

Replacing the Historic Veterans Memorial Gay Street Bridge in Phoenixville

Once again, the Veterans Memorial Gay Street Bridge stands tall over the French Creek in Phoenixville, Pa.

The bridge was rebuilt in record time after it was declared unsafe by the Pennsylvania Department of Transportation in 2007. Nearly five months ahead of schedule, the Gay Street Bridge on Route 113 was completed, with a dedication ceremony in October 2009.

The vital bridge links portions of Phoenixville and transports more than 6,700 vehicles a day, so it was important to get the bridge built as quickly as possible. The key to doing that was in careful planning.

"Completing the new bridge ahead of schedule was a team effort. All parties involved made it possible. The new structure blends in well, reconnects Phoenixville and looks fantastic," says Bob Urban, field operations manager for High Steel Structures Inc., who notes that the process went very well from start to finish.

High Steel Structures Inc. fabricated and erected the steel beams and arches for the new Gay Street/Route 113 Bridge, which spans 972 feet from end to end. The bridge's concrete deck is supported by steel beams on the three southern and two northern approach spans, and by steel arches on the four central spans.

The general contractor for the \$17 million project is Nyleve Bridge Corporation of Emmaus, Pa., with 80 percent of the funds from the federal budget and 20 percent from state funds. The preliminary engineering, environmental studies, final design and construction consultation services were done by Johnson, Mirmiran & Thompson (JMT) of Sparks, Md.



"From design to fabrication, all parties involved in the project worked together as a team," says High Steel's project manager Mike Kennedy. "And for High Steel, it goes back to our philosophy of giving good measure."

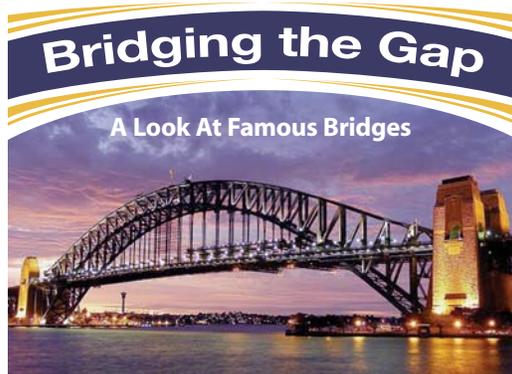
Working closely with Nyleve, High Steel fabricated 36 steel girders and 57 steel columns for the bridge. Every detail had to be painstakingly planned in the fabrication process, report Bill Mankin, chief fabrication planner, and Don Richardson, fabrication planner.

"Maintaining the geometry of each arch is critical," says Mankin, who has worked for High Steel for 43 years.

That meant that the entire structure had to be set up ahead of time at the High Steel yard in Lancaster, Pa. Even temperature changes needed to be evaluated as the steel expands with the heat of the sun and then contracts when it cools.

"With each connection we had to adjust the mill to bear so that it was absolutely precise," notes Mankin.

That required more than three months of set up and adjustments in the milling. A state inspector worked with High Steel

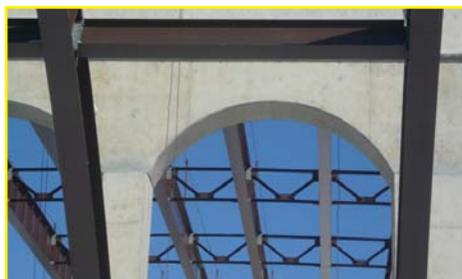


Bridging the Gap

A Look At Famous Bridges

Sydney Harbour Bridge

In Sydney, Australia, one of the world's most famous bridges provides the stage for thrilling fireworks displays on New Year's Eve and other holidays. The spectacular 1,149 meters (3,770 feet) Sydney Harbour Bridge spans the harbour with an arch span of 503 meters (1,650 feet), connecting the Business District with the North Shore. The world's largest (but not longest) steel arch bridge, it was built in 1932. Graceful and massive at the same time, it stands side by side with the iconic Sydney Opera House in the panoramic harbour. Made of 52,800 tonnes (51,966 tons) of steel, it is affectionately nicknamed "the Coat Hanger."



Message from the President Jeffrey L. Sterner, P.E.

Learning from Bridge Fabricators Overseas

High Steel Structures is a leader in the steel bridge fabrication industry, but we are under no illusion that we know all there is to know. We are forever searching for new ideas and new technological innovations that can help us be more efficient in producing the highest quality products in the most cost effective manner. Some improvements come from years of hard work, doing the research and development necessary to go in a new direction. Other improvements come from having our eyes opened by observing how other fabricators go about their business.

