

M-49 Survey

CS 30011, JN 1158020

Village of Camden, Hillsdale County, Michigan

Spalding DeDecker Associates, Inc. (SDA) worked with SSI to deliver this survey utilizing mobile LiDAR technology. SDA performed project and scan control, property, utilities, and alignment. SSI performed point cloud extraction and pick-up survey for obscured areas.



Work was performed through the **Statewide As-Needed Design, Photogrammetric, and Mobile LiDAR Surveys** contract. Mapping extended beyond the right of way for 1.1 miles along M-49 and another 0.4 mile along an intersecting roadway for 1.5 miles of total length. The work included pre-targeting scan acquisition targets (SCATS) and validation targets (VATS). An alignment drawing was completed, and the centerline of M-43 was monumented by points installed in new monument boxes at the points of curvature, intersection, and tangency. New land corner recordation certificates were prepared for all alignment points and public land survey system corners.

The project included performing a **mobile LiDAR control survey**. The base map was created using **mobile LiDAR** data and supplemented with conventional observations for obscured areas and utilities. The scope included establishing two primary control points along with intermediate control. Static and RTK observations, with a base unit on each primary control point, was used to establish **state plane coordinates**, Michigan South Zone (2113), and international feet based upon the CORS adjustment of **NAD83**. The vertical datum was **NAVD'88**, based upon **OPUS** solutions. An **electronic Leica DNA03 digital level** was used to measure precise elevations for all intermediate control, benchmarks, SCATS, and VATS.



OWNER / CLIENT

Michigan Department of Transportation

PROJECT START - END

May 2012 – October 2012

SDA PROJECT NO.

SM12-028

SDA SERVICES

Photogrammetric Control Surveys

We were provided with a scanning trajectory plan, including the proposed location for all scan acquisition targets (SCATS) and scan validation targets (VATS). We pre-targeted each location, marking them with chevrons constructed using yellow adhesive foil pavement marking tape. Points were measured horizontally with GPS RTK observations, using a base at each primary control point, incorporated into the GPS network, and adjusted with least-squares methods. All elevations were determined by direct leveling using an electronic level and also adjusted by least-squares methods. **OPUS** was used to validate the network solution and confirm the project datum, which was GPS-derived NAVD'88.

We provided ASCII files for the control, and our team produced comparison reports for the mobile LiDAR adjustments. All adjustment outputs, raw data, and comparison reports were included in an electronic **survey portfolio** for the project. We provided deliverables according to MDOT's *Standards of Practice*, including the additional comparison reports required for mobile LiDAR. The final deliverable included all items required according to the *Standards of Practice*. Additional items included digital photographs and LiDAR point clouds, both from the mobile scanning equipment.