

# Rent Right



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# Down Under

*Choice Construction uses 28, 120-foot lifts to access damaged sections of Hoan Bridge*

■ *By Barry Gantenbein, editor, Western Builder*



The use of 600 pounds of explosives to drop a 130-foot, 520-ton section of the Hoan Bridge last December was just the start of the work needed to repair the bridge that links the South Side of Milwaukee to Downtown.

It has not been an easy job. Repair work that began in May has included the use of 28, 120-foot lifts for access to the damaged sections of the bridge.

The story began on Dec. 13 when a 200-foot section of the bridge buckled, leaving a four-foot dip in a section of the northbound lanes. The Hoan Bridge, which carries approximately 35,000 vehicles a day, was immediately closed to traffic.

An inspection of the span found that two of the three 10-foot-deep girders in that span had completely fractured from the bottom flange to the top flange.

Controlled Demolition, Inc., Phoenix, Md., was contracted to demolish the damaged section of the bridge. That cleared the way for further repair of the bridge.

Zenith Tech, Inc., Waukesha, Wis., is the primary contractor for the \$7.4-million final repair of the Hoan Bridge, which began in May and is expected to be complete by November.

The repair of the Hoan Bridge includes a retrofit and replacement of the failed section of the bridge. Much of the work is removing the lateral bracing and taking out the defects that caused the failure.

Choice Construction Companies, Inc., Menomonee Falls, Wis., is the subcontractor responsible for the removal of all lower lateral bracing.

The company is using 28, 120-foot lifts to access damaged sections of the bridge, according to Michael J. Owsley, project manager for the job and one of the owners of Choice Construction.

"The biggest thing we're trying to accomplish, all the lower lateral bracing is being removed because of how it

The Choice Construction crew is using 120-foot lifts to access damaged sections of the bridge, which are being removed by mechanical means.

Right: A JLG lift on the job, one of 28 lifts rented from United Rentals.

Bottom right: A photo of some of the 28, 120-foot lifts Choice Construction rented to remove lower lateral bracing at the Hoan Bridge in Milwaukee.



changes in temperature, which caused a great deal of wear and tear on lower lateral bracing on spans of the Hoan Bridge with only three girders.

"When the sun comes up and hits this outside girder, this outside girder is considerably warmer than the next one in. Because there's only three girders to each section, this girder expands a lot farther. When it cools, the girder contracts. They keep working back and forth like a saw, and it tears the connecting plates that are welded to the girder.

"It's literally tearing it away from the girder web.

You start out with a crack that may only be 3/4 inch to one inch long, then you get cold temperature or a bunch of shock loading from a couple of salt trucks on a span at the same time, and the crack will run. That's how they got the large cracks that caused the initial failure," said Owsley

Bridges are built today with a redundant girder system with five or more girders in a span, not the three girders found on spans in the Hoan Bridge.

When there are multiple girders, the problem isn't as serious if a fracture develops in a girder.

"They claimed when they built this it wasn't fracture critical because they had a redundancy with the girders because they had more than two girders. Now, they've found out that if you lose one girder, you've still got a problem," Owsley said.

The sudden failure of the Hoan Bridge was caused by a combination of a strained joint caused by a standard 1970's bridge design, extreme cold temperatures, and the stress of traffic across the bridge, according to the Wisconsin Department of Transportation (WisDOT).

The main cause of the bridge failure was a design element known as a "lower lateral connection joint assembly," reported a WisDOT investigation team that included experts from Lehigh University, the Federal Highway Administration (FHWA) and Lichtenstein Consulting Engineers.

Bridge investigators concluded that the failure originated in a joint assembly on a main girder - where several bridge components came together - and where stress was concentrated. The joint assembly as this point was highly constrained, with no room to give or bend.

### Job history

After the bridge buckled in December, WisDOT hired Choice Construction, along with Zenith Tech and Lunda Construction, headquartered in Black River Falls, Wis., to do emergency repair work.

was attached to the girder webs. It was done in a welded method. With the different stresses and loads on the bridge, where those plates were welded to the girder webs, they actually tore away," Owsley said.

### Under stress

Choice Construction is removing all the lateral braces for 18 spans, all of which have three girders per span, on either side of the bridge's arch span. With only three girders per span, lower lateral bracing was under a great deal of stress.

Steel expands and contracts with

biggest thing for us, was guaranteeing that we could supply the equipment. It was a huge undertaking. This stuff came in from all over the country.”

Choice Construction rents almost all the equipment it uses.

