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Leafy-gray approach

Minneapolis brings concrete, trees together for MARQ2 job

Marquette Avenue South and 2nd Avenue South are parallel arteries in the heart of downtown Minneapolis that serve as its two chief express bus streets.

But between 1st and 12th streets South, these streets and their nearly complete total reconstruction—called the MARQ2 Transit Project—constitute an intersection of many facets including the pairing of environmentally friendly concrete and almost 200 new trees that are a part of a dramatic new streetscape design. Upon completion by the federally mandated Dec. 31, 2009, deadline, MARQ2 represented the first major step in a historic refashioning of how people are moved through the city.

Getting access

And by all accounts, the new streets—side-by-side ribbons of roadway created with 15,000 cu yd of locally sourced concrete, from

Cemstone Products Co.—and streetscaping and landscaping, as well as transit enhancements, will be a more sustainable and pedestrian-friendly environment enjoyed by commuters, residents, visitors and businesses.

“We were, of course, very gratified that the city of Minneapolis and the MARQ2 project team chose concrete and chose us to provide it,” said Thor Becken, president of Cemstone. “We are seeing a shift to concrete as the material of choice for projects like MARQ2 and other infrastructure projects like ramps and parking areas. Concrete’s performance and environmental advantages are numerous and significant. In terms of safety alone, concrete is recognized as a better surface due to reduced potholes and rutting, and longer lasting skid resistance. Concrete also improves visibility, especially on rainy nights.”

To even be possible at this time required the coming together of a 10-year transportation improvement plan called Access Minneapolis (created with the input of business and neighborhood representatives and approved

by the city's mayor and council) and the opportune solicitation by the Minnesota Department of Transportation (Mn/DOT) to receive priority federal funding through its Urban Partnership program.

Minneapolis had not originally scheduled any transportation reconstruction until 2013. But, because the plan was in place when urban partners were sought, Minneapolis was poised to be competitive and, as such, was awarded Urban Partnership status. As a result, the original timeline was compressed.

(This is a perfect illustration of the consequence of having a vision and a plan in place, even if funding has yet to be determined. About \$32 million of the estimated MARQ2 project cost of \$37 million for street and streetscape construction is funded from the \$133 million Urban Partnership Agreement grant awarded to the Twin Cities in August 2007.)

Urban partner status was granted to five metropolitan areas based on their comprehensive, aggressive congestion-relief program that utilizes the four complementary and synergistic strategies of tolling, transit, telecommuting and technology to relieve urban congestion. MARQ2 in Minneapolis targets transit and incorporates technology. That technology, as well as materials and construction procedure choices, in many instances, also demonstrates the city's commitment to sustainability and delivering long-term value to taxpayers.

In August 2008, work began rebuilding both Marquette Avenue South and 2nd Avenue South from building front to building front. The streets each will have two bus lanes and two traffic lanes and will be flanked by wider sidewalks than before. Public art, more attractive landscaping—including a lot more trees—and streetscaping will enhance the pedestrian experience. Commuters will benefit from new transit amenities such as new transit shelters and real-time electronic departure information displays.

Easing the excess

The reconstruction process itself has been a crossroads of cooperation of city engineers, contractors, subcontractors, private utility companies, city

residents and businesses, commuters and pedestrians.

The MARQ2 Project is only one part of a comprehensive strategy designed to deal with downtown Minneapolis transportation and transit that involves in excess of 150,000 commuters coming into and leaving downtown every day. That strategy is a notable reshaping of how people are moved through the city. At the MARQ2 groundbreaking, Minneapolis Mayor R.T. Rybak (recently re-elected to his third term) explained, "Now, every bus can only move as fast as the slowest bus along Marquette and Second. This work will add a second bus lane, making it possible for buses to come into and get out of downtown faster." According to Bill Fellows, P.E., MARQ2 project manager for the city of Minneapolis, the current transit system serves 40% of commuters and, by 2030, it is expected that 60% will make use of it.

Access Minneapolis dramatically alters how buses will come into the city and how they will move through it once there. It also provides for a more pedestrian-friendly Nicollet Mall as well as pioneering bike route modifications. MARQ2 is the first major project under the plan.

Deserting the island effect

The centerpiece of the MARQ2 renovation, visually and with regard to sustainability, is the parallel aisles of all-concrete roadway—24 blocks in all—that stand apart from the surrounding asphalt streets. Bill Fellows explained, "The long ribbon of concrete is an important element of the streetscape design. And we believe concrete is more environmentally friendly than bituminous alternatives."

The more reflective, lighter colored concrete reduces solar-heat absorption and the "urban heat island" effect. A reduced urban heat island effect, in turn, reduces cooling costs—a boon to the city, its businesses and residents. Cemstone, a Twin Cities-based supplier of concrete since 1927, produced and delivered the 15,000 cu yd of concrete for MARQ2. Fellows explained that the choice of locally produced concrete reduced transportation, travel time and their costs, as well as the attendant

environmental costs. In addition to being local, with nearby facilities and an expert engineering services group to design ideal mixes, Cemstone has a solid history of work on major infrastructure projects on tight timelines, including the national award-winning I-35W bridge reconstruction.

The existing pavement was recycled and returned as a Class 5, 6-in. sub-base. Crews placed 9 in. of new reinforced concrete pavement on top of the recycled material. The concrete mix consisted of a 0.4 water/cement ratio or lower, which reduced the cure time to two to three days. The total paving width for the project was 45 ft, plus an additional 2 ft of gutter on each side. Mn/DOT has done away with tining concrete pavement, so crews on the MARQ2 project used a heavy broom drag to increase skid resistance. Mn/DOT also executed normal air entrainment and strength tests.

