

ECONOMICS

Structural Steel Pricing Not Affected by Ore Price Increases

Will rising ore prices impact the price of structural steel? The American Institute of Steel Construction says that rising ore prices should not impact the cost of fabricated structural steel in the U.S.

On March 30 the world's largest mining company, BHP Billiton, and most of its customers announced a new pricing structure for iron ore. Within hours the AISC Steel Solutions Center began receiving calls and emails asking how the new ore prices would impact the cost of structural steel used in buildings and bridges.

The short answer: It should have little-to-no impact. While most media outlets treat steel as a homogenous industry, the fact is the steel used in automobiles is different than that used in beams. Both the raw materials used to make the different types of steel and the processes used are different. Topping it off, less than half the steel produced in the U.S. even uses iron ore as its primary feedstock. The reality is that 62% of all domestic steel—and almost 100% of beams and columns—comes from “mini-mills” using recycled steel scrap as their feedstock (and virtually no iron ore at all). These mills melt scrap in electric arc furnaces (EAF) producing products with a recycled steel content in excess of 93%. Therefore, while a rise in the cost of scrap might impact the cost of beams, the increase in ore costs should mostly impact steel produced at integrated mills using basic oxygen furnaces (BOF). And fortunately, the large majority of steel used in the U.S. building and bridge industry (including almost 100% of beams and columns and 80% of the plate used for bridge construction) is produced in EAF mills.

As the chart below illustrates, there is a near direct relationship between scrap prices and structural steel pricing, while there is almost no relationship between iron ore and structural steel pricing.

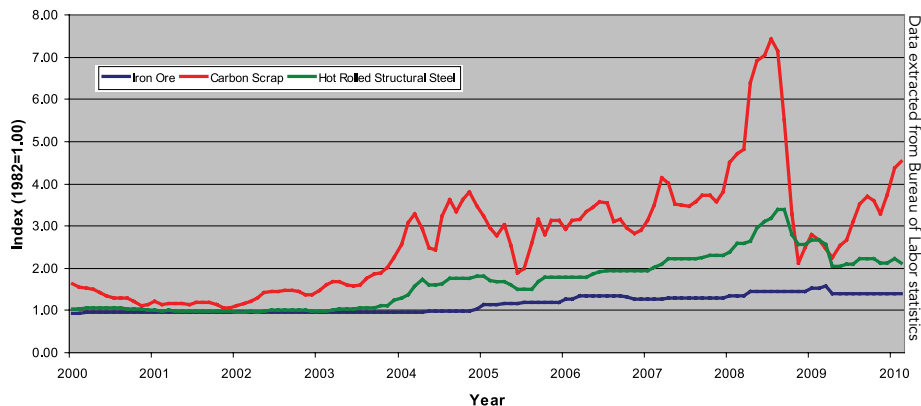
Additionally, individual mills produce specific types of steel. A mill designed to produce sheet steel for use in the automobile industry cannot produce structural steel sections for use in building construction. And a mill producing reinforcing bar for concrete does not produce plate steel for the ship building industry.

The cost of steel is typically driven by a number of factors, including the price of the raw material, the price of energy, and the supply/demand relationship for that specific type of steel. If there is a shortage of automobile sheet, it would drive up the price of automobile sheet steel but would not necessarily impact the price of beams and columns.

Finally, it's important to remember that end-users need to be more concerned with the price of the entire steel package and not simply the cost of the raw material. Typically, the cost of materials represents only 25%-30% of the total structural steel package for a building. The remaining 70%-75% of the cost is fabrication and erection. Even a 20% increase in material costs (which is certainly not anticipated at this time) would only result in a 5% increase in the cost of the steel package.

So when a recent caller to the AISC Steel Solutions Center asked if increasing ore prices would result in their community being unable to afford a new school building, the confident answer was that they could still move ahead with the project and that their choice of structural steel as the framing material was a wise one.

