# WEDA Navigation Award Application

## Year 2014

**April 18, 2014**

**By**

Durocher Marine

A Division of

kokosing

CONSTRUCTION COMPANY, INC.

**Summary/Project Description:**

In December 2012, low water conditions created a crisis for the St. Louis Corps of Engineers District between river miles 47 to 38.5 of the Mississippi River. The President of the United States ordered the St. Louis District to do the necessary dredging to maintain the 9 ft navigation channel depth. In response to this directive the Corps of Engineers issued Kokosing Construction Company a "letter contract" to proceed with the work because they considered the need urgent and compelling. On December 7, 2012 the Letter Contract was signed. The contract required Kokosing to be mobilized by December 17th and to be complete by January 18th of 2013. They Corps later added a milestone date of January 11th, which required all work within the new channel alignment be completed.

Mobilization included Kokosing's marine plant (excavation barge, crane barge, drill and blast barge, duty cycle crane, tug boats, material barges, excavators), subcontractors (surveyors and blasters), and to quickly provide the Corps with the all required submittals. The majority of our floating equipment was mobilized from the Chicago area, while our subcontractors mobilized from northern Wisconsin, Illinois, and Jacksonville, Florida. In 10 days our excavation spread was onsite working. The drill & blast spread, and the crane barge arrived to start work soon after.

The dredging and rock removal work was far from typical. Initially, our work required 136 cubic yards of unspecified rock removal in 200 plus locations which were spread across 33 acres of the river. The average cut was just a few tenths of an inch. The Corps broke this area into 33 boxes in order to track the work. By contract we were required to remove all obstacles detected by multibeam survey from within the confines of the work areas. The pre work survey showed many small additional high spots that became incorporated into our original schedule. In fact, the Corps later added 6 boxes to our contract via change order due to our progress and effectiveness in removing obstructions.

Throughout the project there was constant pressure to perform the work in an efficient manner and to open the river to commercial barge traffic each night. Each day the Coast Guard would close the Thebes section of the river to commercial barge traffic at 6 AM and would open the river at 10 PM. This allowed for 16 hours of continuous work on the river inside the navigation channel. At the end of each workday we were required to do a multibeam survey of each work area to confirm the minimum channel elevation requirements were met. The Corps of Engineers also surveyed these work areas to confirm our results. When the Corps verified our daily work they informed the Coast Guard who would then open the river between 10 PM and 6 AM. Throughout the project we were able to open the river to commercial traffic every night without delay.

Our blasting efforts required close communications with our subcontractors, the Corps, Coast Guard, and Fish & Wildlife from both Missouri and Illinois. Twenty four hours before each blast our blast plan was submitted for review. Each day Paschke Drilling and Blasting, Inc. would mobilize enough explosive for the blasting planned for that day. This was documented and monitored by the Corps. The USCG was required to be onsite and witness each blast. Blast monitoring of structures occurred for each blast and no incidents or mishaps occurred during our blasting efforts. Comprehensive blast reports were sent out each day within 24 hours of each blast.

The milestone date of January 11th required all dredge areas inside the newly defined navigation channel alignment be complete. We were successful in completing this goal. The remainder of the work would have been complete by January 18th except we were affected by flash flooding. This brought large amounts of floating debris down the river and elevated the river stage. The combination made working conditions unsafe and we were forced to shut down twice. To enhance our capabilities and to work in deeper water conditions, we mobilized additional larger equipment to complete the project.

In conclusion, the work was initiated under duress. We responded in a very timely manner to meet the Corp's fast paced schedule. Our crews worked 24/7 throughout the project. All work efforts were performed without incident including the drilling and blasting. We worked seamlessly with all agencies, commercial barge lines, and all other stakeholders concerned with the project. We met all our deadlines, and completed the work while working under immense scrutiny and public attention. In recognition of our success we won the Mississippi Valley AGC Safety Performance Award for this project with the St. Louis Corps District.

**Project Team Members:**

**Owner**

United States Army Corp of Engineers, St. Louis District- Southern Area Office
Archie C. Ringgenberg- St. Louis District- Supervisory COR
Jeff Derrick, P.E. Area Engineer, ACO Southern Area Office
Matt Neal, P.E Southern Area Office
Dan Foster- Southern Area Office
USACE Survey Vessels Boyer and Crew Members- Todd, Jarrod and Randy- QA multi-beam survey

**Prime Contractor**

Kokosing Construction Company, Inc. Durocher Marine Division- WEDA member
Mark Henrikson- Project Consultant
Travis Lake- Project Manager
Tim Paquette- Project Engineer
David Hudson- Employee and Equipment Coordinator
Todd Merchant- Superintendent
Shawn Ross- Foreman
Doug Boyer- Foreman
Jason Thornton- Foreman
Dave Veasy- Foreman

