

## Steel Industry Announces Improved Structural Grade For Buildings

The American Institute of Steel Construction, Inc. (AISC), in conjunction with the Structural Shapes Producers Council (SSPC), announced today an improved high-strength grade of steel for structural shapes used in buildings—ASTM A572 Gr. 50 (with special requirements). Given the benefits of this enhanced material, it is hoped that it will eventually replace customer demand for ASTM A36 material. According to AISC Chairman Robert E. Owen: "This represents the culmination of more than three years of effort in various committees to develop an improved shape material that offers several advantages to those who design, fabricate and erect steel building structures." The advantages of this specification are:

- An accurate description of the typical steel material being produced today using steel scrap and continuous casting.
- Explicit limits on minimum and maximum yield strength.
- A specified maximum yield-to-tensile strength ratio.
- A more complete description of chemical properties including limits on several residual elements.
- A maximum carbon equivalent to ensure weldability.
- A single high-strength grade

that simplifies the design of the majority of buildings.

- Increased competitiveness of steel through economies of scale for mills, steel service centers and fabricators.

In developing the improved material, the first objective was to create a specification that accurately describes the steel being produced today, using steel scrap as the primary raw material and continuous casting in the forming process. This newer technology produces steels that are of higher strength than the minimum specified 36ksi yield strength traditionally associated with ASTM A36. With no required upper limit on yield strength under the ASTM A36 specification, steels have typically been supplied with actual yield strengths and properties that met the requirements of both ASTM A36 and A572 Gr. 50. An earlier 1993 study under the auspices of the SSPC and performed by Karl Frank, Ph.D., of the University of Texas, Austin, had confirmed these overall material strength increases across the common grades of steel for building construction.

The aftermath of the Northridge earthquake gave a further push to the development of this enhanced material. In addition to explicit limits on yield strength, designers in seismic zones need a more complete description of the chemical and mechanical properties of today's material. To that end, the improved ASTM A572 Gr. 50 provides more definition in terms of both mechanical properties and chemistry, including limits on several residual elements. In order to help engineers assess ductility, performance and strength of their designs and weldability, this new specification incorporates the following conditions:

- An upper limit on yield strength of 65 ksi

- A minimum tensile strength of 65ksi
- A specified maximum yield-to-tensile ratio of 0.85
- A specified maximum carbon equivalent of 0.50

As part of an effort to address the question of weldability, the AISC consulted a well known welding expert, B.A. Graville of Graville Associates, Inc., and made several adjustments to the specification in accordance with his recommendations.

According to Nestor Iwankiw, AISC Vice President of Engineering and Research, these additional limits offer a better defined product than what current standards require.

AISC and the Structural Shapes Producers Council (SSPC) are working with ASTM to discuss a new material standard for the future that would include these special requirements.

Copies of AISC Technical Bulletin #3, giving a complete description of the shape material requirements may be obtained through AISC Marketing Inc. (fax your request to Jeri Irwin at 312-670-5403). The material per these more restrictive requirements will be available after May 1, 1997. Questions about price and availability on specific orders should be addressed to steel mill suppliers and service centers.

When specifying this material it should be described as follows:

***"ASTM A572 Gr. 50 with special requirements per AISC Technical Bulletin #3, New Shape Material, dated March 3, 1997."***

Modifications of these supplemental restrictions or additions of new requirements may limit material availability.

## Short Course On HSS Connections

In association with the American Iron & Steel Institute and the Steel Tube Institute, AISC is publishing a new manual on hollow structural section (HSS) connections. The book, which is expected to be the definitive work on connecting wide flange sections to HSS members, as well as HSS members to other HSS members, is also the basis for a short course following this year's National Steel Construction Conference.

The May 10 Short Course will review and cover all aspects of HSS design and connections, including both simple and moment connections. The morning portion will include discussion on the material and the new design specifications for HSS members that the AISC Specification committee has produced as well as Shear and moment connections.

The afternoon portion will include detailed information on many complicated connections that are used every day when designing with HSS members, including base plates and truss connections. Erection also will be covered.

Among the speakers preliminarily scheduled for the program are: Don Sherman of the University of Wisconsin-Milwaukee, who heads the AISC Specification Committee Task Group that prepared the Specification and who also won the 1996 T.R. Higgins Lectureship Award based on his work with HSS connections; Jim Fisher of Computerized Structural Design, who is spearheading the writing of the manual; Larry Kloiber of LeJeune Steel Company; and Jeff Packer of the University of Toronto.