Pricing Trends for Ore, Scrap and Structural Steel



People and Firms

- The New York-based structural engineering firm **Leslie E. Robertson Associates** has announced a number of promotions, including **Nayan B. Trivedi, P.E.**, to partner; **Murat Baykal, P.E.**, **Matthew D. Melrose, P.E.**, **Seokwon Jang, Ph.D., P.E.**, and **Hari S. Nair, P.E.** to senior associate; and **Hugh D. Kelly, P.E.** and **Tanya Lüthi, P.E.** to associate. The firm also announces that it recently opened an office in Mumbai, India, to facilitate client relations and to manage a growing workload. LERA has been providing structural engineering services to clients in India since 2005.
- On March 22, 2010, AISC member **Tennessee Galvanizing, Inc.**, Jasper, Tenn., received the 2009 WasteWise Honorable Mention for Industrial Material Recycling from the U.S. Environmental Protection Agency's Office of Resource Conservation and Recovery.
- Hackettstown, N.J.-based AISC member firm Medina Consultants P.C. has been acquired by **T.Y. Lin International (TYLI)**, San Francisco. The company's staff of 125 professionals at seven offices in the Northeast U.S. will now conduct business as **T.Y. Lin International | Medina**. Medina president **Robert Medina, P.E.**, is now senior vice president of TYLI. Additionally, several Medina principals including **Chandu J. Bhoraniya, P.E.**, and **Wassim Y. Nader, P.E.**, join TYLI as vice presidents.
- AISC members **Terence E. (Ed) Richardson, P.E.**, and **Man-Chung Tang, P.E., Ph.D.**, were among the 2010 Lifetime Achievement Award recipients announced by the American Society of Civil Engineers in March. Richardson is with Bechtel Corporation, and Tang is with T.Y. Lin International.
- On March 1, Chicago-based **ArcelorMittal USA** was selected as a 2010 Energy Star Sustained Excellence Award winner for Energy Management. This is the third consecutive year the company has been so honored. Each year, the U.S. Environmental Protection Agency and the U.S. Department of Energy honor organizations that have made outstanding contributions to protecting the environment through energy efficiency. In 2008, ArcelorMittal became the first steel company to achieve this respected distinction. To read the firm's citation on the Energy Star website, go to <http://www.bit.ly/cqaROb>.

AWARDS

Six Honored for Industry Accomplishments

Six renowned structural steel industry professionals are being honored this month by the American Institute of Steel Construction (AISC) for their contributions to the advancement of the structural steel design and construction industry.

Thomas M. Murray, Ph.D., professor emeritus, Virginia Polytechnic Institute and State University, receives the Geerhard Haaijer Award for Excellence in Education. One of AISC's most prestigious and least frequently bestowed awards, it provides special recognition to individuals who have had a profound and lasting impact in developing a unique application for engineering practice or in the mentoring of future technical leaders through their research and teaching.

Murray's teaching and research have led to many new ideas and innovations for the steel design community and construction industry. Among other accomplishments, the AISC design guides he has written serve as the seminal works on floor vibrations and moment end-plate connections.



Two individuals are receiving the Lifetime Achievement Award, which recognizes those who have provided outstanding service to AISC and the structural steel design/construction/academic community over a sustained period of years.

Charles H. Thornton, Ph.D., P.E., one of the founders of structural engineering firm Thornton Tomasetti and now chairman of Charles H. Thornton & Company LLC, is honored for his body of work in the design of steel building structures.



Duane S. Ellifritt, Ph.D., P.E., professor emeritus, University of Florida, is recognized for his long-time contributions to AISC's education efforts, especially in creating the nationally and internationally used Steel Sculpture and the Steel Connections Tool Kit. The Steel Sculpture has been built at more than 130 schools nationwide and new schools continue to add the sculpture to their campuses.



AISC's Special Achievement Award is being presented to three individuals who have demonstrated notable achievements in structural steel design, construction, research, and education.