**Subcontractors**

Paschke Drilling and Blasting, Inc.- Drilling and Blasting
Steve Lind- Monitoring Specialist
Pete Gregor- Blast Specialist

Arc Surveying and Mapping, Inc.- WEDA member- Pre job, QC multi-beam survey, As built record drawings.
John Sawyer- Owner
Patrick Sawyer- Onsite Survey
Richard Dunnington- Onsite Survey

Youngs Consulting – Survey assistance
Clifford Youngs - Surveryor

**Key Suppliers**

Girardeau Stevedores, Inc.- Equipment staging and mooring, loading and unloading of blast materials, equipment rental and general assistance with local business and knowledge.
Lanny Koch- Owner
Dan Neal- Dock Foreman

River Docks- Tug Rentals- Local River Knowledge
Tug Charlie Boy- and Crew
River Docks 1
Pat Shea- Owner

Poseidon Barge Corporation- Barge Rental
Mike Lane- Sales and Service

Robishaw Engineering, Inc.- Barge Rental
Justin Warren- Application Engineer

**Navigation Benefits**

The stretch on the Mississippi River between miles 47 and 38.5 are completely clear of rock obstructions to the project depths within the aligned navigation channel. The removal of rock obstructions allows barge operators to carry their maximum cargo through this area during extreme low water conditions.

Another navigational benefit is the channel realignment. The deepening allowed the Corps to realign the navigation channel through this area, so future traffic will have a better access through the Thebes Railroad Bridge area. The bridge is at the narrowest point along this section of river. The current is faster and stronger here. Making an easier approach is something that will benefit all navigation in the future.

**Economic Benefits**

The following is a quote from DredgingToday.com article dated January 3, 2013 relating to the economic impact of low water conditions in the Mississippi River. *"The economic data indicates that in January alone (January 7-31), the potential supply-chain disruption in Mississippi River states could affect more than 8,000 jobs, more than $54 million in wages and benefits, as well as 7.2 million tons of commodities valued at $2.8 billion. This does not take into account the uncertainty in the supply chain that affected operations during the month of December or any potential economic impacts that will extend into February if the nation's waterborne superhighway effectively comes to a halt."*

As the crisis worsened in the late fall of 2012 commercial barges were light loaded to ensure safe passage through the Thebes area. The Coast Guard narrowed the navigation channel to avoid known high spots and rock out cropping's. The narrowing caused the Coast Guard to restrict barge traffic to one way through the area. Traffic jams up and down the river caused expensive delays in the shipping of bulk materials and cargo. The U.S. Army Corps' emergency steps to dredge and remove rock obstacles in the river between Illinois and Missouri ensured the above mentioned billions of dollars of cargo could flow without interruption or economic impact.

**Innovation**

The Letter Contract

The US Army Corps of Engineers used a Letter Contract to expedite the contractual award of this dredging project. Their original timeline involved a pre-bid, a proposal and bid, a review period, award, and notice to proceed. Under this timeline the dredging contractor could not have been onsite before mid-January at the earliest. The Corps decided this schedule was not suitable because of approaching winter/ice conditions and the urgency caused by falling water levels. By issuing a Letter Contract they were able to mobilize a contractor a month earlier and ensure mobilization would not be impacted by ice conditions in the upper pools of the Mississippi.

Leadership

The President of the United States understood the importance of this project and put the wheels in motion for this project. The amount of national media attention brought this to the nation's attention. His focus brought the necessary agencies together in an urgent and compelling manner. The result was a combined effort by the government and private industry to expedite the river dredging. Each day the President was briefed on the project's progress and each person involved in the project was aware of that oversight.

The Jackson Missouri Corps of Engineer's staff was the focus of most of that oversight, and Jeff Derrick, Area Engineer, was the focal point. He and his staff worked tirelessly throughout the project managing all aspects of the work. They were accessible at all hours of the day and night. As a contractor we take great pride in the work effort of our field personnel to work all hours of the day and in all conditions. Interestingly

we found he COE approached the work in a similar manner. The Corps' work ethic was a great motivator for our crews and showed great leadership.

Technologies

The project required a high degree of accuracy in horizontal and vertical control for QC/QA. Several high end survey control systems were used throughout the project. The hydrographic survey required mapping the entire channel with a multi-beam sonar system. These surveys were processed in Hypack and they accurately mapped the work areas. Survey Matrix files were fed into our Trimble GCS 900 system on the excavators. This gave operators real time and high accuracy RTK control for the excavation. The system also enabled the excavator operator to make targets of boulders which could easily be retrieved by the crane barge. The targets were loaded into the crane barge's Hypack system, which allowed it to precisely navigate to those targets. Once in position the crane barge would identify the boulders and pick them out of the water for permanent removal from the channel.