“My philosophy, and the company's philosophy, we want to rent equipment. We don't want to be equipment owners. Too many jobs, you need specific equipment for the job,” Owsley said.

He added, “To try and do another job with 120-foot lifts, they may be too large, too heavy for the ground conditions. You're better off getting the specific equipment to do that job the most efficient way.

“Unless you have a lot of money you don't know what to do with, I'd rather rent it and return it. Then go on to the next job, and get the right piece of equipment for that job.”

With work north and south of the Hoan Bridge's main span, Choice Construction approached the project as if it were two separate jobs.

This approach gave Choice some flexibility in the use of equipment and personnel. This was especially helpful in the work done on the north side of the main span, which is right on top of the Summerfest Grounds.

Summerfest is home to concerts and festivals almost every weekend and many weekdays during summer.

“The most difficult part of the job was how to access the areas over the

Summerfest buildings on the north end of the project,” Owsley said. “As soon as the governor signed a contract, we set up a pre-con meeting and started immediately because we wanted to get a jump start for the work over the buildings because of all the people and all the activity.”

Except for the first few weeks of the job, the Summerfest Grounds have been buzzing with activity.

“We started on the north side and got the part over the buildings done first. When Summerfest started, we went to the south side and completed the south side in its entirety with the exception of a few guys working with the engineers. Then, the bulk of the guys came back here to finish the work on the north side,” said Owsley.

### The company

Choice Construction Companies, which does reinforcing steel, structural steel, and retrofit work on bridges and buildings, was founded in 1994 by Owsley and two other partners.

Partner Jeff Pereles, who is a CPA, does the company's books, all paper work, manpower scheduling, and assists in the management of projects in progress, while Owsley spends a great deal of his time in the field. The third partner has left the business.

“I'm out in the field probably 75 - 80 percent of the time. Since I'm an owner and am ultimately responsible for the projects timeliness, I'll take the larger, tougher jobs to make sure they get done on time,” Owsley said.

And with the work on the Hoan Bridge, he seems to have done just that.

Of course, the job has been a team effort, with Choice Construction working closely with Zenith Tech, WisDOT, Summerfest officials, the Milwaukee Metropolitan Sewerage District, Lichtenstein Consulting Engineers, CH2M Hill, of Milwaukee, and United Painting, of Forest Junction, Wis. □

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Michael J. Owsley, project manager for the job and one of the owners of Choice Construction, at the site.



Owsley said of his company's return to the job this summer, "We didn't have the inside track because it was a public bid, but we did know the project pretty well when we put in our bid."

Choice Construction started work on this phase of the work on May 21, and is expected to be finished sometime this month, Owsley said.

There are some significant differences between the emergency repair and this job.

The biggest differences are the scope of the work and access to damaged sections of the bridge. Stripping platforms were used in a relatively small area in December, while 120-foot lifts were used to access a much larger work area this summer.

During emergency repair work the entire bridge was shut down, so construction workers could use stripping platforms secured on the bridge deck to access the repair area.

But with half of the bridge open to traffic and the scope of the work much bigger for the final repair work, the use of stripping platforms wasn't an option.

"There's not a lot of stripping platforms in the state. You couldn't even find

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Choice Construction employees put on safety harnesses before getting on a JLG lift to do repair work at the Hoan Bridge. The bridge received national attention in December when a 200-foot section buckled, and was demolished with the use of explosives.

the stripping platforms, let alone have the contractors rent them to you. The only people that have them are contractors that custom built them for themselves, so they're not going to rent them out," Owsley said.

For 60-foot stripping platforms, such as those used for the emergency repair, the platform needs 32 feet of space on the top of the bridge to make repairs beneath the bridge. In addition, a crane is positioned on the top of the bridge.

"Now, you have a project where half of the bridge has live traffic on it, so you have to access it from down below so you don't interrupt the traffic flow that is up there," said Owsley.

The Choice Construction crew on the job, which peaked at 25, is using 120-foot lifts to gain access to damaged sections of the bridge, which are being removed by mechanical means. Pieces are hoisted down by crane, with the largest piece removed weighing in at 1,600 pounds.

### Rental equipment

All lifts on the job are rentals. The 120-foot lifts supplied by United Rentals are JLG, Genie and Snorkel models.

Finding the equipment was a challenge.

"One of the most difficult parts of a job like this is finding a resource that has 28, 120-foot lifts. It's unusual to have four on one job," said Bill Tilch, commercial/industrial equipment specialist at the Milwaukee office of United Rentals. "The

