

PART 540 – FIELD SURVEYS

ND540.0 General

- A. All survey grade GPS or total station surveys shall have an instrument control point and a minimum of two additional control points set with steel pins, wood hubs, or otherwise marked in a manner that can be reasonably expected to remain in place for 3 years. Construction drawings will include coordinates, locations, and descriptions of control points.
- B. Surveys completed with a total station or level utilizing multiple setup points will be closed and the error of closure documented, for approval by the design engineer as being acceptable precision for the specific project. If notes are taken manually, the formats outlined in NEH, Part 650, Chapter 1 will be utilized.
- C. Construction drawings put together based on a GPS survey will include a narrative description of the map projection, horizontal datum, vertical datum, Geoid model/date, and survey units on the cover sheet. Example statement: *“Survey work for the project was completed with a Survey Grade GPS in a local site calibration mode with the following settings: UTM13, NAD83(CONUS MOL), Geoid Model 03, International Feet for vertical and horizontal datums. All stationing and distances shown on these drawings are measured horizontal distance and all quantities are listed as in-place yardage.”*
- D. The decision on whether to tie in to USGS benchmarks for horizontal or vertical control will be made by the design engineer for the project. Typically survey work on projects that require floodplain permits, or are associated with project dams, are tied into a minimum of 2 third order or better vertical control points.
- E. LIDAR elevation data is available for the majority of North Dakota. Nominal Point Spacing (NPS) of the data is 1.4 meters (4.6 feet) and the Root Mean Square Error in the vertical direction is ≤ 15 cm. From an engineering perspective, this data can be considered equivalent to a 2 ft contour accuracy. The decision on whether this data is of sufficient accuracy for planning or design work rests with the approving individual for the practice. Use of LIDAR data for design work requires written justification by the design engineer as to its suitability for the project, in the design notes.
- F. NRCS employees are not authorized to complete boundary survey work, and therefore should not depict property boundaries or survey monuments on construction drawings without accompanying disclaimers. In the design of features that could result in a property line dispute, such as a pivot center point, final selection of the feature location should be made by the property owner or their designee.
- G. Soil borings or tests pits should typically be surveyed in utilizing the same datum as the topographic survey work for the project.