TO COUNTY ROAD 43, 24.0 FEET NORTH OF COUNTY ROAD 43, 2.0 FEET NORTH OF A GUARD RAIL, 2.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1073.607	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1073.630	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1073.630	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1073.236	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1073.236	.016	2				VERTICAL CONTROL SURVEY	1975	L133 MINN
1073.236	.016	2				VERTICAL CONTROL SURVEY	1972	L22567

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1073.587	.262		982.364	.197	2011	GPS - OPUS	2019	GPSBM
			982.370	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1073.620	.131		982.478	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1073.620	.131		982.593	.066	1996	GPS - STATIC	2009	HMOOSE
1073.620	.131		982.478	.066	2007	GPS - STATIC	2009	HMOOSE
1073.466	.262		982.514	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.227 12B = -91.201 09 = -91.102 03 = -90.951

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.44318	92 49 43.66218	517993.601	314104.350	.131	3	GPS - OPUS	2019	GPSBM
46 19 01.44351	92 49 43.66185	517993.624	314104.383	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.44343	92 49 43.66268	517993.566	314104.375	.033	C	ADJUSTMENT	2009	GPS2566
46 19 01.44343	92 49 43.66268	517993.566	314104.375	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 01.44300	92 49 43.66262	517993.570	314104.331	.033	C	GPS - STATIC	2009	HMOOSE
46 19 01.44406	92 49 43.66217	517993.602	314104.439	.131	3	GPS - RTRN	2008	RTRN2008

BENSON RM 2

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983741.717	811575.929	1683660.900	16828349.198	.131	3	GPS - OPUS	2019	GPSBM
2983741.740	811575.962	1683660.923	16828349.231	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983741.681	811575.953	1683660.865	16828349.223	.033	C	ADJUSTMENT	2009	GPS2566
2983741.681	811575.953	1683660.865	16828349.223	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983741.686	811575.910	1683660.870	16828349.180	.033	C	GPS - STATIC	2009	HMOOSE
2983741.716	811576.018	1683660.901	16828349.287	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BENSON_RM_2-RN0541-3N-12DEC2019.jpg	N	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BENSON_RM_2-RN0541-2-27JUN2017.jpg		Jun 27, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BENSON_RM_2-RN0541-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: BIRCH
NGS Name: BIRCH
County: PINE, MN (Sheet 2)

NGS ACRN: RN1652 Get Map
NGS Quad / Sta Num : 46092344/1002
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	45 N	21 W	462236.18	925938.91		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1960) **Stamping:** BIRCH 1960

2.5 MILES WEST OF DENHAM, 1.9 MILES WEST ALONG COUNTY ROAD 159 FROM THE JUNCTION OF COUNTY ROAD 159 AND COUNTY ROAD 40 IN DENHAM, THEN 0.5 MILE NORTH ON COUNTY ROAD 159, THEN 0.15 MILE WEST ON COUNTY ROAD 159, THEN 0.05 MILE NORTH ON A FARM DRIVE, 141.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF A HOUSE, 97.0 FEET SOUTHWEST OF THE NORTHWEST CORNER OF A BARN, 67.0 FEET SOUTH OF A FENCE, 88.20 FEET NORTHEAST OF BIRCH RM 1, 76.09 FEET SOUTH OF BIRCH RM 2, 39.0 FEET EAST OF A FENCE, 89.0 FEET NORTHEAST OF A WITNESS POST AND A FENCE CORNER.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1305.772	.262		1214.774	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1305.804						RECIPROCAL VERTICAL ANGLE	1960	HORZ

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.122 09 = -90.987 03 = -90.902

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 36.17750	92 59 38.90904	476236.070	335864.780	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 36.17334	92 59 38.90268	476236.515	335864.358	.131	3	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 36.36910	92 59 38.14720			.100	3	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2941624.932	832618.756	1641894.867	16850047.081	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2941625.384	832618.341	1641895.313	16850046.660	.131	3	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2317021.005	504552.398			.100	3	CLASSICAL SURVEY	1961	12611

BIRCH RM 1

Mn/DOT Name: BIRCH RM 1

NGS Name: BIRCH RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2254 Get Map
NGS Quad / Sta Num : 46092344/1002
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	45 N	21 W	462236.00	925939.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 4 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1960) **Stamping:** BIRCH NO 1 1960

2.5 MILES WEST OF DENHAM, 1.9 MILES WEST ON COUNTY ROAD 159 FROM THE JUNCTION OF COUNTY ROAD 159 AND COUNTY ROAD 40 AT DENHAM, THEN 0.5 MILE NORTH ON COUNTY ROAD 159 THEN 0.15 MILE WEST ON COUNTY ROAD 159, THEN 0.05 MILE NORTH ON A FARM DRIVE, 26.0 FEET SOUTH OF A 10.0 INCH DIAMETER BIRCH TREE, 1.0 FOOT NORTH OF A WITNESS POST AND A FENCE CORNER.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.122 09 = -90.987 03 = -90.902

BIRCH RM 2

Mn/DOT Name: BIRCH RM 2 **NGS Name:** BIRCH RM 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	45 N	21 W	462236.00	925939.00		

NGS ACRN: CJ2255 Get Map
NGS Quad / Sta Num : 46092344/1002
USGS Quad: KETTLE RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 4 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1960) **Stamping:** BIRCH NO 2 1960

2.5 MILES WEST OF DENHAM, 1.9 MILES WEST ON COUNTY ROAD 159 FROM THE JUNCTION OF COUNTY ROAD 159 AND COUNTY ROAD 40 AT DENHAM, THEN 0.5 MILE NORTH ON COUNTY ROAD 159, THEN 0.15 MILE WEST ON COUNTY ROAD 159, THEN 0.05 MILE NORTH ON FARM DRIVE, SET IN A NORTHWEST FENCE CORNER.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.122 09 = -90.987 03 = -90.902

BIRCH RM 3

Mn/DOT Name: BIRCH RM 3 **NGS Name:** BIRCH RM 3

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	45 N	21 W	462236.00	925939.00		

NGS ACRN: CJ2256 Get Map
NGS Quad / Sta Num : 46092344/1002
USGS Quad: KETTLE RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	DESTROYED	Horz=NO Vert=NO	YES		PROJECTS 8 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1960) **Stamping:** BIRCH NO 3 1960

2.5 MILES WEST OF DENHAM, 1.9 MILES WEST ON COUNTY ROAD 159 FROM THE JUNCTION OF COUNTY ROAD 159 AND COUNTY ROAD 40 AT DENHAM, THEN 0.5 MILE NORTH ON COUNTY ROAD 159, THEN 0.15 MILE WEST ON COUNTY ROAD 159, 24.0 FEET WEST OF THE CENTERLINE OF A GRAVEL ROAD, 18.0 FEET NORTHEAST OF A 12.0 INCH DIAMETER ELM TREE, 1.0 FOOT WEST OF A WIRE FENCE, 1.0 FOOT WEST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.122 09 = -90.987 03 = -90.902

Mn/DOT Name: BLOM **NGS Name:** BLOM

County: PINE, MN (Sheet 2)

NGS ACRN: DL4727 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	45 N	19 W	462346.47	924632.80	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 55 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** BLOM 2008

2.4 MILES EAST-NORTHEAST OF STURGEON LAKE, 1.6 MILES NORTHEAST ALONG INTERSTATE 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, AT INTERSTATE HIGHWAY 35 MILEPOINT 211.45, 82.0 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 52.4 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 3.0 FEET SOUTH OF A WITNESS POST.

Station Notes
THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1086.245	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1086.238	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			994.627	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1086.251	.131		994.729	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1086.251	.131		994.867	.066	1996	GPS - STATIC	2009	HMOOSE
1086.251	.131		994.729	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.575 12B = -91.575 09 = -91.466 03 = -91.273

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 46.46719	92 46 32.79765	531346.213	342996.214	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 46.46729	92 46 32.79843	531346.158	342996.224	.033	C	ADJUSTMENT	2009	GPS2566
46 23 46.46729	92 46 32.79843	531346.158	342996.224	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 46.46707	92 46 32.79842	531346.159	342996.201	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2996598.110	840687.387	1696970.827	16857244.924	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2996598.055	840687.396	1696970.772	16857244.934	.033	C	ADJUSTMENT	2009	GPS2566
2996598.055	840687.396	1696970.772	16857244.934	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2996598.056	840687.374	1696970.773	16857244.912	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BLOM-DL4727-3W-22DEC2008.jpg	W	Dec 22, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BLOM-DL4727-2-22DEC2008.jpg		Dec 22, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BLOM-DL4727-1-22DEC2008.jpg		Dec 22, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: BR 58002 **NGS Name:** BR 58002

County: PINE, MN (Sheet 2)

NGS ACRN: DL9243 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	43 N	20 W	461047.00	924954.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2008	NOT FOUND	Horz=NO Vert=?	YES	58002		NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE RAILING	BENCH MARK DISK	MNDT

Description: (2002) **Stamping:** 5809 A 1982

2.4 MILES WEST OF ASKOV, 1.5 MILES EAST ON TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123, 24.2 FEET SOUTH OF TRUNK HIGHWAY 23, AT TRUNK HIGHWAY 23 MILEPOINT 291.39, IN THE TOP OF THE EAST END OF A POST ON THE SOUTH BRIDGE RAILING OF TRUNK HIGHWAY 23 BRIDGE NUMBER 58002 OVER THE KETTLE RIVER.

Station Notes
THE DISK WAS SET IN THE BRIDGE WHEN IT WAS BUILT IN 1982 THAN IT WAS STAMPED WHEN IT WAS USED IN 2008.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1024.197	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1024.197	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1023.899	.033	3				VERTICAL CONTROL SURVEY	1982	CS5809

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1024.020	.262		934.099	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.128 12B = -90.144 09 = -90.023 03 = -89.921

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 47.96542	92 49 54.87390	517249.387	264111.352	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983849.849	761583.700	1682980.146	16778377.552	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BR_58002-DL9243-3S-10JUL2007.jpg	S	Jul 10, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BR_58002-DL9243-2-10JUL2007.jpg		Jul 10, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BR_58002-DL9243-1-10JUL2007.jpg		Jul 10, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BRABEL

Mn/DOT Name: BRABEL **NGS Name:** BRABEL

County: PINE, MN (Sheet 2)

NGS ACRN: DL4729 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	44 N	20 W	461507.97	924931.88	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** BRABEL 2008

5.0 MILES SOUTH OF WILLOW RIVER, 4.6 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN THE WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 200.80, 100.0 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 60.0 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.130	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1081.126	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.199	.262		990.408	.197	2011	GPS - OPUS	2020	GPSBM
1081.179	.262		990.385	.197	2011	GPS - RTRN	2020	RTRN2020
			990.362	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1081.133	.131		990.461	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1081.133	.131		990.572	.066	1996	GPS - STATIC	2009	HMOOSE
1081.133	.131		990.461	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.791 12B = -90.794 09 = -90.672 03 = -90.531

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 07.97108	92 49 31.88395	518842.516	290452.765	.131	3	GPS - OPUS	2020	GPSBM
46 15 07.97133	92 49 31.88267	518842.606	290452.790	.131	3	GPS - RTRN	2020	RTRN2020
46 15 07.97162	92 49 31.88339	518842.555	290452.819	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 07.97153	92 49 31.88422	518842.497	290452.810	.033	C	ADJUSTMENT	2009	GPS2566
46 15 07.97153	92 49 31.88422	518842.497	290452.810	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 07.97130	92 49 31.88399	518842.513	290452.787	.033	C	GPS - STATIC	2009	HMOOSE

BRABEL

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984993.553	787945.246	1684539.334	16804709.276	.131	3	GPS - OPUS	2020	GPSBM
2984993.642	787945.273	1684539.424	16804709.301	.131	3	GPS - RTRN	2020	RTRN2020
2984993.591	787945.302	1684539.373	16804709.330	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984993.533	787945.292	1684539.315	16804709.321	.033	C	ADJUSTMENT	2009	GPS2566
2984993.533	787945.292	1684539.315	16804709.321	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984993.549	787945.269	1684539.331	16804709.298	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BRABEL-DL4729-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BRABEL-DL4729-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BRABEL-DL4729-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BREMEN

Mn/DOT Name: BREMEN
NGS Name: BREMEN
County: PINE, MN (Sheet 2)

NGS ACRN: RN1648 Get Map
NGS Quad / Sta Num : 46092343/1001
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	44 N	21 W	461511.14	925928.37		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1960) **Stamping:** BREMEN 1960

5.0 MILES NORTHWEST OF FINLAYSON, 3.6 MILES WEST ON TRUNK HIGHWAY 18 FROM THE RAILROAD CROSSING AT FINLAYSON THEN 3.5 MILES NORTH ON COUNTY ROAD 36, 100.0 FEET SOUTHWEST OF A TELEPHONE POLE, 54.0 FEET WEST OF COUNTY ROAD 36 (GRAVEL), 23.0 FEET EAST OF TWIN SPRUCE TREES, 80.24 FEET WEST OF BREMEN RM 1, 104.84 FEET SOUTH OF STATION TT 21 USGS, 3.0 FEET NORTHWEST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.517	.262		1001.862	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.485						RECIPROCAL VERTICAL ANGLE	1960	HORZ

Geoid Separations(ft): GEOID18 = -90.856 12B = -90.807 09 = -90.686 03 = -90.561

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 11.13534	92 59 28.37171	476923.238	290777.733	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 11.12891	92 59 28.36459	476923.738	290777.082	.131	3	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 11.32680	92 59 27.63240			.100	3	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943080.030	787555.780	1642638.394	16804981.283	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943080.540	787555.137	1642638.894	16804980.632	.131	3	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2318474.658	459489.632			.100	3	CLASSICAL SURVEY	1961	12611

BREMEN AZ MK

Mn/DOT Name: BREMEN AZ MK
NGS Name: BREMEN AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: CJ2279 Get Map
NGS Quad / Sta Num : 46092334/1001
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	4	43 N	21 W	461442.00	925927.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 5 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1960) **Stamping:** BREMEN 1960

5.0 MILES NORTHWEST OF FINLAYSON, 3.6 MILES WEST ON TRUNK HIGHWAY 18 FROM THE RAILROAD CROSSING AT FINLAYSON, THEN 3.5 MILES NORTH ON COUNTY ROAD 36, 45.0 FEET NORTH OF THE CENTERLINE OF COUNTY ROAD 36 (GRAVEL ROAD), 28.0 FEET EAST OF THE CENTERLINE OF WILLOW LEAF ROAD (GRAVEL ROAD), 2.0 FEET WEST OF A TELEPHONE POLE, 1.0 FOOT NORTHWEST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.840 12B = -90.794 09 = -90.672 03 = -90.548

BREMEN RM 1

Mn/DOT Name: BREMEN RM 1

NGS Name: BREMEN RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2280 Get Map
NGS Quad / Sta Num : 46092343/1001
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	44 N	21 W	461511.10	925927.23		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1960) **Stamping:** BREMEN NO 1 1960

5.0 MILES NORTHWEST OF FINLAYSON, 3.6 MILES WEST ON TRUNK HIGHWAY 18 FROM THE RAILROAD CROSSING AT FINLAYSON THEN 3.5 MILES NORTH ON COUNTY ROAD 36, 67.0 FEET SOUTH OF A TELEPHONE POLE, 28.0 FEET EAST OF THE CENTERLINE OF COUNTY ROAD 36 (GRAVEL ROAD).

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.856 12B = -90.807 09 = -90.686 03 = -90.561

BRUNO MNDT

Mn/DOT Name: BRUNO MNDT **NGS Name:** BRUNO

County: PINE, MN (Sheet 2)

NGS ACRN: AC4961 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	6	43 N	18 W	461440.63	923929.01	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1995	2016	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT) (DEPTH 7 FT)	METAL ROD	MNDT

Description: (2015) **Stamping:** BRUNO 1995

2.5 MILES SOUTH OF BRUNO, 2.5 MILES SOUTH ALONG COUNTY ROAD 22 (FLEMING ROAD) FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 22, 76.5 FEET WEST OF COUNTY ROAD 22, 27.0 FEET SOUTH OF STARCH ROAD, 37.8 FEET WEST OF A POWER POLE, 11.5 FEET NORTHWEST OF THE NORTHWEST CORNER OF A HIGH VOLTAGE BOX, 2.6 FEET NORTH OF A WITNESS POST.

Station Notes

THE STATION IS A DRIVEN STAINLESS STEEL ROD WITH AN ACCESS COVER.
IN 10-09-2008 IT WAS DETERMINED THAT THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1197.494	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1197.498	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1197.494			1107.711	.008	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1197.494	.131		1107.951	.066	1996	GPS - STATIC	2017	HMNCORS07
1197.494			1107.711	.008	2011	GPS - STATIC	2017	HMNPH
1197.455	.262		1107.629	.197	2011	GPS - RTRN	2015	RTRN2015
1197.494	.131		1107.668	.066	2011	HORIZONTAL ADJUSTMENT	2012	GPS2829-C
			1107.711	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1107.813	.049	2007	HORIZONTAL ADJUSTMENT	2011	GPS2829
1197.504	.098		1107.813	.049	2007	HORIZONTAL ADJUSTMENT	2010	GPS2697
1197.504	.098		1107.813	.049	2007	GPS - STATIC	2010	HBMN2
1197.570	.131		1107.813	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1197.570	.131		1107.951	.066	1996	GPS - STATIC	2009	HMOOSE
1197.570	.131		1107.813	.066	2007	GPS - STATIC	2009	HMOOSE
1197.481	.262		1107.855	.197	1996	GPS - RTRN	2008	RTRN2008
			1107.813	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1197.603	.098		1107.951	.049	1996	GPS - STATIC	2005	GPS2036
1197.570	.098		1107.951	.049	1996	GPS - STATIC	2004	GPS1954
1197.504	.131		1107.951	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1197.504	.131		1107.951	.066	1996	GPS - STATIC	2002	HPINE
1197.471	.098		1107.951	.049	1996	GPS - STATIC	1997	GPS805-B
1197.471	.131		1107.951	.066	1996	GPS - STATIC	1997	GPS805-C

Geoid Separations(ft): GEOID18 = -89.796 12B = -89.826 09 = -89.698 03 = -89.626

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 40.63488	92 39 29.00790	561219.454	287767.716	.007		ADJUSTMENT	2018	GPS3119
46 14 40.63488	92 39 29.00790	561219.454	287767.716	.007	C	GPS - STATIC	2017	HMNPH
46 14 40.63495	92 39 29.00763	561219.473	287767.723	.131	3	GPS - RTRN	2015	RTRN2015
46 14 40.63488	92 39 29.00790	561219.454	287767.716	.003		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 40.63483	92 39 29.00863	561219.402	287767.711	.016	B	ADJUSTMENT	2011	GPS2829
46 14 40.63483	92 39 29.00863	561219.402	287767.711	.016	B	ADJUSTMENT	2010	GPS2697
46 14 40.63483	92 39 29.00863	561219.402	287767.711	.016	B	GPS - STATIC	2010	HBMN2
46 14 40.63483	92 39 29.00863	561219.402	287767.711	.033	C	ADJUSTMENT	2009	GPS2566
46 14 40.63483	92 39 29.00863	561219.402	287767.711	.033	C	GPS - STATIC	2009	HMOOSE
46 14 40.63483	92 39 29.00863	561219.402	287767.711	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.033	C	GPS - STATIC	2017	HMNCORS07
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.033	C	GPS - STATIC	2009	HMOOSE
46 14 40.63512	92 39 29.00824	561219.430	287767.740	.131	3	GPS - RTRN	2008	RTRN2008
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.016	B	GPS - STATIC	2005	GPS2036
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.016	B	GPS - STATIC	2004	GPS1954
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.033	C	ADJUSTMENT	2003	GPS1839
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.033	C	GPS - STATIC	2002	HPINE
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.016	B	GPS - STATIC	1997	GPS805-B
46 14 40.63468	92 39 29.00824	561219.430	287767.696	.033	C	GPS - STATIC	1997	GPS805-C

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3027404.862	785983.454	1726900.909	16802079.063	.007		ADJUSTMENT	2018	GPS3119
3027404.862	785983.454	1726900.909	16802079.063	.007	C	GPS - STATIC	2017	HMNPH
3027404.881	785983.462	1726900.928	16802079.070	.131	3	GPS - RTRN	2015	RTRN2015
3027404.862	785983.454	1726900.909	16802079.063	.003		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3027404.811	785983.448	1726900.858	16802079.058	.016	B	ADJUSTMENT	2011	GPS2829
3027404.811	785983.448	1726900.858	16802079.058	.016	B	ADJUSTMENT	2010	GPS2697
3027404.811	785983.448	1726900.858	16802079.058	.016	B	GPS - STATIC	2010	HBMN2
3027404.811	785983.448	1726900.858	16802079.058	.033	C	ADJUSTMENT	2009	GPS2566
3027404.811	785983.448	1726900.858	16802079.058	.033	C	GPS - STATIC	2009	HMOOSE
3027404.811	785983.448	1726900.858	16802079.058	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3027404.839	785983.434	1726900.885	16802079.042	.033	C	GPS - STATIC	2017	HMNCORS07
3027404.839	785983.434	1726900.885	16802079.042	.033	C	GPS - STATIC	2009	HMOOSE
3027404.838	785983.478	1726900.885	16802079.087	.131	3	GPS - RTRN	2008	RTRN2008
3027404.839	785983.434	1726900.885	16802079.042	.016	B	GPS - STATIC	2005	GPS2036
3027404.839	785983.434	1726900.885	16802079.042	.016	B	GPS - STATIC	2004	GPS1954
3027404.839	785983.434	1726900.885	16802079.042	.033	C	ADJUSTMENT	2003	GPS1839
3027404.839	785983.434	1726900.885	16802079.042	.033	C	GPS - STATIC	2002	HPINE
3027404.839	785983.434	1726900.885	16802079.042	.016	B	GPS - STATIC	1997	GPS805-B
3027404.839	785983.434	1726900.885	16802079.042	.033	C	GPS - STATIC	1997	GPS805-C

BRUNO MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BRUNO-AC4961-3W-11NOV2008.jpg	W	Nov 11, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BRUNO-AC4961-2-27APR2015.jpg		Apr 27, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BRUNO-AC4961-1-11NOV2008.jpg		Nov 11, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BUGA MNDT

Mn/DOT Name: BUGA MNDT **NGS Name:** BUGA

County: PINE, MN (Sheet 2)

NGS ACRN: AG9983 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	8	42 N	20 W	460759.90	925316.14	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1993	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 20 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (1993) **Stamping:** BUGA 1993

1.0 MILE WEST OF SANDSTONE, 3.7 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 (THE JUNCTION IS 3.5 MILES NORTH OF SANDSTONE), IN THE MEDIAN AT INTERSTATE HIGHWAY 35 MILEPOINT 191.9, 32.1 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 52.2 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 28.0 FEET SOUTH OF A CROSSOVER, 57.0 FEET SOUTH-SOUTHWEST OF THE WEST LEG OF A SIGN, 34.6 FEET NORTHWEST OF A WITNESS POST.

Station Pair: BALUT - PINE, MN

Station Notes
PART OF THE DISK IS BROKEN OFF, BUT IT IS STABLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.567	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1113.567	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.561	.262		1023.423	.197	2011	GPS - RTRN	2017	RTRN2017
			1023.433	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1113.580	.131		1023.525	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1113.580	.131		1023.663	.066	1996	GPS - STATIC	2009	HASKO
1113.580	.131		1023.525	.066	2007	GPS - STATIC	2009	HASKO
1113.580	.131		1023.525	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1113.580	.131		1023.663	.066	1996	GPS - STATIC	2009	HMOOSE
1113.580	.131		1023.525	.066	2007	GPS - STATIC	2009	HMOOSE
1113.400	.262		1023.495	.197	1996	GPS - RTRN	2008	RTRN2008
			1023.541	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1113.548	.131		1023.686	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1113.548	.131		1023.686	.066	1996	GPS - STATIC	2002	HPINE
1113.564	.131		1023.679	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS917

Geoid Separations(ft): GEOID18 = -90.134 12B = -90.138 09 = -90.039 03 = -90.134

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 59.89722	92 53 16.14230	503088.850	247078.204	.131	3	GPS - RTRN	2017	RTRN2017
46 07 59.89721	92 53 16.14283	503088.812	247078.203	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 59.89719	92 53 16.14368	503088.752	247078.201	.033	C	ADJUSTMENT	2010	GPS2619
46 07 59.89719	92 53 16.14368	503088.752	247078.201	.033	C	GPS - STATIC	2009	HASKO
46 07 59.89719	92 53 16.14368	503088.752	247078.201	.033	C	ADJUSTMENT	2009	GPS2566
46 07 59.89719	92 53 16.14368	503088.752	247078.201	.033	C	GPS - STATIC	2009	HMOOSE
46 07 59.89717	92 53 16.14429	503088.710	247078.199	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 59.89718	92 53 16.14319	503088.787	247078.200	.033	C	GPS - STATIC	2009	HASKO
46 07 59.89718	92 53 16.14319	503088.787	247078.200	.033	C	GPS - STATIC	2009	HMOOSE
46 07 59.89684	92 53 16.14303	503088.798	247078.166	.131	3	GPS - RTRN	2008	RTRN2008
46 07 59.89718	92 53 16.14413	503088.721	247078.200	.033	C	ADJUSTMENT	2003	GPS1839
46 07 59.89718	92 53 16.14413	503088.722	247078.200	.033	C	GPS - STATIC	2002	HPINE
46 07 59.89718	92 53 16.14413	503088.721	247078.200	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 59.89167	92 53 16.13747	503089.191	247077.642	.033	C	GPS - STATIC	1994	HI35N

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969983.330	744313.664	1668847.323	16761334.119	.131	3	GPS - RTRN	2017	RTRN2017
2969983.292	744313.662	1668847.285	16761334.118	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969983.233	744313.659	1668847.226	16761334.116	.033	C	ADJUSTMENT	2010	GPS2619
2969983.233	744313.659	1668847.226	16761334.116	.033	C	GPS - STATIC	2009	HASKO
2969983.233	744313.659	1668847.226	16761334.116	.033	C	ADJUSTMENT	2009	GPS2566
2969983.233	744313.659	1668847.226	16761334.116	.033	C	GPS - STATIC	2009	HMOOSE
2969983.190	744313.656	1668847.183	16761334.114	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969983.267	744313.659	1668847.260	16761334.115	.033	C	GPS - STATIC	2009	HASKO
2969983.267	744313.659	1668847.260	16761334.115	.033	C	GPS - STATIC	2009	HMOOSE
2969983.279	744313.625	1668847.271	16761334.081	.131	3	GPS - RTRN	2008	RTRN2008
2969983.201	744313.658	1668847.194	16761334.115	.033	C	ADJUSTMENT	2003	GPS1839
2969983.201	744313.657	1668847.194	16761334.115	.033	C	GPS - STATIC	2002	HPINE
2969983.201	744313.658	1668847.194	16761334.115	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969983.679	744313.108	1668847.663	16761333.558	.033	C	GPS - STATIC	1994	HI35N

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BUGA-AG9983-3S-25MAY2017.jpg	S	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BUGA-AG9983-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/BUGA-AG9983-1-25MAY2017.jpg		May 25, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

BURAK

Mn/DOT Name: BURAK
NGS Name: BURAK
County: PINE, MN (Sheet 2)

NGS ACRN: DL4731 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	44 N	20 W	461823.06	924932.68	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** BURAK 2008

1.0 MILE SOUTHEAST OF WILLOW RIVER, 0.7 MILE SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, AT INTERSTATE HIGHWAY 35 MILEPOINT 204.70, 60.2 FEET WEST OF A FENCE LINE, 30.5 FEET EAST-NORTHEAST OF THE NORTHBOUND INTERSTATE HIGHWAY 35, 7.9 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1050.582	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1050.585	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			959.378	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1050.588	.131		959.486	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1050.588	.131		959.598	.066	1996	GPS - STATIC	2009	HMOOSE
1050.588	.131		959.486	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.178 12B = -91.148 09 = -91.053 03 = -90.902

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 23.05882	92 49 32.67866	518768.217	310216.427	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 23.05877	92 49 32.67947	518768.161	310216.422	.033	C	ADJUSTMENT	2009	GPS2566
46 18 23.05877	92 49 32.67947	518768.161	310216.422	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 23.05840	92 49 32.67934	518768.170	310216.385	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984582.392	807702.276	1684440.087	16824464.003	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984582.335	807702.269	1684440.030	16824463.998	.033	C	ADJUSTMENT	2009	GPS2566
2984582.335	807702.269	1684440.030	16824463.998	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984582.345	807702.232	1684440.040	16824463.961	.033	C	GPS - STATIC	2009	HMOOSE

Mn/DOT Name: C 154 **NGS Name:** C 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0444 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	13	45 N	20 W	462253.00	924925.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** C 154 1935

IN STURGEON LAKE, 69.0 FEET SOUTH OF THE STURGEON LAKE RAILROAD STATION, 190.0 FEET NORTHEAST ALONG MAIN STREET, THEN 66.0 FEET EAST ON COUNTY ROAD 46, 30.0 FEET EAST OF A RAILROAD, 39.0 FEET WEST OF COUNTY ROAD 61.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1074.909	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1074.496	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1074.496	.007	1				VERTICAL CONTROL SURVEY	1935	L30 MINN

Geoid Separations(ft): GEOID18 = -91.473 12B = -91.457 09 = -91.355 03 = -91.181

*** No Horizontal Positions in the Database ***

Mn/DOT Name: C 155 **NGS Name:** C 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0488 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	25	45 N	18 W	462127.00	923420.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (2002) **Stamping:** C 155 1935

1.5 MILES NORTHEAST OF KERRICK, 1.5 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF MAIN STREET AND TRUNK HIGHWAY 23, 45.0 FEET NORTHWEST OF THE RAILROAD TRACKS, 30.0 FEET SOUTHEAST OF TRUNK HIGHWAY 23, 9.0 FEET EAST OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.552	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.145	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1160.145	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.889 12B = -90.899 09 = -90.738 03 = -90.649

*** No Horizontal Positions in the Database ***

Mn/DOT Name: C 158 **NGS Name:** C 158

County: PINE, MN (Sheet 2)

NGS ACRN: RN0513 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	17	45 N	18 W	462231.00	923923.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** C 158 1935

5.1 MILES WEST OF DUQUETTE, 5.0 MILES WEST ALONG COUNTY ROAD 47 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47 (OAK LEAF ROAD), 135.0 FEET EAST AND 30.0 FEET NORTH OF THE JUNCTION OF COUNTY ROAD 49 (NORTH-SOUTH) -COUNTY ROAD 47 (EAST) AND COUNTY ROAD 162 (WEST).

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1111.422	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1111.021	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.411 12B = -91.424 09 = -91.276 03 = -91.142

*** No Horizontal Positions in the Database ***

CANE MNDT

Mn/DOT Name: CANE MNDT **NGS Name:** CANE

County: PINE, MN (Sheet 2)

NGS ACRN: AG9984 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	44 N	20 W	461532.79	924929.32	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1993	2008	GOOD	Horz=YES Vert=YES	YES		PROJECTS 5 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2008) **Stamping:** CANE 1993

2.0 MILES EAST OF RUTLEDGE, 3.0 MILES SOUTH ALONG COUNTY ROAD 152 FROM THE JUNCTION OF COUNTY ROAD 152 AND COUNTY ROAD 43, THEN 1.0 MILE WEST ON COUNTY ROAD 33, AT INTERSTATE HIGHWAY 35 MILEPOINT 201.35, 18.0 FEET SOUTH OF COUNTY ROAD 33, 10.6 FEET EAST OF THE SOUTHEAST CORNER OF COUNTY ROAD 33 BRIDGE NUMBER 58809 OVER INTERSTATE HIGHWAY 35, 3.5 FEET SOUTH OF A GUARDRAIL, 2.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.669	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1108.669	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1017.829	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1108.659	.131		1017.928	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1108.659	.131		1018.043	.066	1996	GPS - STATIC	2009	HMOOSE
1108.659	.131		1017.928	.066	2007	GPS - STATIC	2009	HMOOSE
1108.521	.262		1017.938	.197	1996	GPS - RTRN	2008	RTRN2008
			1017.951	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1018.043	.066	1996	GPS - STATIC	1999	GPS917

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.200						GPS - STATIC	1994	HORZ

Geoid Separations(ft): GEOID18 = -90.846 12B = -90.850 09 = -90.728 03 = -90.584

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.78749	92 49 29.31793	519020.473	292966.991	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.78742	92 49 29.31877	519020.414	292966.984	.033	C	ADJUSTMENT	2009	GPS2566
46 15 32.78742	92 49 29.31877	519020.414	292966.984	.033	C	GPS - STATIC	2009	HMOOSE
46 15 32.78793	92 49 29.31853	519020.431	292967.036	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.78713	92 49 29.31856	519020.429	292966.955	.033	C	GPS - STATIC	2009	HMOOSE
46 15 32.78718	92 49 29.31849	519020.434	292966.960	.131	3	GPS - RTRN	2008	RTRN2008
46 15 32.78751	92 49 29.31839	519020.442	292966.993	.033	C	GPS - STATIC	1999	GPS917

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.78186	92 49 29.31164	519020.917	292966.422	.033	C	GPS - STATIC	1994	HI35N

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985128.605	790461.829	1684714.036	16807222.606	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985128.546	790461.820	1684713.977	16807222.599	.033	C	ADJUSTMENT	2009	GPS2566
2985128.546	790461.820	1684713.977	16807222.599	.033	C	GPS - STATIC	2009	HMOOSE
2985128.562	790461.872	1684713.994	16807222.650	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985128.562	790461.791	1684713.992	16807222.570	.033	C	GPS - STATIC	2009	HMOOSE
2985128.566	790461.796	1684713.997	16807222.574	.131	3	GPS - RTRN	2008	RTRN2008
2985128.573	790461.830	1684714.004	16807222.608	.033	C	GPS - STATIC	1999	GPS917

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985129.057	790461.266	1684714.479	16807222.037	.033	C	GPS - STATIC	1994	HI35N

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CANE-AG9984-3S-17NOV2008.jpg	S	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CANE-AG9984-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CANE-AG9984-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

CEN OF A LARGE PILE OF ROCKS

Mn/DOT Name: CEN OF A LARGE PILE OF ROCKS
NGS Name: CEN OF A LARGE PILE OF ROCKS
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	45 N	21 W	462215.75	925558.72		

NGS ACRN: CJ2328 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
UNKNOWN	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

3600.0 FEET NORTHEAST OF DENHAM, 0.8 MILE EAST ALONG ROCK CUTS ROAD FROM THE JUNCTION OF THE ROCK CUTS ROAD AND TRUNK HIGHWAY 40, 830.0 FEET NORTH OF THE ROCK CUTS ROAD

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.237 12B = -91.191 09 = -91.073 03 = -90.945

Mn/DOT Name: CISAR **NGS Name:** CISAR

County: PINE, MN (Sheet 2)

NGS ACRN: DL4734 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	23	43 N	20 W	461204.09	925039.23	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)
Disk Type: METAL ROD (WITH REMOVABLE ID DISK)
Mon. Agency: MNDT

Description: (2009) **Stamping:** CISAR 2008

6.0 MILES NORTH OF SANDSTONE, 5.9 MILES NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 197.15, 33.2 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 3.2 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1140.365	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1140.365	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1049.965	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1140.352	.131		1050.044	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1140.352	.131		1050.169	.066	1996	GPS - STATIC	2009	HMOOSE
1140.352	.131		1050.044	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.384 12B = -90.387 09 = -90.279 03 = -90.161

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 04.08553	92 50 39.22978	514122.683	271820.255	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 04.08551	92 50 39.23053	514122.630	271820.253	.033	C	ADJUSTMENT	2009	GPS2566
46 12 04.08551	92 50 39.23053	514122.630	271820.253	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 04.08536	92 50 39.23023	514122.651	271820.237	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980592.574	769237.269	1679845.111	16786079.097	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980592.521	769237.266	1679845.058	16786079.094	.033	C	ADJUSTMENT	2009	GPS2566
2980592.521	769237.266	1679845.058	16786079.094	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980592.543	769237.251	1679845.079	16786079.079	.033	C	GPS - STATIC	2009	HMOOSE

COMPLAIN

Mn/DOT Name: COMPLAIN
NGS Name: COMPLAIN
County: PINE, MN (Sheet 2)

NGS ACRN: DL4736 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	29	42 N	20 W	460510.88	925344.45	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)
Disk Type: METAL ROD (WITH REMOVABLE ID DISK)
Mon. Agency: MNDT

Description: (2009)
Stamping: COMPLAIN 2008

3.0 MILES SOUTH-SOUTHWEST OF SANDSTONE, 2.8 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 188.75, 62.9 FEET NORTHWEST OF A FENCE LINE, 36.9 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.938	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1083.941	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			993.896	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1083.955	.131		993.994	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1083.955	.131		994.112	.066	1996	GPS - STATIC	2009	HMOOSE
1083.955	.131		993.994	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.029 12B = -90.029 09 = -89.921 03 = -89.800

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 10.87675	92 53 44.44884	501096.181	229955.682	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 10.87658	92 53 44.44951	501096.134	229955.665	.033	C	ADJUSTMENT	2009	GPS2566
46 05 10.87658	92 53 44.44951	501096.134	229955.665	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 10.87652	92 53 44.44911	501096.162	229955.659	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2968282.980	727161.602	1666877.064	16744216.669	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2968282.933	727161.584	1666877.017	16744216.652	.033	C	ADJUSTMENT	2009	GPS2566
2968282.933	727161.584	1666877.017	16744216.652	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2968282.961	727161.579	1666877.045	16744216.646	.033	C	GPS - STATIC	2009	HMOOSE

CORKY MNDT

Mn/DOT Name: CORKY MNDT **NGS Name:** CORKY

County: PINE, MN (Sheet 2)

NGS ACRN: RN0575 Get Map
NGS Quad / Sta Num : 46092334/1043
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	8	42 N	20 W	460825.09	925316.74	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** CORKY 1964

1.5 MILES NORTHWEST OF SANDSTONE, 0.95 MILE NORTH ON INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 192.35, 82.54 FEET SOUTHEAST OF CORKY MNDT RM 2, 72.62 FEET NORTHEAST OF CORKY MNDT RM 1, 26.4 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 6.3 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.959	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1135.959	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1135.959	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.601	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1135.624	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1135.601	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1135.647	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1045.805	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1135.956	.131		1045.900	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1135.956	.131		1046.031	.066	1996	GPS - STATIC	2009	HMOOSE
1135.956	.131		1045.900	.066	2007	GPS - STATIC	2009	HMOOSE
1135.834	.262		1045.897	.197	1996	GPS - RTRN	2008	RTRN2008
			1045.900	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1046.048	.066	1996	GPS - STATIC	1999	GPS917
1136.021	.131		1046.048	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1135.956	.131		1046.048	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.167 12B = -90.170 09 = -90.072 03 = -89.937

CORKY MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 25.09278	92 53 16.73614	503046.641	249630.602	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 25.09261	92 53 16.73702	503046.579	249630.585	.033	C	ADJUSTMENT	2009	GPS2566
46 08 25.09261	92 53 16.73702	503046.579	249630.585	.033	C	GPS - STATIC	2009	HMOOSE
46 08 25.09308	92 53 16.73624	503046.634	249630.633	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 25.09249	92 53 16.73660	503046.608	249630.573	.033	C	GPS - STATIC	2009	HMOOSE
46 08 25.09285	92 53 16.73603	503046.648	249630.609	.131	3	GPS - RTRN	2008	RTRN2008
46 08 25.09269	92 53 16.73595	503046.655	249630.593	.033	C	GPS - STATIC	1999	GPS917
46 08 25.09269	92 53 16.73595	503046.654	249630.593	.033	C	ADJUSTMENT	1999	17648
46 08 25.09269	92 53 16.73595	503046.654	249630.593	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 25.08716	92 53 16.72904	503047.140	249630.032	.033	C	GPS - STATIC	1994	HI35N
46 08 25.08679	92 53 16.73716	503046.569	249629.995	.066	2	GPS - STATIC	1991	HFIN
46 08 25.08680	92 53 16.73717	503046.568	249629.996	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 25.27200	92 53 16.01500			.100	2	CLASSICAL SURVEY	1982	17020
46 08 25.27177	92 53 16.01523			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969897.633	746864.678	1668801.921	16763885.334	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969897.571	746864.659	1668801.860	16763885.316	.033	C	ADJUSTMENT	2009	GPS2566
2969897.571	746864.659	1668801.860	16763885.316	.033	C	GPS - STATIC	2009	HMOOSE
2969897.625	746864.708	1668801.914	16763885.364	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969897.601	746864.648	1668801.889	16763885.304	.033	C	GPS - STATIC	2009	HMOOSE
2969897.641	746864.685	1668801.929	16763885.341	.131	3	GPS - RTRN	2008	RTRN2008
2969897.646	746864.669	1668801.935	16763885.325	.033	C	GPS - STATIC	1999	GPS917
2969897.646	746864.669	1668801.935	16763885.325	.033	C	ADJUSTMENT	1999	17648
2969897.646	746864.669	1668801.935	16763885.325	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969898.143	746864.117	1668802.422	16763884.765	.033	C	GPS - STATIC	1994	HI35N
2969897.572	746864.070	1668801.850	16763884.727	.066	2	GPS - STATIC	1991	HFIN
2969897.571	746864.071	1668801.850	16763884.728	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2345291.872	418797.582			.100	2	CLASSICAL SURVEY	1982	17020
2345291.850	418797.560			.100	C	CLASSICAL SURVEY	1950	UNK

CORKY MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY-RN0575-3W-13NOV2008.jpg	W	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY-RN0575-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY-RN0575-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

CORKY MNDT RM 1

Mn/DOT Name: CORKY MNDT RM 1 **NGS Name:** CORKY RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0576 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	8	42 N	20 W	460824.60	925317.49	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
REFERENCE MARK DISK

Mon. Agency
MNDT

Description: (1964) **Stamping:** CORKY NO 1 1964

1.5 MILES NORTHWEST OF SANDSTONE, 1.1 MILES NORTH ON INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 AT SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 192.4, 115.8 FEET SOUTH OF CORKY MNDT RM 2, 79.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 72.62 FEET SOUTHWEST OF STATION CORKY MNDT, 20.0 FEET EAST OF A FENCE, 1.5 FEET NORTH OF A WITNESS POST.

Station Notes
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) POSITION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.450	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1135.450	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1135.450	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1135.093	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1135.093	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1135.093	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1135.139	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.167 12B = -90.170 09 = -90.072 03 = -89.937

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY_RM_1-RN0576-3W-13NOV2008.jpg	W	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY_RM_1-RN0576-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY_RM_1-RN0576-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

CORKY MNDT RM 2

Mn/DOT Name: CORKY MNDT RM 2 **NGS Name:** CORKY RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0574 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	8	42 N	20 W	460825.74	925317.44	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2008) **Stamping:** CORKY NO 2 1964

1.5 MILES NORTHWEST OF SANDSTONE, 1.1 MILES NORTH ON INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 192.4, 117.3 FEET NORTH OF A WITNESS POST, 115.8 FEET NORTH OF CORKY MNDT RM 1, 82.54 FEET NORTHWEST OF STATION CORKY MNDT, 76.4 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 23.0 FEET EAST OF A FENCE, 2.0 FEET EAST OF A WITNESS POST.

Station Notes

THE REAL TIME REFERENCE NETWORK (RTRN) CONNECTION FAILED DUE TO TREES IN THE AREA.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1138.200	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1138.200	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1138.200	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1137.842	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1137.842	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1137.842	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1137.888	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.167 12B = -90.170 09 = -90.075 03 = -89.941

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY_RM_2-RN0574-3W-13NOV2008.jpg	W	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY_RM_2-RN0574-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CORKY_RM_2-RN0574-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

CORNER OF A BARN

Mn/DOT Name: CORNER OF A BARN

NGS Name: CORNER OF A BARN

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2396 Get Map
NGS Quad / Sta Num : 46092344/
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	45 N	21 W	462236.37	925938.15		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

97.0 FEET NORTHEAST OF A STATION BIRCH.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.122 09 = -90.987 03 = -90.902

CORNER OF A FRAME HOUSE

Mn/DOT Name: CORNER OF A FRAME HOUSE

NGS Name: CORNER OF A FRAME HOUSE

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2397 Get Map
NGS Quad / Sta Num : 46092344/
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	45 N	21 W	462236.37	925938.15		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

141.0 FEET SOUTHEAST OF A STATION BIRCH.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.122 09 = -90.987 03 = -90.902

COWTIP

Mn/DOT Name: COWTIP
NGS Name: COWTIP
County: PINE, MN (Sheet 2)

NGS ACRN: DL4737 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	20	42 N	20 W	460637.46	925316.81	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** COWTIP 2008

1.0 MILE SOUTH OF SANDSTONE, 1.05 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 190.3, 45.5 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 40.0 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 2.2 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.713	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1080.706	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			990.648	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1080.706	.131		990.733	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1080.706	.131		990.867	.066	1996	GPS - STATIC	2009	HMOOSE
1080.706	.131		990.733	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.049 12B = -90.059 09 = -89.954 03 = -89.826

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 37.46269	92 53 16.80582	503043.378	238727.296	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 37.46272	92 53 16.80673	503043.314	238727.299	.033	C	ADJUSTMENT	2009	GPS2566
46 06 37.46272	92 53 16.80673	503043.314	238727.299	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 37.46270	92 53 16.80627	503043.347	238727.297	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970080.189	735964.145	1668812.374	16752986.851	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970080.125	735964.147	1668812.310	16752986.854	.033	C	ADJUSTMENT	2009	GPS2566
2970080.125	735964.147	1668812.310	16752986.854	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970080.157	735964.145	1668812.342	16752986.852	.033	C	GPS - STATIC	2009	HMOOSE

CROSSOVER

Mn/DOT Name: CROSSOVER
NGS Name: CROSSOVER
County: PINE, MN (Sheet 2)

NGS ACRN: DL4739 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	45 N	19 W	462420.84	924554.54	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 85 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** CROSSOVER 2008

3.1 MILES NORTHEAST OF STURGEON LAKE, 2.45 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, AT INTERSTATE HIGHWAY 35 MILEPOINT 212.30, 42.4 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 42.0 FEET SOUTHWEST OF A CROSSOVER, 34.0 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 3.0 FEET NORTH OF A WITNESS POST.

Station Notes
THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1101.497	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1101.487	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1009.837	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1101.474	.131		1009.942	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1101.474	.131		1010.083	.066	1996	GPS - STATIC	2009	HMOOSE
1101.474	.131		1009.942	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.624 12B = -91.624 09 = -91.516 03 = -91.332

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 20.83666	92 45 54.54093	534021.876	346482.547	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 20.83686	92 45 54.54169	534021.822	346482.567	.033	C	ADJUSTMENT	2009	GPS2566
46 24 20.83686	92 45 54.54169	534021.822	346482.567	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 20.83669	92 45 54.54160	534021.829	346482.549	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2999213.584	844218.355	1699640.835	16860733.072	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2999213.530	844218.374	1699640.781	16860733.093	.033	C	ADJUSTMENT	2009	GPS2566
2999213.530	844218.374	1699640.781	16860733.093	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2999213.537	844218.357	1699640.788	16860733.075	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CROSSOVER-DL4739-3SW-22DEC2008.jpg	SW	Dec 22, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CROSSOVER-DL4739-2-22DEC2008.jpg		Dec 22, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/CROSSOVER-DL4739-1-22DEC2008.jpg		Dec 22, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: D 154 **NGS Name:** D 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0447 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	26	45 N	20 W	462047.05	925014.72	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2007) **Stamping:** D 154 1935

2.0 MILES NORTH OF WILLOW RIVER, 2.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43 IN WILLOW RIVER, IN THE NORTHWEST QUADRANT OF DAGO LAKE AND THE COUNTY ROAD 61 JUNCTION, 56.0 FEET WEST OF COUNTY ROAD 61, 35.0 FEET EAST OF A STATE TRAIL, 26.0 FEET NORTH OF DAGO LAKE ROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1055.605	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1055.191	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1055.191	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1055.191	.007	1				VERTICAL CONTROL SURVEY	1971	L30 MINN
1055.191	.007	1				VERTICAL CONTROL SURVEY	1935	L30 MINN

Geoid Separations(ft): GEOID18 = -91.322 12B = -91.302 09 = -91.191 03 = -91.033

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/D_154-RN0447-3W-03JUN2007.jpg	W	Jun 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/D_154-RN0447-2-03JUN2007.jpg		Jun 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/D_154-RN0447-1-03JUN2007.jpg		Jun 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: D 155 **NGS Name:** D 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0489 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	45 N	18 W	462211.84	923313.43	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 12 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2007) **Stamping:** D 155 1935

AT DUQUETTE, 195.0 FEET NORTHEAST ON A RAILROAD FROM THE RAILROAD STATION, 117.0 FEET NORTH OF A ROAD CROSSING, 115.0 FEET NORTHEAST OF THE RANGE LINE ROAD, 95.3 FEET SOUTH-SOUTHEAST OF TRUNK HIGHWAY 23, 30.0 FEET WEST OF THE RAILROAD TRACKS, 30.0 FEET NORTH-NORTHWEST AND WEST OF A RAIL, 1.4 FEET SOUTHWEST AT TRUNK HIGHWAY 23 MILEPOINT 310.8.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1147.209	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1147.193	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1147.229	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1146.828	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1146.828	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1146.828	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1147.104	.262		1056.389	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.955 12B = -90.961 09 = -90.794 03 = -90.715

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 11.84198	92 33 13.43126	587418.510	333575.566	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3052815.372	832225.644	1753029.977	16847900.178	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/D_155-RN0489-3NE-14OCT2008.jpg	NE	Oct 14, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/D_155-RN0489-2-14OCT2008.jpg		Oct 14, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/D_155-RN0489-1-14OCT2008.jpg		Oct 14, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: D 158 **NGS Name:** D 158

County: PINE, MN (Sheet 2)

NGS ACRN: RN0514 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	22	45 N	18 W	462228.00	923651.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (1935) **Stamping:** D 158 1935

3.1 MILES WEST OF DUQUETTE, 180.0 FEET EAST AND 30.0 FEET SOUTH OF COUNTY ROAD 47 AT A TOWNSHIP ROAD NORTH, AT A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1114.814	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1114.414	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1114.414	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.292 12B = -91.302 09 = -91.145 03 = -91.030

*** No Horizontal Positions in the Database ***

DAGO MNDT

Mn/DOT Name: DAGO MNDT **NGS Name:** DAGO

County: PINE, MN (Sheet 2)

NGS ACRN: RN0533 Get Map
NGS Quad / Sta Num : 46092342/1059
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	45 N	20 W	462046.02	924843.82	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2008) **Stamping:** DAGO 1966

2.2 MILES NORTH-NORTHEAST OF WILLOW RIVER, 1.5 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 41, THEN 1.2 MILES ON DAGEL LAKE ROAD, NEAR THE SOUTHWEST CORNER OF DAGO LAKE ROAD BRIDGE NUMBER 58813 OVER INTERSTATE HIGHWAY 35, 221.35 FEET WEST OF DAGO RM 2, 83.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 37.58 FEET SOUTH OF DAGO RM 1, 17.0 FEET SOUTH OF DAGO LAKE ROAD, 13.2 FEET WEST OF THE SOUTHWEST CORNER OF A BRIDGE, 2.0 FEET SOUTH OF A GUARDRAIL, 0.6 FOOT SOUTH OF A GUARDRAIL POST, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.745	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1093.745	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1093.751	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.338	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1093.338	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1093.338	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1002.396	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1093.731	.131		1002.491	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1093.731	.131		1002.610	.066	1996	GPS - STATIC	2009	HMOOSE
1093.731	.131		1002.491	.066	2007	GPS - STATIC	2009	HMOOSE
			1002.505	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1002.678	.066	1996	GPS - STATIC	1999	GPS917
1093.764	.131		1002.678	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.335 12B = -91.325 09 = -91.217 03 = -91.053

DAGO MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 46.01790	92 48 43.81522	522182.853	324702.814	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 46.01783	92 48 43.81604	522182.795	324702.806	.033	C	ADJUSTMENT	2009	GPS2566
46 20 46.01783	92 48 43.81604	522182.795	324702.806	.033	C	GPS - STATIC	2009	HMOOSE
46 20 46.01750	92 48 43.81613	522182.789	324702.773	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 46.01746	92 48 43.81600	522182.798	324702.769	.033	C	GPS - STATIC	2009	HMOOSE
46 20 46.01705	92 48 43.81614	522182.788	324702.727	.033	C	GPS - STATIC	1999	GPS917
46 20 46.01705	92 48 43.81614	522182.788	324702.727	.033	C	ADJUSTMENT	1999	17648
46 20 46.01393	92 48 43.81067	522183.172	324702.412	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 46.01382	92 48 43.81055	522183.181	324702.400	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 46.20500	92 48 43.09000			.100	2	CLASSICAL SURVEY	1982	17020
46 20 46.20519	92 48 43.09037			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987749.155	822242.879	1687834.843	16838948.188	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987749.097	822242.871	1687834.785	16838948.180	.033	C	ADJUSTMENT	2009	GPS2566
2987749.097	822242.871	1687834.785	16838948.180	.033	C	GPS - STATIC	2009	HMOOSE
2987749.092	822242.837	1687834.779	16838948.147	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987749.101	822242.834	1687834.788	16838948.143	.033	C	GPS - STATIC	2009	HMOOSE
2987749.092	822242.792	1687834.779	16838948.101	.033	C	GPS - STATIC	1999	GPS917
2987749.092	822242.792	1687834.779	16838948.101	.033	C	ADJUSTMENT	1999	17648
2987749.481	822242.483	1687835.163	16838947.786	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987749.490	822242.472	1687835.171	16838947.775	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2363144.046	494176.225			.100	2	CLASSICAL SURVEY	1982	17020
2363144.020	494176.240			.100	C	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO-RN0533-3S-04JUN2007.jpg	S	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO-RN0533-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO-RN0533-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DAGO MNDT AZ MK

Mn/DOT Name: DAGO MNDT AZ MK
NGS Name: DAGO AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0530 Get Map
NGS Quad / Sta Num : 46092342/1060
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	45 N	19 W	462144.09	924804.21	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2007) **Stamping:** DAGO 1966

1.5 MILES SOUTHEAST OF STURGEON LAKE, 1.0 MILE SOUTH-SOUTHEAST ALONG THE INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF THE INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, AT INTERSTATE 35 MILEPOINT 208.8, AT THE INTERSTATE HIGHWAY 35 STATION 2496+70, 63.5 FEET WEST OF THE SOUTHBOUND INTERSTATE HIGHWAY 35, 35.5 FEET EAST OF A RIGHT-OF-WAY FENCE, 10.0 FEET EAST OF THE EDGE OF PINE TREES TO THE WEST, 3.2 FEET EAST OF A WITNESS POST.

