

WATER PLANT EXPANSION UNDER WAY



Concrete is pumped onto the project.

A major expansion to the Wyoming Clean Water Plant in Wyoming, as well as rehabilitation of some of the existing facilities and equipment is under way. The project includes the addition of a generator building, which houses two, 2-megawatt generators, along with auxiliary electrical switchgear and equipment. A new aeration basin (which includes a blower building, three basins and various other pipe galleries) is a major part of the project. The project began in November 2005 and it will be completed in October.

Also, four new 95-foot-diameter final clarifiers with a Return Activated Sludge (RAS)/Waste Activated Sludge (WAS) pump station are included in this project. A total of 25,000 cubic yards of concrete, miles of pipe, conduit, and wire will be installed on the project.

Project includes rehabilitation of existing facilities

BY ARAM KALOUSDIAN, EDITOR

The project also includes rehabilitating four existing primary clarifiers, re-lining a 60-inch influent pipe and replacing three large raw sewage pumps.

Erhardt Construction, of Ada, is the general contractor for the \$35.6-million project. Just under 1,000 cubic yards of concrete was poured in a single pour. Erhardt self-performed placement of 20,000 cubic yards of concrete. Placement of 5,000 cubic yards was subcontracted to Burgess Concrete Construction, Inc., of Moline.

Water Park Expansion

"This is also the first project that we used our lean construction principles on, both at the project level and on our self-performed concrete operations," Ben Wickstrom, P.E., vice president of Construction Operations at Erhardt Construction said.

"Lean construction is a production-based method of project delivery. The roots of lean construction come from the manufacturing industry," Wickstrom said. Erhardt is taking these manufacturing best practices and applying them to construction.

"We strive to eliminate waste by focusing on the relationship between tasks and specifically, by improving the reliability of the hand-off of a task from one person or one trade to another. We track the reliability of that hand-off. We've seen a 30-percent increase in the reliability of that hand-off, compared to published industry averages," Wickstrom said.

"What that means is that on this project, we have a 30-percent greater commitment kept every week by our project team compared to the national average for construction. This benefits our clients because when a project has more reliable work flow, it results in shorter project duration. It also benefits our subcontractors because they can count on work being ready for them when we say it will be.

"Another key concept is that we empower decision-making at all levels. The people closest to the work are the ones that have the best ideas on how to do it better and faster. We want to give all of our people the opportunity to do that.

"Some things that our employees came up with on this job include new forming systems that allow us to form and strip faster and switching to all gas-powered, backpack-mounted concrete vibrators."

Erhardt used a combination of two Schwing boom pumps with 34-meter booms and one 105-foot Putzmeister telebelt conveyor for the concrete placement on the Wyoming Clean Water Plant project. All three pieces of equipment were rented from Burgess Concrete Construction, Inc.

Approximately 15,000 cubic yards of the 25,000 cubic yards of concrete that was poured was base mat foundations that varied in thickness from 4 feet to 1 foot. There was another 7,500 cubic yards of concrete walls and another 2,500 cubic yards of concrete supportive slab.

"We used all three pieces of equipment in different combinations for all three types of pours," Wickstrom said. Everything below grade is concrete and the buildings above grade are concrete frames with concrete roofs and brick and masonry walls.

"One of the challenges that we encountered immediately was the size of our concrete pours. Our first 10 pours averaged 400 cubic yards each. These were the 4-foot thick base mats. Those

presented some unique challenges, but we provided the right combination of people and machines to get the concrete placed safely, efficiently and according to the specifications. Once we found that right combination and by the time we completed our 39th base mat pour, we were able to cut the man hours required per pour to almost half," Wickstrom said.

"Another challenge to the project was the expanse of the pouring operation. Each of three tanks is 120 feet by 220 feet and the size of our pours was limited in the specifications to a 60-foot by 60-foot maximum pour size. So, we prepared a detailed concrete pour sequence for the base mats, walls and supporting slabs before the first reinforcing steel submittal was drafted.

"That allowed us to clearly communicate the direction of the operation to the entire team and the reinforcing steel submittals were detailed accordingly. The reinforcing steel was fabricated, ordered and delivered by pour number, which cut down on the on-site storage and double handling.

"Another challenge we had was controlling groundwater. The wastewater plant is next to a river and the bottom of our deepest tank was 34 feet below grade. The static groundwater table is usually approximately 6 feet below grade. So, we had a pretty extensive dewatering operation and we developed a pretty unique system by partnering with a local dewatering contractor."

Wickstrom said that there were very tight tolerances in the specifications for the concrete mix. "So, we had to work very closely with our ready mix supplier, Consumers Concrete, in order to come up with a mix that was workable for us during placement of the concrete and performed according to the requirements of the contract documents," Wickstrom said.

Material suppliers include Consumers Concrete, of Kalamazoo, and Ambassador Steel (reinforced steel), of Auburn, Ind. Bee Steel, of Grand Rapids, is the reinforced steel installer, and Black & Veatch is the architect.

Erhardt personnel on the project included: Dave Vander Hyde, project superintendent; and Craig Schroeder, project manager.



Left: Concrete is loaded into a Schwing pump.

Above: A 105-foot Putzmeister telebelt conveyor is used on the Wyoming Clean Water Plant expansion and rehabilitation project.