Project Profile

M-142 over Nettle Run
CS 32021, JN 90241D
Oliver Township, Huron County, Michigan

Spalding DeDecker Associates, Inc. (SDA) was retained by the Michigan Department of Transportation (MDOT) to provide a design survey for M-29 over Nettle Run.

SDA performed a design survey for approximately 1,200 feet of roadway along M-142, and **structure and hydraulic surveys** for the replacement of the structure over Nettle Run. SDA worked closely with Tom Bogren, MDOT's Survey Consultant Project Manager, to develop the survey work plan and execute the survey. All work was performed according to **MDOT's Standards of Practice**, including establishing horizontal and vertical control, performing mapping, and retracing right of way and property lines.

The hydraulic analysis was performed by MDOT's Hydraulic Unit in Lansing. The project included a site meeting with Larry Wiggins of MDOT to review the location and extent of the cross-sections. Cross-sections were measured using MDOT's code list and procedures. The measurements were processed in **CAiCE** according to **MDOT's Standards of Practice**, allowing MDOT to process the data using their tugboats for automated-input into **HEC-RAS** for the hydraulic analysis.

SDA met with an engineer from the MDOT Hydraulic Unit in the field prior to completing the work. Work was done in **State Plane Coordinates** based upon the CORS adjustment of **NAD83**. The **NAVD'88** vertical datum based upon NGS benchmarks was used as the basis for our elevations. We completed detailed bridge sections, requiring familiarity with **bridge structure survey and nomenclature**. Work was performed according to MDOT's *Standards of Practice*. Points collected were coded according to these standards using MDOT's feature codes, and the crews were required to identify **vegetation changes/friction points**, **top of water** elevations, and apparent high-water marks.

We provided deliverables according to MDOT's *Standards of Practice*. This included a stand-alone survey portfolio and surveyor's report specifically for the hydraulic survey. The data was collected electronically in the field using MDOT's feature code list, imported through Leica Geo-office, and processed into **CAiCE** for manipulation. The final deliverable included ASCII text files, GeoPAK and MicroStation files, cross-section location sketches, structure sketches, electronic photos for the structure and each cross-section, and other required deliverables.

OWNER / CLIENT
Michigan Department of Transportation

PROJECT START - END
July 2009 - October 2009

SDA PROJECT NO.
SM09-032

SDA SERVICES
Hydraulic Surveys
Structure Surveys

The scope of the structure survey included establishing intermediate control using GPS RTK observations based upon **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 observations to adjacent NAVD'88 benchmarks made using an **electronic Leica DNA03 digital level**. Details requested for the bridge included computing as-constructed centerline alignment, reference point locations and elevations, bottom of beam elevations, and other abutment and bridge details.

Field mapping was performed using a robotic Leica TCRP1203 total-station utilizing the electronic MDOT feature code list. Data was downloaded into Leica Geo-office, exported as an ASHTO cal file, and processed with **CAiCE**. All drafting was performed in Power GeoPAK. The final deliverable included all items required according to MDOT's *Standards of Practice,* which was included in a **survey portfolio**. Mapping was included in the MicroStation and CAiCE files, and specific details requested on the structure were marked in red pen on existing bridge plans and included in the survey portfolio.