Competition and non-collusion laws limit the opportunities to share best practices among bridge fabricators in the USA. However, I have learned that good ideas can be found in many unexpected places. Businesses that work with metal fabrication in other industries have figured out very efficient processes that we can apply to our business. Networking with other manufacturing professionals, and visiting other manufacturing facilities is always high on my priority list.

We have also had several opportunities to visit fabricators of steel bridges in other

countries. FHWA sponsored an international trip in 1999 which took a group of US steel bridge fabricators and DOT professionals to see bridge fabricators in Great Britain, Germany, Italy, and Japan. Earlier in 2009, Ficep Corporation, a manufacturer of machinery used by steel fabricators, organized a similar trip to fabricators in Great Britain and Italy. On our own, we have sought out plant visits in other countries as well, always happy to share our best practices with someone willing to share with us.

There are some very interesting differences between the approach to steel bridge fabrication in the US, Europe, and Asia. Compared to the US, they produce much shorter girders to be shipped to the job sites. Curved bridges are more likely to be constructed with straight girders segmented together in other countries. And field splices are preferred to be welded in some countries, which is contrary to the preferences of most steel bridge erectors in this country. Many of these differences can be traced back to physical constraints, like the road systems with more tight turns through small towns that are centuries old. Other differences

are probably just based on tradition. But in any event, the tools and processes used by men and women to build large heavy members out of steel are what we focus on, and we always come back with a few more good ideas.

I certainly hope we never run out of good ideas, and if we do, we will be back on the road again to see what else we can learn. That is how we intend to remain the leader in the fabrication of steel plate girders.



Jeffrey L. Sterner, P.E.
President
High Steel Structures Inc.



Steel – The “Green” Material Choice

by **Steve Bussanmas**, Senior Vice President of Sales & Marketing

I don't know about you but all this “Green” stuff gets a bit confusing to me. I guess we all have a carbon footprint, whatever that is, and we are going to be able to trade it or buy someone else's... I think. And we can all be LEED Certified if we score 40 points, which may not be a problem for LeBron James but it is for me. The bottom line is that I just didn't follow the “Green” movement all that close and, as you can tell, I'm no wiz kid on it today.

The one part of the “Green” movement that I have always understood was recycling. Anytime you can take a natural resource and recycle it, that extends its availability and holds down costs. Many products are able to be recycled, but steel is by far the leader. According to the Steel Recycling Institute, 64 percent of all steel products are recycled and that is more

than any other material in the U.S. including glass, paper, plastic and aluminum, combined.

Steel has been recycled for about 150 years in the United States. By recycling cars, washing machines and so forth we have saved landfill space and helped conserve this natural resource.

Some other interesting facts from the Steel Recycling Institute about steel:

- Steel recycling saves the energy equivalent of electrical power for about one-fifth of U.S. households (or about 18 million homes) for one year.
- Every ton of recycled steel saves 2,500 pounds of iron ore, 1,400 pounds of coal and 120 pounds of limestone.
- For steel produced under the Basic Oxygen Furnace method, 25% to 35%

recycled old steel is used to make new steel.

- For steel produced by Mini-Mills where the Electric Arc Furnace method is used, 100% of the new steel comes from recycled steel.

At High Steel, we not only recycle the scrap steel that is a by-product of our fabrication process; we also recycle the flux used in the submerged arc welding process and the shot from our blasting machine.

This brings us back to steel and its usage in bridge superstructures. The next time you list the attributes of steel versus the other popular material choice, add the “Green” factor.



East Side Story: High Steel Provides Steel for NYC's East Side Access

If you have ever tried to navigate the railroad system of Manhattan's East Side, you know how challenging it can be—especially at hectic rush hours each morning and evening.

Help is on the way with the MTA's East Side Access project that will connect Long Island Railroad's Main and Port Washington lines in Queens to a new LIRR terminal beneath Grand Central Terminal in Manhattan.

It's a huge task. According to the MTA East Side Access website, the project began in 2001 and is not scheduled for completion until 2015. The price is equally awesome, at an estimated cost of \$7.2 billion. The

impact of the project will be felt by an estimated 162,000 rail passengers each day.

"High Steel is providing 1,300 tons of steel for the tunnels near the terminal," says Rich Truxel, sales manager at High Steel Structures, noting that High Steel is working as a subcontractor for the joint venture of Dragados/Judlau.

When the East Side Access project is completed, the new connection will increase the Long Island Railroad's capacity into Manhattan, and dramatically shorten travel time for Long Island and eastern Queens commuters traveling to the east side of Manhattan.

