

Nov. 4, 2009

David Bolduc
WGCP, Cadillac, MI

Antenna Site: 4415 M 115
Cadillac, MI

SCOPE OF WORK

As a licensed professional in the state of Michigan, I have been selected to provide a service of staking and verifying the direction of a FM Antenna for WGCP, Cadillac, MI. The antenna is to be pointed in a direction of N11E to True/Geodetic North.

EQUIPMENT

TCRP 1205 R100 5" total station with Reflectorless EDM; Make: Leica Geosystems

Smart Rover GPS 1200; Make: Leica Geosystems

MDOT CORS; RTCM broadcast service

PROCEDURE

The first step in determining the Geodetic Azimuth is enabling the GPS Smart Rover and setting control points on the site using State Plane Coordinates from the NAD83 Zone (2112) Lambert Central. This is achieved by communicating with the MDOT CORS stationed in Cadillac and applying the necessary projection and finally putting Grid coordinates on the control. From the control set, the TCRP 1205 was set up and the existing tower base ring was located which was used to calculate the center of the tower.

Taking this information and applying it to the NGS Geodetic Tool Kit site http://www.ngs.noaa.gov/cgi-bin/spc_getgp.pri; allows for the Convergence Angle to be calculated for our site. The Convergence Angle is the angle that is the difference between a Grid azimuth and the Geodetic azimuth that we are looking for, which for our site is -00 47 34.39. This angle was added to the Grid azimuth to obtain the Geodetic azimuth. This is what the stakes for the tower are based on.

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Finally, after the tower is set, I made another visit to the site to locate the base and tip of the 3' long antennas for both the top and bottom. This was accomplished by utilizing the Reflectorless EDM on the total station.

CERTIFICATION

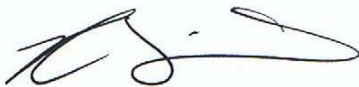
I certify that on November 3, 2009 I have located the azimuth to the best of my control and information provided from the base to the tip of the 3' long antenna's whose final position is on said date as follows:

Top Antenna

Geodetic Azimuth: 10-54-25.39

Bottom Antenna

Geodetic Azimuth: 11-07-02.39



Kelly Simmer, PS

Nov, 4 2009



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