Theodore M. Zoli, HNTB

Corporation, is being honored for his work on the S-shaped cable-stayed Bob Kerrey Pedestrian Bridge, which was converted from a concrete bridge to steel through use of design-build project delivery.

Nabih F.G. Youssef, Nabih Yousseff & Associates, receives the award for the LA Live project. His firm converted the 52-story structure from a concrete shear wall system to a steel building with a steel-plate shear wall system through performance-based design.

Todd Helwig, Ph.D., associate professor, University of Texas, Austin, is being recognized for his leadership in the area of stability of steel structures. He developed bridge girder bracing systems as well as short courses on bracing for stability that have been provided to thousands of practicing engineers throughout the U.S.

The award recipients will be recognized at the 2010 NASCC: The Steel Conference/The Structures Congress, May 12-15, in Orlando, Fla. For more information, visit www.aisc.org/nascc.

EDUCATION

Student Steel Bridge Competition Finals Near

Now in its 23rd year, the Student Steel Bridge Competition pits engineering students from across the nation to design and build steel bridges. The year's round of competition began January 15 at the University of Texas at San Antonio and will culminate May 28-29 at Purdue University in West Lafayette, Ind.

The annual competition is a cooperative effort between the American Institute of Steel Construction (AISC) and the American Society of Civil Engineers (ASCE). Steel bridge teams from colleges and universities throughout the United States, Mexico, and Canada compete in regional events associated with the ASCE Student Chapter conferences. Winners of those conference competitions advance to the national competition, which this year is at Purdue.

Each bridge team designs, fabricates, and constructs its bridge based on rules and functional requirements that change yearly. Categories of competition are display, construction speed, lightness, stiffness, construction economy, and structural efficiency. In addition, overall performance is rated through a load test.

The rules simulate the conditions and expectations that accompany a real-world project. This year's specific challenge included a short construction season, ground loading limitations based on tundra conditions, and access restricted to one bank of

the river and barges. No permanent piers could be located within the river, due to moving ice concerns, although temporary piers were permitted during construction.

For more information about the Student Steel Bridge Competition, visit www.aisc.org/steelbridge, where you can also download the complete rules document.

To learn more about this year's national

finals, go to <http://www.bit.ly/cxJRgd>.

The full schedule of regional competitions (including host school contact info) is available at <http://www.bit.ly/btPANu>.

The Michigan State University SSBC team scrambles to erect its entry at the North Central regional competition held March 27 at Western Michigan University, Kalamazoo, Mich.



Nancy Gavlin

PUBLICATION

Steel Sheet Piling Benefits

A new report from the North American Steel Sheet Piling Association (NASSPA) highlights the advantages of using hot-rolled steel sheet piling for retaining walls.

Evaluating the various retaining wall systems for specific project requirements can be complicated and time consuming. The Federal Highway Administration decision-making matrix concludes that for permanent retaining wall structures, cost and speed of construction are typically among the most important material selection factors.

Using those criteria as the basis for its 2009 report *Comparison Retaining Wall Design and Cost Study: Steel Sheet Piling vs. Various Walls*, EIC Group compared six retaining wall types including steel sheet piling. Drawings and engineering calculations were developed for each wall

system, based on AASHTO *Standard Specifications for Highway Bridges*, 17th edition (2002).

The hypothetical 100-ft-long permanent structure had an exposed face of 19 ft that retained dense fine sand with no water table present. Above the wall, the embankment sloped up at an 18° angle.

Material and construction costs and construction time were developed based on *Means Heavy Construction Cost Data 2009*. The report concludes hot-rolled steel sheet piling can provide the fastest construction time as well as significant cost savings over competing systems.

The results are available in two documents—*Retaining Wall Comparison Brochure* and *Retaining Wall Comparison - Technical Report*—freely downloadable from the NASSPA website, www.nasspa.org.

SCULPTURE

Big, New Steel Art

A huge structural steel sculpture will be one of the icons of the 2012 Olympic Games. Dubbed the ArcelorMittal Orbit, the structure will have a height of 377 ft, about 60 ft taller than another well-known icon, the Statue of Liberty. As another comparison, the nearby London Eye stands 442 ft high.

