HIGH Steel News

Information from High Steel Structures LLC

Winter 2014

High Steel's Team Steps Up to Repair Fire-Damaged Route 22 Bridge at I-81

In the early hours of May 9, 2013, a tanker truck carrying 7,500 gallons of diesel fuel travelled northbound near Harrisburg, Pa. at an apparently high rate of speed. While going over the 22/322 overpass just north of where I-81 crosses the Susquehanna River, the driver lost control and the tanker flipped over, bursting into flames.

The driver managed to escape with minor injuries. The fire burned throughout the day and the plume of black smoke could be seen from distant communities. Its searing heat destroyed the ramp to the Exit 67 interchange and badly damaged the overhead bridge that carried eastbound Route 22 toward Downtown Harrisburg.

"There really could not have been a worse spot for this to have occurred," said Pennsylvania Transportation Secretary Barry Schoch.

I-81 handles about 100,000 vehicles every day, while Route 22-322 transports about 34,000. Greg Penny, Community Relations Coordinator of Pennsylvania Department of Transportation (PennDOT) Engineering District 8, refers to the I-81 interchange as "a spaghetti bowl" of roadways that swirl around and link highways in all directions. Transportation in the region is highly dependent on the interchange to move traffic north, south, east and west around Harrisburg.

At one point on the first day, vehicles were backed up for 10 miles on I-81 in both directions, according to State Police Commissioner Frank Noonan. It was a transportation nightmare.

"This was a repair that needed to be done as quickly as possible," said Mike Keiser, District Executive of PennDOT District 8.

Very soon after the accident, PennDOT had engineers on site assessing the damage. The ramp needed to come down, and there were concerns about traffic below the ramp, on I-81.

Fire rages at Route 22 Bridge at I-81 near Harrisburg. (Courtesy of PennDOT)

The charred tanker that overturned on the Route 22/I-81 ramp. (Courtesy of PennDOT)

As soon as Harivadan Parikh, P.E., the District 8 bridge engineer for PennDOT, learned that High Steel Structures had fabricated the original steel for the bridge back in 1975, he contacted the company. Parikh knew that High Steel was one of the largest steel fabricators in North America, highly regarded for its emergency bridge repair expertise, and located just 40 miles from the site.

High has been a leader in its industry going all the way back to the 1950s, when it helped revolutionize the bridge fabrication process by advocating for the then brand new technology of welding.

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"High Steel did the original fabrication and was right in our own backyard," said Parikh.

Removal and Repair

A plan was quickly put into place to haul away the damaged bridge. The accident had occurred on a Thursday morning, and by late Saturday, crews had removed the damaged portion over I-81. The work to remove the damaged ramp was conducted by J.D. Eckman, Inc., with High Transit LLC providing transport services for the removal of the dismantled pieces.

Mike Murry, Director of High Transit, pointed out that the transport job was a bit more challenging than a typical job. High Transit's group normally calibrates very precisely the weights and measures of each shipment. They know exactly how large each beam or truss is, and exactly how to load it on the transport vehicle.

"This tear-down operation was different," Murry said. There were different sizes and shapes being loaded, some misshapen into challenging configurations. Most of the damaged pieces went to storage sites near the accident location or to storage areas in Chester County, Pa.

By June, only weeks after the accident, PennDOT had awarded a contract to High Steel Structures to fabricate the 365 tons of structural steel components that would be needed. Shortly after, G.A. & F.C. Wagman, Inc. was awarded a contract to serve as general contractor. Wagman would oversee repair of the existing piers and abutments and building of the new bridge superstructure and deck. Wagman in turn hired High Steel's Field Operations group as a subcontractor to erect the new bridge.

High Transit hauls away damaged portions of I-81 ramp. (Courtesy of PennDOT)

Normally for High Steel, six or seven months would be invested in a job of this size – 365 tons of massive structural steel components – from beginning to delivery. On this emergency project, because of its significant impact on the region's transportation, High committed to getting the job done in just two months.

Needless to say, time was at a premium. "To call this a fast-track project is an understatement," said Ken Glidden, project manager from High Steel.

High Steel worked closely with PennDOT to review the original blueprints and make modifications so that the two replacement steel boxes and 30 steel I-beam girders would meet modern construction codes. The order was placed for two steel boxes at 25 tons each, as well as 30 girders.

