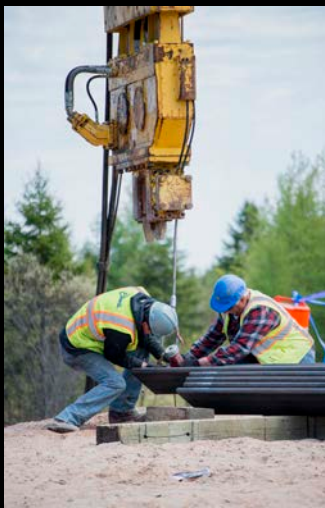


I-75 Culvert



PROJECT: I-75 Culvert Installation

CHALLENGE: Replace existing corrugated metal pipe and arch pipe with steel multi-plate culvert in short time constraints

SOLUTION: Efficiently installing new steel multi-plate culvert technology with attention to detail, patience, and persistence

OWNER: Michigan Department of Transportation

CONTRACT AMOUNT: \$1,272,407.00

DESIGN ENGINEER: David Rusch and Chris Rupinski

LOCATION: I-75, from north of Mackinac Trail to south of the I-75 and M-28 interchange in Chippewa County

DATE STARTED: April 2015

DATE COMPLETED: July 2015

SELF-PERFORMED: 70%

PARTNERS: Hunt Brothers Concrete, Payne & Dolan

I-75 is a central freeway in Michigan's Upper Peninsula, from the crossing at the Mackinac Bridge all the way up north to the Canadian border. So when two large culverts on the portion of I-75 between Sault Ste. Marie and Dafer reached the end of their usable service life, getting them replaced quickly and efficiently was essential. Team Elmer's competitive bid was awarded the construction contract by MDOT to remove the 50-year old culverts and replace them with newer models.

For the project, MDOT had to close off a segment of I-75 and set up a major detour. With traffic redirected, Team Elmer's was able to get to work. To start, we removed sizable sections of pavement and used a crane to install 11 semi-truck loads of sheeting at the site. The sheeting was necessary to create a cofferdam and dewater the older culvert.

After removing and disposing of the old culvert, Team Elmer's turned its attention to laying the

TEAM
Elmer's
www.TeamElmers.com

Esphalt™ • Excavation • Concrete • Cranes

foundation for the new work. And the job really did require a foundation: before we could put the new culvert in, we had to line the bottom of the passage with a 21AA aggregate base, as well as two separate layers of 6AA and peastone. Only then could the large metal pieces of the new culvert be moved into place — a process that brought its own set of challenges.

The steel multi-plate culverts created several new factors to consider while installing the new technology. Most culverts along I-75 are concrete box culverts. The new metal culvert pieces we were installing for this project were both bigger and more unwieldy than the usual installations. The typical concrete box culvert also comes pre-assembled and ready to be moved into place. To complete this particular job, Team Elmer's had to assemble the culvert from large panels — a task that felt like a giant, three-dimensional jigsaw puzzle.

Of course, most jigsaw puzzles are installed by hand — something that certainly wasn't the case with either of these two culverts. Instead, the large and heavy nature of the panels meant that Team Elmer's had to utilize a lot of equipment into a 200-foot area to get the job done, from excavators to a Manitowoc 70-ton crane. Using the right machines, we were able to line up the pieces of the culvert and fit them together.

Perhaps the most challenging part of the project was attaching the pieces of the culvert to one another. For both culverts, that process involved approximately 8,000 bolts, so needless to say that this part of the job would have been tedious even in the best situation. It was rendered even more maddening on the first day by the fact that every time Team Elmer's would tighten one bolt, the vibration of the impacts would actually loosen the other bolts. In order to make sure the culvert could be put together safely and securely, stronger guns were used for tightening the bolts to take the excess vibration out of the equation.

Luckily, our team had a strong assist from the culvert company, who sent a representative to consult on the project. The representative, Bob Meinzer, had a few kind words to say about Team Elmer's at the end of the project.

I-75 Culvert By The Numbers

- Culvert Replacement: **0.81 miles**
- Multi-Plate Arch (87"x63" diameter): **200 feet**
- Multi-Plate Arch (137"x87" diameter): **220 feet**
- Aggregates: **4,076 ton**
- Temp Sheet Piling: **4,104 feet**
- Cold Milling: **1,649 square yards**
- 9" Concrete Base: **459 square yds**
- HMA: **1,460 tons**

"I've been in the business 50 years and I've never worked with a crew that worked together as a team and worked harder than this crew," Bob said. "They work together and they work hard, and they work hard all the time."

That collaborative approach served Team Elmer's well as we worked to get both culverts installed. MDOT had originally set a completion date of October 15th for the project. However, thanks to some classic Elmer's teamwork and some helpful guidance from Bob Meinzer, we managed a total completion of the project by the end of July. As a result, MDOT was able to open I-75 two and a half months earlier than expected — something that was greatly appreciated by locals and travelers alike.

