Precast Concrete Pipe Receives RAVE REVIEWS on South Broadway Avenue

By Ron Almquist • North Dakota Concrete Products, Bismarck, North Dakota • 701-720-4581

Since its construction in 1961, South Broadway --the busiest thoroughfare in Minot, South Dakota -- had seen its condition steadily worsen. In 2003, the 42-year old roadway was 10 years beyond its service life and high costs to maintain the 1.7-mile segment of roadway had become harder and harder to justify. South Broadway served as Minot's major north-south traffic artery and played a vital role in the flow of traffic through the city, located in north central South Dakota.

In addition to the high maintenance costs, there were significant safety issues along South Broadway as well. In a three-year period more than 300 vehicle accidents occurred along the route; and there was traffic congestion at major intersections along the corridor.

Currently, South Broadway traffic volume is about 27,000 vehicles per day. By 2021, traffic volume is forecast to increase to 47,000 vehicles per day as the city grows.

Public utilities such as water and storm sewer lines under the roadway were even older than the street, requiring extensive ongoing maintenance at the public's expense. The capacity of the current storm sewer system had been exceeded several times, resulting in overland flooding. It was clear that the opportune time to reconstruct these and other public utilities would be while the street was reconstructed, lessening the inconvenience to the community. Approximately six miles of underground work was needed. With the underground work being done while South Broadway was being reconstructed there would be significant savings to the City of Minot.

A precast manhole with integral base is connected to the 60-inch diameter RCP along South Broadway.

The North Dakota Department of Transportation (DOT) became involved in the project, as South Broadway is also US Highway 83. The DOT divided the reconstruction project into phases to expedite completion of the project in one season. It was vital to local businesses that the roadway be open during the construction period, and construction activities completed quickly.

The first two phases, included reconstruction of South Broadway from 7th Ave. SW to 19th Ave. SW. Minot contractor, Minot Paving submitted the low bid of $5,921,536 and was awarded the contract. This

Fire hydrants are lowered into the trench for connection while work on the water, sanitary sewers and storm drain continued.

project started at 7th Ave. SW and went to 15th Ave. SW. Robert Gibb and Sons, a Fargo contractor, was the subcontractor for the water, sanitary sewer and storm sewer work. The sewer work consisted of replacing 13 precast manholes with integral bases and precast inverts for sanitary sewers and related sanitary pipe and service lines. The storm sewer system involved installing 2029 feet of 36-inch diameter RCP, 209 feet of 24-inch RCP, 15 precast concrete manholes from 48-inch through 84-inch diameter, plus 40 precast 2-foot x 3-foot and 2-foot x 6-foot inlets. There were also three special 8-foot x 6-foot box vault precast inlets installed on 11th Ave., a side street intersecting South Broadway.

Precast concrete products were used to expedite construction and help reopen the major thoroughfare to travelers and local businesses.

Several multi-inlet precast structures were fabricated by North Dakota Concrete Products Company for the South Broadway project.

The contractor on the second phase was Coughlin Construction, a Minot construction company that tendered a bid of $5,299,014. Coughlin Construction undertook construction of all the underground work and subbed the surface work to Northern Improvement, a Fargo company. On this project, the sanitary sewer work consisted of replacing 11 precast concrete manholes with integral bases and precast inverts, along with related piping and service lines. The storm sewer was a major part of this phase. Storm sewer pipe included over 3,000 feet of 24-inch diameter through 60-inch diameter precast concrete pipe. There were 12 precast concrete manholes ranging in size from 48-inch through 120-inch diameter, plus 25 (2-foot x 3-foot and 2-foot x 6-foot) precast concrete inlets. Two special precast concrete box vault 8-foot x 6-foot inlets were installed on 16th Ave SW, an intersecting street to South Broadway.

The work on both these projects was complicated by the fact that the contractors could close only half of the thoroughfare as traffic flow had to be maintained. In addition, there were a number of grade conflicts with existing sewer and water mains, and sanitary services. There were also a large number of other obstacles in the form of electrical lines, natural gas mains, service lines, and telephone lines. Work on these two projects, started in early May and by late-September all of the underground work was completed.

Phase 3 of the work consisted of storm sewer work from Western Ave. south to approximately 6th Ave. SW. The low bidder on this project was Robt. Gibb and Sons with a bid of $762,719. This project crossed Burdick Expressway, a major east-west artery through Minot. The work consisted of installing 1617 feet of 36-inch diameter RCP, 31 feet of 24-inch diameter RCP and 12 feet of 44-inch x 27-inch arch RCP. Installation included eight precast manholes, 60-inch through 84-inch diameter, plus four special 8-foot x 6-foot box vault precast concrete inlets and 13 (2-foot x 3-foot or 2-foot x 6-foot standard inlets. Much of this work was difficult as the excavation was in gravel soils and the 36-inch diameter RCP was relatively deep and installed between a concrete telephone duct and a 10-inch high-pressure natural gas main. The work was completed by mid September.

The final phase of this work was bid on August 15th and started in the first week of September. Kemper Construction, a Minot contractor, submitted the low bid of $981,096. Work consisted of installing 1790 feet of 60-inch diameter RCP, 332 feet of 73-inch x 45-inch RCP arch, 156 feet of 18-inch diameter RCP and 13 precast manholes from 48-inch through 120-inch diameter.

Ulteig Engineering, a North Dakota consulting firm, completed the design work for all four of these projects at their Bismarck, N.D. office. They also undertook the construction inspection of the first two projects. Wold Engineering, a North Dakota firm, undertook construction inspection of the final two projects through their Minot office.

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Project: Minot South Broadway Construction
Minot, North Dakota

Owner: North Dakota Department of Transportation

Consulting Engineer: Ulteig Engineers, Inc.
Bismark, North Dakota

Contractors: Minot Paving - Minot, North Dakota
Coughlin Construction - Minot, North Dakota
Robert Gibb and Sons - Minot, North Dakota
Kemper Construction - Minot, North Dakota
Northern Improvement - Fargo, North Dakota

Quantities:
2730 feet of 60-inch diameter Class III RCP
1307 feet of 54-inch diameter Class III RCP
3771 feet of 36-inch diameter Class III RCP
116 feet of 30-inch diameter Class III RCP
320 feet of 24-inch diameter Class III RCP
156 feet of 18-inch diameter Class III RCP
72 precast manholes (48-inch through 120-inch diameter)
12 feet of 44-inch x 27-inch arch RCP
332 feet of 73-inch x 45-inch arch RCP
78 precast 2-foot x 3-foot and 2-foot x 6-foot inlets
9 special 8-foot x 6-foot box vault precast inlets

Producer: North Dakota Concrete Products
Bismarck, North Dakota
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