

# Preliminary Survey Procedure

Design Manual  
Chapter 1  
General Information

Originally Issued: 09-22-00  
Revised: 01-23-04

This section provides information relevant to preliminary survey requests and preliminary surveys, and how these tie into creating a Digital Terrain Model (DTM).

## Survey Requests

### Planning

A survey request layout should be provided to Preliminary Survey and Photogrammetry by November 1 of each calendar year. The Planning DTM mapping limits will be defined by an aerial photo with mapping boundaries penciled in or electronically drawn on the perimeters of the corridor as per the Project Management Team's needs. Planning DTM mapping limits are provided to the Photogrammetry Section in the "Order Aerial Photography" event. The photography used to generate the Planning DTM will be flown at a flight height of 3,000 feet or lower.

### Design Section

A survey request should be provided to Preliminary Survey that defines the preferred alignment corridor. The field survey will be conducted in a narrowly defined corridor along the preferred construction alignment. For this event, the survey layout shall be an aerial photo with mapping boundaries penciled in or electronically drawn on the perimeters of the construction corridor. This layout shall be a product of the Project Management Team's preferred alignment decision. Photogrammetrically collected data and field collected data are combined to create a Design Level DTM.

## Preliminary Survey

The current policy is to obtain preliminary surveys to 3<sup>rd</sup> order Class I accuracy for survey centerlines (including side roads) and 3<sup>rd</sup> order Class II accuracy for the remainder of the survey. Below is the procedure used to accomplish this accuracy and eliminate any duplication of work by the preliminary and cornerstone parties.

1. All preliminary engineering surveys shall be done in such a manner as to insure that the survey centerline is at least 2<sup>nd</sup> order Class II (1:20,000) accuracy.
2. Preliminary engineering survey parties shall check the accuracy of their surveys by tying to the GPS control network where available or by running a closed traverse.
3. If the error of closure on the traverse run to determine the accuracy of survey is not within the prescribed limits, it indicates that an error in field work has been made and the work should be checked and the error corrected.
4. On projects where the preliminary engineering survey was done and the District Land Surveyor finds the preliminary survey centerline is less than 2<sup>nd</sup> order Class II (1:20,000), the Supervisor of Surveys, Office of Road Design shall be notified and requested to make the appropriate adjustments to bring the survey within prescribed limits of accuracy.

5. The District Land Surveyor shall tie the land corners to the survey centerline or local project control other than outlined in 4 above.
6. All field notes obtained by the District Land Surveyor shall be kept in the district files.

## **Preliminary Survey Information**

All requests for additional preliminary survey information beyond the normal data furnished by our ground surveys shall be submitted to the Survey Supervisor. The purpose of this coordination of survey is to provide the best utilization of our crews, determine need of additional survey for necessary and possible correction of data collected, and the proper utilization of RCE survey. Even in situations where the District agreed to provide additional survey data, this should be submitted through the Survey Supervisor.

Aerial photography is being obtained and updated for all primary highway improvement projects. This should provide an adequate corridor on each side of the proposed centerline. Preliminary survey crews will provide necessary ground control so that a DTM can be generated through stereo plotter operation. This procedure should effectively reduce the problem of disruption of survey scheduling caused by moving back survey crews to pick up additional preliminary survey information.

## **Final Design DTM**

Upon completion of the Preliminary Survey, all field data collected at critical points and at critical lines will be merged into the original Planning DTM. Field generated point and line data will supercede photogrammetrically collected data. The Planning DTM supplemented with field data then becomes the Final Design DTM.