

CASE STUDY / MARQUETTE CONNECTOR PIPELINE

MAKING CONNECTIONS TO IMPROVE RELIABILITY

SEMCO Energy Gas Co. envisioned a new pipeline to enhance service reliability and increase capacity in the Upper Peninsula. Faced with a project of significant scale, the utility needed to reach beyond internal resources. A creative approach combined with efficient project controls helped this vital project achieve success.



TO ENHANCE SERVICE, FIRST WE ENHANCED THE PROJECT TEAM

The client utilized a host of our support services to supplement limited internal staffing and experience with projects of this type.

PROJECT STATS

CLIENT

SEMCO Energy Gas Co.

LOCATION

Michigan

COMPLETION DATE

December 2019

43

MILES OF GAS PIPELINE

144M

CUBIC FEET OF NATURAL GAS DELIVERED PER DAY

35K

CUSTOMERS SERVED IN UPPER PENINSULA

CHALLENGE

SEMCO Energy Gas Co., a subsidiary of AltaGas, provides natural gas to customers in the northern Upper Peninsula of Michigan. The only gas supply came through the Northern Natural Gas (NNG) pipeline, which decreases in diameter and pressure and terminates near the city of Marquette. Any interruption in that line could disrupt service, and the pipeline already was operating at capacity, which was limiting opportunities to support growth in the region.

The Marquette Connector Pipeline project was planned to enhance both energy reliability and capacity by providing a connection to the Great Lakes Gas Transmission (GLGT) line located in the southern portion of the Upper Peninsula. This included 36.2 miles of 20-inch pipeline and 6.5 miles of 10-inch pipeline, interconnecting with the existing NNG and GLGT pipelines, delivering 144 million cubic feet of natural gas daily.

The terrain along the route would pose some challenges. Portions of the route traversed wetlands with about 2 to 5 feet of water-saturated vegetation mixed with soil. Below that was a hard rock bottom that would require blasting and complicate drilling. These conditions would require

creativity to install the pipe without damaging it or its coating.

The scale of the project was of much greater magnitude than the utility was accustomed, and SEMCO did not anticipate similar-sized projects in the future. The company decided to reach beyond internal resources to proceed.

SOLUTION

SEMCO selected Burns & McDonnell initially for support with engineering design, procurement and nonenvironmental permitting services. In addition to performing most engineering, with the exception of horizontal directional drilling (HDD) — which was already being performed by another contractor — our support began by specifying, bidding and evaluating all vendor bids.

The project included the design and construction of two interconnecting pipeline segments (the Marquette Connector Pipeline and Marquette Connector Lateral), six new automated mainline valves, four new stations for connections with the NNG and GLGT pipelines, a new interconnect between the two new segments, and two short pipeline segments, as well as modification of an existing station.

As packages went out to bid, our role began to evolve and expand. We brought our experience with



project controls to facilitate schedule and cost management for the entire project. We developed the estimate that SEMCO's board used to make a final investment decision, and it became the baseline budget and basis for the project controls. When the project moved closer to construction, we provided further support through construction management. We evaluated bids and created a shortlist of four contractors and our recommendations.

Using our experience in both engineering and construction, we were able to coordinate between them in creating and organizing the construction bid package. Using a combination of methodologies that varied according to the risk and level of definition for different aspects, our approach resulted in very few change orders, none of which proved controversial.

To protect the pipe being installed in wetlands, we developed a customized approach that involved wrapping the pipe with rock shield and installing a

semicircle of two-by-fours, with the wooden planks secured with fiberglass tape. The planks helped protect the pipe from the rough rock bottom of the trench during installation in the trench. The pipe was weighted and padded for buoyancy control and so it would not shift during backfilling. Finally, the trench was backfilled with the saturated soils removed during trenching.

RESULTS

The wetland pipe installation approach proved to be a cost-effective and expedient solution where other methods like dewatering weren't feasible or practical. Testing after installation confirmed that the pipes showed no dents or damage, and that the coating also was undamaged.

The Upper Peninsula can be one of the coldest locations in the continental U.S., and heating is a necessity. Reliable access to fuel is essential. The Marquette Connector Pipeline project has improved system reliability by creating a loop and tapping into a second large regional transmission

SPECIALIZED SERVICES

- Engineering design
- Permitting support
- Project controls
- Estimating
- Procurement
- Construction management

system, reducing the terminating city's dependence on a single source.

The pipeline was successfully commissioned in December 2019, completed safely, on budget and in time for the winter heating season. Our multidisciplinary knowledge and experience helped SEMCO complete work efficiently, supplementing limited internal resources to achieve success on a project that was at a scale the utility was not accustomed to and did not anticipate repeating.



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