Steel producer ArcelorMittal will provide the steel and underwrite much of the structure's cost. The design is by Anish Kapoor, who also designed the bean-shaped polished stainless steel Cloud Gate in Chicago's Millennium Park. Structural engineering will be spearheaded by Arup's Cecil Balmond.

ArcelorMittal's online announcement of the project includes a four-minute video that includes brief but enlightening interviews with both Kapoor and Balmond. Go to <http://bit.ly/cRwQAE> to read the press release and view the embedded video.

EDUCATION

Kids Can Learn the Joy of Manufacturing

A landmark partnership between two organizations is pioneering the effort to inspire tomorrow's inventors, engineers, manufacturers and entrepreneurs, and addresses a dire need to fill skilled labor positions in this country. Nuts, Bolts & Thingamajigs (NBT), The Foundation of the Fabricators & Manufacturers Association, Intl. (FMA), and the National Association for Community College Entrepreneurship (NACCE), have joined forces to develop a national program that builds on NBT's successful summer manufacturing camp blueprint.

In 2010, 18 NACCE member community colleges throughout the U.S. will offer NBT summer manufacturing camps targeting youth at the critical level of secondary education, exposing them to math, science, engineering and entrepreneurship principles, while having the opportunity to see the technology being used in the industry.

"Our new partnership sets in place a model curriculum to enable NACCE schools to conduct a series of summer manufacturing career exploration experiences for young people," said Gerald Shankel, FMA president & CEO. "With beginner through advanced programs, students can return for a new camp experience each summer, being challenged more in each subsequent program."

In addition to learning about manufacturing technologies, participants also will learn how products become businesses and how small businesses are run, which should make them very desirable as employees once they complete their schooling.

Camp participants use technology to create a product from start to finish pro-

viding them practical manufacturing experience in 3D design, computer numerical control (CNC) programming, welding, machining, and more, while learning product creation, problem solving, entrepreneurship and team building. Visits to area manufacturers provide an up-close look at products being made as well as career advice and inspiration from the entrepreneurs who run the companies.

"The purpose of the manufacturing camps is to provide a positive, hands-on experience so young people will consider manufacturing as a career option," said Shankel. "Both NACCE and NBT are making an investment in tomorrow's workforce because there is an ever-increasing demand for highly-skilled professionals who can design, program and operate technology."

"These camps expose youth to vocational and technical trades that they would rarely encounter in public education systems," said actor and producer John Ratzenberger, an NBT founder who leads the group's efforts to promote manufacturing as a viable career choice. "Many young people today have no role models when it comes to fixing things themselves or tak-

ing pride in building something useful, and they dismiss the idea of considering a career in one of the manual arts such as manufacturing, electrical, plumbing, carpentry or welding. These are some of the career areas that offer the greatest opportunity for people who want to become entrepreneurs."

A recent national poll sponsored by NBT showed a majority of teens—52%—have little or no interest in a manufacturing career and another 21% are ambivalent. When asked why, a whopping 61% said they seek a professional career, far surpassing other issues such as pay (17%), career growth (15%) and physical work (14%).

"It's absolutely critical for this mindset to change because when America recovers from its economic downturn, there will be a dire need for skilled manpower in the trades," said Ratzenberger.

For a list of camp locations and information on how to sign up, visit <http://www.nutsandboltsfoundation.org/Grants>.

To support the efforts of NBT and NACCE, visit <http://www.nutsandboltsfoundation.org/Ways-to-Give.cfm> or call 888.394.4362.



The Foundation of the Fabricators & Manufacturers Association, Intl.

INDUSTRY EVENT

Save the Date for SteelDay 2010

SteelDay 2010, a national event hosted by AISC and its members for the entire structural steel industry, has been scheduled for September 24. The various local events will feature free networking and educational opportunities.

