

Civil Engineering NEWS

HIGHWAYS

Construction Begun On Improvements to Key Memphis Interchange

CONSTRUCTION BEGAN in October on improvements to the interchange of interstates 40 and 240 on the eastern edge of the Memphis, Tennessee, metropolitan area. Known as the I-40/I-240 Interchange Improvement Project, the effort is designed to alleviate serious congestion and improve safety at one of the state's busiest highway interchanges.

On September 20 the Tennessee Department of Transportation awarded a \$109.3-million construction con-

tract for the project to the Dement Construction Company, LLC, of Jackson, Tennessee, the largest single contract ever issued by the department. The project includes the construction of a four-level interchange as well as the addition of new lanes to multiple ramps and roadways throughout the interchange to relieve traffic congestion and improve safety. Roadway plans for the project were designed by Buchart Horn, Inc., which has its headquarters in York, Pennsylvania. The Department of Transportation carried out the bridge design work in-house. Geotechnology, Inc., of St. Louis, conducted geotechnical investigations for the project, and construction engineering and inspection services are being overseen by Smith Seckman Reid, Inc., of Nashville, Tennessee.

Decades ago plans were made to construct Interstate 240 as a beltway around most of Memphis, while I-40

was to run east–west through the downtown area. However, public opposition scuttled that plan. I-40 essentially became what would have been the northern loop of the planned beltway, and I-240 became the southern loop. The highways thus have two interchanges, one on the western side of Memphis and one on the city's eastern edge. As for the arrangement of the eastern interchange, I-40 forms the northern and eastern legs, I-240 forms the southern leg, and a local road known as Sam Cooper Boulevard forms the western leg.

Rapid growth on the east side of the city has meant significant increases in

To improve safety and address congestion, the Tennessee Department of Transportation recently awarded a \$109-million construction contract for improvements to the interchange of interstate highways 40 and 240 on the eastern edge of the Memphis metropolitan area, one of the state's busiest.



traffic congestion at the eastern interchange. Since 1985 average daily traffic through this interchange has increased from 49,000 vehicles to approximately 200,000 vehicles today. And traffic growth is not expected to abate in the future. By 2035 the interchange is projected to see more than 350,000 vehicles per day.

However, the layout of the eastern interchange includes certain features that have hampered its ability to meet the growing traffic demands, says Ian Engstrom, P.E., the project engineer for Smith Seckman Reid. “The existing interchange is unique in its current

Among the main improvements to be made as part of the project are two new flyover ramps that will directly connect the two interstates. By providing additional lane capacity, they will enable drivers to travel at higher speeds as they transfer from one highway to the other.

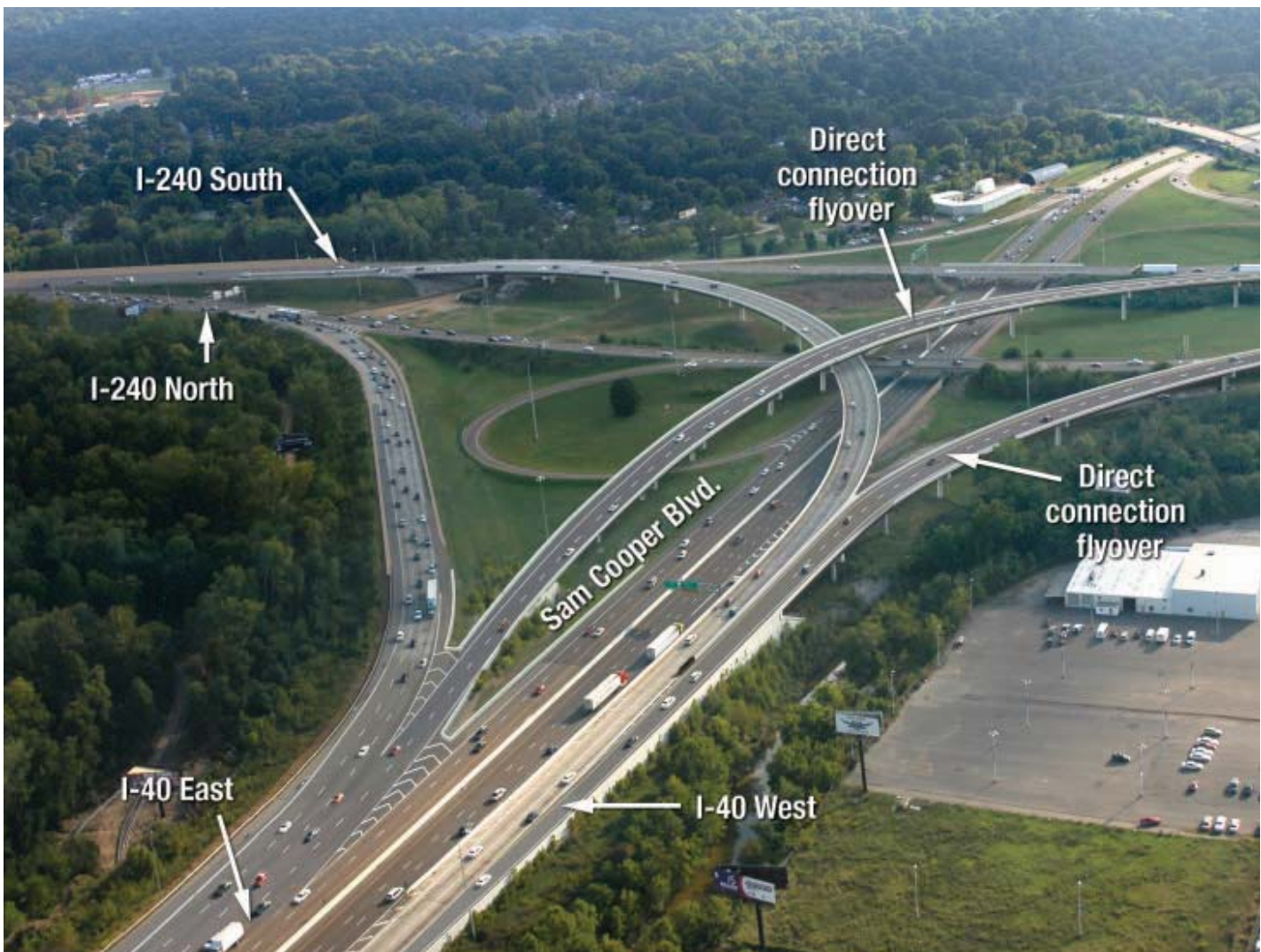
SINCE 1985 average daily traffic through this interchange has increased from 49,000 vehicles to approximately 200,000 vehicles today. And traffic growth is not expected to abate in the future.