Registration for the course costs \$275 (\$225 for AISC members) and includes a copy of the new HSS Connections Manual. Educational credit for the course is 0.7 CEUs or 7.0 P.D.H.s.

### Short Course Schedule

8:00 - 8:30 a.m.  
Registration/Coffee & Rolls

8:30 - 8:45 a.m.  
Welcome & Introductory Remarks

8:45 - 9:15 a.m.  
Specification Highlights

9:15 - 10:00 a.m.  
Materials, Welding & Bolting

10:00 - 10:15 a.m.  
Refreshment Break

10:15 - 11:00 a.m.  
Simple Shear Connections

11:00 - 11:45 a.m.  
Moment Connections

11:45 a.m. - noon  
Question/Answer Panel

Noon - 1:00 p.m.  
Lunch

1:00 - 2:00 p.m.  
Base Plates and Column Splices

2:00 - 3:00 p.m.  
Tension and Compression Connections

3:00 - 3:15 p.m.  
Break

3:15 - 4:15 p.m.  
Truss Connections and Examples

4:15 - 4:45 p.m.  
Constructability Issues for HSS Connections

4:45 - 5:00 p.m.  
Question/Answer Panel

For more information, contact: Robert Lorenz, AISC Director of Education, at 312/670-5406 or fax 312/670-5403.

## National Steel Construction Conference

With today's economic climate and the fast and furious pace of advancing technologies and resources, questions mount seemingly faster than they can be answered. AISC's National Steel Construction Conference is a once-a-year opportunity to delve into the rapidly changing and advancing world of steel design and construction and surface with practical information to help your practice today. The conference and exhibition, May 7-9 in Chicago, includes more than 25 problem-solving technical sessions as well as a comprehensive product exhibit.

This year, sessions are offered in five areas: erection; fabrication; engineering management; engineering technical; and welding. Following the conference there will be a separate short course on HSS Connections.

Some of the papers to be presented at NSCC '97 include:

- Bracing and Stability.
- Cladding on Multistory Steel Frames.
- Moment Connections.
- Erection of Large Scale Projects.
- Detailing for the Shop.
- Connections that Caused Erectors Severe Problems
- Teaming to Compete with

Prefabricated Packages

- Structural Welding Code Requirements.
- What an Engineer Should Know About Welding Procedures.
- Innovations in Cutting, Burning and Welding.

For more information on NSCC '97, point your favorite Internet browser at AISC's web page at <http://www.aiscweb.com> or use the NSCC faxback service at 800/787-0052 x110.

## AISC Announces New Seminar Series: "Designing Steel for Serviceability"

The advent of powerful computer software allows engineers to readily review a myriad of alternative design schemes to obtain optimum strength designs. Today's successful designer must look beyond just strength, however, and consider a building's function and maintenance requirements. In short, serviceability issues are becoming increasingly important.

AISC's new 49-city Seminar Series, "Designing Steel for Serviceability", covers five important topics: frame layout options & strength design; roof ponding; floor elevation & levelness; control of lateral drift; and control of floor vibrations.

**Frame Layout Options & Strength Design:** This portion of the seminar will include information on selection of a steel system, frame layout options and trade-offs, structural analysis, member selection for strength, and serviceability design concerns.

**Roof Ponding:** Most commercial buildings are designed and constructed with near-flat roofs. Too often, this is not well coordinated with roof drain location, which can create an unforeseen ponding load on the roof structure. If not considered in design, this ponding effect can cause leakage, damage or even partial roof collapse. This presentation provides an explanation of the ponding mechanism and through design examples shows how to minimize structural complications.

**Floor Elevation & Levelness:** The placing of fresh concrete on flexible floor systems to achieve a level floor requires an understanding of the interactive effect of construction floor

deflections and the additional loading that may be created in the leveling process. For the unwary, this can result in: non-level floor surfaces; interference with ceiling plenum elements; additional concrete to compensate for the sagged supporting systems; failure to attain specific floor elevations; and potential construction collapse. This portion of the seminar will discuss these issues and through design examples provide alternative solutions to this troublesome problem.

**Control of Lateral Drift:** Lateral drift of a building has always been an index of structural performance under service loads. And as structural materials have become stronger while non-structural materials have become lighter and less rigid, its importance has only increased. This portion of the seminar provides new information by correlating the racking effect of lateral deformations with damage to various non-structural components. Design examples will be presented.

