

## SPECIFICATIONS FOR LiDAR SERVICES

This document is a reference guide for providing LiDAR services for Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), Lakewood, Colorado.

### I. GENERAL DESCRIPTION

The work consists of LiDAR data collection in CFLHD U.S. Customary Units format; also known as the U.S. Survey Foot (one meter equals 3937/1200 feet.). The Technical Requirements section of this specification document indicates more specific requirements.

### II. TECHNICAL REQUIREMENTS

- A. All MicroStation® files must be in V8-X30 most current edition.
- B. CFLHD will furnish ground control points within the project area, some of which, CFLHD may withhold from the Contractor for the purpose of verifying the accuracy of the LiDAR coverage.
- C. Make the necessary adjustments to insure that the LiDAR tin file fits the control provided at a 95% confidence level to an accuracy of 0.3 foot vertically and 0.50 foot horizontally throughout the project area.
- D. The LiDAR data is to be separated into three ASCII files:
  - 1. The Post-Processed Raw LiDAR Data containing the un-thinned point cloud.
  - 2. The unthinned Bald Earth LiDAR Data containing all the data points that depict the ground surface with all the points which represent vegetation, structures or other non-surface features removed.
  - 3. A thinned Bald Earth LiDAR Data file containing those data points needed to accurately depict the ground surface with all points that represent vegetation, structures and other features deleted. Care should be taken to ensure that steep terrain areas are not accidentally filtered out with the vegetation. Major thinning of data should only be performed where there is little elevation change, to ensure accurate data around grade changes.
- E. Both the Post-Processed Raw LiDAR Data and the Bald Earth LiDAR Data files must be recorded as space-delimited ASCII (text) files with each data point's coordinates given in the order Easting, Northing and Elevation (XYZ) for each project area.
- F. Using the CFLHD Microstation seed file named **Sur\_ft3D.dgn**, create thinned digital terrain model (dtm) files from the thinned ASCII Bald Earth data file, which incorporates break line enforced Bald Earth LiDAR Data. Breaklines along the edge of road are

needed. These breaklines are to be placed with vertices to ensure an accurate depiction of the road surface. The LiDAR points in the roadway between the edge of road break lines will be removed. Each dtm file will be of a size acceptable to the COTR, fit against adjacent dtms without gaps and be line for line joined.

1. Create a triangular irregular network (tin) file compatible with GeoPak® current edition. The tin will be derived from the MicroStation® dtm file(s) described above.
- G. All digital files are to be placed on DVD+R disks in 1/4" jewel cases with disk labels and jewel case inserts stating the creator's name, date and names and sizes of the files contained therein.