Station Notes
A TREE BLOCKS GPS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.115	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1088.692	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1088.692	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.105	.197		997.977	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.404 12B = -91.397 09 = -91.292 03 = -91.125

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 44.08963	92 48 04.21195	524954.023	330589.242	.066	2	ADJUSTMENT	1999	17648
46 21 44.08576	92 48 04.20742	524954.341	330588.851	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 44.08561	92 48 04.20734	524954.347	330588.835	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position				Project Info				
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 44.27800	92 48 03.48900			.100	2	CLASSICAL SURVEY	1982	17020
46 21 44.27782	92 48 03.48867			.100	2	CLASSICAL SURVEY	1950	UNK

DAGO MNDT AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990419.214	828174.913	1690597.297	16844835.467	.066	2	ADJUSTMENT	1999	17648
2990419.539	828174.527	1690597.616	16844835.076	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990419.544	828174.512	1690597.621	16844835.061	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2365814.011	500108.361			.100	2	CLASSICAL SURVEY	1982	17020
2365814.030	500108.340			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO_AZ_MK-RN0530-3W-03DEC2008.jpg	W	Dec 3, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO_AZ_MK-RN0530-2-03DEC2008.jpg		Dec 3, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO_AZ_MK-RN0530-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DAGO RM 1

Mn/DOT Name: DAGO RM 1 **NGS Name:** DAGO RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0534 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	45 N	20 W	462046.38	924843.68	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2007) **Stamping:** DAGO NO 1 1966

2.0 MILES NORTH-NORTHEAST OF WILLOW RIVER, 2.0 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, 37.58 FEET NORTH OF STATION DAGO MNDT, 20.0 FEET NORTH OF DAGO LAKE ROAD, 16.0 FEET WEST OF THE NORTHWEST CORNER OF DAGO LAKE ROAD BRIDGE NUMBER 58813 OVER INTERSTATE HIGHWAY 35, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.538	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1093.538	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1093.538	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.124	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1093.124	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1093.124	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.400	.262		1002.347	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.335 12B = -91.325 09 = -91.217 03 = -91.056

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 46.37625	92 48 43.67561	522192.607	324739.128	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987758.288	822279.350	1687844.547	16838984.498	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO_RM_1-RN0534-3W-03DEC2008.jpg	W	Dec 3, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO_RM_1-RN0534-2-03DEC2008.jpg		Dec 3, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAGO_RM_1-RN0534-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DAGO RM 2

Mn/DOT Name: DAGO RM 2 **NGS Name:** DAGO RM 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	45 N	20 W	462045.93	924840.66		

NGS ACRN: CJ7867 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2010) **Stamping:** DAGO NO 2 1966

2.0 MILES NORTH-NORTHEAST OF WILLOW RIVER, 1.5 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 41, THEN 1.3 MILES ON DAGEL LAKE ROAD, SET IN THE SOUTHEAST CORNER OF THE COUNTY ROAD BRIDGE OVER INTERSTATE HIGHWAY 35 (BRIDGE NUMBER 58813).

Station Notes

THE STATION WAS REPLACED WITH 5880 SS.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.338 12B = -91.325 09 = -91.220 03 = -91.056

Mn/DOT Name: DAVE **NGS Name:** DAVE

County: PINE, MN (Sheet 2)

NGS ACRN: DL6291 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	42 N	20 W	460901.37	924814.84	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** DAVE 2009

2.6 MILES SOUTHWEST OF ASKOV, 2.55 MILES SOUTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 (THE JUNCTION IS 1.0 MILE WEST OF ASKOV), AT TRUNK HIGHWAY 123 MILEPOINT 5.5, 100.0 FEET WEST OF TRUNK HIGHWAY 123, 30.0 FEET WEST OF A FENCE CORNER, 15.0 FEET NORTH OF TENQUIST TRAIL.

Station Notes
THE DISK WAS MISSING 8/13/2009.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.804	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1133.810	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1044.073	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1133.823	.131		1044.138	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1133.823	.131		1044.283	.066	1996	GPS - STATIC	2009	HASKO
1133.823	.131		1044.138	.066	2007	GPS - STATIC	2009	HASKO

Geoid Separations(ft): GEOID18 = -89.708 12B = -89.728 09 = -89.619 03 = -89.534

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 01.37431	92 48 14.84190	524301.594	253320.477	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 01.37429	92 48 14.84280	524301.531	253320.475	.033	C	ADJUSTMENT	2010	GPS2619
46 09 01.37429	92 48 14.84280	524301.531	253320.475	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 01.37422	92 48 14.84248	524301.554	253320.468	.033	C	GPS - STATIC	2009	HASKO

DAVE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991084.147	750915.872	1690042.832	16767600.333	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991084.084	750915.868	1690042.769	16767600.331	.033	C	ADJUSTMENT	2010	GPS2619
2991084.084	750915.868	1690042.769	16767600.331	.033	C	GPS - STATIC	2009	HASKO

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991084.106	750915.862	1690042.791	16767600.324	.033	C	GPS - STATIC	2009	HASKO

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAVE-DL6291-3N-22JUN2009.jpg	N	Jun 22, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAVE-DL6291-2-22JUN2009.jpg		Jun 22, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DAVE-DL6291-1-22JUN2009.jpg		Jun 22, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DELL

Mn/DOT Name: DELL **NGS Name:** DELL

County: PINE, MN (Sheet 2)

NGS ACRN: RN1273 Get Map
NGS Quad / Sta Num : 46093222/1007
USGS Quad: KROSCHEL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	42 N	21 W	460633.33	930201.57		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	1993	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	MNDT

Description: (2001) **Stamping:** DELL 1961 1993

6.25 MILES NORTH AND 4.5 MILES WEST OF HINCKLEY, 7.4 MILES NORTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23, THEN 5.5 MILES WEST-SOUTH AND WEST ON COUNTY ROAD 27, THEN 561.0 FEET NORTH ON A DIRT ROAD, 1.0 MILE WEST OF THE SOUTH END OF GRINDSTONE LAKE, 60.4 FEET WEST-SOUTHWEST OF A POWER POLE, 23.0 FEET WEST OF SJODAHL ROAD, 49.0 FEET SOUTH OF AN ENTRANCE EAST, 84.28 FEET SOUTHWEST OF DELL RM 1, 92.01 FEET NORTHWEST OF DELL RM 2, 2.8 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1182.757	.262		1092.304	.197	1996	GPS - RTRN	2008	RTRN2008
1181.100	.197		1090.579	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1182.708						GPS - STATIC	1994	HORZ
1181.100						RECIPROCAL VERTICAL ANGLE	1961	HORZ

Geoid Separations(ft): GEOID18 = -90.741 12B = -90.712 09 = -90.617 03 = -90.449

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.33315	93 02 01.57308	466068.606	238337.261	.131	3	GPS - RTRN	2008	RTRN2008
46 06 33.33187	93 02 01.57448	466068.507	238337.131	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.32584	93 02 01.56831	466068.941	238336.520	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.50150	93 02 00.79940			.100	2	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2933121.605	734944.221	1631854.476	16752550.517	.131	3	GPS - RTRN	2008	RTRN2008
2933121.508	734944.089	1631854.378	16752550.388	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2933121.952	734943.485	1631854.812	16752549.777	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2308518.506	406876.036			.100	2	CLASSICAL SURVEY	1961	12611

DELL AZ MK

Mn/DOT Name: DELL AZ MK
NGS Name: DELL AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: CP3616 Get Map
NGS Quad / Sta Num : 46093222/1007
USGS Quad: KROSCHEL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	42 N	21 W	460653.50	930201.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (2010) **Stamping:** DELL 1961

8.1 MILES WEST OF SANDSTONE, 5.4 MILES WEST ALONG GRINDSTONE LAKE ROAD FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD GRINDSTONE LAKE ROAD, THEN 0.5 MILE NORTH ON SJODAHL ROAD, 33.0 FEET EAST OF THE CENTERLINE OF SJODAHL ROAD, 32.0 FEET SOUTH OF A POWER POLE, 2.0 FEET SOUTH OF A WITNESS POST.

Station Notes

IN 10-09-2008 IT WAS DETERMINED THAT THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.745 12B = -90.715 09 = -90.617 03 = -90.453

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_AZ_MK-CP3616-3E-09OCT2008.jpg	E	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_AZ_MK-CP3616-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_AZ_MK-CP3616-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DELL RESET

Mn/DOT Name: DELL RESET
NGS Name: DELL RESET
County: PINE, MN (Sheet 2)

NGS ACRN: AG9991 Get Map
NGS Quad / Sta Num : 46093222/
USGS Quad: KROSCHEL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	42 N	21 W	460633.33	930201.58		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1993	2007	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2007) **Stamping:** DELL 1961 1993

8.2 MILES WEST OF SANDSTONE, 5.5 MILES WEST ALONG GRINDSTONE LAKE ROAD FROM THE JUNCTION OF GRINDSTONE LAKE ROAD AND COUNTY ROAD 61, 1.0 MILE WEST OF THE SOUTH END OF GRINDSTONE LAKE, 560.0 FEET NORTH ON SJODAHL ROAD, AT A TOWNSHIP ROAD, 23.0 FEET WEST OF A TOWNSHIP ROAD, 2.8 FEET SOUTH OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1092.347	.019	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1092.445	.018	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1092.583	.066	1996	GPS - STATIC	1999	GPS917

Geoid Separations(ft): GEOID18 = -90.741 12B = -90.712 09 = -90.617 03 = -90.449

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.33121	93 02 01.57596	466068.403	238337.065	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.33101	93 02 01.57664	466068.355	238337.044	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.33094	93 02 01.57636	466068.376	238337.036	.033	C	GPS - STATIC	1999	GPS917

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2933121.405	734944.021	1631854.274	16752550.321	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2933121.357	734944.000	1631854.226	16752550.301	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2933121.377	734943.993	1631854.245	16752550.294	.033	C	GPS - STATIC	1999	GPS917

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_RESET-AG9991-3W-02APR2007.jpg	W	Apr 2, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_RESET-AG9991-2-02APR2007.jpg		Apr 2, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_RESET-AG9991-1-02APR2007.jpg		Apr 2, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DELL RM 1

Mn/DOT Name: DELL RM 1

NGS Name: DELL RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CP3617 Get Map
NGS Quad / Sta Num : 46093222/1007
USGS Quad: KROSCHEL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	42 N	21 W	460633.00	930201.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 10 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description:

Stamping: DELL NO 1 1961

6.25 MILES NORTH AND 4.5 MILES WEST OF HINCKLEY, 7.4 MILES NORTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23 THEN 5.5 MILES WEST-SOUTH AND WEST ON COUNTY ROAD 27, THEN 561.0 FEET NORTH ON SJODAHL ROAD, 55.0 FEET NORTH OF A POWER POLE, 32.0 FEET EAST OF THE CENTERLINE OF SJODAHL ROAD.

Station Notes

IN 10-09-2008 DETERMINED THAT FENCES ARE GONE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.741 12B = -90.712 09 = -90.617 03 = -90.449

DELL RM 2

Mn/DOT Name: DELL RM 2 **NGS Name:** DELL RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CP3618 Get Map
NGS Quad / Sta Num : 46093222/1007
USGS Quad: KROSCHEL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	42 N	21 W	460633.00	930201.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description:

Stamping: DELL NO 2 1961

6.25 MILES NORTH AND 4.5 MILES WEST OF HINCKLEY, 7.4 MILES NORTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23 THEN 5.5 MILES WEST-SOUTH AND WEST ON COUNTY ROAD 27 THEN 561.0 FEET NORTH ON SOUTH JORDAHL ROAD, 64.0 FEET SOUTH OF A POWER POLE, 51.0 FEET EAST OF THE CENTERLINE, 12.5 FEET EAST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.741 12B = -90.712 09 = -90.617 03 = -90.449

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_RM_2-CP3618-3E-09OCT2008.jpg	E	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_RM_2-CP3618-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DELL_RM_2-CP3618-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DEMER

Mn/DOT Name: DEMER **NGS Name:** DEMER

County: PINE, MN (Sheet 2)

NGS ACRN: DL4743 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	18	45 N	19 W	462253.38	924703.83	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 105 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010) **Stamping:** DEMER 2008

2.0 MILES EAST OF STURGEON LAKE, 2.0 MILES EAST ALONG LAKE TOWN ROAD FROM THE JUNCTION OF LAKE TOWN ROAD AND COUNTY ROAD 61 (MAIN STREET), THEN 0.5 MILE NORTH ON INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 210.4, 88.6 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 43.6 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 27.0 FEET SOUTHWEST OF A CROSSOVER, 1.9 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.237	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1079.230	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.207	.262		987.705	.197	2011	GPS - OPUS	2020	GPSBM
1079.181	.262		987.685	.197	2011	GPS - RTRN	2020	RTRN2020
			987.685	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1079.230	.131		987.787	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1079.230	.131		987.915	.066	1996	GPS - STATIC	2009	HMOOSE
1079.230	.131		987.787	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.502 12B = -91.499 09 = -91.394 03 = -91.214

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 53.37818	92 47 03.82841	529178.960	337614.511	.131	3	GPS - OPUS	2020	GPSBM
46 22 53.37845	92 47 03.82836	529178.963	337614.538	.131	3	GPS - RTRN	2020	RTRN2020
46 22 53.37863	92 47 03.82798	529178.990	337614.556	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 53.37868	92 47 03.82876	529178.935	337614.561	.033	C	ADJUSTMENT	2009	GPS2566
46 22 53.37868	92 47 03.82876	529178.935	337614.561	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 53.37843	92 47 03.82877	529178.934	337614.536	.033	C	GPS - STATIC	2009	HMOOSE

DEMER

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2994523.211	835270.245	1694811.399	16851862.913	.131	3	GPS - OPUS	2020	GPSBM
2994523.214	835270.273	1694811.403	16851862.941	.131	3	GPS - RTRN	2020	RTRN2020
2994523.240	835270.291	1694811.429	16851862.959	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2994523.185	835270.296	1694811.374	16851862.964	.033	C	ADJUSTMENT	2009	GPS2566
2994523.185	835270.296	1694811.374	16851862.964	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2994523.185	835270.270	1694811.374	16851862.938	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DEMER-DL4743-3NW-07MAY2020.jpg	NW	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DEMER-DL4743-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DEMER-DL4743-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: DENHAM
NGS Name: DENHAM
County: PINE, MN (Sheet 2)

NGS ACRN: RN1645 Get Map
NGS Quad / Sta Num : 46092343/1013
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	45 N	21 W	462215.56	925559.46		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (2010) **Stamping:** DENHAM 1952

0.5 MILE NORTHEAST OF DENHAM, 0.5 MILE NORTH ALONG EDGEWOOD ROAD (MAIN STREET) FROM THE JUNCTION OF EDGEWOOD ROAD (MAIN STREET) AND BALLFIELD ROAD, THEN 0.6 MILE EAST ON ROCK CUTS ROAD, THEN 0.1 MILE NORTHEAST ON DRIVEWAY NUMBER 20195 TO A HOUSE ON THE LEFT, THEN 0.15 MILE NORTHEAST THROUGH THE WOODS TO THE TOP OF A HILL, 17.0 FEET WEST OF A FENCE, 70.62 FEET SOUTH OF DENHAM RM 1, 68.94 FEET NORTH OF DENHAM RM 2, 2.0 FEET SOUTHWEST OF A WITNESS POST, 1.5 FEET SOUTHEAST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1234.315	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1234.414	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1234.571	.066	1996	GPS - STATIC	1999	GPS917
1325.588	.131		1234.571	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1325.194						GPS - STATIC	1994	HORZ
1325.489						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -91.240 12B = -91.194 09 = -91.073 03 = -90.945

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 15.55679	92 55 59.45966	491622.746	333763.397	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 15.55672	92 55 59.46042	491622.693	333763.390	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 15.55631	92 55 59.46038	491622.695	333763.348	.033	C	GPS - STATIC	1999	GPS917
46 22 15.55631	92 55 59.46038	491622.696	333763.348	.033	C	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 15.55251	92 55 59.45357	491623.173	333762.963	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 15.74800	92 55 58.72300			.100	1	CLASSICAL SURVEY	1961	12611

DENHAM

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2957043.120	830780.114	1657277.163	16847966.026	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2957043.067	830780.106	1657277.110	16847966.019	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2957043.070	830780.065	1657277.113	16847965.978	.033	C	GPS - STATIC	1999	GPS917
2957043.070	830780.065	1657277.113	16847965.978	.033	C	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2957043.554	830779.688	1657277.590	16847965.593	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2332437.886	502713.747			.100	1	CLASSICAL SURVEY	1961	12611

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM-RN1645-3E-20NOV2007.jpg	E	Nov 20, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM-RN1645-2-20NOV2007.jpg		Nov 20, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM-RN1645-1-20NOV2007.jpg		Nov 20, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DENHAM AZ MK

Mn/DOT Name: DENHAM AZ MK
NGS Name: DENHAM AZ MK
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	19	45 N	20 W	462204.00	925535.00		

NGS ACRN: CJ2422 Get Map
NGS Quad / Sta Num : 46092343/1013
USGS Quad: DENHAM

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (2010) **Stamping:** DENHAM 1952

0.5 MILE NORTHEAST OF DENHAM, 0.5 MILE NORTH ALONG EDGEWOOD ROAD (MAIN STREET) FROM THE JUNCTION OF EDGEWOOD ROAD (MAIN STREET) AND BALLFIELD ROAD, THEN 1.0 MILE EAST ON ROCK CUTS ROAD, 31.0 FEET NORTH OF THE CENTERLINE OF ROCK CUTS ROAD, 1.0 FOOT NORTH OF A FENCE, 1.0 FOOT SOUTH OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.237 12B = -91.194 09 = -91.073 03 = -90.941

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_AZ_MK-CJ2422-3N-16OCT2008.jpg	N	Oct 16, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_AZ_MK-CJ2422-2-16OCT2008.jpg		Oct 16, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_AZ_MK-CJ2422-1-16OCT2008.jpg		Oct 16, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DENHAM RM 1

Mn/DOT Name: DENHAM RM 1 **NGS Name:** DENHAM RM 1

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	45 N	21 W	462216.25	925559.38		

NGS ACRN: CJ2423 Get Map
NGS Quad / Sta Num : 46092343/1013
USGS Quad: DENHAM

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2008) **Stamping:** DENHAM NO 1 1952

0.5 MILE NORTHEAST OF DENHAM, 0.5 MILE NORTH ALONG EDGEWOOD ROAD (MAIN STREET) FROM THE JUNCTION OF EDGEWOOD ROAD (MAIN STREET) AND BALLFIELD ROAD, THEN 0.5 MILE EAST ON ROCK CUTS ROAD, THEN 0.1 MILE NORTHEAST ON DRIVEWAY NUMBER 20195 TO A HOUSE AND A BARN ON THE LEFT, THEN 0.15 MILE NORTHEAST THROUGH THE WOODS TO THE TOP OF A HILL, 12.0 FEET WEST OF A FENCE, 6.0 FEET WEST OF A TRIPLE TRUNKED TREE, 70.62 FEET NORTH OF STATION DENHAM.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.240 12B = -91.194 09 = -91.073 03 = -90.945

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_RM_1-CJ2423-3E-20NOV2007.jpg	E	Nov 20, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_RM_1-CJ2423-2-20NOV2007.jpg		Nov 20, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_RM_1-CJ2423-1-20NOV2007.jpg		Nov 20, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DENHAM RM 2

Mn/DOT Name: DENHAM RM 2 **NGS Name:** DENHAM RM 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	45 N	21 W	462214.88	925559.38		

NGS ACRN: CJ2424 Get Map
NGS Quad / Sta Num : 46092343/1013
USGS Quad: DENHAM

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2010) **Stamping:** DENHAM NO 2 1952

0.5 MILE NORTHEAST OF DENHAM, 0.5 MILE NORTH ALONG EDGEWOOD ROAD (MAIN STREET) FROM THE JUNCTION OF EDGEWOOD ROAD (MAIN STREET) AND BALLFIELD ROAD, THEN 0.6 MILE EAST ON ROCK CUTS ROAD, THEN 0.1 MILE NORTHEAST ON DRIVEWAY NUMBER 20195 TO A HOUSE AND A BARN ON THE LEFT, THEN 0.15 MILE NORTHEAST THROUGH THE WOODS TO THE TOP OF A HILL, 12.0 FEET WEST OF A FENCE, 6.0 FEET WEST OF A TRIPLE TRUNKED TREE, 68.94 FEET SOUTH OF STATION DENHAM, 12.0 FEET WEST OF A FENCE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.237 12B = -91.191 09 = -91.073 03 = -90.945

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_RM_2-CJ2424-3E-20NOV2007.jpg	E	Nov 20, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_RM_2-CJ2424-2-20NOV2007.jpg		Nov 20, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DENHAM_RM_2-CJ2424-1-20NOV2007.jpg		Nov 20, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: DETR MNDT **NGS Name:** DETR

County: PINE, MN (Sheet 2)

NGS ACRN: AF9147 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	20	43 N	21 W	461207.11	930121.71	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 75 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** DETR 1991

5.0 MILES WEST OF FINLAYSON, 5.1 MILES WEST ON TRUNK HIGHWAY 18, AT THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 37, AT TRUNK HIGHWAY 18 MILEPOINT 71.5, 125.0 FEET SOUTHWEST OF THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 37, 68.2 FEET WEST OF A SECTION CORNER, 21.2 FEET SOUTHEAST OF COUNTY ROAD 37, 12.7 FEET NORTH-NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.611	.016	2/1				VERTICAL ADJUSTMENT	2013	00000795
1110.615	.016	2/1				VERTICAL CONTROL SURVEY	2010	VNABE
1110.493	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1110.483	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.103	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.706	.262		1019.955	.197	2011	GPS - OPUS	2020	GPSBM
1110.661	.262		1019.952	.197	2011	GPS - RTRN	2020	RTRN2020
			1019.758	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1019.867	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1110.529	.131		1019.968	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1110.496	.131		1019.968	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.751 12B = -90.708 09 = -90.594 03 = -90.462

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.11245	93 01 21.71186	468929.358	272145.908	.131	3	GPS - OPUS	2020	GPSBM
46 12 07.11285	93 01 21.71121	468929.404	272145.948	.131	3	GPS - RTRN	2020	RTRN2020
46 12 07.11317	93 01 21.71171	468929.369	272145.981	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.11319	93 01 21.71250	468929.313	272145.983	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.11318	93 01 21.71175	468929.366	272145.982	.033	C	ADJUSTMENT	1999	17648
46 12 07.11318	93 01 21.71175	468929.366	272145.982	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.10600	93 01 21.70446	468929.878	272145.254	.066	2	GPS - STATIC	1991	HFIN

DETR MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2935405.692	768792.754	1634671.493	16786347.739	.131	3	GPS - OPUS	2020	GPSBM
2935405.737	768792.796	1634671.538	16786347.780	.131	3	GPS - RTRN	2020	RTRN2020
2935405.702	768792.828	1634671.503	16786347.812	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2935405.646	768792.829	1634671.448	16786347.814	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2935405.699	768792.829	1634671.500	16786347.813	.033	C	ADJUSTMENT	1999	17648
2935405.699	768792.829	1634671.500	16786347.813	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2935406.223	768792.109	1634672.013	16786347.086	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DETR-AF9147-3SE-06MAY2020.jpg	SE	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DETR-AF9147-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DETR-AF9147-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DIX MNDT

Mn/DOT Name: DIX MNDT
NGS Name: DIX
County: PINE, MN (Sheet 2)

NGS ACRN: RN0523 Get Map
NGS Quad / Sta Num : 46092341/1063
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	4	45 N	19 W	462434.45	924534.85	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** DIX 1966

3.0 MILES SOUTH OF MOOSE LAKE, 2.0 MILES SOUTHWEST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 73, 0.6 MILE SOUTH OF THE CARLTON-PINE COUNTY LINE, AT INTERSTATE HIGHWAY 35 MILEPOINT 212.7, AT INTERSTATE HIGHWAY 35 STATION 2699+80, 94.2 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 48.25 FEET SOUTH OF DIX MNDT RM 1, 4.7 FEET WEST OF A RIGHT-OF-WAY FENCE, 3.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1116.117	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1116.107	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1116.107	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1115.680	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1115.680	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1115.680	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1024.447	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1024.539	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1024.758	.066	1996	GPS - STATIC	1999	GPS917
1116.107	.131		1024.758	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.644 12B = -91.644 09 = -91.535 03 = -91.355

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 34.45067	92 45 34.84929	535399.468	347864.169	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 34.45061	92 45 34.84998	535399.420	347864.163	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 34.45028	92 45 34.84995	535399.421	347864.130	.033	C	GPS - STATIC	1999	GPS917
46 24 34.45028	92 45 34.84995	535399.422	347864.130	.033	C	ADJUSTMENT	1999	17648
46 24 34.44778	92 45 34.84648	535399.666	347863.877	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 34.44746	92 45 34.84655	535399.661	347863.844	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 34.64300	92 45 34.13400			.100	2	CLASSICAL SURVEY	1982	17020
46 24 34.64254	92 45 34.13423			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000567.233	845623.074	1701016.040	16862115.819	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000567.185	845623.068	1701015.992	16862115.813	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000567.188	845623.034	1701015.994	16862115.779	.033	C	GPS - STATIC	1999	GPS917
3000567.188	845623.034	1701015.994	16862115.780	.033	C	ADJUSTMENT	1999	17648
3000567.436	845622.785	1701016.238	16862115.527	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000567.431	845622.753	1701016.233	16862115.495	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2375961.752	517556.854			.100	2	CLASSICAL SURVEY	1982	17020
2375961.740	517556.810			.100	C	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX-RN0523-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX-RN0523-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX-RN0523-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DIX MNDT AZ MK

Mn/DOT Name: DIX MNDT AZ MK
NGS Name: DIX AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0525 Get Map
NGS Quad / Sta Num : 46092341/1065
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	8	45 N	19 W	462359.46	924626.19	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2001) **Stamping:** DIX 1966

4.0 MILES SOUTH OF MOOSE LAKE, 3.0 MILES SOUTHWEST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 73 (2.0 MILES FROM MOOSE LAKE), AT INTERSTATE HIGHWAY 35 MILEPOINT 211.75, AT INTERSTATE HIGHWAY 35 STATION 2650+35, 94.3 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 4.6 FEET EAST OF A RIGHT-OF-WAY FENCE, 3.8 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.103	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1095.096	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1095.054	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1094.627	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1094.627	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1003.469	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1095.109	.131		1003.574	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1095.109	.131		1003.712	.066	1996	GPS - STATIC	2009	HMOOSE
1095.109	.131		1003.574	.066	2007	GPS - STATIC	2009	HMOOSE
			1003.551	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1095.044	.131		1003.748	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1095.044	.131		1003.748	.066	1996	GPS - STATIC	2002	HPINE
1095.044	.131		1003.748	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1095.054	.131		1003.689	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS917

Geoid Separations(ft): GEOID18 = -91.591 12B = -91.591 09 = -91.483 03 = -91.289

DIX MNDT AZ MK

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 59.46252	92 46 26.18729	531807.473	344313.497	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 59.46267	92 46 26.18808	531807.418	344313.512	.033	C	ADJUSTMENT	2009	GPS2566
46 23 59.46267	92 46 26.18808	531807.418	344313.512	.033	C	GPS - STATIC	2009	HMOOSE
46 23 59.46233	92 46 26.18793	531807.429	344313.478	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 59.46249	92 46 26.18808	531807.418	344313.494	.033	C	GPS - STATIC	2009	HMOOSE
46 23 59.46192	92 46 26.18799	531807.424	344313.436	.033	C	ADJUSTMENT	2003	GPS1839
46 23 59.46192	92 46 26.18799	531807.424	344313.435	.033	C	GPS - STATIC	2002	HPINE
46 23 59.46192	92 46 26.18799	531807.424	344313.436	.033	C	ADJUSTMENT	1999	17648
46 23 59.46192	92 46 26.18799	531807.424	344313.436	.033	1	ADJUSTMENT	1998	GPS917
46 23 59.45923	92 46 26.18559	531807.593	344313.164	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 59.45898	92 46 26.18558	531807.594	344313.138	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 59.65400	92 46 25.47200			.100	2	CLASSICAL SURVEY	1982	17020
46 23 59.65358	92 46 25.47172			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2997036.783	842012.164	1697430.201	16858562.194	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2997036.728	842012.178	1697430.146	16858562.209	.033	C	ADJUSTMENT	2009	GPS2566
2997036.728	842012.178	1697430.146	16858562.209	.033	C	GPS - STATIC	2009	HMOOSE
2997036.739	842012.143	1697430.157	16858562.175	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2997036.728	842012.159	1697430.146	16858562.191	.033	C	GPS - STATIC	2009	HMOOSE
2997036.735	842012.102	1697430.152	16858562.133	.033	C	ADJUSTMENT	2003	GPS1839
2997036.735	842012.102	1697430.153	16858562.133	.033	C	GPS - STATIC	2002	HPINE
2997036.735	842012.102	1697430.152	16858562.133	.033	C	ADJUSTMENT	1999	17648
2997036.735	842012.102	1697430.152	16858562.133	.033	1	ADJUSTMENT	1998	GPS917
2997036.908	842011.833	1697430.321	16858561.861	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2997036.910	842011.807	1697430.322	16858561.836	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2372431.206	513945.865			.100	2	CLASSICAL SURVEY	1982	17020
2372431.230	513945.820			.100	C	CLASSICAL SURVEY	1950	UNK

DIX MNDT AZ MK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_AZ_MK-RN0525-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_AZ_MK-RN0525-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_AZ_MK-RN0525-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DIX MNDT RM 1

Mn/DOT Name: DIX MNDT RM 1 **NGS Name:** DIX RM 1

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	4	45 N	19 W	462434.87	924534.53	2	

NGS ACRN: RN0524 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2007) **Stamping:** DIX NO 1 1966

3.0 MILES SOUTH OF MOOSE LAKE, 2.0 MILES SOUTHWEST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 73, AT INTERSTATE HIGHWAY 35 MILEPOINT 212.7, 0.6 MILE SOUTH OF THE CARLTON-PINE COUNTY LINE, 94.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 48.25 FEET NORTH OF STATION DIX MNDT, 5.0 FEET WEST OF A RIGHT-OF-WAY FENCE, 2.0 FEET WEST OF A WITNESS POST.

Station Notes
NEEDS A HOBBIT ROD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1115.565	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1115.556	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1115.533	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1115.106	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1115.106	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1115.106	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.647 12B = -91.644 09 = -91.535 03 = -91.355

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_RM_1-RN0524-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_RM_1-RN0524-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_RM_1-RN0524-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DIX MNDT RM 2

Mn/DOT Name: DIX MNDT RM 2 **NGS Name:** DIX RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0522 Get Map
NGS Quad / Sta Num : 46092341/1064
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	4	45 N	19 W	462435.63	924538.38	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2007) **Stamping:** DIX NO 2 1966

3.0 MILES SOUTH OF MOOSE LAKE, 2.0 MILES SOUTHWEST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 73, AT INTERSTATE HIGHWAY 35 MILEPOINT 212.7, 0.6 MILE SOUTH OF THE CARLTON-PINE COUNTY LINE, 96.5 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 2.0 FEET EAST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes
THE STATION CAN BE SUITABLE FOR GPS OBSERVATION IF BRUSH IS REMOVED.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1103.203	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1103.193	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1103.147	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1102.721	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1102.721	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1102.721	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1103.147	.197		1011.796	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.647 12B = -91.644 09 = -91.535 03 = -91.355

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 35.62705	92 45 38.37760	535152.006	347982.914	.066	2	ADJUSTMENT	1999	17648
46 24 35.62456	92 45 38.37411	535152.251	347982.662	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 35.62424	92 45 38.37419	535152.246	347982.629	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 35.81900	92 45 37.66200			.100	2	CLASSICAL SURVEY	1982	17020
46 24 35.81933	92 45 37.66175			.100	2	CLASSICAL SURVEY	1950	UNK

DIX MNDT RM 2

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000317.816	845737.567	1700768.540	16862234.194	.066	2	ADJUSTMENT	1999	17648
3000318.066	845737.319	1700768.785	16862233.943	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000318.060	845737.287	1700768.780	16862233.911	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2375712.350	517671.307			.100	2	CLASSICAL SURVEY	1982	17020
2375712.370	517671.340			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_RM_2-RN0522-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_RM_2-RN0522-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DIX_RM_2-RN0522-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DOKAL

Mn/DOT Name: DOKAL **NGS Name:** DOKAL

County: PINE, MN (Sheet 2)

NGS ACRN: DL4745 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	43 N	20 W	461354.22	924938.40	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 110 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** DOKAL 2008

6.0 MILES SOUTH OF WILLOW RIVER, 6.1 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, AT INTERSTATE HIGHWAY 35 MILEPOINT 199.45, 64.2 FEET EAST-SOUTHEAST OF A FENCE LINE, 35.7 FEET WEST-NORTHWEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 3.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.521	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1062.518	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			971.917	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1062.531	.131		972.009	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1062.531	.131		972.111	.066	1996	GPS - STATIC	2009	HMOOSE
1062.531	.131		972.009	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.613 12B = -90.620 09 = -90.499 03 = -90.367

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 54.21570	92 49 38.39962	518391.437	282980.484	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 54.21564	92 49 38.40048	518391.377	282980.478	.033	C	ADJUSTMENT	2009	GPS2566
46 13 54.21564	92 49 38.40048	518391.377	282980.478	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 54.21550	92 49 38.40022	518391.395	282980.464	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984669.963	780467.284	1684097.891	16797239.753	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984669.903	780467.277	1684097.830	16797239.746	.033	C	ADJUSTMENT	2009	GPS2566
2984669.903	780467.277	1684097.830	16797239.746	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984669.922	780467.263	1684097.848	16797239.732	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DOKAL-DL4745-3W-22DEC2008.jpg	W	Dec 22, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DOKAL-DL4745-2-22DEC2008.jpg		Dec 22, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DOKAL-DL4745-1-22DEC2008.jpg		Dec 22, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DUXBURY

Mn/DOT Name: DUXBURY
NGS Name: DUXBURY
County: PINE, MN (Sheet 2)

NGS ACRN: RN1615 Get Map
NGS Quad / Sta Num : 46092321/1073
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	43 N	17 W	461109.72	923033.90	2	1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	NGS

Description: (2007) **Stamping:** DUXBURY 1974

12.0 MILES EAST OF ASKOV, 12.5 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23, 4.0 MILES NORTH OF DUXBURY, IN THE SOUTHWEST QUADRANT OF THE JUNCTION OF COUNTY ROAD 32 AND COUNTY ROAD 24, 78.0 FEET SOUTHWEST OF A JUNCTION, 76.0 FEET NORTH OF THE NORTHEAST CORNER OF A HOUSE, 81.54 FEET SOUTH-SOUTHWEST OF DUXBURY RM 1, 80.87 FEET NORTHWEST OF DUXBURY RM 2, 5.0 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1165.231	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1165.296	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1153.869	.131		1066.412	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1154.985						RECIPROCAL VERTICAL ANGLE	1974	HORZ

Geoid Separations(ft): GEOID18 = -87.569 12B = -87.621 09 = -87.500 03 = -87.533

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.72279	92 30 33.89886	598935.345	266550.976	.033	1	ADJUSTMENT	1999	17648
46 11 09.71730	92 30 33.89339	598935.733	266550.422	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.71537	92 30 33.89315	598935.751	266550.226	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.91723	92 30 33.18613			.100	1	CLASSICAL SURVEY	1977	15955

DUXBURY

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3065472.626	765415.763	1764627.372	16780919.370	.033	1	ADJUSTMENT	1999	17648
3065473.023	765415.216	1764627.760	16780918.816	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3065473.044	765415.021	1764627.778	16780918.621	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2440869.011	437350.398			.100	1	CLASSICAL SURVEY	1977	15955

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DUXBURY-RN1615-3S-09JUL2007.jpg	S	Jul 9, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DUXBURY-RN1615-2-09JUL2007.jpg		Jul 9, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/DUXBURY-RN1615-1-09JUL2007.jpg		Jul 9, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

DUXBURY RM 1

Mn/DOT Name: DUXBURY RM 1 **NGS Name:** DUXBURY RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2456 Get Map
NGS Quad / Sta Num : 46092321/1073
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	43 N	17 W	461109.00	923034.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2008	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

Description: (2018) **Stamping:** DUXBURY NO 1 1974

12.5 MILES EAST OF ASKOV, 12.8 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23, 4.0 MILES NORTH OF DUXBURY, IN THE NORTHWEST QUADRANT OF THE JUNCTION OF COUNTY ROAD 32 AND COUNTY ROAD 24, 81.54 FEET NORTH-NORTHEAST OF STATION DUXBURY.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.618 09 = -87.497 03 = -87.533

DUXBURY RM 2

Mn/DOT Name: DUXBURY RM 2 **NGS Name:** DUXBURY RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2457 Get Map
NGS Quad / Sta Num : 46092321/1073
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	43 N	17 W	461109.00	923034.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2008	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

Description: (1974) **Stamping:** DUXBURY NO 2 1974

12.5 MILES EAST OF ASKOV, 12.5 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23, 4.0 MILES NORTH OF DUXBURY, IN THE SOUTHWEST QUADRANT OF THE JUNCTION OF COUNTY ROAD 32 AND COUNTY ROAD 24, 80.87 FEET SOUTHEAST OF STATION DUXBURY.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.618 09 = -87.497 03 = -87.533

DUXBURY RM 3

Mn/DOT Name: DUXBURY RM 3 **NGS Name:** DUXBURY RM 3

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	43 N	17 W	461109.00	923033.00		

NGS ACRN: CJ2458 Get Map
NGS Quad / Sta Num : 46092321/1073
USGS Quad: DUXBURY

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	GOOD	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

Description: **Stamping:** DUXBURY NO 2 1974

12.5 MILES EAST OF ASKOV, 12.8 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23, 4.0 MILES NORTH OF DUXBURY, IN THE SOUTHWEST QUADRANT OF THE JUNCTION OF COUNTY ROAD 32 AND COUNTY ROAD 24.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.618 09 = -87.497 03 = -87.529

E 154

Mn/DOT Name: E 154 **NGS Name:** E 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0448 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461910.00	925026.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1971) **Stamping:** E-154 1935

AT WILLOW RIVER, AT THE JUNCTION OF COUNTY ROAD 158 AND COUNTY ROAD 61, 42.0 FEET NORTH ON A RAILROAD FROM 1ST ROAD CROSSING NORTH OF THE RAILROAD STATION, 18.0 FEET FROM A RAILROAD TRACK, AT THE BASE OF A BELL TOWER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1038.479	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1038.059	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1038.059	.007	1				VERTICAL CONTROL SURVEY	1935	L30 MINN

Geoid Separations(ft): GEOID18 = -91.230 12B = -91.204 09 = -91.102 03 = -90.955

*** No Horizontal Positions in the Database ***

Mn/DOT Name: E 155 **NGS Name:** E 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0490 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	45 N	17 W	462318.88	923139.28	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2019	GOOD	Horz=NO Vert=NO	YES		PROJECTS 10 IN.	MARKER W/BAR MAGNET

Monument Type: CONCRETE MONUMENT (CAST-IN-PLACE)
Disk Type: BENCH MARK DISK
Mon. Agency: NGS

Description: (2010) **Stamping:** E 155 1935

1.9 MILES NORTHEAST OF DUQUETTE, 1.8 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 47 AND TRUNK HIGHWAY 23, MILEPOINT 312.75, 0.1 MILE EAST ON WOLF DRIVE, 40.3 FEET WEST-NORTHWEST OF THE WEST RAIL OF A RAILROAD TRACK, 36.7 FEET SOUTH OF WOLF DRIVE, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes
THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1174.781	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1174.765	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1174.719	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1174.322	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1174.322	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1174.322	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1083.745	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1174.666	.262		1083.856	.197	1996	GPS - RTRN	2008	RTRN2008
			1083.853	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1174.735	.131		1083.974	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1174.702	.131		1083.974	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.046 12B = -91.053 09 = -90.886 03 = -90.810

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 18.87964	92 31 39.27794	593989.386	340396.863	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 18.87972	92 31 39.27844	593989.351	340396.871	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 18.88020	92 31 39.27921	593989.297	340396.920	.131	3	GPS - RTRN	2008	RTRN2008
46 23 18.87949	92 31 39.27819	593989.369	340396.848	.033	C	ADJUSTMENT	2003	GPS1839
46 23 18.87949	92 31 39.27819	593989.370	340396.849	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3059268.032	839157.139	1759589.178	16854726.911	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3059267.997	839157.146	1759589.143	16854726.919	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3059267.942	839157.193	1759589.088	16854726.967	.131	3	GPS - RTRN	2008	RTRN2008
3059268.015	839157.123	1759589.160	16854726.895	.033	C	ADJUSTMENT	2003	GPS1839
3059268.015	839157.123	1759589.160	16854726.895	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/E_155-RN0490-3SW-14OCT2008.jpg	SW	Oct 14, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/E_155-RN0490-2-14OCT2008.jpg		Oct 14, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/E_155-RN0490-1-14OCT2008.jpg		Oct 14, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

E 158

Mn/DOT Name: E 158 **NGS Name:** E 158

County: PINE, MN (Sheet 2)

NGS ACRN: RN0515 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	23	45 N	18 W	462228.00	923426.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (1935) **Stamping:** E 158 1935

1.2 MILES WEST OF DUQUETTE, 1.1 MILES WEST ALONG COUNTY ROAD 47 (OAK LEAF ROAD) FROM THE JUNCTION OF COUNTY ROAD 47 (OAK LEAF ROAD) AND TRUNK HIGHWAY 23.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1139.417	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1139.017	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1139.017	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.122 12B = -91.132 09 = -90.968 03 = -90.873

*** No Horizontal Positions in the Database ***

EAGLEHEAD

Mn/DOT Name: EAGLEHEAD **NGS Name:** EAGLEHEAD

County: PINE, MN (Sheet 2)

NGS ACRN: RN1613 Get Map
NGS Quad / Sta Num : 46092321/1012
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	18 W	460743.63	923618.49		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (2004) **Stamping:** EAGLEHEAD 1952

12.5 MILES EAST OF SANDSTONE, 9.6 MILES EAST ON COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND TRUNK HIGHWAY 123, AT THE EAGLEHEAD LOOKOUT TOWER, ON THE NORTH SIDE OF A GRAVEL ROAD, 94.0 FEET EAST-NORTHEAST OF THE NORTHEAST LEG OF A TOWER, 85.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE, 81.46 FEET NORTH OF EAGLEHEAD RM 1, 89.51 FEET EAST-NORTHEAST OF EAGLEHEAD RM 2.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1130.470	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1130.739	.131		1043.085	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.775 12B = -87.861 09 = -87.756 03 = -87.716

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.62866	92 36 18.49465	574766.596	245568.471	.033	1	ADJUSTMENT	1999	17648
46 07 43.62437	92 36 18.48968	574766.947	245568.037	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.62219	92 36 18.48744	574767.106	245567.817	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.81200	92 36 17.78800			.100	1	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041668.183	744026.432	1740495.541	16759915.326	.033	1	ADJUSTMENT	1999	17648
3041668.542	744026.005	1740495.893	16759914.894	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041668.704	744025.788	1740496.051	16759914.674	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2417063.504	415959.978			.100	1	CLASSICAL SURVEY	1961	12611

EAGLEHEAD AZ MK

Mn/DOT Name: EAGLEHEAD AZ MK
NGS Name: EAGLEHEAD AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: CJ2462 Get Map
NGS Quad / Sta Num : 46092321/1012
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	15	42 N	18 W	460736.00	923618.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	POOR	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	STEEL SPIKE ADJ TO MON

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
AZIMUTH MARK DISK

Mon. Agency
NGS

Description: (1952)

Stamping: EAGLEHEAD 1952

12.5 MILES EAST OF SANDSTONE, 9.6 MILES EAST ON COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND TRUNK HIGHWAY 123, 575.0 FEET SOUTH ALONG A FIRE TOWER LANE FROM THE JUNCTION OF COUNTY ROAD 30 AND A FIRE TOWER LANE, 10.0 FEET EAST OF A FIRE TOWER LANE.

Station Notes

IN 10-09-2008 IT WAS DETERMINED THAT THERE IS NO REAL TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA, AND THAT THE DISK IS BENT.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.759 12B = -87.844 09 = -87.743 03 = -87.700

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_AZ_MK-CJ2462-3E-09OCT2008.jpg	E	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_AZ_MK-CJ2462-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_AZ_MK-CJ2462-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

EAGLEHEAD LOOKOUT TOWER

Mn/DOT Name: EAGLEHEAD LOOKOUT TOWER **NGS Name:** EAGLEHEAD LOOKOUT TOWER

County: PINE, MN (Sheet 2)

NGS ACRN: RN1614 Get Map
NGS Quad / Sta Num : 46092321/1024
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	18 W	460743.20	923619.85		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	LOOKOUT TOWER	NGS

Description: (1952) **Stamping:**

12.5 MILES EAST OF SANDSTONE, 9.5 MILES EAST ALONG COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND TRUNK HIGHWAY 123, ON THE NORTH SIDE OF A GRAVEL ROAD.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.779 12B = -87.864 09 = -87.759 03 = -87.720

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.20277	92 36 19.85440	574670.982	245524.972	.328	4	ADJUSTMENT	1999	17648
46 07 43.19838	92 36 19.84948	574671.330	245524.529	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.19647	92 36 19.84727	574671.487	245524.336	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.38600	92 36 19.14800			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041573.337	743981.314	1740400.023	16759871.726	.328	4	ADJUSTMENT	1999	17648
3041573.692	743980.877	1740400.372	16759871.283	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041573.852	743980.686	1740400.529	16759871.090	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2416968.637	415914.849			.100	4	CLASSICAL SURVEY	1954	10724

EAGLEHEAD RM 1

Mn/DOT Name: EAGLEHEAD RM 1 **NGS Name:** EAGLEHEAD RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2463 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	18 W	460743.10	923618.70		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2007) **Stamping:** EAGLEHEAD NO 1 1952

12.5 MILES EAST OF SANDSTONE, 9.5 MILES EAST ON COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND TRUNK HIGHWAY 123, 5.0 MILES WEST OF DUXBURY, 12.0 FEET EAST OF A DRIVEWAY. 138.0 FEET NORTH OF COUNTY ROAD 30, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

THE TOWER IS GONE THE CONCRETE BASE FOR LEGS IS STILL IN PLACE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1126.428	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.775 12B = -87.861 09 = -87.756 03 = -87.716

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_RM_1-CJ2463-3N-16APR2007.jpg	N	Apr 16, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_RM_1-CJ2463-2-16APR2007.jpg		Apr 16, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_RM_1-CJ2463-1-16APR2007.jpg		Apr 16, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

EAGLEHEAD RM 2

Mn/DOT Name: EAGLEHEAD RM 2 **NGS Name:** EAGLEHEAD RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2464 Get Map
NGS Quad / Sta Num : 46092321/
USGS Quad: DUXBURY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	18 W	460743.40	923619.90		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2007) **Stamping:** EAGLEHEAD NO 2 1952

12.5 MILES EAST OF SANDSTONE, 9.6 MILES EAST ALONG COUNTY ROAD 30 FROM THE JUNCTION OF COUNTY ROAD 30 AND TRUNK HIGHWAY 123, 5.0 MILES WEST OF DUXBURY, 13.0 FEET NORTH OF THE NORTHEAST LEG OF A LOOKOUT TOWER. 189.0 FEET NORTH OF COUNTY ROAD 30, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes

THE TOWER IS GONE THE CONCRETE BASE LEGS ARE STILL IN PLACE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.826	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.779 12B = -87.864 09 = -87.759 03 = -87.720

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_RM_2-CJ2464-3W-16APR2007.jpg	W	Apr 16, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_RM_2-CJ2464-2-16APR2007.jpg		Apr 16, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/EAGLEHEAD_RM_2-CJ2464-1-16APR2007.jpg		Apr 16, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: F 154 **NGS Name:** F 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0452 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	44 N	20 W	461727.00	925104.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1971) **Stamping:** F 154 1935

2.0 MILES NORTH OF RUTLEDGE, 2.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 61, 39.0 FEET NORTH OF A DRIVEWAY, 39.0 FEET WEST OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1056.110	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1055.690	.007	1				VERTICAL CONTROL SURVEY	1935	L30 MINN

Geoid Separations(ft): GEOID18 = -91.102 12B = -91.073 09 = -90.974 03 = -90.827

*** No Horizontal Positions in the Database ***

Mn/DOT Name: F 155 **NGS Name:** F 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0498 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	13	45 N	20 W	462241.88	924838.76	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2020	GOOD	Horz=NO Vert=NO	YES		PROJECTS 5 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1970) **Stamping:** F 155 1935

0.6 MILE EAST-SOUTHEAST OF STURGEON LAKE, 1.2 MILES WEST ALONG COUNTY ROAD 46 (LAKE TOWN ROAD) FROM THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 61, THEN 0.15 MILE SOUTH ALONG GENERAL ANDREWS DRIVE, 200.0 FEET NORTH OF VIKING CIRCLE, 61.0 FEET SOUTH OF A DRIVE EAST, 32.4 FEET EAST OF GENERAL ANDREWS DRIVE, 21.0 FEET NORTH OF A DRIVEWAY, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

THE AREA WAS MOWED AND THERE WAS NO WITNESS POST. THE SURVEY MARK IS TOO CLOSE TO A TREE TRUNK TO BE USED FOR GEODETIC WORK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.096	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1080.080	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1080.060	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.640	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1079.640	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.100	.262		988.640	.197	2011	GPS - RTRN	2020	RTRN2020
1079.939	.262		988.758	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.470 12B = -91.457 09 = -91.358 03 = -91.184

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 41.88097	92 48 38.75996	522524.352	336441.167	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 41.88170	92 48 38.76038	522524.322	336441.241	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987890.465	833983.788	1688161.304	16850681.654	.131	3	GPS - RTRN	2020	RTRN2020

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987890.434	833983.862	1688161.275	16850681.728	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/F_155-RN0498-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/F_155-RN0498-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/F_155-RN0498-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

FALLEN

Mn/DOT Name: FALLEN **NGS Name:** FALLEN

County: PINE, MN (Sheet 2)

NGS ACRN: DM2820 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	4	45 N	17 W	462447.94	923014.91		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 65 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** FALLEN 2009

0.1 MILE SOUTHWEST OF NICKERSON, 0.1 MILE SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND MAIN STREET AT TRUNK HIGHWAY 23 MILEPOINT 314.75, 22.7 FEET NORTHWEST OF TRUNK HIGHWAY 23, 19.5 FEET NORTHEAST OF DRIVEWAY NUMBER 94319, 1.3 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: SIDEWAYS - CARLTON, MN

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1056.507	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1147.734	.131		1056.625	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2699
1147.734	.131		1056.625	.066	2007	GPS - STATIC	2009	HGARY
1147.734	.131		1056.740	.066	1996	GPS - STATIC	2009	HGARY

Geoid Separations(ft): GEOID18 = -91.247 12B = -91.253 09 = -91.076 03 = -91.010

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 47.94476	92 30 14.90954	599858.963	349448.500	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 47.94476	92 30 14.91013	599858.921	349448.500	.033	C	ADJUSTMENT	2010	GPS2699
46 24 47.94476	92 30 14.91013	599858.921	349448.500	.033	C	GPS - STATIC	2009	HGARY

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 47.94450	92 30 14.90986	599858.940	349448.473	.033	C	GPS - STATIC	2009	HGARY

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3064981.515	848306.376	1765444.483	16863782.114	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3064981.473	848306.375	1765444.441	16863782.114	.033	C	ADJUSTMENT	2010	GPS2699
3064981.473	848306.375	1765444.441	16863782.114	.033	C	GPS - STATIC	2009	HGARY

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3064981.493	848306.349	1765444.460	16863782.088	.033	C	GPS - STATIC	2009	HGARY

FALLEN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FALLEN-DM2820-3NW-23JUN2009.jpg	NW	Jun 23, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FALLEN-DM2820-2-23JUN2009.jpg		Jun 23, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FALLEN-DM2820-1-23JUN2009.jpg		Jun 23, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

FINL MNDT

Mn/DOT Name: FINL MNDT **NGS Name:** FINL

County: PINE, MN (Sheet 2)

NGS ACRN: AF9148 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	27	43 N	20 W	461047.61	925157.84	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2024	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 10 FT)
Disk Type: HORIZONTAL CONTROL DISK
Mon. Agency: MNDT

Description: (2002) **Stamping:** FINL 1991

5.5 MILES SOUTHEAST OF FINLAYSON, AT THE JUNCTION OF TRUNK HIGHWAY 18 AND TRUNK HIGHWAY 23 (THE JUNCTION IS 5.5 MILES SOUTHEAST OF FINLAYSON), AT TRUNK HIGHWAY 23 MILEPOINT 289.7, 59.0 FEET EAST OF TRUNK HIGHWAY 18, 27.0 FEET NORTH OF TRUNK HIGHWAY 23, 72.0 FEET SOUTHWEST OF A POWER POLE, 19.1 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.140	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1092.140	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1092.140	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1092.140	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1092.130	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1092.130	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1092.101	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1092.101	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.720	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.189	.262		1001.888	.197	2011	GPS - OPUS	2020	GPSBM
1092.219	.262		1001.921	.197	2011	GPS - RTRN	2020	RTRN2020
1092.127	.262		1001.829	.197	2011	GPS - RTRN	2017	RTRN2017
			1001.852	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1092.124	.131		1001.927	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1092.124	.131		1002.052	.066	1996	GPS - STATIC	2009	HMOOSE
1092.124	.131		1001.927	.066	2007	GPS - STATIC	2009	HMOOSE
1092.002	.262		1001.924	.197	1996	GPS - RTRN	2008	RTRN2008
			1001.927	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1002.052	.066	1996	GPS - STATIC	1999	GPS917
1092.124	.131		1002.052	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1092.091	.131		1002.052	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.302 12B = -90.298 09 = -90.197 03 = -90.075

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 47.60720	92 51 57.83872	508596.438	264069.514	.131	3	GPS - OPUS	2020	GPSBM
46 10 47.60732	92 51 57.83878	508596.433	264069.526	.131	3	GPS - RTRN	2020	RTRN2020
46 10 47.60753	92 51 57.83936	508596.392	264069.547	.131	3	GPS - RTRN	2017	RTRN2017
46 10 47.60756	92 51 57.83878	508596.433	264069.550	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 47.60751	92 51 57.83957	508596.377	264069.545	.033	C	ADJUSTMENT	2009	GPS2566
46 10 47.60751	92 51 57.83957	508596.377	264069.545	.033	C	GPS - STATIC	2009	HMOOSE
46 10 47.60751	92 51 57.83957	508596.377	264069.545	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 47.60726	92 51 57.83919	508596.404	264069.520	.033	C	GPS - STATIC	2009	HMOOSE
46 10 47.60779	92 51 57.83966	508596.371	264069.574	.131	3	GPS - RTRN	2008	RTRN2008
46 10 47.60726	92 51 57.83919	508596.404	264069.521	.033	C	GPS - STATIC	1999	GPS917
46 10 47.60726	92 51 57.83919	508596.404	264069.520	.033	C	ADJUSTMENT	1999	17648
46 10 47.60726	92 51 57.83919	508596.404	264069.520	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 47.60175	92 51 57.83189	508596.919	264068.963	.033	C	GPS - STATIC	1994	HI35N
46 10 47.59985	92 51 57.83524	508596.683	264068.769	.066	2	GPS - STATIC	1991	HFIN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975199.894	761394.389	1674331.084	16778324.831	.131	3	GPS - OPUS	2020	GPSBM
2975199.890	761394.401	1674331.079	16778324.844	.131	3	GPS - RTRN	2020	RTRN2020
2975199.849	761394.422	1674331.038	16778324.865	.131	3	GPS - RTRN	2017	RTRN2017
2975199.889	761394.425	1674331.079	16778324.868	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975199.834	761394.419	1674331.024	16778324.863	.033	C	ADJUSTMENT	2009	GPS2566
2975199.834	761394.419	1674331.024	16778324.863	.033	C	GPS - STATIC	2009	HMOOSE
2975199.834	761394.419	1674331.024	16778324.863	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975199.861	761394.395	1674331.051	16778324.837	.033	C	GPS - STATIC	2009	HMOOSE
2975199.827	761394.448	1674331.017	16778324.891	.131	3	GPS - RTRN	2008	RTRN2008
2975199.861	761394.395	1674331.050	16778324.838	.033	C	GPS - STATIC	1999	GPS917
2975199.861	761394.395	1674331.051	16778324.837	.033	C	ADJUSTMENT	1999	17648
2975199.861	761394.395	1674331.051	16778324.837	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975200.385	761393.846	1674331.565	16778324.280	.033	C	GPS - STATIC	1994	HI35N
2975200.152	761393.649	1674331.329	16778324.088	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FINL-AF9148-3E-06MAY2020.jpg	E	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FINL-AF9148-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FINL-AF9148-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

FINLAYSON

Mn/DOT Name: FINLAYSON
NGS Name: FINLAYSON
County: PINE, MN (Sheet 2)

NGS ACRN: RN1622 Get Map
NGS Quad / Sta Num : 46092331/1014
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	43 N	20 W	461334.14	925151.74		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1952) **Stamping:** FINLAYSON 1952

2.5 MILES SOUTH OF RUTLEDGE, 2.6 MILES SOUTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39, THEN 0.1 MILE EAST ON A FARM DRIVE, ON THE EAST SIDE OF COUNTY ROAD 61, 52.0 FEET EAST-SOUTHEAST OF THE SOUTHEAST CORNER OF A BARN, 46.5 FEET SOUTHEAST OF A SILO, 67.25 FEET WEST OF FINLAYSON RM 1, 79.34 FEET EAST OF FINLAYSON RM 2, 5.0 FEET NORTHWEST OF A WITNESS POST.