### Control of Floor Vibrations:

Excessive vertical motion of floors can cause significant occupant discomfort and sometimes alarm. Modern construction materials and methods, where both structural and non-structural systems are lighter, have only exacerbated the problem. Serviceability guidelines in the past emphasized stiffness limits that have been inefficient in neutralizing potential vibration in floors: Only when both mass and damping are included in the total design can effective control be expected. This portion of the seminar will provide guidelines for controlling this problem.

The seminar series has a CEU value of 0.55 (5.5 PDH). Registration is \$120 (\$90 for AISC members). *Please note that all MSC subscribers will automatically receive a registration form six weeks prior to the seminar scheduled in their area.*

For more information, call 630/369-3772, fax 630/369-3773 or point your favorite web browser to: <http://www.aiscweb.com>

### Structural Welding: Design & Specification

A new one-day seminar from the Steel Structures Technology Center is designed to familiarize designers, fabricators, detailers and inspectors with the new format of the AWS Structural Welding Code-Steel D1.1-96 and its design-related provisions, as well as cover pertinent AISC provisions. It also includes information on the latest developments from recent research into welding design following the Northridge earthquake, as well as other changes in the industry.

#### Seminar Schedule

- April 7 ....Hasbrouck Heights, NJ
- April 16 .....Los Angeles
- April 17 .....San Francisco
- April 22 .....Minneapolis
- April 23 .....Denver
- April 29 .....Philadelphia
- April 30 .....Boston
- May 20 .....Charlotte
- May 21 .....Atlanta
- May 22 .....Houston

Registration fee is \$165 per person, including handout material, dinner and breaks. To register, call 630/369-7784 or fax 810/344-2911, or write: Steel Structures Technology Center, Inc., 40612 Village Oaks Dr., Novi, MI 48375-4462.

### Northridge Earthquake Research Conference

The NSF-funded Northridge Earthquake Research Conference is scheduled for August 20-22 in Los Angeles. The conference will highlight results obtained in research projects funded by NEHRP agencies. For more information, contact: Northridge Earthquake Research Conference, California Universities for Research in Earthquake Engineering, 1301 S. 46th St., Richmond, CA 94804; ph: 510/231-9557; fax: 510/231-5664; email: [curee@nisee.ce.berkeley.edu](mailto:curee@nisee.ce.berkeley.edu)

### Fracture & Fatigue

A course on Fracture and Fatigue Control in Structures—Applications of Fracture Mechanics, will be offered at The University of Kansas October 28-30. Instructors for the course are John

## 1997-98 Seminar Series Schedule

### 1997

- June 16-17\* .....San Diego
- June 18-19\* .....Orange County
- June 24 .....Minneapolis
- June 26 .....Milwaukee
- July 1 .....Charlotte
- July 2 .....Greenville, SC
- July 9 .....Rochester, NY
- July 10 .....Albany, NY
- July 16 .....Cincinnati
- July 17 .....Charleston, WV
- July 22 .....Washington, DC
- July 23 .....Richmond, VA
- July 24 .....Norfolk, VA
- July 29 .....St. Louis
- July 31 .....Omaha
- Sept. 17 .....Dallas
- Sept. 18 .....Oklahoma City
- Sept. 24 .....Sacramento
- Sept. 25 .....San Francisco
- Oct. 8 .....Chicago
- Oct. 15 .....Philadelphia
- Oct. 16 .....Edison, NJ
- Oct. 21 .....Detroit
- Oct. 23 .....Indianapolis
- Oct. 28 .....Raleigh
- Oct. 30 .....Birmingham

- Nov. 5 .....Portland, OR
- Nov. 6 .....Seattle
- Nov. 12 .....New Orleans
- Nov. 13 .....Houston
- Nov. 18 .....Meriden, CT
- Nov. 19 .....New York City
- Nov. 25 .....Atlanta
- Dec. 2 .....Memphis
- Dec. 4 .....Nashville
- Dec. 11 .....Salt Lake City

### 1998

- Jan. 14 .....Los Angeles
- Jan. 15 .....Los Angeles-East
- Jan. 21 .....Columbus, OH
- Jan. 22 .....Cleveland
- Jan. 27 .....Jacksonville
- Jan. 29 .....Tampa
- Feb. 4 .....Boston
- Feb. 5 .....Portland, ME
- Feb. 11 .....Albuquerque
- Feb. 12 .....Phoenix
- Feb. 18 .....Pittsburgh
- March 3 .....Kansas City
- March 5 .....Denver

*\*Seminar will be held over the course of two evenings*

Barsom, Ph.D., from USX and Stan Rolfe, Ph.D., chairman of civil engineering at the University of Kansas.

