High Steel News

Information from High Steel Structures, Inc.

Spring/Summer 2006

Bridge Project Completed Early!

High Steel Marks 75 Years with the Opening of the Arthur Ravenel, Jr. Bridge

This year marks 75 years that the High Companies have been in business. So it was a special occasion for High Steel when the massive Arthur Ravenel, Jr. Bridge, spanning the Cooper River in Charleston, South Carolina, was completed a year early and right on time for our anniversary.

Back when High Steel Structures started as the founding company, it was known as High Welding Company. Now, the completion of the Arthur Ravenel, Jr. Bridge marks the largest single project in our history. It is indeed a modern marvel, at 3.5 miles and eight lanes. The huge bridge was constructed with more than 24,000 tons of fabricated steel and a main span that is the longest cable-stay in North America at 1,750 feet.

The contractor for the Arthur Ravenel, Jr. Bridge was Palmetto Bridge Constructors, a joint venture of Tidewater Skanska, Inc., and Flatiron Constructors, Inc. Much to the delight and amazement of the South Carolina Department of Transportation and the local community, the immense bridge project was actually completed a year earlier than anticipated. The project was also unique in that it was a Design/Build project pitting different Contractor/Designer teams with different bridge solutions against each other. Palmetto s design partner was Parsons Brinkerhoff of New York City for this $632 million project.

From a fabrication standpoint this job posed several significant challenges:

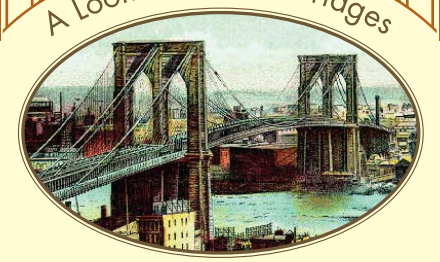
- Cable stay girders, which we call shark fins due to their distinctive shape, were designed for the bridge cables to pass through, then attaching to the deck and holding up the bridge. In fabricating these massive pieces, the bending of the web to the proper angle while maintaining the integrity of the bend was critical. This was important at both the bending phase and the shipping phase. This was monitored by using digital protractors to assure the correct degrees of angle.
- The fitting, or the alignment of, the pipe assemblies to the cable stay girder webs was the next critical operation. We used a combination of techniques including lasers to accomplish this task.
- Tower box girders became girders that were actually made a part of the 575 foot tall concrete diamond shaped towers. Each would hold two cables that extended down to the bridge deck, holding up the bridge. Each tower box girder was unique with a different angle as they progressed down the tower. Fabrication of these was the most difficult task we faced. The bearing assemblies inside the boxes had compound angles and mill to bear conditions. We used a laser system to align the bearing assemblies to meet the "work points" as detailed. We also used the digital protractors to monitor and assure that the proper angles were maintained. After welding was completed, we then had to align the pipe assemblies that attached to the tower box and protruded through the concrete towers. Placement, alignment and attachment to the tower boxes was critical.

- A logistical challenge was created due to a requirement by SCDOT that the prime coat of paint (part of a three coat system) cure for 60 days. Completed girders consumed a large chunk of real estate where they idled until the second and third coats could be applied.

The Arthur Ravenel, Jr. Bridge opened to the public on July 16, 2005, connecting Charleston to Mt. Pleasant, South Carolina, along Highway 17. It will be a community landmark for decades to come and High Steel is proud to have been a participant in the project.

Bridging the Gap

A Look at Famous Bridges



"Hey, buddy, wanna buy the Brooklyn Bridge?"

That used to be an old expression about how gullible some people could be when they visited New York City and got swindled by a fast-talking salesman. Nowadays, of course, no one would get tricked by that old line. But it has made the Brooklyn Bridge one of the most famous bridges in the world.

The Brooklyn Bridge is located on the East River of New York City, connecting Park Row, Manhattan to Adams Street, Brooklyn, and features dramatic buttressed gothic style granite towers. Designed by architects John A. and Washington Roebling, the 272-foot high and 6,016-foot long bridge was completed in 1883 and remains as a cultural icon and landmark.