Station Notes
THE BARN IS GONE, THE AREA IS IN A PLOWED FIELD.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.394	.197		988.951	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.394						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -90.679 12B = -90.663 09 = -90.561 03 = -90.430

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 34.14338	92 51 51.73660	509018.285	280940.664	.066	2	ADJUSTMENT	1999	17648
46 13 34.13737	92 51 51.73011	509018.741	280940.055	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 34.13686	92 51 51.72950	509018.784	280940.003	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 34.33100	92 51 51.01700			.100	2	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975334.087	778268.249	1674731.483	16795189.016	.066	2	ADJUSTMENT	1999	17648
2975334.554	778267.649	1674731.941	16795188.408	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975334.598	778267.598	1674731.984	16795188.356	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2350728.302	450201.842			.100	2	CLASSICAL SURVEY	1954	10724

FINLAYSON AZ MK

Mn/DOT Name: FINLAYSON AZ MK

NGS Name: FINLAYSON AZ MK

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	43 N	20 W	461324.00	925157.00		

NGS ACRN: CJ2503 Get Map
NGS Quad / Sta Num : 46092331/1014
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
SEE DESCRIPTION

Mon. Agency
NGS

Description: (2010)

Stamping: FINLAYSON 1952

2.5 MILES SOUTH OF RUTLEDGE, 2.8 MILES SOUTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39, 88.0 FEET EAST OF THE CENTERLINE OF HIGHWAY 61, 23.0 FEET SOUTH OF THE CENTERLINE OF EDS ROAD, 1.5 FEET NORTH OF A WITNESS POST.

Station Notes
FOUND THE CONCRETE BROKEN AND THE DISK WAS GONE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.663 12B = -90.643 09 = -90.541 03 = -90.410

FINLAYSON RAD STA KAA 426 MAST

Mn/DOT Name: FINLAYSON RAD STA KAA 426 MAST **NGS Name:** FINLAYSON RAD STA KAA 426 MAST

County: PINE, MN (Sheet 2)

NGS ACRN: RN1635 Get Map
NGS Quad / Sta Num : 46092334/1009
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	19	43 N	20 W	461156.86	925507.65		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	1961	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	RADIO/TV MAST	NGS

Description: (1961)

Stamping:

AT THE SOUTH EDGE OF FINLAYSON, AT THE JUNCTION OF FRONT STREET AND SCHOOL STREET.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.640 12B = -90.607 09 = -90.521 03 = -90.380

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 56.86101	92 55 07.65199	495241.015	271083.986	.328	4	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 56.85409	92 55 07.64490	495241.514	271083.285	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 57.04900	92 55 06.92600			.100	4	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961728.463	768179.404	1660972.764	16785319.371	.328	4	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961728.974	768178.711	1660973.263	16785318.671	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2337122.747	440113.055			.100	4	CLASSICAL SURVEY	1961	12611

FINLAYSON RM 1

Mn/DOT Name: FINLAYSON RM 1

NGS Name: FINLAYSON RM 1

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	43 N	20 W	461334.13	925150.78		

NGS ACRN: CJ2504 Get Map
NGS Quad / Sta Num : 46092331/1014
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1952) **Stamping:** FINLAYSON NO 1 1952

2.5 MILES SOUTH OF RUTLEDGE, 2.5 MILES SOUTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39, THEN 0.1 MILE EAST ON A FARM DRIVE, ON THE EAST SIDE OF COUNTY ROAD 61, 62.0 FEET EAST OF THE NORTHWEST CORNER OF A FENCE AROUND SEVERAL PILES OF ROCK, 35.0 FEET WEST OF THE NORTHEAST CORNER OF A FENCE AROUND SEVERAL PILES OF ROCK, 1.0 FOOT NORTH OF A FENCE.

Station Notes

IN 10-09-2008 NOTED THAT THE LOCATION IS AT FIRE NUMBER 68426 AND THAT THE FENCES ARE GONE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.679 12B = -90.663 09 = -90.561 03 = -90.426

FINLAYSON RM 2

Mn/DOT Name: FINLAYSON RM 2

NGS Name: FINLAYSON RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2505 Get Map
NGS Quad / Sta Num : 46092331/1014
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	43 N	20 W	461334.26	925152.85		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1952) **Stamping:** FINLAYSON NO 2 1952

2.5 MILES SOUTH OF RUTLEDGE, 2.5 MILES SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39, THEN 0.1 MILE EAST ON A FARM DRIVE, ON THE EAST SIDE OF COUNTY ROAD 61 (AT FIRE NUMBER 68426), 2.5 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A BARN.

Station Notes

IN 10-09-2008 DETERMINED THAT THE BARN WAS GONE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.679 12B = -90.663 09 = -90.561 03 = -90.426

Mn/DOT Name: FIRST
NGS Name: FIRST
County: PINE, MN (Sheet 2)

NGS ACRN: DL4747 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	44 N	20 W	461929.23	924929.20	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 65 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** FIRST 2008

0.5 MILE NORTHEAST OF WILLOW RIVER, 0.5 MILE NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 206.0, 82.0 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 67.8 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 2.7 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1053.394	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1053.403	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			962.134	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1053.410	.131		962.239	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1053.410	.131		962.354	.066	1996	GPS - STATIC	2009	HMOOSE
1053.410	.131		962.239	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.256 12B = -91.233 09 = -91.132 03 = -90.981

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 29.22919	92 49 29.20231	519005.948	316920.224	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 29.22908	92 49 29.20313	519005.890	316920.213	.033	C	ADJUSTMENT	2009	GPS2566
46 19 29.22908	92 49 29.20313	519005.890	316920.213	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 29.22865	92 49 29.20308	519005.894	316920.170	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984705.787	814408.285	1684669.228	16831165.086	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984705.730	814408.273	1684669.170	16831165.074	.033	C	ADJUSTMENT	2009	GPS2566
2984705.730	814408.273	1684669.170	16831165.074	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984705.735	814408.229	1684669.174	16831165.031	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FIRST-DL4747-3W-16DEC2008.jpg	W	Dec 16, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FIRST-DL4747-2-16DEC2008.jpg		Dec 16, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FIRST-DL4747-1-16DEC2008.jpg		Dec 16, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

FRIESLAND MNDT

Mn/DOT Name: FRIESLAND MNDT
NGS Name: FRIESLAND
County: PINE, MN (Sheet 2)

NGS ACRN: RN0589 Get Map
NGS Quad / Sta Num : 46092333/1040
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	42 N	20 W	460421.03	925409.77	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** FRIESLAND 1964

4.5 MILES NORTH-NORTHEAST OF HINCKLEY, 4.6 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 48 AT HINCKLEY, 3.75 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 AT SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 187.6, 80.44 FEET NORTHWEST OF FRIESLAND MNDT RM 2, 64.51 FEET SOUTHWEST OF FRIESLAND MNDT RM 1, 26.7 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 6.0 FEET WEST OF A WITNESS POST.

Station Notes

IN 1993 THE GEODETIC UNIT FOUND STATION FRIESLAND MNDT-FRIESLAND MNDT RM 1 AND FRIESLAND MNDT RM 2.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1105.503	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1105.503	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1105.503	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1105.191	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1105.191	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1105.191	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1105.247	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1015.464	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1105.510	.131		1015.605	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1105.510	.131		1015.684	.066	1996	GPS - STATIC	2009	HMOOSE
1105.510	.131		1015.605	.066	2007	GPS - STATIC	2009	HMOOSE
1105.421	.262		1015.611	.197	1996	GPS - RTRN	2008	RTRN2008
			1015.605	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1015.684	.066	1996	GPS - STATIC	1999	GPS917
1105.510	.131		1015.684	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.042 12B = -90.042 09 = -89.931 03 = -89.810

FRIESLAND MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 21.02530	92 54 09.76485	499311.516	224905.580	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 21.02515	92 54 09.76558	499311.465	224905.565	.033	C	ADJUSTMENT	2009	GPS2566
46 04 21.02515	92 54 09.76558	499311.465	224905.565	.033	C	GPS - STATIC	2009	HMOOSE
46 04 21.02515	92 54 09.76558	499311.465	224905.565	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 21.02507	92 54 09.76528	499311.486	224905.557	.033	C	GPS - STATIC	2009	HMOOSE
46 04 21.02600	92 54 09.76501	499311.505	224905.651	.131	3	GPS - RTRN	2008	RTRN2008
46 04 21.02507	92 54 09.76528	499311.485	224905.557	.033	C	GPS - STATIC	1999	GPS917
46 04 21.02507	92 54 09.76528	499311.486	224905.557	.033	C	ADJUSTMENT	1999	17648
46 04 21.01747	92 54 09.75814	499311.989	224904.787	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 21.01929	92 54 09.75894	499311.934	224904.970	.033	C	GPS - STATIC	1994	HI35N
46 04 21.01746	92 54 09.75813	499311.990	224904.786	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 21.20100	92 54 09.02900			.100	2	CLASSICAL SURVEY	1982	17020
46 04 21.20059	92 54 09.02910			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2966584.834	722082.379	1665099.535	16739166.560	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2966584.783	722082.363	1665099.484	16739166.544	.033	C	ADJUSTMENT	2009	GPS2566
2966584.783	722082.363	1665099.484	16739166.544	.033	C	GPS - STATIC	2009	HMOOSE
2966584.783	722082.363	1665099.484	16739166.544	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2966584.804	722082.355	1665099.505	16739166.536	.033	C	GPS - STATIC	2009	HMOOSE
2966584.822	722082.449	1665099.524	16739166.631	.131	3	GPS - RTRN	2008	RTRN2008
2966584.804	722082.355	1665099.505	16739166.536	.033	C	GPS - STATIC	1999	GPS917
2966584.804	722082.355	1665099.505	16739166.536	.033	C	ADJUSTMENT	1999	17648
2966585.320	722081.594	1665100.009	16739165.767	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2966585.261	722081.777	1665099.952	16739165.951	.033	C	GPS - STATIC	1994	HI35N
2966585.321	722081.593	1665100.010	16739165.766	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2341980.067	394015.078			.100	2	CLASSICAL SURVEY	1982	17020
2341980.060	394015.040			.100	C	CLASSICAL SURVEY	1950	UNK

FRIESLAND MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND-RN0589-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND-RN0589-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND-RN0589-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

FRIESLAND MNDT RM 1

Mn/DOT Name: FRIESLAND MNDT RM 1 **NGS Name:** FRIESLAND RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0588 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	42 N	20 W	460421.24	925408.90	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2008) **Stamping:** FRIESLAND NO 1 1964

4.5 MILES NORTH-NORTHEAST OF HINCKLEY, 4.6 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 48 AT HINCKLEY, AT INTERSTATE HIGHWAY 35 MILEPOINT 187.6, 83.0 FEET NORTH-NORTHWEST OF A WITNESS POST, 81.1 FEET NORTH-NORTHWEST OF FRIESLAND MNDT RM 2, 77.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 64.51 FEET NORTHEAST OF STATION FRIESLAND MNDT, 60.5 FEET NORTHEAST OF A WITNESS POST, 23.0 FEET WEST OF A FENCE, 2.0 FEET WEST OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) DUE TO THE TREES IN AREA.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.823	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1108.823	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1108.823	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.508	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1108.508	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1108.508	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1108.564	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.036 12B = -90.039 09 = -89.928 03 = -89.806

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND_RM_1-RN0588-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND_RM_1-RN0588-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND_RM_1-RN0588-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

FRIESLAND MNDT RM 2

Mn/DOT Name: FRIESLAND MNDT RM 2 **NGS Name:** FRIESLAND RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0587 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	42 N	20 W	460420.43	925408.99	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1964) **Stamping:** FRIESLAND NO 2 1964

4.5 MILES NORTH-NORTHEAST OF HINCKLEY, 4.6 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 48 IN HINCKLEY, 3.75 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 AT SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 187.6, 98.5 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 81.1 FEET SOUTH-SOUTHEAST OF FRIESLAND MNDT RM 1, 80.9 FEET SOUTHEAST OF STATION FRIESLAND MNDT, 75.5 FEET SOUTHEAST OF A WITNESS POST, 2.0 FEET NORTH OF A WITNESS POST, 1.5 FEET WEST OF A FENCE.

Station Notes

REAL TIME REFERENCE NETWORK (RTRN) CONNECTION FAILED DUE TO THE TREES IN AREA.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.407	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1113.407	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1113.407	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.092	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1113.092	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1113.092	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1113.147	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.039 12B = -90.042 09 = -89.928 03 = -89.806

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND_RM_2-RN0587-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND_RM_2-RN0587-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/FRIESLAND_RM_2-RN0587-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: G 154 **NGS Name:** G 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0453 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	44 N	20 W	461555.95	925158.12	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2009) **Stamping:** G 154 1935

IN RUTLEDGE, 4.4 MILES NORTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 18 EAST OF FINLAYSON, THEN 200.0 FEET NORTHWEST ON LONG LAKE ROAD, 61.0 FEET SOUTHWEST OF LONG LAKE ROAD, 60.0 FEET NORTHWEST OF A TRAIL, 1.0 FOOT NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1032.757	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1032.347	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1032.347	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT
1032.347	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1032.347	.007	1				VERTICAL CONTROL SURVEY	1971	L30 MINN
1032.347	.007	1				VERTICAL CONTROL SURVEY	1935	L30 MINN

Geoid Separations(ft): GEOID18 = -90.968 12B = -90.945 09 = -90.833 03 = -90.689

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/G_154-RN0453-3SW-10SEP2009.jpg	SW	Sep 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/G_154-RN0453-2-10SEP2009.jpg		Sep 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/G_154-RN0453-1-10SEP2009.jpg		Sep 10, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

G 155

Mn/DOT Name: G 155 **NGS Name:** G 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0499 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	20	45 N	19 W	462228.36	924653.92	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1971) **Stamping:** G 155 1935

2.0 MILES EAST-SOUTHEAST OF A TOWN OF STURGEON LAKE, 2.2 MILES EAST, SOUTH AND EAST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 61 IN STURGEON LAKE, 0.4 MILE EAST OF INTERSTATE HIGHWAY 35, 300.0 FEET SOUTHEAST OF THE JUNCTION OF COUNTY ROAD 51 AND COUNTY ROAD 46, NEAR THE WEST SHORE OF STURGEON LAKE, 63.0 FEET NORTH-NORTHWEST OF A POWER POLE, 58.0 FEET SOUTH-SOUTHWEST OF A SPEED LIMIT 30 MPH SIGN, 33.0 FEET WEST OF COUNTY ROAD 46, 2.6 FEET EAST OF A WOOD FENCE, 0.6 FOOT NORTHEAST OF A SIGN FOR FIRE NUMBER 35092, 0.5 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1075.464	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1075.441	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1075.441	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1075.008	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1075.008	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1075.008	.007	1				VERTICAL CONTROL SURVEY	1972	L133 MINN
1075.008	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.473 12B = -91.470 09 = -91.365 03 = -91.191

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/G_155-RN0499-3NW-05NOV2008.jpg	NW	Nov 5, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/G_155-RN0499-2-05NOV2008.jpg		Nov 5, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/G_155-RN0499-1-05NOV2008.jpg		Nov 5, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: GENERAL
NGS Name: GENERAL
County: PINE, MN (Sheet 2)

NGS ACRN: DL4749 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	36	45 N	20 W	462027.06	924853.80	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 50 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010) **Stamping:** GENERAL 2008

1.7 MILES NORTHEAST OF WILLOW RIVER, 1.8 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 207.2, 56.0 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 44.5 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.9 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1073.170	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1073.170	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			981.848	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1073.161	.131		981.947	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1073.161	.131		982.058	.066	1996	GPS - STATIC	2009	HMOOSE
1073.161	.131		981.947	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.315 12B = -91.302 09 = -91.194 03 = -91.037

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 27.06449	92 48 53.80402	521484.113	322781.913	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 27.06440	92 48 53.80484	521484.055	322781.903	.033	C	ADJUSTMENT	2009	GPS2566
46 20 27.06440	92 48 53.80484	521484.055	322781.903	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 27.06399	92 48 53.80479	521484.059	322781.862	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987083.352	820310.599	1687138.853	16837027.268	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987083.295	820310.588	1687138.795	16837027.259	.033	C	ADJUSTMENT	2009	GPS2566
2987083.295	820310.588	1687138.795	16837027.259	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2987083.299	820310.547	1687138.799	16837027.218	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GENERAL-DL4749-3W-16DEC2008.jpg	W	Dec 16, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GENERAL-DL4749-2-16DEC2008.jpg		Dec 16, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GENERAL-DL4749-1-16DEC2008.jpg		Dec 16, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

GENERAL ANDREWS LOT

Mn/DOT Name: GENERAL ANDREWS LOT
NGS Name: GENERAL ANDREWS LOT
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	45 N	20 W	462100.80	924924.82		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092342/1058
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	SURVEY DISK	MNDT

Description: (1966)

Stamping:

2.5 MILES NORTHEAST OF WILLOW RIVER, 2.5 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43, THEN 0.5 MILE EAST ON A TEE-ROAD.

Station Notes

THE NATIONAL GEODETIC SURVEY (NGS) DATABASE IS EMPTY.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.345 12B = -91.332 09 = -91.224 03 = -91.060

Lat/Lon and County Coordinates (Feet)

NAD27

Geodetic Position Latitude	Longitude	X	Y	Acc	Order	Determination Method	Project Info Year	Reference
46 21 00.99811	92 49 24.10264			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD27

MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Project Info Year	Reference
2360240.460	495622.420			.100		CLASSICAL SURVEY	1950	UNK

Mn/DOT Name: GEON
NGS Name: GEON
County: PINE, MN (Sheet 2)

NGS ACRN: DL4750 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	30	45 N	19 W	462133.94	924805.27	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 60 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** GEON 2008

3.5 MILES NORTH-NORTHEAST OF WILLOW RIVER, 3.2 MILES NORTH-NORTHEAST ALONG INTERSTATE 35 FROM THE JUNCTION OF INTERSTATE 35 AND COUNTY ROAD 43 AT WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 208.65, 40.0 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 40.0 FEET NORTHWEST OF A FENCE LINE, 1.9 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1086.560	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1086.556	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			995.139	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1086.546	.131		995.234	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1086.546	.131		995.352	.066	1996	GPS - STATIC	2009	HMOOSE
1086.546	.131		995.234	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.394 12B = -91.384 09 = -91.279 03 = -91.112

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 33.94084	92 48 05.26438	524881.482	329560.989	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 33.94082	92 48 05.26519	524881.426	329560.987	.033	C	ADJUSTMENT	2009	GPS2566
46 21 33.94082	92 48 05.26519	524881.426	329560.987	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 33.94050	92 48 05.26515	524881.428	329560.954	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990364.221	827145.709	1690526.093	16843807.587	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990364.165	827145.706	1690526.036	16843807.585	.033	C	ADJUSTMENT	2009	GPS2566
2990364.165	827145.706	1690526.036	16843807.585	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990364.168	827145.673	1690526.039	16843807.552	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GEON-DL4750-3E-16DEC2008.jpg	E	Dec 16, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GEON-DL4750-2-16DEC2008.jpg		Dec 16, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GEON-DL4750-1-16DEC2008.jpg		Dec 16, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

GRON MNDT

Mn/DOT Name: GRON MNDT **NGS Name:** GRON

County: PINE, MN (Sheet 2)

NGS ACRN: AH3106 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	24	43 N	21 W	461132.88	925543.76		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2020	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)

Disk Type
HORIZONTAL CONTROL DISK

Mon. Agency
MNDT

Description: (2003) **Stamping:** GRON 1991

0.8 MILE SOUTHWEST OF FINLAYSON, 0.6 MILE SOUTH ON COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 18 IN FINLAYSON, 41.7 FEET WEST OF COUNTY ROAD 35, 210.5 FEET NORTH-NORTHWEST OF CABLE MARKER NUMBER E19LP2, 4.6 FEET NORTH OF A WITNESS POST.

Station Notes
DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1030.136	.016	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1030.247	.015	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1120.765	.131		1030.352	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1120.765	.131		1030.352	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1120.405						GPS - STATIC	1991	HORZ

Geoid Separations(ft): GEOID18 = -90.633 12B = -90.600 09 = -90.515 03 = -90.371

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 32.88392	92 55 43.75514	492700.457	268655.748	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 32.88395	92 55 43.75582	492700.409	268655.752	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 32.88383	92 55 43.75541	492700.437	268655.740	.033	C	ADJUSTMENT	1999	17648
46 11 32.88383	92 55 43.75541	492700.437	268655.740	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 32.87657	92 55 43.74925	492700.871	268655.004	.066	2	GPS - STATIC	1991	HFIN

GRON MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959229.956	765708.518	1658436.391	16782889.017	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959229.908	765708.520	1658436.344	16782889.020	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959229.937	765708.508	1658436.372	16782889.008	.033	C	ADJUSTMENT	1999	17648
2959229.937	765708.508	1658436.372	16782889.008	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959230.382	765707.780	1658436.806	16782888.273	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GRON-AH3106-3W-06MAY2020.jpg	W	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GRON-AH3106-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/GRON-AH3106-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

H 154

Mn/DOT Name: H 154 **NGS Name:** H 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0474 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	44 N	20 W	461535.00	925200.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1972) **Stamping:** H 154 1935

AT RUTLEDGE, 0.1 MILE SOUTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 33, AT THE SOUTHEAST CORNER OF A JACK PINE TREE GROVE, 114.0 FEET NORTH OF COUNTY ROAD 33, 24.0 FEET WEST OF COUNTY ROAD 61.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1030.569	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1030.159	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1030.159	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.948 12B = -90.928 09 = -90.813 03 = -90.669

*** No Horizontal Positions in the Database ***

Mn/DOT Name: H 155 **NGS Name:** H 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0500 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	45 N	19 W	462201.00	924452.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1970) **Stamping:** H-155 1935

3.7 MILES SOUTHEAST OF STURGEON LAKE, 2.0 MILES EAST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND INTERSTATE HIGHWAY 35, 0.5 MILE WEST OF A TEE-ROAD NORTH, NEAR A LARGE BARN, 36.0 FEET SOUTH OF COUNTY ROAD 46, 4.0 FEET WEST OF A GAS PUMP.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1090.441	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1090.004	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1090.004	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.443 12B = -91.443 09 = -91.329 03 = -91.168

*** No Horizontal Positions in the Database ***

Mn/DOT Name: H 38 **NGS Name:** H 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0885 Get Map
NGS Quad / Sta Num : 46093212/
USGS Quad: ARTHYDE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	45 N	21 W	462203.20	930304.36	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2019	NOT FOUND	Horz=NO Vert=NO	YES		PROJECTS 4 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2007) **Stamping:** H 38 1934

2.05 MILES EAST-NORTHEAST OF ARTHYDE, 2.0 MILES EAST ALONG COUNTY ROAD 34 FROM THE JUNCTION OF COUNTY ROAD 34 AND COUNTY ROAD 75, THEN 1.5 MILES SOUTH ON WAGON WHEEL ROAD, 216.0 FEET EAST OF A CONCRETE CULVERT, 42.0 FEET WEST OF MILEPOST 224, AT THE AITKIN AND PINE COUNTY LINE FOR A TRAIL, 36.0 FEET SOUTH OF A TRAIL, 20.0 FEET EAST OF AN OUTHOUSE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1249.026	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1248.590	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1248.590	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1248.567	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1248.567	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1158.200	.016	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1158.292	.018	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1249.013	.131		1158.397	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1892
1249.013	.131		1158.397	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1249.177	.131		1158.397	.066	1996	GPS - STATIC	2002	HAITK
1249.013	.131		1158.397	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.109 12B = -91.023 09 = -90.869 03 = -90.817

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 03.20461	93 03 04.36175	461823.615	332546.545	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 03.20470	93 03 04.36236	461823.572	332546.554	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 03.20443	93 03 04.36254	461823.560	332546.527	.033	C	ADJUSTMENT	2003	GPS1892
46 22 03.20443	93 03 04.36254	461823.560	332546.527	.033	C	ADJUSTMENT	2003	GPS1839
46 22 03.20443	93 03 04.36254	461823.560	332546.527	.033	C	GPS - STATIC	2002	HAITK
46 22 03.20443	93 03 04.36254	461823.561	332546.527	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2927273.019	829055.935	1627493.158	16846712.272	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2927272.976	829055.943	1627493.115	16846712.281	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2927272.964	829055.916	1627493.102	16846712.254	.033	C	ADJUSTMENT	2003	GPS1892
2927272.964	829055.916	1627493.102	16846712.254	.033	C	ADJUSTMENT	2003	GPS1839
2927272.964	829055.916	1627493.102	16846712.254	.033	C	GPS - STATIC	2002	HAITK
2927272.964	829055.916	1627493.102	16846712.254	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/H_38-RN0885-3S-11APR2007.jpg	S	Apr 11, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/H_38-RN0885-2-11APR2007.jpg		Apr 11, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/H_38-RN0885-1-11APR2007.jpg		Apr 11, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

HAMA MNDT

Mn/DOT Name: HAMA MNDT **NGS Name:** HAMA

County: PINE, MN (Sheet 2)

NGS ACRN: AF9149 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	14	43 N	21 W	461207.65	925735.75	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2008	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 33 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2008) **Stamping:** HAMA 1991

2.0 MILES WEST OF FINLAYSON, 2.1 MILES WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND FRONT STREET IN FINLAYSON, AT THE JUNCTION OF TRUNK HIGHWAY 18 AND HAMALINE ROAD, AT TRUNK HIGHWAY 18 MILEPOINT 74.45, 104.1 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A GARAGE, 57.4 FEET NORTH OF TRUNK HIGHWAY 18, 52.3 FEET EAST-SOUTHEAST OF A POWER POLE, 22.5 FEET EAST OF HAMALINE ROAD, 7.3 FEET NORTH OF CABLE MARKER NUMBER D11, 3.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1131.179	.016	2/1				VERTICAL ADJUSTMENT	2011	00000681
1131.179	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMATT
1131.136	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1131.130	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1130.749	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1040.395	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1130.946	.262		1040.490	.197	1996	GPS - RTRN	2008	RTRN2008
			1040.510	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1131.133	.131		1040.605	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1131.133	.131		1040.605	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.735 12B = -90.692 09 = -90.600 03 = -90.456

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.64517	92 57 35.74881	484823.957	272181.630	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.64520	92 57 35.74948	484823.910	272181.633	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.64505	92 57 35.74892	484823.950	272181.618	.131	3	GPS - RTRN	2008	RTRN2008
46 12 07.64513	92 57 35.74909	484823.938	272181.626	.033	C	ADJUSTMENT	1999	17648
46 12 07.64513	92 57 35.74909	484823.938	272181.626	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.63789	92 57 35.74240	484824.408	272180.892	.066	2	GPS - STATIC	1991	HFIN

HAMA MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2951295.466	769099.256	1650558.964	16786403.421	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2951295.418	769099.259	1650558.917	16786403.424	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2951295.458	769099.244	1650558.956	16786403.409	.131	3	GPS - RTRN	2008	RTRN2008
2951295.446	769099.252	1650558.944	16786403.417	.033	C	ADJUSTMENT	1999	17648
2951295.446	769099.252	1650558.944	16786403.417	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2951295.928	769098.526	1650559.415	16786402.684	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HAMA-AF9149-3NE-24JAN2008.jpg	NE	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HAMA-AF9149-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HAMA-AF9149-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

HANKS

Mn/DOT Name: HANKS **NGS Name:** HANKS

County: PINE, MN (Sheet 2)

NGS ACRN: DP7034 Get Map
NGS Quad / Sta Num : 46092233/
USGS Quad: DANBURY WEST

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	26	42 N	17 W	460511.30	922753.85		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2012	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2012) **Stamping:** HANKS 2012

14.2 MILES EAST-NORTHEAST OF CLOVERDALE, 14.1 MILES EAST ALONG TRUNK HIGHWAY 48 FROM THE JUNCTION OF TRUNK HIGHWAY 48 AND COUNTY ROAD 21 IN CLOVERDALE TO TRUNK HIGHWAY 48 MILEPOINT 23.35, THEN 6.0 MILES NORTH ON COUNTY ROAD 173, THEN 0.9 MILE WEST ON COUNTY ROAD 25, 57.0 FEET NORTHEAST OF COUNTY ROAD 25, 18.2 FEET NORTHWEST OF AN ENTRANCE, 1.5 FEET SOUTHEAST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1027.754	.262		941.025	.197	2011	GPS - OPUS	2020	GPSBM
1027.675	.262		940.946	.197	2011	GPS - OPUS	2020	GPSBM
1027.701			940.966	.026	2011	HORIZONTAL ADJUSTMENT	2015	GPS3071
1027.701			940.966	.026	2011	GPS - STATIC	2015	HCLVR
1027.918	.131		941.169	.066	2007	GPS - STATIC	2012	HCLVR
1027.984	.131		941.301	.066	1996	GPS - STATIC	2012	HCLVR

Geoid Separations(ft): GEOID18 = -86.729 12B = -86.824 09 = -86.758 03 = -86.686

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 11.30093	92 27 53.84988	610395.089	230300.488	.131	3	GPS - OPUS	2020	GPSBM
46 05 11.30143	92 27 53.85028	610395.060	230300.539	.131	3	GPS - OPUS	2020	GPSBM
46 05 11.30100	92 27 53.85028	610395.061	230300.495	.033		ADJUSTMENT	2015	GPS3071
46 05 11.30100	92 27 53.85028	610395.061	230300.495	.033	C	GPS - STATIC	2015	HCLVR

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 11.30090	92 27 53.85116	610394.999	230300.485	.033	C	GPS - STATIC	2012	HCLVR

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 11.30067	92 27 53.85110	610395.003	230300.461	.033	C	GPS - STATIC	2012	HCLVR

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3077547.970	729370.275	1776128.039	16744698.750	.131	3	GPS - OPUS	2020	GPSBM
3077547.941	729370.325	1776128.011	16744698.800	.131	3	GPS - OPUS	2020	GPSBM
3077547.942	729370.281	1776128.011	16744698.757	.033		ADJUSTMENT	2015	GPS3071
3077547.942	729370.281	1776128.011	16744698.757	.033	C	GPS - STATIC	2015	HCLVR

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3077547.880	729370.270	1776127.949	16744698.746	.033	C	GPS - STATIC	2012	HCLVR

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3077547.885	729370.247	1776127.953	16744698.723	.033	C	GPS - STATIC	2012	HCLVR

HANKS

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANKS-DP7034-3NE-21NOV2019.jpg	NE	Nov 21, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANKS-DP7034-2-21NOV2019.jpg		Nov 21, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANKS-DP7034-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

HANSON MNDT

Mn/DOT Name: HANSON MNDT
NGS Name: HANSON
County: PINE, MN (Sheet 2)

NGS ACRN: RN0526 Get Map
NGS Quad / Sta Num : 46092341/1061
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	45 N	19 W	462309.81	924651.63	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2007) **Stamping:** HANSON 1966

2.0 MILES EAST-NORTHEAST OF STURGEON LAKE, 0.9 MILE NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, AT INTERSTATE HIGHWAY 35 MILEPOINT 210.7, AT INTERSTATE HIGHWAY 35 STATION 2597+20, 66.8 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 57.12 FEET NORTHWEST OF HANSON RM 2, 46.94 FEET SOUTHWEST OF HANSON RM 1, 23.4 FEET WEST OF A RIGHT-OF-WAY FENCE, 3.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.386	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1081.386	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1081.386	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.959	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1080.959	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1080.959	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			989.827	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1081.395	.131		989.926	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1081.395	.131		990.054	.066	1996	GPS - STATIC	2009	HMOOSE
1081.395	.131		989.926	.066	2007	GPS - STATIC	2009	HMOOSE
			989.906	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			990.139	.066	1996	GPS - STATIC	1999	GPS917
1081.395	.131		990.139	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.525 12B = -91.522 09 = -91.417 03 = -91.233

HANSON MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 09.81201	92 46 51.62794	530031.878	339280.674	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 09.81204	92 46 51.62872	530031.823	339280.677	.033	C	ADJUSTMENT	2009	GPS2566
46 23 09.81204	92 46 51.62872	530031.823	339280.677	.033	C	GPS - STATIC	2009	HMOOSE
46 23 09.81194	92 46 51.62844	530031.843	339280.667	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 09.81181	92 46 51.62877	530031.820	339280.653	.033	C	GPS - STATIC	2009	HMOOSE
46 23 09.81154	92 46 51.62847	530031.840	339280.627	.033	C	GPS - STATIC	1999	GPS917
46 23 09.81154	92 46 51.62847	530031.841	339280.626	.033	C	ADJUSTMENT	1999	17648
46 23 09.80726	92 46 51.62551	530032.049	339280.193	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 09.80858	92 46 51.62515	530032.073	339280.325	.033	C	GPS - STATIC	1994	HI35N
46 23 09.80708	92 46 51.62547	530032.052	339280.175	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 10.00100	92 46 50.91000			.100	2	CLASSICAL SURVEY	1982	17020
46 23 10.00087	92 46 50.91026			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995347.486	836950.482	1695661.813	16853529.403	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995347.431	836950.485	1695661.758	16853529.406	.033	C	ADJUSTMENT	2009	GPS2566
2995347.431	836950.485	1695661.758	16853529.406	.033	C	GPS - STATIC	2009	HMOOSE
2995347.451	836950.475	1695661.778	16853529.396	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995347.428	836950.461	1695661.755	16853529.383	.033	C	GPS - STATIC	2009	HMOOSE
2995347.450	836950.434	1695661.776	16853529.355	.033	C	GPS - STATIC	1999	GPS917
2995347.450	836950.434	1695661.776	16853529.355	.033	C	ADJUSTMENT	1999	17648
2995347.665	836950.005	1695661.984	16853528.922	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995347.688	836950.139	1695662.009	16853529.056	.033	C	GPS - STATIC	1994	HI35N
2995347.668	836949.986	1695661.987	16853528.904	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2370742.059	508883.956			.100	2	CLASSICAL SURVEY	1982	17020
2370742.040	508883.940			.100	C	CLASSICAL SURVEY	1950	UNK

HANSON MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON-RN0526-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON-RN0526-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON-RN0526-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

HANSON RM 1

Mn/DOT Name: HANSON RM 1 **NGS Name:** HANSON RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0527 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	45 N	19 W	462310.12	924651.13	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2010) **Stamping:** HANSON NO 1 1966

2.0 MILES EAST-NORTHEAST OF THE TOWN OF STURGEON LAKE, 0.2 MILE NORTHEAST ALONG COUNTY ROAD 46 (LAKETOWN ROAD) FROM THE JUNCTION OF COUNTY ROAD 46 (LAKETOWN ROAD) AND INTERSTATE HIGHWAY 35, THEN 0.8 MILE NORTH ON COUNTY ROAD 51, AT INTERSTATE HIGHWAY 35 MILEPOINT 210.7, 94.0 FEET NORTH OF HANSON RM 2, 88.6 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 46.94 FEET NORTHEAST OF STATION HANSON MNDT, 2.0 FEET WEST OF A RIGHT-OF-WAY FENCE, 2.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.779	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1081.779	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1081.779	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.353	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1081.353	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1081.353	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.525 12B = -91.522 09 = -91.417 03 = -91.233

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON_RM_1-RN0527-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON_RM_1-RN0527-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON_RM_1-RN0527-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

HANSON RM 2

Mn/DOT Name: HANSON RM 2 **NGS Name:** HANSON RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0528 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	45 N	19 W	462309.25	924651.60	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2007) **Stamping:** HANSON NO 2 1966

2.0 MILES EAST-NORTHEAST OF THE TOWN OF STURGEON LAKE, 0.2 MILE NORTHEAST ALONG COUNTY ROAD 46 (LAKETOWN ROAD) FROM THE JUNCTION OF COUNTY ROAD 46 (LAKETOWN ROAD) AND INTERSTATE HIGHWAY 35, THEN 0.8 MILE NORTH ON COUNTY ROAD 51, AT INTERSTATE HIGHWAY 35 MILEPOINT 210.7, 94.0 FEET SOUTH OF HANSON RM 1, 89.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 57.12 FEET SOUTHEAST OF STATION HANSON MNDT, 2.0 FEET WEST OF A RIGHT-OF-WAY FENCE, 2.0 FEET EAST OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) ON THE MARK DUE TO TREES, REAL TIME REFERENCE NETWORK (RTRN) SHOT WAS TAKEN 15.0 FEET EAST OF A MARK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.729	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1079.729	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1079.729	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.302	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1079.302	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1079.302	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.525 12B = -91.522 09 = -91.417 03 = -91.233

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON_RM_2-RN0528-3E-04JUN2007.jpg	E	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON_RM_2-RN0528-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/HANSON_RM_2-RN0528-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: ISID
NGS Name: ISID
County: PINE, MN (Sheet 2)

NGS ACRN: DL4753 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	18	45 N	19 W	462230.13	924728.62	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 245 FT)
Disk Type: METAL ROD (WITH REMOVABLE ID DISK)
Mon. Agency: MNDT

Description: (2009)
Stamping: ISID 2008

1.5 MILES EAST OF THE TOWN OF STURGEON LAKE, 1.7 MILES EAST ALONG COUNTY ROAD 46E FROM THE JUNCTION OF LAKE TOWN ROAD AND COUNTY ROAD 46, AT THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, AT INTERSTATE HIGHWAY 35 MILEPOINT 209.9, 65.0 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35 OFF RAMP TO COUNTY ROAD 46, 30.0 FEET NORTH OF COUNTY ROAD 46, 15.4 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.615	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1091.599	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1000.096	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1091.599	.131		1000.192	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1091.599	.131		1000.313	.066	1996	GPS - STATIC	2009	HMOOSE
1091.599	.131		1000.192	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.466 12B = -91.463 09 = -91.361 03 = -91.184

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 30.13337	92 47 28.61461	527444.349	335257.145	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 30.13336	92 47 28.61542	527444.293	335257.144	.033	C	ADJUSTMENT	2009	GPS2566
46 22 30.13336	92 47 28.61542	527444.293	335257.144	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 30.13305	92 47 28.61538	527444.295	335257.113	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2992829.272	832883.968	1693080.570	16849504.415	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2992829.215	832883.966	1693080.513	16849504.414	.033	C	ADJUSTMENT	2009	GPS2566
2992829.215	832883.966	1693080.513	16849504.414	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2992829.218	832883.935	1693080.516	16849504.382	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ISID-DL4753-3E-18DEC2008.jpg	E	Dec 18, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ISID-DL4753-2-18DEC2008.jpg		Dec 18, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ISID-DL4753-1-18DEC2008.jpg		Dec 18, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

J 154

Mn/DOT Name: J 154 **NGS Name:** J 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0475 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	34	44 N	20 W	461533.00	925105.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2003) **Stamping:** J-154 1935

IN RUTLEDGE, 0.2 MILE SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND MAIN STREET, THEN 0.8 MILE EAST ON CENTRAL AVENUE (COUNTY ROAD 33), 1.25 MILES WEST OF INTERSTATE HIGHWAY 35, 0.1 MILE EAST OF A DRIVEWAY SOUTH, 66.0 FEET SOUTHWEST OF A POWER POLE, 30.0 FEET SOUTH OF COUNTY ROAD 33, AT A SMALL RISE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1043.748	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1043.328	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1043.328	.007	1				VERTICAL CONTROL SURVEY	1972	L133 MINN
1043.328	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.905 12B = -90.892 09 = -90.777 03 = -90.633

*** No Horizontal Positions in the Database ***

Mn/DOT Name: J 155 **NGS Name:** J 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0501 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	22	45 N	19 W	462156.02	924324.26	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2019	GOOD	Horz=NO Vert=NO	YES		PROJECTS 3 IN.	STEEL ROD IMBED IN MON

Monument Type: CONCRETE POST (PREFABRICATED)
Disk Type: BENCH MARK DISK
Mon. Agency: NGS

Description: (2008) **Stamping:** J 155 1935

4.8 MILES SOUTHEAST OF STURGEON LAKE, 3.9 MILES EASTERLY ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND INTERSTATE HIGHWAY 35 (THE JUNCTION IS 1.5 MILES EAST OF STURGEON LAKE), THEN 0.15 MILE SOUTH ALONG COUNTY ROAD 46 TO COUNTY ROAD 50, 83.0 FEET EAST OF COUNTY ROAD 50, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes
THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1100.483	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1100.050	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1100.050	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1100.050	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1009.092	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1100.490	.131		1009.194	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1100.490	.131		1009.309	.066	1996	GPS - STATIC	2009	HMOOSE
1100.490	.131		1009.194	.066	2007	GPS - STATIC	2009	HMOOSE
			1009.174	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1100.490	.131		1009.309	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1100.490	.131		1009.309	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.427 12B = -91.434 09 = -91.306 03 = -91.155

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 56.02407	92 43 24.25956	544586.427	331832.297	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 56.02408	92 43 24.26026	544586.378	331832.298	.033	C	ADJUSTMENT	2009	GPS2566
46 21 56.02408	92 43 24.26026	544586.378	331832.298	.033	C	GPS - STATIC	2009	HMOOSE
46 21 56.02429	92 43 24.26085	544586.336	331832.319	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 56.02406	92 43 24.26063	544586.352	331832.295	.033	C	GPS - STATIC	2009	HMOOSE
46 21 56.02406	92 43 24.26063	544586.352	331832.295	.033	C	ADJUSTMENT	2003	GPS1839
46 21 56.02406	92 43 24.26063	544586.352	331832.296	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010024.961	829752.332	1710219.252	16846102.912	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010024.912	829752.332	1710219.203	16846102.913	.033	C	ADJUSTMENT	2009	GPS2566
3010024.912	829752.332	1710219.203	16846102.913	.033	C	GPS - STATIC	2009	HMOOSE
3010024.870	829752.352	1710219.161	16846102.934	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010024.886	829752.329	1710219.177	16846102.911	.033	C	GPS - STATIC	2009	HMOOSE
3010024.886	829752.329	1710219.177	16846102.911	.033	C	ADJUSTMENT	2003	GPS1839
3010024.885	829752.329	1710219.177	16846102.911	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/J_155-RN0501-3E-09DEC2008.jpg	E	Dec 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/J_155-RN0501-2-09DEC2008.jpg		Dec 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/J_155-RN0501-1-09DEC2008.jpg		Dec 9, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: J 38 **NGS Name:** J 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0886 Get Map
NGS Quad / Sta Num : 46093212/
USGS Quad: ARTHYDE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	21	45 N	21 W	462213.00	930035.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (1934) **Stamping:** J 38 1934

3.3 MILES WEST OF DENHAM, 2.0 MILES WEST ALONG COUNTY ROAD 159 FROM THE JUNCTION OF COUNTY ROAD 159 AND COUNTY ROAD 40, THEN 0.5 MILE NORTH ON BIRCH CREEK ROAD, THEN 1.0 MILE WEST ON COUNTY ROAD 159 (WESTWIND ROAD), ALONG A RAILROAD, 720.0 FEET EAST OF A CONCRETE CULVERT, AT A CURVE, 45.0 FEET EAST OF RAILROAD MILEPOST 226, 39.0 FEET NORTH OF A RAILROAD, AT A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1241.431	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1241.005	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1241.005	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1240.985	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1240.985	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Geoid Separations(ft): GEOID18 = -91.151 12B = -91.076 09 = -90.935 03 = -90.863

*** No Horizontal Positions in the Database ***

Mn/DOT Name: JAROS **NGS Name:** JAROS

County: PINE, MN (Sheet 2)

NGS ACRN: DL4754 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	44 N	20 W	461853.58	924942.79	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 90 FT)

Disk Type
METAL ROD (WITH REMOVABLE ID DISK)

Mon. Agency
MNDT

Description: (2009)

Stamping: JAROS 2008

0.5 MILE EAST-SOUTHEAST OF WILLOW RIVER, 0.15 MILE SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, AT INTERSTATE HIGHWAY 35 MILEPOINT 205.3, 111.5 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 79.6 FEET WEST-SOUTHWEST OF AN ENTRANCE RAMP ONTO SOUTHBOUND INTERSTATE HIGHWAY 35, 3.1 FEET EAST-NORTHEAST OF A FENCE LINE, 2.7 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1063.472	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1063.485	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			972.239	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1063.482	.131		972.347	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1063.482	.131		972.462	.066	1996	GPS - STATIC	2009	HMOOSE
1063.482	.131		972.347	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.217 12B = -91.191 09 = -90.941 03 = -90.941

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 53.57681	92 49 42.79488	518055.197	313307.480	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 53.57672	92 49 42.79571	518055.138	313307.471	.033	C	ADJUSTMENT	2009	GPS2566
46 18 53.57672	92 49 42.79571	518055.138	313307.471	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 53.57629	92 49 42.79566	518055.142	313307.428	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983816.878	810780.328	1683723.476	16827552.765	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983816.820	810780.318	1683723.418	16827552.756	.033	C	ADJUSTMENT	2009	GPS2566
2983816.820	810780.318	1683723.418	16827552.756	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983816.825	810780.274	1683723.422	16827552.712	.033	C	GPS - STATIC	2009	HMOOSE

JITTERS

Mn/DOT Name: JITTERS **NGS Name:** JITTERS

County: PINE, MN (Sheet 2)

NGS ACRN: DL4755 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	4	45 N	19 W	462437.09	924533.00	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** JITTERS 2008

3.5 MILES NORTHEAST OF STURGEON LAKE, 2.9 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46 (1.5 MILES EAST OF STURGEON LAKE), AT INTERSTATE HIGHWAY 35 MILEPOINT 212.75, 96.5 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 4.0 FEET NORTHWEST OF A FENCE LINE, 4.0 FEET NORTHWEST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1112.960	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1112.947	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1021.274	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1112.957	.131		1021.379	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1112.957	.131		1021.524	.066	1996	GPS - STATIC	2009	HMOOSE
1112.957	.131		1021.379	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.647 12B = -91.647 09 = -91.539 03 = -91.358

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 37.08568	92 45 32.99912	535528.650	348131.351	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 37.08588	92 45 32.99987	535528.597	348131.372	.033	C	ADJUSTMENT	2009	GPS2566
46 24 37.08588	92 45 32.99987	535528.597	348131.372	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 37.08572	92 45 32.99978	535528.603	348131.355	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000691.823	845892.384	1701144.823	16862383.044	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000691.770	845892.403	1701144.770	16862383.064	.033	C	ADJUSTMENT	2009	GPS2566
3000691.770	845892.403	1701144.770	16862383.064	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3000691.777	845892.387	1701144.777	16862383.048	.033	C	GPS - STATIC	2009	HMOOSE

JITTERS

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JITTERS-DL4755-3E-24DEC2008.jpg	E	Dec 24, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JITTERS-DL4755-2-24DEC2008.jpg		Dec 24, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JITTERS-DL4755-1-24DEC2008.jpg		Dec 24, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

JULES MNDT

Mn/DOT Name: JULES MNDT **NGS Name:** JULES

County: PINE, MN (Sheet 2)

NGS ACRN: RN0544 Get Map
NGS Quad / Sta Num : 46092342/1054
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	13	44 N	20 W	461727.52	924910.01	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2001) **Stamping:** JULES 1966

1.8 MILES SOUTH-SOUTHEAST OF WILLOW RIVER, 1.8 MILES SOUTH-SOUTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 203.55, AT INTERSTATE HIGHWAY 35 STATION 2223+50, 2.2 MILES NORTH OF COUNTY ROAD 33, 94.97 FEET SOUTH-SOUTHEAST OF JULES RM 2, 87.2 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 56.38 FEET EAST OF JULES RM 1, 11.9 FEET WEST OF A RIGHT-OF-WAY FENCE, 3.3 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1062.016	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1062.016	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1062.016	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.592	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1061.592	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1061.592	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			970.959	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			971.064	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			971.205	.066	1996	GPS - STATIC	1999	GPS917
1062.006	.131		971.205	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.079 12B = -91.060 09 = -90.958 03 = -90.810

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 27.52291	92 49 10.00476	520365.814	304591.785	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 27.52289	92 49 10.00554	520365.759	304591.783	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 27.52249	92 49 10.00545	520365.764	304591.743	.033	C	GPS - STATIC	1999	GPS917
46 17 27.52249	92 49 10.00545	520365.765	304591.743	.033	C	ADJUSTMENT	1999	17648
46 17 27.51568	92 49 09.99847	520366.256	304591.053	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 27.51558	92 49 09.99836	520366.264	304591.043	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 27.70600	92 49 09.28200			.100	2	CLASSICAL SURVEY	1982	17020
46 17 27.70642	92 49 09.28191			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986275.428	802106.402	1686044.081	16818843.905	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986275.373	802106.399	1686044.027	16818843.902	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986275.380	802106.358	1686044.033	16818843.862	.033	C	GPS - STATIC	1999	GPS917
2986275.380	802106.358	1686044.033	16818843.862	.033	C	ADJUSTMENT	1999	17648
2986275.882	802105.677	1686044.525	16818843.173	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986275.890	802105.667	1686044.532	16818843.163	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2361670.149	474039.442			.100	2	CLASSICAL SURVEY	1982	17020
2361670.150	474039.490			.100	C	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES-RN0544-3E-18NOV2008.jpg	E	Nov 18, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES-RN0544-2-18NOV2008.jpg		Nov 18, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES-RN0544-1-03JAN2008.jpg		Jan 3, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

JULES MNDT AZ MK

Mn/DOT Name: JULES MNDT AZ MK
NGS Name: JULES AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0543 Get Map
NGS Quad / Sta Num : 46092342/1055
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	44 N	20 W	461812.07	924932.09	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2008) **Stamping:** JULES 1966

0.9 MILE SOUTH-SOUTHEAST OF WILLOW RIVER, 0.9 MILE SOUTH-SOUTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 204.5, INTERSTATE HIGHWAY 35 STATION 2271+10, 65.6 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 32.8 FEET EAST OF A RIGHT-OF-WAY FENCE, 8.0 FEET EAST OF A TREE LINE, 3.3 FEET EAST OF A WITNESS POST.

