



FDM 9-70-1 Introduction

October 28, 1994

1.1 When Used

WisDOT currently uses topography surveys to determine the position of natural and fabricated features along the survey route. Several different methods are used to obtain this data: station and offset left or right to a survey alignment or baseline, aerial mapping, or collecting data radially based on a coordinate system.

1.2 Standards and Specifications

Specifications, standards, and datums shall conform to Section 40, Vertical Control when determining elevations along with horizontal positioning, and to Section 35, Horizontal Control. Measurement of topography is usually to the nearest one foot (300 mm). However, measurements to the nearest tenth of a foot (30 mm) may be necessary to objects when it is not clear if they occupy existing right of way or encroach upon landmarks.

1.3 Other References

There is a certain amount of ground survey work involved in control and checking of photogrammetric methods. These procedures are covered in Section 45, Aerial Projects.

Sources of information for supplementing the survey include the following:

1. Region survey files
2. As built plans
3. Private and county surveyors
4. Municipalities
5. Railroads
6. Utility companies

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Topographic features located by the station and offset method are normally expressed as a station value (plus) and an offset distance (out). The offset distance is always perpendicular to the survey reference line. When using radial topography methods, topographic features will be relative to a coordinate system for the project.

The surveyor shall identify all natural and fabricated features with sufficient accuracy to ensure contract quantity computation and production of planimetric drawings that accurately portray these features in relationship to each another. If natural or fabricated features impose a constraint on the design of a project or are an encroachment on an existing facility, conduct measurements more accurately. The measurement of most objects will be taken to the front or point nearest the alignment. Possible exceptions are right of way posts and utility poles; measure these to the back edge. When surveying to round manholes, measure to the center of casting. For curb inlets, use the flow line of the curb. When surveying existing pipes or larger drainage structures, indicate the size, type, condition, and total length of pipe or drainage structure.

Record the location of all bench marks and soil borings. Take extra care to accurately locate underground features such as wells, septic systems, and utility installations. The location of underground utilities should be established by coordination with Diggers Hotline, utility companies, and local government units.

When locating storm sewers, sanitary sewers, and water mains, coordinate efforts with the municipality or drainage region. They can provide plans and assistance, which will make the task much easier.

The region designer will specify the width of the project and topographic information is obtained for the entire length of the project to the width specified by the region designer or survey supervisor. The width is based on the proposed scope of the improvement and character of the terrain. Additional width may be obtained from aerial mapping.

Survey crew chiefs and other personnel who record field notes should become familiar with and use the conventional symbols and standard abbreviations contained in [Chapter 15](#) of this manual. Notes taken electronically shall conform to the SDMS format.

5.1 Computations

When working with a survey alignment, the line bearings and curve information will be required. When collecting data radially with a coordinate system it shall conform to the SDMS format so post processing can easily be carried out. You will need the horizontal and vertical data for control points when using the radial method.

5.2 Field Notes

It shall be a policy for the crew chief to scan the field notes for completeness. In the case of electronic data collection, the final plot should be reviewed by the crew chief for accuracy.

FDM 9-70-10 Data Destination, Formats, ETC.

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Field notes will be compiled and entered into the survey folder for each particular project. The survey folder should be forwarded to the survey supervisor and/or survey coordinator who will check for completeness and will either file the survey folder or forward to the design engineer.

Data collected by electronic data collector shall be downloaded to a personal computer for processing. This information will then be stored on a diskette and stored in the survey folder or other appropriate location. A hard copy should be printed out for the region files and the design engineer. The processed data will then be transferred to the appropriate unit/designer for plotting/processing.