The roadway platform is hung on two-inch diameter steel suspenders strung from two pairs of cables that are 16 inches in diameter. Each cable is composed of 5,296 galvanized steel wires, at a total length of 14,357 miles. Each of the four cables is capable of sustaining a load of 12,000 tons!

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

The Drive to Find a Better Way

The automobile industry sure seems to get a lot of bad press. Maybe that industry is just so large that it's easy for anyone to find something to criticize. Perhaps it's because we all have the common experience of reaching deep into our wallets for those new car purchases, which for most of us are second only to our homes in value. But I find something admirable about the automobile industry as well, especially when I consider the last 25 years or so. Today's cars are simply better than they used to be, in regard to both reliability and amenities, yet the prices have not gone up as fast as the rate of inflation.

How did they do that? Every customer of every product in the world is clamoring for that kind of trend. "Make it better, but keep the cost down." The answer is undoubtedly complex, but much of the credit is generally attributed to a new approach to manufacturing that was pioneered by Toyota. Lean manufacturing principles were developed by this Japanese company, because they had to learn to compete during a time when they did not have the resources that their competitors did. The big three American auto makers had to turn to the same principles because foreign competitors had become more nimble and efficient, and were taking their market share away from them. Each of these companies had a "burning platform" that forced them to think differently.

High Steel Structures experienced its own burning platform a couple of years ago. The perfect storm was created when our nation seemed unable to agree on a new highway funding bill for over two years, while at the same time an unprecedented spike in the cost of steel turned the industry on its head. Motivated by necessity, High Steel Structures set out to begin our own lean journey.

We are still just infants along this new journey, but the drive for continuous improvement helps us to see things more clearly. Nothing is taken for granted any more. We enjoy the process of challenging the way we do our own business again and again. And as we begin to peel away the old baggage, we get a clearer view of how traditional industry-wide paradigms and practices are adding waste (and therefore cost) in the bridge industry.

The automobile industry is driven by the customer, or consumer. These consumers are demanding, but they are also ever changing. The speed at which the car consumer can change their demands forces the automobile industry to become nimble as well. In fact, the big three American automobile makers continue to suffer because they are not as nimble as their Japanese counterparts. The customers of the bridge industry are also demanding, but they are not very nimble. In fact, the state bureaucracies that represent our ultimate consumers are painfully slow to change. That is no reflection on the professionals that work in the DOTs, rather a commentary on the processes that have become entrenched in the institutions of public service.

As an industry, we need to find a new paradigm for our processes. How can we take the waste out of this system so we can deliver products faster, better, and cheaper? In the current system, it can take months or even years after an order to deliver a single girder, but it rarely takes more than a week for the actual construction of that girder in our plant. However, our processes of design, material procurement, detailing, submittals, approvals, and inspections fill in the rest of the time. Is this what the public demands? Here is where we have to challenge the current system. The public demands quality. They expect us to produce bridges that are safe and built to last. The processes that exist today were created by public servants, a long time ago, as their methodology to deliver the quality demanded by the public. Is there a better way? I don t have all of the answers, but I do have confidence and optimism that there is a better way. We just need to work together to develop it.

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

People Make the Company: In Memory of **Dave Ross**

High Steel recently lost one of its best when Dave Ross was tragically killed in a non-work related accident.

Many of our customers and business partners came to know Dave over his 35 years at High Steel. Dave began by working part time while going to college at Shippensburg University in the early 1970s. He was a powerfully built young man, which landed him on the assembly and reaming line. He liked the company so much that he went on full time and joined the iron working crew. He later served as a supervisor for Field Operations erecting steel bridges for nearly 20 years.

By 1988 Dave obtained his Project Management Certification from Penn State University and joined that department managing various projects from New England to Virginia in the south and to Ohio in the west. His iron worker background helped him understand what the contractors were facing when field problems arose. Dave was adept at guiding field personnel through problems, many times without even visiting the site.

In 2005 Dave went back to his roots in Field Operations, taking over the position of Coordinator of Field Operations Planning and Estimating.

Like many others in this industry, there were many bridges that Dave crossed or drove under and said "I helped build that one." In that respect, his mark will live on.

People make a company what it is and in so many ways, Dave Ross made High Steel a very good company. Those of you who dealt with Dave, either as a Project Manager or in Field Operations, knew him to be knowledgeable, helpful and efficient. He will be missed by everyone who knew him.

Dave is survived by his wife, Wendy, and daughters Heather and Corrine, as well as five grandchildren. We send our sympathy to his family and will remember him always.

Taking a Lesson from History

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

If you were around in 1997, you will remember the surge in road and bridge construction that followed the passage of the Transportation Bill that was known as TEA-21. A flurry of projects rolled forward as State DOTs and other owners took advantage of increased federal funds to fix or replace their most deteriorated infrastructure.

The steel bridge fabrication industry at that time was coming off many years of consolidation that saw capacity at a very low point, matching the pre-1997 volume needed. When the boom hit, our industry was not prepared for that volume of structural steel orders. Delivery times for a normal size job doubled from 5-6 months to 10-12 months as a result.

It took about a year for the steel fabrication industry to expand capacity and adjust to the new environment. Plant additions were made, new machinery purchased and new employees added in order to bring delivery times back to the acceptable range.

Why the history lesson? Well, what may seem to be a similar situation exists today. At the end of TEA-21, a new replacement bill was not passed in a timely fashion. During the ensuing two years, funding was inconsistent which forced owners to cancel or delay projects. The volume of fabricated bridge steel dropped and that forced the industry to once again idle the capacity that had been needed earlier. It wasn't until mid-year of 2005 that the new Transportation Bill, TEA-LU, was finally passed.

If owners once again rush to catch up to deteriorating infrastructure needs, will the steel industry be able to respond?

The answer is yes. The capacity is there to return to late 90s and early 2000s volumes. Some time will be necessary to hire and train new employees, but the industry is not starting from ground zero this time around. The capacity has been idled, but it still exists.

The bottom line is that there may be a bump or two in the road, if the industry is asked to expand, but we welcome that challenge!

"So, What's Fabricated Steel Going For?"

by **Tom Wandzilak,** Technical Marketing Manager

At High Steel, we are contacted frequently by designers and owners asking that question. It's a loaded question, but an important one. Since raw plate steel prices spiked in early 2004, there is a strong desire to understand the pricing trends.

This article addresses generalities, but if you would like a budget price on a particular project you are working on, go to our website www.highsteel.com and click on the "Project Pricing" button. That will take you to a form to fill out the pertinent data on your project. We will try to respond with a budget price within 48 hours.

As we discuss fabricated steel budget pricing, it will be based on a price per pound. One disclaimer we must make is that pricing per pound can vary widely due to several variables, so remember that there is no "rule of thumb" answer. A design with light steel members can have a very high price per pound, where a very large heavy steel member may have a comparatively low cost per pound. The types of welds (fillet or full penetration), coatings (weathering steel, 3 coat paint, galvanized) and girder type (I-girder, tub, haunch, etc.) can all affect the price per pound significantly.

So what is fabricated steel going for? In early 2004, raw plate steel prices increased dramatically, almost doubling in a six month period. Since approximately 35% of the total cost of fabricated steel is in this raw material, the overall cost only increased about 20 to 25 cents per pound. Since then, plate prices have stabilized allowing the steel fabrication industry to recover. Other raw materials have also stabilized, transportation has increased moderately, but margins have been held in check due to excess capacity within the fabrication industry. In other words, what was a $1.00 per pound, prior to the raw material cost increase in 2004, is now about $1.25 to $1.30 per pound. These prices include the delivery of the finished product to the job site. An additional price to erect the steel should be obtained to get an "in place" price if needed.

A few examples of recently bid projects are shown to demonstrate current market pricing:

- **Fayette County, PA**
  PA Turnpike's Mon-Fayette Expressway, S.R. 43 (51B), Structures MF 152 and 153 used 1,670 tons of Grade 50W weathering steel. Steel pricing came in at $1.28 per pound including the erection. MF 154 and 155 used 2,019 tons of Grade 50W and prices came in at $1.30 per pound, also including the erection. Swank Associated, Co. is the general contractor.
- **Westchester County, NY**
  NYS DOTs Ramp X on SB Taconic State Parkway. Ramp used 205 tons of uncoated Grade 50W weathering steel. Steel pricing at $1.16 per pound, not including the erection. CCA Civil, Inc. / Halmar International LLC Joint Venture is the general contractor.

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Recent Contracts Awarded

Tappan Zee Bridge
New York, New York
Contractor: Perini/Tudor-Saliba
8017 Tons

Rte. 43 over
Fan Hollow Road
Fayette County, Pennsylvania
Contractor: Swank Associated Co.
3689 Tons

Maryland 201 over
Maryland 965
Prince George's County, Maryland
Contractor:
Concrete General, Inc.
1127 Tons

Interstate 287
Westchester County, New York
Contractor: Yonkers Contracting
2231 Tons

State Route 48, Section A16
Allegheny County, Pennsylvania
Contractor:
Brayman Construction Co.
1557 Tons

State Route 219
McKean County, Pennsylvania
Contractor:
Mascaro Construction
1772 Tons

Ramp "B" over I-95/I-495
Prince George's County, Maryland
Contractor: G.A. & F.C. Wagman
890 Tons

HIGH STEEL STRUCTURES, INC.
A Division of High Industries, Inc.

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(717) 299-5211 ■ Fax (717) 399-4102 ■ www.highsteel.com
Additional plant location: Williamsport, PA

For the best practices in steel bridge design, visit the **AASHTO/NSBA Collaborative** on line at **www.steelbridge.org**

Public and Private individuals working together to improve the quality and value of steel bridges.

Celebrating 75 Years
THE HIGH COMPANIES
Since 1931

Tech Talk

The Latest Coatings Technology

Tom Calzone, Director of Bridge Sales, Carboline Corporation

(First in a series on "Coatings")

Design life expectations for new steel bridges have become more ambitious.

Today 70 and even 100 year plans are proposed regularly now. I am often asked how long will the coating system protect with what we know today. This question comes with a preconception that maintenance painting will involve abrasive blasting of toxic material and repainting at high cost. Indeed, this is common practice for bridges that are in need of painting today.

Lead based paint performed fairly well in many environments for years. The upgrade from lead to inorganic zinc primers began in the 1960s, coincidentally with the exploding use of de-icing salt. High salt usage took a toll on structural concrete and steel. Salt is the bane of lead based paint, but inorganic zinc is virtually immune to salt. This feature was so obvious to engineers of the time that zinc primers rapidly improved DOT specifications across the country. Nevertheless, even today thousands of bridges are coated with lead based paint older than 30 years and these are the ones giving the wrong impression about steel bridge maintenance. After all, lead is toxic, zinc is a vitamin supplement.

Historically, lead-based formulations were required by specification to perform in the 1,000 hour salt fog exposure with some corrosion allowed. Today inorganic zinc must perform in the same salt fog for 5,000 hours, with no corrosion allowed on the scribed panel per AASHTO M 300.

As expectations increase for the life expectancy of coatings, technologies will most likely utilize inorganic zinc for its capabilities to resist salt and corrosion.

"So, What's Fabricated Steel Going For?"

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- **Middlesex County, NJ**
  NJ DOT Route 1 & 9 Ramp C over Rahway River project. Ramp used 301 tons of Grade 50 steel with a three-coat paint system. Steel girders were curved on skewed sub structures and used lateral bracing in exterior bays. Steel price was $1.42 per pound. Union Paving & Construction Co., Inc. is the general contractor.
- **Prince George's County, MD**
  MD State Highway Administration's MD 201 over MD 965 bridge replacement project. Bridges used 1,127 tons of Grade 50W weathering steel that was partially coated. Project involves phased construction that requires additional mobilizations for setting the steel. Erected steel prices came in at $1.49 per pound. Concrete General, Inc. is the general contractor.

You can see from these recently bid projects that the price for fabricated bridge steel has increased only marginally since 2004. The most accurate way to determine the current market price for fabricated steel is to contact a fabricator.
Check us out on our web site: www.highsteel.com.