The girders would be 4 feet deep, ranging in length from 54 to 120 feet and weighing from 13,000 to 24,000 pounds. The two box girders were 4 feet deep, 51 feet long, 2 ½ feet wide, with stub girders attached making the shipping width 11 feet. The box girder shipments weighted approximately 74,000 pounds each.

Steel had already been ordered in late May from ArcelorMittal steel mills in Coatesville and Conshohocken, Pa. – the steel that would be needed to fabricate the massive bridge components. The material arrived just 11 days later, reported Glidden.

"That allowed fabrication of the steel to start in early June," says Glidden, noting that fabrication crews worked long hours to keep the emergency project on a fast track.

Inside one of High's enormous fabrication shops in Lancaster, Job No. 134, or "81" as it was referred to by the High team, became a mission and a source of pride. At any given time, there may be a dozen different projects going on in the various fabrication shops at High Steel – three shops in Lancaster and one in Williamsport, Pa. But in Lancaster, 81 became a challenge and a commitment. Stickers on hardhats resolutely displayed the red and blue 81 emblem along with the words, "Git-R-Done."

As promised, the steel components were fabricated in just two months. By August 9, steel delivery began, and by August 11 High's field operations crew began the steel erection process. The steel erection was

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One of the project's two steel box beams with stub girders attached

completed in record time as well, just two weeks later.

"This emergency repair has definitely been a Pennsylvania project," said Greg Penny of PennDOT. "Relying on our own Pennsylvania resources for steel production, fabrication, transportation and erection turned out to be an excellent move," he added.

"This is the kind of project that can only be done with a great deal of teamwork," said Glidden of High Steel. "Especially when it needs to be done as quickly as this one did. Everyone really pulled together."

The remaining reconstruction and rehabilitation work would take place over the next several months. In November, the new eastbound Route 22 bridge over Interstate 81 was opened to traffic and on December 18th, the repaired ramp from northbound Interstate 81 to westbound Route 22/322 reopened. The work was completed just in time for the holidays.

"The steel beams still need to be painted, and this will be done in the spring when warmer weather suitable for painting returns," says Mike Keiser, District Executive for PennDOT District 8.

A Look Back at the Herculean I-81 Response

PennDOT estimates that the emergency response to the tanker fire, the demolition and reconstruction of the eastbound Route 22 bridge, the rehabilitation of the ramp from northbound I-81 to westbound Route 22/322, and the handling of traffic cost between $12 and $13 million.

Looking back, Keiser reports that it was one of the biggest crises ever faced by him and his team. He recalls that he was getting ready for work on that Thursday morning in May. It was 6:15 a.m. when the accident occurred and a few minutes later when Keiser was notified by mobile phone.

"It was fortunate that it happened as early as it did, otherwise there would have been many more vehicles on the road," said Keiser.

By May 13, the damaged overhead bridge was cleared, and a temporary crossover two-lane bridge, with a lane borrowed from westbound Route 22, was installed by local contractor Pennsy Supply. This temporary solution restored the eastbound Route 22 connection to Harrisburg while the removal of the eastbound bridge allowed the closed portion of Route 81 to be re-opened.

One of the key factors in working rapidly to complete the emergency repair was obtaining permission from the federal government to modify PennDOT's bidding process, in order to expedite bids for the work. In anticipation of the state-wide Pennsylvania Farm Show that takes place every January, the goal was to reopen the ramp by the beginning of 2014.

"A key element in achieving that goal was High Steel. They did an excellent job as part of the team, and it was especially helpful that High Steel had done the original steel fabrication," says Keiser.

A project of the scope of the I-81 Interchange might ordinarily take more than a year to complete. To get the job done in two months, High Steel employees worked around the clock.

"We're proud of our highly skilled and talented team, which is well known for its ability to handle emergency jobs," said Brian LaBorde, president of High Steel. "They're the best of the best, and we're all very proud to have helped return to service this important portion of Pennsylvania's infrastructure."

Repairs underway on Route 22 Bridge at I-81 near Harrisburg.

