The perfect circle: 47 feet tall

PROJECT: Water filtration plant update
CHALLENGE: Circular Sheet Piling
SOLUTION: Simultaneously pound sheet piles into 22-foot circle

CUSTOMER: Benton Harbor Charter Township
LOCATION: Benton Harbor, Michigan
TIMING: September 2010
VALUE: $260,000

PARTNERS:
Erhardt Construction

Imagine drawing a perfect circle. Now picture yourself doing so in the dark…and you're holding your pencil with your toes. Sounds tough, right? A recent Team Elmer's earth retention project was just as tough.

The City of Benton Harbor was updating its water filtration plant to boost water processing from 10 million gallons per day to 12 million per day.

The plan called for a raw intake system adjacent to the plant that would divert water from underground pipes and above-ground cylinders–each designed to "pre-filter" and process 6 million gallons of Lake Michigan water. The water would then be pumped to a new filter system within the water treatment plant.

Team Elmer's was tasked with creating the bank retention and circular sheet piling that would then allow the other contractors to build the pipe and pre-filter system. In a typical 'straight' job, these sheet piles are driven one at a time. But in this case, it was critical that the piles formed a circle that was precise, straight and plumb so the concrete forms for the intake pipe could be poured against it.

The result? The Team Elmer's sheet piling gurus simultaneously pounded 47-foot tall sheet piles into the ground in a perfect 22-foot diameter circle. That's almost as tall as a five-story building and wider than your living room!

The other contractors were then able to pour the concrete intake pipe that would ultimately complete the upgrade to the City's plant.

Marc Felt, an Erhardt Construction project engineer, oversaw the entire project and was blown away by Scott Tebben and the rest of the Team Elmer's crew.

"Our expectations were exceeded by far. I was impressed by the controlled manner that the pilings were installed and their tolerances are maintained to this day. Not to mention Team Elmer's was accommodating to project changes that occurred while we were on-site, provided a quick turnaround, and the crew was easy to work with."

It wasn't a typical job…but at Team Elmer's, there's no such thing!

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About Sheet Piles

Sheet piling is a form of driven piling using thin interlocking sheets of steel to obtain a continuous barrier in the ground. Its main application is in retaining walls and cofferdams erected to enable permanent work to proceed. Normally, vibrating hammer, t-crane and crawler drilling are used to establish sheet piles.

Why Use Sheet Piles

- Economy of scale
- Temporary shoring
- Longevity of retention wall

Drawbacks

- Vibration
- Noise

About Helical Tiebacks

Helical tiebacks are used to stabilize existing walls that are failing or bowing inward, or for adding strength in newly constructed walls, for retaining walls and sheet piling used for excavation or soil retention. Capabilities can reach over 200 kip and perform immediately after installation.

Why Use Helical Tiebacks

- Poor subsoil projects
- Immediate loading capabilities
- Installed in tight spaces
- 200,000 lb loading capacity without large space and equipment needs
- Ideal in projects with less than 100,000 lb loading capacity per pier and less than 100 piers per project
- End bearing pile
- Instant capacity data
- Monitor torque during install

Drawbacks

- Obstructions in soil, such as cobbles or debris, stop helical pier advancement and cause lower torque capacity
- In cases where minimum depths are required, dense soils and undersized shaft capacities can prohibit reaching depth requirements

Benton Harbor By The Numbers

47-foot XZ-95 sheeting was installed with a vibration hammer
40-foot well with a **7-foot** toe into soils
Intake pipe was poured from the top down in **5-10 foot** increments
Stiff clay was hit at **30 feet**
Hydraulic hammer was used to penetrate **80 blow** count soil