In a joint venture with Dragados USA, Judlau is boring new tunnels under the East River from Queens to Grand Central Station.

"This is one of the largest tunneling undertakings in the last 50 years," reports Sean Pitzer, project manager for High Steel.

As Pitzer explains, the work that High Steel is doing relates to the column reframing for the support structures at the escalators in the vicinity beneath 45th to 48th Streets.

"The project has an aggressive delivery schedule, and it takes careful coordination to make sure everything goes smoothly with on-time delivery," says Pitzer. "This is definitely a different animal than typical plate girders."



Both Truxel and Pitzer are familiar with the railroad route. The direct service from the Long Island/Queens corridor into Grand Central Terminal will create a more streamlined travel

experience for thousands of passengers each day.

Above all, the reliability of train service will be dramatically improved, reducing the crowding on the subway lines that use Penn Station and the No. 7 line, as well as providing for a more balanced transportation system for New York City, reports MTA's website.

The toughest part of the massive undertaking is constructing new tunnels from the LIRR Mainline tracks in Queens, under Amtrak's Sunnyside Yard and LIRR's Existing Rail Yard, connecting to the existing 63rd Street Tunnel just beyond Northern Blvd. In Manhattan, new tunnels will be bored from the existing bellmouth structure at Second Avenue and 63rd Street, west and then south, under Park Avenue and Metro-North Railroad's four-track right of way.

Far more visible will be the sleek, new passenger concourse at Grand Central Terminal, which will be constructed in the space currently occupied by Metro-North's Madison Avenue Yard. Eight tracks and four wide platforms will be constructed, along with mezzanines and concourses, beneath Park Avenue at an elevation right below Grand Central's existing lower level.

To understand the magnitude of the project,

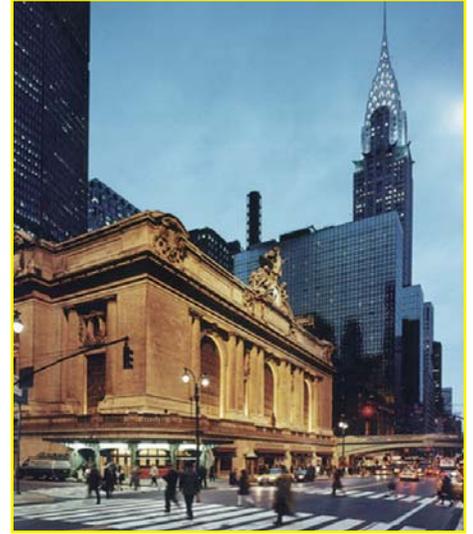


Photo courtesy of Patrick Cashin/MTA

the depth of the tunnels will total 140 feet, with 80 to 140 feet beneath Manhattan and 90 feet in Queens. A total of 60,000 tons of steel and 390,000 cubic yards of concrete will be used to construct the tunnels and terminal.

The new high-tech terminal will have a 60,000-square-foot mezzanine, with a 350,000-square-foot concourse, connected by 46 escalators and 13 elevators.

The East Side Access website reports that the project is being done by MTA Capital Construction, led by Dr. Michael Horodniceanu and Alan Paskoff, P.E. Program management is being done by



the URS Corporation. The Tri-Venture Team of Parsons Brinckerhoff, STV Incorporated and Parsons are serving as general engineering consultant on the project, while the Joint Venture Team of Jacobs Engineering Group, Inc., Edwards & Kelcey and LiRo Group is serving as Consultant for Construction Management Services. The lead federal agency on the East Side Access project is the Federal Transit Administration.



Employee Spotlight:

Bradley J. Dillman, Business Development and Design Manager

High Steel Expands Technical Design Services

Bradley J. Dillman, P.E. recently joined High Steel's Sales and Marketing team as Business Development and Design Manager. Brad comes from sister company High Concrete Group LLC where he was a Design Team Manager, managing and coordinating engineering teams in the design and detailing of structural and architectural precast concrete projects.

Previously, Brad was a Project Manager for Modjeski and Masters' Mechanicsburg, PA office. During his 13 years at M&M, he performed many duties including bridge analysis, design, detailing and project management.

In his new role at High Steel, Brad has teamed with Business Development Manager Tom Wandzilak to serve as a technical design resource for owners, contractors and designers. He is involved in managing Design-Build projects through the estimating and bidding process, including steel projects and traditional projects that are candidates for alternate or improved steel designs.