TIMELINE For I-81 Interchange Ramp

1975
I-81 Interchange Built, High Steel Fabricates Steel

May 9, 2013
Truck Fire on I-81 Interchange Ramp

May 9, 2013
Ramp Inspected, Determined to be Unsafe

May 10, 2013
High Steel Contacted PennDOT to Offer Assistance

May 10, 2013
Alternate Route Set Up at I-81 Interchange

May 11, 2013
Damaged Ramp Demolition

May 13, 2013
Damaged Ramp Hauled Away

May 23, 2013
High Steel Gets Notice to Proceed from PennDOT

May 23, 2013
First Material Order placed by High Steel (Webs and Flanges)

June 3, 2013
All Web and Flange Material Received by High Steel (11 days after NTP)

June 6, 2013
Start of Fabrication (2 weeks after NTP)

August 9, 2013
Start of Steel Delivery (11 weeks after NTP)

August 12, 2013
Start of Steel Erection

August 26, 2013
Completion of Steel Erection (13-1/2 weeks after NTP)

September 2013
Construction Continues to Rebuild Ramp

November 21, 2013
Route 22 through the I-81 Exit Interchange Reopens Two Lanes

December 18, 2013
Repaired Ramp Reopens

Collaborative Approach: A Common Thread for Successful Emergency Bridge Replacements

When a bridge needs unexpected replacement due to an accident, weather event, or sudden structural failure, time is of the essence.

In addition to the recent I-81 project, High Steel has a proven track record in helping project owners quickly return other closed bridges to service, assisting the project team with the technical expertise, material resources and fabrication capacity to quickly deliver a quality steel superstructure that fits together right the first time.

The following emergency project summaries illustrate the experience High Steel brings to the process:

1998: Interstate 95 over Chester Creek, Chester, PA

On May 23, 1998, a gasoline tanker truck crashed across a concrete barrier, striking a pickup truck and bursting into flames on I-95 over Chester Creek just outside of Philadelphia. Two were killed, and the charred bridge buckled under intense heat exceeding 2,000 degrees. Holiday travelers remained stalled for most of the day along this stretch of highway that averages 80,000 vehicles daily. PennDOT closed the damaged southbound lanes indefinitely, and a state of emergency was declared.

High Steel was immediately hired to produce nine specially designed steel plate girders and cross-frames to repair the bridge, which the governor hoped to reopen by mid-July. With a full production schedule, High Steel reallocated priorities, altered weekend plans, and committed to work twenty-four hours a day, seven days a week. Fabrication was completed in two weeks, and the steel was delivered to the site on June 8th, a week ahead of schedule. The bridge was reopened on June 29, 1998, 16 days ahead of schedule.

2001: SEPTA Railroad Bridge, Fort Washington, PA

On June 16th and 17th, 2001, Tropical Storm Allison blew into Eastern Pennsylvania, destroying the 90-year old stone arch railroad bridge at Fort Washington on the R5 Lansdale-Doylestown line in storm-related flooding. A serious loss for SEPTA, this bridge is used by thousands of weekday commuters.

Emergency funds were secured, and following an emergency bid process on June 25th, the steel fabrication for the new bridge was awarded to High Steel. The contract began on June 29th and called for round-the-clock work to restore rail service as soon as possible. High Steel built a pre-constructed steel bridge comprised of six deck units. Each 30-40 ton unit consisted of a row of stringers tied together with a deck plate.

9-Mile Bridge in Hazel Park, MI.

High Steel delivered the deck units to the job site on July 12th, and erection began that night. By July 23rd the new three-span bridge was opened. The new bridge is twice the length of the old structure and is able to withstand twice the volume of floodwaters as the structure it replaced.

2009: Route 90 Bridge, Ocean City, MD

When a routine inspection revealed previously undetected concrete deterioration and reinforcing steel corrosion in the concrete girders of the Ocean City Route 90 Bridge navigational span in the fall of 2009, the Maryland State Highway Administration closed the bridge for emergency repairs.

The MDSHA chose a steel girder superstructure for the span replacement, because it weighed less than other replacement alternatives. This reduced costs and allowed for more of the bridge to be preserved. High Steel was awarded a contract using expedited procurement for steel fabrication and delivery of the replacement girders. High Steel was given notice to proceed on October 6.

