

# CCFSS NEWS

Wei-Wen Yu Center for Cold-Formed Steel Structures at the University of Missouri-Rolla

Email: [ccfss@umr.edu](mailto:ccfss@umr.edu); <http://www.umr.edu/~ccfss>

Director: Roger A. LaBoube, Ph.D, P.E.

Founding Director: Wei-Wen Yu, Ph.D., P.E.

Butler-Carlton Civil Engineering Hall

1870 Miner Circle

Rolla, MO 65409-0030

Telephone: 573-341-4471

Fax: 573-341-4476

Volume 13, Number 2

February 2003

## AISI Committee on Framing Standards Update

By Jay Larson, Bethlehem Steel

The AISI Committee on Framing Standards (COFS) continues to meet and work towards its objectives to eliminate regulatory barriers and increase the reliability and cost competitiveness of cold-formed steel framing in residential and light commercial building construction through improved design and installation standards. Interest remains high in the four recently completed ANSI-accredited AISI standards, which include the General Provisions, Truss Design, Header Design and Prescriptive Method for One and Two-Family Dwellings.



The ANSI-Accredited COFS Standards can be purchased online at the AISI Bookstore at [www.steel.org](http://www.steel.org) (click on Publications)

Committee efforts are currently focused on the development of two new standards for Wall Stud Design and Lateral Resistance Design, as well as a comprehensive Commentary to the Prescriptive Method and an industry Code of Standard Practice. For more information about the activities of the COFS, please check the AISI website at [www.steel.org/construction/framing/](http://www.steel.org/construction/framing/).

---

## 16th International Specialty Conference on Cold-Formed Steel Structures

Recent research discoveries, as well as new industry applications and developments, were the topic of discussion at the 16<sup>th</sup> International Specialty Conference on Cold-Formed Steel Structures that was held in Orlando, Florida on October 17<sup>th</sup> and 18<sup>th</sup>, 2002.

Based on the Planning Committee's paper review, 56 technical papers were accepted for publication and presentation at the two-day conference. A total of 102 participants from 18 countries attended the conference.

Based on responses obtained from the post-conference evaluation form participants valued the interaction with industry representatives and researchers from all over the world and best is summarized by the following:

"The UMR Specialty Conference is the biannual reunion of the cold-formed steel structures international family. I know of no other event that provides the same opportunity for learning about the state-of-the-art and accessing the experts in the field."

For further information regarding the conference or to purchase a copy of the proceedings, contact the Wei-Wen Yu Center for Cold-Formed Steel Structures, University of Missouri-Rolla, Rolla, MO 65409-0030, USA (Telephone: 573-341-4471, e-mail: [ccfss@umr.edu](mailto:ccfss@umr.edu)).

# CONTINUING Education



## Short Course on Cold-Formed Steel Design

The Center for Cold-Formed Steel Structures is planning for its 18th Short Course on Cold-Formed Steel Structures. The short course will be held October 14, 15 and 16, 2003 in St. Louis, MO.

The short course will discuss the behavior of cold-formed steel members and connections. The short course is structured to provide an introduction to behavior and design for the engineer unfamiliar with cold-formed steel. For engineers experienced with cold-formed steel design, that course will strengthen their understanding of the fundamental behavior of both members and connections, as well as provide a better understanding of the AISI design specification. A preview of future specification changes will also be provided. Both commercial and residential applications of cold-formed steel will be discussed.

Lectures will be based on information contained in the AISI North American Specification for the Design of Cold-Formed Steel Structural Members, 2001 edition and the COFS Design Standards. The text *Cold-Formed Steel Design*, 3rd Edition, 2000 by W.W. Yu will also serve as a course reference.