Last September SteelDay 2009 events were held at more than 170 different locations all across the U.S. More than

7,000 architects, engineers, contractors, owners, developers, and university faculty and students attended educational presentations and toured facilities, including mills, fabrication shops, and galvanizing facilities.

SteelDay 2010 is expected to offer a larger variety of events through partnering with other industry groups and

organizations and through the use of new communications tools.

For more information on SteelDay 2010, visit <http://www.steelday.org>. If you are interested in hosting a SteelDay event in your area, got to www.aisc.org/Hosts.aspx. To see highlights from a variety of SteelDay 2009 events, visit <http://www.bit.ly/SteelDay2009>.

CALL FOR ENTRIES

World-Class Infrastructure Projects Sought for Competition

Bentley Systems Inc. is now accepting entries for its 2010 *Be Inspired Awards* competition. The program brings together infrastructure professionals from around the world as well as members of the academic community to advance innovation in information modeling best practices leading to higher-performing infrastructure and more cost-effective project realization; and to promote the extraordinary achievements of architects, engineers, constructors, geospatial professionals, and owner-operators in sustaining infrastructure empowered by Bentley software.

Since its inception in 2004, the *Be*

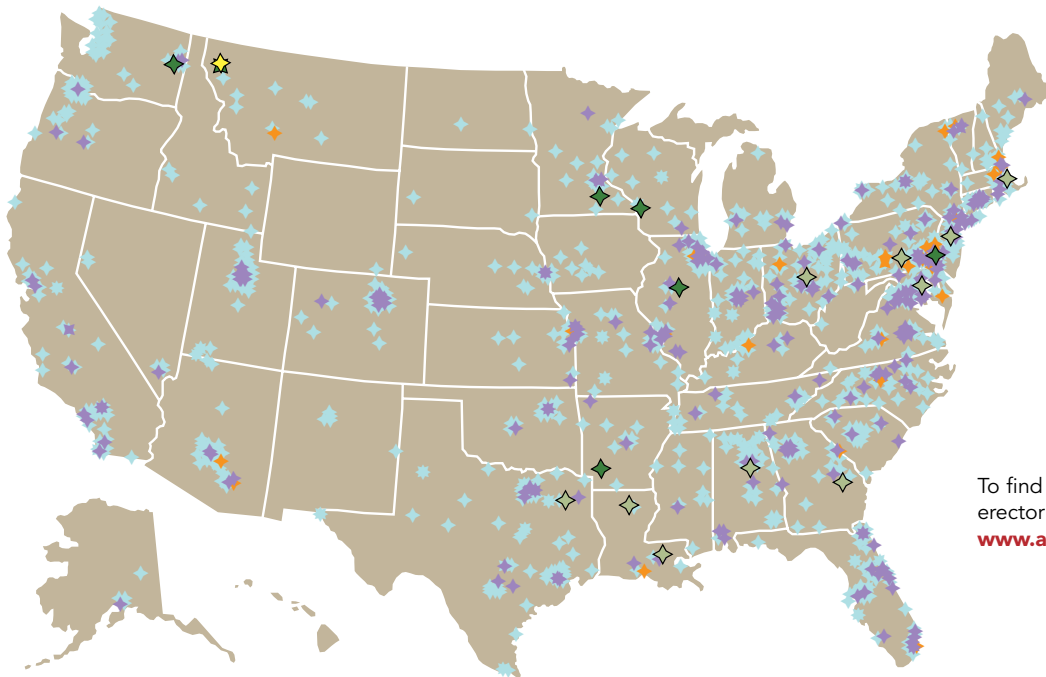
Inspired Awards program has recognized more than 1,000 world-class infrastructure projects, along with the teams responsible for creating them. Bentley users wishing to have their projects considered for recognition in the 2010 competition must submit their entries by June 18.

