ms consultants, inc.
engineers, architects, planners

STATE ROUTE 11 REHABILITATION

CHALLENGE

A COST EFFECTIVE STRATEGY WAS NEEDED TO REHABILITATE A FIVE-MILE STRETCH OF STATE ROUTE 11, INCLUDING AN INTERCHANGE RAMP AND EIGHT BRIDGES.

SERVICES

- Design Build
- Bridge Inspection
- Bridge Rehabilitation
- Bridge Replacement
- Environmental Planning for Wetlands
- Highway Engineering
- Traffic Engineering
- Utility Coordination
- Survey

STATE ROUTE 11 REHABILITATION

The design/build team provided design and construction services for completion of the TRU-11-7.69 highway improvement project in northeast Ohio. The project involved milling and resurfacing of approximately five miles of four-lane State Route 11, including the SR11/SR82 interchange ramps and the reconstruction of eight bridges in, Trumbull County, Ohio.

For three bridges within the interchange, primary objectives involved improving the sub-standard vertical clearance to 16′-6″, replacing the concrete decks and converting the abutments to semi-integral type. The fourth bridge of the interchange was removed and replaced with a wider bridge with higher vertical clearance.

Additional work involved minor upgrades to four other structures, replacement of guardrail and concrete barriers, replacement of the signing and pavement markings, replacement of lighting features disturbed by the work and a maintenance of traffic planning during

construction. As mutually decided by the team, part-width construction maintenance of traffic schemes were used for all construction sequencing.

In advance of their selection, ms consultants and Marucci & Gaffney collaborated to formulate the most cost effective strategy to complete the project. Numerous options were studied for salvaging or replacing the steel superstructures while improving the vertical clearance for the interchange structures. Ways to raise the existing bridges and mainline pavement were compared with lowering the roadways below to achieve the most economical solution. It was determined that SR82 would not be altered and all changes to the vertical profiles would occur on mainline SR11 and the affected ramps.

From these studies, a plan for salvaging the existing steel superstructures proved to be more economical than replacing the structural members with shallower ones. Under this scheme of re-using the existing beams or girders, the mainline bridges and pavement section were raised and transitioned to match into the existing pavement sections. New vertical curves were developed to improve the vertical clearances and attain the desired clearance.

Where grade change increases are greater than four inches, limits of full depth pavement replacement were confirmed; where less than four inches, variable depth transition sections matched the new profiles into the existing pavement profiles. Due the proximity of the ramps to the bridges, the ramp profiles were also studied for changes each would need to undergo to fit the new mainline profiles. Due to the impact of the higher profile on Ramp A (SR11 southbound to eastbound SR82) and due to the presence of a wetland area at the bottom of the slope, steepened reinforced slopes were proposed as an alternative along this ramp to avoid impact to the wetland from earthwork encroachment. This reinforced slope concept was expanded in other areas of grade change to simplify embankment construction.