Additional information regarding the course may be obtained by contacting Ms. Christina Stratman, Wei-Wen Yu Center for Cold-Formed Steel Structures, Tel: (573) 341-4471, Fax: (573) 341-4476, email: [ccfss@umr.edu](mailto:ccfss@umr.edu) or Dr. Roger LaBoube, Tel: (573) 341-4481, Fax: (573) 341-4476, email: [laboube@umr.edu](mailto:laboube@umr.edu), or online at <http://web.umn.edu/~ccfss/conted&seminars.html>

## Seminars on Cold-Formed Steel Design

The six-hour seminar on cold-formed steel design was developed to explain the intricacies of designing structures using cold-formed steel members and connections. The contents of the lectures provide an overview of the AISI Specification, but will also highlight the new provisions contained in the 2001 edition. Seminar attendance would be beneficial for practicing engineers, engineering professors, and students. Seminars are being planned for late 2003. For details watch the Center's website [www.umn.edu/~ccfss/conted&seminars.html](http://www.umn.edu/~ccfss/conted&seminars.html), or contact Ms. Christina Stratman, Wei-Wen Yu Center for Cold-Formed Steel Structures, Tel: (573) 341-4471, Fax: (573) 341-4476, email: [ccfss@umr.edu](mailto:ccfss@umr.edu) or Dr. Roger LaBoube, Tel: (573) 341-4481, Fax: (573) 341-4476, email: [laboube@umr.edu](mailto:laboube@umr.edu).

## Cold-Formed Steel Design for the Practical Engineer

The use of cold-formed steel and the volume of technical information, for both residential and commercial construction are growing at an ever-increasing rate. Chances are, if you haven't already been using cold-formed steel, you may have the opportunity to use cold-formed steel in the future. This seminar introduces the latest developments in cold-formed steel framing, and presents practical and invaluable design tips and techniques, for use on a future cold-formed steel project. Seminars are being planned for 2003. For details contact Larry Williams, Managing Director, Light Gauge Steel Engineers Association, Tel: (866) 465-4732, Fax: (202) 785-3856, email: [larry@lgsea.com](mailto:larry@lgsea.com).

## 17th International Specialty Conference

Preparations are being made for the 17th International Specialty Conference on Cold-Formed Steel Structures. The conference is scheduled for November 4th and 5th, 2004 and will be held in Orlando, FL. It is anticipated that approximately 40 technical papers will be selected for presentation during the two-day conference. Visit the Center's website [www.umn.edu/~ccfss](http://www.umn.edu/~ccfss) for the announcement for the call for papers and a copy of the brochure.

## 4th International Conference on Thin-Walled Structures

The 4th International Conference on Thin-Walled Structures will be held June 22-24, 2004 at Loughborough University, Loughborough, Leicestershire, UK. For more information regarding the conference and the Call for Papers see [www.lboro.ac.uk/departments/tt/ictws2004](http://www.lboro.ac.uk/departments/tt/ictws2004).

### Wei-Wen Yu Updates Textbook

***Cold-Formed Steel Design***  
3rd Edition, 2000

is available from the Center at a discounted publisher's price of \$100.00

The order form may be accessed through the Center's website  
[www.umn.edu/~ccfss](http://www.umn.edu/~ccfss)

## AISI Committee on Specifications Meets

The Committee on Specifications for the Design of Cold-Formed Steel Structural Members and its subcommittees met for their semi-annual meeting on February 19, 20, and 21 in Orlando, FL. The meeting consisted of updates pertaining to research as well as discussion on proposed changes to the Specification.

Research reports were presented on several AISI sponsored research projects. Dr. T.B. Pekoz updated the Committee on the progress of a study of cold-formed steel beam-columns. Distortional buckling experiments is the focus of a study reported on by Dr. Ben Schafer. Dr. T.M. Murray briefed the Committee on the progress of a study to better define the anchorage forces for a Z-purlin roof system. A proposed study pertaining to lateral torsional bracing requirements for C-sections subject to bending or axial load was summarized by Dr. Tom Sputo. Dr. R.M. Schuster provided status

reports on a study of multi-web deck sections subjected to web crippling and a project to redefine the interaction of bending and web crippling in web elements.

A major focus of the meetings was the development of the 2003 edition of the Cold-Formed Steel Design Manual. The Manual will be significant because the document will more accurately reflect industry standard cross sections, their properties and strength.

Several enhancements to and/or additions to the Specification were adopted at the February 19, 20, and 21 meetings. These enhancements or additions pertained to the following: fracture in the net section for bolted connections, bearing strength of bolted connections, strength for combined bending and web crippling strength of web elements, shear strength of web elements, web crippling strength of web elements, and strength increase from cold-work of forming.

