



## CHALLENGE

SERVING AS THE GATEWAY TO A RAPIDLY GROWING MULTI-USE DEVELOPMENT, THE EASTON AREA NEEDED MULTIPLE TRANSPORTATION IMPROVEMENTS.

## SERVICES

- Bridge Design
- Noise Impact Studies
- Noise Barrier Design
- Roadway Engineering
- Structural Engineering
- Survey Engineering
- Traffic Control
- Traffic Engineering
- Traffic Signal Design

## AWARDS



2000 OUTSTANDING  
ACHIEVEMENT AWARD  
Consulting Engineers Council  
of Ohio

## CDMS PROJECTS – EASTON AREA

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The ms design team supplied all survey, roadway, traffic, and structural engineering for 13,800 feet of two- and three-lane collector-distributor roadways adjacent to I-270 along with a new interchange at the Sunbury Connector, and approximately 2,000 feet of divided road for the new interchange. A new structure, the Easton bridge, was designed as part of the

interchange. Another new bridge was also designed to replace an existing structure carrying McCutcheon Road over I-270. Final design was also completed for MSE (mechanically stabilized earth) walls, highway lighting, traffic signs and signals, noise barriers, right-of-way and building demolition.

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### THE EASTON / I-270 INTERCHANGE

Considered the gateway to an upscale multi-use commercial complex, the Easton interchange with I-270 combines engineering ingenuity and aesthetic awareness to achieve the goals of public owner and private client.

Seeking a unified aesthetic for this landmark development, the client requested that “Easton Blue”, a signature color, appear wherever possible. The ms design team promoted this initiative on behalf of the client and negotiated approval. Travelers on I-270 approaching the Easton complex are greeted by the bold blue on sign and light posts, bridge girders and a decorative bridge railing.

The Easton bridge is a continuous four-span structure with an overall length of 363 feet and supported on concrete cap and column piers with a wall abutment on the west end and a pile abutment enclosed within an MSE wall on the east. The bridge railing, the first of its kind in the state, incorporates the word “Easton,” 42

inches high, spelled out 11 times in wrought iron railing and painted Easton Blue. Specially created by an Ohio fabricator, the Easton railing is among the visual highlights of the interchange and connects the bridge deck with specially designed, retro-style light fixtures.

The bridge carrying McCutcheon Road over I-270 is a continuous two-span supported by a concrete cap and column pier and semi-integral abutments. The new bridge, with a length of 276 feet, replaced an existing four-span structure.

Extensive plantings and landscaping soften interchanges and bridge approaches throughout the project area and this emphasis is most apparent at the Easton interchange where decorative trees and ground cover embellish the trumpet areas (an ODOT term for areas between the ramps, overpass bridges, and mainline). The Easton Bridge is accented by concrete retaining walls serving as planters, also landscaped with ornamental trees and ground cover.

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### THE MORSE ROAD / I-270 INTERCHANGE

The Morse Road and I-270 interchange rests at the heart of the \$280 million CDMS (Collector-Distributor Morse Stelzer) roadway improvement program. Centrally located among CDMS Projects 1-11, the interchange required extensive reworking to coordinate with the collector-distributor roadway system (CDMS 3) that allowed for construction of the new Easton interchange (CDMS 1) within six-tenths of a mile.

The upgrade of the interchange involved aerial and ground surveys, cut and fill calculations for the proposed alignment and profile, and final design for the widening of ramps and the widening and raising of I-270 over Morse Road. The design also widened

Morse for 3,600 feet from an existing four lanes to seven lanes through the interchange area. Two replacement structures carrying I-270 over Morse and two replacement structures carrying I-270 over Sunbury were also designed.

Construction documents addressed MSE (mechanically stabilized earth) walls, highway lighting, traffic signs and signals, noise barriers, right of way, and project streetscape enhancements. ms traffic engineers provided design for three new signals as part of a closed-loop system and the modification of a signal at Morse and Stelzer.

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## BRIDGE DESIGN

The four bridges designed as part of CDMS 6 are replacement structures carrying the I-270 mainline. Two structures over Sunbury Road are three-span structures supported on concrete cap and column piers and integral abutments. The overall length of each

bridge is approximately 190 feet. Two replacement bridges spanning Morse Road are single-span structures with a clear span of approximately 159 feet supported by semi-integral abutments on MSE walls.

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## TRAFFIC SIGNAL DESIGN AND TRAFFIC CONTROL

The Morse Road interchange upgrade required design for three signals including two three-phase freeway-ramp terminal signals and a six-phase signal at Morse Road and Appian Way/Limited Parkway. The traffic engineers also modified the signal at Morse Road and Stelzer Road. All installations used a suspended box-span wire design and were fully actuated. Major guide signs and continuous lighting along Morse Road were included in the final plans. Freeway and arterial signing and pavement marking were part of the construction documents as well.

Because of the increase in both the number of lanes and interchanges that would come about with the completion of CDMS, traffic engineers maintained access to project arterials and also preserved the existing level of traffic flow along I-270 during construction by utilizing the available space inherent in the collector-distributor design.

Construction began with the existing interior lanes along with the Morse Road interchange open while construction of the exterior lanes and the Easton interchange were underway. All three existing lanes in each direction were left open during peak travel hours, thus eliminating any additional construction disruption during the most important parts of the travel day. During off-peak hours, at least two lanes remained open in each direction. Once the new lanes and interchange had been completed, the older, interior lanes and the Morse Road interchange were shut down for rehabilitation, and the newly built exterior lanes and Easton interchange were opened to traffic. Again, three lanes each way remained open during peak travel hours, with at least two lanes open in each direction open during off-peak times. By taking advantage of the opportunities provided by this construction schedule, Columbus travelers were spared the frustration of peak-hour lane closures in one of the busiest traffic areas in town.

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## NOISE IMPACT AND BARRIER DESIGN

Part of the environmental documentation required for the entire CDMS assignment, noise impact analysis, including development of a Stamina 2.0 computer model of existing and proposed traffic-generated noise, was prepared by ms consultants. The model included a complete “stop and go” traffic situation at the intersection of Morse and Sunbury Roads. To make sure that the noise effects of mainline projects were minimized as much as possible, advanced highway noise modeling techniques were utilized, including state-of-the-art TrafficnoiseCAD, to predict noise impacts and then design over 250,000 square feet of noise barriers. Those barriers were shown to reduce noise impact to 240 adjacent residences in accordance with FHWA noise abatement criteria.

With an eye to a naturalized and less obtrusive effect, ms coordinated public input to analyze various materials, sizes, and colors for the noise walls.