



Surveyor's Office

61150 SE 27th St. • Bend, Oregon 97702
(541) 388-6581 • FAX (541) 388-2719

Examples of Using GPS Observations and Coordinate Systems as Basis of Bearing on Surveys and Plats

Central Oregon Coordinate System-Merely stating that the Central Oregon Coordinate System (C.O. Grid) is the basis of bearing for a survey or plat is not sufficient for a Basis of Bearing statement. A few examples of accepted methods of citing the C.O. Grid are:

CS18127.

BASIS OF BEARINGS

BASE BEARING DETERMINED FROM THE CENTRAL OREGON COORDINATE SYSTEM USING CONTROL MARKS 15130900 AND 15131600. N00°33'29"W ~ 5258.71 (RECORD). N00°33'29"W ~ 5258.56 (MEASURED).

CS18107

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CENTRAL OREGON COORDINATE SYSTEM BASED UPON GPS OBSERVATIONS AT NGS STATION 'PILOT BUTTE' (PID QD1681), ALSO KNOWN AS CENTRAL OREGON COORDINATE SYSTEM CONTROL POINT 'GIS 031'. THE PUBLISHED CENTRAL OREGON COORDINATE SYSTEM COORDINATES FOR "GIS 031" WERE HELD.

CS18133

THE BASIS OF BEARINGS IS THE NORTH LINE OF THE NORTHEAST ONE-QUARTER (NE1/4) OF SECTION 11 BEING NORTH 89°34'52" WEST (CENTRAL OREGON COORDINATE SYSTEM) AS SHOWN HEREIN. BASIS OF BEARINGS DETERMINED BY RTK (REAL TIME KINEMATIC) OBSERVATION FROM THE DESCHUTES COUNTY, REDMOND ORGN (OREGON REAL TIME GPS NETWORK) BASE.

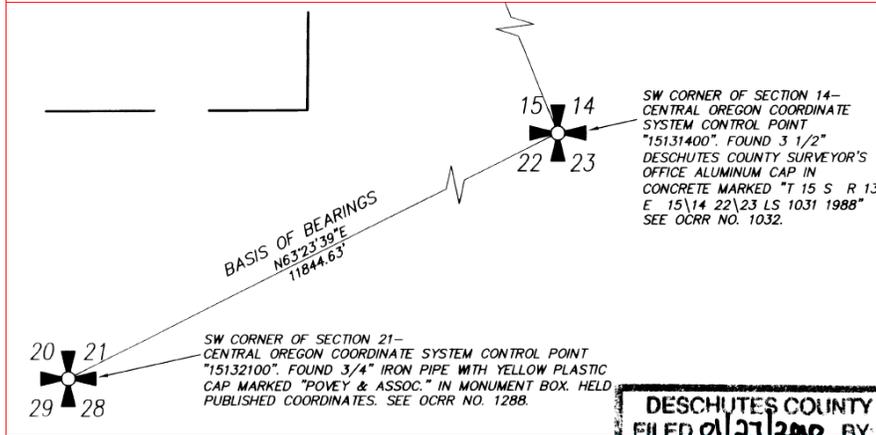
CS18146

BASIS OF BEARING

DESCHUTES COUNTY COORDINATE SYSTEM RECORD BEARING S0°04'42"W BETWEEN O.C.R.R. 030 AND 016

CS18108:

THE BASIS OF BEARINGS FOR THIS SURVEY IS BASED ON THE BEARING OF THE LINE BETWEEN CENTRAL OREGON COORDINATE SYSTEM CONTROL POINTS '15132100' AND '15131400' AS BEING NORTH 63°23'39" EAST AS COMPUTED FROM THEIR PUBLISHED COORDINATES. SEE DETAILS ON THIS SHEET.



Examples of Opus Solution for Basis of Bearing:

CS18257

PROJECT PROCEDURES

WE PERFORMED A STATIC GPS SURVEY AROUND THE PROJECT AREA BRACKETING THE SITE. THESE CONTROL POINTS WERE SUBMITTED TO NGS FOR OPUS SOLUTION IN NAD 83 (CORS 96). THE LATITUDE AND LONGITUDE OF THE NGS OPUS SOLUTIONS WERE CONVERTED BY TRIMBLE GEOMATICS SOFTWARE TO GRID COORDINATES IN WGS 84 USING THE MAPPING PARAMETERS SHOWN HEREON. WE THEN CALIBRATED OUR TRIMBLE 5700 GPS SYSTEM ON THESE POINTS IN RTK MODE AND SURVEY TIED THE PREVIOUSLY MONUMENTED CORNERS OF THE SECTIONS CONTROLLING OUR WORK DIRECTLY BY GPS USING THE CONTROL POINTS ESTABLISHED USING THE GPS. WE THEN SEARCHED FOR THE REMAINING CONTROLLING CORNERS, TYING THE FOUND CORNERS AND RE-ESTABLISHING THOSE CORNERS BY SURVEY NECESSARY TO COMPLETE THE SUBDIVISION OF THE SECTIONS IN ACCORDANCE WITH THE BUREAU OF LAND MANAGEMENT MANUAL OF INSTRUCTIONS. AFTER CORNER DETERMINATION WE USED OUR GPS EQUIPMENT IN RTK MODE TO MONUMENT THE CORNERS OF THIS SURVEY AND POST THE BOUNDARY LINES DEPICTED ON THIS PLAT. SURVEY PROCEDURES FOLLOWED THE "STANDARDS AND GUIDELINES FOR CADASTRAL SURVEYS USING GLOBAL POSITIONING SYSTEM METHODS, VERSION 1.0. MARCH 31, 2001 AS ADOPTED BY THE USDOJ BUREAU OF LAND MANAGEMENT AND USDA FOREST SERVICE". BEARINGS ARE BASED ON GPS "NORTH" FOR THE PROJECT USING THE NGS OPUS SOLUTION SHOWN FOR POINT NUMBER 2 LOCATED NEAR THE CORNER Z-3, 1/4 S31/S6.

