

M-3 Northbound and Southbound (Gratiot Avenue) over the Clinton River Mount Clemens & Clinton Twp, Michigan

Spalding DeDecker Associates, Inc. (SDA) was retained by the Michigan Department of Transportation (MDOT) to provide complete design for the rehabilitation of M-3 (Gratiot Avenue), from Sunnyview to Sandpiper Streets, located in Mt. Clemens and Clinton Township. The project included a 3.94-mile-long, four-lane wide, southbound section and a 3.23-mile-long, three - to four-lane wide northbound section.



SDA performed surveys on, and in the vicinity of, the existing bridge, as well as hydraulic surveys of the Clinton River, to support the total replacement of the bridge. The hydraulic survey included obtaining cross-sections of the river, both upstream and downstream of the structure. This work was performed by conventional methods, and required the use of our survey boat. Data was input into CAICE and submitted in a separate survey portfolio to the MDOT Hydraulics Design group, as well as the Bridge Design Group in Lansing, for their design of the replacement structures.

The work was done in **State Plane Coordinates** based upon the CORS adjustment of **NAD83**; elevations were based on **NAVD'88** vertical datum established from NGS benchmarks. 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. The crews were required to identify **vegetation changes/friction points, top of water** elevations, and apparent high-water marks.

OWNER / CLIENT

Michigan Department of Transportation

PROJECT START - END

August 2005 – August 2010

SDA PROJECT NO.

RB05-009

SDA SERVICES

Hydraulic Surveys

Structure Surveys



We provided deliverables according to MDOT's *Standards of Practice*. This included a stand-alone survey portfolio and a surveyor's report specific to 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.

The project also included a detailed **structure survey** of both the bridge and the approaches (1,400 feet to the north and 1,000 feet to the south). The scope 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 an as-constructed centerline alignment, reference point locations and elevations, bottom of beam elevations, and other details on the abutments and bridge.

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 MicroStation and CAiCE. We provided deliverables according to MDOT's *Standards of Practice*. The final deliverable, a **survey portfolio**, included all items required according to the *Standards of Practice*. Mapping was included in the Power GeoPAK file, and specific details requested on the structure were marked in red pen on existing bridge plans and included in the survey portfolio.