Brad has Bachelor of Science degrees in Civil Engineering and Architectural Engineering from Drexel University and a Master's Degree in Engineering Science from Penn State University.

He has also achieved the designation as a Professional Engineer in the state of Pennsylvania.

Brad and his wife, Anne, have five children, including two daughters, 10-year-old Théodora and new baby Etienne, and three sons, Conrad, 6, Keller, 5, and Lincoln, 3. In his free time, Brad enjoys playing sports with his kids and camping, hunting, fishing and running.



Tech Talk The High Tech Corner

The Right Steel Design Can Reduce Shipping Costs

By Ronnie Medlock, P.E., Vice President Technical Services

Be sure to consider shipping to achieve economy in your steel bridge. Members of typical steel bridges are inherently large, and oversize loads cannot be avoided, but there are important rules of thumb that can be considered to help achieve economy.

Shipping options include truck, rail, and barge, but costs vary significantly and

trucking usually offers the best economy. If you can keep to pieces that can be shipped by truck, you are probably providing the best opportunity for shipping flexibility and competitive costs.

Trucks offer the most flexibility simply because they can go the most places: just about any site that is accessible by road can handle a truck, and most certainly,

all bridge fabricators are readily able to load bridge pieces onto trucks. Conversely, not all fabricators have rail or water access.

For the best economy, try to stay within these limits in order for most competitive shipping:

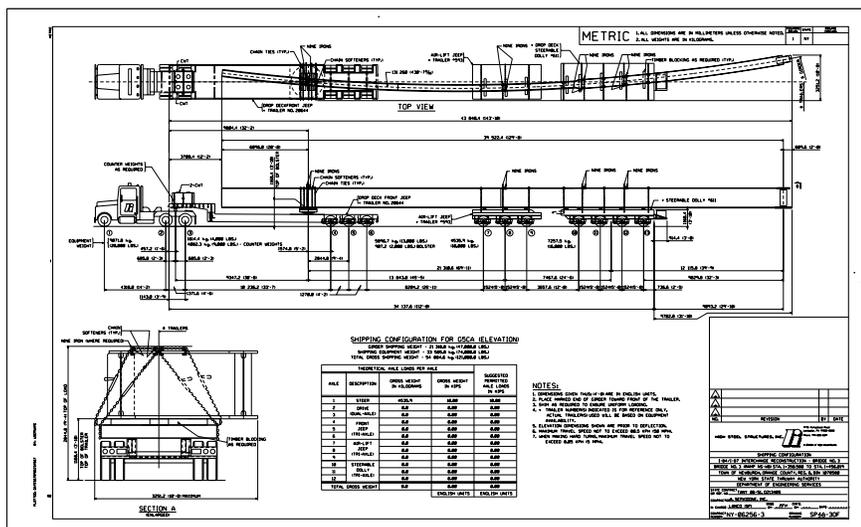
- Length: 125 feet
- Weight: 35 tons
- Height: 9 feet tall

Within these limits, your bridge parts can readily be delivered, but these are not the largest pieces that can be shipped by truck. The largest sizes are about as follows:

- Length: 165 feet
- Weight: 105 tons
- Height: 10.5 feet standing up, or 14 feet laying down

Again, these are not absolutes. Job proximity or member geometry can move these numbers one way or the other. For example, haunch girders with a maximum depth of 12 feet can be shipped standing up.

continued on page 5



Replacing the Historic Veterans Memorial Gay Street Bridge in Phoenixville

continued from page 1

to make sure every single piece of the bridge met tolerance requirements. An independent surveyor verified the measurements.

The fabricated steel was disassembled, painted in a deep bronze brown three-coat system, then shipped to Phoenixville, where it was reassembled at the site of the new bridge by High Steel's field operations group.

"What made everything work so well and go so smoothly was the upfront planning that Bill and his team did," says Richardson.

Indeed, the steel erection was completed a month ahead of schedule. The new bridge has the same alignment as the previous structure, offering two 12-foot wide travel lanes, two 6-foot wide shoulders, two 6-foot wide sidewalks and ornamental street lights to retain the historic feel of the bridge.

"It's quite a beautiful, striking looking bridge," notes Mankin, who was among High Steel representatives who joined PennDOT, Phoenixville, Nyleve and other officials at the Oct. 16 dedication ceremony.

It was a far cry from the situation the bridge faced in 2007, when, after 84 years, the structure had fallen into decline, with crumbling concrete. Declared unsafe, the massive bridge was closed. As an integral connector for the community of Phoenix-

ville, the only feasible option was to replace the entire structure.