## ASCE-SEI CFS Committee Meets

The American Society of Civil Engineering - Structural Engineering Institute (ASCE-SEI) Cold-Formed Steel Committee met during the recent AISI meetings in Orlando, FL. The committee has recently completed an article on accommodating deflections in cold-formed steel systems that is slated for the April issue of STRUCTURE magazine. Also, an article reviewing recently published cold-formed steel textbooks was published in the November issue of the ASCE Journal of Structural Engineering.

The committee members recently completed a survey of research needs in cold-formed steel structures and voted and prioritized those needs. The identified needs were broken into three categories: primers (state-of-the-art summaries), fundamental research, and standardization. Of the primers, shearwalls, headers, seismic design, and

bracing were identified as the top categories. Identified for fundamental research needs were stud-to-track detail performance and a host of questions regarding lateral load transfer systems. For standardization, standard connection details were tagged as the top need. Based on these needs, and the expertise of the committee, a special project request is being put forth to ASCE to develop a primer on bracing of cold-formed steel members.

The committee hopes to share its list of perceived needs with a wider audience and generate greater discussion and interest in cold-formed steel research. ASCE-SEI members interested in joining the committee should contact Chairperson Ben Schafer at [schafer@jhu.edu](mailto:schafer@jhu.edu). More information about the committee's activities is available online at [www.ce.jhu.edu/bschafer](http://www.ce.jhu.edu/bschafer).

## Light Gauge Steel Design Software

EnR-Solutions announces the release of the new version of its Steel Smart System™ (SSS) software, version 2.5. SSS is a design software for light gauge steel components; roof trusses, roof rafters, wall studs, floor joists, shear walls, and openings headers. The software optimizes the design for the member cross section, the connector (if needed) and the fastener to the structure (concrete, steel, or masonry). The design is optimized based on AISI Specification, and uses standard SSMA stud and track cross sections. Some proprietary clips and fasteners are recommended to offer a complete design solution. The software has also modules to generate minimum design loads (wind, seismic, and snow) for the under-design light gauge component based on ASCE 7 standard.

### Steel Smart System Version 2.5

This saves many engineering hours consumed to generate these loads and incorporate them in another design software. SSS also offers a library of about 400 connection details for light gauge applications with other structural materials.

The new version of SSS (v. 2.5) offers an enhanced GUI for input and output data, full compatibility with Windows XP Professional and Home versions, and many other design features for light gauge steel components.

As EnR-Solutions is dedicated to providing the most innovative and technologically advanced solutions in the engineering field, the company offers a comprehensive suite of structural engineering software tools. This includes load calculator tools (EnR-Seismic, EnR-Wind, EnR-Snow), static and dynamic finite element analysis (EnR-Diamond), structural design tools (EnR-Steel, EnR-Column, EnR-Foundation, and EnR-Sections), and structural collapse modeling (EnR-Collapse). For further information about these programs, visit [www.enrsolutions.com](http://www.enrsolutions.com).

## AISI Design Manual Updated

The AISI Committee on Specifications is nearing completion of an update for the *Cold-Formed Steel Design Manual*. The update is based on the design provisions of the 2001 edition of the *North American Specification for the Design of Cold-Formed Steel Structural Members*.

Significant changes to the Manual include the following:

1. Industry standard cross sections are used in dimensions, section properties, strength tables and charts and example problems. Properties of SSMA studs and tracks are tabulated and used in the example problems. Properties of Cs and Zs equivalent to LGSI sections are tabulated and used in example problems.
2. New example problems that highlight new web opening, built-up compression member and connection shear lag provisions are included in the Manual.
3. New design tables are provided for arc spot weld tension strength and screw pull-over.
4. New test methods for cold-formed steel products have been incorporated in the Manual.
5. Updates of all other materials specified in Chapter A of the Specification are reflected in the Manual. Also, newly approved ASTM steels have been added while obsolete steels have been deleted.

