

Accelerated Timeline Creates Additional Project Challenges

Short construction season and tight timeframe challenge engineers.

By Steve Windish

Building a 1.17-mile stretch of U.S. Highway 83-South Broadway in Minot, ND, in summer 2003 was the type of project civil engineers hope for—at least once in their lifetime. Everything that could go right did. What made this project so challenging was the tight timeframe we were under from the preliminary engineering through the actual construction.

The North Dakota Department of Transportation (NDDOT) had budgeted the project for 2004; however, Minot wanted the project completed in 2003 because of other construction projects planned elsewhere throughout the city in 2004 and beyond. NDDOT agreed to the earlier date and the city advanced more than \$11 million in construction funds to make it happen.

NDDOT hired Ulteig Engineers, Inc. (www.ulteig.com) in late 2001 to prepare a project concept report and preliminary engineering on the project. The first public input meeting was conducted in Minot in December 2001. In September 2002, the Federal Highway Administration approved the concept report and NDDOT gave the go-ahead to proceed with design work. Ten engineers and technicians from Ulteig's Bismarck, Fargo, and Minneapolis offices immersed themselves in the project to complete the final design by January 2003.

Because of the short construction season, it was originally considered that one contractor would have worked on the roadway over two seasons. As a

result of input from the business community, however, it was decided to complete the project in one construction season, with the project split into two contracts to expedite the construction.

Projects of this size are usually bid in the fall in North Dakota so that the successful contractor has time to get material and equipment in place over the winter and before road restrictions take effect in the spring. However, with the accelerated time line, this project was bid in April 2003.

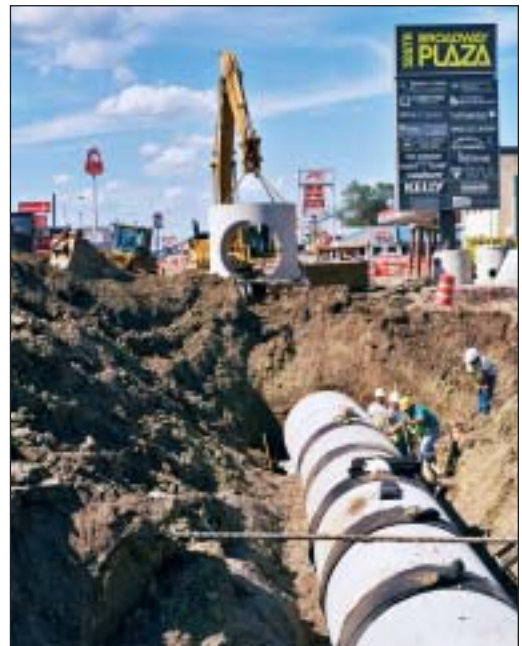
NDDOT awarded the project on May 2, preconstruction meetings with the contractors were held May 9, and construction started May 12. Six weeks of the limited construction time window had already passed and weather keeps the construction season in northern North Dakota short, thus adding to the challenge. NDDOT awarded Minot Paving Company, Inc. the bid for the South Broadway segment between 7th Avenue and 15th Avenue SW. The bid amount was just over \$5.9 million. Coughlin Construction, Inc., was awarded the segment stretching from 15th Avenue to 19th Avenue with a bid of \$5.3 million.

South Broadway, Minot's busiest thoroughfare, was last constructed in 1961. The 42-year old roadway was ten years beyond its expected life. Among the biggest challenges was making the road "fit" the initial

design from the late 1950s. Some water and storm sewer lines under the roadway were even older than the street. The current storm sewer system's capacity was exceeded several times resulting in surcharging and overland flooding. The water main had experienced several failures. Approximately six miles of underground work was included as part of the project.

Innovative Design

NDDOT approved some innovative design with this project. For example, we were able to leave joints unsealed on



Part of a manhole is moved into position along the main sanitary sewer line. The deepest open cut on the project was 24 ft. The deepest portion was 35 ft deep where a storm sewer was sliplined.



Some innovative project design included leaving joints unsealed on sections of the new storm sewer that went through areas of high groundwater. The effect is to lower the water table and alleviate water problems for property owners.

sections of the new storm sewer that went through areas of high groundwater, similar to drain tile. The effect is to lower the water table. Adjacent property owners are now operating sump pumps less often and not having to deal with constantly wet basements.

The project involved 20 sub-contractors and four utility companies. Once the project started, the consultant's on-site staff included 13 individuals to work with contractors and subcontractors to keep the project moving forward.

Even though there was a lot of work to be done within a short construction time window, my job as project engineer was relatively easy. Ulteig staffed the project with enough people on site to observe all critical construction activities, thus avoiding delays. We assigned one engineer to each contractor. One engineer watched over the underground work while another oversaw the surface work. The contractors and subcontractors, as well as the consultant, did what was needed to get the job done, including working from sunup to sundown seven days a week over most of the summer and fall.

Keeping a project of this magnitude flowing was the biggest challenge because there was so much going on at once. When faced with unforeseen obstacles, we were able to sit down with NDDOT engineers and officials from Minot to

resolve those issues and communicate a resolution to the contractor without delay.

Because more than 80 businesses lined this stretch of roadway and head-to-head traffic was maintained on Broadway during the construction, public relations played an important role in the success of the project. Ongoing communications with businesses, the media, and the public kept people informed.

Business communications included one-on-one meetings with all businesses affected by the project before the start of construction and ongoing communications through the summer and fall, including weekly public informational meetings. NDDOT had contracted with a public information consultant for this project, Odney Advertising (www.odney.com). Odney's role included a web site specifically for

this project and timely email updates to the adjacent businesses, news media, and general public. These emails, often updated daily, proved to be critical in communicating changes in the project's schedule. The project had the potential to significantly impact these businesses, but good communication alleviated the concerns of business owners and fostered a cooperative, positive attitude.

If success can be measured in the number of complaint phone calls to city hall, then the lack of calls tells us just how successful the project was. Working together, everyone did what had to be done to get this project completed by the end of October. The public was exceptional. Businesses were patient in spite of the disruption and inconvenience and worked with us.

The entire stretch of Broadway reopened to traffic on October 29—just two days shy of the contractors' construction deadline. The following week, North Dakota Governor John Hoeven and Dave Sprynczynatyk, NDDOT Director, traveled to Minot to participate in a ceremonial ribbon cutting—in the snow. GE

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Project Points

- 55,000 tons of gravel were used on the project.
- The deepest open cut on the project was 24 ft.
- The deepest portion was 35 ft where a storm sewer was slip lined.
- 7,800 blocks were used to build retaining walls.
- A concrete storm sewer manhole was the largest project item placed underground. It displaces 1,750 cu ft or 13,100 gal. It was also the most expensive single item at \$17,700.
- In total, concrete was the most expensive project item at \$2 million.
- 22,700 cu yd of concrete were used on the project.
- Over 30,000 ft of pipe were placed under the street.
- Man hours into the project exceeded 125,000.
- 72 precast manholes (48- through 120-in. diameter)
- 78 precast 2- by 3-ft and 2- by 6-ft inlets
- 9 special 8- by 6-ft box vault precast manholes
- 2,730 ft of 60-in. diameter Class III RCP
- 1,307 ft of 54-in. diameter Class III RCP
- 3,771 ft of 36-in. diameter Class III RCP
- 116 ft of 30-in. diameter Class III RCP
- 320 ft of 24-in. diameter Class III RCP
- 156 ft of 18-in. diameter Class III RCP
- 332 ft of 73- by 45-in. arch RCP