Station Notes
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) POSITION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.127	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1057.127	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1057.127	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1056.710	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1056.710	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.117	.197		966.235	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.161 12B = -91.132 09 = -91.037 03 = -90.886

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 12.06613	92 49 32.09498	518810.239	309102.825	.066	2	ADJUSTMENT	1999	17648
46 18 12.06035	92 49 32.08847	518810.696	309102.239	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 12.06025	92 49 32.08836	518810.704	309102.229	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 12.25100	92 49 31.36900			.100	2	CLASSICAL SURVEY	1982	17020
46 18 12.25141	92 49 31.36936			.100	2	CLASSICAL SURVEY	1950	UNK

JULES MNDT AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984643.384	806589.694	1684483.498	16823350.953	.066	2	ADJUSTMENT	1999	17648
2984643.851	806589.116	1684483.956	16823350.369	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984643.859	806589.107	1684483.964	16823350.359	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2360038.271	478522.889			.100	2	CLASSICAL SURVEY	1982	17020
2360038.240	478522.930			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES_AZ_MK-RN0543-3W-18NOV2008.jpg	W	Nov 18, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES_AZ_MK-RN0543-2-18NOV2008.jpg		Nov 18, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES_AZ_MK-RN0543-1-18NOV2008.jpg		Nov 18, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

JULES RM 1

Mn/DOT Name: JULES RM 1 **NGS Name:** JULES RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0545 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	13	44 N	20 W	461727.40	924910.79	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1966) **Stamping:** JULES - RM1 - 1966

1.0 MILE SOUTHEAST OF WILLOW RIVER, 1.8 MILES SOUTH ON INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT WILLOW RIVER, 2.2 MILES NORTH OF COUNTY ROAD 33, 56.4 FEET WEST OF STATION JULES MNDT, 109.5 FEET SOUTHWEST OF JULES RM 2, 68.0 FEET WEST OF A RIGHT-OF-WAY FENCE, 31.3 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 203.6.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1058.036	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.613	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1057.613	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1057.613	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.079 12B = -91.063 09 = -90.961 03 = -90.810

*** No Horizontal Positions in the Database ***

JULES RM 2

Mn/DOT Name: JULES RM 2 **NGS Name:** JULES RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0546 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	13	44 N	20 W	461728.43	924910.34	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2008) **Stamping:** JULES NO 2 1966

1.5 MILES SOUTH-SOUTHEAST OF WILLOW RIVER, 1.8 MILES SOUTH-SOUTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 AT WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 203.6, 2.2 MILES NORTH OF COUNTY ROAD 33, 94.97 FEET NORTH-NORTHWEST OF STATION JULES MNDT, 72.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 26.0 FEET WEST OF A RIGHT-OF-WAY FENCE, 2.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.609	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1061.609	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1061.609	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.186	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1061.186	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1061.186	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1061.586	.262		970.503	.197	2011	GPS - OPUS	2020	GPSBM
1061.615	.262		970.553	.197	2011	GPS - RTRN	2020	RTRN2020
			970.533	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1061.612	.131		970.644	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1061.612	.131		970.759	.066	1996	GPS - STATIC	2009	HMOOSE
1061.612	.131		970.644	.066	2007	GPS - STATIC	2009	HMOOSE
1061.497	.262		970.687	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.082 12B = -91.063 09 = -90.961 03 = -90.810

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 28.43120	92 49 10.33849	520342.283	304683.778	.131	3	GPS - OPUS	2020	GPSBM
46 17 28.43160	92 49 10.33830	520342.297	304683.818	.131	3	GPS - RTRN	2020	RTRN2020
46 17 28.43169	92 49 10.33816	520342.306	304683.827	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 28.43164	92 49 10.33900	520342.247	304683.822	.033	C	ADJUSTMENT	2009	GPS2566
46 17 28.43164	92 49 10.33900	520342.247	304683.822	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 28.43122	92 49 10.33889	520342.255	304683.780	.033	C	GPS - STATIC	2009	HMOOSE
46 17 28.43197	92 49 10.33883	520342.260	304683.856	.131	3	GPS - RTRN	2008	RTRN2008

JULES RM 2

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986250.336	802197.968	1686020.445	16818935.826	.131	3	GPS - OPUS	2020	GPSBM
2986250.348	802198.009	1686020.458	16818935.867	.131	3	GPS - RTRN	2020	RTRN2020
2986250.358	802198.018	1686020.468	16818935.876	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986250.299	802198.012	1686020.409	16818935.871	.033	C	ADJUSTMENT	2009	GPS2566
2986250.299	802198.012	1686020.409	16818935.871	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986250.308	802197.969	1686020.417	16818935.828	.033	C	GPS - STATIC	2009	HMOOSE
2986250.311	802198.046	1686020.421	16818935.904	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES_RM_2-RN0546-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES_RM_2-RN0546-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/JULES_RM_2-RN0546-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

K 154

Mn/DOT Name: K 154 **NGS Name:** K 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0476 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	44 N	20 W	461532.37	924836.04	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 12 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2003) **Stamping:** K 154 1935

3.6 MILES SOUTHEAST OF RUTLEDGE, 0.75 MILE EAST ALONG COUNTY ROAD 33/SWANSON ROAD FROM THE JUNCTION OF COUNTY ROAD 33/SWANSON ROAD AND INTERSTATE HIGHWAY 35 IN RUTLEDGE, 111.0 FEET EAST OF A FARM ENTRANCE SOUTH, 97.0 FEET WEST-SOUTHWEST OF A POWER POLE, 27.0 FEET SOUTH OF COUNTY ROAD 33, 19.2 FEET WEST-NORTHWEST OF A WEST GATEPOST, 3.2 FEET NORTH OF AN EAST-WEST FENCE, 1.1 FEET NORTH OF A WITNESS POST.

Station Notes
THE REAL TIME REFERENCE NETWORK (RTRN) DATA WAS COLLECTED 30.0 FEET NORTH OF THE MARK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.630	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1099.630	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1099.630	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.194	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1099.194	.007	1				VERTICAL CONTROL SURVEY	1976	L23306
1099.194	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1099.194	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.807 12B = -90.813 09 = -90.695 03 = -90.548

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/K_154-RN0476-3S-18NOV2008.jpg	S	Nov 18, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/K_154-RN0476-2-18NOV2008.jpg		Nov 18, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/K_154-RN0476-1-18NOV2008.jpg		Nov 18, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: K 155 **NGS Name:** K 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0502 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	24	45 N	19 W	462138.00	924059.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** K 155 1935

6.0 MILES NORTHWESTERLY ON COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND TRUNK HIGHWAY 23
IN KERRICK, 15.0 FEET FROM A ROAD TO A FARM, AT A FENCE, 27.0 FEET NORTH OF COUNTY ROAD 46.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1100.752	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1100.319	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.348 12B = -91.361 09 = -91.214 03 = -91.076

*** No Horizontal Positions in the Database ***

Mn/DOT Name: K 38 **NGS Name:** K 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0410 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	23	45 N	21 W	462147.52	925811.51	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	SEE DESCRIPTION

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
BENCH MARK DISK

Mon. Agency
NGS

Description: (2008)

Stamping: K 38 1934

1.0 MILE WEST OF DENHAM, 1.5 MILES WEST ALONG OLD CREAMERY ROAD, ALONG AN ALL-TERRAIN VEHICLE (ATV) / SNOWMOBILE TRAIL FROM THE JUNCTION OF A TRAIL AND COUNTY ROAD 40 IN A METAL CULVERT, 156.0 FEET EAST OF A CONCRETE CULVERT, 42.0 FEET NORTH OF AN ALL-TERRAIN VEHICLE (ATV) / SNOWMOBILE TRAIL.

Station Notes
THE REAL TIME REFERENCE NETWORK (RTRN) SHOT WAS TAKEN 40.0 FEET SOUTH OF THE MARK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1208.429	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1208.013	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1208.013	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1207.967	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Geoid Separations(ft): GEOID18 = -91.161 12B = -91.099 09 = -90.968 03 = -90.866

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/K_38-RN0410-3E-11APR2007.jpg	E	Apr 11, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/K_38-RN0410-2-11APR2007.jpg		Apr 11, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/K_38-RN0410-1-11APR2007.jpg		Apr 11, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

KATHY MNDT

Mn/DOT Name: KATHY MNDT **NGS Name:** KATHY

County: PINE, MN (Sheet 2)

NGS ACRN: RN0582 Get Map
NGS Quad / Sta Num : 46092333/1041
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	42 N	20 W	460608.87	925316.37	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** KATHY 1964

1.6 MILES SOUTH-SOUTHWEST OF SANDSTONE, 1.6 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 AT SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 189.75, 6.3 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 48 AT HINCKLEY, 61.4 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 43.42 FEET NORTHWEST OF KATHY MNDT RM 2, 36.05 FEET SOUTHWEST OF KATHY MNDT RM 1, 2.9 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1082.193	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1082.193	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1082.180	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.848	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1081.848	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1081.848	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1081.901	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			992.180	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1082.183	.131		992.278	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1082.183	.131		992.413	.066	1996	GPS - STATIC	2009	HMOOSE
1082.183	.131		992.278	.066	2007	GPS - STATIC	2009	HMOOSE
1082.075	.262		992.275	.197	1996	GPS - RTRN	2008	RTRN2008
			992.275	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			992.367	.066	1996	GPS - STATIC	1999	GPS917
1082.183	.131		992.367	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.023 12B = -90.029 09 = -89.924 03 = -89.800

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 08.86782	92 53 16.36806	503074.663	235830.551	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 08.86763	92 53 16.36889	503074.605	235830.532	.033	C	ADJUSTMENT	2009	GPS2566
46 06 08.86763	92 53 16.36889	503074.605	235830.532	.033	C	GPS - STATIC	2009	HMOOSE
46 06 08.86730	92 53 16.36830	503074.646	235830.498	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 08.86763	92 53 16.36841	503074.639	235830.532	.033	C	GPS - STATIC	2009	HMOOSE
46 06 08.86792	92 53 16.36775	503074.685	235830.561	.131	3	GPS - RTRN	2008	RTRN2008
46 06 08.86724	92 53 16.36807	503074.663	235830.493	.033	C	GPS - STATIC	1999	GPS917
46 06 08.86724	92 53 16.36807	503074.662	235830.492	.033	C	ADJUSTMENT	1999	17648
46 06 08.86191	92 53 16.36659	503074.767	235829.953	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 08.86176	92 53 16.36148	503075.126	235829.938	.033	C	GPS - STATIC	1994	HI35N
46 06 08.86189	92 53 16.36660	503074.766	235829.951	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 09.04600	92 53 15.64200			.100	2	CLASSICAL SURVEY	1982	17020
46 06 09.04582	92 53 15.64199			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970160.833	733068.680	1668847.287	16750091.426	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970160.775	733068.659	1668847.228	16750091.407	.033	C	ADJUSTMENT	2009	GPS2566
2970160.775	733068.659	1668847.228	16750091.407	.033	C	GPS - STATIC	2009	HMOOSE
2970160.817	733068.627	1668847.270	16750091.373	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970160.809	733068.660	1668847.262	16750091.407	.033	C	GPS - STATIC	2009	HMOOSE
2970160.855	733068.690	1668847.309	16750091.436	.131	3	GPS - RTRN	2008	RTRN2008
2970160.834	733068.621	1668847.286	16750091.368	.033	C	GPS - STATIC	1999	GPS917
2970160.834	733068.621	1668847.286	16750091.368	.033	C	ADJUSTMENT	1999	17648
2970160.947	733068.083	1668847.391	16750090.828	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970161.307	733068.074	1668847.751	16750090.813	.033	C	GPS - STATIC	1994	HI35N
2970160.946	733068.081	1668847.391	16750090.826	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2345555.455	405001.565			.100	2	CLASSICAL SURVEY	1982	17020
2345555.450	405001.550			.100	C	CLASSICAL SURVEY	1950	UNK

KATHY MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY-RN0582-3E-28MAY2009.jpg	E	May 28, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY-RN0582-2-28MAY2009.jpg		May 28, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY-RN0582-1-28MAY2009.jpg		May 28, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

KATHY MNDT AZ MK

Mn/DOT Name: KATHY MNDT AZ MK
NGS Name: KATHY AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0585 Get Map
NGS Quad / Sta Num : 46092333/1042
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	42 N	20 W	460538.82	925330.37	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1993) **Stamping:** KATHY 1964

2.0 MILES SOUTH-SOUTHWEST OF SANDSTONE, 2.25 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE 35 MILEPOINT 189.20, 33.9 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 25.6 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1087.580	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1087.586	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1087.580	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1087.255	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1087.255	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1087.308	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			997.567	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1087.596	.131		997.655	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1087.596	.131		997.787	.066	1996	GPS - STATIC	2009	HMOOSE
1087.596	.131		997.655	.066	2007	GPS - STATIC	2009	HMOOSE
1087.413	.262		997.613	.197	1996	GPS - RTRN	2008	RTRN2008
1087.317	.262		997.521	.197	1996	GPS - RTRN	2008	RTRN2008
			997.655	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			997.770	.066	1996	GPS - STATIC	1999	GPS917
1087.596	.131		997.770	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.023 12B = -90.026 09 = -89.921 03 = -89.800

KATHY MNDT AZ MK

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 38.81869	92 53 30.37010	502088.280	232786.358	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 38.81841	92 53 30.37109	502088.210	232786.330	.033	C	ADJUSTMENT	2009	GPS2566
46 05 38.81841	92 53 30.37109	502088.210	232786.330	.033	C	GPS - STATIC	2009	HMOOSE
46 05 38.81841	92 53 30.37109	502088.210	232786.330	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 38.81854	92 53 30.37042	502088.258	232786.343	.033	C	GPS - STATIC	2009	HMOOSE
46 05 38.81858	92 53 30.37015	502088.277	232786.347	.131	3	GPS - RTRN	2008	RTRN2008
46 05 38.81912	92 53 30.37027	502088.268	232786.402	.131	3	GPS - RTRN	2008	RTRN2008
46 05 38.81836	92 53 30.37086	502088.228	232786.326	.033	C	GPS - STATIC	1999	GPS917
46 05 38.81836	92 53 30.37086	502088.226	232786.325	.033	C	ADJUSTMENT	1999	17648
46 05 38.81198	92 53 30.36842	502088.398	232785.678	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 38.81287	92 53 30.36430	502088.687	232785.768	.033	C	GPS - STATIC	1994	HI35N
46 05 38.81197	92 53 30.36843	502088.398	232785.677	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 38.99600	92 53 29.64300			.100	2	CLASSICAL SURVEY	1982	17020
46 05 38.99599	92 53 29.64251			.100	C	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969226.584	730008.460	1667865.167	16747047.340	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969226.514	730008.430	1667865.097	16747047.312	.033	C	ADJUSTMENT	2009	GPS2566
2969226.514	730008.430	1667865.097	16747047.312	.033	C	GPS - STATIC	2009	HMOOSE
2969226.514	730008.430	1667865.097	16747047.312	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969226.562	730008.444	1667865.144	16747047.325	.033	C	GPS - STATIC	2009	HMOOSE
2969226.580	730008.448	1667865.163	16747047.329	.131	3	GPS - RTRN	2008	RTRN2008
2969226.571	730008.503	1667865.154	16747047.384	.131	3	GPS - RTRN	2008	RTRN2008
2969226.531	730008.425	1667865.113	16747047.307	.033	C	GPS - STATIC	1999	GPS917
2969226.531	730008.425	1667865.113	16747047.307	.033	C	ADJUSTMENT	1999	17648
2969226.714	730007.782	1667865.286	16747046.661	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969227.002	730007.877	1667865.576	16747046.751	.033	C	GPS - STATIC	1994	HI35N
2969226.713	730007.781	1667865.285	16747046.660	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2344621.259	401941.274			.100	2	CLASSICAL SURVEY	1982	17020
2344621.290	401941.270			.100	C	CLASSICAL SURVEY	1950	UNK

KATHY MNDT AZ MK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_AZ_MK-RN0585-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_AZ_MK-RN0585-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_AZ_MK-RN0585-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

KATHY MNDT RM 1

Mn/DOT Name: KATHY MNDT RM 1 **NGS Name:** KATHY RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0581 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	42 N	20 W	460609.16	925316.07	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1964) **Stamping:** KATHY NO 1 1964

1.6 MILES SOUTH-SOUTHWEST OF SANDSTONE, 1.6 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 AT SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 189.75, 6.3 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 48 AT HINCKLEY, 78.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 59.2 FEET NORTH-NORTHWEST OF KATHY MNDT RM 2, 36.0 FEET NORTHEAST OF STATION KATHY MNDT, 34.8 FEET NORTHEAST OF A WITNESS POST, 22.0 FEET WEST OF A FENCE, 1.5 FEET WEST OF A WITNESS POST.

Station Notes
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.351	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1083.351	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1083.351	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.016	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1083.016	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1083.016	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1083.069	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.023 12B = -90.029 09 = -89.924 03 = -89.800

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_RM_1-RN0581-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_RM_1-RN0581-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_RM_1-RN0581-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

KATHY MNDT RM 2

Mn/DOT Name: KATHY MNDT RM 2 **NGS Name:** KATHY RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0583 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	42 N	20 W	460608.58	925315.91	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2008) **Stamping:** KATHY NO 2 1964

1.6 MILES SOUTH-SOUTHWEST OF SANDSTONE, 1.6 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 189.75, 99.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 59.2 FEET SOUTH-SOUTHEAST OF KATHY MNDT RM 1, 59.0 FEET SOUTH-SOUTHEAST OF A WITNESS POST, 43.4 FEET SOUTHEAST OF STATION KATHY MNDT, 41.4 FEET SOUTHEAST OF A WITNESS POST, 1.0 FOOT WEST OF A FENCE, 2.0 FEET WEST OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.341	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1083.341	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1083.341	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.010	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1083.010	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1083.010	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1083.059	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Geoid Separations(ft): GEOID18 = -90.023 12B = -90.029 09 = -89.924 03 = -89.800

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_RM_2-RN0583-3E-13NOV2008.jpg	E	Nov 13, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_RM_2-RN0583-2-13NOV2008.jpg		Nov 13, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KATHY_RM_2-RN0583-1-13NOV2008.jpg		Nov 13, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

KETT MNDT

Mn/DOT Name: KETT MNDT **NGS Name:** KETT

County: PINE, MN (Sheet 2)

NGS ACRN: AF9150 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	43 N	20 W	461046.87	925121.98	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 23 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** KETT 1991

3.5 MILES NORTH OF SANDSTONE, AT THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 EAST (THE JUNCTION IS 3.5 MILES NORTH OF SANDSTONE), AT INTERSTATE HIGHWAY 35 MILEPOINT 195.60 AND TRUNK HIGHWAY 23 MILEPOINT 290.2, 20.5 FEET SOUTH OF TRUNK HIGHWAY 23, 13.5 FEET EAST-SOUTHEAST OF THE SOUTHEAST CORNER OF A BRIDGE, 2.0 FEET SOUTH OF A GUARDRAIL, 1.7 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.036	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1134.036	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1134.036	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1134.036	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1134.030	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1134.030	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1134.036	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1134.036	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.656	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.027	.262		1043.774	.197	2011	GPS - RTRN	2017	RTRN2017
			1043.797	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1134.020	.131		1043.909	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1134.020	.131		1044.024	.066	1996	GPS - STATIC	2009	HASKO
1134.020	.131		1043.909	.066	2007	GPS - STATIC	2009	HASKO
1134.020	.131		1043.909	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1134.020	.131		1044.024	.066	1996	GPS - STATIC	2009	HMOOSE
1134.020	.131		1043.909	.066	2007	GPS - STATIC	2009	HMOOSE
1133.974	.262		1043.945	.197	1996	GPS - RTRN	2008	RTRN2008
			1043.909	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1044.024	.066	1996	GPS - STATIC	1999	GPS917
1134.053	.131		1044.024	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1134.053	.131		1044.024	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899
1134.086						GPS - STATIC	1994	HORZ

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.252 09 = -90.144 03 = -90.029

KETT MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 46.87011	92 51 21.98102	511119.769	263996.077	.131	3	GPS - RTRN	2017	RTRN2017
46 10 46.86977	92 51 21.98203	511119.699	263996.043	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 46.86983	92 51 21.98254	511119.662	263996.049	.033	C	ADJUSTMENT	2010	GPS2619
46 10 46.86983	92 51 21.98254	511119.662	263996.049	.033	C	GPS - STATIC	2009	HASKO
46 10 46.86983	92 51 21.98254	511119.662	263996.049	.033	C	ADJUSTMENT	2009	GPS2566
46 10 46.86983	92 51 21.98254	511119.662	263996.049	.033	C	GPS - STATIC	2009	HMOOSE
46 10 46.86983	92 51 21.98254	511119.662	263996.049	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 46.86957	92 51 21.98220	511119.686	263996.023	.033	C	GPS - STATIC	2009	HASKO
46 10 46.86957	92 51 21.98220	511119.686	263996.023	.033	C	GPS - STATIC	2009	HMOOSE
46 10 46.87006	92 51 21.98273	511119.649	263996.072	.131	3	GPS - RTRN	2008	RTRN2008
46 10 46.86957	92 51 21.98220	511119.686	263996.024	.033	C	GPS - STATIC	1999	GPS917
46 10 46.86957	92 51 21.98220	511119.686	263996.023	.033	C	ADJUSTMENT	1999	17648
46 10 46.86957	92 51 21.98220	511119.686	263996.023	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 46.86406	92 51 21.97490	511120.202	263995.466	.033	C	GPS - STATIC	1994	HI35N
46 10 46.86197	92 51 21.97841	511119.953	263995.253	.066	2	GPS - STATIC	1991	HFIN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977723.813	761363.979	1676853.389	16778254.606	.131	3	GPS - RTRN	2017	RTRN2017
2977723.742	761363.943	1676853.318	16778254.571	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977723.706	761363.949	1676853.282	16778254.578	.033	C	ADJUSTMENT	2010	GPS2619
2977723.706	761363.949	1676853.282	16778254.578	.033	C	GPS - STATIC	2009	HASKO
2977723.706	761363.949	1676853.282	16778254.578	.033	C	ADJUSTMENT	2009	GPS2566
2977723.706	761363.949	1676853.282	16778254.578	.033	C	GPS - STATIC	2009	HMOOSE
2977723.706	761363.949	1676853.282	16778254.578	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977723.731	761363.923	1676853.306	16778254.551	.033	C	GPS - STATIC	2009	HASKO
2977723.731	761363.923	1676853.306	16778254.551	.033	C	GPS - STATIC	2009	HMOOSE
2977723.693	761363.972	1676853.269	16778254.601	.131	3	GPS - RTRN	2008	RTRN2008
2977723.731	761363.923	1676853.306	16778254.551	.033	C	GPS - STATIC	1999	GPS917
2977723.731	761363.923	1676853.306	16778254.551	.033	C	ADJUSTMENT	1999	17648
2977723.731	761363.923	1676853.306	16778254.551	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977724.254	761363.374	1676853.821	16778253.994	.033	C	GPS - STATIC	1994	HI35N
2977724.011	761363.158	1676853.574	16778253.782	.066	2	GPS - STATIC	1991	HFIN

KETT MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KETT-AF9150-3S-25MAY2017.jpg	S	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KETT-AF9150-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KETT-AF9150-1-25MAY2017.jpg		May 25, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

KLATT

Mn/DOT Name: KLATT
NGS Name: KLATT
County: PINE, MN (Sheet 2)

NGS ACRN: DL4757 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	14	43 N	20 W	461234.84	925020.36	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	SURVEY DISK	MNDT

Description: (2009) **Stamping:** KLATT 2008

6.5 MILES NORTH OF SANDSTONE, 3.5 MILES NORTH-NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 2.2 MILES NORTH ON INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 197.8, 45.4 FEET NORTHWEST OF A RAMP TO THE REST AREA, 42.3 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.6 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1086.947	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1086.943	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1086.986	.262		996.540	.197	2011	GPS - OPUS	2020	GPSBM
1086.983	.262		996.537	.197	2011	GPS - RTRN	2020	RTRN2020
			996.507	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1086.940	.131		996.592	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1086.940	.131		996.714	.066	1996	GPS - STATIC	2009	HMOOSE
1086.940	.131		996.592	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.449 12B = -90.446 09 = -90.334 03 = -90.216

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 34.84422	92 50 20.36202	515447.499	274937.241	.131	3	GPS - OPUS	2020	GPSBM
46 12 34.84434	92 50 20.36100	515447.570	274937.254	.131	3	GPS - RTRN	2020	RTRN2020
46 12 34.84466	92 50 20.36227	515447.481	274937.286	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 34.84461	92 50 20.36302	515447.428	274937.281	.033	C	ADJUSTMENT	2009	GPS2566
46 12 34.84461	92 50 20.36302	515447.428	274937.281	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 34.84447	92 50 20.36271	515447.450	274937.267	.033	C	GPS - STATIC	2009	HMOOSE

KLATT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981863.910	772376.009	1681165.408	16789196.370	.131	3	GPS - OPUS	2020	GPSBM
2981863.981	772376.022	1681165.480	16789196.382	.131	3	GPS - RTRN	2020	RTRN2020
2981863.891	772376.053	1681165.390	16789196.415	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981863.838	772376.047	1681165.338	16789196.409	.033	C	ADJUSTMENT	2009	GPS2566
2981863.838	772376.047	1681165.338	16789196.409	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981863.860	772376.033	1681165.359	16789196.395	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KLATT-DL4757-3N-07MAY2020.jpg	N	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KLATT-DL4757-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KLATT-DL4757-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: KOGG **NGS Name:** KOGG

County: PINE, MN (Sheet 2)

NGS ACRN: DL4759 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	45 N	19 W	462501.81	924521.64	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** KOGG 2008

4.0 MILES NORTHEAST OF STURGEON LAKE, 3.1 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46 (1.5 MILES NORTHEAST OF STURGEON LAKE), AT INTERSTATE HIGHWAY 35 MILEPOINT 213.2, 0.1 MILE SOUTHWEST OF COUNTY LINE, 44.2 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 44.0 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 3.0 FEET SOUTHEAST OF A WITNESS POST, THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.127	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1107.114	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1015.424	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1107.117	.131		1015.529	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1107.117	.131		1015.674	.066	1996	GPS - STATIC	2009	HMOOSE
1107.117	.131		1015.529	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.676 12B = -91.676 09 = -91.568 03 = -91.388

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 01.80616	92 45 21.63838	536320.232	350637.213	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 01.80637	92 45 21.63912	536320.180	350637.234	.033	C	ADJUSTMENT	2009	GPS2566
46 25 01.80637	92 45 21.63912	536320.180	350637.234	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 25 01.80621	92 45 21.63901	536320.188	350637.218	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3001440.459	848411.034	1701932.852	16864888.770	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3001440.407	848411.054	1701932.800	16864888.792	.033	C	ADJUSTMENT	2009	GPS2566
3001440.407	848411.054	1701932.800	16864888.792	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3001440.415	848411.038	1701932.808	16864888.775	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KOGG-DL4759-3W-24DEC2008.jpg	W	Dec 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KOGG-DL4759-2-24DEC2008.jpg		Dec 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/KOGG-DL4759-1-24DEC2008.jpg		Dec 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: L 154 **NGS Name:** L 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0477 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	44 N	19 W	461532.32	924656.72	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2020	GOOD	Horz=YES Vert=YES	YES		PROJECTS 18 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2003) **Stamping:** L 154 1935

4.2 MILES EAST ON OF RUTLEDGE, 3.0 MILES SOUTH ALONG COUNTY ROAD 152 FROM THE JUNCTION OF COUNTY ROAD 152 AND COUNTY ROAD 43, THEN 1.0 MILE EAST ON COUNTY ROAD 33, AT THE TURN IN A ROAD FROM EAST TO SOUTH, 61.0 FEET SOUTH OF COUNTY ROAD 33 EXIT 8 (SWANSON ROAD), 37.0 FEET EAST COUNTY ROAD 33 (BEAVER TAIL ROAD), 27.0 FEET SOUTH OF A FENCE CORNER, 29.0 FEET SOUTH OF A POWER POLE, 1.1 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1147.291	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1146.845	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1146.845	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1146.845	.007	1				VERTICAL CONTROL SURVEY	1972	L133 MINN
1146.845	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1148.436	.262		1057.718	.197	2011	GPS - OPUS	2020	GPSBM
1148.328	.262		1057.609	.197	2011	GPS - OPUS	2020	GPSBM
1148.321	.262		1057.586	.197	2011	GPS - RTRN	2020	RTRN2020

Geoid Separations(ft): GEOID18 = -90.718 12B = -90.735 09 = -90.617 03 = -90.462

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.34082	92 46 56.71578	529743.686	292934.733	.131	3	GPS - OPUS	2020	GPSBM
46 15 32.34100	92 46 56.71621	529743.656	292934.751	.131	3	GPS - OPUS	2020	GPSBM
46 15 32.34071	92 46 56.71507	529743.736	292934.722	.131	3	GPS - RTRN	2020	RTRN2020

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2995849.473	790612.375	1695432.512	16807203.918	.131	3	GPS - OPUS	2020	GPSBM
2995849.442	790612.393	1695432.482	16807203.936	.131	3	GPS - OPUS	2020	GPSBM
2995849.523	790612.365	1695432.562	16807203.907	.131	3	GPS - RTRN	2020	RTRN2020

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/L_154-RN0477-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/L_154-RN0477-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/L_154-RN0477-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

L 155

Mn/DOT Name: L 155 **NGS Name:** L 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0503 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	45 N	18 W	462137.00	923839.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO	58533		SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** L 155 1935

4.0 MILES NORTHWEST OF KERRICK, 3.7 MILES WEST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND TRUNK HIGHWAY 23, IN THE SOUTHEAST CORNER OF COUNTY ROAD 46 BRIDGE NUMBER 58533 OVER THE WILLOW RIVER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.832	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.409	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1091.409	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.253 12B = -91.266 09 = -91.112 03 = -90.984

*** No Horizontal Positions in the Database ***

Mn/DOT Name: L 38 **NGS Name:** L 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0411 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	24	45 N	21 W	462149.00	925634.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1934) **Stamping:** L 38 1934

AT DENHAM, 93.0 FEET EAST OF A RAILROAD STATION, 36.0 FEET EAST OF THE EAST END OF THE STATION PLATFORM, 21.0 FEET NORTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1203.275	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1202.865	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1202.865	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1202.852	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Geoid Separations(ft): GEOID18 = -91.197 12B = -91.148 09 = -91.023 03 = -90.902

*** No Horizontal Positions in the Database ***

LETZKO

Mn/DOT Name: LETZKO **NGS Name:** LETZKO

County: PINE, MN (Sheet 2)

NGS ACRN: DL4760 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	33	43 N	20 W	460932.75	925242.67	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	SURVEY DISK	MNDT

Description: (2009) **Stamping:** LETZKO 2008

2.0 MILES NORTH-NORTHWEST OF SANDSTONE, 2.5 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 193.9, 74.2 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 58.3 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1123.315	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1123.311	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1123.246	.262		1033.029	.197	2011	GPS - OPUS	2020	GPSBM
1123.318	.262		1033.102	.197	2011	GPS - RTRN	2020	RTRN2020
			1033.072	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1123.325	.131		1033.157	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1123.325	.131		1033.289	.066	1996	GPS - STATIC	2009	HMOOSE
1123.325	.131		1033.157	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.216 12B = -90.216 09 = -90.118 03 = -89.990

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 32.75233	92 52 42.67301	505443.515	256485.289	.131	3	GPS - OPUS	2020	GPSBM
46 09 32.75183	92 52 42.67179	505443.601	256485.238	.131	3	GPS - RTRN	2020	RTRN2020
46 09 32.75239	92 52 42.67134	505443.633	256485.295	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 32.75239	92 52 42.67209	505443.580	256485.295	.033	C	ADJUSTMENT	2009	GPS2566
46 09 32.75239	92 52 42.67209	505443.580	256485.295	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 32.75224	92 52 42.67170	505443.607	256485.279	.033	C	GPS - STATIC	2009	HMOOSE

LETZKO

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2972177.060	753758.422	1671189.108	16770739.999	.131	3	GPS - OPUS	2020	GPSBM
2972177.147	753758.373	1671189.194	16770739.949	.131	3	GPS - RTRN	2020	RTRN2020
2972177.177	753758.430	1671189.226	16770740.005	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2972177.125	753758.429	1671189.173	16770740.005	.033	C	ADJUSTMENT	2009	GPS2566
2972177.125	753758.429	1671189.173	16770740.005	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2972177.152	753758.414	1671189.201	16770739.990	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LETZKO-DL4760-3E-07MAY2020.jpg	E	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LETZKO-DL4760-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LETZKO-DL4760-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

LONE PINE TREE

Mn/DOT Name: LONE PINE TREE
NGS Name: LONE PINE TREE
County: PINE, MN (Sheet 2)

NGS ACRN: CJ3226 Get Map
NGS Quad / Sta Num : 46092332/
USGS Quad: SANDSTONE SOUTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	42 N	20 W	460659.72	925044.55		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

138.0 FEET WEST OF STATION SANDSTONE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.780 12B = -89.796 09 = -89.691 03 = -89.586

LUNDGREN MNDT

Mn/DOT Name: LUNDGREN MNDT **NGS Name:** LUNDGREN

County: PINE, MN (Sheet 2)

NGS ACRN: RN0566 Get Map
NGS Quad / Sta Num : 46092331/1047
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	22	43 N	20 W	461127.19	925044.28	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1993) **Stamping:** LUNDGREN 1964

4.5 MILES NORTH-NORTHEAST OF SANDSTONE, 4.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND INTERSTATE HIGHWAY 35, THEN 1.0 MILE NORTH ON TURTLE ROAD, 100.5 FEET NORTH OF A FARM ENTRANCE, 30.5 FEET WEST OF A TRAIL, 3.3 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.741	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.357	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1163.397	.016	2				VERTICAL CONTROL SURVEY	1974	L23306

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1163.744	.197		1073.659	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.295 12B = -90.298 09 = -90.190 03 = -90.075

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 27.18778	92 50 44.27715	513770.193	268082.085	.066	2	ADJUSTMENT	1999	17648
46 11 27.17976	92 50 44.27564	513770.300	268081.273	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 27.17976	92 50 44.27559	513770.303	268081.273	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 27.36765	92 50 43.56199			.100	2	CLASSICAL SURVEY	1982	17020

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980303.893	765494.082	1679497.489	16782342.142	.066	2	ADJUSTMENT	1999	17648
2980304.014	765493.272	1679497.597	16782341.330	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980304.017	765493.272	1679497.600	16782341.330	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2355697.980	437426.971			.100	2	CLASSICAL SURVEY	1982	17020

LUNDGREN MNDT AZ MK

Mn/DOT Name: LUNDGREN MNDT AZ MK **NGS Name:** LUNDGREN AZ MK

County: PINE, MN (Sheet 2)

NGS ACRN: RN0564 Get Map
NGS Quad / Sta Num : 46092331/1048
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	22	43 N	20 W	461152.53	925046.08	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1993) **Stamping:** LUNDGREN 1966

5.0 MILES NORTH-NORTHEAST OF SANDSTONE, 4.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123, THEN 1.4 MILES NORTH ON INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 196.95, AT INTERSTATE HIGHWAY 35 STATION 1872+52, IN A MEDIAN, 44.7 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 4.0 FEET EAST OF A WITNESS POST.

Station Notes

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1155.546	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1155.546	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1155.496	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1155.109	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1155.109	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1155.145	.016	2				VERTICAL CONTROL SURVEY	1975	L23805

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1155.509	.197		1065.355	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.361 12B = -90.364 09 = -90.256 03 = -90.141

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 52.53446	92 50 46.07715	513641.814	270649.742	.066	2	ADJUSTMENT	1999	17648
46 11 52.52581	92 50 46.07500	513641.966	270648.866	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 52.52579	92 50 46.07494	513641.970	270648.863	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 52.71400	92 50 45.36200			.100	2	CLASSICAL SURVEY	1982	17020
46 11 52.71419	92 50 45.36165			.100	2	CLASSICAL SURVEY	1950	UNK

LUNDGREN MNDT AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980131.784	768058.870	1679365.931	16784908.497	.066	2	ADJUSTMENT	1999	17648
2980131.950	768057.997	1679366.084	16784907.621	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980131.955	768057.995	1679366.088	16784907.619	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2355525.861	439991.711			.100	2	CLASSICAL SURVEY	1982	17020
2355525.880	439991.730			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUNDGREN_AZ_MK-RN0564-3NW-17NOV2008.jpg	NW	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUNDGREN_AZ_MK-RN0564-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUNDGREN_AZ_MK-RN0564-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

LUNDGREN MNDT RM 1

Mn/DOT Name: LUNDGREN MNDT RM 1 **NGS Name:** LUNDGREN RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ3246 Get Map
NGS Quad / Sta Num : 46092331/1047
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	22	43 N	20 W	461127.00	925044.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	MNDT

Description: (1964) **Stamping:** LUNDGREN NO 1 1964

4.5 MILES NORTH-NORTHEAST OF SANDSTONE, 4.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123, THEN 1.0 MILE NORTH ON TURTLE ROAD, 8.9 FEET EAST OF THE CENTERLINE OF A TRAIL.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.295 12B = -90.302 09 = -90.190 03 = -90.079

LUNDGREN MNDT RM 2

Mn/DOT Name: LUNDGREN MNDT RM 2 **NGS Name:** LUNDGREN RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ3247 Get Map
NGS Quad / Sta Num : 46092331/1047
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	22	43 N	20 W	461125.00	925042.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2008	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	MNDT

Description: (1964) **Stamping:** LUNDGREN NO 2 1964

4.5 MILES NORTH-NORTHEAST OF SANDSTONE, 4.0 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123, THEN 1.0 MILE NORTH ON TURTLE ROAD, 39.9 FEET NORTH OF THE CENTERLINE OF A FARM ENTRANCE, 8.5 FEET EAST OF THE CENTERLINE OF A TRAIL.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.289 12B = -90.292 09 = -90.180 03 = -90.069

LUOMA MNDT

Mn/DOT Name: LUOMA MNDT **NGS Name:** LUOMA

County: PINE, MN (Sheet 2)

NGS ACRN: AF9151 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	21	43 N	20 W	461205.36	925303.97	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2008	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER W/BAR MAGNET

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)
Disk Type: HORIZONTAL CONTROL DISK
Mon. Agency: MNDT

Description: (2002) **Stamping:** LUOMA 1991

1.7 MILES EAST OF FINLAYSON, 1.5 MILES WEST ALONG COUNTY ROAD 61, 53.3 FEET SOUTH OF TRUNK HIGHWAY 18, AT TRUNK HIGHWAY 18 MILEPOINT 78.05, 97.3 FEET SOUTH-SOUTHEAST OF A POWER POLE, 24.5 FEET NORTHWEST OF CABLE MARKER NUMBER B 8, 8.5 FEET EAST OF A DRIVEWAY, 3.8 FEET WEST OF A WITNESS POST.

Station Notes
THE DISK WAS GONE, AND THE MARK WAS RESET.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.775	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1110.772	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.391	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1020.231	.014	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1020.333	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1110.759	.131		1020.451	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1110.759	.131		1020.451	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.551 12B = -90.528 09 = -90.436 03 = -90.305

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.36399	92 53 03.96982	503941.279	271945.204	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.36400	92 53 03.97049	503941.232	271945.205	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.36376	92 53 03.97014	503941.257	271945.181	.033	C	ADJUSTMENT	1999	17648
46 12 05.36376	92 53 03.97014	503941.257	271945.181	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.35649	92 53 03.96576	503941.565	271944.444	.066	2	GPS - STATIC	1991	HFIN

LUOMA MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970411.743	769188.658	1669668.073	16786191.161	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970411.695	769188.659	1669668.025	16786191.162	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970411.721	769188.635	1669668.050	16786191.138	.033	C	ADJUSTMENT	1999	17648
2970411.721	769188.635	1669668.050	16786191.138	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970412.041	769187.904	1669668.359	16786190.402	.066	2	GPS - STATIC	1991	HFIN

LUOMA MNDT RESET

Mn/DOT Name: LUOMA MNDT RESET
NGS Name: LUOMA RESET 2008
County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	21	43 N	20 W	461205.36	925303.97		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2017	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)	SURVEY DISK	MNDT

Description: (2008) **Stamping:** LUOMA RESET 1991 2008

1.7 MILES EAST OF FINLAYSON, 1.5 MILES WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 61 IN FINLAYSON, AT TRUNK HIGHWAY 18 MILEPOINT 78.05, 97.3 FEET SOUTH-SOUTHEAST OF A POWER POLE, 53.3 FEET SOUTH OF TRUNK HIGHWAY 18, 24.5 FEET NORTHWEST OF CABLE MARKER NUMBER B 8, 8.5 FEET EAST OF DRIVEWAY FIRE NUMBER 35256, 3.8 FEET WEST OF A WITNESS POST.

Station Notes
THE DISK WAS TURNED IN TO THE OFFICE.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.631	.262		1020.326	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.551 12B = -90.528 09 = -90.436 03 = -90.305

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.36390	92 53 03.96971	503941.287	271945.195	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970411.750	769188.650	1669668.080	16786191.152	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUOMA_RESET_2008-3S-23JAN2008.jpg	S	Jan 23, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUOMA_RESET_2008-2-23JAN2008.jpg		Jan 23, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUOMA_RESET_2008-1-23JAN2008.jpg		Jan 23, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

LUOMA MNDT RESET 2

Mn/DOT Name: LUOMA MNDT RESET 2 **NGS Name:** LUOMA RESET

County: PINE, MN (Sheet 2)

NGS ACRN: DR2725 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	21	43 N	20 W	461205.36	925303.97	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) **Stamping:** LUOMA 2008 2017

1.7 MILES EAST OF FINLAYSON, 1.15 MILES EAST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 34 IN FINLAYSON, AT TRUNK HIGHWAY 18 MILEPOINT 78.05, 53.3 FEET SOUTH OF TRUNK HIGHWAY 18, 97.3 FEET SOUTH-SOUTHEAST OF A POWER POLE, 8.5 FEET EAST OF DRIVEWAY FIRE NUMBER 35256, 5.4 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.608	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1110.608	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.618	.262		1020.087	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -90.551 12B = -90.528 09 = -90.436 03 = -90.305

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 05.36421	92 53 03.96866	503941.361	271945.226	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970411.824	769188.682	1669668.154	16786191.183	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUOMA_RESET-DR2725-3S-30MAY2017.jpg	S	May 30, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUOMA_RESET-DR2725-2-30MAY2017.jpg		May 30, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUOMA_RESET-DR2725-1-30MAY2017.jpg		May 30, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

LUTH MNDT

Mn/DOT Name: LUTH MNDT **NGS Name:** LUTH

County: PINE, MN (Sheet 2)

NGS ACRN: AF9152 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	19	43 N	20 W	461203.48	925542.69	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2020	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2003) **Stamping:** LUTH 1991

0.55 MILE WEST OF FINLAYSON, 0.5 MILE SOUTH OF TRUNK HIGHWAY 18, AT TRUNK HIGHWAY 18 MILEPOINT 75.95, 122.5 FEET SOUTH OF A DRIVEWAY, 73.7 FEET SOUTH-SOUTHWEST OF A FENCE CORNER, 19.1 FEET EAST OF COUNTY ROAD 35, 19.8 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.761	.016	2/1				VERTICAL ADJUSTMENT	2011	00000681
1128.761	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMATT
1128.761	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1128.758	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.377	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1128.892	.262		1038.216	.197	2011	GPS - OPUS	2020	GPSBM
1128.790	.262		1038.151	.197	2011	GPS - RTRN	2020	RTRN2020
			1038.092	.015	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1038.203	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1128.771	.131		1038.305	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1128.771	.131		1038.305	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.676 12B = -90.640 09 = -90.554 03 = -90.410

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 03.47839	92 55 42.69454	492776.185	271755.093	.131	3	GPS - OPUS	2020	GPSBM
46 12 03.47860	92 55 42.69572	492776.102	271755.114	.131	3	GPS - RTRN	2020	RTRN2020
46 12 03.47905	92 55 42.69649	492776.048	271755.160	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 03.47907	92 55 42.69717	492776.000	271755.162	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 03.47896	92 55 42.69676	492776.029	271755.151	.033	C	ADJUSTMENT	1999	17648
46 12 03.47896	92 55 42.69676	492776.029	271755.151	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 03.47171	92 55 42.69052	492776.468	271754.416	.066	2	GPS - STATIC	1991	HFIN

LUTH MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959252.851	768808.331	1658508.186	16785987.078	.131	3	GPS - OPUS	2020	GPSBM
2959252.768	768808.351	1658508.103	16785987.099	.131	3	GPS - RTRN	2020	RTRN2020
2959252.713	768808.396	1658508.049	16785987.144	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959252.665	768808.397	1658508.001	16785987.146	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959252.694	768808.386	1658508.030	16785987.135	.033	C	ADJUSTMENT	1999	17648
2959252.694	768808.386	1658508.030	16785987.135	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959253.145	768807.660	1658508.469	16785986.401	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUTH-AF9152-3E-06MAY2020.jpg	E	May 6, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUTH-AF9152-2-06MAY2020.jpg		May 6, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/LUTH-AF9152-1-06MAY2020.jpg		May 6, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

M 154

Mn/DOT Name: M 154 **NGS Name:** M 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0478 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	6	43 N	19 W	461440.00	924657.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1972	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
STRUCTURE (MASSIVE)	BENCH MARK DISK	NGS

Description: (1972) **Stamping:** M 154 1935

4.2 MILES EAST OF RUTLEDGE, 4.0 MILES EAST ALONG COUNTY ROAD 33, THEN 1.0 MILE SOUTH ON BEAVER TAIL ROAD, AT THE FOUR CORNERS (COUNTY ROAD 45 LEADING EAST), 12.0 FEET SOUTH OF AN EAST-WEST ROAD, 16.5 FEET WEST OF A NORTH-SOUTH ROAD, ON THE SOUTHEAST HEADWALL OF A BRIDGE OVER A SMALL CREEK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.042	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1112.603	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.567 12B = -90.587 09 = -90.466 03 = -90.321

*** No Horizontal Positions in the Database ***

Mn/DOT Name: M 155 **NGS Name:** M 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0504 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	28	45 N	18 W	462046.00	923757.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** M 155 1935

2.5 MILES NORTHWEST ON COUNTY ROAD 46 FROM KERRICK, 102.0 FEET SOUTH OF THE SOUTHWEST CORNER OF A HOUSE, 27.0 FEET NORTH OF COUNTY ROAD 46, 4.5 FEET NORTH OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1141.244	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1140.818	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.063 12B = -91.076 09 = -90.918 03 = -90.800

*** No Horizontal Positions in the Database ***

M 38

Mn/DOT Name: M 38 **NGS Name:** M 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0412 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	45 N	20 W	462205.00	925442.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1934) **Stamping:** M 38 1934

1.7 MILES EAST OF DENHAM, 1.5 MILES EAST ALONG ROCK CUTS ROAD FROM THE JUNCTION OF ROCK CUTS ROAD AND EDGEWOOD ROAD (MAIN STREET), 180.0 FEET WEST OF RAILROAD MILEPOST 231, 36.0 FEET WEST OF A CULVERT, AT THE ROAD CROSSING, 66.0 FEET WEST OF A ROAD, 24.0 FEET NORTH OF A RAILROAD.

Station Notes

THE RAILROAD IS NOW AN ALL-TERRAIN VEHICLE (ATV)/SNOWMOBILE TRAIL IMPROVED TRAIL AND ROAD CROSSING POWER LINE, RIGHT-OF-WAY WAS IMPROVED.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1190.641	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1190.234	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1190.234	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1190.221	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Geoid Separations(ft): GEOID18 = -91.266 12B = -91.227 09 = -91.109 03 = -90.968

*** No Horizontal Positions in the Database ***

MARALYN

Mn/DOT Name: MARALYN **NGS Name:** MARALYN

County: PINE, MN (Sheet 2)

NGS ACRN: DL4761 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	13	42 N	20 W	460743.18	924831.37	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2014	DISTURBED	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** MARALYN 2008

3.0 MILES EAST OF SANDSTONE, 2.9 MILES EAST AND NORTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT TRUNK HIGHWAY 123 MILEPOINT 3.8, 0.25 MILE WEST OF THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 30, 145.0 FEET WEST OF AN ENTRANCE AT FIRE NUMBER 32586, 18.8 FEET SOUTH OF TRUNK HIGHWAY 123, 6.8 FEET NORTH OF A WITNESS POST.