The next edition of the Manual is expected to be available in July of 2003. For information pertaining to purchase of the Manual contact Dr. Helen Chen at AISI, 202-452-7134.

Visit the AISI website at [www.steel.org](http://www.steel.org).

## AISI Promotes Boring to Vice President of Construction Market Development

The American Iron and Steel Institute (AISI) announced today that Delbert F. Boring, P.E. has been promoted to vice president of construction market development. Previously, Mr. Boring was senior director of construction. He has provided professional direction and leadership to AISI's construction market program for 26 years.

"This promotion is a strong endorsement of Del Borings's leadership in our efforts to grow the construction market for North American steel," said David C. Jeanes, senior vice president of market development for AISI. "Del is respected throughout the steel and construction industries for his expertise in codes and standards development in the commercial and residential framing markets. This promotion is well-deserved recognition of his work over the years by AISI's Board of Directors, and reinforces the importance of the construction market to the North American steel industry. Construction is the largest consuming industry for steel products and affords unique opportunities for continued growth."

During Mr. Boring's tenure with AISI, he has managed steel industry participation in the development of U.S. and Canadian building codes and has participated in the activities of model building code organizations. He has also served as the leading steel industry authority on structural fire protection. He currently directs the activities of AISI's Construction Market program, which encompasses 11 markets in transportation/infrastructure and commercial and residential buildings.

Mr. Boring is a 1971 graduate of The Ohio State University (B.S.C.E) and received a master's degree in structural engineering from Ohio State in 1979. He is a registered professional engineer, and the co-author of four publications on fire protection.

He was awarded with the prestigious ANSI (American National Standards Institute) Meritorious Service Award in 2000 in recognition

of his significant contributions to the voluntary consensus standards system. He received the ASTM (American Society for Testing and Materials) Award of Merit in 1990 and the ASTM Committee E-5 Award of Recognition in 1986 and 1989.

AISI's Construction Market program is supported through an investment by the following AISI member companies: Bethlehem Steel Corporation, Dofasco Inc., IPSCO Inc., Ispat Inland Inc., National Steel Corporation, Nucor Corporation, Rouge Steel Company, Stelco, Inc., United States Steel Corporation, USS-POSCO Industries, and Weirton Steel Corporation.

The American Iron and Steel Institute is a non-profit association of North American companies engaged in the iron and steel industry. The Institute comprises 33 member companies, including integrated and electric furnace steel makers, and 140 associate and affiliate members who are suppliers to, or customers of, the steel industry. For more information about AISI's Construction Market program, visit [www.steel.org](http://www.steel.org).

### Fisher Named as SJI Consulting Engineer

The Steel Joist Institute has announced that Jim Fisher has been named as the new SJI consulting engineer. Dr. Fisher is Vice President of Computerized Structural Design, Inc., a Milwaukee, Wisconsin Consulting Engineering firm. He is a long time member of both the AISC and AISI specification committees, is well known and respected in the design and code community, has considerable joist design experience and is the author of many books on structural design. Dr. Fisher will assume responsibilities from Theodore V. Galambos, who is retiring.



## AISI Announces Errata to North American Specification for the Design of Cold-Formed Steel Structural Members 2001 Edition

### Corrections Released on January 10, 2003:

1. On line 20 of page 38, change "...60 (450)..." to "...60 (410)...".
2. On line 10 from the bottom of page 39, change the text to "For  $w/t \leq 0.067E/F_y$ ".
3. On line 7 from top of page 75, change the text to "..., corner radii  $\geq 2t$ ".
4. On page 87, revise the text of the definition for  $P_n$  to "...in accordance with Sections C4 and C6". On the same page, revise the text of the definition for  $P_{no}$  to "in accordance with Sections C4 and C6, ...".
5. On page 89, change Eq. C5.2.2-4 and Eq. C5.2.2-5 to the following, accordingly:

$$\alpha_x = 1 - \frac{\bar{P}}{P_{Ex}} \quad (\text{Eq. C5.2.2-4})$$

$$\alpha_y = 1 - \frac{\bar{P}}{P_{Ey}} \quad (\text{Eq. C5.2.2-5})$$

6. On page 92, add the parentheses to the denominator terms as follows:
 
$$R = F_y / (2F_e) \leq 1.0 \quad (\text{Eq. C6.2-6})$$
7. On page 109, add the unit to constant "3" and add the corresponding conversion as follows:
 
$$t d_a F_u \leq 3 \text{ kips (13.34 kN)}$$
8. On page A2, revise the text of the second bullet to "bolted connections, and"