All nominees in this year's program will receive an invitation to the 2010 *Be Inspired Awards* event this fall in Europe. Their projects will be highlighted at the event as well as in Bentley's globally distributed *Year in Infrastructure* publication. Finalists, in addition, will be invited to present their projects at the event before their peers

and members of the media, and will be acknowledged during the awards ceremony. Winners are selected by an independent panel of jurors and will receive all of the above, plus will be awarded a custom-crafted trophy and will have their projects prominently featured and detailed in *The Year in Infrastructure 2010*. In addition, Bentley will make a \$1,000 donation on behalf of each winning organization to its choice of charitable group.

For more information about the 2010 *Be Inspired Awards* program or to submit an entry, visit www.bentley.com/BeInspired or email beinspired@bentley.com.

Newly Certified Facilities: March 1-31, 2010



To find a certified fabricator or erector in a particular area, visit www.aisc.org/certsearch.

Existing Certified Fabricator Facilities

Existing Certified Erector Facilities

Existing Certified Bridge Component Facilities

Newly Certified Fabricator Facilities

Newly Certified Erector Facilities

Newly Certified Bridge Component Facilities

Newly Certified Erector Facilities

- Aim Steel, Inc., Morrow, Ga.
- Stonebridge Inc., South Plainfield, N.J.
- Waggoner Fabrication & Millwright LLC, Mt. Holly Springs, Pa.
- Constructors and Erectors, Inc., Gladewater, Texas
- Ranger Steel Erectors, Inc., West Monroe, La.
- James F. Stearns Company, LLP, Pembroke, Mass.
- Champion Steel Company, LLC, Denham Springs, La.
- Quinlan Enterprises, Claxton, Ga.
- R&J Welding & Ironworks, LLC, Huntingtown, Md.
- Corna Kokosing Construction Company, Westerville, Ohio

Newly Certified Fabricator Facilities

- Mid-City Steel, Inc., La Crosse, Wis.
- The Factory Company International, Inc., Spokane, Wash.
- O'Rourke & Sons, Inc., Westchester, Pa.
- Anderson Iron Works, Inc., Rogers, Minn.
- Premier Fabrication, Inc., Congerville, Ill.
- CMC Steel Products, Hope, Ark.
- Stinger Welding, Inc., Libby, Mont.

Newly Certified Bridge Component Facilities

- Stinger Welding, Inc., Libby, Mont.

Article Misrepresented Committee Concerns Over Chapter N

The authors of “Quality Time” (*MSC* March 2009) present an incomplete and possibly misleading view of the Structural Engineers Association of California, Construction Quality Assurance Committee (SEAOC CQA) concerns regarding the welding inspection provisions in the new Chapter N of AISC 360-10.

SEAOC CQA has been full of praise for Chapter N, particularly its engaging of the fabricator and erector’s QC function, and the excellent list of welding inspection tasks. We continue however to oppose the *IBC* code change proposal that would replace the structural steel special inspection requirements of Chapter 17 with the quality assurance provisions of AISC 360, Chapter N in its present form.

The article makes reference to our “complaint” that Chapter N should have more inspection. In fact, our concerns are with what we see as a *reduction* in the code-required inspection levels for certain welds only (multi-pass fillet welds and all groove welds), which currently require “continuous” special inspection under the 2009 *IBC*.

2009 *IBC* defines “special inspection, continuous” as:

“The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.”

The article’s discussion of the problems with the term “continuous” is focused on the clause describing the inspector’s presence at the site, rather than an interpretation of the phrase “full-time.” In fact, reference to this part of the definition is never made.

The article states “...*IBC* references other codes, such as AWS D1.1, for requirements associated with ‘continuous’ inspections, and the reference information requires these so-called ‘continuous’ inspections to be performed ‘at suitable intervals.’”

Actually *IBC* references AWS D1.1 for all welding inspection, not just continuous inspection. We have stated clearly that the building code has defined these “suitable intervals” by the use of the terms “continuous” and “periodic” and has assigned the more stringent interval (continuous) to those welds where it is suitable (multi-pass fillet welds and all groove welds).