Drilling and blasting was used to remove pinnacles and high spots. Initially, this was very problematic. The blasting barge was positioned with GPS, monitored in Hypack, and accurately located using RTK. However, locating a point above water didn't guarantee locating the same point underwater. The depth of water and river current caused inaccuracies in locating the drill steel onto the high spot. Initially we had very poor results with our blasting accuracy. To improve our accuracy we utilized Arc Surveying's Blue View Scanning Sonar. Once the drill barge was maneuvered over the high spot the Blue View would scan the area. The Blue View produced a Lidar image of the bottom which allowed us to accurately move the drill steel directly on top of the rock protrusion. Within a very short time our drilling crew became very adept at hitting the exact high spot which drastically improved the rock removal production.

**Transferability/ Lessons Learned**

The Mississippi River can be controlled but never tamed. Mother Nature created extreme low water conditions during the late fall of 2012. During the course of our contract we witnessed two periods of heavy precipitation throughout the upper Mississippi and Ohio River valleys. The rains caused flash floods which produced rapidly rising water levels, faster river velocities, and large floating debris fields. The combination caused emergency shutdowns, which delayed the project's completion. Fortunately, higher river elevations allowed barge traffic to commence 24 hours/day during the non-work periods. We learned that the Mississippi River has a mind of its own and conditions can change in a few short hours.

From St. Louis, MO south, the Mississippi is no longer controlled by dams. We needed experienced and knowledgeable partners who understood the river, so we hired local tugs to work onsite with our crews. This ensured our crews' safety and gave us local knowledge of the area. It also helped to meet the 10 day mobilization deadline. Their knowledge was also key to our productivity. Their understanding of currents, shoals, and tug maneuvers was a great asset. This was especially true during the flash flood conditions we encountered. Hiring local knowledge proved to be a good decision for the project, and for the safety of our workers and equipment. Their assistance helped us complete the project without incident. We learned the value of local knowledge.