Station Notes

THE PINE COUNTY PUBLIC WORKS REPORTED THAT MARK WAS DISTURBED. THE ALUMINUM ROD WAS BENT TO THE NORTHEAST, AND IT APPEARS THAT SOMETHING HIT IT, THE MARK WAS ALSO MISSING A REMOVABLE DISK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1081.550	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1081.560	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			991.950	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1081.560	.131		991.999	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1081.560	.131		992.144	.066	1996	GPS - STATIC	2009	HASKO
1081.560	.131		991.999	.066	2007	GPS - STATIC	2009	HASKO
1081.560	.131		991.999	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1081.560	.131		992.144	.066	1996	GPS - STATIC	2009	HMOOSE
1081.560	.131		991.999	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -89.577 12B = -89.593 09 = -89.488 03 = -89.409

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.18214	92 48 31.37089	523146.926	245397.951	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.18209	92 48 31.37186	523146.858	245397.946	.033	C	ADJUSTMENT	2010	GPS2619
46 07 43.18209	92 48 31.37186	523146.858	245397.946	.033	C	GPS - STATIC	2009	HASKO
46 07 43.18209	92 48 31.37186	523146.858	245397.946	.033	C	ADJUSTMENT	2009	GPS2566
46 07 43.18209	92 48 31.37186	523146.858	245397.946	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 43.18202	92 48 31.37154	523146.880	245397.939	.033	C	GPS - STATIC	2009	HASKO
46 07 43.18202	92 48 31.37154	523146.880	245397.939	.033	C	GPS - STATIC	2009	HMOOSE

MARALYN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990064.833	742975.727	1688898.648	16759679.848	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990064.765	742975.720	1688898.580	16759679.842	.033	C	ADJUSTMENT	2010	GPS2619
2990064.765	742975.720	1688898.580	16759679.842	.033	C	GPS - STATIC	2009	HASKO
2990064.765	742975.720	1688898.580	16759679.842	.033	C	ADJUSTMENT	2009	GPS2566
2990064.765	742975.720	1688898.580	16759679.842	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2990064.787	742975.714	1688898.603	16759679.835	.033	C	GPS - STATIC	2009	HASKO
2990064.787	742975.714	1688898.603	16759679.835	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MARALYN-DL4761-3S-08JUN2009.jpg	S	Jun 8, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MARALYN-DL4761-2-08JUN2009.jpg		Jun 8, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MARALYN-DL4761-1-08JUN2009.jpg		Jun 8, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

MATT MNDT

Mn/DOT Name: MATT MNDT **NGS Name:** MATT

County: PINE, MN (Sheet 2)

NGS ACRN: AC4967 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	23	43 N	21 W	461206.69	925812.91	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2008	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** MATT 1991

2.5 MILES WEST OF FINLAYSON, 2.0 MILES WEST ALONG COUNTY ROAD 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35, AT TRUNK HIGHWAY 18 MILEPOINT 73.95, 107.7 FEET SOUTH OF TRUNK HIGHWAY 18, 86.7 FEET SOUTHEAST OF A POWER POLE, 79.7 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A JUNCTION BOX, 58.0 FEET SOUTH OF A FENCE CORNER, 31.0 FEET EAST OF MATTSON LINE ROAD, 3.0 FEET SOUTH OF A WITNESS POST, 1.0 FOOT WEST OF AN ELECTRIC BARBED WIRE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.675	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1132.672	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.291	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1041.937	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1132.554	.262		1042.091	.197	1996	GPS - RTRN	2008	RTRN2008
			1042.052	.007	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1132.675	.098		1042.150	.049	1996	GPS - STATIC	2005	GPS2036
1132.675	.098		1042.150	.049	1996	GPS - STATIC	2004	GPS1954
1132.675	.098		1042.150	.049	1996	HORIZONTAL ADJUSTMENT	2003	GPS1924
1132.675	.131		1042.150	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1892
1132.675	.131		1042.150	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1132.675	.131		1042.150	.066	1996	GPS - STATIC	2003	HKANA
1132.708	.131		1042.150	.066	1996	GPS - STATIC	2002	HAITK
1132.675	.131		1042.150	.066	1996	GPS - STATIC	2002	HPINE
1132.675	.098		1042.150	.049	1996	HORIZONTAL ADJUSTMENT	1999	17648
1132.675	.131		1042.150	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899
1132.672	.098		1042.150	.049	1996	GPS - STATIC	1997	GPS805-B
1132.672	.131		1042.150	.066	1996	GPS - STATIC	1997	GPS805-C

Geoid Separations(ft): GEOID18 = -90.745 12B = -90.702 09 = -90.607 03 = -90.462

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68884	92 58 12.90906	482209.974	272086.888	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68887	92 58 12.90973	482209.927	272086.891	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68885	92 58 12.90964	482209.933	272086.889	.131	3	GPS - RTRN	2008	RTRN2008
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.016	B	GPS - STATIC	2005	GPS2036
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.016	B	GPS - STATIC	2004	GPS1954
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.016	B	ADJUSTMENT	2003	GPS1924
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	ADJUSTMENT	2003	GPS1892
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	ADJUSTMENT	2003	GPS1839
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	GPS - STATIC	2003	HKANA
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	GPS - STATIC	2002	HAITK
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	GPS - STATIC	2002	HPINE
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.016	B	ADJUSTMENT	1999	17648
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	ADJUSTMENT	1998	GPS899
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.016	B	GPS - STATIC	1997	GPS805-B
46 12 06.68880	92 58 12.90941	482209.949	272086.884	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68161	92 58 12.90233	482210.446	272086.155	.066	2	GPS - STATIC	1991	HFIN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948683.790	768960.002	1647946.264	16786305.434	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948683.742	768960.004	1647946.217	16786305.437	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948683.749	768960.002	1647946.223	16786305.435	.131	3	GPS - RTRN	2008	RTRN2008
2948683.765	768959.998	1647946.239	16786305.430	.016	B	GPS - STATIC	2005	GPS2036
2948683.765	768959.998	1647946.239	16786305.430	.016	B	GPS - STATIC	2004	GPS1954
2948683.765	768959.998	1647946.239	16786305.430	.016	B	ADJUSTMENT	2003	GPS1924
2948683.765	768959.998	1647946.239	16786305.430	.033	C	ADJUSTMENT	2003	GPS1892
2948683.765	768959.998	1647946.239	16786305.430	.033	C	ADJUSTMENT	2003	GPS1839
2948683.765	768959.998	1647946.239	16786305.430	.033	C	GPS - STATIC	2003	HKANA
2948683.765	768959.998	1647946.239	16786305.430	.033	C	GPS - STATIC	2002	HAITK
2948683.765	768959.998	1647946.239	16786305.430	.033	C	GPS - STATIC	2002	HPINE
2948683.765	768959.998	1647946.239	16786305.430	.016	B	ADJUSTMENT	1999	17648
2948683.765	768959.998	1647946.239	16786305.430	.033	C	ADJUSTMENT	1998	GPS899
2948683.765	768959.998	1647946.239	16786305.430	.016	B	GPS - STATIC	1997	GPS805-B
2948683.765	768959.998	1647946.239	16786305.430	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948684.275	768959.278	1647946.738	16786304.702	.066	2	GPS - STATIC	1991	HFIN

MATT MNDT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MATT-AC4967-3E-24JAN2008.jpg	E	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MATT-AC4967-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MATT-AC4967-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

MATT MNDT RESET

Mn/DOT Name: MATT MNDT RESET
NGS Name: MATT RESET
County: PINE, MN (Sheet 2)

NGS ACRN: DM2727 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	23	43 N	21 W	461206.69	925812.91	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2016	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** MATT RESET 1991 2009

2.5 MILES WEST OF FINLAYSON, 2.6 MILES WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND FRONT STREET IN FINLAYSON, AT TRUNK HIGHWAY 18 MILEPOINT 73.95, 107.7 FEET SOUTH OF TRUNK HIGHWAY 18, 86.7 FEET SOUTHEAST OF A POWER POLE, 79.7 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A JUNCTION BOX, 58.0 FEET SOUTH OF A FENCE CORNER, 31.0 FEET EAST OF MATSON LINE ROAD, 3.0 FEET SOUTH OF A WITNESS POST, 1.0 FOOT WEST OF AN ELECTRIC FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.521	.016	2/1				VERTICAL ADJUSTMENT	2011	00000681
1132.521	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMATT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.504	.262		1041.760	.197	2011	GPS - RTRN	2022	RTRN2022P
1132.557	.262		1041.816	.197	2011	GPS - RTRN	2022	RTRN2022T
1132.521			1041.848	.014	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1132.521	.131		1042.042	.066	1996	GPS - STATIC	2017	HMNCORS07
1132.521			1041.848	.014	2011	GPS - STATIC	2017	HMNPH
1132.334	.262		1041.632	.197	2011	GPS - RTRN	2015	RTRN2015
			1041.848	.018	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1132.544	.098		1041.904	.049	2007	HORIZONTAL ADJUSTMENT	2010	GPS2697
1132.544	.098		1041.904	.049	2007	GPS - STATIC	2010	HBMN2

Geoid Separations(ft): GEOID18 = -90.745 12B = -90.702 09 = -90.607 03 = -90.462

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68943	92 58 12.90897	482209.980	272086.948	.131	3	GPS - RTRN	2022	RTRN2022P
46 12 06.68930	92 58 12.90850	482210.013	272086.934	.131	3	GPS - RTRN	2022	RTRN2022T
46 12 06.68902	92 58 12.90894	482209.982	272086.906	.010		ADJUSTMENT	2018	GPS3119
46 12 06.68902	92 58 12.90894	482209.982	272086.906	.010	C	GPS - STATIC	2017	HMNPH
46 12 06.68851	92 58 12.90934	482209.954	272086.854	.131	3	GPS - RTRN	2015	RTRN2015
46 12 06.68902	92 58 12.90894	482209.982	272086.906	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68893	92 58 12.90966	482209.932	272086.897	.016	B	ADJUSTMENT	2010	GPS2697
46 12 06.68893	92 58 12.90966	482209.932	272086.897	.016	B	GPS - STATIC	2010	HBMN2

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.68878	92 58 12.90946	482209.945	272086.882	.033	C	GPS - STATIC	2017	HMNCORS07

MATT MNDT RESET

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948683.795	768960.062	1647946.270	16786305.494	.131	3	GPS - RTRN	2022	RTRN2022P
2948683.828	768960.049	1647946.303	16786305.480	.131	3	GPS - RTRN	2022	RTRN2022T
2948683.798	768960.020	1647946.272	16786305.452	.010		ADJUSTMENT	2018	GPS3119
2948683.798	768960.020	1647946.272	16786305.452	.010	C	GPS - STATIC	2017	HMNPH
2948683.770	768959.968	1647946.244	16786305.400	.131	3	GPS - RTRN	2015	RTRN2015
2948683.798	768960.020	1647946.272	16786305.452	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948683.747	768960.011	1647946.222	16786305.443	.016	B	ADJUSTMENT	2010	GPS2697
2948683.747	768960.011	1647946.222	16786305.443	.016	B	GPS - STATIC	2010	HBMN2

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2948683.761	768959.996	1647946.236	16786305.428	.033	C	GPS - STATIC	2017	HMNCORS07

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MATT_RESET-DM2727-3SE-10SEP2009.jpg	SE	Sep 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MATT_RESET-DM2727-2-10SEP2009.jpg		Sep 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/MATT_RESET-DM2727-1-10SEP2009.jpg		Sep 10, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: MECL **NGS Name:** MECL

County: PINE, MN (Sheet 2)

NGS ACRN: DL4763 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	24	44 N	20 W	461707.80	924915.28	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)

Disk Type
METAL ROD (WITH REMOVABLE ID DISK)

Mon. Agency
MNDT

Description: (2008) **Stamping:** MECL 2008

2.0 MILES SOUTH OF WILLOW RIVER, 2.25 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 203.2, 67.6 FEET EAST-SOUTHEAST OF A FENCE LINE, 32.0 FEET WEST-NORTHWEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 4.9 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.524	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1057.524	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			966.491	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1057.511	.131		966.602	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1057.511	.131		966.717	.066	1996	GPS - STATIC	2009	HMOOSE
1057.511	.131		966.602	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.043 12B = -91.030 09 = -90.922 03 = -90.774

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 07.80328	92 49 15.27569	519997.633	302593.677	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 07.80324	92 49 15.27654	519997.573	302593.673	.033	C	ADJUSTMENT	2009	GPS2566
46 17 07.80324	92 49 15.27654	519997.573	302593.673	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 07.80281	92 49 15.27642	519997.581	302593.629	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985941.406	800102.562	1685678.592	16816846.225	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985941.347	800102.557	1685678.532	16816846.221	.033	C	ADJUSTMENT	2009	GPS2566
2985941.347	800102.557	1685678.532	16816846.221	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985941.356	800102.513	1685678.541	16816846.178	.033	C	GPS - STATIC	2009	HMOOSE

MZH C

Mn/DOT Name: MZH C
NGS Name: MZH C
County: PINE, MN (Sheet 2)

NGS ACRN: DP2672 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	45 N	20 W	462456.89	924824.44		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 5 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
STEEL ROD (NO SLEEVE) (DEPTH 52 FT)	FLANGE-ENCASED ROD	LOCENG

Description: (2014) **Stamping:** MZH C 2009

STATION MZH C IS LOCATED ABOUT 6.9 MILES NORTH-NORTHEAST OF WILLOW RIVER, 6.2 MILES SOUTHEAST OF KETTLE RIVER AND 3.4 MILES SOUTHWEST OF MOOSE LAKE. OWNERSHIP CARLTON COUNTY, CARLTON COUNTY COURTHOUSE, 301 WALNUT AVENUE, CARLTON MINNESOTA 55718. PHONE 218-879-4911. CONTACT THE AIRPORT MANAGER CELL AT 218-591-6157 TO OBTAIN PERMISSION TO ACCESS STATION MZH C. TO REACH FROM THE INTERSECTION OF TRUNK HIGHWAY 73 AND COUNTY HIGHWAY 61 IN MOOSE LAKE, GO SOUTHWEST ALONG COUNTY ROAD 61 FOR A DISTANCE OF 2.4 MILES TO THE ENTRANCE OF MOOSE LAKE AIRPORT, TURN RIGHT AND GO NORTHWESTERLY ON AIRPORT ENTRANCE ROAD FOR A DISTANCE OF 0.2 MILE TO THE AIRPORT OFFICE. STATION MZH C IS LOCATED 2100.0 FEET SOUTHWEST IN THE GRASS, STATION MZH C IS A STAINLESS STEEL ROD, A GREASE SLEEVE 2.0 FEET LONG WAS INSTALLED, THE LOGO CAP IS FLUSH WITH THE GROUND AND THE TOP OF THE ROD IS RECESSED 5.0 INCHES, THE ROD IS DRIVEN 52.0 FEET INTO THE GROUND. IT IS 0.51 MILE SOUTHWEST OF RUNWAY 22 END, 575.0 FEET NORTHEAST OF RUNWAY 4 END, 295.0 FEET SOUTHEAST OF A RUNWAY CENTERLINE AND 2.0 FEET SOUTH OF A FIBERGLASS WITNESS POST. STATION MZH C IS DESIGNATED AS A SECONDARY AIRPORT CONTROL STATION.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.394			987.797	.049	2011	HORIZONTAL ADJUSTMENT	2013	GPS3014-B

Geoid Separations(ft): GEOID18 = -91.634 12B = -91.624 09 = -91.519 03 = -91.335

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 56.89259	92 48 24.44107	523512.320	350120.322	.013		ADJUSTMENT	2013	GPS3014-B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2988644.977	847675.942	1689131.457	16864355.821	.013		ADJUSTMENT	2013	GPS3014-B

Mn/DOT Name: N 154 **NGS Name:** N 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0479 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	3	43 N	19 W	461440.89	924426.54	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2003) **Stamping:** N 154 1935

6.2 MILES SOUTHEAST OF RUTLEDGE, 9.5 MILES EAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 18, THEN 1.3 MILES WEST ON COUNTY ROAD 149 (JACKSON ROAD) 48.0 FEET EAST OF AN EXTENDED CENTERLINE OF ONE MILE ROAD (JACKSON ROAD), 30.0 FEET SOUTH OF COUNTY ROAD 149, 21.3 FEET EAST OF A POWER POLE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1159.775	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1159.775	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN
1159.775	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1159.338	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1159.338	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT
1159.338	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1159.716	.262		1069.578	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.374 12B = -90.407 09 = -90.275 03 = -90.138

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 40.88742	92 44 26.53846	540306.896	287740.560	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3006498.392	785599.695	1705997.607	16802025.417	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/N_154-RN0479-3S-23JAN2008.jpg	S	Jan 23, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/N_154-RN0479-2-23JAN2008.jpg		Jan 23, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/N_154-RN0479-1-23JAN2008.jpg		Jan 23, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: N 155 **NGS Name:** N 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0505 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	27	45 N	18 W	462045.00	923543.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** N 155 1935

0.7 MILE NORTHWEST OF KERRICK, 0.5 MILE NORTHWEST ALONG COUNTY ROAD 46 (DEERFIELD ROAD) FROM THE JUNCTION OF COUNTY ROAD 46 AND TRUNK HIGHWAY 23, 270.0 FEET WEST OF COUNTY ROAD 56 NORTH, 30.0 FEET NORTH OF COUNTY ROAD 46, AT A FENCE NEAR A RUNWAY TO A BARN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1171.359	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1170.939	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1170.939	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.866 12B = -90.879 09 = -90.718 03 = -90.623

*** No Horizontal Positions in the Database ***

Mn/DOT Name: N 38 **NGS Name:** N 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0413 Get Map
NGS Quad / Sta Num : 46092344/
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	45 N	20 W	462343.12	925430.86	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2000) **Stamping:** N 38 1934

4.2 MILES EAST OF STURGEON LAKE, 4.4 MILES WEST ALONG COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 61 (MAIN STREET), THEN 0.3 MILE NORTH ON COUNTY ROAD 166 (WALCZAK ROAD), 36.0 FEET SOUTH OF AN OLD RAILROAD CROSSING, 28.5 FEET EAST OF WALCZAK ROAD, 0.7 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1165.578	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1165.172	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1165.172	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1165.162	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1165.759	.262		1074.365	.197	2011	GPS - OPUS	2019	GPSBM
			1074.496	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1074.575	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1165.582	.131		1074.709	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1165.582	.131		1074.709	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -91.391 12B = -91.352 09 = -91.237 03 = -91.092

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 43.12104	92 54 30.85567	497837.164	342632.858	.131	3	GPS - OPUS	2019	GPSBM
46 23 43.12115	92 54 30.85549	497837.177	342632.869	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 43.12119	92 54 30.85624	497837.124	342632.873	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 43.12096	92 54 30.85609	497837.135	342632.850	.033	C	ADJUSTMENT	2003	GPS1839
46 23 43.12096	92 54 30.85609	497837.134	342632.848	.033	C	GPS - STATIC	2002	HPINE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2963104.663	839752.989	1663477.550	16856839.272	.131	3	GPS - OPUS	2019	GPSBM
2963104.675	839753.001	1663477.562	16856839.284	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2963104.622	839753.004	1663477.510	16856839.288	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2963104.633	839752.981	1663477.520	16856839.264	.033	C	ADJUSTMENT	2003	GPS1839
2963104.633	839752.981	1663477.520	16856839.264	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/N_38-RN0413-3E-12DEC2019.jpg	E	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/N_38-RN0413-2-12DEC2019.jpg		Dec 12, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/N_38-RN0413-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

NE CORNER OF A FRAME BLDG

Mn/DOT Name: NE CORNER OF A FRAME BLDG
NGS Name: NE CORNER OF A FRAME BLDG
County: PINE, MN (Sheet 2)

NGS ACRN: CJ3389 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	42 N	21 W	460511.31	925546.66		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

IN FRIESLAND, AT THE NORTH JUNCTION OF COUNTY ROAD 61 AND FRIESLAND ROAD, 152.0 FEET SOUTH OF STATION TOOTSIE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.246 09 = -90.141 03 = -90.003

NE CORNER OF A FRAME HOUSE

Mn/DOT Name: NE CORNER OF A FRAME HOUSE
NGS Name: NE CORNER OF A FRAME HOUSE
County: PINE, MN (Sheet 2)

NGS ACRN: CJ3390 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	43 N	21 W	461034.87	925929.57		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

4.0 MILES SOUTHEAST OF FINLAYSON, 1.8 MILES SOUTH ALONG COUNTY ROAD 36/NORWAY SPRUCE ROAD FROM THE JUNCTION OF COUNTY ROAD 36/NORWAY SPRUCE ROAD AND TRUNK HIGHWAY 18/COUNTY ROAD 18 IN FINLAYSON, 104.0 FEET WEST OF STATION PINE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.712 12B = -90.676 09 = -90.574 03 = -90.426

Mn/DOT Name: NEMA MNDT **NGS Name:** NEMA

County: PINE, MN (Sheet 2)

NGS ACRN: AC4970 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	1	43 N	16 W	461419.15	921848.71	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1995	2016	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
STEEL ROD (IN SLEEVE) (DEPTH 20 FT)	METAL ROD	MNDT

Description: (2008) **Stamping:** NEMA 1995

IN KINGSDALE, AT THE JUNCTION OF KINGSDALE ROAD AND GANDY DANCER TRAIL, 31.0 FEET NORTH OF A GRAVEL ROAD (OMANS DRIVE), 25.0 FEET EAST OF A SNOWMOBILE TRAIL, 144.3 FEET EAST-SOUTHEAST OF A POWER POLE, 3.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1181.136	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1181.221	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1181.136			1094.096	.009	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1181.261	.131		1094.309	.066	1996	GPS - STATIC	2017	HMNCORS07
1181.136			1094.096	.009	2011	GPS - STATIC	2017	HMNPH
			1094.089	.008	2011	HORIZONTAL ADJUSTMENT	2014	GPS2870-B
			1094.096	.009	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1094.210	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1181.297	.098		1094.309	.049	1996	GPS - STATIC	2005	GPS2036
1181.264	.098		1094.309	.049	1996	GPS - STATIC	2004	GPS1954
1181.264	.131		1094.309	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1181.264	.131		1094.309	.066	1996	GPS - STATIC	2002	HPINE
1181.198	.098		1094.309	.049	1996	HORIZONTAL ADJUSTMENT	1999	17648
1181.175	.098		1094.309	.049	1996	GPS - STATIC	1997	GPS805-B

Geoid Separations(ft): GEOID18 = -86.975 12B = -87.001 09 = -86.880 03 = -86.922

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 19.14525	92 18 48.71464	648410.926	286044.663	.007		ADJUSTMENT	2018	GPS3119
46 14 19.14525	92 18 48.71464	648410.926	286044.663	.007	C	GPS - STATIC	2017	HMNPH
46 14 19.14524	92 18 48.71457	648410.931	286044.662	.007		ADJUSTMENT	2014	GPS2870-B
46 14 19.14525	92 18 48.71464	648410.926	286044.663	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 19.14532	92 18 48.71537	648410.874	286044.670	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.033	C	GPS - STATIC	2017	HMNCORS07
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.016	B	GPS - STATIC	2005	GPS2036
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.016	B	GPS - STATIC	2004	GPS1954
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.033	C	ADJUSTMENT	2003	GPS1839
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.033	C	GPS - STATIC	2002	HPINE
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.016	B	ADJUSTMENT	1999	17648
46 14 19.14524	92 18 48.71507	648410.895	286044.662	.016	B	GPS - STATIC	1997	GPS805-B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3114602.288	785748.715	1814057.312	16800467.885	.007		ADJUSTMENT	2018	GPS3119
3114602.288	785748.715	1814057.312	16800467.885	.007	C	GPS - STATIC	2017	HMNPH
3114602.293	785748.714	1814057.316	16800467.884	.007		ADJUSTMENT	2014	GPS2870-B
3114602.288	785748.715	1814057.312	16800467.885	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3114602.237	785748.721	1814057.260	16800467.892	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3114602.258	785748.713	1814057.281	16800467.884	.033	C	GPS - STATIC	2017	HMNCORS07
3114602.258	785748.713	1814057.281	16800467.884	.016	B	GPS - STATIC	2005	GPS2036
3114602.258	785748.713	1814057.281	16800467.884	.016	B	GPS - STATIC	2004	GPS1954
3114602.258	785748.713	1814057.281	16800467.884	.033	C	ADJUSTMENT	2003	GPS1839
3114602.258	785748.713	1814057.281	16800467.884	.033	C	GPS - STATIC	2002	HPINE
3114602.258	785748.713	1814057.281	16800467.884	.016	B	ADJUSTMENT	1999	17648
3114602.258	785748.713	1814057.281	16800467.884	.016	B	GPS - STATIC	1997	GPS805-B

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NEMA-AC4970-3N-01JUN2009.jpg	N	Jun 1, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NEMA-AC4970-2-01JUN2009.jpg		Jun 1, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NEMA-AC4970-1-01JUN2009.jpg		Jun 1, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

NICKERSON LOOKOUT TOWER

Mn/DOT Name: NICKERSON LOOKOUT TOWER **NGS Name:** NICKERSON LOOKOUT TOWER

County: PINE, MN (Sheet 2)

NGS ACRN: RN1609 Get Map
NGS Quad / Sta Num : 46092311/1032
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	45 N	17 W	462342.91	923113.45		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	LOOKOUT TOWER	NGS

Description: (1952)

Stamping:

1.5 MILES SOUTHWEST OF NICKERSON, 1.6 MILES SOUTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND MAIN STREET, THEN 0.1 MILE WEST ON A FIRE TOWER ROAD.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.096 12B = -91.102 09 = -90.932 03 = -90.856

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 42.90965	92 31 13.45359	595788.135	342839.867	.328	4	ADJUSTMENT	1999	17648
46 23 42.90727	92 31 13.44994	595788.392	342839.627	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 42.90766	92 31 13.45221	595788.232	342839.666	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 43.09000	92 31 12.75000			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3061024.593	841630.146	1761383.983	16857171.152	.328	4	ADJUSTMENT	1999	17648
3061024.854	841629.911	1761384.241	16857170.913	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3061024.695	841629.947	1761384.082	16857170.951	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2436420.106	513562.910			.100	4	CLASSICAL SURVEY	1954	10724

NORMAN MNDT

Mn/DOT Name: NORMAN MNDT **NGS Name:** NORMAN

County: PINE, MN (Sheet 2)

NGS ACRN: RN0551 Get Map
NGS Quad / Sta Num : 46092342/1052
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	26	44 N	20 W	461533.12	924929.05	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	STEEL ROD ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1993) **Stamping:** NORMAN 1966

4.0 MILES SOUTH OF WILLOW RIVER, 4.0 MILES SOUTH ON INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, 92.3 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 16.0 FEET NORTH OF AN EAST-WEST ROAD, 29.0 FEET EAST OF THE EAST END OF A COUNTY ROAD 33 BRIDGE OVER INTERSTATE HIGHWAY 35, 145.62 FEET NORTH-NORTHEAST OF NORMAN MNDT RM 2, 3.0 FEET WEST-SOUTHWEST OF A WITNESS POST.

Station Notes

IN 1993, THE GEODETIC UNIT FOUND THE STATION DIRECTLY UNDER A GUARDRAIL , NORMAN MNDT RM 1 WAS FOUND REMOVED AND NORMAN MNDT RM 2 WAS OKAY.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.803	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.373	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1107.393	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1107.373	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1107.399	.016	2				VERTICAL CONTROL SURVEY	1975	L23805
1107.399	.016	2				VERTICAL CONTROL SURVEY	1972	L22567

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.806	.197		1017.219	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.846 12B = -90.850 09 = -90.731 03 = -90.584

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 33.12034	92 49 29.04906	519039.335	293000.729	.066	2	ADJUSTMENT	1999	17648
46 15 33.11207	92 49 29.04307	519039.756	292999.891	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 33.11199	92 49 29.04298	519039.762	292999.883	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 33.30300	92 49 28.33000			.100	2	CLASSICAL SURVEY	1982	17020
46 15 33.30288	92 49 28.33043			.100	2	CLASSICAL SURVEY	1950	UNK

NORMAN MNDT

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985146.886	790495.878	1684732.846	16807256.352	.066	2	ADJUSTMENT	1999	17648
2985147.322	790495.049	1684733.269	16807255.516	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985147.329	790495.040	1684733.275	16807255.508	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2360541.337	462428.931			.100	2	CLASSICAL SURVEY	1982	17020
2360541.310	462428.920			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NORMAN-RN0551-3N-17NOV2008.jpg	N	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NORMAN-RN0551-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NORMAN-RN0551-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

NORMAN MNDT AZ MK

Mn/DOT Name: NORMAN MNDT AZ MK
NGS Name: NORMAN AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: RN0549 Get Map
NGS Quad / Sta Num : 46092342/1053
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	44 N	20 W	461607.39	924932.98	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1993) **Stamping:** NORMAN 1966

3.35 MILES SOUTH OF WILLOW RIVER, 3.35 MILES SOUTH ON INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, 111.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 STATION 2140+90, 12.2 FEET WEST OF A FENCE, 3.2 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.559	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.132	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1080.132	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1080.575	.197		989.900	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.928 12B = -90.922 09 = -90.807 03 = -90.659

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 07.38632	92 49 32.97531	518760.206	296471.834	.066	2	ADJUSTMENT	1999	17648
46 16 07.37882	92 49 32.96905	518760.647	296471.075	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 07.37873	92 49 32.96895	518760.653	296471.066	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 07.57000	92 49 32.25500			.100	2	CLASSICAL SURVEY	1982	17020
46 16 07.56968	92 49 32.25511			.100	2	CLASSICAL SURVEY	1950	UNK

NORMAN MNDT AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984808.666	793961.287	1684449.457	16810725.555	.066	2	ADJUSTMENT	1999	17648
2984809.120	793960.535	1684449.898	16810724.797	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984809.127	793960.527	1684449.905	16810724.788	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2360203.187	465894.424			.100	2	CLASSICAL SURVEY	1982	17020
2360203.180	465894.390			.100	2	CLASSICAL SURVEY	1950	UNK

NORMAN MNDT RM 1

Mn/DOT Name: NORMAN MNDT RM 1 **NGS Name:** NORMAN RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0552 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	35	44 N	20 W	461533.12	924928.43	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1993) **Stamping:** NORMAN NO 1 1966

4.0 MILES SOUTH OF WILLOW RIVER, 4.0 MILES SOUTH ON INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, 135.6 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 81.1 FEET EAST-NORTHEAST OF NORMAN MNDT RM 2, 72.0 FEET EAST OF THE EAST END OF A COUNTY ROAD 33 BRIDGE OVER INTERSTATE HIGHWAY 35, 43.3 FEET EAST OF STATION NORMAN MNDT, 16.0 FEET NORTH OF COUNTY ROAD 33, 1.0 FOOT NORTH OF A GUARDRAIL CABLE, 1.0 FOOT SOUTHWEST OF A STEEL REFLECTOR POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.662	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1107.232	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1107.258	.016	2				VERTICAL CONTROL SURVEY	1975	L23805
1107.232	.016	2				VERTICAL CONTROL SURVEY	1972	L22567

Geoid Separations(ft): GEOID18 = -90.840 12B = -90.843 09 = -90.725 03 = -90.581

*** No Horizontal Positions in the Database ***

NORMAN MNDT RM 2

Mn/DOT Name: NORMAN MNDT RM 2 **NGS Name:** NORMAN RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0550 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	35	44 N	20 W	461532.79	924929.48	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2008	GOOD	Horz=NO Vert=YES	YES	58809	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1974) **Stamping:** NORMAN R.M. NO. 2 1966

4.0 MILES SOUTH OF WILLOW RIVER, IN THE SOUTHEAST CORNER OF COUNTY ROAD 33 BRIDGE NUMBER 58809 OVER INTERSTATE HIGHWAY 35, 2.0 MILES SOUTH ALONG COUNTY ROAD 33 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 33, 45.6 FEET SOUTH-SOUTHWEST OF STATION NORMAN MNDT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.922	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1108.922	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE
1108.922	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.492	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1108.492	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1108.492	.016	2				VERTICAL CONTROL SURVEY	1976	L23805
1108.518	.016	2				VERTICAL CONTROL SURVEY	1975	L23805
1108.492	.016	2				VERTICAL CONTROL SURVEY	1972	L22567

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1108.810	.262		1018.226	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.846 12B = -90.850 09 = -90.728 03 = -90.584

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.78524	92 49 29.48151	519008.979	292966.752	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985117.118	790461.394	1684702.547	16807222.353	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NORMAN_RM_2-RN0550-3S-17NOV2008.jpg	S	Nov 17, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NORMAN_RM_2-RN0550-2-17NOV2008.jpg		Nov 17, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NORMAN_RM_2-RN0550-1-17NOV2008.jpg		Nov 17, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

NW CORNER OF A FRAME HOUSE

Mn/DOT Name: NW CORNER OF A FRAME HOUSE

NGS Name: NW CORNER OF A FRAME HOUSE

County: PINE, MN (Sheet 2)

NGS ACRN: CJ3404 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	31	44 N	20 W	461533.25	925459.40		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description:

2.4 MILES WEST OF RUTLEDGE, 2.4 MILES WEST ALONG TRUNK HIGHWAY 39 FROM THE JUNCTION OF TRUNK HIGHWAY 39 AND TRUNK HIGHWAY 61, 220.0 FEET SOUTH OF TRUNK HIGHWAY 39.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.945 12B = -90.909 09 = -90.804 03 = -90.659

Mn/DOT Name: NYRUD **NGS Name:** NYRUD

County: PINE, MN (Sheet 2)

NGS ACRN: DL4767 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	13	44 N	20 W	461752.67	924923.27	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** NYRUD 2008

1.5 MILES SOUTHEAST OF WILLOW RIVER, 1.35 MILES SOUTH ALONG INTERSTATE 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 204.1, 63.8 FEET SOUTHWEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 19.1 FEET NORTHEAST OF A FENCE LINE, 1.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1054.424	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1054.424	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			963.279	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1054.427	.131		963.390	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1054.427	.131		963.505	.066	1996	GPS - STATIC	2009	HMOOSE
1054.427	.131		963.390	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.128 12B = -91.102 09 = -91.007 03 = -90.856

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 52.67330	92 49 23.26888	519431.838	307138.778	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 52.67324	92 49 23.26972	519431.779	307138.772	.033	C	ADJUSTMENT	2009	GPS2566
46 17 52.67324	92 49 23.26972	519431.779	307138.772	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 52.67285	92 49 23.26960	519431.788	307138.733	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985298.292	804636.780	1685107.303	16821388.575	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985298.232	804636.773	1685107.244	16821388.568	.033	C	ADJUSTMENT	2009	GPS2566
2985298.232	804636.773	1685107.244	16821388.568	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985298.242	804636.733	1685107.252	16821388.529	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NYRUD-DL4767-3W-18DEC2008.jpg	W	Dec 18, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NYRUD-DL4767-2-18DEC2008.jpg		Dec 18, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/NYRUD-DL4767-1-18DEC2008.jpg		Dec 18, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: P 154 **NGS Name:** P 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0480 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	35	44 N	19 W	461448.00	924246.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2002) **Stamping:** P 154 1935

3.0 MILES SOUTHWEST OF BRUNO, 3.2 MILES SOUTHWEST ON TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43, 0.3 MILE NORTHEAST OF A ROAD CROSSING, 180.0 FEET NORTHEAST OF RAILROAD MILEPOST 52, 36.0 FEET NORTHWEST OF THE RAILROAD TRACKS, AT A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1198.357	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1197.924	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.233 12B = -90.269 09 = -90.134 03 = -90.013

*** No Horizontal Positions in the Database ***

Mn/DOT Name: P 155 **NGS Name:** P 155

County: PINE, MN (Sheet 2)

NGS ACRN: RN0491 Get Map
NGS Quad / Sta Num : 46092244/
USGS Quad: HOLYOKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	45 N	17 W	462441.85	922957.24	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** P 155 1935

IN NICKERSON, 0.1 MILE NORTHEAST ON DELONG ROAD, 96.0 FEET NORTHEAST OF A RAILROAD STATION, 60.0 FEET SOUTHEAST OF THE RAILROAD TRACKS, 33.0 FEET NORTHWEST OF THE RAILROAD TRACKS, 30.0 FEET SOUTHWEST OF COUNTY ROAD 64.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1156.399	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1156.015	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1156.015	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT
1156.015	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.197 12B = -91.204 09 = -91.027 03 = -90.964

*** No Horizontal Positions in the Database ***

Mn/DOT Name: P 38 **NGS Name:** P 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0414 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	9	45 N	20 W	462413.00	925217.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1934) **Stamping:** P 38 1934

3.2 MILES NORTHWEST OF STURGEON LAKE, 1.0 MILE NORTH ALONG COUNTY ROAD 165 FROM THE JUNCTION OF COUNTY ROAD 165 AND COUNTY ROAD 46, THEN 1.2 MILES WEST ON NORTHVIEW ROAD, ALONG A RAILROAD, 6.0 FEET WEST OF RAILROAD MILEPOST 235, 0.25 MILE EAST OF A RAILROAD BRIDGE OVER THE KETTLE RIVER, 24.0 FEET SOUTH OF THE SOUTH RAIL OF A RAILROAD TRACK, 33.0 FEET SOUTH OF A RAILROAD, 3.0 FEET NORTH OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1145.706	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1145.303	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1145.303	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1145.296	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Geoid Separations(ft): GEOID18 = -91.493 12B = -91.466 09 = -91.355 03 = -91.194

*** No Horizontal Positions in the Database ***

PARTRIDGE

Mn/DOT Name: PARTRIDGE
NGS Name: PARTRIDGE
County: PINE, MN (Sheet 2)

NGS ACRN: RN1621 Get Map
NGS Quad / Sta Num : 46092331/1016
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	21	43 N	19 W	461116.72	924535.04		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2005	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	MNDT

Description: (1993) **Stamping:** PARTRIDGE 1952

1.0 MILE EAST OF ASKOV, 1.35 MILES EAST ON COUNTY ROAD 32 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23, AT TRUNK HIGHWAY 23 MILEPOINT 293.75, THEN 0.1 MILE NORTH ON A DRIVEWAY, IN A FENCE LINE, 93.0 FEET NORTH-NORTHEAST OF THE NORTHWEST CORNER OF A BARN, 4.3 FEET WEST OF A FENCE, 105.88 FEET NORTHWEST OF PARTRIDGE RM 1, 69.93 FEET SOUTH OF PARTRIDGE RM 2, 2.1 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1213.794	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1124.535	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1124.630	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1124.758	.066	1996	GPS - STATIC	1999	GPS917
1214.335	.131		1124.758	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1214.204	.131		1124.758	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1214.007						GPS - STATIC	1994	HORZ

Geoid Separations(ft): GEOID18 = -89.796 12B = -89.829 09 = -89.705 03 = -89.619

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 16.71853	92 45 35.04307	535528.387	267048.117	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 16.71849	92 45 35.04379	535528.337	267048.113	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 16.71840	92 45 35.04354	535528.355	267048.104	.033	C	GPS - STATIC	1999	GPS917
46 11 16.71840	92 45 35.04354	535528.354	267048.104	.033	C	ADJUSTMENT	1999	17648
46 11 16.71840	92 45 35.04354	535528.354	267048.104	.033	C	ADJUSTMENT	1998	GPS899
46 11 16.71389	92 45 35.03591	535528.892	267047.648	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 16.71309	92 45 35.03562	535528.913	267047.567	.066	2	GPS - STATIC	1991	HFIN
46 11 16.71310	92 45 35.03562	535528.913	267047.568	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 16.90300	92 45 34.32500			.100	1	CLASSICAL SURVEY	1954	10724

PARTRIDGE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3002073.958	764831.297	1701247.364	16781336.074	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3002073.908	764831.292	1701247.313	16781336.069	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3002073.926	764831.283	1701247.331	16781336.060	.033	C	GPS - STATIC	1999	GPS917
3002073.926	764831.283	1701247.331	16781336.061	.033	C	ADJUSTMENT	1999	17648
3002073.926	764831.283	1701247.331	16781336.061	.033	C	ADJUSTMENT	1998	GPS899
3002074.471	764830.837	1701247.869	16781335.606	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3002074.493	764830.756	1701247.889	16781335.525	.066	2	GPS - STATIC	1991	HFIN
3002074.493	764830.757	1701247.889	16781335.526	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2377468.882	436764.729			.100	1	CLASSICAL SURVEY	1954	10724

PARTRIDGE AZ MK

Mn/DOT Name: PARTRIDGE AZ MK

NGS Name: PARTRIDGE AZ MK

County: PINE, MN (Sheet 2)

NGS ACRN: CJ3447 Get Map
NGS Quad / Sta Num : 46092331/1016
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	43 N	19 W	461112.00	924601.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	1979	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1952)

Stamping: PARTRIDGE 1952

1.0 MILE EAST OF ASKOV, 1.35 MILES EAST ON COUNTY ROAD 32 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23, AT TRUNK HIGHWAY 23 MILEPOINT 293.75, 26.0 FEET SOUTH OF THE CENTERLINE OF THE ROAD, 1.5 FEET NORTH OF THE RIGHT-OF-WAY FENCE, 2.0 FEET EAST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.826 12B = -89.859 09 = -89.731 03 = -89.645

PARTRIDGE RM 1

Mn/DOT Name: PARTRIDGE RM 1 **NGS Name:** PARTRIDGE RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: AH3107 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	21	43 N	19 W	461115.76	924534.43		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1952) **Stamping:** PARTRIDGE NO 1 1952

1.0 MILE EAST OF ASKOV, 1.0 MILE EAST ON COUNTY ROAD 32 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23, 110.0 FEET SOUTHEAST OF STATION PARTRIDGE, 23.0 FEET EAST OF THE NORTHEAST CORNER OF A BARN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1214.122	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.796 12B = -89.829 09 = -89.705 03 = -89.619

*** No Horizontal Positions in the Database ***

PARTRIDGE RM 2

Mn/DOT Name: PARTRIDGE RM 2

NGS Name: PARTRIDGE RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: AH3103 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	21	43 N	19 W	461117.41	924535.01		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1952) **Stamping:** PARTRIDGE NO 2 1952

1.0 MILE EAST OF ASKOV, 1.2 MILES EAST ON COUNTY ROAD 32 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23, 370.0 FEET NORTH OF STATION PARTRIDGE, 2.0 FEET EAST OF A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1209.840	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.796 12B = -89.829 09 = -89.705 03 = -89.619

*** No Horizontal Positions in the Database ***

PBM 11

Mn/DOT Name: PBM 11 **NGS Name:** 11 CAP

County: PINE, MN (Sheet 2)

NGS ACRN: RN0445 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	14	45 N	20 W	462248.00	924929.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	1971	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)

Disk Type
CAP OF CAP-AND-BOLT PAIR

Mon. Agency
MRC

Description: (1971)

Stamping:

AT STURGEON LAKE, AT THE JUNCTION OF COUNTY ROAD 46 AND MAIN STREET, 321.0 FEET SOUTH OF THE RAILROAD STATION, 209.0 FEET SOUTHWEST OF A BARN, 34.0 FEET EAST OF A RAILROAD, ON A STEEP HILLSIDE SOUTHEAST OF AN OLD LAKE BED, THE STATION IS THE TOP OF A COPPER BOLT UNDER A CAPPED PIPE.

Station Notes
THE STATION IS THE COPPER BOLT TO STATION PBM 11 A.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1067.078	.007	1				VERTICAL CONTROL SURVEY	1891	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1067.855	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -91.466 12B = -91.450 09 = -91.348 03 = -91.174

*** No Horizontal Positions in the Database ***

PBM 11 A

Mn/DOT Name: PBM 11 A
NGS Name: PBM 11 A
County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	14	45 N	20 W	462322.00	925012.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	SEE DESCRIPTION	MRC

Description: (1900)
Stamping:

AT STURGEON LAKE, 321.0 FEET SOUTH OF THE RAILROAD STATION, 209.0 FEET SOUTHWEST OF A BARN, 34.0 FEET EAST OF A RAILROAD, ON A STEEP HILLSIDE SOUTHEAST OF AN OLD LAKEBED.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.090	.007	1				VERTICAL CONTROL SURVEY	1891	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.868	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -91.496 12B = -91.473 09 = -91.368 03 = -91.194

*** No Horizontal Positions in the Database ***

PBM 12

Mn/DOT Name: PBM 12 **NGS Name:** 12 BOLT

County: PINE, MN (Sheet 2)

NGS ACRN: RN0450 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461901.00	925043.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	2008	NOT FOUND	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	BOLT	MRC

Description: (1971) **Stamping:** PBM 12 MRC

AT WILLOW RIVER, 0.2 MILE SOUTHWEST ON WILLOW STREET FROM THE JUNCTION OF COUNTY ROAD 158 (WILLOW STREET) AND CREEK DRIVE, 108.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE, 95.0 FEET WEST OF A POWER POLE WITH A TRANSFORMER, 61.0 FEET WEST OF A TOWNSHIP ROAD AT A CURVE, 6.0 FEET WEST OF A GUY POWER POLE, SURROUNDED BY A FENCE WITH A CANAL SURVEY MARKER NUMBER 1800 SIGN.

Station Notes

IF NOT LOCATED, ALSO TRY FINDING STATION AT THE FOLLOWING REFERENCE LATITUDE/LONGITUDE: 461921.00 AND 925016.00. THE MARK IS UNDERGROUND, THE 12.0 INCH CAP WAS RECOVERED, BUT NOT THE BOLT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1027.009	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1026.648	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1026.645	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1026.645	.007	1				VERTICAL CONTROL SURVEY	1971	L30 MINN
1026.645	.007	1				VERTICAL CONTROL SURVEY	1891	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1027.409	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -91.217 12B = -91.191 09 = -91.086 03 = -90.938

*** No Horizontal Positions in the Database ***

PBM 12 A

Mn/DOT Name: PBM 12 A

NGS Name: 12 CAP

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461921.00	925016.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	BENCH MARK DISK	MRC

Description: (1971)

Stamping:

IN WILLOW RIVER, 0.2 MILE SOUTHWEST ALONG WILLOW STREET FROM THE JUNCTION OF COUNTY ROAD 158 (WILLOW STREET) AND CREEK DRIVE, 108.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE, 95.0 FEET WEST OF A POWER POLE WITH A TRANSFORMER, 61.0 FEET WEST OF A TOWNSHIP ROAD AT A CURVE, 6.0 FEET WEST OF A GUY POWER POLE, SURROUNDED BY A WOODEN FENCE, MARKED WITH A SIGN CANAL SURVEY MARKER NUMBER 1800, LEADED IN A TILE 3.0 FEET BELOW THE GROUND.

Station Notes

NO FENCE FOUND.
THE SET DATE IS UNKNOWN. COVERED WITH A 4.0 INCH IRON PIPE WITH A STANDARD MISSISSIPPI RIVER COMMISSION CAP.
UNCONFIRMED REPORT STATES THAT THIS CAP WAS RESET BY A MINNESOTA DEPARTMENT OF TRANSPORTATION 2ND ORDER LEVEL CREW IN 12-01-1971.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.243 12B = -91.217 09 = -91.115 03 = -90.968

PBM 13

Mn/DOT Name: PBM 13 **NGS Name:** 13 BOLT

County: PINE, MN (Sheet 2)

NGS ACRN: RN0455 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	44 N	20 W	461553.00	925203.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	BOLT	MRC

Description: (1934) **Stamping:**

AT RUTLEDGE, 0.1 MILE WEST ALONG JACK PINE ROAD FROM THE JUNCTION OF JACK PINE ROAD AND COUNTY ROAD 61, 390.0 FEET SOUTHWEST OF A RAILROAD STATION, 262.0 FEET NORTHWEST OF A RAILROAD, 147.0 FEET WEST OF THE NORTHWEST CORNER OF A SCHOOLHOUSE, 32.0 FEET WEST OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1029.804	.007	1				VERTICAL CONTROL SURVEY	1891	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1030.556	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -90.961 12B = -90.938 09 = -90.827 03 = -90.682

*** No Horizontal Positions in the Database ***

PBM 13 A

Mn/DOT Name: PBM 13 A
NGS Name: 13 CAP
County: PINE, MN (Sheet 2)

NGS ACRN: RN0454 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	44 N	20 W	461553.00	925203.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	CAP OF CAP-AND-BOLT PAIR	MRC

Description: (1934)
Stamping:

IN RUTLEDGE, 0.1 MILE WEST ALONG JACK PINE ROAD FROM THE JUNCTION OF JACK PINE ROAD AND COUNTY ROAD 61, 390.0 FEET SOUTHWEST OF A RAILROAD STATION, 262.0 FEET NORTHWEST OF A RAILROAD, 147.0 FEET WEST OF THE NORTHWEST CORNER OF A SCHOOLHOUSE, 32.0 FEET WEST OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1033.791	.007	1				VERTICAL CONTROL SURVEY	1891	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1034.542	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -90.964 12B = -90.941 09 = -90.830 03 = -90.686

*** No Horizontal Positions in the Database ***

PBM 14

Mn/DOT Name: PBM 14 **NGS Name:** 14 BOLT

County: PINE, MN (Sheet 2)

NGS ACRN: RN0463 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	6	42 N	20 W	460905.00	925519.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	2007	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (TILE OR CLAY) FILLED WITH CONCRETE	BOLT	MRC

Description: (1954) **Stamping:**

IN GRONIGAN, 330.0 FEET SOUTH OF THE RAILROAD STATION, 360.0 FEET SOUTH OF A WATER TANK, 170.0 FEET NORTH OF A ROAD CROSSING, 101.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF A SCHOOLHOUSE, 36.0 FEET SOUTH OF A CULVERT, 43.5 FEET EAST OF THE EAST RAIL OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1129.013	.007	1				VERTICAL CONTROL SURVEY	1929	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1129.742	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -90.416 12B = -90.397 09 = -90.308 03 = -90.164

*** No Horizontal Positions in the Database ***

PBM 14 A

Mn/DOT Name: PBM 14 A

NGS Name: 14 CAP

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	6	42 N	20 W	460904.00	925524.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	SEE DESCRIPTION	MRC

Description: (1954)

Stamping:

AT GRONINGEN, 0.1 MILE EAST ALONG COUNTY ROAD 28/GRONINGEN ROAD FROM THE JUNCTION OF COUNTY ROAD 28/GRONINGEN ROAD AND GRONINGEN LOOP, 330.0 FEET SOUTH OF A RAILROAD STATION, 360.0 FEET SOUTH OF A WATER TANK, 170.0 FEET NORTH OF A ROAD CROSSING, 101.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF A SCHOOLHOUSE, 36.0 FEET SOUTH OF A CULVERT, 43.5 FEET EAST OF THE EAST RAIL OF A RAILROAD.

Station Notes

A 4.0-INCH IRON PIPE BEARING A MISSISSIPPI RIVER COMMISSION STANDARD CAP.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.416 12B = -90.397 09 = -90.308 03 = -90.164

PBM 15

Mn/DOT Name: PBM 15 **NGS Name:** 15 BOLT

County: PINE, MN (Sheet 2)

NGS ACRN: RN0466 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	18	42 N	20 W	460712.00	925541.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	BOLT	MRC

Description: (1974) **Stamping:**

2.5 MILES NORTH OF FRIESLAND, 2.4 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 26, THEN 0.3 MILE NORTH ON COUNTY ROAD 35, 150.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF AN OLD SANDSTONE JUNCTION RAILROAD STATION SITE, 1120.0 FEET NORTH OF A ROAD CROSSING WEST AT A COUNTY ROAD 61 CURVE NORTHEAST, 121.5 FEET WEST OF A RAILROAD, 35.5 FEET EAST OF A POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1118.479	.007	1				VERTICAL CONTROL SURVEY	1929	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1119.197	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -90.334 12B = -90.321 09 = -90.226 03 = -90.082

*** No Horizontal Positions in the Database ***

PBM 15 A

Mn/DOT Name: PBM 15 A
NGS Name: 15 CAP
County: PINE, MN (Sheet 2)

NGS ACRN: RN0465 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	18	42 N	20 W	460711.00	925540.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1891	1954	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	CAP OF CAP-AND-BOLT PAIR	MRC

Description: (1954)
Stamping:

2.5 MILES NORTH OF THE FRIESLAND RAILROAD STATION, 150.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF AN OLD SANDSTONE JUNCTION RAILROAD STATION SITE, 1120.0 FEET NORTH OF A ROAD CROSSING WEST AT A TRUNK HIGHWAY 61 CURVE NORTHEAST, 121.5 FEET WEST OF A RAILROAD, 35.5 FEET EAST OF A POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1122.478	.007	1				VERTICAL CONTROL SURVEY	1929	L30 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1123.197	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -90.331 12B = -90.318 09 = -90.223 03 = -90.082

*** No Horizontal Positions in the Database ***

Mn/DOT Name: PINCE
NGS Name: PINCE
County: PINE, MN (Sheet 2)

NGS ACRN: DL4769 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	44 N	20 W	461623.34	924930.93	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	SURVEY DISK	MNDT

Description: (2008) **Stamping:** PINCE 2008

3.0 MILES SOUTH OF WILLOW RIVER, 3.15 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 202.3, 50.5 FEET WEST-NORTHWEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 49.0 FEET EAST-NORTHEAST OF A FENCE LINE, 3.0 FEET EAST-SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1053.912	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1053.912	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			962.967	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1053.902	.131		963.076	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1053.902	.131		963.190	.066	1996	GPS - STATIC	2009	HMOOSE
1053.902	.131		963.076	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.961 12B = -90.955 09 = -90.840 03 = -90.692

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 23.34159	92 49 30.93173	518902.262	298088.342	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 23.34153	92 49 30.93258	518902.202	298088.336	.033	C	ADJUSTMENT	2009	GPS2566
46 16 23.34153	92 49 30.93258	518902.202	298088.336	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 23.34120	92 49 30.93238	518902.216	298088.303	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984923.130	795579.779	1684589.406	16812341.521	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984923.070	795579.772	1684589.347	16812341.515	.033	C	ADJUSTMENT	2009	GPS2566
2984923.070	795579.772	1684589.347	16812341.515	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984923.085	795579.739	1684589.361	16812341.482	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINCE-DL4769-3W-22DEC2008.jpg	W	Dec 22, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINCE-DL4769-2-22DEC2008.jpg		Dec 22, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINCE-DL4769-1-22DEC2008.jpg		Dec 22, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

PINE

Mn/DOT Name: PINE
NGS Name: PINE
County: PINE, MN (Sheet 2)

NGS ACRN: RN1634 Get Map
NGS Quad / Sta Num : 46092334/1003
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	43 N	21 W	461034.68	925930.30		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
TRIANGULATION STATION DISK

Mon. Agency
NGS

Description: (2007)

Stamping: PINE 1960

3.5 MILES WEST AND 1.75 MILES SOUTH OF FINLAYSON, 3.0 MILES WEST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35, THEN 1.85 MILES SOUTH ON COUNTY ROAD 36, 104.0 FEET EAST OF THE NORTHEAST CORNER OF A HOUSE, 65.0 FEET WEST OF COUNTY ROAD 36 (GRAVEL ROAD), 37.0 FEET NORTH OF A DRIVEWAY, 97.77 FEET SOUTH OF PINE RM 1, 138.55 FEET SOUTHWEST OF PINE RM 2.

Station Notes
NO REAL TIME REFERENCE NETWORK (RTRN) POSITION.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1047.062	.015	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1047.173	.013	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1137.760	.131		1047.272	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1137.760	.131		1047.272	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1137.399						GPS - STATIC	1991	HORZ

Geoid Separations(ft): GEOID18 = -90.712 12B = -90.676 09 = -90.574 03 = -90.426

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 34.67558	92 59 30.29889	476755.501	262771.053	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 34.67561	92 59 30.29960	476755.451	262771.056	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 34.67555	92 59 30.29907	476755.488	262771.050	.033	C	ADJUSTMENT	1999	17648
46 10 34.67555	92 59 30.29907	476755.488	262771.050	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 34.66847	92 59 30.29143	476756.025	262770.332	.066	2	GPS - STATIC	1991	HFIN
46 10 34.66848	92 59 30.29143	476756.025	262770.333	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 34.86720	92 59 29.56520			.100	2	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943389.474	759553.701	1642505.929	16776986.889	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943389.424	759553.703	1642505.879	16776986.892	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943389.461	759553.697	1642505.916	16776986.886	.033	C	ADJUSTMENT	1999	17648
2943389.461	759553.697	1642505.916	16776986.886	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943390.010	759552.989	1642506.454	16776986.169	.066	2	GPS - STATIC	1991	HFIN
2943390.010	759552.990	1642506.454	16776986.170	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2318783.773	431487.720			.100	2	CLASSICAL SURVEY	1961	12611

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE-RN1634-3E-07MAY2008.jpg	E	May 7, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE-RN1634-2-07MAY2008.jpg		May 7, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE-RN1634-1-07MAY2008.jpg		May 7, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

PINE AZ MK

Mn/DOT Name: PINE AZ MK

NGS Name: PINE AZ MK

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	43 N	21 W	461127.00	925928.00		

NGS ACRN: CJ3486 Get Map
NGS Quad / Sta Num : 46092334/1003
USGS Quad: FINLAYSON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

Monument Type
CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type
AZIMUTH MARK DISK

Mon. Agency
NGS

Description: (1960)

Stamping: PINE 1960

3.5 MILES WEST AND 1.75 MILES SOUTH OF FINLAYSON, 3.0 MILES WEST ON TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35 IN FINLAYSON, THEN 1.85 MILES SOUTH ON COUNTY ROAD 36, 51.0 FEET EAST OF THE CENTERLINE OF A GRAVEL ROAD, 3.0 FEET SOUTH OF A TELEPHONE POLE, 1.0 FOOT SOUTHEAST OF A WITNESS POST.

Station Notes
IN 10-09-2008 DETERMINED THAT THE DESCRIPTION DOES NOT MATCH THE LATITUDE/LONGITUDE COORDINATES.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.735 12B = -90.699 09 = -90.590 03 = -90.449

PINE RM 1

Mn/DOT Name: PINE RM 1 **NGS Name:** PINE RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: AH3104 Get Map
NGS Quad / Sta Num : 46092334/1003
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	43 N	21 W	461035.64	925930.35		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	GOOD	Horz=YES Vert=YES	YES		PROJECTS 1 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1960) **Stamping:** PINE NO 1 1960

4.0 MILES SOUTHWEST OF FINLAYSON, 3.0 MILES WEST ON TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35 IN FINLAYSON, THEN 1.8 MILES SOUTH ON COUNTY ROAD 36, 97.0 FEET SOUTH OF A FENCE CORNER, 81.0 FEET SOUTHWEST OF A POWER POLE, 66.0 FEET WEST OF THE CENTERLINE OF A GRAVEL ROAD.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.712 12B = -90.676 09 = -90.574 03 = -90.426

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE_RM_1-AH3104-3E-07MAY2008.jpg	E	May 7, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE_RM_1-AH3104-2-07MAY2008.jpg		May 7, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE_RM_1-AH3104-1-07MAY2008.jpg		May 7, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

PINE RM 2

Mn/DOT Name: PINE RM 2 **NGS Name:** PINE RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: AH3105 Get Map
NGS Quad / Sta Num : 46092334/1003
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	43 N	21 W	461035.23	925928.50		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1960) **Stamping:** PINE NO 2 1960

4.0 MILES SOUTHWEST OF FINLAYSON, 3.6 MILES WEST ON TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35 IN FINLAYSON, THEN 1.85 MILES SOUTH ON COUNTY ROAD 36, 63.0 FEET EAST OF THE CENTERLINE OF THE GRAVEL ROAD, 5.0 FEET WEST OF A 4.0 INCH DIAMETER BIRCH TREE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.712 12B = -90.676 09 = -90.574 03 = -90.426

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE_RM_2-AH3105-3E-07MAY2008.jpg	E	May 7, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE_RM_2-AH3105-2-07MAY2008.jpg		May 7, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/PINE_RM_2-AH3105-1-07MAY2008.jpg		May 7, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

PRICE

Mn/DOT Name: PRICE
NGS Name: PRICE
County: PINE, MN (Sheet 2)

NGS ACRN: DL4771 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	22	43 N	20 W	461138.60	925052.17	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** PRICE 2008

5.0 MILES NORTH OF SANDSTONE, 5.4 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 196.60, 81.0 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 18.5 FEET NORTHWEST OF A FENCE LINE, 2.8 FEET NORTHWEST OF THE WITNESS POST.