The article suggests that SEAOC CQA fears “abuse” by the welding inspector for inspection tasks designated O for Observe. Perhaps the authors are referring to our concern that, under Chapter N, once the inspector has verified the materials, WPSs,

welder qualifications and skills, etc., at the beginning of a project, complete penetration groove weld joints could be started (fit-up and root pass) and completed (filler passes) without any of the steps being observed by the welding inspector (either QA or QC). This would not be an abuse by the welding inspector—the inspector would be simply following the intent of Chapter N. Our contention is that this represents a substantial decrease in scrutiny over the continuous inspection currently required for this type of weld, regardless of how loosely one interprets the term continuous.

Lastly, we would like to make it clear that, in our discussions with AISC, we only suggested that *certain* (not all) observe tasks be changed to perform in the task lists for “before” and “during” welding, and *only* for multipass fillet welds and all groove welds. The article’s contention that such a proposal would represent a “massive increase” in inspection, is simply not supportable.

We have proposed alternate language for the inspection provisions for multipass fillet welds and groove welds that, if adopted, would allow us to support the incorporation of AISC 360 Chapter N into the *IBC*. However, AISC has to date declined to accommodate our proposal. The reduction in special inspection represented by Chapter N for multipass fillet welds and all groove welds has not been adequately justified by reliability studies to permit this to become part of the building code.

Structural Engineers Association of CA Construction Quality Assurance Committee

Authors of the article respond:

Thank you for clarifying the views of SEAOC CQA, and affirming that you like Chapter N in AISC 360-10.

To be clear, though, this attempt to reinstate a “continuous” inspection requirement for multipass fillet welds and groove welds at the last moment in the ICC process through a public comment is a fallback. The original request SEAOC CQA made to AISC and others was that all observe-level inspection tasks for welding in Chapter N should be changed to the perform-level. When your recommendations were questioned, you explicitly clarified that you want hold points for inspection after every step in the process of preparing and making groove welds and multi-pass fillets welds. Were it accepted, this proposal for change would result in a massive increase in inspection require-

ments over what is done now, as we stated.

SEAOC CQA recommendations, which were submitted as a public comment on AISC 341-10, were heard and not accepted by the ANSI-accredited AISC Committee on Specifications. Additionally, these recommendations have, so far, not been accepted by any other national group that you have approached, including the NCSEA Code Advisory Committee Quality Assurance/Special Inspection Subcommittee, the Building Seismic Safety Council’s Code Resource Support Committee, and the ICC Structural Code Committee. We believe your arguments keep meeting with rejection because nobody agrees with your interpretation of the current *IBC* requirements for “continuous” inspection.

The provisions in AISC 360-10 Chapter N (and AISC 341-10 Chapter J) provide a complete, coordinated quality plan with specific requirements that are better structured and less prone to abuse or misunderstanding than the current *IBC* Chapter 17 provisions. Our balanced, consensus committee process has succeeded in clarifying when perform-level inspection—100% inspection—is required, and when observe-level inspection can be used. Note that the observe label does not make inspection optional as you seem to suggest. Rather, it requires purposeful, regular, random inspection with a frequency that is appropriate to assure that the process is being performed correctly. It also is combined with non-destructive examination requirements we’ve added in Chapter N that do not exist in the current *IBC*. Ultimately, we believe our specific plan actually will be used, and that will be a marked improvement over the common current practice of just ignoring the confusing requirements for “continuous” and “periodic” inspection that you seem to prefer.

Although your ICC public comment has receded from your original request to AISC, we believe that it still cherry-picks inappropriately. Unfortunately, despite significant feedback from a broad spectrum of knowledgeable experts who have heard and attempted to address your concerns, you are unwilling to change your position. We strongly believe that AISC 360-10 Chapter N provides a solution that enhances quality in the constructed project and resolves the well-known problems with varying interpretations of what “continuous” and “periodic” mean. Respectfully, we must assert that, if adopted, your public comment would only serve to cast these productive and beneficial solutions back into a morass of confusion.