configuration as I-40 is reduced to one lane in each direction,” he says, while vehicles moving from one highway to another must adhere to “low-speed exit ramp movements.”

To accommodate the anticipated increase in traffic and improve safety conditions, the I-40/I-240 Interchange Improvement Project will entail the construction of two flyover ramps, the replacement of an I-40 bridge over the Wolf River, and the widening of three bridges. An additional lane of traffic will be added in each direc-

tion along Sam Cooper Boulevard. Besides boosting traffic capacity, the improvements are expected to reduce the amount of weaving by vehicles using the interchange.

“The existing low-speed ramps which carry the eastbound and westbound I-40 movements will be replaced by higher-speed flyover structures with two lanes each,” Engstrom says. Of the two new flyover ramps to be constructed, the one conveying traffic directly along westbound I-40 from the eastern leg to the northern leg of



PINEAPPLE STUDIOS/BUCHART HORN, BOTH

Civil Engineering NEWS

the interchange will be a 1,565 ft long, 44 ft wide structure with eight spans. As the fourth level of the interchange, this flyover will attain a height of roughly 75 ft above Sam Cooper Boulevard.

The second flyover, which will facilitate direct traffic flows along southbound I-40 from the northern leg to the eastern leg of the interchange, will be approximately 2,320 ft long and 43 ft wide and have 13 spans. Both flyovers will feature curved steel plate girders with a concrete deck superstructure supported by hammerhead piers on pile footings. Meanwhile, the replacement of the I-40 bridge over the Wolf River will be a 1,145 ft long, 11-span structure varying in width from 203 ft to approximately 208 ft. To be founded on pile bents, the bridge will consist of steel plate girders and prestressed-concrete beams and have a concrete deck superstructure.

Construction work on the interchange improvements will proceed in two stages, the first of which recently began and will conclude in the autumn of 2015. Along with the two flyover bridges, the first stage will include widening sections of I-240 and Sam Cooper Boulevard. To be completed by the summer of 2017, the project's second stage will entail replacing the I-40 bridge over the Wolf River, widening sections of I-40, and conducting final paving for the entire project.

—JAY LANDERS

WASTEWATER

Construction Begins On Disinfection Facilities at Two Chicago Treatment Plants

UNDER PRESSURE from the U.S. Environmental Protection Agency, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) began examining in 2011 how best to reintroduce disinfection at its 354 mgd Calumet Water Reclamation Plant and its 333 mgd Terrence J. O'Brien Water Reclamation Plant (formerly known as the North Side Water Reclamation Plant). Initially expected to require 12 years to design and construct, the disinfection facilities are now on track to be completed by the end of 2015. Construction of the disinfection facilities is under way at both plants, marking a milestone in efforts to improve water quality within the roughly 100 mi of canals and modified streams that make up what is called the Chicago Area Waterway System.

This system of waterways was created more than a century ago to divert the flow of the Chicago and Calumet rivers from Lake Michigan, Chicago's source of drinking water. The system includes the North Shore Channel, the Chicago River and its south branch, the Chicago Sanitary and Ship Canal, the Little Calumet River, and the Calumet-Saganashkee (Cal-Sag) Channel (see map). For most of the 20th century the waterways were used primarily

New from **ASCE**

Minimum Design Loads for Buildings and Other Structures Standard ASCE/SEI 7-10

*Essential Guide to
Building Code Load Requirements*

What's New?

The new third printing **incorporates errata** and **includes Supplement 1**. In addition, the seismic commentary has been expanded and completely revised.

2014 | 618 pp. | List \$165 | **ASCE Member \$123.75**

Soft Cover: ISBN 978-0-7844-1291-6 | Stock # 41291

CD-ROM: ISBN 978-0-7844-1292-3 | Stock #41292

E-book: ISBN 978-0-7844-7785-4 | Stock #47785

List \$248 | **ASCE Member \$186**

Soft Cover + CD-ROM set: ISBN 978-0-7844-1322-7 | Stock # 41322



ASCE | PUBLICATIONS

How to order:

Phone: 1-800-548-2723 (US)

1-703-295-6300 (Int'l)

Fax: 1-703-295-6211

Web: www.asce.org/bookstore