Station Notes
THE BILLBOARD IS 30.0 FEET SOUTHEAST OF A MARK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1142.176	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1142.176	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1051.871	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1142.189	.131		1051.970	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1142.189	.131		1052.098	.066	1996	GPS - STATIC	2009	HMOOSE
1142.189	.131		1051.970	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.334 12B = -90.334 09 = -90.229 03 = -90.115

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 38.60273	92 50 52.17066	513214.082	269238.103	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 38.60270	92 50 52.17142	513214.029	269238.100	.033	C	ADJUSTMENT	2009	GPS2566
46 11 38.60270	92 50 52.17142	513214.029	269238.100	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 38.60253	92 50 52.17110	513214.051	269238.083	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2979728.226	766640.315	1678940.168	16783496.946	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2979728.172	766640.312	1678940.115	16783496.942	.033	C	ADJUSTMENT	2009	GPS2566
2979728.172	766640.312	1678940.115	16783496.942	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2979728.195	766640.294	1678940.137	16783496.925	.033	C	GPS - STATIC	2009	HMOOSE

Mn/DOT Name: Q 154 **NGS Name:** Q 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0481 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	25	44 N	19 W	461605.00	924050.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
UNKNOWN	BENCH MARK DISK	NGS

Description: (2002) **Stamping:** Q 154 1935

1.0 MILE SOUTH OF BRUNO, 1.0 MILE SOUTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43 (MAIN STREET), 600.0 FEET NORTH OF RAILROAD MILEPOST 50, 42.0 FEET WEST OF A RAILROAD, 12.0 FEET EAST OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.618	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1160.191	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1160.191	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.321 12B = -90.357 09 = -90.213 03 = -90.095

*** No Horizontal Positions in the Database ***

Mn/DOT Name: Q 38 **NGS Name:** Q 38

County: PINE, MN (Sheet 2)

NGS ACRN: RN0415 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	2	45 N	20 W	462501.23	924940.16	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2020	GOOD	Horz=NO Vert=YES	YES		PROJECTS 1 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2007) **Stamping:** Q 38 1934

3.9 MILES SOUTHWEST OF MOOSE LAKE, 3.3 MILES WEST ALONG TRUNK HIGHWAY 27 FROM THE JUNCTION OF TRUNK HIGHWAY 27 AND TRUNK HIGHWAY 73, THEN 2.3 MILES SOUTH ON COUNTY ROAD 134, 0.3 MILE NORTHEAST OF RAILROAD MILEPOST 237, 750.0 FEET SOUTHWEST OF A ROAD CROSSING, 375.0 FEET SOUTHWEST OF A FARM ROAD CROSSING, 4.0 FEET NORTHWEST OF A CENTERLINE ALL-TERRAIN VEHICLE (ATV)/SNOWMOBILE TRAIL (SOO LINE), 27.5 FEET NORTH-NORTHWEST OF A CONCRETE CULVERT.

Station Notes
DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1145.660	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1145.260	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1145.257	.007	1				VERTICAL CONTROL SURVEY	1974	L3434
1145.257	.007	1				VERTICAL CONTROL SURVEY	1941	L60 MINN

Geoid Separations(ft): GEOID18 = -91.611 12B = -91.594 09 = -91.493 03 = -91.312

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/Q_38-RN0415-3NW-11APR2007.jpg	NW	Apr 11, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/Q_38-RN0415-2-11APR2007.jpg		Apr 11, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/Q_38-RN0415-1-11APR2007.jpg		Apr 11, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

R 154

Mn/DOT Name: R 154 **NGS Name:** R 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0482 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	19	44 N	18 W	461645.00	923952.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2002	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2002) **Stamping:** R 154 1935

AT BRUNO, 240.0 FEET NORTHEAST ON A RAILROAD FROM THE RAILROAD STATION, 69.0 FEET NORTHEAST OF A COUNTY ROAD 41 CROSSING, 24.0 FEET NORTHWEST OF THE RAILROAD TRACKS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1151.369	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1150.949	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1150.949	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.374 12B = -90.407 09 = -90.252 03 = -90.147

*** No Horizontal Positions in the Database ***

Mn/DOT Name: RARD **NGS Name:** RARD

County: PINE, MN (Sheet 2)

NGS ACRN: DL4772 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	43 N	20 W	461304.86	925002.66	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** RARD 2008

7.0 MILES NORTH OF SANDSTONE, 7.2 MILES NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE NORTH JUNCTION OF TRUNK HIGHWAY 23 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 198.45, 0.1 MILE SOUTHWEST OF A BRIDGE OVER THE KETTLE RIVER, 44.5 FEET NORTHWEST OF A FENCE LINE, 34.9 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1026.504	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1026.497	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			935.999	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1026.507	.131		936.078	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1026.507	.131		936.196	.066	1996	GPS - STATIC	2009	HMOOSE
1026.507	.131		936.078	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.512 12B = -90.512 09 = -90.394 03 = -90.272

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 04.86048	92 50 02.66289	516689.787	277979.041	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 04.86042	92 50 02.66371	516689.729	277979.035	.033	C	ADJUSTMENT	2009	GPS2566
46 13 04.86042	92 50 02.66371	516689.729	277979.035	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 04.86031	92 50 02.66344	516689.748	277979.023	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983054.019	775438.173	1682403.308	16792238.385	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983053.962	775438.166	1682403.250	16792238.379	.033	C	ADJUSTMENT	2009	GPS2566
2983053.962	775438.166	1682403.250	16792238.379	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983053.981	775438.155	1682403.269	16792238.368	.033	C	GPS - STATIC	2009	HMOOSE

REHBEIN MNDT

Mn/DOT Name: REHBEIN MNDT
NGS Name: REHBEIN
County: PINE, MN (Sheet 2)

NGS ACRN: AH1783 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	24	44 N	20 W	461649.54	924919.14	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1993	2008	GOOD	Horz=YES Vert=YES	YES		PROJECTS 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	SURVEY DISK	MNDT

Description: (1993) **Stamping:** REHBEIN 1993

3.0 MILES SOUTH-SOUTHEAST OF WILLOW RIVER, 2.6 MILES SOUTH-SOUTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43, AT INTERSTATE HIGHWAY 35 MILEPOINT 202.85, 68.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 30.8 FEET WEST OF A RIGHT-OF-WAY FENCE, 2.4 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1057.987	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1057.987	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			966.993	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1058.003	.131		967.111	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1058.003	.131		967.222	.066	1996	GPS - STATIC	2009	HMOOSE
1058.003	.131		967.111	.066	2007	GPS - STATIC	2009	HMOOSE
1057.862	.262		967.121	.197	1996	GPS - RTRN	2008	RTRN2008
			967.111	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1057.970	.131		967.222	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1057.970	.131		967.222	.066	1996	GPS - STATIC	2002	HPINE
1057.983	.131		967.216	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS917

Geoid Separations(ft): GEOID18 = -91.007 12B = -90.997 09 = -90.889 03 = -91.010

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 49.53622	92 49 19.13592	519728.324	300742.831	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 49.53619	92 49 19.13679	519728.263	300742.827	.033	C	ADJUSTMENT	2009	GPS2566
46 16 49.53619	92 49 19.13679	519728.263	300742.827	.033	C	GPS - STATIC	2009	HMOOSE
46 16 49.53619	92 49 19.13679	519728.263	300742.827	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 49.53572	92 49 19.13667	519728.272	300742.780	.033	C	GPS - STATIC	2009	HMOOSE
46 16 49.53643	92 49 19.13604	519728.316	300742.852	.131	3	GPS - RTRN	2008	RTRN2008
46 16 49.53572	92 49 19.13667	519728.272	300742.780	.033	C	ADJUSTMENT	2003	GPS1839
46 16 49.53572	92 49 19.13667	519728.272	300742.781	.033	C	GPS - STATIC	2002	HPINE
46 16 49.53572	92 49 19.13667	519728.272	300742.780	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 49.53013	92 49 19.12995	519728.744	300742.213	.033	C	GPS - STATIC	1994	HI35N

REHBEIN MNDT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985703.720	798247.628	1685411.744	16814995.866	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985703.659	798247.623	1685411.683	16814995.863	.033	C	ADJUSTMENT	2009	GPS2566
2985703.659	798247.623	1685411.683	16814995.863	.033	C	GPS - STATIC	2009	HMOOSE
2985703.659	798247.623	1685411.683	16814995.863	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985703.668	798247.576	1685411.692	16814995.815	.033	C	GPS - STATIC	2009	HMOOSE
2985703.711	798247.649	1685411.735	16814995.888	.131	3	GPS - RTRN	2008	RTRN2008
2985703.668	798247.576	1685411.692	16814995.815	.033	C	ADJUSTMENT	2003	GPS1839
2985703.668	798247.576	1685411.692	16814995.816	.033	C	GPS - STATIC	2002	HPINE
2985703.668	798247.576	1685411.692	16814995.815	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985704.150	798247.018	1685412.164	16814995.251	.033	C	GPS - STATIC	1994	HI35N

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/REHBEIN-AH1783-3E-18NOV2008.jpg	E	Nov 18, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/REHBEIN-AH1783-2-18NOV2008.jpg		Nov 18, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/REHBEIN-AH1783-1-18NOV2008.jpg		Nov 18, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: RENIW **NGS Name:** RENIW

County: PINE, MN (Sheet 2)

NGS ACRN: DL4773 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	42 N	20 W	460840.56	925315.76	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** RENIW 2008

1.5 MILES NORTHWEST OF SANDSTONE, 1.3 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 192.7, 54.6 FEET WEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 32.3 FEET EAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 1.8 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.636	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1132.636	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1042.439	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1132.642	.131		1042.527	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1132.642	.131		1042.662	.066	1996	GPS - STATIC	2009	HMOOSE
1132.642	.131		1042.527	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.187 12B = -90.187 09 = -90.092 03 = -89.957

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 40.56387	92 53 15.76235	503114.973	251197.893	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 40.56381	92 53 15.76314	503114.917	251197.887	.033	C	ADJUSTMENT	2009	GPS2566
46 08 40.56381	92 53 15.76314	503114.917	251197.887	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 40.56372	92 53 15.76273	503114.946	251197.878	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969939.237	748432.725	1668868.251	16765452.017	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969939.182	748432.718	1668868.196	16765452.010	.033	C	ADJUSTMENT	2009	GPS2566
2969939.182	748432.718	1668868.196	16765452.010	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2969939.210	748432.709	1668868.225	16765452.001	.033	C	GPS - STATIC	2009	HMOOSE

Mn/DOT Name: RIES **NGS Name:** RIES

County: PINE, MN (Sheet 2)

NGS ACRN: DL4775 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	42 N	20 W	460446.43	925357.74	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	GOOD	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** RIES 2008

3.5 MILES SOUTH-SOUTHWEST OF SANDSTONE, 3.3 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 188.2, 26.7 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1098.843	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1098.843	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1008.781	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1098.850	.131		1008.876	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1098.850	.131		1008.994	.066	1996	GPS - STATIC	2009	HMOOSE
1098.850	.131		1008.876	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.036 12B = -90.036 09 = -89.928 03 = -89.806

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 46.42881	92 53 57.74222	500159.167	227479.011	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 46.42860	92 53 57.74285	500159.123	227478.989	.033	C	ADJUSTMENT	2009	GPS2566
46 04 46.42860	92 53 57.74285	500159.123	227478.989	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 04 46.42852	92 53 57.74245	500159.151	227478.981	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2967388.413	724669.597	1665943.578	16741739.916	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2967388.369	724669.575	1665943.533	16741739.895	.033	C	ADJUSTMENT	2009	GPS2566
2967388.369	724669.575	1665943.533	16741739.895	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2967388.398	724669.567	1665943.561	16741739.887	.033	C	GPS - STATIC	2009	HMOOSE

RUNGS

Mn/DOT Name: RUNGS
NGS Name: RUNGS
County: PINE, MN (Sheet 2)

NGS ACRN: DL4776 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	26	44 N	20 W	461557.36	924931.95	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** RUNGS 2008

4.0 MILES SOUTH OF WILLOW RIVER, 3.7 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 201.80, 36.0 FEET WEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 14.8 FEET EAST OF THE SOUTH CORNER OF A FENCE LINE, 3.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.186	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1071.186	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1071.126	.262		980.221	.197	2011	GPS - OPUS	2020	GPSBM
1071.231	.262		980.329	.197	2011	GPS - RTRN	2020	RTRN2020
			980.290	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1071.192	.131		980.398	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1071.192	.131		980.513	.066	1996	GPS - STATIC	2009	HMOOSE
1071.192	.131		980.398	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.905 12B = -90.902 09 = -90.787 03 = -90.640

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 57.35614	92 49 31.95178	518833.067	295455.779	.131	3	GPS - OPUS	2020	GPSBM
46 15 57.35568	92 49 31.95102	518833.120	295455.732	.131	3	GPS - RTRN	2020	RTRN2020
46 15 57.35619	92 49 31.95034	518833.168	295455.784	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 57.35614	92 49 31.95118	518833.109	295455.779	.033	C	ADJUSTMENT	2009	GPS2566
46 15 57.35614	92 49 31.95118	518833.109	295455.779	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 57.35581	92 49 31.95099	518833.122	295455.745	.033	C	GPS - STATIC	2009	HMOOSE

RUNGS

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984898.826	792946.749	1684523.569	16809710.046	.131	3	GPS - OPUS	2020	GPSBM
2984898.881	792946.703	1684523.622	16809709.999	.131	3	GPS - RTRN	2020	RTRN2020
2984898.927	792946.756	1684523.670	16809710.051	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984898.868	792946.749	1684523.611	16809710.046	.033	C	ADJUSTMENT	2009	GPS2566
2984898.868	792946.749	1684523.611	16809710.046	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2984898.883	792946.716	1684523.624	16809710.012	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUNGS-DL4776-3W-07MAY2020.jpg	W	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUNGS-DL4776-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUNGS-DL4776-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

RUTL MNDT

Mn/DOT Name: RUTL MNDT **NGS Name:** RUTL

County: PINE, MN (Sheet 2)

NGS ACRN: AF9153 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	43 N	20 W	461206.28	925200.44	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 13 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** RUTL 1991

2.5 MILES EAST OF FINLAYSON, AT THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 61 (THE JUNCTION IS 2.5 MILES EAST OF FINLAYSON), AT TRUNK HIGHWAY 18 MILEPOINT 78.9, 88.0 FEET WEST OF COUNTY ROAD 61, 65.0 FEET NORTH OF TRUNK HIGHWAY 18, 122.0 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A METAL BUILDING, 112.0 FEET SOUTH OF A FENCE CORNER, 88.5 FEET SOUTH-SOUTHWEST OF CABLE MARKER NUMBER B 14, 74.0 FEET EAST-NORTHEAST OF A POWER POLE, 4.9 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1111.372	.016	2/1				VERTICAL ADJUSTMENT	2020	00000949
1111.372	.016	2/1				VERTICAL CONTROL SURVEY	2019	VSAND
1111.372	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1111.372	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1110.992	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1111.369	.262		1020.884	.197	2011	GPS - OPUS	2019	GPSBM
1111.438	.262		1020.966	.197	2011	GPS - RTRN	2017	RTRN2017
			1020.890	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1111.382	.131		1021.015	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1111.382	.131		1021.136	.066	1996	GPS - STATIC	2009	HMOOSE
1111.382	.131		1021.015	.066	2007	GPS - STATIC	2009	HMOOSE
			1021.015	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1111.382	.131		1021.136	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1111.382	.131		1021.136	.066	1996	GPS - STATIC	2002	HPINE
1111.382	.131		1021.136	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1111.382	.131		1021.136	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899
1111.372	.131		1021.136	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS917
1111.415						GPS - STATIC	1994	HORZ

Geoid Separations(ft): GEOID18 = -90.485 12B = -90.476 09 = -90.377 03 = -90.485

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.28319	92 52 00.44152	508409.952	272039.694	.131	3	GPS - OPUS	2019	GPSBM
46 12 06.28260	92 52 00.44115	508409.978	272039.634	.131	3	GPS - RTRN	2017	RTRN2017
46 12 06.28294	92 52 00.44155	508409.950	272039.669	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.28282	92 52 00.44227	508409.899	272039.656	.033	C	ADJUSTMENT	2009	GPS2566
46 12 06.28282	92 52 00.44227	508409.899	272039.656	.033	C	GPS - STATIC	2009	HMOOSE
46 12 06.28282	92 52 00.44227	508409.899	272039.656	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.28259	92 52 00.44187	508409.927	272039.633	.033	C	GPS - STATIC	2009	HMOOSE
46 12 06.28259	92 52 00.44187	508409.927	272039.633	.033	C	ADJUSTMENT	2003	GPS1839
46 12 06.28259	92 52 00.44187	508409.928	272039.633	.033	C	GPS - STATIC	2002	HPINE
46 12 06.28259	92 52 00.44187	508409.927	272039.633	.033	C	ADJUSTMENT	1999	17648
46 12 06.28259	92 52 00.44187	508409.927	272039.633	.033	C	ADJUSTMENT	1998	GPS899
46 12 06.28259	92 52 00.44187	508409.927	272039.633	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.27703	92 52 00.43457	508410.440	272039.069	.033	C	GPS - STATIC	1994	HI35N
46 12 06.27500	92 52 00.43787	508410.209	272038.864	.066	2	GPS - STATIC	1991	HFIN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974877.619	769359.282	1674134.640	16786291.238	.131	3	GPS - OPUS	2019	GPSBM
2974877.646	769359.223	1674134.666	16786291.179	.131	3	GPS - RTRN	2017	RTRN2017
2974877.618	769359.257	1674134.638	16786291.213	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974877.567	769359.244	1674134.588	16786291.201	.033	C	ADJUSTMENT	2009	GPS2566
2974877.567	769359.244	1674134.588	16786291.201	.033	C	GPS - STATIC	2009	HMOOSE
2974877.567	769359.244	1674134.588	16786291.201	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974877.596	769359.221	1674134.616	16786291.177	.033	C	GPS - STATIC	2009	HMOOSE
2974877.596	769359.221	1674134.616	16786291.177	.033	C	ADJUSTMENT	2003	GPS1839
2974877.596	769359.221	1674134.616	16786291.177	.033	C	GPS - STATIC	2002	HPINE
2974877.596	769359.221	1674134.616	16786291.177	.033	C	ADJUSTMENT	1999	17648
2974877.596	769359.221	1674134.616	16786291.177	.033	C	ADJUSTMENT	1998	GPS899
2974877.596	769359.221	1674134.616	16786291.177	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2974878.119	769358.667	1674135.130	16786290.615	.033	C	GPS - STATIC	1994	HI35N
2974877.890	769358.457	1674134.898	16786290.409	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTL-AF9153-3N-25MAY2017.jpg	N	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTL-AF9153-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTL-AF9153-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: RUTLEDGE
NGS Name: RUTLEDGE RESET
County: PINE, MN (Sheet 2)

NGS ACRN: RN1646 Get Map
NGS Quad / Sta Num : 46092343/1018
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	31	44 N	20 W	461533.06	925500.13		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2007	GOOD	Horz=YES Vert=YES	YES			STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (2007) **Stamping:** RUTLEDGE 1952 1960

2.5 MILES WEST OF RUTLEDGE, 2.3 MILES WEST ON COUNTY ROAD 39 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 THEN 0.05 MILE SOUTH ON A DRIVEWAY, 67.0 FEET WEST OF A DRIVEWAY, 7.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1125.569	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1125.949	.131		1035.234	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -90.945 12B = -90.909 09 = -90.804 03 = -90.659

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 33.05738	92 55 00.12567	495775.053	292985.787	.033	1	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 33.05102	92 55 00.11893	495775.527	292985.143	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 33.24600	92 54 59.39800			.100	1	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961889.140	790084.446	1661478.985	16807212.069	.033	1	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961889.624	790083.810	1661479.459	16807211.426	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2337283.502	462018.041			.100	1	CLASSICAL SURVEY	1961	12611

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTLEDGE_RESET-RN1646-3N-15APR2007.jpg	N	Apr 15, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTLEDGE_RESET-RN1646-2-15APR2007.jpg		Apr 15, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTLEDGE_RESET-RN1646-1-15APR2007.jpg		Apr 15, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

RUTLEDGE 1952

Mn/DOT Name: RUTLEDGE 1952 **NGS Name:** RUTLEDGE

County: PINE, MN (Sheet 2)

NGS ACRN: CU8213 Get Map
NGS Quad / Sta Num : 46092343/1018
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	31	44 N	20 W	461533.00	925500.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	1960	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: **Stamping:** RUTLEDGE 1952

IN KETTLE RIVER TOWNSHIP, 2.5 MILES WEST OF RUTLEDGE, 22.0 FEET EAST OF A GATEPOST, 67.0 FEET WEST OF THE CENTER OF A DRIVEWAY, 7.0 FEET EAST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.945 12B = -90.909 09 = -90.804 03 = -90.659

RUTLEDGE AZ MK

Mn/DOT Name: RUTLEDGE AZ MK
NGS Name: RUTLEDGE AZ MK RESET
County: PINE, MN (Sheet 2)

NGS ACRN: DF5947 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	30	44 N	20 W	461535.75	925430.81		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2020	GOOD	Horz=YES Vert=YES	YES		PROJECTS 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (2000) **Stamping:** RUTLEDGE RESET 1960 1952

2.0 MILES WEST OF RUTLEDGE, 2.0 MILES WEST ON COUNTY ROAD 39 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61, 2077.0 FEET EAST OF STATION RUTLEDGE, 175.0 FEET WEST OF THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 34 SOUTH-COUNTY ROAD 151 NORTH, 81.0 FEET NORTH OF COUNTY ROAD 39, 12.0 FEET WEST OF A FENCE, 0.8 FOOT NORTH OF A WITNESS POST.

Station Notes
THE ARROW POINTS EAST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.740	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1088.305	.262		997.357	.197	2011	GPS - OPUS	2020	GPSBM
1088.387	.262		997.439	.197	2011	GPS - OPUS	2020	GPSBM
1088.285	.262		997.370	.197	2011	GPS - RTRN	2020	RTRN2020
			997.363	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1088.252	.131		997.482	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1088.252	.131		997.590	.066	1996	GPS - STATIC	2009	HMOOSE
1088.252	.131		997.482	.066	2007	GPS - STATIC	2009	HMOOSE
			997.482	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1088.285	.131		997.590	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1088.285	.131		997.590	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -90.948 12B = -90.915 09 = -90.813 03 = -90.666

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 35.75063	92 54 30.81341	497834.814	293258.304	.131	3	GPS - OPUS	2020	GPSBM
46 15 35.75045	92 54 30.81370	497834.794	293258.286	.131	3	GPS - OPUS	2020	GPSBM
46 15 35.75070	92 54 30.81328	497834.823	293258.311	.131	3	GPS - RTRN	2020	RTRN2020
46 15 35.75110	92 54 30.81314	497834.833	293258.351	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 35.75114	92 54 30.81364	497834.798	293258.355	.033	C	ADJUSTMENT	2009	GPS2566
46 15 35.75114	92 54 30.81364	497834.798	293258.355	.033	C	GPS - STATIC	2009	HMOOSE
46 15 35.75114	92 54 30.81364	497834.798	293258.355	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 35.75095	92 54 30.81330	497834.822	293258.336	.033	C	GPS - STATIC	2009	HMOOSE
46 15 35.75095	92 54 30.81330	497834.822	293258.336	.033	C	ADJUSTMENT	2003	GPS1839
46 15 35.75095	92 54 30.81330	497834.821	293258.337	.033	C	GPS - STATIC	2002	HPINE

RUTLEDGE AZ MK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2963943.701	790391.989	1663537.480	16807487.059	.131	3	GPS - OPUS	2020	GPSBM
2963943.681	790391.970	1663537.460	16807487.040	.131	3	GPS - OPUS	2020	GPSBM
2963943.710	790391.996	1663537.489	16807487.065	.131	3	GPS - RTRN	2020	RTRN2020
2963943.719	790392.037	1663537.499	16807487.106	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2963943.684	790392.040	1663537.464	16807487.110	.033	C	ADJUSTMENT	2009	GPS2566
2963943.684	790392.040	1663537.464	16807487.110	.033	C	GPS - STATIC	2009	HMOOSE
2963943.684	790392.040	1663537.464	16807487.110	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2963943.708	790392.021	1663537.488	16807487.091	.033	C	GPS - STATIC	2009	HMOOSE
2963943.708	790392.021	1663537.488	16807487.091	.033	C	ADJUSTMENT	2003	GPS1839
2963943.708	790392.021	1663537.488	16807487.091	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTLEDGE_AZ_MK_RESET-DF5947-3N-07MAY2020.jpg	N	May 7, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTLEDGE_AZ_MK_RESET-DF5947-2-07MAY2020.jpg		May 7, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/RUTLEDGE_AZ_MK_RESET-DF5947-1-07MAY2020.jpg		May 7, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

RUTLEDGE AZ MK 1952

Mn/DOT Name: RUTLEDGE AZ MK 1952 **NGS Name:** RUTLEDGE AZ MK

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2715 Get Map
NGS Quad / Sta Num : 46092343/1018
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	29	44 N	20 W	461538.00	925323.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	1960	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1952) **Stamping:** RUTLEDGE 1952

110.0 FEET SOUTHWEST OF THE ROAD INTERSECTION, 59.0 FEET WEST-SOUTHWEST OF A TELEPHONE POLE, 2.0 FEET SOUTHWEST OF A WHITE WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.951 12B = -90.922 09 = -90.817 03 = -90.669

RUTLEDGE RM 1

Mn/DOT Name: RUTLEDGE RM 1 **NGS Name:** RUTLEDGE RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2717 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	31	44 N	20 W	461533.28	925458.86		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1960) **Stamping:** RUTLEDGE NO 1 1952

2.5 MILES WEST OF RUTLEDGE, 2.3 MILES WEST ON COUNTY ROAD 39 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61, THEN 0.05 MILE SOUTH ON A DRIVEWAY, 45.0 FEET NORTH OF THE NORTHWEST CORNER OF THE FRAME HOUSE, 20.0 FEET EAST OF THE CENTERLINE OF A DRIVEWAY.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.945 12B = -90.909 09 = -90.804 03 = -90.656

RUTLEDGE RM 2

Mn/DOT Name: RUTLEDGE RM 2 **NGS Name:** RUTLEDGE RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN1649 Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	31	44 N	20 W	461532.23	925459.23		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=YES Vert=YES	NO			STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1993) **Stamping:** RUTLEDGE NO 2 1952

2.5 MILES WEST OF RUTLEDGE, 2.3 MILES WEST ON COUNTY ROAD 39 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61, THEN 0.05 MILE SOUTH ON A DRIVEWAY, 105.1 FEET SOUTHEAST OF STATION RUTLEDGE, 56.0 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A HOUSE, 22.0 FEET SOUTH OF A POWER POLE WITH A METER, 3.0 FEET SOUTHWEST OF A GUY WIRE, 34.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1124.493	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1033.964	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1034.063	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			1034.178	.066	1996	GPS - STATIC	1999	GPS917
1124.899	.131		1034.178	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1124.506						GPS - STATIC	1994	HORZ

Geoid Separations(ft): GEOID18 = -90.945 12B = -90.909 09 = -90.804 03 = -90.656

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.22660	92 54 59.22881	495838.057	292901.611	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.22659	92 54 59.22959	495838.002	292901.610	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.22626	92 54 59.22941	495838.014	292901.576	.033	C	GPS - STATIC	1999	GPS917
46 15 32.22626	92 54 59.22941	495838.015	292901.577	.033	C	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.21990	92 54 59.22269	495838.487	292900.932	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 32.41563	92 54 58.49759			.100	1	CLASSICAL SURVEY	1991	17504
46 15 32.41505	92 54 58.50198			.100	1	CLASSICAL SURVEY	1977	15955

RUTLEDGE RM 2

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961953.561	790001.366	1661542.067	16807128.010	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961953.506	790001.364	1661542.012	16807128.008	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961953.519	790001.331	1661542.024	16807127.975	.033	C	GPS - STATIC	1999	GPS917
2961953.519	790001.331	1661542.024	16807127.975	.033	C	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2961954.002	790000.695	1661542.497	16807127.332	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2337348.174	461935.008			.100	1	CLASSICAL SURVEY	1991	17504
2337347.867	461934.944			.100	1	CLASSICAL SURVEY	1977	15955

Mn/DOT Name: S 154 **NGS Name:** S 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0492 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461911.00	925011.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1971) **Stamping:** S 154 1935

AT WILLOW RIVER, AT A PUBLIC SCHOOL, 0.2 MILE EAST ON MAIN STREET FROM THE JUNCTION OF MAIN STREET, 3.0 FEET NORTH OF THE SOUTH ENTRANCE WALK, IN A FENCE CORNER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1046.920	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1046.504	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1046.504	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.233 12B = -91.207 09 = -91.105 03 = -90.958

*** No Horizontal Positions in the Database ***

Mn/DOT Name: SANDSTONE
NGS Name: SANDSTONE
County: PINE, MN (Sheet 2)

NGS ACRN: RN1627 Get Map
NGS Quad / Sta Num : 46092332/1019
USGS Quad: SANDSTONE SOUTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	42 N	20 W	460659.54	925045.27		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	NGS

Description: (1993) **Stamping:** SANDSTONE 1952 1960

1.5 MILES SOUTHEAST OF SANDSTONE, 1.0 MILE EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64 TO TRUNK HIGHWAY 123 MILEPOINT 2.0, THEN 0.85 MILE SOUTH ON COUNTY ROAD 29, 138.0 FEET EAST OF A 14.0 INCH DIAMETER PINE TREE, 95.0 FEET WEST OF COUNTY ROAD 29, 85.01 FEET SOUTHWEST OF SANDSTONE RM 1, 81.84 FEET NORTHWEST OF SANDSTONE RM 2, 74.0 FEET NORTHWEST OF A TELEPHONE POLE, 3.9 FEET EAST-NORTHEAST OF A WITNESS POST.

Station Notes
IN 1993, GEODETIC UNIT FOUND SANDSTONE RM 2 HAD BEEN HIT BY SOMETHING.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			997.229	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1086.989	.262		997.400	.197	1996	GPS - RTRN	2008	RTRN2008
			997.331	.013	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			997.419	.066	1996	GPS - STATIC	1999	GPS917
1087.006	.131		997.419	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1086.710						GPS - STATIC	1994	HORZ
1089.204						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -89.783 12B = -89.796 09 = -89.695 03 = -89.586

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 59.54272	92 50 45.26796	513718.920	240968.511	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 59.54255	92 50 45.26873	513718.866	240968.493	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 59.54270	92 50 45.26782	513718.930	240968.509	.131	3	GPS - RTRN	2008	RTRN2008
46 06 59.54246	92 50 45.26850	513718.884	240968.485	.033	C	GPS - STATIC	1999	GPS917
46 06 59.54246	92 50 45.26850	513718.882	240968.484	.033	C	ADJUSTMENT	1999	17648
46 06 59.53780	92 50 45.26204	513719.338	240968.012	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 59.53701	92 50 45.26219	513719.327	240967.932	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 59.72300	92 50 44.54700			.100	1	CLASSICAL SURVEY	1961	12611

SANDSTONE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980714.774	738386.728	1679480.377	16755240.499	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980714.720	738386.710	1679480.323	16755240.482	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980714.784	738386.726	1679480.387	16755240.497	.131	3	GPS - RTRN	2008	RTRN2008
2980714.736	738386.701	1679480.339	16755240.473	.033	C	GPS - STATIC	1999	GPS917
2980714.736	738386.701	1679480.340	16755240.473	.033	C	ADJUSTMENT	1999	17648
2980715.200	738386.237	1679480.795	16755240.002	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980715.190	738386.157	1679480.785	16755239.922	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2356109.332	410319.823			.100	1	CLASSICAL SURVEY	1961	12611

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE-RN1627-3W-24JAN2008.jpg	W	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE-RN1627-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE-RN1627-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SANDSTONE AZ MK

Mn/DOT Name: SANDSTONE AZ MK

NGS Name: SANDSTONE AZ MK

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	14	42 N	20 W	460731.00	925042.00		

NGS ACRN: CJ2733 Get Map
NGS Quad / Sta Num : 46092331/1019
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	1960	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 8 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1952) **Stamping:** SANDSTONE 1952

1.5 MILES SOUTHEAST OF SANDSTONE, AT THE SANDSTONE STATE HOSPITAL, 1.0 MILE EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64 TO TRUNK HIGHWAY 123 MILEPOINT 2.0, THEN 0.85 MILE SOUTH ON COUNTY ROAD 29, 117.0 FEET EAST OF THE APPROXIMATE CENTERLINE OF PRISON ROAD (COUNTY ROAD 29), 6.0 FEET WEST OF A POWER POLE, 2.0 FEET SOUTH OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.819 12B = -89.836 09 = -89.731 03 = -89.623

SANDSTONE AZ MK RESET

Mn/DOT Name: SANDSTONE AZ MK RESET **NGS Name:** SANDSTONE AZ MK RESET

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	14	42 N	20 W	460731.00	925043.00		

NGS ACRN: CJ2734 Get Map
NGS Quad / Sta Num : 46092331/1019
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 5 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1960) **Stamping:** SANDSTONE 1952 RESET 1960

1.5 MILES SOUTHEAST OF SANDSTONE, AT THE SANDSTONE STATE HOSPITAL, 1.0 MILE EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64 TO TRUNK HIGHWAY 123 MILEPOINT 2.0, THEN 0.85 MILE SOUTH ON COUNTY ROAD 29, 45.0 FEET EAST OF THE CENTERLINE OF PRISON ROAD, AT A DRIVEWAY TO FIRE NUMBER 54533, 4.0 FEET SOUTH OF A POWER POLE, 1.0 FOOT NORTH OF A WITNESS POST.

Station Notes

IN 10-09-2008 DETERMINED THAT THERE IS NO REAL-TIME REFERENCE NETWORK (RTRN) AND NO BASE DATA.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.819 12B = -89.836 09 = -89.731 03 = -89.623

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_AZ_MK_RESET-CJ2734-3E-21MAY2009.jpg	E	May 21, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_AZ_MK_RESET-CJ2734-2-21MAY2009.jpg		May 21, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_AZ_MK_RESET-CJ2734-1-21MAY2009.jpg		May 21, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SANDSTONE LAND O LAKES CRM STK

Mn/DOT Name: SANDSTONE LAND O LAKES CRM STK **NGS Name:** SANDSTONE LAND O LAKES CRM STK

County: PINE, MN (Sheet 2)

NGS ACRN: RN1625 Get Map
NGS Quad / Sta Num : 46092331/1033
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	20 W	460803.00	925201.06		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	STACK	NGS

Description: (1961)

Stamping:

IN SANDSTONE, 0.3 MILE NORTH ALONG COUNTY ROAD 64 FROM THE JUNCTION OF COUNTY ROAD 64 AND TRUNK HIGHWAY 123, THEN 0.1 MILE SOUTH ON TRUNK HIGHWAY 23

Station Notes

IN 10-09-2008 DETERMINED THAT WHILE THE BUILDING STILL EXISTS, THE STACK IS GONE.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.010 12B = -90.020 09 = -89.915 03 = -89.790

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 03.00256	92 52 01.06409	508376.395	247394.290	.328	4	ADJUSTMENT	1999	17648
46 08 02.99774	92 52 01.05765	508376.849	247393.801	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 02.99753	92 52 01.05832	508376.801	247393.780	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 08 03.18800	92 52 00.34900			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975264.113	744719.782	1674132.130	16761656.716	.328	4	ADJUSTMENT	1999	17648
2975264.575	744719.302	1674132.584	16761656.229	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2975264.528	744719.280	1674132.537	16761656.208	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2350658.076	416653.338			.100	4	CLASSICAL SURVEY	1954	10724

SANDSTONE MUNICIPAL TANK

Mn/DOT Name: SANDSTONE MUNICIPAL TANK
NGS Name: SANDSTONE MUNICIPAL TANK
County: PINE, MN (Sheet 2)

NGS ACRN: RN1623 Get Map
NGS Quad / Sta Num : 46092331/1034
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	42 N	20 W	460754.85	925138.04		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=?	YES			NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	NGS

Description: (1961)

Stamping:

IN THE NORTHEAST PART OF SANDSTONE, 0.2 MILE EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64, THEN 0.2 MILE ON PARK AVENUE, ON THE EAST END OF 6TH STREET.

Station Notes

THE LOCATION IS AN ELEVATED TANK, AND NOT ON MAP.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.957 12B = -89.970 09 = -89.865 03 = -89.744

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 54.85037	92 51 38.04401	509998.058	246569.182	.328	4	ADJUSTMENT	1999	17648
46 07 54.84564	92 51 38.03773	509998.500	246568.703	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 54.84539	92 51 38.03841	509998.452	246568.677	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 55.03300	92 51 37.32300			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2976899.417	743922.528	1675754.113	16760834.014	.328	4	ADJUSTMENT	1999	17648
2976899.868	743922.056	1675754.556	16760833.536	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2976899.820	743922.030	1675754.508	16760833.510	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2352293.852	415855.816			.100	4	CLASSICAL SURVEY	1954	10724

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_MUNICIPAL_TANK-RN1623-3E-09OCT2008.jpg	E	Oct 9, 2008
Monument:			
Disk:			

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SANDSTONE RADIO MAST

Mn/DOT Name: SANDSTONE RADIO MAST **NGS Name:** SANDSTONE RADIO MAST

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	42 N	20 W	460835.41	925202.14		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092331/1044
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1964	2017	GOOD	Horz=NO Vert=NO	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	RADIO/TV MAST	MNDT

Description: (2010) **Stamping:**

IN SANDSTONE, 0.75 MILE NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123 IN SANDSTONE, AT TRUNK HIGHWAY 23 MILEPOINT 287.1, 1,000.0 FEET WEST OF TRUNK HIGHWAY 23.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.056 12B = -90.069 09 = -89.960 03 = -89.839

Lat/Lon and County Coordinates (Feet)

NAD27

Geodetic Position Latitude	Longitude	X	Y	Acc	Order	Determination Method	Project Info Year	Reference
46 08 35.59873	92 52 01.41298			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD27

MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Project Info Year	Reference
2350525.840	419934.460			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RADIO_MAST-3SW-09OCT2008.jpg	SW	Oct 9, 2008
Monument:			
Disk:			

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SANDSTONE RM 1

Mn/DOT Name: SANDSTONE RM 1 **NGS Name:** SANDSTONE RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2735 Get Map
NGS Quad / Sta Num : 46092332/1019
USGS Quad: SANDSTONE SOUTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	42 N	20 W	460700.29	925044.73		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2008) **Stamping:** SANDSTONE NO 1 1952

1.5 MILES SOUTHEAST OF SANDSTONE, AT THE SANDSTONE STATE HOSPITAL, 1.0 MILE EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64 TO TRUNK HIGHWAY 123 MILEPOINT 2.0, THEN 0.85 MILE SOUTH ON COUNTY ROAD 29, 56.3 FEET WEST OF COUNTY ROAD 29, 85.01 FEET NORTHEAST OF STATION SANDSTONE, 0.6 FOOT EAST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.738	.262		994.152	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.783 12B = -89.796 09 = -89.695 03 = -89.586

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 00.29498	92 50 44.73438	513756.459	241044.743	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980751.004	738463.580	1679517.804	16755316.745	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RM_1-CJ2735-3W-24JAN2008.jpg	W	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RM_1-CJ2735-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RM_1-CJ2735-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SANDSTONE RM 2

Mn/DOT Name: SANDSTONE RM 2 **NGS Name:** SANDSTONE RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2736 Get Map
NGS Quad / Sta Num : 46092332/1019
USGS Quad: SANDSTONE SOUTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	42 N	20 W	460659.32	925045.13		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2008) **Stamping:** SANDSTONE NO 2 1952

1.5 MILES SOUTHEAST OF SANDSTONE, AT THE SANDSTONE STATE HOSPITAL, 1.0 MILE EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64, TO TRUNK HIGHWAY 123 MILEPOINT 2.0, THEN 0.85 MILE SOUTH ON COUNTY ROAD 29, 81.84 FEET SOUTHEAST OF STATION SANDSTONE, 60.6 FEET WEST OF COUNTY ROAD 29, 1.0 FOOT EAST OF A STEEL WITNESS POST.

Station Notes

THE MARK HAS BEEN HIT BY MOWER, BUT STILL STABLE.
IN 1993 SANDSTONE RM 2 APPEARED TO HAVE BEEN HIT, BUT IT IS STILL STABLE.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.541	.262		993.955	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -89.780 12B = -89.796 09 = -89.691 03 = -89.586

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 58.80091	92 50 44.80832	513751.353	240893.385	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2980748.479	738312.175	1679512.891	16755165.448	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RM_2-CJ2736-3W-24JAN2008.jpg	W	Jan 24, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RM_2-CJ2736-2-24JAN2008.jpg		Jan 24, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_RM_2-CJ2736-1-24JAN2008.jpg		Jan 24, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SANDSTONE STATE HOSPITAL STACK

Mn/DOT Name: SANDSTONE STATE HOSPITAL STACK **NGS Name:** SANDSTONE STATE HOSPITAL STACK

County: PINE, MN (Sheet 2)

NGS ACRN: RN1626 Get Map
NGS Quad / Sta Num : 46092332/1035
USGS Quad: SANDSTONE SOUTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	22	42 N	20 W	460631.41	925114.54		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	STACK	NGS

Description: (1960)

Stamping:

2.6 MILES SOUTHEAST OF SANDSTONE, 1.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64, THEN 2.2 MILES SOUTH ON COUNTY ROAD 29

Station Notes

IN 10-09-2008 DETERMINED THAT STACK NO LONGER EXISTS.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.810 12B = -89.823 09 = -89.718 03 = -89.609

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 31.41419	92 51 14.53581	511658.640	238117.703	.328	4	ADJUSTMENT	1999	17648
46 06 31.41056	92 51 14.52808	511659.185	238117.335	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 31.41453	92 51 14.52391	511659.478	238117.738	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 31.60200	92 51 13.80700			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978703.616	735501.540	1677424.592	16752388.360	.328	4	ADJUSTMENT	1999	17648
2978704.167	735501.183	1677425.138	16752387.993	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978704.454	735501.590	1677425.431	16752388.396	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2354098.660	407435.418			.100	4	CLASSICAL SURVEY	1954	10724

SANDSTONE STATE HOSPITAL TANK

Mn/DOT Name: SANDSTONE STATE HOSPITAL TANK **NGS Name:** SANDSTONE STATE HOSPITAL TANK

County: PINE, MN (Sheet 2)

NGS ACRN: RN1628 Get Map
NGS Quad / Sta Num : 46092332/1036
USGS Quad: SANDSTONE SOUTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	22	42 N	20 W	460632.94	925112.15		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=NO	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	ELEVATED TANK	NGS

Description: (1961) **Stamping:**

3.0 MILES SOUTHEAST OF SANDSTONE, 1.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 64, THEN 1.5 MILES SOUTH ON COUNTY ROAD 29.

Station Notes

THE LOCATION IS AT THE END OF THE PRISON ROAD, INSIDE PRISON PROPERTY.

*** No Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -89.806 12B = -89.819 09 = -89.714 03 = -89.606

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 32.93515	92 51 12.14818	511826.782	238271.879	.328	4	ADJUSTMENT	1999	17648
46 06 32.93060	92 51 12.14149	511827.254	238271.418	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 32.93030	92 51 12.14186	511827.228	238271.388	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 33.11300	92 51 11.42800			.100	4	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978869.087	735658.542	1677592.467	16752542.679	.328	4	ADJUSTMENT	1999	17648
2978869.567	735658.090	1677592.939	16752542.219	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978869.541	735658.059	1677592.913	16752542.189	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2354263.546	407591.400			.100	4	CLASSICAL SURVEY	1954	10724

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SANDSTONE_STATE_HOSPITAL_TANK-RN1628-3SW-09OCT2008.jpg	SW	Oct 9, 2008
Monument:			
Disk:			

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: SECOND
NGS Name: SECOND
County: PINE, MN (Sheet 2)

NGS ACRN: DL4778 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	1	44 N	20 W	461946.90	924918.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)
Disk Type: METAL ROD (WITH REMOVABLE ID DISK)
Mon. Agency: MNDT

Description: (2008)
Stamping: SECOND 2008

1.0 MILE NORTHEAST OF WILLOW RIVER, 0.95 MILE NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER, AT INTERSTATE HIGHWAY 35 MILEPOINT 206.45, 82.5 FEET NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 67.2 FEET SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 1.8 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1050.283	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1050.287	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			959.011	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1050.293	.131		959.116	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1050.293	.131		959.227	.066	1996	GPS - STATIC	2009	HMOOSE
1050.293	.131		959.116	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.276 12B = -91.256 09 = -91.151 03 = -910000

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 46.90408	92 49 18.72635	519739.444	318711.540	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 46.90398	92 49 18.72718	519739.386	318711.530	.033	C	ADJUSTMENT	2009	GPS2566
46 19 46.90398	92 49 18.72718	519739.386	318711.530	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 46.90355	92 49 18.72713	519739.390	318711.487	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985408.549	816211.611	1685400.126	16832956.523	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985408.490	816211.600	1685400.068	16832956.513	.033	C	ADJUSTMENT	2009	GPS2566
2985408.490	816211.600	1685400.068	16832956.513	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985408.495	816211.556	1685400.072	16832956.469	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SECOND-DL4778-3W-16DEC2008.jpg	W	Dec 16, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SECOND-DL4778-2-16DEC2008.jpg		Dec 16, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SECOND-DL4778-1-16DEC2008.jpg		Dec 16, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

SHARLOW

Mn/DOT Name: SHARLOW
NGS Name: SHARLOW
County: PINE, MN (Sheet 2)

NGS ACRN: DL4780 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	42 N	20 W	460615.95	925317.46	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** SHARLOW 2008

1.5 MILES SOUTH-SOUTHWEST OF SANDSTONE, 1.4 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 189.9, 76.7 FEET WEST-NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 58.2 FEET EAST-SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 2.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1087.121	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1087.121	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1087.025	.262		996.996	.197	2011	GPS - OPUS	2020	GPSBM
1087.176	.262		997.140	.197	2011	GPS - RTRN	2020	RTRN2020
			997.068	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1087.137	.131		997.163	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1087.104	.131		997.298	.066	1996	GPS - STATIC	2009	HMOOSE
1087.104	.131		997.163	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.029 12B = -90.039 09 = -89.934 03 = -89.810

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 15.94825	92 53 17.46366	502997.352	236547.809	.131	3	GPS - OPUS	2020	GPSBM
46 06 15.94797	92 53 17.46310	502997.391	236547.781	.131	3	GPS - RTRN	2020	RTRN2020
46 06 15.94928	92 53 17.46328	502997.379	236547.913	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 15.94917	92 53 17.46405	502997.324	236547.902	.033	C	ADJUSTMENT	2009	GPS2566
46 06 15.94917	92 53 17.46405	502997.324	236547.902	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 15.94912	92 53 17.46360	502997.356	236547.897	.033	C	GPS - STATIC	2009	HMOOSE

SHARLOW

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970071.318	733784.435	1668769.108	16750808.269	.131	3	GPS - OPUS	2020	GPSBM
2970071.358	733784.407	1668769.147	16750808.241	.131	3	GPS - RTRN	2020	RTRN2020
2970071.343	733784.540	1668769.135	16750808.374	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970071.289	733784.528	1668769.080	16750808.362	.033	C	ADJUSTMENT	2009	GPS2566
2970071.289	733784.528	1668769.080	16750808.362	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970071.321	733784.523	1668769.112	16750808.358	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SHARLOW-DL4780-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SHARLOW-DL4780-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/SHARLOW-DL4780-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

STA 4842+94

Mn/DOT Name: STA 4842+94 **NGS Name:** STA 4842+94

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461924.00	925019.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1955	2008	DESTROYED	Horz=NO Vert=NO	NO	8820		SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
BRIDGE HEADWALL	SURVEY DISK	MNDT

Description: (1955) **Stamping:**

IN THE SOUTHEAST CORNER OF WILLOW RIVER, 0.3 MILE ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 156.

Station Notes

THE MARK WAS FOUND WITH THE CONCRETE BROKEN OFF, THE DISK WAS REMOVED AND TURNED THE DISK IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1032.219	.033	3				VERTICAL CONTROL SURVEY	1955	CS5807

Geoid Separations(ft): GEOID18 = -91.247 12B = -91.220 09 = -91.115 03 = -90.968

*** No Horizontal Positions in the Database ***

STARKO MNDT

Mn/DOT Name: STARKO MNDT **NGS Name:** STARKO

County: PINE, MN (Sheet 2)

NGS ACRN: AF9154 Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	19	43 N	21 W	461206.45	930207.50	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2002) **Stamping:** STARKO 1991

5.6 MILES WEST OF FINLAYSON, 5.0 MILES ALONG TRUNK HIGHWAY 18 TO THE JUNCTION WITH COUNTY ROAD 37, 0.6 MILE WEST ALONG COUNTY ROAD 37, 182.2 FEET WEST-NORTHWEST OF A POWER POLE, 56.8 FEET EAST-NORTHEAST OF CABLE MARKER NUMBER D1305, 33.5 FEET SOUTH OF COUNTY ROAD 37, 13.5 FEET WEST OF AN ENTRANCE, 2.5 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1105.523	.016	2/1				VERTICAL ADJUSTMENT	2013	00000795
1105.523	.016	2/1				VERTICAL CONTROL SURVEY	2010	VNABE
1105.523	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1105.510	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1105.129	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1105.467	.262		1014.726	.197	2011	GPS - OPUS	2019	GPSBM
			1014.785	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1014.896	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1105.510	.131		1014.998	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1105.510	.131		1014.998	.066	1996	GPS - STATIC	2002	HPINE
1105.575	.131		1014.998	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1105.510	.131		1014.998	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS899

Geoid Separations(ft): GEOID18 = -90.741 12B = -90.699 09 = -90.577 03 = -90.453

STARKO MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.44998	93 02 07.49630	465708.704	272084.021	.131	3	GPS - OPUS	2019	GPSBM
46 12 06.44932	93 02 07.49641	465708.697	272083.955	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.44936	93 02 07.49663	465708.681	272083.959	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.44936	93 02 07.49583	465708.737	272083.959	.033	C	ADJUSTMENT	2003	GPS1839
46 12 06.44936	93 02 07.49582	465708.738	272083.959	.033	C	GPS - STATIC	2002	HPINE
46 12 06.44936	93 02 07.49582	465708.738	272083.959	.033	C	ADJUSTMENT	1999	17648
46 12 06.44936	93 02 07.49582	465708.738	272083.959	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 06.44219	93 02 07.48852	465709.250	272083.231	.066	2	GPS - STATIC	1991	HFIN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932186.947	768676.022	1631452.351	16786281.836	.131	3	GPS - OPUS	2019	GPSBM
2932186.940	768675.955	1631452.344	16786281.769	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932186.924	768675.959	1631452.328	16786281.773	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932186.981	768675.960	1631452.384	16786281.773	.033	C	ADJUSTMENT	2003	GPS1839
2932186.981	768675.960	1631452.385	16786281.773	.033	C	GPS - STATIC	2002	HPINE
2932186.981	768675.960	1631452.385	16786281.773	.033	C	ADJUSTMENT	1999	17648
2932186.981	768675.960	1631452.385	16786281.773	.033	C	ADJUSTMENT	1998	GPS899

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2932187.506	768675.242	1631452.898	16786281.047	.066	2	GPS - STATIC	1991	HFIN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STARKO-AF9154-3S-12DEC2019.jpg	S	Dec 12, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STARKO-AF9154-2-12DEC2019.jpg		Dec 12, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STARKO-AF9154-1-12DEC2019.jpg		Dec 12, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: STEPAN **NGS Name:** STEPAN

County: PINE, MN (Sheet 2)

NGS ACRN: DL4785 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	42 N	20 W	460907.15	925302.66	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2023	DISTURBED	Horz=YES Vert=YES	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** STEPAN 2008

2.0 MILES NORTH OF SANDSTONE, 1.9 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 193.25, 72.2 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 27.3 FEET NORTHWEST OF A FENCE LINE, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Notes

THERE ARE TREES 20.0 FEET NORTH AND 40.0 FEET TO THE SOUTH, GPS'D FOR HMOOSE PROJECT. DISTRICT 1 SURVEYS, DULUTH, NOTICED THAT THIS MONUMENT WAS HIT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1132.321	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1132.327	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1042.107	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1132.314	.131		1042.193	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1132.314	.131		1042.321	.066	1996	GPS - STATIC	2009	HMOOSE
1132.314	.131		1042.193	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.207 12B = -90.207 09 = -90.108 03 = -89.977

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 07.15355	92 53 02.66084	504036.970	253891.697	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 07.15361	92 53 02.66156	504036.919	253891.703	.033	C	ADJUSTMENT	2009	GPS2566
46 09 07.15361	92 53 02.66156	504036.919	253891.703	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 07.15348	92 53 02.66115	504036.948	253891.689	.033	C	GPS - STATIC	2009	HMOOSE

STEPAN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970815.085	751141.538	1669786.450	16768145.786	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970815.034	751141.543	1669786.400	16768145.792	.033	C	ADJUSTMENT	2009	GPS2566
2970815.034	751141.543	1669786.400	16768145.792	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2970815.063	751141.530	1669786.429	16768145.779	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STEPAN-DL4785-3NW-01DEC2023.jpg	NW	Dec 1, 2023
Monument:			
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STEPAN-DL4785-1-01DEC2023.jpg		Dec 1, 2023

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

STURGEON

Mn/DOT Name: STURGEON **NGS Name:** STURGEON

County: PINE, MN (Sheet 2)

NGS ACRN: RN1610 Get Map
NGS Quad / Sta Num : 46092314/1020
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	10	45 N	19 W	462414.44	924337.39		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	FAIR	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (2008) **Stamping:** STURGEON 1952

4.0 MILES SOUTHEAST OF MOOSE LAKE, 3.0 MILES SOUTH ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 73, THEN 1.0 MILE SOUTH ON PALON ROAD, 85.61 FEET WEST OF STURGEON RM 1, 88.17 FEET (SLOPE) NORTHEAST OF STURGEON RM 2, 12.0 FEET EAST-SOUTHEAST OF AN OAK TREE, 9.0 FEET NORTH OF A FIELD ROAD, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes

THE NORTHEAST SIDE OF THE MONUMENT HAS A BIG CHIP OF CONCRETE TAKEN OUT. THE MARK IS IN A STABLE CONDITION.
THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) POSITION DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1169.282	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1169.683	.131		1078.344	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.634 12B = -91.634 09 = -91.519 03 = -91.352

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 14.44147	92 43 37.39376	543634.800	345853.245	.033	1	ADJUSTMENT	1999	17648
46 24 14.43808	92 43 37.38880	543635.148	345852.902	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 14.43790	92 43 37.38878	543635.150	345852.884	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 24 14.62900	92 43 36.67500			.100	1	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3008834.531	843753.128	1709250.186	16860116.306	.033	1	ADJUSTMENT	1999	17648
3008834.885	843752.792	1709250.535	16860115.964	.033	1	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3008834.887	843752.773	1709250.537	16860115.946	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2384229.549	515686.462			.100	1	CLASSICAL SURVEY	1961	12611

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON-RN1610-3N-07MAY2008.jpg	N	May 7, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON-RN1610-2-07MAY2008.jpg		May 7, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON-RN1610-1-07MAY2008.jpg		May 7, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

STURGEON AZ MK

Mn/DOT Name: STURGEON AZ MK
NGS Name: STURGEON AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: CJ2850 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	10	45 N	19 W	462405.00	924333.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	NGS

Description: (1952) **Stamping:** STURGEON 1952

4.2 MILES SOUTHEAST OF MOOSE LAKE, 2.8 MILES SOUTH ON COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 73 AT MOOSE LAKE, THEN 1.2 MILES SOUTH ON PALON ROAD, 0.2 MILE SOUTH OF STATION STURGEON, 21.0 FEET WEST OF PALON ROAD, AT THE NORTH EDGE OF A PILE OF ROCKS, 1.5 FEET NORTH OF A WITNESS POST.