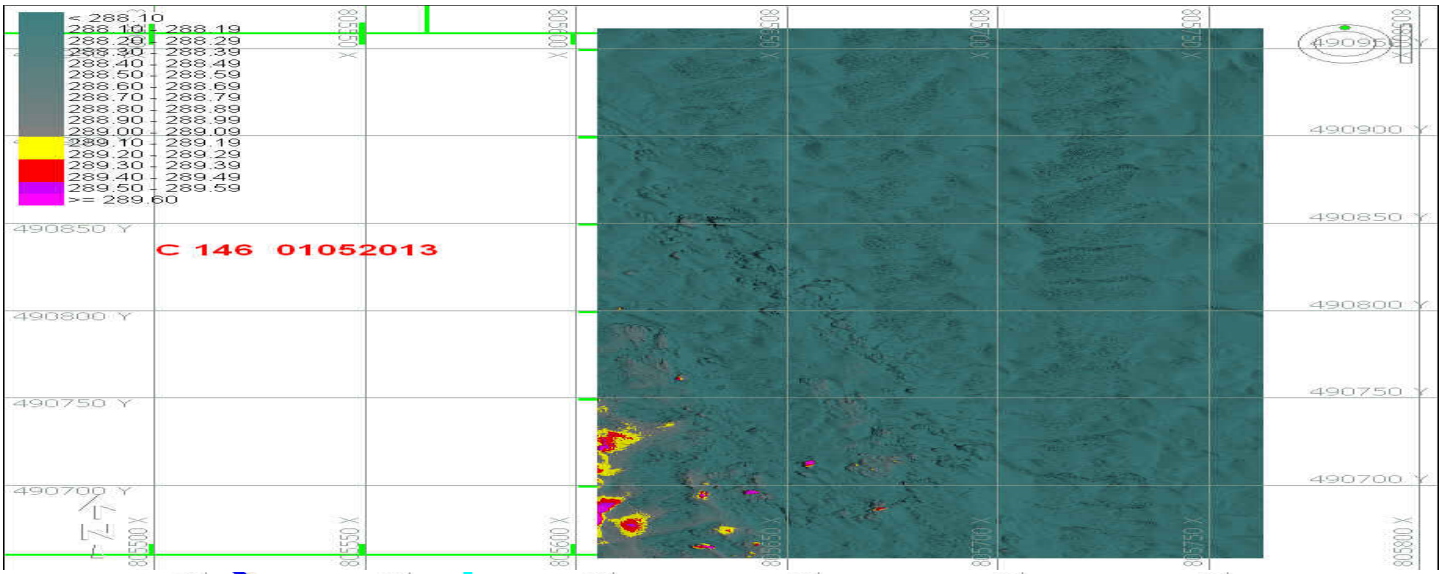
**Outreach and Education**

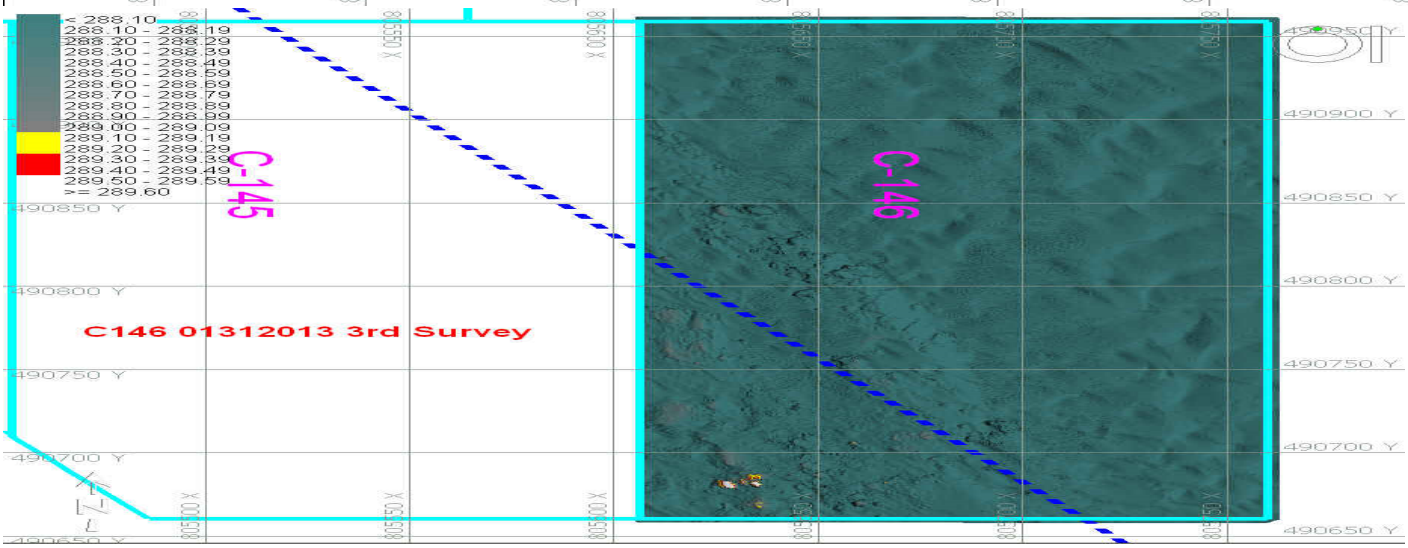
The US Army Corps of Engineers, US Coast Guard, American Waterway's Operators, Waterway's Council, Inc., US Fish and Wildlife, and many other organizations, had up front and behind the scenes involvement in the project's scope and processes. The wide spectrum of partners and their level of project buy-in helped get the project get completed with a sense of urgency. The daily oversight of the President was an important mechanism in getting the stakeholders involved and motivated to work together. We are proud as a company to assist the nation in the time of need and to completely fulfill the expectations of the contract.

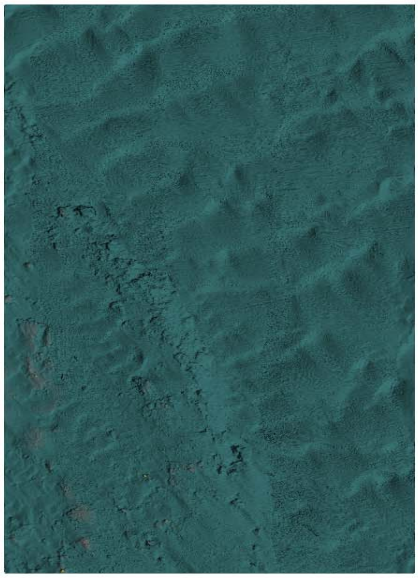
**Pictures/Diagrams**

Top - Drill and Blast Spread, Middle - Excavation Spread, Bottom - Crane Spread

Box 146: Top - Existing Survey, Middle -Progress Survey, Bottom - Final Survey for Record Drawings



Top- Crane Spread Removing Boulders,  Bottom- Excavation Spread