Cold Comfort
Pipe Relining Project Overcomes Harsh Weather  
By Greg Thompson

Reading a project story about a cold-weather job makes sense in the winter months. You’re inside, nice and warm. Maybe you’ve got a nice, hot cup of coffee in front of you. The winter howls outside your window, but it can’t reach you as you read about the crew’s success despite freezing temperatures. But then there’s weather that goes beyond just being cold. Twenty degrees is cold. It’s uncomfortable at first, but manageable. Once you get going, you might only need a sweatshirt to stay warm. Single-digit temperatures — well now we’re starting to get uncomfortable. Still, it can be done. A job completed in single-digit temperatures is impressive, but not unbelievable.

The temperatures that greeted crews each morning as they tackled a pipe-relining project in Appleton, Wis., in late 2008 were in the neighborhood of minus 25 F, with wind chill temperatures approaching minus 50 F. That’s not just cold, that’s mean. It’s the kind of story that needs to be told in the summer, when the sympathetic ache that creeps into your toes at the thought of those cold mornings can be readily cured by stepping into the sun.
Patient History and Diagnosis
Like many cities across the United States, Appleton is faced with an aging infrastructure. With a growing number of water and wastewater lines outliving their design life, rehabbing or replacing those lines has become increasingly important in recent years.

Flooding in 2001 pressed city engineers to address a problematic stretch of wastewater pipeline. The 66-in. clay tile storm line had been built in 1915 and had served the city well, moving a large volume of water — especially during wet seasons — but it had become worn and developed I/1 issues over time. Spot repairs would not be enough to bring the line to present-day standards — the decision to rel ine the pipe was fairly straightforward. Much more straightforward, it turns out, than the relining project would prove to be.

“It’s a large pipe — a main collector line,” explains Chad Weyenberg, a project engineer with the City of Appleton. “Prior to this project, our relining work was done mostly on smaller lines.”

“We bid the project on a cold-weather schedule,” says Kelly Odell, vice president of Michels Pipe Services. “The line typically runs about half-full and runs nearly full in wet weather. We wanted to be able to address the line that size would have had a huge impact financially on the project overall,” he says.

The City agreed with Michels’ plan and gave them a two-winter window in which to complete the job. “You never know what the weather’s going to do,” says Weyenberg. “We wanted to make sure that if this winter wasn’t cold enough, they could still be on schedule if the work got pushed back to next winter.”

The winter cooperated. And then some.

Sampson Street Freeze Out
Michels crews mobilized to the site in November 2008 and were greeted not only by the cold, but by the additional obstacle of an early snowfall. “The site was in a residential area,” explains Michels superintendent Shawn Thorson. “Keeping driveways clear and homeowners happy was a challenge.” To that end, the project crew coordinated with the city as much as possible to ensure that the city’s snow removal and road salting program didn’t interfere with the crew coming and going and vice versa.

The project was a so-called “over-the-hole” project, meaning the wet-out is brought to the jobsite and the tube is injected and rolled to thickness on site. This meant that a series of tents and heaters were needed to shelter the work filled, which presented obvious concerns given the weather. “The resin truck left Minnesota at 75 F and by the time it got to Appleton, five hours away, the temperature of the resin had dropped to around 40 F,” Odell explains. “We used thermal blankets on the tanks to bring it back up to temperature and keep it there.”

Other Challenges
The last 900 If of pipeline was on a steep grade and required additional planning by the crew to complete. “When you have a 66-in. pipe full of water, it takes a lot of hold back force not to burst the tube,” says Thorson. The solution was to make the bag thicker at the end that would bear the brunt of the pressure. “Sometimes we had a bag that was 54 mm thick rather than the more standard 33 mm thick,” Thorson says.

In addition to the steep grade, the manhole depth on the last stretch was too deep for the 6-in. pumps that the crew had been using. Renting 8-in. hydraulic submersible pumps was an easy fix, but the size of the larger pump did present a challenge. “Getting the pump and other necessary equipment into the down tube, getting it all to fit, was tough,” says Thorson. Nevertheless, these obstacles were overcome and the 4,000-If job was completed on time — including an additional 900-If of spot-repair downstream from the relined portion — which minimized the disruption in the neighborhood ...

Conclusion
“This project did two things,” says Weyenberg. “It took care of a part of the city that needed to be addressed and it brought a nearly-100-year-old line up to current standards.”

Odell figures the cold weather tacked about two weeks onto the project schedule — still on time given the original timeline — even though at times it was nearly cold enough to stop work. “Everything is slower in that kind of weather,” he says. “You’ve got to steel yourself just to walk from your truck to the tent.”

Jim Mortell, president of Premier Pipe — the designer of the CIPP method used on the project, echoes Odell’s sentiment. “Doing anything is hard in those conditions,” he says. “Tackling a 4,000 If, 66-in. line over the hole job in that kind of cold is pretty incredible. To be successful in a situation like that you need the kind of leadership that can adapt to the conditions and an experienced crew to make it all go. This crew respected the task at hand and everyone was on the same page — a sure recipe for success.”

It took heaters, tents and thermal blankets to get through the job, but looking back on it, especially looking back from the safety and warmth of the summer months, but most of all, the crew made it happen. "Everyone involved can be proud of this project," Thorson says. “We worked very hard to finish on time and with no problems.”

Greg Thompson is an assistant editor of Trenchless Technology.