

Projected Chain Life of 50 Years
 Routine Chain Tension Adjustment Once Every 1.5 Years
 “Bigger Bang for the Buck”
 “Fantastic”

QUICK FACTS

Project:

Grafton Wastewater Treatment Plant

Project Type:

New construction for capital equipment retrofit and replacement. Replaced lift bar screen, collector chains, and head-and footshaft sprockets. Grafton plant has a rated capacity of 2.5 mgd serving a population of 11,500. Effluent discharged to Milwaukee River, with permit limitations of 30 mg/l BOD, 30 mg/l suspended solids. The plant achieves 90 to 99% pollutant removal.

Location:

Grafton, WI

The Situation

As any wastewater treatment plant operator will tell you, screening the suspended material moving through a plant’s headwork (sticks, rags, small toys, paper products, food matter) is a dirty job, but it is critical to keeping the wastewater treatment process working. Which is what the Village of Grafton, WI, was striving for when they realized they were fighting a losing battle.

For 20 years, Grafton had been operating a German-made lift coarse bar screen which handled Grafton’s debris-laden inflows very well. At first, when repairs were needed, the plant’s staff could make them. But as time went on, and more parts needed replacing, this became a labor-intensive and time-consuming undertaking as those parts had to be special-ordered from Germany. “We’d have to wait months for those replacement parts,” commented Tom Kreuger, Grafton’s Utility Director. As the existing bar screen with its $\frac{3}{4}$ ” screen size continued to age, downstream equipment and processes began to suffer also. Tom noticed more time was needed to clean out anaerobic digesters and related piping due to all the rags and trash that were getting through the old screen. In 2004, when Grafton wanted to upgrade its aeration capacity, “The engineers told us we needed to upgrade the bar screen or the aeration upgrade wouldn’t be successful,” Tom says. Rich Wesson, Grafton’s Plant Operator, remembers, “The screen was old and rusty. It was a ticking time bomb. We wondered every day when it would be done for good.”



ABOVE: Rusted Bar Screen

Both Tom and Rich wanted to replace the bar screen quickly before a catastrophic failure happened, but they needed to be smart to control costs. Ordering another screen from Germany would be easy, but prohibitively expensive and time consuming. Ordering an off-the-shelf U. S.-made screen would also be easy, but standard screens would not fit into the existing channel without substantial modification of the surrounding concrete, including widening the influent channel, another very expensive and very time consuming undertaking. Faced with these challenges and watching their screen disintegrate, Rich and Tom met with wastewater treatment plant equipment expert Mike Humcke of Environmental Resources, Inc., to discuss a solution.

The Solution

Mike quickly assessed that the situation was far from a simple bar rack replacement. Not only were there special sizing and equipment requirements, but the screen carriage, chains and sprockets were also worn out. It was clear that replacing just the bar rack would not make good financial sense if the equipment carriage was going to break down soon, too. Given the age of the screen, and the amount of work a retrofit of the existing screen would require, everyone agreed to avoid quick-fix options, and instead look for reliable, durable long-lasting equipment capable of withstanding the debris the Grafton plant experienced. After a cost and mechanical equipment evaluation, Mike knew the answer to Grafton’s problems: DuraMax.

“Price was definitely a factor. We got a bigger bang for the buck.”

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Rich Wesson
Plant Operator

The Solution Continued...

As the name implies, DuraMax parts are specifically designed to be durable under extreme and heavy duty use in the maximum corrosive and abrasive environments of wastewater treatment plants. After three decades of research and testing, DuraMax chains are the first-of-their-kind cast aerospace-grade stainless steel. The high-quality casting process and stainless steel alloys not only make DuraMax chains stronger than most other drive chains on the market, but they also provide superior hardness and corrosion resistance. The combined effects of design, material alloy, and manufacturing process produce chains that are backed by a 10-year full replacement warranty. DuraMax products also include other loading-bearing equipment components, such as sprockets, bearings, and shaftings, all engineered to withstand the challenges of wastewater treatment plants.

The Village of Grafton took bids from a number of vendors, but found Amwell's bid to be the best in several ways. First, Amwell proposed DuraMax chains and DuraMax high-torque, urethane sprockets with DuraMax greaseless footshaft bearings to complement a 10-foot long standard-duty bar screen, ensuring long-lasting low-maintenance screening function. Second, Amwell's design did not require any modification to existing facility structures. Third, Amwell's price beat all other vendors. In fact, the money saved using DuraMax parts and Amwell's services allowed Grafton, under a constrained budget, to add a much needed screenings washer-compact - and still save money over other vendors' equipment prices. Rich commented, "Price was definitely a factor" in awarding the contract to Amwell, while Tom recalled that with Amwell, "We got a bigger bang for the buck."

In 2009, Mike revisited the Grafton plant, and measured the wear on the chains and the sprockets. His findings? After four years, the DuraMax chains had a total combined wear of less than 0.009 inches per year, or less than the thickness of a razor blade. Even the wear on the sprockets was negligible. Comparing pictures of the new equipment in 2005 to those taken after four years, there is hardly any difference (see pictures, above). Mike noted, "With that little amount of wear, Grafton could see these chains and sprockets lasting for another 50 years." Rich recently commented of bar screen with associated chains and sprockets, "Fantastic. No problems."



DuraMax cast stainless steel chain and urethane sprockets newly installed in 2005 (above); and same today (below) looking hardly any different.



The Results

Equipment

Before DuraMax Products

- Antiquated, overseas-made lift bar screen with hard-to-find, expensive replacement parts that took months to order and arrive
- Repairs were becoming more expensive than the equipment was worth
- Fabricated chain has no guarantee

After DuraMax Products Installed in 2005

- DuraMax products have performed without fault
- Design life of 20 years saves Grafton money in economically tough times
- Standard 10-year guarantee gives peace of mind
- Runs without problems, low cost of ownership

Operations

Before DuraMax Products

Operations would be interrupted to repair screens and clean out digester

After DuraMax Products Installed in 2005

Equipment runs with only minimal (once yearly) maintenance needed, requiring no interruption of operations

For more than 140 years, Amwell has incorporated new technology and materials into products to better serve the needs of our customers. In keeping with this service commitment, we are proud to provide DuraMax high quality products to the water and wastewater treatment industry.

To learn more about how Amwell and DuraMax can assist in meeting your water and wastewater treatment needs, please contact us today.

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