Station Notes

THE MARK WAS COMPLETELY OUT OF THE GROUND, THE DISK WAS REMOVED AND TURNED IN TO THE CENTRAL OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1134.506	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -91.621 12B = -91.621 09 = -91.502 03 = -91.338

*** No Horizontal Positions in the Database ***

STURGEON RM 1

Mn/DOT Name: STURGEON RM 1 **NGS Name:** STURGEON RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2851 Get Map
NGS Quad / Sta Num : 46092314/1020
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	10	45 N	19 W	462414.48	924336.17		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 5 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2008) **Stamping:** STURGEON NO 1 1952

4.0 MILES SOUTHEAST OF MOOSE LAKE, 2.8 MILES SOUTH ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 73, THEN 1.0 MILE SOUTH ON PALON ROAD, 250.0 FEET WEST OF PALON ROAD, 85.61 FEET EAST OF STATION STURGEON, 10.0 FEET NORTH OF AN OLD FIELD ROAD, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

THERE WAS NO REAL TIME REFERENCE NETWORK (RTRN) POSITION DUE TO TREES.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1167.481	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -91.637 12B = -91.634 09 = -91.519 03 = -91.355

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON_RM_1-CJ2851-3N-07MAY2008.jpg	N	May 7, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON_RM_1-CJ2851-2-07MAY2008.jpg		May 7, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON_RM_1-CJ2851-1-07MAY2008.jpg		May 7, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

STURGEON RM 2

Mn/DOT Name: STURGEON RM 2 **NGS Name:** STURGEON RM 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	10	45 N	19 W	462413.82	924338.28		

NGS ACRN: AI5008 Get Map
NGS Quad / Sta Num : 46092314/1020
USGS Quad: HANGING HORN LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2008) **Stamping:** STURGEON NO 2 1952

4.0 MILES SOUTHEAST OF MOOSE LAKE, 2.8 MILES SOUTH ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 73, THEN 1.0 MILE SOUTH ON PALON ROAD, THEN 0.1 MILE WEST ON AN OLD FARM ROAD, 1.0 FOOT NORTH OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.634 12B = -91.634 09 = -91.519 03 = -91.352

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON_RM_2-AI5008-3W-07MAY2008.jpg	W	May 7, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON_RM_2-AI5008-2-07MAY2008.jpg		May 7, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/STURGEON_RM_2-AI5008-1-07MAY2008.jpg		May 7, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: T 154 **NGS Name:** T 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0493 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	44 N	20 W	461835.00	924944.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (1971) **Stamping:** T-154 1935

0.9 MILE SOUTHEAST OF WILLOW RIVER, 0.5 MILE EAST ON COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43 AT WILLOW RIVER, THEN 0.5 MILE SOUTH ON PARK DRIVE, TO THE CURVE EAST, THEN 0.1 MILE SOUTH ON A DRIVEWAY, 603.0 FEET WEST OF INTERSTATE HIGHWAY 35, 33.0 FEET EAST OF A DRIVEWAY, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1056.487	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1056.074	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1056.074	.007	1				VERTICAL CONTROL SURVEY	1972	L22567
1056.074	.007	1				VERTICAL CONTROL SURVEY	1972	L133 MINN
1056.074	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.194 12B = -91.165 09 = -91.069 03 = -90.918

*** No Horizontal Positions in the Database ***

TBM 1 A L23805

Mn/DOT Name: TBM 1 A L23805 **NGS Name:** TBM 1 A

County: PINE, MN (Sheet 2)

NGS ACRN: AL9425 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	43 N	20 W	461331.00	924945.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

6.5 MILES SOUTH OF WILLOW RIVER, 6.4 MILES SOUTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.561 12B = -90.564 09 = -90.443 03 = -90.318

TBM 1 L3440

Mn/DOT Name: TBM 1 L3440 **NGS Name:** TBM 1

County: PINE, MN (Sheet 2)

NGS ACRN: BI8996 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	18	42 N	20 W	460701.00	925538.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

3.0 MILES EAST OF SANDSTONE, 0.5 MILE EAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 123, THEN 0.5 MILE EAST ON COUNTY ROAD 61, THEN 1.5 MILES EAST ON COUNTY ROAD 61.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.321 12B = -90.308 09 = -90.210 03 = -90.069

TBM 1 L7030-10

Mn/DOT Name: TBM 1 L7030-10 **NGS Name:** TBM 1

County: PINE, MN (Sheet 2)

NGS ACRN: BC4834 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	29	45 N	18 W	462137.00	923923.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

3.7 MILES NORTHWEST OF KERRICK, 4.2 MILES WEST ON COUNTY ROAD 46 FROM THE JUNCTION OF COUNTY ROAD 46 AND TRUNK HIGHWAY 23.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.289 12B = -91.302 09 = -91.151 03 = -91.017

TBM 1 L7030-11

Mn/DOT Name: TBM 1 L7030-11 **NGS Name:** TBM 1

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	44 N	19 W	461809.00	924638.00		

NGS ACRN: BC5362 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

3.2 MILES EAST OF WILLOW RIVER, 4.0 MILES EAST ALONG COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 43 AND COUNTY ROAD 61.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.092 12B = -91.086 09 = -90.984 03 = -90.827

TBM 1 L7030-2

Mn/DOT Name: TBM 1 L7030-2 **NGS Name:** TBM 1

County: PINE, MN (Sheet 2)

NGS ACRN: BC4973 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	44 N	20 W	461532.00	924936.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

4.1 MILES SOUTH OF WILLOW RIVER, 1.8 MILES SOUTH ALONG COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 43 AND INTERSTATE HIGHWAY 35, THEN 3.0 MILES SOUTH ON COUNTY ROAD 152, THEN 1.1 MILES WEST ON COUNTY ROAD 33.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.850 12B = -90.850 09 = -90.731 03 = -90.587

TBM 11 L3434

Mn/DOT Name: TBM 11 L3434 **NGS Name:** TBM 11

County: PINE, MN (Sheet 2)

NGS ACRN: BI9320 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	7	45 N	19 W	462346.00	924802.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.5 MILES NORTHEAST OF STURGEON LAKE, 0.6 MILE EAST ALONG COUNTY ROAD 161 FROM THE JUNCTION OF COUNTY ROAD 161 AND MAIN STREET, THEN LEFT ONTO A HORIZON TRAIL.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.555 12B = -91.545 09 = -91.447 03 = -91.253

TBM 12 L3434

Mn/DOT Name: TBM 12 L3434 **NGS Name:** TBM 12

County: PINE, MN (Sheet 2)

NGS ACRN: BI9321 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	13	45 N	20 W	462235.00	924842.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

IN STURGEON LAKE, 0.6 MILE EAST ALONG LAKETOWN ROAD FROM THE JUNCTION OF COUNTY ROAD 46 AND LAKETOWN ROAD, THEN 0.3 MILE SOUTH ON GENERAL ANDREWS DRIVE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.460 12B = -91.447 09 = -91.348 03 = -91.174

TBM 13 L3434

Mn/DOT Name: TBM 13 L3434 **NGS Name:** TBM 13

County: PINE, MN (Sheet 2)

NGS ACRN: BI9322 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	45 N	20 W	462039.00	924948.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.8 MILES NORTHEAST OF WILLOW RIVER, 1.5 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 41, THEN 0.3 MILE EAST ON DAGEL LAKE ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.322 12B = -91.302 09 = -91.194 03 = -91.037

TBM 14 L3434

Mn/DOT Name: TBM 14 L3434 **NGS Name:** TBM 14

County: PINE, MN (Sheet 2)

NGS ACRN: BI9323 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461913.00	925036.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

IN WILLOW RIVER, AT THE JUNCTION OF CREEK DRIVE AND COUNTY ROAD 158, 151.0 FEET NORTH ALONG COUNTY ROAD 158.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.230 12B = -91.204 09 = -91.102 03 = -90.955

TBM 154 A L22567

Mn/DOT Name: TBM 154 A L22567 **NGS Name:** TBM 154 A

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	44 N	19 W	461532.00	924656.00		

NGS ACRN: AM7396 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

4.0 MILES EAST ALONG SWANSON ROAD FROM THE JUNCTION OF SWANSON ROAD AND CENTRAL AVENUE, AT THE JUNCTION OF COUNTY ROAD 33 (BEAVER TAIL ROAD).

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.715 12B = -90.731 09 = -90.613 03 = -90.459

TBM 154 B L22567

Mn/DOT Name: TBM 154 B L22567 **NGS Name:** TBM 154 B

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	44 N	20 W	461556.00	925157.00		

NGS ACRN: AM7394 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

1.2 MILES NORTHEAST OF RUTLEDGE, 0.4 MILE NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39 AND RUTLEDGE, THEN 121.0 FEET NORTHWEST ON THE WILLARD MUNGER STATE TRAIL.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.968 12B = -90.945 09 = -90.833 03 = -90.689

TBM 2 L3440

Mn/DOT Name: TBM 2 L3440 **NGS Name:** TBM 2

County: PINE, MN (Sheet 2)

NGS ACRN: BI8997 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	42 N	21 W	460458.00	925557.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

5.0 MILES NORTH OF HINCKLEY, 4.6 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 18 IN HINCKLEY.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.259 12B = -90.256 09 = -90.147 03 = -90.010

TBM 2 L7030-2

Mn/DOT Name: TBM 2 L7030-2 **NGS Name:** TBM 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	34	44 N	19 W	461443.00	924405.00		

NGS ACRN: BC4974 Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

4.7 MILES NORTHWEST OF ASKOV, 5.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 IN ASKOV, THEN 1.0 MILE WEST ON COUNTY ROAD 149/JACKSON ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.348 12B = -90.384 09 = -90.249 03 = -90.115

TBM 2 L7030-9

Mn/DOT Name: TBM 2 L7030-9 **NGS Name:** TBM 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	5	45 N	18 W	462435.00	923925.00		

NGS ACRN: BC4459 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

5.7 MILES NORTHWEST OF DUQUETTE, 5.3 MILES WEST ALONG COUNTY ROAD 47 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47 IN DUQUETTE, THEN 2.4 MILES NORTH COUNTY ROAD 49 (WILLOW HAY ROAD).

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.653 12B = -91.653 09 = -91.519 03 = -91.381

TBM 3 L3440

Mn/DOT Name: TBM 3 L3440 **NGS Name:** TBM 3

County: PINE, MN (Sheet 2)

NGS ACRN: BI8998 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	36	42 N	21 W	460417.00	925604.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

4.2 MILES NORTH OF HINCKLEY, 3.8 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 18 IN HINCKLEY, THEN 0.2 MILE WEST ON TOWNSHIP ROAD 128 (HAPPYS DRIVE).

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.243 12B = -90.246 09 = -90.131 03 = -89.997

TBM 3 L7030-2

Mn/DOT Name: TBM 3 L7030-2 **NGS Name:** TBM 3

County: PINE, MN (Sheet 2)

NGS ACRN: BC4975 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	8	45 N	17 W	462402.00	923046.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

3.0 MILES NORTHEAST OF DUQUETTE, 2.9 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 47 AND TRUNK HIGHWAY 23 IN DUQUETTE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.125 12B = -91.132 09 = -90.955 03 = -90.886

TBM 3 L7030-9

Mn/DOT Name: TBM 3 L7030-9 **NGS Name:** TBM 3

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	17	45 N	18 W	462230.00	923829.00		

NGS ACRN: BC4460 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

4.2 MILES WEST OF DUQUETTE, 4.3 MILES WEST ALONG COUNTY ROAD 47 (OAK LEAF ROAD) FROM THE JUNCTION OF ROAD 47 (OAK LEAF ROAD) AND TRUNK HIGHWAY 23 IN DUQUETTE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.378 12B = -91.391 09 = -91.240 03 = -91.109

TBM 33 1 L22567

Mn/DOT Name: TBM 33 1 L22567 **NGS Name:** TBM 33 1

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	44 N	20 W	461547.00	925138.00		

NGS ACRN: AM7393 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

5.0 MILES NORTHEAST OF FINLAYSON, 4.2 MILES NORTH ON COUNTY HIGHWAY 61 FROM THE JUNCTION OF COUNTY HIGHWAY 61 AND COUNTY HIGHWAY 18 IN FINLAYSON, THEN 0.2 MILE EAST ON CENTRAL AVENUE, THEN 226.0 FEET SOUTHEAST ON COUNTY ROAD 33 (SWANSON ROAD).

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.945 12B = -90.928 09 = -90.813 03 = -90.669

TBM 33 2 L22567

Mn/DOT Name: TBM 33 2 L22567 **NGS Name:** TBM 33 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	35	44 N	20 W	461533.00	925018.00		

NGS ACRN: AM7392 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

1.4 MILES SOUTHEAST OF RUTLEDGE, 3.0 MILES SOUTH ALONG COUNTY ROAD 152 FROM THE JUNCTION OF COUNTY ROAD 43 AND COUNTY ROAD 152 IN RUTLEDGE, THEN 1.7 MILES WEST ON SWANSON ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.879 12B = -90.873 09 = -90.758 03 = -90.613

TBM 33 3 L22567

Mn/DOT Name: TBM 33 3 L22567 **NGS Name:** TBM 33 3

County: PINE, MN (Sheet 2)

NGS ACRN: AM7395 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	31	44 N	19 W	461532.00	924737.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

4.7 MILES SOUTHEAST OF WILLOW RIVER, 1.8 MILES EAST ALONG COUNTY ROAD 43 FROM THE JUNCTION OF COUNTY ROAD 43 AND COUNTY ROAD 61, THEN 3.0 MILES SOUTH ON COUNTY ROAD 152, THEN 0.5 MILE EAST ON COUNTY ROAD 33.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.754 12B = -90.768 09 = -90.649 03 = -90.495

TBM 35 L7030-1

Mn/DOT Name: TBM 35 L7030-1

NGS Name: TBM 35

County: PINE, MN (Sheet 2)

NGS ACRN: BC7077 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	1	45 N	20 W	462420.00	924821.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.5 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 46, THEN 0.4 MILE NORTH ON OLD HIGHWAY NUMBER 1.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.591 12B = -91.581 09 = -91.479 03 = -91.289

TBM 36 L7030-1

Mn/DOT Name: TBM 36 L7030-1

NGS Name: TBM 36

County: PINE, MN (Sheet 2)

NGS ACRN: BC7078 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	14	45 N	20 W	462233.00	924933.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

0.5 MILE SOUTHWEST OF STURGEON LAKE, 0.4 MILE SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 46.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.447 12B = -91.430 09 = -91.329 03 = -91.155

TBM 37 L7030-1

Mn/DOT Name: TBM 37 L7030-1

NGS Name: TBM 37

County: PINE, MN (Sheet 2)

NGS ACRN: BC7079 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	45 N	20 W	462131.00	924956.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.3 MILES SOUTH OF STURGEON LAKE, 1.6 MILES SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 46

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.371 12B = -91.355 09 = -91.247 03 = -91.079

TBM 38 L7030-1

Mn/DOT Name: TBM 38 L7030-1

NGS Name: TBM 38

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	35	45 N	20 W	462019.00	925017.00		

NGS ACRN: BC7080 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.42 MILES NORTH OF WILLOW RIVER, 1.3 MILES NORTH ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND MAIN STREET.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.296 12B = -91.276 09 = -91.165 03 = -91.014

TBM 39 L7030-1

Mn/DOT Name: TBM 39 L7030-1

NGS Name: TBM 39

County: PINE, MN (Sheet 2)

NGS ACRN: BC7081 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	2	44 N	20 W	461945.00	925021.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.0 MILE NORTH OF WILLOW RIVER, 1.2 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.263 12B = -91.240 09 = -91.135 03 = -90.987

TBM 4 L7030-2

Mn/DOT Name: TBM 4 L7030-2 **NGS Name:** TBM 4

County: PINE, MN (Sheet 2)

NGS ACRN: BC4976 Get Map
NGS Quad / Sta Num : 46092311/
USGS Quad: NICKERSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	4	45 N	17 W	462418.00	923027.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

3.4 MILES NORTHEAST OF DUQUETTE, 3.3 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 47.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.155 12B = -91.161 09 = -90.984 03 = -90.918

TBM 40 L7030-1

Mn/DOT Name: TBM 40 L7030-1

NGS Name: TBM 40

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	11	44 N	20 W	461832.00	925040.00		

NGS ACRN: BC7082 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

0.66 MILE SOUTH OF WILLOW RIVER, 0.8 MILE SOUTH ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND MAIN STREET.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.187 12B = -91.158 09 = -91.056 03 = -90.909

TBM 41 L7030-1

Mn/DOT Name: TBM 41 L7030-1 **NGS Name:** TBM 41

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	15	44 N	20 W	461803.00	925051.00		

NGS ACRN: BC7083 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

2.7 MILES NORTH OF RUTLEDGE, 3.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.151 12B = -91.119 09 = -91.023 03 = -90.873

TBM 42 L7030-1

Mn/DOT Name: TBM 42 L7030-1 **NGS Name:** TBM 42

County: PINE, MN (Sheet 2)

NGS ACRN: BC7084 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	22	44 N	20 W	461700.00	925120.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.7 MILES NORTH OF RUTLEDGE, 2.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.063 12B = -91.033 09 = -90.935 03 = -90.787

TBM 43 1 L22567

Mn/DOT Name: TBM 43 1 L22567 **NGS Name:** TBM 43 1

County: PINE, MN (Sheet 2)

NGS ACRN: AM7388 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	44 N	20 W	461858.00	924958.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

4.0 MILES NORTHEAST OF RUTLEDGE, 4.3 MILES NORTHEAST ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 0.4 MILE EAST ON COUNTY ROAD 13.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.220 12B = -91.194 09 = -91.096 03 = -90.945

TBM 43 L7030-1

Mn/DOT Name: TBM 43 L7030-1 **NGS Name:** TBM 43

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	44 N	20 W	461628.00	925138.00		

NGS ACRN: BC7085 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.4 MILES NORTH, 1.1 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.014 12B = -90.991 09 = -90.886 03 = -90.738

TBM 58 1 L22567

Mn/DOT Name: TBM 58 1 L22567 **NGS Name:** TBM 58 1

County: PINE, MN (Sheet 2)

NGS ACRN: AM7381 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	45 N	19 W	462416.00	924603.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

11.0 MILES NORTHEAST OF RUTLEDGE, 6.7 MILES NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN RUTLEDGE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.617 12B = -91.617 09 = -91.509 03 = -91.322

TBM 58 1 L23306

Mn/DOT Name: TBM 58 1 L23306 **NGS Name:** TBM 58 1

County: PINE, MN (Sheet 2)

NGS ACRN: AM1425 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	44 N	20 W	461514.00	924930.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

2.1 MILES SOUTHEAST OF RUTLEDGE, 0.5 MILE EAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23 IN RUTLEDGE, THEN 5.4 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.804 12B = -90.807 09 = -90.686 03 = -90.544

TBM 58 1 L23805

Mn/DOT Name: TBM 58 1 L23805 **NGS Name:** TBM 58 1

County: PINE, MN (Sheet 2)

NGS ACRN: AL9426 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	44 N	20 W	461515.00	924931.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

2.1 SOUTH OF RUTLEDGE, 0.5 MILE WEST FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23 IN RUTLEDGE, THEN 5.4 MILES NORTH ON INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.807 12B = -90.810 09 = -90.689 03 = -90.548

TBM 58 2 A L22567

Mn/DOT Name: TBM 58 2 A L22567 **NGS Name:** TBM 58 2 A

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	18	45 N	19 W	462252.00	924704.00		

NGS ACRN: AM7383 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

9.0 MILES NORTH OF RUTLEDGE, 4.3 MILES NORTHEAST ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 4.9 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.502 12B = -91.496 09 = -91.394 03 = -91.214

TBM 58 2 L22567

Mn/DOT Name: TBM 58 2 L22567 **NGS Name:** TBM 58 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	45 N	19 W	462332.00	924640.00		

NGS ACRN: AM7382 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

10.0 MILES NORTH OF RUTLEDGE, 4.3 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 5.7 MILES NORTH ON INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.555 12B = -91.552 09 = -91.447 03 = -91.256

TBM 58 2 L23306

Mn/DOT Name: TBM 58 2 L23306 **NGS Name:** TBM 58 2

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	14	43 N	20 W	461251.00	925006.00		

NGS ACRN: AM1426 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

3.1 MILES SOUTHEAST OF ASKOV, 3.6 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23 IN ASKOV, THEN 1.9 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.479 12B = -90.476 09 = -90.361 03 = -90.243

TBM 58 2 L23805

Mn/DOT Name: TBM 58 2 L23805 **NGS Name:** TBM 58 2

County: PINE, MN (Sheet 2)

NGS ACRN: AL9424 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	14	43 N	20 W	461252.00	925006.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

3.1 MILES SOUTHEAST OF ASKOV, 3.6 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY HIGHWAY 32 AND TRUNK HIGHWAY 23 IN ASKOV, THEN 2.0 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.479 12B = -90.479 09 = -90.361 03 = -90.243

TBM 58 3

Mn/DOT Name: TBM 58 3

NGS Name: TBM 58 3

County: PINE, MN (Sheet 2)

NGS ACRN: AM7384 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	45 N	19 W	462201.00	924749.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

8.0 MILES NORTHEAST OF RUTLEDGE, 4.2 MILES NORTH ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 4.2 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.427 12B = -91.420 09 = -91.319 03 = -91.148

TBM 58 3 L23306

Mn/DOT Name: TBM 58 3 L23306 **NGS Name:** TBM 58 3

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	14	43 N	20 W	461206.00	925036.00		

NGS ACRN: AM1427 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

3.1 MILES NORTHWEST OF ASKOV, 3.6 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23 IN ASKOV, THEN 1.6 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.387 12B = -90.387 09 = -90.279 03 = -90.161

TBM 58 3 L23805

Mn/DOT Name: TBM 58 3 L23805 **NGS Name:** TBM 58 3

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	14	43 N	20 W	461206.00	925036.00		

NGS ACRN: AL9423 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

3.0 MILES NORTHWEST OF ASKOV, 3.6 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23 IN ASKOV, THEN 1.6 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.387 12B = -90.387 09 = -90.279 03 = -90.161

TBM 58 4 L22567

Mn/DOT Name: TBM 58 4 L22567 **NGS Name:** TBM 58 4

County: PINE, MN (Sheet 2)

NGS ACRN: AM7386 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	36	45 N	20 W	462016.00	924858.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

5.0 MILES NORTHEAST OF RUTLEDGE, 6.3 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 0.7 MILE EAST ALONG DAGEL LAKE ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.306 12B = -91.289 09 = -91.184 03 = -91.027

TBM 58 4 L23306

Mn/DOT Name: TBM 58 4 L23306 **NGS Name:** TBM 58 4

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	27	43 N	20 W	461111.00	925105.00		

NGS ACRN: AM1428 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

3.3 MILES EAST OF ASKOV, 3.6 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23 IN ASKOV, THEN 0.5 MILE NORTH ALONG TURTLE ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.282 12B = -90.285 09 = -90.180 03 = -90.062

TBM 58 4 L23805

Mn/DOT Name: TBM 58 4 L23805 **NGS Name:** TBM 58 4

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	27	43 N	20 W	461111.00	925105.00		

NGS ACRN: AL9422 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

3.3 MILES EAST OF ASKOV, 3.6 MILES WEST ALONG TRUNK HIGHROAD 23 FROM THE JUNCTION OF COUNTY ROAD 32 AND TRUNK HIGHWAY 23 IN ASKOV, THEN 0.5 MILE NORTH ALONG TURTLE ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.282 12B = -90.285 09 = -90.180 03 = -90.062

TBM 58 5 L22567

Mn/DOT Name: TBM 58 5 L22567 **NGS Name:** TBM 58 5

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	1	44 N	20 W	461927.00	924926.00		

NGS ACRN: AM7387 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

5.0 MILES NORTHEAST OF RUTLEDGE, 4.3 MILES ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 0.7 MILE EAST ALONG COUNTY ROAD 43, THEN 0.6 MILE NORTH ON WALTERS LANE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.253 12B = -91.230 09 = -91.132 03 = -90.981

TBM 58 5 L23306

Mn/DOT Name: TBM 58 5 L23306 **NGS Name:** TBM 58 5

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	43 N	20 W	461006.00	925207.00		

NGS ACRN: AM1429 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

4.3 MILES NORTHEAST OF ASKOV, 3.7 MILES WEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 32 IN ASKOV, THEN 4.0 MILES SOUTHWEST ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.226 12B = -90.226 09 = -90.124 03 = -90.003

TBM 58 5 L23805

Mn/DOT Name: TBM 58 5 L23805 **NGS Name:** TBM 58 5

County: PINE, MN (Sheet 2)

NGS ACRN: AL9421 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	43 N	20 W	461006.00	925206.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

2.5 MILES NORTH OF SANDSTONE,0.2 MILE NORTH FROM THE JUNCTION OF COUNTY ROAD 28 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 3.0 MILES NORTH ON INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.223 12B = -90.226 09 = -90.121 03 = -90.003

TBM 58 6 L22567

Mn/DOT Name: TBM 58 6 L22567 **NGS Name:** TBM 58 6

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	13	44 N	20 W	461742.00	924917.00		

NGS ACRN: AM7391 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

7.7 MILES NORTHWEST OF ASKOV, 8.3 MILES NORTH OF ASKOV FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 18 IN ASKOV, THEN NORTH 8.3 MILES NORTH ON INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.109 12B = -91.086 09 = -90.987 03 = -90.836

TBM 58 6 L23306

Mn/DOT Name: TBM 58 6 L23306 **NGS Name:** TBM 58 6

County: PINE, MN (Sheet 2)

NGS ACRN: AM1430 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	8	42 N	20 W	460759.00	925314.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

5215.0 FEET WEST OF SANDSTONE, 0.2 MILE NORTH FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN NORTH ON INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.128 12B = -90.134 09 = -90.036 03 = -89.901

TBM 58 6 L23805

Mn/DOT Name: TBM 58 6 L23805 **NGS Name:** TBM 58 6

County: PINE, MN (Sheet 2)

NGS ACRN: AL9420 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	8	42 N	20 W	460758.00	925314.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

5173.0 FEET WEST OF SANDSTONE, 0.2 MILE NORTH FROM THE JUNCTION OF COUNTY ROAD 61 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN NORTH 0.4 MILE ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.128 12B = -90.131 09 = -90.033 03 = -89.901

TBM 61 A 2 L23306

Mn/DOT Name: TBM 61 A 2 L23306 **NGS Name:** TBM 61 A

County: PINE, MN (Sheet 2)

NGS ACRN: AM1431 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	42 N	20 W	460726.00	925352.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description: (2010)

Stamping:

1.5 MILES WEST OF SANDSTONE, 0.5 MILE WEST FROM THE JUNCTION OF COUNTY ROAD 28 AND TRUNK HIGHWAY 25 IN SANDSTONE, THEN 151.0 FEET SOUTH ALONG COUNTY ROAD 28.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.161 12B = -90.164 09 = -90.065 03 = -89.928

TBM 7 L3434

Mn/DOT Name: TBM 7 L3434 **NGS Name:** TBM 7

County: PINE, MN (Sheet 2)

NGS ACRN: BI9316 Get Map
NGS Quad / Sta Num : 46092344/
USGS Quad: KETTLE RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	8	45 N	20 W	462325.00	925431.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description: (2010) **Stamping:**

2.4 MILES NORTHEAST OF DENHAM, 1.9 MILES EAST FROM THE JUNCTION OF COUNTY ROAD 40 AND COUNTY ROAD 46 IN DENHAM, THEN 1.9 MILES EAST ON COUNTY HIGHWAY 46.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.368 12B = -91.329 09 = -91.214 03 = -91.069

TBM 8 L3434

Mn/DOT Name: TBM 8 L3434 **NGS Name:** TBM 8

County: PINE, MN (Sheet 2)

NGS ACRN: BI9317 Get Map
NGS Quad / Sta Num : 46092341/
USGS Quad: MOOSE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	3	45 N	20 W	462426.00	925132.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

5.0 MILES NORTHEAST OF DENHAM, 4.9 MILES EAST FROM THE JUNCTION OF COUNTY ROAD 46 AND COUNTY ROAD 40, THEN 1.0 MILE NORTH ALONG COUNTY ROAD 165, THEN 0.6 MILE WEST ALONG NORTHVIEW ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.529 12B = -91.502 09 = -91.397 03 = -91.227

TBM 80 D L23306

Mn/DOT Name: TBM 80 D L23306 **NGS Name:** TBM 80 D

County: PINE, MN (Sheet 2)

NGS ACRN: AM1433 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	42 N	20 W	460441.00	925358.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description: (2010) **Stamping:**

4.0 MILES SOUTH OF SANDSTONE, 8.1 MILES SOUTH FROM THE JUNCTION OF COUNTY HIGHWAY 28 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 8.1 MILES SOUTH ALONG INTERSTATE HIGHWAY 35, THEN NORTH 4.7 MILES NORTH ON INTERSTATE HIGHWAY 35 NORTH.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.033 12B = -90.033 09 = -89.924 03 = -89.803

TBM 80 D L23805

Mn/DOT Name: TBM 80 D L23805 **NGS Name:** TBM 80 D

County: PINE, MN (Sheet 2)

NGS ACRN: AL9418 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	42 N	20 W	460441.00	925358.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

5.0 MILES NORTHWEST OF HINCKLEY, 4.9 MILES NORTH FROM THE JUNCTION OF COUNTY ROAD 18 AND COUNTY ROAD 61 IN HINCKLEY, THEN 4.9 MILES NORTH ON INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.033 12B = -90.033 09 = -89.924 03 = -89.803

TBM 80 E L23306

Mn/DOT Name: TBM 80 E L23306

NGS Name: TBM 80 E

County: PINE, MN (Sheet 2)

NGS ACRN: AM1432 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	29	42 N	20 W	460522.00	925337.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

6.0 MILES NORTHEAST OF HINCKLEY, 5.6 MILES NORTH FROM THE JUNCTION OF COUNTY HIGHWAY 18 AND COUNTY HIGHWAY 61 IN HINCKLEY, THEN 5.6 MILES NORTH ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.023 12B = -90.026 09 = -89.918 03 = -89.796

TBM 80 E L23805

Mn/DOT Name: TBM 80 E L23805

NGS Name: TBM 80 E

County: PINE, MN (Sheet 2)

NGS ACRN: AL9419 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	29	42 N	20 W	460522.00	925337.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

6.0 MILES NORTHWEST OF HINCKLEY, 5.6 MILES NORTH FROM THE JUNCTION OF COUNTY ROAD 18 AND COUNTY ROAD 61 IN HINCKLEY, THEN NORTH 5.6 MILES ALONG INTERSTATE HIGHWAY 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.023 12B = -90.026 09 = -89.918 03 = -89.796

TBM A L22567

Mn/DOT Name: TBM A L22567 **NGS Name:** TBM A

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	36	45 N	20 W	462045.00	924925.00		

NGS ACRN: AM7385 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

2.0 MILES NORTHEAST OF WILLOW RIVER, 2.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43, THEN 0.6 EAST ON DAGO LAKE ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.329 12B = -91.315 09 = -91.207 03 = -91.046

TBM A L3434

Mn/DOT Name: TBM A L3434 **NGS Name:** TBM A

County: PINE, MN (Sheet 2)

NGS ACRN: BI9327 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	17	43 N	20 W	461209.00	925354.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.0 MILE EAST OF FINLAYSON, 1.4 MILES EAST ALONG TRUNK HIGHWAY 18 FROM THE JUNCTION OF TRUNK HIGHWAY 18 AND COUNTY ROAD 35.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.603 12B = -90.577 09 = -90.489 03 = -90.351

TBM B L3434

Mn/DOT Name: TBM B L3434 **NGS Name:** TBM B

County: PINE, MN (Sheet 2)

NGS ACRN: BI9326 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	4	43 N	20 W	461420.00	925252.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

2.0 MILES SOUTH OF RUTLEDGE, 1.5 MILES SOUTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 39, THEN 0.3 MILE WEST ON REUER DRIVE.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.813 12B = -90.787 09 = -90.682 03 = -90.544

TBM C L3434

Mn/DOT Name: TBM C L3434 **NGS Name:** TBM C

County: PINE, MN (Sheet 2)

NGS ACRN: BI9325 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	44 N	20 W	461600.00	925206.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

IN RUTLEDGE, 0.1 MILE NORTH ALONG THE WILLARD MUNGER STATE TRAIL FROM THE JUNCTION OF THE WILLARD MUNGER STATE TRAIL AND TRUNK HIGHWAY 61, THEN 0.1 MILE WEST ON LONG LAKE ROAD.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.974 12B = -90.951 09 = -90.840 03 = -90.695

TBM D L3434

Mn/DOT Name: TBM D L3434 **NGS Name:** TBM D

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	15	44 N	20 W	461750.00	925115.00		

NGS ACRN: BI9324 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	NGS

Description:

1.7 MILES SOUTHWEST OF WILLOW RIVER, 0.6 MILE WEST ALONG TRUNK HIGHWAY 43 FROM THE JUNCTION OF TRUNK HIGHWAY 43 AND TRUNK HIGHWAY 35, 1.5 MILES SOUTH ON TRUNK HIGHWAY 61, 900.0 FEET WEST OF TRUNK HIGHWAY 61.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.135 12B = -91.099 09 = -91.004 03 = -90.853

TBM MRC A L22567

Mn/DOT Name: TBM MRC A L22567

NGS Name: TBM MRC A

County: PINE, MN (Sheet 2)

NGS ACRN: AM7390 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461901.00	925041.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

IN WILLOW RIVER, 0.2 MILE SOUTHWEST ALONG COUNTY ROAD 158 FROM THE JUNCTION OF COUNTY ROAD 158 AND MAIN STREET.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.220 12B = -91.191 09 = -91.089 03 = -90.938

TBM PBM 12 A CAP MRC L22567

Mn/DOT Name: TBM PBM 12 A CAP MRC L22567 **NGS Name:** TBM PBM 12 A CAP MRC

County: PINE, MN (Sheet 2)

NGS ACRN: AM7389 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	44 N	20 W	461901.00	925040.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON ROD	UNMONUMENTED	MNDT

Description:

IN WILLOW RIVER, 0.2 MILE SOUTHWEST ALONG COUNTY ROAD 158 FROM THE JUNCTION OF COUNTY ROAD 158 AND MAIN STREET.

Stamping:

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -91.220 12B = -91.191 09 = -91.089 03 = -90.941

TIELZ

Mn/DOT Name: TIELZ
NGS Name: TIELZ
County: PINE, MN (Sheet 2)

NGS ACRN: DL4787 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	43 N	20 W	461026.51	925141.13	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2008	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008)
Stamping: TIELZ 2008

2.9 MILES NORTH OF SANDSTONE, 3.8 MILES NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 EAST, AT INTERSTATE HIGHWAY 35 MILEPOINT 195.10, 63.6 FEET NORTHWEST OF A FENCE LINE, 35.4 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.4 FEET NORTHWEST OF A WITNESS POST.

Station Notes
GPS'D FOR HMOOSE PROJECT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.650	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1099.637	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1009.460	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1099.637	.131		1009.545	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1099.637	.131		1009.670	.066	1996	GPS - STATIC	2009	HMOOSE
1099.637	.131		1009.545	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.229 12B = -90.233 09 = -90.128 03 = -90.010

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 26.50592	92 51 41.12967	509773.283	261932.394	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 26.50588	92 51 41.13037	509773.233	261932.390	.033	C	ADJUSTMENT	2009	GPS2566
46 10 26.50588	92 51 41.13037	509773.233	261932.390	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 26.50567	92 51 41.12998	509773.261	261932.369	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2976412.854	759277.891	1675510.098	16776190.142	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2976412.805	759277.886	1675510.049	16776190.138	.033	C	ADJUSTMENT	2009	GPS2566
2976412.805	759277.886	1675510.049	16776190.138	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2976412.833	759277.865	1675510.077	16776190.117	.033	C	GPS - STATIC	2009	HMOOSE

Mn/DOT Name: TINA
NGS Name: TINA
County: PINE, MN (Sheet 2)

NGS ACRN: RN1616 Get Map
NGS Quad / Sta Num : 46092323/1004
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	34	42 N	19 W	460505.79	924351.08		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1971) **Stamping:** TINA 1961

7.0 MILES SOUTHEAST OF SANDSTONE, 3.1 MILES EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23, THEN 2.95 MILES EAST ON COUNTY ROAD 30, THEN 3.0 MILES SOUTH ON COUNTY ROAD 21, THEN 0.5 MILE EAST ON A TOWNSHIP ROAD, IN A CULTIVATED FIELD, 63.0 FEET SOUTH OF THE JUNCTION OF A GRAVEL ROAD AND A FIELD ENTRANCE, 86.72 FEET SOUTHWEST OF TINA RM 1, 87.32 FEET SOUTHEAST OF TINA RM 2, 3.0 FEET EAST OF A FENCE LINE, 4.0 FEET NORTHEAST OF A WITNESS POST.

Station Notes
THE DISK WAS FOUND BROKEN OFF THE STEM TURNED IN TO CENTRAL OFFICE.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1056.428	.262		968.102	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1056.396						RECIPROCAL VERTICAL ANGLE	1961	HORZ

Geoid Separations(ft): GEOID18 = -88.491 12B = -88.592 09 = -88.478 03 = -88.363

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 05.78733	92 43 51.07663	542923.276	229485.714	.131	3	ADJUSTMENT	1999	17648
46 05 05.78378	92 43 51.07301	542923.532	229485.355	.131	3	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 05.78176	92 43 51.07110	542923.667	229485.150	.131	3	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 05.96690	92 43 50.36220			.100	3	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010107.365	727404.758	1708686.325	16743799.482	.131	3	ADJUSTMENT	1999	17648
3010107.627	727404.404	1708686.582	16743799.123	.131	3	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3010107.765	727404.202	1708686.717	16743798.919	.131	3	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2385502.346	399337.930			.100	3	CLASSICAL SURVEY	1961	12611

Geodetic Data Sheet (Feet)
GSID Station # 71042

TINA AZ MK

04/28/2026
Sheet Help

Mn/DOT Name: TINA AZ MK
NGS Name: TINA AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: CJ2904 Get Map
NGS Quad / Sta Num : 46092323/1004
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	42 N	19 W	460505.00	924355.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 2 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1961) **Stamping:** TINA 1961

7.0 MILES SOUTHEAST OF SANDSTONE, 3.1 MILES EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23 IN SANDSTONE, THEN 2.95 MILES EAST ON COUNTY ROAD 30, THEN 3.0 MILES SOUTH ON COUNTY ROAD 21, 221.0 FEET SOUTHEAST OF THE INTERSECTION OF COUNTY ROAD 21 AND SEIVERT DRIVE, 35.0 FEET EAST OF COUNTY ROAD 21, 3.0 FEET EAST OF A WIRE FENCE, 4.0 FEET NORTHEAST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -88.592 12B = -88.687 09 = -88.573 03 = -88.455

TINA RM 1

Mn/DOT Name: TINA RM 1 **NGS Name:** TINA RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2905 Get Map
NGS Quad / Sta Num : 46092323/1004
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	34	42 N	19 W	460505.00	924351.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 4 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1961) **Stamping:** TINA NO 1 1961

7.0 MILES SOUTHEAST OF SANDSTONE, 3.1 MILES EAST ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23, THEN 2.95 MILES EAST ON COUNTY ROAD 30, THEN 3.0 MILES SOUTH ON COUNTY ROAD 21 THEN 0.5 MILE EAST ON SEIVERT DRIVE, IN A CULTIVATED FIELD, 16.0 FEET SOUTH OF THE CENTERLINE OF A ROAD, 4.0 FEET SOUTH OF A FENCE LINE, 90.0 FEET NORTHEAST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -88.491 12B = -88.592 09 = -88.478 03 = -88.363

TINA RM 2

Mn/DOT Name: TINA RM 2 **NGS Name:** TINA RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2906 Get Map
NGS Quad / Sta Num : 46092323/1004
USGS Quad: CLOVERDALE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	34	42 N	19 W	460505.00	924351.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1961) **Stamping:** TINA NO 2 1961

7.0 MILES SOUTHEAST OF SANDSTONE, 3.1 MILES EAST ON TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 123 AND TRUNK HIGHWAY 23, THEN 2.95 MILES EAST ON COUNTY ROAD 30, THEN 3.0 MILES SOUTH ON COUNTY ROAD 21, THEN 0.5 MILE EAST ON A TOWNSHIP ROAD, IN A CULTIVATED FIELD, 21.0 FEET SOUTH OF THE CENTERLINE OF A ROAD, 3.0 FEET SOUTH OF A WIRE FENCE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -88.491 12B = -88.592 09 = -88.478 03 = -88.363

TOOTSIE

Mn/DOT Name: TOOTSIE **NGS Name:** TOOTSIE

County: PINE, MN (Sheet 2)

NGS ACRN: RN1631 Get Map
NGS Quad / Sta Num : 46092333/1005
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	42 N	21 W	460511.12	925547.39		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1971) **Stamping:** TOOTSIE 1961

5.0 MILES NORTH OF HINCKLEY, 4.9 MILES NORTH FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 26, 73.0 FEET WEST OF TRUNK HIGHWAY 61, 152.0 FEET NORTH OF THE NORTHEAST CORNER OF A BUILDING, 35.0 FEET NORTH OF A WITNESS POST AND A POWER POLE, 34.84 FEET NORTH OF TOOTSIE RM 1, 85.72 FEET NORTHEAST OF TOOTSIE RM 2.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.237	.262		999.211	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1089.204						RECIPROCAL VERTICAL ANGLE	1961	HORZ

Geoid Separations(ft): GEOID18 = -90.252 12B = -90.249 09 = -90.141 03 = -90.003

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 11.12473	92 55 47.39494	492429.881	229982.193	.131	3	ADJUSTMENT	1999	17648
46 05 11.11929	92 55 47.38971	492430.249	229981.642	.131	3	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 11.11929	92 55 47.38914	492430.289	229981.642	.131	3	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 05 11.30740	92 55 46.65780			.100	3	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959618.449	727040.424	1658214.567	16744232.277	.131	3	ADJUSTMENT	1999	17648
2959618.826	727039.879	1658214.936	16744231.727	.131	3	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959618.867	727039.880	1658214.976	16744231.727	.131	3	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2335013.546	398973.780			.100	3	CLASSICAL SURVEY	1961	12611

TOOTSIE AZ MK

Mn/DOT Name: TOOTSIE AZ MK

NGS Name: TOOTSIE AZ MK

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2915 Get Map
NGS Quad / Sta Num : 46092333/1005
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	42 N	21 W	460516.00	925547.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1961)

Stamping: TOOTSIE 1961

5.0 MILES NORTH OF HINCKLEY, 4.9 MILES FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 26, 68.0 FEET EAST OF THE CENTERLINE OF COUNTY ROAD 61, 44.0 FEET EAST OF THE EAST HEADWALL OF A CONCRETE CULVERT, 3.0 FEET SOUTH OF A WITNESS POST.

Station Notes

IN 10-09-2008 DETERMINED THAT THE CULVERT HAS BEEN REMOVED AND THE MONUMENT COULD NOT BE FOUND.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.252 12B = -90.249 09 = -90.144 03 = -90.006

TOOTSIE RM 1

Mn/DOT Name: TOOTSIE RM 1 **NGS Name:** TOOTSIE RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2916 Get Map
NGS Quad / Sta Num : 46092333/1005
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	42 N	21 W	460510.80	925546.70		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2008) **Stamping:** TOOTSIE NO 1 1961

5.0 MILES NORTH OF HINCKLEY, 4.9 MILES NORTH FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 26, 78.0 FEET WEST OF THE CENTERLINE OF COUNTY ROAD 61, 1.0 FOOT WEST OF A POWER POLE, 2.0 FEET NORTH OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.246 09 = -90.138 03 = -90.003

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TOOTSIE_RM_1-CJ2916-3W-12DEC2007.jpg	W	Dec 12, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TOOTSIE_RM_1-CJ2916-2-12DEC2007.jpg		Dec 12, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TOOTSIE_RM_1-CJ2916-1-12DEC2007.jpg		Dec 12, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TOOTSIE RM 2

Mn/DOT Name: TOOTSIE RM 2

NGS Name: TOOTSIE RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: CJ2917 Get Map
NGS Quad / Sta Num : 46092333/1005
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	42 N	21 W	460511.00	925547.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2008	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 4 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2010) **Stamping:** TOOTSIE NO 2 1961

5.0 MILES NORTH OF HINCKLEY, 4.9 MILES FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 26, 75.0 FEET WEST OF THE POWER POLE, 3.0 FEET NORTHEAST OF A 9.0 INCH DIAMETER ELM TREE, 77.0 FEET WEST OF A WITNESS POST.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -90.249 12B = -90.246 09 = -90.141 03 = -90.003

TT 20 FJH

Mn/DOT Name: TT 20 FJH
NGS Name: TT 20 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	26	44 N	21 W	461536.00	925738.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092343/
USGS Quad: DENHAM

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 20 FJH 1954 1092

4.5 MILES WEST ON COUNTY ROAD 39 FROM THE JUNCTION OF COUNTY ROAD 39 AND COUNTY ROAD 61 AT RUTLEDGE,
34.0 FEET NORTH AND 17.0 FEET WEST OF A TEE-DRIVE WEST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1091.769	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.915 12B = -90.869 09 = -90.758 03 = -90.620

*** No Horizontal Positions in the Database ***

TT 21 USGS

Mn/DOT Name: TT 21 USGS **NGS Name:** TT 21

County: PINE, MN (Sheet 2)

NGS ACRN: RN1647 Get Map
NGS Quad / Sta Num : 46092343/1001
USGS Quad: DENHAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	44 N	21 W	461512.14	925928.03		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1960	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (1960) **Stamping:** TT 21 FJH 1954 1093

5.0 MILES NORTHWEST OF FINLAYSON, 3.6 MILES WEST ON TRUNK HIGHWAY 18 FROM A RAILROAD CROSSING AT FINLAYSON THEN 3.5 MILES NORTH ON COUNTY ROAD 36, 66.0 FEET NORTHWEST OF A POWER POLE, 30.0 FEET WEST OF COUNTY ROAD 36 (GRAVEL ROAD), 13.0 FEET NORTHWEST OF THE NORTH END OF A CULVERT, 104.84 FEET NORTH OF STATION BREMEN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.056	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1092.517	.197		1001.862	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1093.010						RECIPROCAL VERTICAL ANGLE	1960	HORZ

Geoid Separations(ft): GEOID18 = -90.856 12B = -90.807 09 = -90.686 03 = -90.561

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 12.14227	92 59 28.02741	476947.551	290879.714	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 12.13583	92 59 28.02029	476948.051	290879.061	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 12.33380	92 59 27.28810			.100	2	CLASSICAL SURVEY	1961	12611

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943102.598	787658.147	1642662.567	16805083.249	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2943103.109	787657.503	1642663.068	16805082.597	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2318497.227	459592.005			.100	2	CLASSICAL SURVEY	1961	12611

TT 22 FJH

Mn/DOT Name: TT 22 FJH
NGS Name: TT 22 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	43 N	21 W	461324.00	925927.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 22 FJH 1954 1096

2.5 MILES SOUTH AND 6.0 MILES WEST OF RUTLEDGE, 1.0 MILE NORTH ALONG COUNTY ROAD 36 FROM THE JUNCTION OF COUNTY ROAD 36 AND TRUNK HIGHWAY 18, 16.0 FEET NORTH AND 24.0 FEET WEST OF THE CROSSROADS, 9.0 FEET NORTH OF A FENCE CORNER, ALONG A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.526	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.804 12B = -90.754 09 = -90.643 03 = -90.515

*** No Horizontal Positions in the Database ***

TT 23 FJH

Mn/DOT Name: TT 23 FJH
NGS Name: TT 23 FJH
County: PINE, MN (Sheet 2)

NGS ACRN: AF9155 Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	21	43 N	21 W	461145.26	925929.66	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2025	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 23 FJH 1954 1142

0.4 MILE SOUTH AND 3.0 MILES WEST OF FINLAYSON, 0.4 MILE SOUTH ON COUNTY ROAD 36 FROM THE JUNCTION OF TRUNK HIGHWAY 18, 34.0 FEET NORTH OF A DRIVEWAY, 36.0 FEET WEST OF ACOUNTY ROAD 36.