5 within 5%

According to Fellows, however, aesthetics and sustainability were only ranked third and fourth in terms of selection criteria favoring concrete. First, and foremost, concrete was chosen because of its durability.

"The bid package for MARQ2 was based on completing the general traffic



MARQ2 lined Marquette and 2nd avenues with almost 200 new trees, which were planted with structural cells.

side of the street with full-depth asphalt and the transit side of the street with concrete, but included an alternate for an all-concrete roadway. We received five bids for the project and, in all cases, the cost of the concrete was within 5% of the asphalt option. In addition to being cost competitive, the concrete will be more durable."

John Lee of Cemstone said that concrete has historically been chosen for pavements that will be supporting heavy loads but that with petroleum costs on the rise, smaller concrete projects are becoming more prevalent.

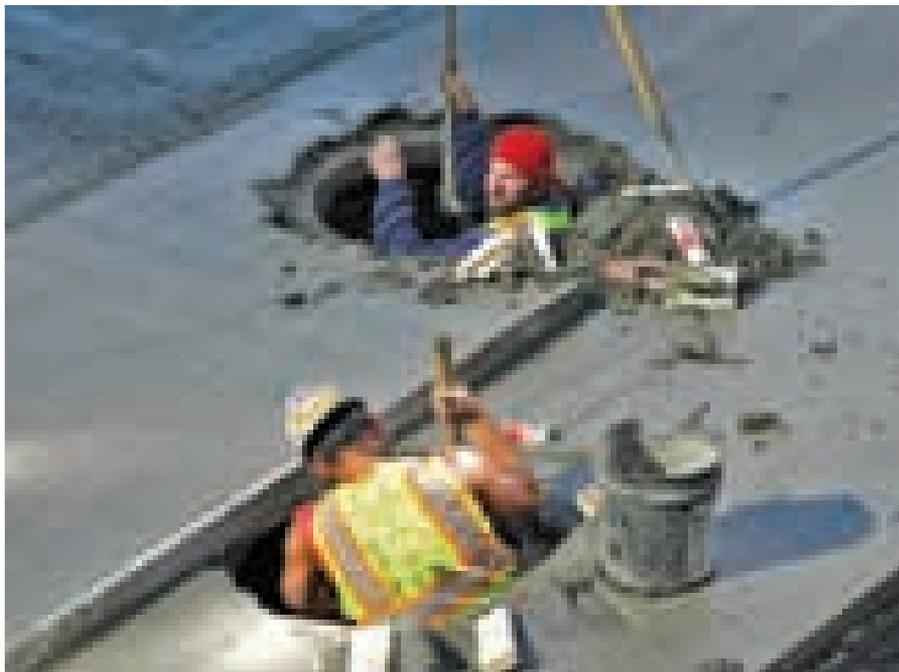
emissions, new energy-efficient lights will focus illumination on streets and sidewalks. Substantial energy savings will be realized through LED technology used in new traffic signals. And, the city will enjoy more flexibility to adjust light levels depending on the time of day with an advanced lighting management system resulting in further energy and cost savings.

Increased transit efficiencies made possible from the reconstruction will result in a decrease in pollution from, in part, idling buses. The speed and reliability of bus service through downtown

moved from there to Marquette and 2nd avenues.

MARQ2 also will line Marquette and 2nd avenues with almost 200 new trees. Fellows said, "If you had to be a tree in the middle of a downtown urban core, this is where you would want to be."

The new trees were planted with structural cells, a multilayered system for supporting hardscape areas that enables tree-root growth and accommodates filtering, retention, storage and infiltration of storm water while preventing hardscape damage. Technology like pervious concrete makes an urban park environment possible. The MARQ2 streetscape plans included about 15,000 sq ft of porous pavers over the structural cells. "The porous pavers should reduce peak flow by about 10%," Fellows noted.



Crews placed 9 in. of new reinforced concrete pavement on top of the recycled material. The concrete mix consisted of a 0.4 water/cement ratio or lower, which reduced the cure time to two to three days.

A secondary advantage, according to Fellows, of using concrete for MARQ2 involved the logistics of underground operations, including utility and water-main upgrades; the choice of concrete allowed for a thinner pavement section, thereby reducing some of the underground conflicts.

Fresher breaths

In addition to its extensive use of concrete, MARQ2 incorporates many details that reflect an eye toward sustainability—the embodiment of the crossroad of conservation and innovation. In an effort to reduce fugitive light

is expected to improve dramatically. Carrying capacity on the two streets will triple, and the trip time through downtown is expected to be shortened by as much as 10 minutes.

"MARQ2 will make using buses more attractive to downtown commuters and make our city more accessible than ever before," explained City Council Transportation and Public Works Committee Chair Sandy Colvin Roy.

The expectation is that ridership will increase, and with it attendant environmental benefits will increase. A friendlier pedestrian climate on nearby Nicollet Mall will ensue when express buses are

Pleased to see it

The ambitious MARQ2 renovation, which was slated for completion at the end of 2009 after less than 18 months, unfolded without any "big glitches" and, according to Fellows, "While it has been a disruption to local businesses and, of course, pedestrians, when it's all said and done, we think most people will be pleased with the result."

Fellows has been on these parallel stretches of roadway—Marquette and 2nd avenues—and has been a part of the multifaceted intersections encountered on MARQ2 throughout the process. Fellows' team initiated communication with the private utility companies more than two years before the Urban Partnership grant was awarded. He further explained, "We had a really extensive communication plan, beginning with community meetings and individual block meetings as we put the design together." A project website, e-mail lists, kiosks and weekly stakeholder meetings were utilized to communicate project and construction updates. "Completion of a project like this within such a tight timeline, in the middle of a busy, fully developed urban area, wouldn't have been possible without the cooperation of the downtown community." **R&B**

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