

LESSONS LEARNED:

CONSTRUCTION ENGINEERING SERVICES

OBSERVATIONS AND LESSONS FROM THE SCHOOL OF EXPERIENCE

STRUCTURAL STEEL - NON-DESTRUCTIVE TESTING & INSPECTION

As structural steel ("red iron") and framing designs evolve toward lighter, stronger, more cost-effective structures, the importance of structural steel inspection becomes even greater. Most governmental agencies are now requiring independent inspection of both shop and field welded and bolted connections prior to issuance of a certificate of occupancy. In addition to visual inspection and non-destructive testing of fabricated materials, these code-driven Special Inspection requirements also include the review of the fabricator's (aka, shop) quality control procedures. The following paragraphs are offered for your consideration:

The Code: The vast majority of specifications require that welded connections comply with the American Welding Society's AWS D1.1, Structural Welding Code - Steel. The International Building Code (IBC) require that your inspectors know the requirements of AWS code, be familiar with the welding process being used, and be certified to perform the testing and inspections. (Note: Certification includes a visual acuity exam every three years.) **Always request copies of the welding inspector's credentials.**

The Bible: The American Institute of Steel Construction (AISC) publishes the Manual of Steel Construction. This manual is a compilation of several specifications governing the design, fabrication, erection and inspection of structural steel. It incorporates the requirements of AWS D1.1 (welded connections) and includes ANSI/AISC 360, (Specification for Structural Steel Buildings), along with the Research Council on Structural Connection's (RCSC) Specification for Structural Joints Using High-Strength Bolts. In recent years both AISC 360 and RCSC's specification for bolted connections have undergone significant revisions to better define the fabricator's, erector's and the inspector's roles and responsibilities. This manual is the inspector's bible, and he/she should be using it as a primary reference for the inspection of your steel framing.

The Key: Successful structural steel inspection programs require the early involvement of all parties. The structural engineer, erector, general contractor, steel fabricator, and independent testing agency should **meet prior to the start of work** to discuss erection and inspection requirements, and to clarify questions about the plans and specifications. Inspections during the fabrication and erection process can help identify problems before they become schedule stoppers and/or rework items.

Here are some suggestions from our "**Lessons Learned**" experience for your next steel project:

- Begin early! Identify the Special Inspection requirements before construction begins.
- Shop inspections can reduce and/or prevent delays during construction.
- Site inspections can avoid incomplete, non-compliant welded and bolted connections.
- The greater the inspection frequency, the less chance that a non-compliant connection becomes part of the completed work. (It's about "getting what you pay for")
- **Effective communication and coordination are essential.**

We hope these "**Lessons Learned**" will be helpful to you in your next new construction, renovation, or repair project.

Respectfully,

ECS Corporate Services, LLC

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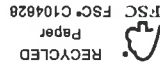
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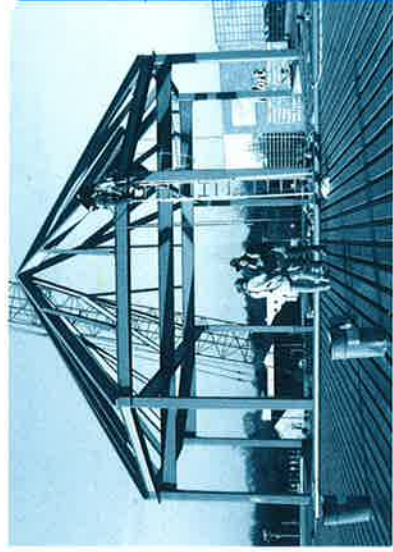
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& INSPECTION**



**LESSONS
LEARNED**

Practical Observations, Comments
and Lessons of General Interest to

- Owners
- Developers
- Contractors
- Property Managers
- Facility Managers
- Architects
- Engineers
- Planners
- Investors



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