Replacing the bridge was made even more challenging by the complexities of tearing down the old structure, piece by piece. As the old bridge fell one section at a time, the fascinating progression—or rather, digression—was captured on YouTube.

JMT, Inc. of Sparks, Md. and York, Pa. performed the preliminary engineering, environmental studies, final design and construction consultation services for the project.

According to High Steel's project manager Mike Kennedy, the first step was to build the sub-structure support system that consists of eight new reinforced concrete piers and two reinforced concrete abutments, followed by setting

new steel beams in place.

"The Gay Street Bridge has served Phoenixville's transportation needs for more than 80 years," said Lester C. Toaso, PennDOT's district executive for southeastern Pennsylvania, adding that the new bridge will continue to serve those needs with a safer structure.

The town of Phoenixville developed around the Phoenix Iron Company, the silk mill, and the Byrne Knitting Mill, growing steadily as immigrants were attracted by the work opportunities in industry. The heritage of hard work brought cultural institutions such as the Knights of Columbus, the St. Anna Italian Club and the Holy Trinity Church. The Gay Street Bridge is among the town's major landmarks, along with the Phoenix Hotel and West End Fire Company.

JUST THE FACTS:

Steel:	695 Tons of Steel
Project:	Gay Street/Route 113 Bridge Replacement Phoenixville, Pa.
Cost:	\$17,537,681
Owner:	Pennsylvania Department of Transportation (PennDOT)
General Contractor:	Nyleve Bridge Corporation, Emmaus, Pa.
Engineer/Designer:	Johnson, Mirmiran & Thompson, Inc., Sparks, Md.
Steel Fabrication:	High Steel Structures, Inc., Lancaster, Pa.

The Right Steel Design Can Reduce Shipping Costs *continued from page 4*

Permitting rules will impact shipping economy. Permits are not too costly, but rules about when oversize loads may be moved can cause headaches for your project. Some owners only allow shipping at night, while others require shipping by day. Further, many cities and bridge authorities also have their own special rules.

The maximum length that can be shipped by rail on one car is 89 feet, so rail may be suitable for shipping a large

number of smaller pieces, as in for a truss, particularly over greater distances. Above this length one or two idler cars may be required, depending upon clearances. At the top end of the spectrum, a dedicated train can be used, but there must be a great number of pieces to be shipped at a given time to make this an economical solution. One nice advantage of using rail: far less permitting fuss.

Curved girders add their own complications. Generally, the windows described

above will work, but some curved girders have special lateral balance-turning considerations that must be evaluated on a case by case basis. One key that is especially important on

curved girders: allow optional splices to be located by the fabricator to facilitate shipping.

While mixing transportation modes can offer benefits, often this is not the case. Moving pieces from one mode to another increases handling costs. For example, if rail is used to ship pieces near a project site and then trucks are used for the balance of the trip, the cost of moving pieces from rail to the truck will reduce the savings realized from using the rail.

Remember, at High Steel, we're always ready to help with advice about your project. For specific questions about shipping, visit our website, www.highsteel.com, and complete our **Shipping Advisor** form detailing the specifications for the structural members in your design. We will look over your details and alert you to any possible challenges, but keep the above rules in mind: they will get you started in the right direction.



In This Issue

Veterans Memorial Gay Street Bridge Page 1
Message from the President Page 2
Steel — The “Green” Material Choice Page 2
NYC’s East Side Access Page 3
Employee Spotlight: Bradley J. Dillman Page 4
Tech Talk: Shipping Costs Reduction Page 4
Recent Contracts Back Page

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Fast Answers to Your STEEL Questions

Please address comments to editor,
Lisa Fulginiti, at Lfulginiti@high.net

Recent Contracts Awarded

Six Mile Creek Bridge Erie County, PA Joseph B. Fay Co. 1,738 Tons	Route 60 / Chadakoin River Chatauqua, NY UCC Constructors 1,246 Tons
Dulles Corridor Metrorail Project Vienna, VA Dulles Transit Partners 1,531 Tons	MDSHA Emergency Contract Rt 90 / Assawoman Bay Ocean City, MD Covington Machine and Welding 84 Tons
I-87 / CR 10 and Schroon River Warren County, NY Tioga Construction Co., Inc. 1,307 Tons	MDOT Emergency Contract 9-Mile Road over I-75 Oakland, MI Walter Toebe Construction 343 Tons
NJ TPK Interchange 7A and Ramp TN over I-195 Mercer County, NJ IEW Construction Group 1,278 Tons	



**“Lay down a good weld
and give good measure”**

Sanford High 1931