For more information, contact: Mary Heberling, Division of Continuing Education, The University of Kansas, Lawrence, KS 66045-2607; ph: 913/864-3969.

## Composites in Infrastructure

The second International Conference on Composites in Infrastructure (ICCI '98) will be held in Tuscon January 3-4, 1998. Topics include: basic characterization of composite materials; application of composite materials in the rehabilitation of infrastructure; composite materials in new construction; environmental considerations; life cycle costs; analysis, design, specifications & standards; construction practices; manufacturing processes; case studies; fire resistance; non-destructive testing; and service life & durability.

For more information, contact: Engineering Professional Development, Box 9 Harvill Building, Room 235, The University of Arizona, P.O. Box 210076, Tuscon, AZ 85721-0076; ph: 520/621-3054; fax: 520/621-1443; email: baltes@enr.arizona.edu

## Torsional Analysis

AISC's Steel Design Guide #9, *Torsional Analysis of Structural Steel Members*, is now available.

The guide is an update and expansion of the AISC publication, *Torsional Analysis of Steel Members*. Coverage of shapes has been expanded and includes W-, M-, S- and HP-Shapes, channels (C and MC), structural tees (WT, MT, and ST) angles (L), Z-shapes, and hollow structural sections (square, rectangular and round).

Included is:

- an overview of the fundamentals and basic theory of torsional loading for structural steel members
- determination of torsional stresses and their combination with other stresses
- specification provisions relating to torsion
- serviceability issues
- design examples

Copies of the 116-page guide cost

\$30 (\$22.50 for AISC members) + s/h. To order a copy, call 800/644-2400 and specify publication #D809.

## Vibration and Joists

The Steel Joist Institute's Technical Digest #5 provides design and construction professionals information on selecting a steel joist/concrete slab design with acceptable vibration characteristics. The 44-page guide sells for \$12.50, including postage and handling. In addition, a computer program to analyze frequency and amplitude of the floor system is available for \$125.

For more information, contact the Steel Joist Institute, 3127 10th Ave., North Ext., Myrtle Beach, SC 29577-6750; ph: 803/626-1995.

## New Welding Magazine

*Practical Welding Today*, a new bimonthly magazine devoted to hands-on, useful information about welding and joining techniques, is scheduled to debut with the July/August 1997 issue. The magazine will be produced by the Fabricators & Manufacturers Association, International subsidiary The Croydon Group, Ltd., publishers of *The FABRICATOR*, *TPJ-The Tube & Pipe Journal*, and *STAMPING Journal*.

A free subscription is available within the U.S. (international subscriptions are available for \$45; \$25 in Canada & Mexico). Call 815/399-8775 or fax 815/399-7679.

## Correspondence

Dear Editor:

Yes, I had noticed the increased coverage of bridges and steel bridge issues in *Modern Steel Construction* lately. I was very happy to see this increase. Please keep it up!

I suspect you may get some correspondence from building designers complaining about buildings being usurped by bridges in your publication. I certainly do not want your increased bridge coverage to replace any building coverage, but only to be in addition to it.

Specifically, I particularly enjoyed the steel bridge awards feature - it is nice to see what others are doing and to have points of contact to discuss general questions and concepts. I

also especially like the Bridge Crossings section—I use *Modern Steel Construction* and other trade and technical journals as learning tools and Bridge Crossing is perfect for that. "Fluff" articles where someone describes what a great job they did on a significant structure are nice, but I really learn a lot more from a practical article with details, information, procedures, etc.

Similarly, I enjoy the Steel Interchange and Steel Quiz as excellent learning/communications tools. Of all of the periodicals I try to keep up with, I get the most practical information from *Modern Steel Construction*.

I am not writing this to stoke your ego. I am genuinely pleased with *Modern Steel Construction* and I want you to know that the efforts of you and your staff to make it a practical, useful publication are very highly valued by me. Don't change!

via email

**Domenic Coletti, PE**  
**HDR Engineering, Inc.**  
**Dallas, TX**

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