## MCA Announces Winners of the 2002 Student Design Competition

This year's MCA Student Design Competition drew 94 outstanding entries from advanced level students of architecture in North America and around the world. Students were challenged to design an outdoor band and performance pavilion by creatively utilizing metal construction components. The architectural firm of Otis Koglin Wilson developed specifications for the projects and the Chicago Park District designated a site in Washington Park, on the city's south side, to give the competition a real-life context. Entries were judged by a panel of architects

using criteria based on creative use of metal, effectiveness in meeting needs, efficient implementation of building systems, and consideration to preserving/improving the surrounding environment. Pictures of the winning entries will be posted online at the "MCA Design Awards" page at [www.metalconstruction.org](http://www.metalconstruction.org).

Cash prizes for the top three winners will be awarded to the students, their advisors, and their schools: 1st Place - Andrew Lind, Anthony Round, Ivan Ilic of the School of Ar-

chitecture, University of Waterloo, Waterloo, Ontario, Canada; 2nd Place - Manuel Blanco-Logueira of Southern California Institute of Architecture, Los Angeles, CA; Janneke van Eck of the College of Architecture, Illinois Institute of Technology, Chicago, IL; Honorable Mention - Tonya R. Cantwell, Architecture Dept., University of Texas at Arlington, Arlington, TX; Joe Le, School of Architecture, Oklahoma State University, Stillwater, OK; Chris Lilly, School of Architecture, Oklahoma State University, Stillwater, OK.

# CCFSS Offers Research Reports Free of Charge

The Wei-Wen Yu Center for Cold-Formed Steel Structures is offering several University of Missouri - Rolla Research Reports free of charge, **excluding shipping**. Anyone interested in obtaining these publications may contact Christina Stratman by e-mail at ccfss@umr.edu; or phone (573) 341-4471; or fax (573) 341-4476. Shipping quotes are available.

The following publications are available from the Center while supplies last:

**(72-5) The Structural Behavior of Cold-Formed Steel Members with Perforated Elements** - Final Report, May 1972 by Charles S. Davis & W.W. Yu

**(75-1) Study of Cold-Formed Steel Structural Members Made of Thick Sheets and Plates** - Final Report, April 1975 by W.M. McKinney, V.A.S. Liu & W.W. Yu

**(78-1) Structural Behavior of Beam Webs Subjected to Bending Stress** - Final Report, June 1978 by R.A. LaBoube & W.W. Yu

**(78-2) Webs for Cold-Formed Steel Flexural Members** - Structural Behavior of Beam Webs Subjected Primarily to Shear Stress - Final Report, June 1978 by R.A. LaBoube & W.W. Yu

**(78-3) Webs for Cold-Formed Steel Flexural Members** - Structural Behavior of Beam Webs Subjected to a Combination of Bending and Shear - Final Report, June 1978 by R.A. LaBoube & W.W. Yu

**(78-4) Webs for Cold-Formed Steel Flexural Members** - Structural Behavior of Beam Webs Subjected to Web Crippling and a Combination of Web Crippling and Bending - Final Report, June 1978 by N. Hetrakul & W.W. Yu

**(78-5) Webs for Cold-Formed Steel Flexural Members** - Structural Behavior of Transversely Reinforced Beam Webs - Final Report, July 1978 by N. Phung & W.W. Yu

**(78-6) Webs for Cold-Formed Steel Flexural Members** - Structural Behavior of Lon-

gitudinally Reinforced Beam Webs - Final Report, July 1978 by N. Phung & W.W. Yu

**(79-1) Load and Resistance Factor Design of Cold-Formed Steel** - Study of Design Formats and Safety Index Combined with Calibration of the AISI Formulas for Cold Work and Effective Design Width - 1st Progress Report, Jan. 1979 by T-N Rang, T.V. Galambos & W.W. Yu