Station Notes

THE MARK MOVES 0.5 INCH, THE FENCE IS GONE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1142.491	.016	2/1				VERTICAL ADJUSTMENT	1998	00000288
1142.485	.016	2/1				VERTICAL CONTROL SURVEY	1995	VFIN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1142.104	.016	2/1				VERTICAL CONTROL SURVEY	1991	VFIN
1141.989	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.745 12B = -90.705 09 = -90.600 03 = -90.459

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_23_FJH-AF9155-3W-02APR2007.jpg	W	Apr 2, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_23_FJH-AF9155-2-02APR2007.jpg		Apr 2, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_23_FJH-AF9155-1-02APR2007.jpg		Apr 2, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 24 FJH

Mn/DOT Name: TT 24 FJH

NGS Name: TT 24 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	43 N	21 W	461011.00	925927.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** TT 24 FJH 1954 1125

2.5 MILES NORTH AND 6.0 MILES WEST OF SANDSTONE, 2.5 MILES SOUTH ON COUNTY ROAD 36 FROM THE JUNCTION OF COUNTY ROAD 36 AND TRUNK HIGHWAY 18, 24.0 FEET EAST OF A ROAD OPPOSITE A TEE FENCE WEST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1125.044	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.702 12B = -90.666 09 = -90.564 03 = -90.416

*** No Horizontal Positions in the Database ***

TT 25 FJH

Mn/DOT Name: TT 25 FJH

NGS Name: TT 25 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	5	42 N	21 W	460911.00	930043.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46093221/
USGS Quad: GIESE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 25 FJH 1954 1124

3.0 MILES NORTH AND 7.0 MILES WEST OF SANDSTONE, 63.0 FEET SOUTH AND 33.0 FEET WEST OF AN OLD TEE DRIVE WEST, AT THE EAST END AND ON THE NORTH SIDE OF A BIRCH TREE GROVE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1124.174	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.725 12B = -90.692 09 = -90.587 03 = -90.433

*** No Horizontal Positions in the Database ***

TT 26 FJH

Mn/DOT Name: TT 26 FJH

NGS Name: TT 26 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	42 N	21 W	460836.00	925926.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092334/
USGS Quad: FINLAYSON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1978) **Stamping:** TT 26 FJH 1954 1124

1.0 MILE NORTH AND 6.0 MILES WEST OF SANDSTONE, 0.5 MILE SOUTH ON COUNTY ROAD 17 FROM THE JUNCTION OF COUNTY ROAD 17 AND COUNTY ROAD 28, 33.0 FEET EAST OF COUNTY ROAD 17 AT THE WEST END OF A GROUP OF TREES.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1123.607	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.663 12B = -90.633 09 = -90.538 03 = -90.380

*** No Horizontal Positions in the Database ***

TT 27 FJH RESET

Mn/DOT Name: TT 27 FJH RESET **NGS Name:** TT 27 FJH RESET

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	22	42 N	21 W	460652.20	925914.90		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1955	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 0 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 27 FJH RESET 1955

6.0 MILES SOUTHWEST OF SANDSTONE, NEAR THE JUNCTION OF COUNTY ROAD 27 AND COUNTY ROAD 17, 0.25 MILE EAST OF A SECTION CORNER, 70.0 FEET SOUTHEAST OF A PAVED ROAD, 2.0 FEET EAST OF A NORTH-SOUTH FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1129.693	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.610 12B = -90.584 09 = -90.492 03 = -90.328

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_27_FJH_RESET-3E-02APR2007.jpg	E	Apr 2, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_27_FJH_RESET-2-02APR2007.jpg		Apr 2, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_27_FJH_RESET-1-02APR2007.jpg		Apr 2, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 28 FJH

Mn/DOT Name: TT 28 FJH

NGS Name: TT 28 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	14	42 N	21 W	460652.00	925646.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	1961	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1954) **Stamping:** TT 28 FJH 1954 1131

1.0 MILE SOUTH AND 4.0 MILES WEST OF SANDSTONE, 29.0 FEET SOUTH AND 140.0 FEET EAST OF THE CENTER OF A TEE DRIVE NORTH AND SOUTH, 1.0 FOOT WEST OF A CORNER FENCE POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1130.651	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.416 12B = -90.400 09 = -90.305 03 = -90.157

*** No Horizontal Positions in the Database ***

TT 29 FJH

Mn/DOT Name: TT 29 FJH
NGS Name: TT 29 FJH
County: PINE, MN (Sheet 2)

NGS ACRN: RN0578 Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	18	42 N	20 W	460724.00	925426.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1954) **Stamping:** TT 29 FJH 1954 1096

2.0 MILES WEST-SOUTHWEST OF SANDSTONE, 1.0 MILE WEST ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND INTERSTATE HIGHWAY 35, 74.0 FEET SOUTH OF COUNTY ROAD 61, 14.0 FEET WEST OF A TOWNSHIP ROAD NORTH EXTENDED, 18.0 FEET EAST OF A POWER POLE, 2.5 FEET NORTHWEST OF A FENCE CORNER, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1096.304	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1095.851	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT
1095.949	.016	2				VERTICAL CONTROL SURVEY	1976	L23306
1095.998	.016	2				VERTICAL CONTROL SURVEY	1974	L23306

Geoid Separations(ft): GEOID18 = -90.226 12B = -90.223 09 = -90.124 03 = -89.987

*** No Horizontal Positions in the Database ***

TT 31 FJH

Mn/DOT Name: TT 31 FJH

NGS Name: TT 31 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	36	44 N	19 W	461442.00	924055.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092324/
USGS Quad: ASKOV LOOKOUT TOWER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 31 FJH 1954 1213

2.5 MILES SOUTHWEST OF BRUNO, 1.0 MILE WEST OF COUNTY ROAD 22, 19.0 FEET NORTH OF A TOWNSHIP ROAD AT A TEE-FENCE NORTH.

Station Notes

THERE IS A ROAD IMPROVEMENT IN THE AREA.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1213.147	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.993 12B = -90.029 09 = -89.898 03 = -89.800

*** No Horizontal Positions in the Database ***

TT 32 FJH

Mn/DOT Name: TT 32 FJH
NGS Name: TT 32 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	44 N	18 W	461520.00	923926.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2002	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (2002) **Stamping:** TT 32 FJH 1954 1186

1.5 MILES SOUTH OF BRUNO, 36.0 FEET EAST OF COUNTY ROAD 22 AT A TEE FENCE CORNER EAST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1185.506	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.960 12B = -89.990 09 = -89.859 03 = -89.773

*** No Horizontal Positions in the Database ***

TT 32 L

Mn/DOT Name: TT 32 L
NGS Name: TT 32 L
County: PINE, MN (Sheet 2)

NGS ACRN: DM5877 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	31	44 N	15 W	461438.00	921735.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1943	2007	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 32 L 1943 1201

0.35 MILE NORTH ALONG KINGSDALE ROAD FROM THE JUNCTION OF KINGSDALE ROAD AND OMANS DRIVEWAY IN KINGSDALE, THEN 0.85 MILE EAST ON ROCKY BOULEVARD, 27.5 FEET NORTH OF ROCKY BOULEVARD, 3.9 FEET EAST OF NORTH FIRE LANE ROAD, 1.7 FEET WEST OF A CABLE PEDESTAL, 0.8 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1201.238	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1201.326	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1201.002	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.955 12B = -86.978 09 = -86.860 03 = -86.896

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_32_L-DM5877-3N-17APR2007.jpg	N	Apr 17, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_32_L-DM5877-2-17APR2007.jpg		Apr 17, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_32_L-DM5877-1-17APR2007.jpg		Apr 17, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 33 FJH

Mn/DOT Name: TT 33 FJH
NGS Name: TT 33 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	21	44 N	18 W	461625.00	923801.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 33 FJH 1954 1177

0.5 MILE SOUTH AND 1.7 MILES EAST OF BRUNO, 1.0 MILE EAST ON COUNTY ROAD 153 FROM THE JUNCTION OF COUNTY ROAD 153 AND COUNTY ROAD 22, 31.0 FEET NORTH OF A ROAD AT A TEE FENCE NORTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1177.101	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.049 12B = -90.075 09 = -89.934 03 = -89.859

*** No Horizontal Positions in the Database ***

TT 33 L

Mn/DOT Name: TT 33 L

NGS Name: TT 33 L

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	25	44 N	16 W	461538.00	921844.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1943	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1943) **Stamping:** TT 33 L 1943 1205

1.5 MILES NORTH OF KINGSDALE, 0.5 MILE NORTH FROM THE JUNCTION OF A COUNTY ROAD AND (ROCKY BOULEVARD), THEN 0.4 MILE NORTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1205.267	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.168 12B = -87.188 09 = -87.060 03 = -87.119

*** No Horizontal Positions in the Database ***

TT 34 FJH

Mn/DOT Name: TT 34 FJH
NGS Name: TT 34 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	26	44 N	18 W	461623.80	923523.70		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=YES Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 34 FJH 1954 1180

0.5 MILE SOUTH AND 3.7 MILES EAST OF BRUNO, 3.2 MILES EAST ON COUNTY ROAD 153 FROM THE JUNCTION OF COUNTY ROAD 22 AND COUNTY ROAD 153 IN BRUNO, 30.0 FEET SOUTH COUNTY ROAD 153 AT A TEE FENCE SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1179.725	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.629 12B = -89.659 09 = -89.511 03 = -89.481

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_34_FJH-3S-23APR2007.jpg	S	Apr 23, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_34_FJH-2-23APR2007.jpg		Apr 23, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_34_FJH-1-23APR2007.jpg		Apr 23, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 34 L

Mn/DOT Name: TT 34 L

NGS Name: TT 34 L

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	13	44 N	16 W	461714.00	921842.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1943	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1943) **Stamping:** TT 34 L 1943 1248

2.4 MILES SOUTH OF THE OLD BELDEN RAILROAD STATION, 41.0 FEET EAST OF AN OLD RAILROAD, 18.0 FEET NORTH AND 41.0 FEET WEST OF A ROAD AT A DIM TEE-ROAD EAST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1248.013	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.447 12B = -87.464 09 = -87.326 03 = -87.401

*** No Horizontal Positions in the Database ***

TT 35 FJH

Mn/DOT Name: TT 35 FJH
NGS Name: TT 35 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	44 N	17 W	461624.00	923306.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 35 FJH 1954 1212

0.5 MILE SOUTH AND 5.7 MILES EAST OF BRUNO, 24.0 FEET NORTH AND 285.0 FEET EAST OF THE JUNCTION OF COUNTY ROAD 153 (WEST AND SOUTH) AND A TOWNSHIP ROAD (EAST).

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1212.114	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.206 12B = -89.252 09 = -89.104 03 = -89.071

*** No Horizontal Positions in the Database ***

TT 35 L

Mn/DOT Name: TT 35 L
NGS Name: TT 35 L
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	1	44 N	16 W	461920.00	921846.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1943	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1943) **Stamping:** TT 35 L 1943 1266

7.0 FEET SOUTH AND 2.0 FEET EAST OF THE SOUTHWEST CORNER OF A CONCRETE PLATFORM OF AN OLD BELDEN RAILROAD FLAG STATION, 168.0 FEET NORTH OF AN OLD RAILROAD CROSSING, 16.0 FEET WEST OF AN OLD RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1265.975	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.913 12B = -87.930 09 = -87.795 03 = -87.871

*** No Horizontal Positions in the Database ***

TT 36 FJH

Mn/DOT Name: TT 36 FJH
NGS Name: TT 36 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	44 N	17 W	461530.70	923147.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=NO Vert=YES	YES			STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 36 FJH 1954 1230

1.5 MILES SOUTH AND 6.0 MILES EAST OF BRUNO, AT THE END OF COUNTY ROAD 153, AT THE EAST EDGE OF A CLEARING ON TIMBERLINE SOUTH, 36.0 FEET SOUTH OF COUNTY ROAD 153 TO TRUNK HIGHWAY 23 MILEPOINT 302.45, THEN 0.33 MILE EAST ALONG COUNTY ROAD 44, THEN 0.32 MILE SOUTH ALONG COUNTY ROAD 22, THEN 7.1 MILES EAST AND SOUTH ALONG COUNTY ROAD 153 TO THE END OF COUNTY ROAD 153 AND A MINIMUM MAINTENANCE ROAD BEGINS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1230.116	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.687 12B = -88.743 09 = -88.592 03 = -88.589

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_36_FJH-3S-23APR2007.jpg	S	Apr 23, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_36_FJH-2-23APR2007.jpg		Apr 23, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_36_FJH-1-23APR2007.jpg		Apr 23, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 36 L

Mn/DOT Name: TT 36 L

NGS Name: TT 36 L

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092242/
USGS Quad: BLACK LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	24	45 N	16 W	462220.00	921850.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1943	2008	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	SURVEY DISK	USGS

Description: (1950) **Stamping:** TT 36 L 1943

ALONG A RAILROAD AT MILEPOST 124, 150.0 FEET SOUTH OF THE EAST-WEST FENCE, 6.0 FEET EAST OF A TRACK, IN A ROCK SET FLUSH WITH A BANK.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -88.756 12B = -88.789 09 = -88.668 03 = -88.701

TT 37 FJH

Mn/DOT Name: TT 37 FJH
NGS Name: TT 37 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	44 N	17 W	461530.00	922916.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092243/
USGS Quad: HOLYOKE SW

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 37 FJH 1954 1220

1.5 MILES SOUTH AND 8.0 MILES EAST OF BRUNO, 231.0 FEET SOUTH AND 44.0 FEET WEST OF A CROSSROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1219.771	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.258 12B = -88.313 09 = -88.163 03 = -88.218

*** No Horizontal Positions in the Database ***

Mn/DOT Name: TT 37 L

NGS Name: TT 37 L

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092241/
USGS Quad: FOXBORO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	1	45 N	16 W	462502.00	921846.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1943	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1943) **Stamping:** TT 37 L 1943

0.4 MILE NORTH OF AN OLD HARLIS RAILROAD STATION, 33.0 FEET NORTH OF OLD RAILROAD MILEPOST 127, 86.0 FEET SOUTH OF AN OLD ROAD CROSSING, 8.0 FEET EAST OF AN OLD RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1299.171	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.619 12B = -89.655 09 = -89.580 03 = -89.498

*** No Horizontal Positions in the Database ***

TT 38 FJH

Mn/DOT Name: TT 38 FJH
NGS Name: TT 38 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	43 N	17 W	461310.00	922916.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2008	GOOD	Horz=? Vert=YES	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (2008) **Stamping:** 38 FJH 1954 1162

6.9 MILES NORTHEAST OF DUXBURY, 32.0 FEET SOUTH AND 29.0 FEET WEST OF A TRAIL AND A CREEK, ON A HIGH MOUND.

Station Notes

10-21-2008: ALL-TERRAIN VEHICLE (ATV) NEEDED.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1162.134	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.749 12B = -87.798 09 = -87.657 03 = -87.726

*** No Horizontal Positions in the Database ***

Mn/DOT Name: TT 39 FJH **NGS Name:** TT 39 FJH

County: PINE, MN (Sheet 2)

NGS ACRN: DM5867 Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	43 N	17 W	461109.68	922918.34	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2020	GOOD	Horz=YES Vert=YES	YES		PROJECTS 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** 1954 1153 TT 39 FJH

14.5 MILES EAST OF ASKOV, 14.15 MILES EAST ALONG COUNTY ROAD 32 (RUTABAGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABAGA ROAD) AND TRUNK HIGHWAY 23 AND COUNTY ROAD 33 IN ASKOV, 1.3 MILES NORTH AND 8.0 MILES WEST OF CLOVERTON, 109.0 FEET WEST OF CREEKVIEW LAN, 59.0 FEET SOUTH A POWER POLE WITH 2 GUY WIRES, 34.0 FEET WEST OF DRIVEWAY NUMBER 62962, 33.0 FEET WEST OF COUNTY ROAD 32 AT A TEE DRIVE SOUTH, 27.0 FEET SOUTH COUNTY ROAD 32 (RUTABAGA ROAD), 1.3 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1153.498	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1153.567	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1153.177	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1153.925	.262		1066.504	.197	2011	GPS - OPUS	2020	GPSBM
1153.840	.262		1066.418	.197	2011	GPS - OPUS	2020	GPSBM
1154.066	.262		1066.592	.197	2011	GPS - RTRN	2020	RTRN2020

Geoid Separations(ft): GEOID18 = -87.418 12B = -87.470 09 = -87.349 03 = -87.382

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.67837	92 29 18.33979	604251.770	266573.281	.131	3	GPS - OPUS	2020	GPSBM
46 11 09.67834	92 29 18.33961	604251.783	266573.278	.131	3	GPS - OPUS	2020	GPSBM
46 11 09.67827	92 29 18.33949	604251.791	266573.271	.131	3	GPS - RTRN	2020	RTRN2020

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3070787.264	765528.779	1769941.499	16780948.409	.131	3	GPS - OPUS	2020	GPSBM
3070787.276	765528.777	1769941.512	16780948.406	.131	3	GPS - OPUS	2020	GPSBM
3070787.285	765528.770	1769941.520	16780948.398	.131	3	GPS - RTRN	2020	RTRN2020

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_39_FJH-DM5867-3S-05MAY2020.jpg	S	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_39_FJH-DM5867-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_39_FJH-DM5867-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 40 FJH

Mn/DOT Name: TT 40 FJH **NGS Name:** TT 40 FJH

County: PINE, MN (Sheet 2)

NGS ACRN: DF5943 Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	24	43 N	17 W	461109.74	922639.16	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2020	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 40 FJH 1954 1133

1.3 MILES NORTH AND 6.0 MILES WEST OF CLOVERTON, 16.25 MILES EAST ALONG COUNTY ROAD 32 (RUTABUGA ROAD) FROM THE JUNCTION OF COUNTY ROAD 32 (RUTABUGA ROAD) AND TRUNK HIGHWAY 23 AND COUNTY ROAD 33 IN ASKOV, 0.1 MILE EAST OF A CROSSROAD AT THE SOUTHWEST CORNER OF SECTION 24, 26.0 FEET NORTH OF COUNTY ROAD 32 AT A TEE FENCE SOUTH, 39.0 FEET EAST OF DRIVEWAY NUMBER 67174, 9.0 FEET EAST OF CABLE BOX NUMBER CLUT 900 23, 0.6 FOOT SOUTHWEST OF A WITNESS POST.

Station Notes
DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.469	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1133.541	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.220	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1133.679	.262		1046.478	.197	2011	GPS - RTRN	2020	RTRN2020
			1046.284	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1046.396	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1133.626	.131		1046.514	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1133.626	.131		1046.514	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -87.149 12B = -87.198 09 = -87.080 03 = -87.106

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.73955	92 26 39.16380	615451.472	266640.537	.131	3	GPS - RTRN	2020	RTRN2020
46 11 09.73987	92 26 39.16274	615451.547	266640.569	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.73995	92 26 39.16346	615451.496	266640.577	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 09.73992	92 26 39.16326	615451.510	266640.574	.033	C	ADJUSTMENT	2003	GPS1839
46 11 09.73992	92 26 39.16326	615451.509	266640.576	.033	C	GPS - STATIC	2002	HPINE

TT 40 FJH

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3081982.855	765787.144	1781136.365	16781029.849	.131	3	GPS - RTRN	2020	RTRN2020
3081982.929	765787.178	1781136.439	16781029.882	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3081982.878	765787.185	1781136.389	16781029.890	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3081982.892	765787.182	1781136.403	16781029.887	.033	C	ADJUSTMENT	2003	GPS1839
3081982.892	765787.182	1781136.403	16781029.887	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_40_FJH-DF5943-3N-05MAY2020.jpg	N	May 5, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_40_FJH-DF5943-2-05MAY2020.jpg		May 5, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_40_FJH-DF5943-1-05MAY2020.jpg		May 5, 2020

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 41 FJH

Mn/DOT Name: TT 41 FJH
NGS Name: TT 41 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	30	43 N	16 W	461109.00	922432.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092234/
USGS Quad: OX CREEK

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 41 FJH 1954 1141

1.3 MILES NORTH AND 4.0 MILES WEST OF CLOVERTON, 23.0 FEET SOUTH AND 26.0 FEET EAST OF A TEE DRIVE SOUTH.

Station Notes

PULLED THE TIES, THE MARK FALLS INTO A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1141.156	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.962 12B = -87.011 09 = -86.896 03 = -86.919

*** No Horizontal Positions in the Database ***

TT 42 FJH

Mn/DOT Name: TT 42 FJH

NGS Name: TT 42 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	43 N	16 W	461109.00	922154.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2008	NOT FOUND	Horz=? Vert=YES	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 42 FJH 1954 1113

1.3 MILES NORTH AND 2.0 MILES WEST OF CLOVERTON, 31.0 FEET SOUTH AND 14.0 FEET WEST OF COUNTY ROAD 32 AT A TEE DRIVE SOUTH, 3.0 FEET SOUTH OF A TELEPHONE POLE.

Station Notes

PULLED THE TIES, THE MARK FALLS INTO A DITCH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.177	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.785 12B = -86.824 09 = -86.726 03 = -86.735

*** No Horizontal Positions in the Database ***

TT 43 FJH

Mn/DOT Name: TT 43 FJH

NGS Name: TT 43 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	26	43 N	16 W	461018.00	922029.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2008	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 43 FJH 1954 1101

0.5 MILE NORTH AND 1.0 MILE WEST OF CLOVERTON, 132.0 FEET NORTH AND 34.0 FEET EAST OF THE JUNCTION OF COUNTY ROAD 32 (NORTH AND EAST) TOWNSHIP ROAD (WEST) AND A DIM ROAD (SOUTH), 16.0 FEET WEST OF A TREE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1101.366	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -86.640 12B = -86.673 09 = -86.598 03 = -86.588

*** No Horizontal Positions in the Database ***

Mn/DOT Name: TT 44 FJH **NGS Name:** TT 44 FJH

County: PINE, MN (Sheet 2)

NGS ACRN: DF5944 Get Map
NGS Quad / Sta Num : 46092231/
USGS Quad: CLOVERTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	36	43 N	16 W	461004.46	921910.28	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2019	DISTURBED	Horz=YES Vert=YES	YES		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** 1954 1100 TT 44 FJH

IN CLOVERTON, 77.9 FEET WEST OF COUNTY ROAD 31 (CLOVERTON ROAD), 31.0 FEET SOUTH OF COUNTY ROAD 32 (RUTABAGA ROAD), 23.0 FEET EAST OF A SNOWMOBILE TRAIL, 8.0 FEET SOUTHEAST OF A POWER POLE WITH A GUY WIRE, 2.0 FEET NORTH OF A WITNESS POST.

Station Notes

STATION TT 44 FJH (23533) IN PINE COUNTY APPEARS TO HAVE BEEN DISTURBED. IT APPEARS THAT THE MONUMENT WAS PUSHED WEST APPROXIMATELY 0.18 FEET BY A SNOWPLOW OR SOMETHING BIG. REPORTED BY KROSCHEL LAND SURVEYORS, INC.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.699	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1099.788	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.460	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1099.666	.262		1013.089	.197	2011	GPS - OPUS	2019	GPSBM
			1013.043	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1013.157	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1099.834	.131		1013.276	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1099.834	.131		1013.276	.066	1996	GPS - STATIC	2002	HPINE

Geoid Separations(ft): GEOID18 = -86.578 12B = -86.607 09 = -86.542 03 = -86.529

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 04.46102	92 19 10.28006	647083.299	260233.418	.131	3	GPS - OPUS	2019	GPSBM
46 10 04.46200	92 19 10.27819	647083.430	260233.518	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 04.46208	92 19 10.27892	647083.378	260233.526	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 04.46206	92 19 10.27877	647083.389	260233.524	.033	C	ADJUSTMENT	2003	GPS1839
46 10 04.46206	92 19 10.27877	647083.388	260233.525	.033	C	GPS - STATIC	2002	HPINE

TT 44 FJH

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3113715.703	759921.670	1812763.146	16774665.571	.131	3	GPS - OPUS	2019	GPSBM
3113715.832	759921.772	1812763.277	16774665.671	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3113715.780	759921.779	1812763.226	16774665.679	.026		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3113715.791	759921.777	1812763.236	16774665.677	.033	C	ADJUSTMENT	2003	GPS1839
3113715.791	759921.777	1812763.236	16774665.677	.033	C	GPS - STATIC	2002	HPINE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_44_FJH-DF5944-3S-17APR2007.jpg	S	Apr 17, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_44_FJH-DF5944-2-17APR2007.jpg		Apr 17, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_44_FJH-DF5944-1-21NOV2019.jpg		Nov 21, 2019

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

TT 49 FJH

Mn/DOT Name: TT 49 FJH
NGS Name: TT 49 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	42 N	21 W	460515.00	925932.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092333/
USGS Quad: HINCKLEY

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 49 FJH 1954 1097

4.5 MILES NORTH AND 2.3 MILES WEST OF HINCKLEY, NEAR THE JUNCTION OF COUNTY ROAD 17 AND COUNTY ROAD 22,
22.0 FEET WEST OF A ROAD, 2.0 FEET SOUTH AND 2.0 FEET EAST OF A CORNER FENCE POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1097.311	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.587 12B = -90.564 09 = -90.469 03 = -90.308

*** No Horizontal Positions in the Database ***

TT 52 RF

Mn/DOT Name: TT 52 RF

NGS Name: TT 52 RF

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092244/
USGS Quad: HOLYOKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	45 N	17 W	462412.00	922722.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1952) **Stamping:** TT 52 RF 1952

2.5 MILES EAST OF NICKERSON ALONG AN ABANDONED ROAD, 90.0 FEET NORTH AND 184.0 FEET EAST OF AN ABANDONED TEE-ROAD NORTH, 87.0 FEET NORTH AND 75.0 FEET WEST OF AN OLD BRIDGE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1158.272	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.791 12B = -90.784 09 = -90.620 03 = -90.581

*** No Horizontal Positions in the Database ***

TT 53 RF

Mn/DOT Name: TT 53 RF

NGS Name: TT 53 RF

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	12	45 N	17 W	462335.00	922530.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092244/
USGS Quad: HOLYOKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
ROCK (0 TO 1 METERS)	SEE DESCRIPTION	USGS

Description: (1952) **Stamping:** TT 53 RF 1952

4.5 MILES SOUTHEAST OF NICKERSON ALONG AN ABANDONED ROAD, 0.3 MILE SOUTH AND 19.0 FEET WEST OF A ROAD AT A RIGHT ANGLE TURN WEST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1191.116	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.328 12B = -90.321 09 = -90.177 03 = -90.164

*** No Horizontal Positions in the Database ***

TT 54 RF

Mn/DOT Name: TT 54 RF

NGS Name: TT 54 RF

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092244/
USGS Quad: HOLYOKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	9	45 N	16 W	462320.00	922301.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
ROCK (0 TO 1 METERS)	SEE DESCRIPTION	USGS

Description: (1952)

Stamping: TT 54 RF 1952

6.8 MILES SOUTHEAST OF NICKERSON ALONG AN ABANDONED ROAD, 14.0 FEET NORTH AND 944.0 FEET WEST OF A DIM TEE-ROAD NORTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1267.550	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.803 12B = -89.816 09 = -89.691 03 = -89.688

*** No Horizontal Positions in the Database ***

TT 55 FJH

Mn/DOT Name: TT 55 FJH
NGS Name: TT 55 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	45 N	19 W	462026.00	924448.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 55 FJH 1954 1084

4.5 MILES NORTH AND 3.0 MILES WEST OF BRUNO, 70.0 FEET SOUTH AND 11.0 FEET WEST OF A ROAD AT A DIM TEE TRAIL EAST, 27.0 FEET EAST OF A TWIN OAK TREE IN A SEMI CLEARING.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1084.315	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -91.299 12B = -91.299 09 = -91.184 03 = -91.030

*** No Horizontal Positions in the Database ***

TT 55 RF

Mn/DOT Name: TT 55 RF

NGS Name: TT 55 RF

County: PINE, MN (Sheet 2)

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092241/
USGS Quad: FOXBORO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	14	45 N	16 W	462317.00	921928.00		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
ROCK (0 TO 1 METERS)	SEE DESCRIPTION	USGS

Description: (1952)

Stamping: TT 55 RF 1952

1.6 MILES SOUTH AND 0.5 MILE WEST OF THE OLD HARLIS RAILROAD STATION, 19.0 FEET SOUTH OF AN ABANDONED ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1308.892	.033	3				VERTICAL CONTROL SURVEY	1980	USGS-VERT

Geoid Separations(ft): GEOID18 = -89.144 12B = -89.186 09 = -89.084 03 = -89.075

*** No Horizontal Positions in the Database ***

TT 56 FJH

Mn/DOT Name: TT 56 FJH

NGS Name: TT 56 FJH

County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	44 N	19 W	461902.00	924620.00		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	USGS

Description: (1954) **Stamping:** TT 56 FJH 1954 1084

2.5 MILES NORTH AND 5.5 MILES WEST OF BRUNO, 22.0 FEET NORTH OF A TEE-ROAD SOUTH, ALONG AN EAST-WEST BRUSH LINE NORTH OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.531	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT

Geoid Separations(ft): GEOID18 = -91.184 12B = -91.181 09 = -91.076 03 = -90.918

*** No Horizontal Positions in the Database ***

TT 57 FJH

Mn/DOT Name: TT 57 FJH
NGS Name: TT 57 FJH
County: PINE, MN (Sheet 2)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	44 N	19 W	461648.82	924428.44		

NGS ACRN: Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1954	2007	GOOD	Horz=YES Vert=YES	YES		PROJECTS 0 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	USGS

Description: (2007) **Stamping:** TT 57 FJH 1954 1169

4.0 MILES WEST OF BRUNO, 19.0 FEET NORTH AND 27.0 FEET WEST OF A NORTH-SOUTH ROAD 19.0 FEET NORTH OF A FIELD ROAD WEST, 3.0 FEET WEST OF A FENCE LINE, 196.0 FEET SOUTH OF A MINIMUM MAINTENANCE ROAD EAST. 4.8 MILES EAST AND SOUTH ALONG COUNTY ROAD 43 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 43 IN WILLOW RIVER THEN 1.5 MILES SOUTH ALONG STEVENS LAKE ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1169.440	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT

Geoid Separations(ft): GEOID18 = -90.781 12B = -90.800 09 = -90.679 03 = -90.525

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_57_FJH-3W-15APR2007.jpg	W	Apr 15, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_57_FJH-2-15APR2007.jpg		Apr 15, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/TT_57_FJH-1-15APR2007.jpg		Apr 15, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: U 154 **NGS Name:** U 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0494 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	18	44 N	19 W	461808.00	924751.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1994	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1953) **Stamping:** U 154 1935

4.2 MILES NORTHWEST OF RUTLEDGE, 0.7 MILE ALONG COUNTY ROAD 39 AND COUNTY ROAD 61 IN RUTLEDGE, THEN 0.7 MILE WEST ON COUNTY ROAD 43, THEN 1.5 MILES ALONG COUNTY ROAD 43.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1074.069	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1073.653	.016	2				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.125 12B = -91.109 09 = -91.014 03 = -90.856

*** No Horizontal Positions in the Database ***

URIAN

Mn/DOT Name: URIAN **NGS Name:** URIAN

County: PINE, MN (Sheet 2)

NGS ACRN: DL4789 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	43 N	20 W	461001.04	925217.84	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** URIAN 2008

2.5 MILES NORTH OF SANDSTONE, 3.1 MILES NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE SOUTH JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23, AT INTERSTATE HIGHWAY 35 MILEPOINT 194.4, 53.3 FEET EAST OF A RIGHT-OF-WAY FENCE, 46.6 FEET NORTHWEST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 3.0 FEET EAST OF A WITNESS POST.

Station Notes
REMOVABLE DISK WAS MISSING, IN 2009-01-22.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1101.402	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1101.389	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1011.156	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1101.376	.131		1011.241	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1101.376	.131		1011.369	.066	1996	GPS - STATIC	2009	HMOOSE
1101.376	.131		1011.241	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.233 12B = -90.233 09 = -90.131 03 = -90.006

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 01.04454	92 52 17.83874	507190.727	259351.957	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 01.04453	92 52 17.83949	507190.675	259351.956	.033	C	ADJUSTMENT	2009	GPS2566
46 10 01.04453	92 52 17.83949	507190.675	259351.956	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 01.04437	92 52 17.83910	507190.702	259351.940	.033	C	GPS - STATIC	2009	HMOOSE

URIAN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2973874.957	756654.117	1672931.937	16773607.597	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2973874.904	756654.115	1672931.884	16773607.596	.033	C	ADJUSTMENT	2009	GPS2566
2973874.904	756654.115	1672931.884	16773607.596	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2973874.932	756654.099	1672931.912	16773607.580	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/URIAN-DL4789-3W-22DEC2008.jpg	W	Dec 22, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/URIAN-DL4789-2-22DEC2008.jpg		Dec 22, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/URIAN-DL4789-1-22DEC2008.jpg		Dec 22, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: V 154 **NGS Name:** V 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0495 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	16	44 N	19 W	461808.64	924535.98	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1994	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1953) **Stamping:** V 154 1935

4.8 MILES EAST ALONG A COUNTY ROAD FROM WILLOW RIVER, AT THE NORTHWEST CORNER OF A FIELD, 27.0 FEET EAST OF A ROAD LEADING TO A SMALL WHITE FARMHOUSE, 34.5 FEET SOUTH OF THE CENTERLINE OF THE COUNTY ROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1120.076	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1119.657	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1119.657	.016	2				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.056 12B = -91.056 09 = -90.948 03 = -90.787

*** No Horizontal Positions in the Database ***

VORHAUER

Mn/DOT Name: VORHAUER **NGS Name:** VORHAUER

County: PINE, MN (Sheet 2)

NGS ACRN: DL4790 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	13	42 N	20 W	460746.67	924813.47	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2008) **Stamping:** VORHAUER 2008

3.0 MILES EAST OF SANDSTONE, 0.9 MILE EAST AND NORTH ALONG TRUNK HIGHWAY 123 FROM THE JUNCTION OF TRUNK HIGHWAY 23 IN SANDSTONE, THEN 3.1 MILES EAST ALONG TRUNK HIGHWAY 123, THEN 0.1 MILE NORTH ALONG TRUNK HIGHWAY 123, THEN 0.1 MILE NORTH OF THE JUNCTION OF TRUNK HIGHWAY 123 AND COUNTY ROAD 30 (EAST), AT TRUNK HIGHWAY 123 MILEPOINT 4.1, 37.3 FEET EAST OF TRUNK HIGHWAY 123, 34.5 FEET SOUTH OF A DRIVE TO FIRE NUMBER 55156, 4.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1112.009	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1112.019	.016	2/1				VERTICAL CONTROL SURVEY	2009	VASKO

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			1022.452	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1112.006	.131		1022.498	.066	2007	HORIZONTAL ADJUSTMENT	2010	GPS2619
1112.006	.131		1022.642	.066	1996	GPS - STATIC	2009	HASKO
1112.006	.131		1022.498	.066	2007	GPS - STATIC	2009	HASKO
1112.038	.131		1022.498	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1112.038	.131		1022.642	.066	1996	GPS - STATIC	2009	HMOOSE
1112.038	.131		1022.498	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -89.547 12B = -89.563 09 = -89.458 03 = -89.383

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 46.67099	92 48 13.47094	524407.277	245752.870	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 46.67098	92 48 13.47186	524407.212	245752.869	.033	C	ADJUSTMENT	2010	GPS2619
46 07 46.67098	92 48 13.47186	524407.212	245752.869	.033	C	GPS - STATIC	2009	HASKO
46 07 46.67098	92 48 13.47186	524407.212	245752.869	.033	C	ADJUSTMENT	2009	GPS2566
46 07 46.67098	92 48 13.47186	524407.212	245752.869	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 07 46.67091	92 48 13.47154	524407.235	245752.862	.033	C	GPS - STATIC	2009	HASKO
46 07 46.67091	92 48 13.47154	524407.235	245752.862	.033	C	GPS - STATIC	2009	HMOOSE

VORHAUER

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991318.806	743352.038	1690157.997	16760036.196	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991318.741	743352.036	1690157.932	16760036.195	.033	C	ADJUSTMENT	2010	GPS2619
2991318.741	743352.036	1690157.932	16760036.195	.033	C	GPS - STATIC	2009	HASKO
2991318.741	743352.036	1690157.932	16760036.195	.033	C	ADJUSTMENT	2009	GPS2566
2991318.741	743352.036	1690157.932	16760036.195	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991318.764	743352.029	1690157.955	16760036.188	.033	C	GPS - STATIC	2009	HASKO
2991318.764	743352.029	1690157.955	16760036.188	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/VORHAUER-DL4790-3E-08JUN2009.jpg	E	Jun 8, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/VORHAUER-DL4790-2-08JUN2009.jpg		Jun 8, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/VORHAUER-DL4790-1-08JUN2009.jpg		Jun 8, 2009

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

W 154

Mn/DOT Name: W 154 **NGS Name:** W 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0496 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	11	44 N	19 W	461811.00	924255.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2007	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (1935) **Stamping:** W 154 1935

4.0 MILES NORTHWEST OF BRUNO ON COUNTY ROAD 43, AT A SCHOOLHOUSE, AT THE SOUTHEAST CORNER OF A SCHOOLYARD, AT A FENCE, 9.0 FEET NORTH OF A CORNER POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1183.754	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1183.324	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1183.324	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.922 12B = -90.938 09 = -90.810 03 = -90.666

*** No Horizontal Positions in the Database ***

WELFARE

Mn/DOT Name: WELFARE
NGS Name: WELFARE
County: PINE, MN (Sheet 2)

NGS ACRN: DL4792 Get Map
NGS Quad / Sta Num : 46092331/
USGS Quad: SANDSTONE NORTH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	27	43 N	20 W	461112.80	925107.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 11 FT)	SURVEY DISK	MNDT

Description: (2008) **Stamping:** WELFARE 2008

4.5 MILES NORTH OF SANDSTONE, 4.85 MILES NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND TRUNK HIGHWAY 23 (COUNTY ROAD 61) IN SANDSTONE, AT INTERSTATE HIGHWAY 35 MILEPOINT 196.1, 0.5 MILE NORTH OF TRUNK HIGHWAY 23, AT THE BANNING JUNCTION, 33.4 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 66.0 FEET NORTHWEST OF A FENCE LINE, 1.4 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1149.620	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1149.617	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1149.604	.262		1059.312	.197	2011	GPS - RTRN	2017	RTRN2017
			1059.352	.007	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1149.604	.131		1059.443	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1149.604	.131		1059.565	.066	1996	GPS - STATIC	2009	HMOOSE
1149.604	.131		1059.443	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -90.289 12B = -90.292 09 = -90.187 03 = -90.072

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.79731	92 51 07.73134	512120.937	266623.202	.131	3	GPS - RTRN	2017	RTRN2017
46 11 12.79775	92 51 07.73332	512120.798	266623.246	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.79770	92 51 07.73405	512120.746	266623.241	.033	C	ADJUSTMENT	2009	GPS2566
46 11 12.79770	92 51 07.73405	512120.746	266623.241	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 12.79748	92 51 07.73368	512120.772	266623.219	.033	C	GPS - STATIC	2009	HMOOSE

WELFARE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978679.939	764007.474	1677850.803	16780881.827	.131	3	GPS - RTRN	2017	RTRN2017
2978679.799	764007.516	1677850.664	16780881.871	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978679.748	764007.510	1677850.612	16780881.866	.033	C	ADJUSTMENT	2009	GPS2566
2978679.748	764007.510	1677850.612	16780881.866	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2978679.774	764007.488	1677850.638	16780881.844	.033	C	GPS - STATIC	2009	HMOOSE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WELFARE-DL4792-3SE-25MAY2017.jpg	SE	May 25, 2017
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WELFARE-DL4792-2-25MAY2017.jpg		May 25, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WELFARE-DL4792-1-25MAY2017.jpg		May 25, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

WILLOW

Mn/DOT Name: WILLOW
NGS Name: WILLOW
County: PINE, MN (Sheet 2)

NGS ACRN: RN0535 Get Map
NGS Quad / Sta Num : 46092342/1021
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	45 N	20 W	462044.11	924959.61	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2019	GOOD	Horz=NO Vert=NO	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (2007) **Stamping:** WILLOW 1952

2.0 MILES NORTH OF WILLOW RIVER, 2.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43, THEN 0.2 MILE EAST ON DAGEL LAKE ROAD, THEN 0.05 MILE SOUTH ON A DRIVEWAY, 0.5 MILE SOUTH OF FOREST SERVICE NURSERY, 21.0 FEET WEST OF A DRIVEWAY, 77.58 FEET NORTHEAST OF WILLOW RM 1, 98.79 FEET SOUTH OF WILLOW RM 2, 3.5 FEET NORTH OF A WITNESS POST.

Station Notes

THE BUILDING USED IN THE PREVIOUS TIES IS NOW GONE 10-29-07. THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1085.342	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1084.929	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1084.929	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1084.929	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			993.984	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			994.083	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
			994.283	.066	1996	GPS - STATIC	1999	GPS917
1085.332	.131		994.283	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -91.322 12B = -91.306 09 = -91.194 03 = -91.037

WILLOW

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 44.11463	92 49 59.60492	516865.771	324504.829	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 44.11450	92 49 59.60567	516865.719	324504.816	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 44.11405	92 49 59.60569	516865.718	324504.771	.033	C	GPS - STATIC	1999	GPS917
46 20 44.11405	92 49 59.60569	516865.718	324504.770	.033	C	ADJUSTMENT	1999	17648
46 20 44.11097	92 49 59.59868	516866.210	324504.459	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 44.11088	92 49 59.59851	516866.222	324504.450	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 44.30200	92 49 58.87500			.100	2	CLASSICAL SURVEY	1954	10724

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982436.920	821954.317	1682520.416	16838743.558	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982436.868	821954.303	1682520.364	16838743.545	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982436.867	821954.257	1682520.362	16838743.499	.033	C	GPS - STATIC	1999	GPS917
2982436.867	821954.257	1682520.362	16838743.499	.033	C	ADJUSTMENT	1999	17648
2982437.365	821953.954	1682520.855	16838743.188	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982437.377	821953.945	1682520.867	16838743.179	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2357831.985	493887.680			.100	2	CLASSICAL SURVEY	1954	10724

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW-RN0535-3W-03JUN2007.jpg	W	Jun 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW-RN0535-2-03JUN2007.jpg		Jun 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW-RN0535-1-03JUN2007.jpg		Jun 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

WILLOW AZ MK

Mn/DOT Name: WILLOW AZ MK
NGS Name: WILLOW AZ MK
County: PINE, MN (Sheet 2)

NGS ACRN: CJ3031 Get Map
NGS Quad / Sta Num : 46092342/1021
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	26	45 N	20 W	462104.46	924941.44		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2008	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (2008) **Stamping:** WILLOW 1952

2.0 MILES NORTH OF WILLOW RIVER, 2.4 MILES NORTH ON COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43 AT STURGEON LAKE, THEN 0.3 MILE EAST ON DIRT ROAD AT GENERAL ANDREWS FOREST TREE NURSERY AT NUMBER 85894 HIGHWAY 61, 180.0 FEET WEST OF A GATE OF THE NURSERY FENCE, 48.2 FEET SOUTH-SOUTHWEST OF A LIGHT POLE WITH A CAMERA, 18.8 FEET NORTH OF THE CENTER OF A FOREST SERVICE ROAD, 2.5 FEET SOUTH-SOUTHEAST OF A WITNESS POST.

*** No Leveling-Derived Orthometric Heights in the Database ***

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1064.827	.262		973.768	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -91.345 12B = -91.332 09 = -91.220 03 = -91.060

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 04.46358	92 49 41.43808	518138.469	326567.462	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2983674.107	824038.071	1683789.926	16840806.869	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_AZ_MK-CJ3031-3N-14OCT2008.jpg	N	Oct 14, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_AZ_MK-CJ3031-2-14OCT2008.jpg		Oct 14, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_AZ_MK-CJ3031-1-14OCT2008.jpg		Oct 14, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

WILLOW RM 1

Mn/DOT Name: WILLOW RM 1 **NGS Name:** WILLOW RM 1

County: PINE, MN (Sheet 2)

NGS ACRN: RN0536 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	45 N	20 W	462043.82	925000.63	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2019	GOOD	Horz=NO Vert=NO	YES		FLUSH	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2007) **Stamping:** WILLOW NO 1 1952

2.5 MILES NORTHEAST OF WILLOW RIVER, 2.4 MILES SOUTH ON COUNTY ROAD 61 FROM A RAILROAD STATION AT STURGEON LAKE, THEN 0.15 MILE EAST ON TOWNSHIP ROAD 634 (DAGO ROAD), THEN 0.05 MILE SOUTH ON A DRIVEWAY, 1.1 MILES WEST OF INTERSTATE HIGHWAY 35, 325.0 FEET NORTH OF DAGO LAKE ROAD, 77.6 FEET SOUTHWEST OF STATION WILLOW, 3.0 FEET EAST OF A WITNESS POST.

Station Notes

THE BUILDING USED IN THE PREVIOUS TIES IS NOW GONE 10-29-2007. A BARN AND A FENCE WERE FOUND REMOVED IN 1971. THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.945	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1083.531	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1083.531	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1083.531	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.322 12B = -91.306 09 = -91.194 03 = -91.037

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_RM_1-RN0536-3W-03JUN2007.jpg	W	Jun 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_RM_1-RN0536-2-03JUN2007.jpg		Jun 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_RM_1-RN0536-1-03JUN2007.jpg		Jun 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

WILLOW RM 2

Mn/DOT Name: WILLOW RM 2 **NGS Name:** WILLOW RM 2

County: PINE, MN (Sheet 2)

NGS ACRN: RN0537 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	35	45 N	20 W	462045.08	924959.38	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2007) **Stamping:** WILLOW NO 2 1952

2.1 MILES NORTH OF WILLOW RIVER, 2.0 MILES NORTH ALONG COUNTY ROAD 61 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 43, THEN 0.2 MILE EAST ON THE DAGEL LAKE ROAD, 1.1 MILES WEST OF INTERSTATE HIGHWAY 35, 175.0 FEET SOUTH OF THE DAGO LAKE ROAD, 98.8 FEET NORTH OF STATION WILLOW, 10.0 FEET WEST OF A DRIVEWAY.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.181	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1078.768	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1078.768	.016	2				VERTICAL CONTROL SURVEY	1972	L22567
1078.768	.016	2				VERTICAL CONTROL SURVEY	1972	L133 MINN

Geoid Separations(ft): GEOID18 = -91.325 12B = -91.306 09 = -91.194 03 = -91.037

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_RM_2-RN0537-3W-03JUN2007.jpg	W	Jun 3, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_RM_2-RN0537-2-03JUN2007.jpg		Jun 3, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WILLOW_RM_2-RN0537-1-03JUN2007.jpg		Jun 3, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: WINDE
NGS Name: WINDE
County: PINE, MN (Sheet 2)

NGS ACRN: DL4793 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	19	45 N	19 W	462201.50	924745.35	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2008	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 110 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** WINDE 2008

1.0 MILE SOUTHEAST OF TOWN OF STURGEON LAKE, 0.6 MILE SOUTHWEST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 46, (1.5 MILES EAST OF STURGEON LAKE), AT INTERSTATE HIGHWAY 35 MILEPOINT 209.25, 70.0 FEET NORTHWEST OF A FENCE LINE, 29.2 FEET SOUTHEAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 1.7 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1079.712	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1079.703	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			988.285	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1079.689	.131		988.381	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1079.755	.131		988.502	.066	1996	GPS - STATIC	2009	HMOOSE
1079.689	.131		988.381	.066	2007	GPS - STATIC	2009	HMOOSE

Geoid Separations(ft): GEOID18 = -91.427 12B = -91.420 09 = -91.319 03 = -91.148

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 01.50253	92 47 45.35034	526274.618	332355.011	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 01.50252	92 47 45.35116	526274.560	332355.010	.033	C	ADJUSTMENT	2009	GPS2566
46 22 01.50252	92 47 45.35116	526274.560	332355.010	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 22 01.50221	92 47 45.35113	526274.562	332354.979	.033	C	GPS - STATIC	2009	HMOOSE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991709.340	829962.703	1691915.053	16846602.112	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991709.282	829962.701	1691914.995	16846602.111	.033	C	ADJUSTMENT	2009	GPS2566
2991709.282	829962.701	1691914.995	16846602.111	.033	C	GPS - STATIC	2009	HMOOSE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2991709.285	829962.669	1691914.997	16846602.079	.033	C	GPS - STATIC	2009	HMOOSE

WINDE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WINDE-DL4793-3E-17DEC2008.jpg	E	Dec 17, 200
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WINDE-DL4793-2-17DEC2008.jpg		Dec 17, 200
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/WINDE-DL4793-1-17DEC2008.jpg		Dec 17, 200

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

X 154

Mn/DOT Name: X 154 **NGS Name:** X 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0497 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	12	44 N	19 W	461812.00	924045.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2017	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SEE DESCRIPTION	NGS

Description: (1935) **Stamping:** X 154 1935

2.4 MILES NORTHWEST OF BRUNO, 0.7 MILE WEST ON MAIN STREET FROM THE JUNCTION OF MAIN STREET AND TRUNK HIGHWAY 18, THEN 1.7 MILES NORTH ON COUNTY ROAD 43, THEN 0.3 MILE EAST ON KELLY ROAD, 198.0 FEET WEST OF A CURVE, AT THE SOUTHEAST CORNER OF A FARMYARD NORTH OF COUNTY ROAD 43, AT A FENCE CORNER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.449	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1113.023	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -90.777 12B = -90.807 09 = -90.653 03 = -90.528

*** No Horizontal Positions in the Database ***

Station Photos

Type	File Name	Dir	Date
Location:			
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/X_154-RN0497-2-13APR2017.jpg		Apr 13, 2017
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/X_154-RN0497-1-13APR2017.jpg		Apr 13, 2017

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: Y 154 **NGS Name:** Y 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0483 Get Map
NGS Quad / Sta Num : 46092313/
USGS Quad: BRUNO

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	17	44 N	18 W	461738.00	923836.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1945	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** Y 154 1935

1.4 MILES NORTHEAST OF BRUNO, 1.5 MILES NORTH ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 43, 36.0 FEET WEST OF A TRACK, 21.0 FEET NORTH OF A FARM ROAD CROSSING, 15.0 FEET EAST OF A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1168.075	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

Geoid Separations(ft): GEOID18 = -90.443 12B = -90.472 09 = -90.315 03 = -90.213

*** No Horizontal Positions in the Database ***

Z 154

Mn/DOT Name: Z 154 **NGS Name:** Z 154

County: PINE, MN (Sheet 2)

NGS ACRN: RN0484 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	9	44 N	18 W	461834.00	923715.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1945	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
STRUCTURE (MASSIVE)	BENCH MARK DISK	NGS

Description: (1935) **Stamping:** Z 154 1935

2.7 MILES SOUTHWEST FROM KERRICK, 2.7 MILES NORTHEAST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46, ALONG THE GREAT NORTHERN RAILROAD, IN THE EAST SIDE OF THE NORTH ABUTMENT OF A BRIDGE OVER A SMALL CREEK, 0.2 MILE NORTH OF POLE NUMBER 460.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1147.396	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

Geoid Separations(ft): GEOID18 = -90.518 12B = -90.535 09 = -90.380 03 = -90.285

*** No Horizontal Positions in the Database ***

Z 154 RESET

Mn/DOT Name: Z 154 RESET
NGS Name: Z 154 RESET
County: PINE, MN (Sheet 2)

NGS ACRN: RN0485 Get Map
NGS Quad / Sta Num : 46092312/
USGS Quad: KERRICK

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	44 N	18 W	461833.93	923717.48	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1945	2008	GOOD	Horz=NO Vert=YES	YES	RR	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	NGS

Description: (2008) **Stamping:** Z 154 RESET 1945

2.5 MILES SOUTHWEST OF KERRICK, 2.7 MILES SOUTHWEST ALONG TRUNK HIGHWAY 23 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND COUNTY ROAD 46 IN KERRICK, AT TRUNK HIGHWAY 23 MILEPOST 305.45, UNDER THE RAILROAD TRACKS AND OVER THE LITTLE WILLOW RIVER, IN THE SOUTHWEST END OF A 10.0 FEET BY 10.0 FEET DOUBLE CONCRETE BOX CULVERT OVER THE LITTLE WILLOW RIVER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1140.099	.016	2/1				VERTICAL ADJUSTMENT	2012	00000702
1140.093	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBRUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1139.748	.016	3				VERTICAL CONTROL SURVEY	1945	L19 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1140.063	.262		1049.772	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -90.525 12B = -90.541 09 = -90.387 03 = -90.289

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 18 33.93154	92 37 17.47887	570381.468	311432.348	.131	3	GPS - RTRN	2008	RTRN2008

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036160.771	809797.924	1736028.792	16825744.936	.131	3	GPS - RTRN	2008	RTRN2008

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/Z_154_RESET-RN0485-3W-14OCT2008.jpg	W	Oct 14, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/Z_154_RESET-RN0485-2-14OCT2008.jpg		Oct 14, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/Z_154_RESET-RN0485-1-14OCT2008.jpg		Oct 14, 2008

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **

Mn/DOT Name: Z 157 **NGS Name:** Z 157

County: PINE, MN (Sheet 2)

NGS ACRN: RN0510 Get Map
NGS Quad / Sta Num : 46092314/
USGS Quad: HANGING HORN LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	2	45 N	19 W	462505.00	924157.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1962	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1995) **Stamping:** Z 157 1935

5.2 MILES EAST-SOUTHEAST OF MOOSE LAKE, 4.1 MILES SOUTHEAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 73, 72.0 FEET WEST AND 27.0 FEET SOUTH OF THE JUNCTION OF COUNTY ROAD 13 AND A TOWNSHIP ROAD (NORTH), 525.0 FEET WEST OF A LARGE WHITE FARMHOUSE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1138.974	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1138.584	.007	1				VERTICAL CONTROL SURVEY	1935	L19 MINN

Geoid Separations(ft): GEOID18 = -91.703 12B = -91.699 09 = -91.584 03 = -91.427

*** No Horizontal Positions in the Database ***

ZALESKY MNDT

Mn/DOT Name: ZALESKY MNDT **NGS Name:** ZALESKY

County: PINE, MN (Sheet 2)

NGS ACRN: AH1796 Get Map
NGS Quad / Sta Num : 46092342/
USGS Quad: WILLOW RIVER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	36	45 N	20 W	462007.59	924905.65	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1993	2008	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type: ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 37 FT)
Disk Type: SURVEY DISK
Mon. Agency: MNDT

Description: (1993) **Stamping:** ZALESKY 1993

1.4 MILES NORTHEAST OF THE WILLOW RIVER, 1.3 MILES NORTH-NORTHEAST ALONG INTERSTATE HIGHWAY 35 FROM THE JUNCTION OF COUNTY ROAD 43 AND INTERSTATE HIGHWAY 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 206.8, IN INTERSTATE HIGHWAY 35 MEDIAN, 91.4 FEET EAST-SOUTHEAST OF SOUTHBOUND INTERSTATE HIGHWAY 35, 67.7 FEET EAST-SOUTHEAST OF THE EAST END OF A 15.0 INCH DIAMETER CONCRETE CULVERT, 46.6 FEET WEST-NORTHWEST OF NORTHBOUND INTERSTATE HIGHWAY 35, 9.3 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Station Notes
NO REAL TIME REFERENCE NETWORK (RTRN) POSITION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1066.067	.016	2/1				VERTICAL ADJUSTMENT	2016	00000879
1066.067	.016	2/1				VERTICAL CONTROL SURVEY	2009	VMOOSE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
			974.778	.006	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1066.074	.131		974.887	.066	2007	HORIZONTAL ADJUSTMENT	2009	GPS2566
1066.074	.131		974.998	.066	1996	GPS - STATIC	2009	HMOOSE
1066.074	.131		974.887	.066	2007	GPS - STATIC	2009	HMOOSE
			974.887	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1066.008	.131		974.998	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1839
1066.008	.131		974.998	.066	1996	GPS - STATIC	2002	HPINE
1066.084	.131		975.001	.066	1996	HORIZONTAL ADJUSTMENT	1998	GPS917

NGVD29

Orthometric Height			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1065.713						GPS - STATIC	1994	HORZ

Geoid Separations(ft): GEOID18 = -91.296 12B = -91.279 09 = -91.174 03 = -91.296

ZALESKY MNDT

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 07.58507	92 49 05.65390	520654.700	320807.615	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 07.58494	92 49 05.65472	520654.642	320807.601	.033	C	ADJUSTMENT	2009	GPS2566
46 20 07.58494	92 49 05.65472	520654.642	320807.601	.033	C	GPS - STATIC	2009	HMOOSE
46 20 07.58494	92 49 05.65472	520654.642	320807.601	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 07.58449	92 49 05.65469	520654.644	320807.556	.033	C	GPS - STATIC	2009	HMOOSE
46 20 07.58449	92 49 05.65469	520654.644	320807.556	.033	C	ADJUSTMENT	2003	GPS1839
46 20 07.58449	92 49 05.65469	520654.644	320807.557	.033	C	GPS - STATIC	2002	HPINE
46 20 07.58449	92 49 05.65469	520654.644	320807.556	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

Geodetic Position		Pine County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 07.58080	92 49 05.64848	520655.081	320807.183	.033	C	GPS - STATIC	1994	HI35N

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986287.822	818322.708	1686312.314	16835052.811	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986287.765	818322.694	1686312.257	16835052.798	.033	C	ADJUSTMENT	2009	GPS2566
2986287.765	818322.694	1686312.257	16835052.798	.033	C	GPS - STATIC	2009	HMOOSE
2986287.765	818322.694	1686312.257	16835052.798	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986287.768	818322.648	1686312.259	16835052.752	.033	C	GPS - STATIC	2009	HMOOSE
2986287.768	818322.648	1686312.259	16835052.752	.033	C	ADJUSTMENT	2003	GPS1839
2986287.767	818322.648	1686312.259	16835052.752	.033	C	GPS - STATIC	2002	HPINE
2986287.768	818322.648	1686312.259	16835052.752	.033	1	ADJUSTMENT	1998	GPS917

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2986288.210	818322.282	1686312.696	16835052.379	.033	C	GPS - STATIC	1994	HI35N

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ZALESKY-AH1796-3W-04JUN2007.jpg	W	Jun 4, 2007
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ZALESKY-AH1796-2-04JUN2007.jpg		Jun 4, 2007
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/pine/ZALESKY-AH1796-1-04JUN2007.jpg		Jun 4, 2007

** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **