HIGH Steel News

Information from High Steel Structures Inc.

Winter 2007

Baltimore Interchange Congestion to Be Eased with Express Toll Lanes

Anyone who has traveled the I-95/I-695 interchange northeast of Baltimore knows how complicated, confusing and congested it can be to travel this area.

In fact, many rate the Baltimore bottleneck as one of the most challenging in the East Coast. With mind-boggling left lane exits and entrances that have a braided effect, the high speeds and sudden lane switches give white-knuckle driving a whole new meaning.

Construction has begun on a new $450 million solution to this hectic interchange. The Maryland Transportation Authority is in the process of a four-year project to revamp the ramps and create two full directional interchanges— one an express toll lane and the other for general purpose traffic. The express toll interchange would essentially be "nested" within the general purpose interchange, with the two eventually replacing the existing interchange.

In other words, travelers will have the choice to pay tolls for the less traveled road or to use the toll-free interchange. The new design will give drivers options and help to relieve congestion on both the toll-free and toll interchanges.

According to Jack Moeller, project manager for engineer Johnson, Mirmiran & Thompson (JMT) of Sparks, Md., the new design will have all entries and exits on the right, which is what drivers expect on an interstate highway. Direct connection ramps will continue to be used, rather than loops, because there is limited right-of-way.

The interchange project will be done in two phases. The $208 million Phase I began in January 2007 and will take more than two years to complete. Design of the Phase II portion of the project is nearly completed and will go out for bid in 2008.

Phase I is being done through a joint venture that includes G.A. & F.C. Wagman Inc. of York, Pa.; Corman Construction Inc. of Annapolis Junction, Md.; and McLean Contracting Co. of Glen Burnie, Md.

High Steel Structures Inc. is working with the contractor team in erecting four flyover ramps and two straight bridges for the project. According to Director of Field Operations Bob Urban, the biggest challenge of all is in keeping existing traffic flowing through the area while the interchanges are under construction.

On such a highly traveled roadway, the Maryland Transportation Authority needed to keep as many lanes open as possible. Yet,

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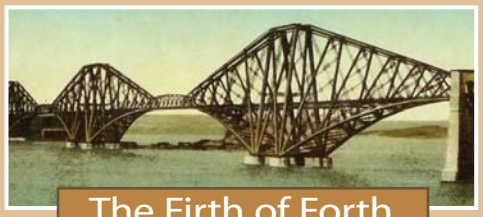
Bridging the Gap

A Look at Famous Bridges



The Firth of Forth

Scotland

Rising out of the water like a colossal sea monster, the Firth of Forth railroad bridge spans nearly a mile and half. It opened in March 1890 after seven years of work by some 5,000 workers. Many believe it to be the strongest bridge ever built. Indeed, its sturdy cantilever-truss construction was purposely overbuilt to prevent a disaster like the collapse of the Firth of Tay bridge when 75 train passengers died. The rail bridge cost £3.5 million and was constructed of 51,000 tons of steel and 5 million rivets. The nearby road bridge was built in 1964, took six years to build, used 39,000 tons of steel and cost £20 million.

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

Steel Erections Lessons Learned

Dale High has told me that High Steel Structures used to erect almost all of the bridge steel it fabricated. Today things have changed. We still love to erect bridge steel, but more contractors either have their own small crews of ironworkers, or are motivated to use erectors with DBE or WBE designations. Sometimes it seems like we just get the difficult erection jobs today. That's okay too. We are very proud of our erection capabilities, and we appreciate all of our customers for the business they send our way.

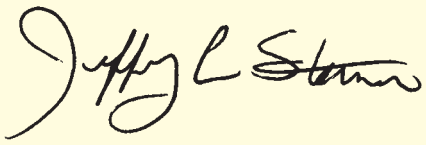
Our field operations know-how also comes in handy when other erectors get into trouble setting steel that we fabricated. We occasionally get those phone calls from a job site that say, "There must be something wrong with the way you fabricated this steel because it's not going together right." We take extraordinary care in our manufacturing operations to make sure that our steel always fits, so that's not what we expect to hear. We also know from our own experience the mistakes that can get an erector into trouble. As you can imagine, lots of the problems can be traced back to an erector that is trying to get all of the main member pieces in the air quickly, and is not taking the time to ensure the basics along the way. Here are a few of the most common mistakes we see:

Maintaining proper splice elevations is critical, and if the erector doesn't take the time to verify that each splice is where it's supposed to be before tightening bolts and unhooking the piece; problems are going to develop down the line. It's not just about making that next connection. It's about making it right!

Curved or skewed bridges present unique problems due to the rolling of girders that takes place during deflection. A straight bridge can often be erected without all of the secondary members in place because everything will deflect uniformly. Not so with curved and skewed bridges, and trying to make a connection on a cross frame that was skipped over in the interest of time can be a major undertaking.

Most of our customers are experienced in the construction of bridges, and these issues are clearly understood by them. However, judging from the calls we get about problems on some jobs sites, not everyone is as familiar with bridge erection as we think they should be.

Make sure your erector has the right experience to perform on your project. And keep us in mind. We love to erect our steel because we know it's the best product you can buy in the industry!



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

The Aftermath of the I-35 Bridge Collapse

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

The August 1, 2007 collapse of the Interstate 35W Bridge in Minneapolis was more than a tragic accident that cost 13 people their lives. It was an event that brought clearly into focus the poor condition of many of our nation's bridges.

Suddenly the average guy on the street had a heightened awareness of the terms, "structurally deficient" and "functionally obsolete." State DOTs scrambled to identify any bridges in their inventory of similar design to the I-35W bridge and rushed to get them inspected, followed soon by inspections of their structurally deficient bridges. The outcome of this rush of activity was to identify some bridges that needed immediate attention, for which action plans were executed. For the most part, the release of inspection information calmed the public's fears of another eminent catastrophic collapse of a major bridge.

The short-term calming effect of inspections did not, however, dim the bright light that shone on our nation's infrastructure weaknesses. A large percentage of our bridges are more than 50 years old and at the end of their designed life. Funding has not kept up with the needs to repair or replace these aging bridges. Suddenly our political representatives were voicing their displeasure with the current state and promising to do something about it!

Senator Amy Klobuchar (D-MN) went so far as to say, "A bridge in America just shouldn't fall down – and when one does fall down, we must rebuild it." This momentum led Representative James Oberstar (D-MN), head of the powerful House Transportation Committee, to propose a temporary 5-cent per gallon gas tax to raise $25 billion for rebuilding and repairing structurally deficient bridges.

This all happened in the immediate weeks following the August 1 collapse. Fast forward to today. President Bush objected to the Oberstar bill saying a tax increase was not needed, "We just need to spend the money more wisely and stop the practice of earmarking the transportation bill." With the pressures applied, Oberstar has repackaged his bill, lowering it to $2 billion to be spent over the next two years on the neediest of bridge projects.

As is always the case, the American public has moved on, and the fear of another collapse has dulled. The topic of fixing our bridges is no longer front-page news. With gas prices skyrocketing, the politicians don't have the stomach to raise taxes to fix the problem. In other words, it looks like the next transportation bill will be a repeat of its predecessors, and all the while those bridges will get older and older.

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Industry Spotlight: Building, Heavy Construction and Fabrication

Rich Truxel

Although High Steel Structures Inc. has long been known as one of the leading fabricators of complex bridge components, "we are more than just bridges," says Rich Truxel, Sales Manager for High Steel.

Rich joined High Steel in June of 2007 and since then, he has moved quickly to make sure that potential customers know that High Steel's capabilities go far beyond bridge components.

Now that High Steel has diversified its operations to support pre-engineered building manufacturers, Rich is developing new business in wide clear span

frames, complex truss systems, box columns, crane steel and other projects.

By focusing attention on construction and general fabrication, High Steel can take advantage of high-rise construction in cities like New York City, Boston and Philadelphia, where there is growth in rebuilding and new construction. The Company's large, highly skilled work force, combined with nearly unlimited crane capacity, makes it a unique partner in the construction sector.

"By assisting metal building systems manufacturers, structural steel fabricators, and erectors with large projects they might not otherwise pursue, or would have to produce off-line, we are helping to reduce the cost and increase the market potential of steel building components," explains Rich. "We have participated in a number of interesting projects this year, including heavy framing members for indoor athletic centers, box girders and frames for airport hangers, complex girders for stadiums, and heavy plate girders for high rises."

It is an important responsibility for Rich, who recently moved to the Lancaster area from Conshohocken, near Philadelphia, with his wife, Karen. Rich has more than 15 years of sales and marketing experience in the steel industry. He was previously employed as Regional Sales Manager with AST-USA, a European-based specialty steel producer, and as a sales representative with J&L Specialty Steel and National Steel Corporation.

Tech Talk The High Tech Corner

(Final chapter of a four part series.)

CHAPTER FOUR: Complex Fabrication

by **Bob Cisneros,** P.E., Chief Engineer

Load & Resistance Factor Design (LRFD) is intended to promote uniform reliability in our nation's bridges. Furthermore, while existing structures (those designed, rehabilitated & re-rated under SLD/LFD) remain in service, LRFR (Rating) should enhance uniformity therein as well. Therefore, we as a bridge-building community, especially bridge designers and owners, will bear a responsibility to ask ourselves two important questions before employing complex components or fabrication processes on a given project:

1. Is a particular bridge that I'm working on sufficiently important that it warrants extra complexity, relative to typical structures of its class in our nation's inventory?
2. Do the specialized components, features and processes that I may be specifying for a particular structure, promote LRFD/LRFR as described above?

If, as in the case of a signature bridge or when pioneering a new bridge type, the answer to question 1 is "yes", then the design may proceed with stakeholders' eyes open at the outset (i.e., understanding that this may add some cost). Otherwise, due consideration may be warranted before specifying high-end (sometimes costly) design/inspection criteria, such as the following:

a) Complex machined-fit surfaces ("clockwork" assemblies)

b) 100% reamed shop assembly (vs. girder line assembly, or CNC-FSH partial check-fit)

c) Numerous flange thickness transitions within a field section; note that minor web thickness transitions at field splices can result in unwieldy, flimsy web splice fill plates

d) Multi- directional CJP (CPGW) weldment assemblies (when fillet-welds can suffice at stiffeners), which may necessitate costly post-fabrication (oven, etc) stress-relief

e) Large fascia overhangs (exceeding 5 feet), especially for low-profile girders (non-standard overhang formwork, possible web distortion issues during deck placement)

f) Complex bracing/crossframe/diaphragm sub-assemblies (double-shear connection plates, milled-to-bear connections to girders, multi-fill plates, etc)

g) Redundant protection (coating) systems; usually painted weathering steel is sufficient. Galvanization plus paint, if desired for aesthetics, may force a fabricator to galvanize sub-

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CHAPTER FOUR: Complex Fabrication

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assemblies prior to painting operations, adding schedule time, handling cost & limiting paint access of certain tight, internal components in the final assembly. Metalizing ("spray welding") similarly adds noteworthy durability, but at a cost.

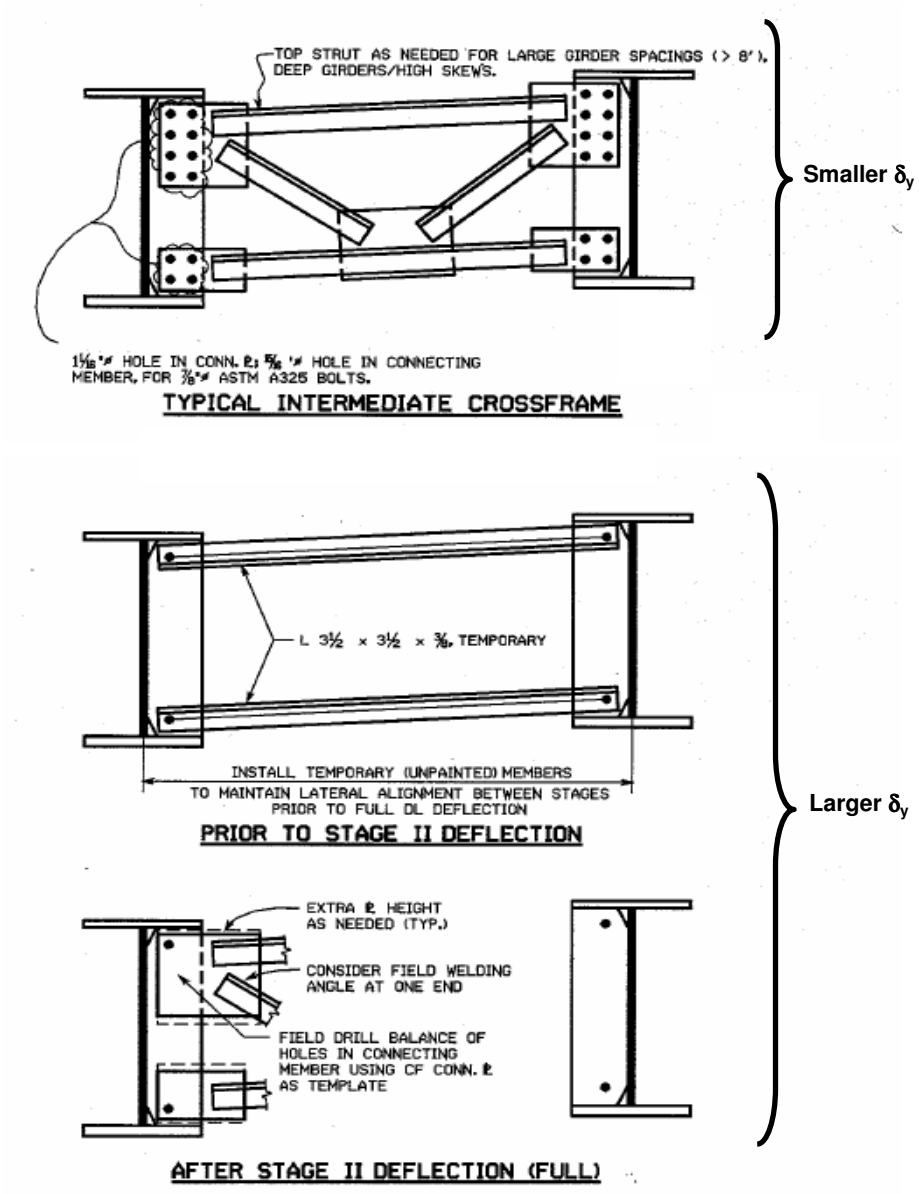
h) Innovative hybrids such as HPS 100W/50W, 100W/70W on otherwise routine structures. The 50W web, 50W compression flange and 70W tension flange hybrid has proven generally efficient, for deflection (not flexural strength) tends to control section requirements on longer spans. Pure 50W, 70W or 100W seem to be efficient in axial applications such as arch tension ties.

i) Staged construction bridges can exhibit significant DL deflections and significant constructive effort to achieve fit. Rather than complex differential deflection analysis, for a routine multi-girder structure it may be more practical to simply leave closure bay "open" through 2nd phase deck cure (pre-closure pour). The details shown to the right temporarily create two parallel structures, facilitating closure-pour bay field fit-up.

Complexity may be warranted if a municipality desires a truly signature gateway to enhance a congested area, one example being the three-rib, vierendeel-braced, aesthetic arch span presented on our website (www.highsteel.com/contactus/newsroom/freeinfo). Traffic flows demanded staged construction of the structural system; items a, b, d, f, g & i were justifiable for this particular project. If you're unsure whether to build in complexity, inquire with fabricators or the NSBA (www.steelbridges.org) for brief review of tricky connections that can be made more fabrication-friendly. Fabricator/erector input can simplify long-span curved girder systems, arch/truss/suspension type structures, SPUIs, etc.

STAGED CONSTRUCTION RECOMMENDED DETAILS

WHEN RELATIVE DEFLECTION BETWEEN STAGES EXCEEDS FEASIBLE ROTATION OF SECONDARY MEMBER USING OVERSIZE HOLES IN CONN. PLATE.



The Aftermath of the I-35 Bridge Collapse

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Before we leave the subject of the I-35W bridge collapse, let's look briefly at the replacement structure. On October 8, 2007, the Minnesota DOT awarded the I-35W replacement bridge contract to the team of Flatiron-Manson. Their segmental concrete design cost $57 million more than the lowest cost steel structure design and will be completed 70 days later.

First, in the interest of full disclosure, we bid on the structural steel to the contractor team that came in second, McCrossan/Kraemer. So you may discount these comments as just sour grapes, but how can we as the Transportation Industry, which includes the Departments of Transportation, continually ask the public for more money via gas tax increases, tolls, etc. then spend their money foolishly? How many additional structurally deficient bridges could have been repaired or replaced with $57 million? We will never know.

Baltimore Interstate Congestion to Be Eased with Express Toll Lanes

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A 70-ton integral pier cap is loaded on special equipment for shipping to the job site.

some of the ramps are as high as 100 to 110 feet, which means that High Steel Structures has been erecting bents at mid-span to support the ramps. Certain parts of the erection process have been coordinated so that they are done at lower traffic periods, such as 9 p.m. Saturday through 9 a.m. on Sunday.

"And one of the biggest challenges is storage," added Urban. "It is complicated to figure out where to store the steel and equipment with limited space."

The project required 16,524 tons of steel, all fabricated at the High Steel Structures plant in Lancaster, Pa., then transported and erected in Maryland. The High Steel Structures erection crew consists of 20 persons on site, under the direction of Superintendent Don Hurst. Six cranes are being used on the project, ranging from 60 to 300 tons in capacity.

The entire design calls for 22 bridges, including seven 300-feet-wide steel plate flyovers that are up to 280 feet long. Approximately 110,000 linear feet of steel pilings as deep as 40 feet will support concrete abutments and piers that tower as high as 100 feet. That makes safety during construction and after construction a high priority— for the traveling public and for those constructing the interchanges. Six foot tall concrete barriers will provide protection for drivers as they navigate the high ramps and will obstruct the view for those who would rather not see just how high they are.

When it is done, the new I-95/I-695 Interchange is expected to provide relief for the increasing congestion on that busy 10-mile stretch. Modeled on successful congestion management projects in San Diego, Ca.; Houston, Texas; Lee County, Fla.; and Ontario, Canada, the Express Toll Lanes will give drivers a choice when they need to travel the area as quickly as possible and make commuting easier for everyone.

The toll system will be so advanced that there will not be toll booths to slow things down. Tolls will be collected automatically through E-ZPass as drivers pass through the overhead electronic toll collection areas. Toll rates will be adjusted for peak travel times during the day and night.

It is estimated that by 2025, the interchange will be handling some 450,000 vehicles each day! By planning ahead, the Maryland Transportation Authority hopes to ease the congestion with more than 66,000 drivers opting to use the toll lanes.

"Everyone at High Steel Structures is pleased to be a part of this exciting project," said Urban. "Many of us drive this area regularly and will personally benefit from the relief of traffic congestion."

The same pier cap is erected using a 300-ton Manitowoc Crawler crane.

JUST THE FACTS:

- 16,524 Tons of Steel
- I-95/I-695 Interchange Phase I
- $208 Million
- Owner: Maryland Transportation Authority
- Engineer: Johnson, Mirmiran & Thompson (JMT), Sparks, Md.
- Joint Venture: G.A. & F.C. Wagman, York, Pa.; Corman Construction Inc., Annapolis Junction, Md. and McLean Contracting Co., Glen Burnie, Md.
- Steel Fabrication and Erection: High Steel Structures Inc., Lancaster, Pa.

Recent Contracts Awarded

Bennington Bypass, Northern Segment NH 019-1(53) Furnace Brook Bridge, East Road Bridge, Ramp G
Bennington, VT
J.A. McDonald, Inc.
1219 Tons

Route 9W Bridge over Twaalfskill
Ulster County, NY
Harrison & Burrowes Bridge Construction
928 Tons

Exit 1 SB Ramp Bridges over I-93 NB and SB and Rehab of Ramp Bridges over S. Policy Street
Hillsborough, NH
SPS New England, Inc.
818 Tons

New Bridge over Ballston Creek
Round Lake, NY
Rifenburg Construction, Inc.
683 Tons

Crane Columns and Girders
Butler Heavy Structures
602 Tons

Columbus Center Deck and Tunnel Project
Boston, MA
Cives Steel Company
348 Tons

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"Lay down a good weld and give good measure"

Sanford High 1931

The High Philosophy.

Every company dreams its dreams and sets its standards.
These are ours...

We are committed to two great tasks:

BUILDING TRUST WORTHY RELATIONSHIPS

- Valuing our customers and meeting their needs.
- Respecting the dignity of all co-workers and their families.
- Energizing our teamwork with participative management.
- Recognizing and rewarding the accomplishments of our co-workers.
- Strengthening our partnership with suppliers.
- Contributing to a world of beauty and prosperity and peace.

BEING INNOVATIVE LEADERS

- Creating an environment for innovation since 1931.
- "Right the first time"— High quality products and services.
- Investing profits to secure our future.