

# MIDWEST CONTRACTOR



**General Excavating**  
**Saves \$2M on**  
**Innovative CRES Project**

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# General Excavation Achieves Zero Leaks on Nebraska

*Crews backfill with crushed limestone and excavated spoil.*





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By Debra Wood

# ka Innovation Campus Project

*“Zero leaks were critical”*

Mitch Holt, Senior Project Manager for Tetrad Property Group of Omaha, Nebraska

An innovative project, the Centralized Renewable Energy System (CRES), to use water discharged from a wastewater plant to help heat and cool the Nebraska Innovation Campus required installation of 10,000 feet of 30 inch diameter pipe, completed by General Excavating of Lincoln, Nebraska, without a leak.

“During preconstruction, we decided to save money by not making CRES Loop wholly redundant system. Having a zero leak expectation was due to our not being able to afford to have a shutdown of the system that will be serving buildings with research projects inside.”

The \$12 million CRES captures 28 million gallons of reclaimed water daily from Lincoln’s Theresa Street Wastewater Treatment Plant, adjacent to the new campus. The temperature of the water discharged from the plant ranges from the upper 50s to the mid-70s and was formerly discharged into Salt Creek.

Now, through a series of pumps, pipes and valves, designed by Olsson Associates of Lincoln, the reclaimed water flows to a centralized heat exchange facility, which harnesses the temperature difference produced by the water and uses it in a closed-loop piping system to heat and cool about 1.8 million square feet of the buildings on the public-private research campus, depending on the season. Those buildings will enjoy about a 30 percent savings on heating costs and a 25 percent savings on cooling costs, as compared to a traditional system.



Crews transport ductile iron pipe for installation.



General Excavating utilized a Komatsu WA250 Wheel Loader on the project

“One of the big selling points for the new campus is green, renewable energy,” states Randy McDonald, Business Development Director for General Excavating.

Olsson Associates reports only a few similar systems are operating in the United States, with this being one of the largest. When completely built out, the campus is expected to have more than 2.2 million square feet of floor space in multiple buildings.

General Excavating, working as a subcontractor to the Kiewit Building Group of Omaha, Nebraska, completed the piping, self-performing 85 percent of the work, from November 2013 until September 2014. The company also performed some work on the lift-station and in the tenant buildings. For instance, General Excavating demolished and removed an abandoned lift station to make room for a new lift station.

## Saving on Construction

Jim Brunner, Project Manager for General Excavating, began working with Olsson Associates and Kiewit about a year before ground was broken, coming up with enough cost-saving measures to ensure the project moved forward. The ideas saved more than \$2 million on construction costs on the \$3.2 million project.

“When we started, they were looking at using an HDPE (high density polyethylene) pipe, but because of the properties of the pipe, they were looking at a 36 inch pipe to keep a 30 inch opening,” says Jim Brunner, Project Manager for General Excavating. “We switched to ductile iron pipe and could use a smaller diameter pipe.”

The change in piping material saved about \$200,000. The original plans also called for multiple vaults and valves, which Brunner and his team identified as unnecessary. A new design, specified direct burying the valves and eliminating the vaults, which saved nearly \$1.3 million.





Crews dig a trench for the project's piping.



Crews check for elevation while installing the pipe.

General Excavating also recommended boring a section of the project, which resulted in savings of approximately \$425,000. The developer obtained an easement. This change in the pipe route saved time and money by boring under a trailer park rather than going around the mobile homes.

"One thing that was good was the team effort and getting General Excavating involved early," Holt says. "We engaged with them and Kiewit and looked to review the overall design of CRES. They were able to provide extensive feedback on price reductions to be able to facilitate the project budget. It was key for General Excavating to be involved in the preconstruction."

### Laying the Pipes

Most of the 18 foot long sections of pipe were placed using an open trench method, with excavations reaching from 8 feet to 23 feet. The company used both push-joint pipe with a rubber gasket and restrained joint on the distribution side of the heat exchange building and restrained joint pipe on the waste treatment side of the building.

"The larger the pipe, the harder they are

to handle," McDonald says. "It's a pretty remarkable feat to put that much pipe in and not have one error."

In addition to the bore under the trailer park, General Excavating used a subcontractor to horizontal bore for pipe installation under the entrance road in order to keep access available to an active wastewater treatment plant.

"The tight schedule made the project more difficult," Brunner says. "A lot of the work we did was in the winter. We had to keep the dirt from freezing. That required all work on each section to take place on the same day. Everything dug during the day had to be backfilled by that night."

The piping from the wastewater plant to the pump house, within a 500 foot zone of the Salt Creek Levee, had to be encased in flowable fill, as required by the U.S. Army Corps of Engineers. General Excavating poured more than 1,400 cubic yards of flowable fill to encase the twin 30 inch ductile iron pipes by the levee. The encasement would act as a barrier in case of a breach.

Crews had to work around existing storm sewers, fiber optic cables and electrical conduit, some active and some

### CRES Project Team

Owner: University of Nebraska-Lincoln

Development Company: Tetrad Property Group, Omaha, Nebraska

Engineer: Olsson Associates, Lincoln, Nebraska

General Contractor: Kiewit Building Group, Omaha, Nebraska

Piping Contractor: General Excavating, Lincoln, Nebraska

abandoned. That required removing some lines, reinstalling others and carefully bypassing necessary piping and cables. General Excavating met daily with Kiewit on the dig plan.

"We were looking ahead to the next day or the day after and what were the possible underground utilities or the encumbrances in the way," McDonald says. "There is a lot that is not located, so there was uncertainty."

General Excavating completed the project with no Occupational Safety and Health Administration recordable injuries, restricted day cases or lost-time accidents. The company held monthly safety meetings, and safety plans were conducted daily or weekly as needed to ensure

everyone on the job site was aware of the risks and how to mitigate them.

"It is a unique project, and that makes it special," McDonald says. "It was a great effort by our guys in the field."

The Nebraska Innovation Campus remains a high-profile endeavor, and the successful completion of the CRES adds to its marketability. Holt praised the experience of the construction team on a successful, on-time completion and its ability to understand the importance of the job and everything that goes into a project of this size and scope.

"By having General Excavating involved," Holt concludes, "we were able to make this project a success." 🍌



Sections of pipe to be joined by fittings.