High Steel had the resources available in both material needs and manpower to fit this project into the shop flow, waiving the standard lead times. Having the material already on hand allowed for a dramatic cut in fabrication time. High Steel's engineering department worked closely with the Design Consultant, URS, and the Maryland SHA to expedite the design and detail drawings approval process. As a result of the fast track approach, the first shipment of steel arrived at the jobsite on October 27, only three weeks after notice to proceed.

Work on the 85-ft portion of the bridge was anticipated to finish in mid-December. But the bridge reopened three weeks early, on November 24, just in time for the Thanksgiving holiday.

2009: 9-Mile Bridge in Hazel Park, MI

On a warm July evening in 2009, a violent fuel tanker explosion brought down part of the 9 Mile Road Bridge. The truck had struck the bridge, closing the heavily trafficked Interstate 75, the major north-south artery serving busy Hazel Park, Michigan. A portion of I-75 was damaged due to the fire and the bridge had to be quickly replaced.

The contract to clear the debris and build temporary pavement was bid within a week. On September 30 the Design-Build team of Walter Toebe Construction and Bergman Associates was awarded the bridge replacement portion of the project. High Steel was awarded a contract to fabricate 317 tons of steel girders for the project.

Working closely with Bergmann Associates, the girders were designed and fabricated in six weeks rather than the normal project lead time. The project was put on a very accelerated schedule, with many operations overlapping. High Steel was given notification to proceed with the project on October 2. On November 13, the first steel delivery arrived at the jobsite.

High Steel collaborated with Bergmann to utilize material the company had available for the girders' webs and flanges. Additionally High Steel's capacity and resources at the steel mill allowed the

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company to absorb the rush job into its schedule.

Bergmann Associates completed design plans within two weeks of the notice of award. High Steel's engineering department worked with a single point of contact for all of the project's design and detailing issues, and detailers worked extended hours, including Saturdays and Sundays, to meet the job's rapid pace.

The bridge was reopened to traffic in mid-December, only 65 days after the project team's notice of award.

2011: Seven Lakes Drive Bridge, Harriman State Park, NY

The Seven Lakes Drive bridge, located over the spillway at Lakes Askoti and Skannatati, on Seven Lakes Drive in Harriman State Park, N.Y., was damaged by Hurricane Irene the last weekend of August, 2011. On September 2, the New York State DOT called on High Steel to replace the bridge and asked how quickly they could deliver girders.

As it turned out, High Steel was able to deliver the fully fabricated girders only 26 days later. New York State DOT designed the new bridge in-house, working closely with High Steel and keeping open lines of communication throughout the process. On September 6, just four days after placing the initial inquiry, NYSDOT provided High Steel with a rough design including basic flange and web dimensions. This rough design was enough to place a material order, which arrived at the plant two weeks later.

While the design was underway NYSDOT also provided dimensional information to High Steel to run their bridge coordinate geometry software, as well as answer key detailing questions that arose during the process. High Steel then developed the shop drawings with in-house personnel while NYSDOT completed the design. Drawing approval was lightning fast – a mere 2-hour turnaround with excellent support from all involved.

Seven Lakes Drive Bridge at Harriman State Park, NY

Ultimately, High Steel delivered fully fabricated plate girders on September 28, just 26 days after receiving the initial call from NYSDOT -- a true testament to the coordination and communication between the two parties. While the newly repaired Seven Lakes Drive bridge was ready for traffic on October 12, 2011, New York State DOT decided to open the bridge just two weeks later.

(Adapted NSBA Newsletter article, December 2011 edition)

Route 90 Bridge span in Ocean City, MD

Recent Contracts Awarded

Tappan Zee Bridge – Approach Spans
Rockland County, NY
Tappan Zee Constructors
50,000 Tons

SR 2082 Sect. A08, Hulton Bridge
Allegheny County, PA
Brayman Construction Corporation
6,152 Tons

PA Turnpike Bridge, MP 250.76 to MP 251.17
Dauphin County, PA
Swank Associated Companies, Inc.
1,544 Tons

Rte 84 / Delaware River
Orange County, NY
Harrison & Burrowes Bridge Constructors Inc.
1,984 Tons

SR 8 Section A12, Butler Street Bridge
Allegheny County, PA
Trumbull Corporation
622 Tons

Rte 2 Crosby's Corner Interchange
Concord to Lincoln, MA
D. W. White Construction, Inc
401 Tons

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"Lay down a good weld and give good measure"

Sanford High 1931

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