CS18112 Sheet 1

GENERAL SURVEY NOTES

1. FIELD SURVEY NOTES ARE ON FILE IN THE OFFICE OF ARMSTRONG SURVEYING & ENGINEERING, INC., 267 NE SECOND STREET, PRINEVILLE, OREGON. TWO BOOKS.
2. BEARINGS ARE GPS NORTH AS PER THE NGS OPUS SOLUTION FOR THE PROJECT - SEE NARRATIVE FOR ADDITIONAL DETAILS.

CS18112 Sheet 4

PROJECT PROCEDURES

WE PERFORMED A STATIC GPS SURVEY AROUND THE PROJECT AREA BRACKETING THE SITE. THESE CONTROL POINTS WERE SUBMITTED TO NGS FOR OPUS SOLUTION. THE CALCULATED LATITUDE AND LONGITUDE OF THE NGS OPUS SOLUTIONS WERE CONVERTED TO GRID COORDINATES BASED ON WGS 84. WE THEN CALIBRATED OUR TRIMBLE 5700 GPS SYSTEM ON THESE POINTS IN RTK MODE AND SURVEY TIED THE PREVIOUSLY MONUMENTED CORNERS OF THE SECTIONS CONTROLLING OUR WORK EITHER DIRECTLY BY GPS OR BY CLOSED CONVENTIONAL TRAVERSE FROM CONTROL POINTS MEASURED BY GPS IN THE CORNER VICINITY. WE THEN SEARCHED THE REMAINING CONTROLLING CORNERS AND RE-ESTABLISHED THOSE CORNERS TO SUBDIVIDE THE SECTIONS IN ACCORDANCE WITH THE 1973 BUREAU OF LAND MANAGEMENT (BLM) MANUAL OF INSTRUCTIONS. WE THEN USED OUR GPS EQUIPMENT IN RTK MODE IN COMBINATION WITH CONVENTIONAL TRAVERSE ORIGINATING FROM GPS RTK POINTS TO MONUMENT THE CORNERS REQUIRED UNDER THIS CONTRACT AND POST THE BOUNDARY LINES DEPICTED ON THIS PLAT. BEARINGS ARE BASED ON GPS "NORTH" FOR THE PROJECT USING THE NGS OPUS SOLUTIONS.

Example of GPS Observations and CORS Data for Basis of Bearing:

CS18111

BASIS OF BEARINGS

BEARINGS ARE GEODETIC DETERMINED BY GPS OBSERVATIONS TAKEN AT THE 1/4 CORNER COMMON TO SECTIONS 16 AND 21, T. 14 S., R. 8 E. W.M. THE CONVERGENCE AT THIS LOCATION IS -00°52'47" (GRID TO GEODETIC)

SURVEY METHOD

THIS SURVEY WAS PERFORMED BETWEEN OCTOBER 13TH AND OCTOBER 16TH TO ESTABLISH THE POSITIONS OF THE CONTROLLING MONUMENTS AND PROJECT CONTROL FOR AN RTK GPS SURVEY TO MARK THE BOUNDARY OF THE MOUNT WASHINGTON WILDERNESS FROM ANGLE POINT NUMBER 88 THROUGH ANGLE POINT NUMBER 89 TO ANGLE POINT NUMBER 90.

THE POSITIONS OF THE CONTROLLING SECTION, 1/4 SECTION AND WILDERNESS BOUNDARY ANGLE POINT WAS DETERMINED BY A STATIC GPS SURVEY USING TOPCON DUAL FREQUENCY HIPER GPS RECEIVERS. THE NETWORK WAS POST PROCESSED USING TOPCON TOOLS POST PROCESSING SOFTWARE AND WAS CONSTRAINED HORIZONTALLY TO NGS CORS STATIONS REDM, STAY AND LPSB AND CONSTRAINED VERTICALLY TO STATION REDM HOLDING THEIR PUBLISHED NAD 83(2007) ADJUSTED POSITIONS. THE WILDERNESS BOUNDARY WAS MARKED USING A