

## M-3 (Gratiot Ave) Rehabilitation, Sunnyview St to Sandpiper St 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 Ave) from Sunnyview to Sandpiper Streets located in Mt. Clemens and Clinton Township. The project included a 3.94 mile long, four (4)-lane wide, southbound section and a 3.23 mile long, three (3) to four (4)-lane wide northbound section.

### SAFETY STUDIES

SDA performed a 3R/4R safety review and crash analysis for accidents that occurred over the previous three (3) years (2003-2006). A crash analysis was also conducted for all signalized intersections and each minor intersection. None of the intersections exceeded thresholds for number of crashes. The analysis revealed several accident types that exceeded threshold limits. SDA then conducted a field investigation at those locations to identify road hazards. In addition, SDA submitted Design Exception Requests and conducted site-specific crash analyses

for each of those sites, as well as time-of-return analyses for all recommended countermeasures.

### OWNER / CLIENT

MDOT - Macomb TSC

### PROJECT START - END

August 2005 – Ongoing (2010)

### SDA PROJECT NO.

RB05-009

### SOFTWARE

MicroStation

SignCAD

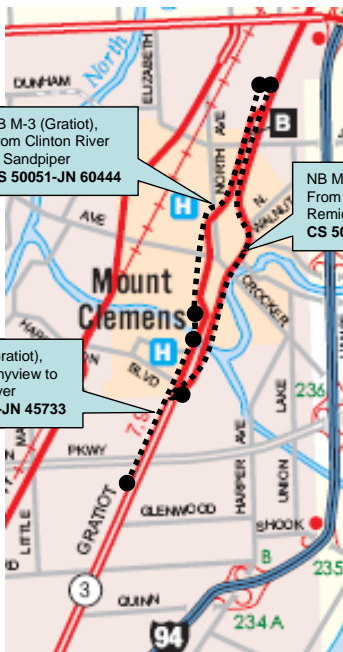
### ROAD AND STREET DESIGN / ROADWAY REHABILITATION & RURAL FREEWAYS

The project scope called for a comprehensive rehabilitation effort that included extensive pavement repairs, cold-milling concrete and HMA pavement, limited reconstruction, minor geometric improvements, HMA resurfacing, upgrading of nearly 200 ADA sidewalk ramps, guardrail replacement, and non-freeway sign upgrading, in accordance with **3R guidelines** for 2011 construction. The project included a safety analysis of all accidents and intersections, maintaining traffic plan, permanent pavement marking plan, and

non-freeway signing plan, as well as design and construction drawings and specifications. The project involved context sensitive design to minimize disturbing an older, well-developed, busy commercial corridor. Several design exceptions were required to keep the project within programmed funding.

Coordination with MDOT was also required, as they were designing the reconstruction of the two bridges (B01 and B02 of 50051) over the Clinton River within the project limits.

A separate project was also split off to reconstruct the existing M-3 NB and SB railroad





crossings with the Michigan Transit Museum (MTM) Railroad on the north side of Mt Clemens for 2009 construction.

MDOT also retained SDA to perform detailed design of approximately 300 ADA sidewalk ramps for a separate CPM resurfacing project on M-3 NB and SB between 14 Mile Road and Sunnyview/Remick and from Sandpiper to 23 Mile Road for 2009 construction.



### HYDRAULIC SURVEYS

SDA performed a hydraulic survey of the Clinton River, consisting of cross-sections of this river upstream and downstream of the two structures. Measurements were performed by conventional methods and required use of a boat. Data was input into CAiCE and submitted to MDOT along with a survey portfolio. Hydraulic analysis was performed by the MDOT Hydraulics group in Lansing who met SDA in the field prior to the work.

### ROAD DESIGN SURVEY

SDA performed a pick-up topographical survey for the project. Horizontal control was established using GPS observations and post-processing the data using the NGS OPUS program to achieve state plane coordinates in relation to the HARN adjustment. Vertical control was established in relation to the NAVD'88 datum, with observations performed using a Leica NA2002 electronic level and least-squares adjustment of the vertical control network. Mapping included performing pavement cross-sections in certain areas and locating surface features, along with underground utilities and surface drainage, and creating a Digital Terrain Model (DTM). Data was combined with aerial mapping that had been performed previously by MDOT.

## STRUCTURE SURVEYS

SDA performed complete survey information for two large structures over the Clinton River. The scope of work included retracing the bridge centerline and reference lines and performing cross-sections of the existing pavement including the approaches. Horizontal control was established using GPS observations and post-processing the data using the NGS OPUS program to achieve state plane coordinates in relation to the HARN adjustment. Vertical control was established in relation to the NAVD'88 datum, with observations performed using a Leica NA2002 electronic level and least-squares adjustment of the vertical control network. Data was furnished to the MDOT Bridge Design group in Lansing for their design.