**(79-2) Load and Resistance Factor Design of Cold-Formed Steel** - Statistical Analysis of Mechanical Properties and Thickness of Materials Combined with Calibration of the AISI Design Provisions on Unstiffened Compression Elements and Connections - 2nd Progress Report, Jan. 1979 by T-N. Rang, T.V. Galambos & W.W. Yu

**(79-3) Load and Resistance Factor Design Provisions on Connections and Axially Loaded Compression Members** - 3rd Progress Report, Jan. 1979 by T-N. Rang, T.V. Galambos & W.W. Yu

**(79-4) Load and Resistance Factor Design of Cold-Formed Steel** - Calibration of the Design on Laterally Unbraced Beams and Beam-Col. - 4th Progress Report, Jan. 1979 by T-N. Rang, T.V. Galambos & W.W. Yu

**(79-5) Load and Resistance Factor Design of Cold-Formed Steel** - Calibration of the Design Provisions on Beam Webs - 5th Progress Report, Sept. 1979 by B. Supornsiliphachai, T. V. Galambos & W.W. Yu

**(80-1) Load and Resistance Factor Design of Cold-Formed Steel** - Tentative Recommendations - Load and Resistance Factor Design Criteria for Cold-Formed Steel Structural Members and Commentary Thereon - 6th Progress Report, March 1980 by T.V. Galambos & W.W. Yu

**(81-1) Bolted Connections in Cold-Formed Steel Structures** - Final Report, Jan. 1981 by W.W. Yu & R.L. Mosby

**(81-2) Web Crippling and Combined Web Crippling and Bending of Steel Decks** - April 1981 by W.W. Yu

**(83-1) Design of Automotive Structural Components Using High Strength Sheet Steels** - 1st Progress Report, Jan. 1983 by W.W. Yu, C. Santaputra & M. B. Parks

**(83-3) Design of Automotive Structural Components Using High Strength Sheet Steels** - Mechanical Properties of Materials - 2nd Progress Report, Aug. 1983 by M. B. Parks & W.W. Yu

**(83-4) Design of Automotive Structural Components Using High Strength Sheet Steels** - Strength of Beam Webs - 3rd Progress Report, Aug. 1983 by C. Santaputra & W.W. Yu

**(83-5) Design of Automotive Structural Components Using High Strength Sheet Steels** - Preliminary Study of Members Consisting of Flat and Curved Elements - 4th Progress Report, Aug. 1983 by B. Parks & W.W. Yu

**(84-1) Design of Automotive Structural Components Using High Strength Sheet Steels** - Structural Behavior of Beam Webs Subjected to Web Crippling and a Combination of Web Crippling and Bending- 5th Progress Report, Oct. 1984 by C. Santaputra & W.W. Yu

**(84-2) Design of Automotive Structural Components Using High Strength Sheet Steels** - Status Report on the Study of Members Consisting of Flat and Curved Elements - 6th Progress Report, Oct. 1984 by B. Parks & W.W. Yu

**(85-1) Design of Automotive Structural Components Using High Strength Sheet Steels** - Results and Evaluation of Stub Column Tests for Unstiffened Curved Elements - 7th Progress Report, Sept. 1985 by B. Parks & W. W. Yu

**(85-2) Load and Resistance Factor Design of Cold-Formed Steel** - Revised Tentative Recommendations - Load and Resistance Factor Design Criteria for Cold-Formed Steel Structural Members with Commentary - 7th Progress Report, Sept. 1985 by T.V. Galambos & W.W. Yu

**(85-3) Load and Resistance Factor Design of Cold-Formed Steel** - Comparative Study of Design Methods for Cold-Formed Steel - 8th Progress Report, Sept. 1985 by B. K. Snyder, L-C. Pan & W.W. Yu

**(86-1) Design of Automotive Structural Components Using High Strength Sheet Steels** - Web Crippling of Cold-Formed Steel Beams - 8th Progress Report, Aug. 1986 by C. Santaputra & W.W. Yu

**(87-2) Design of Automotive Structural Components Using High Strength Sheet Steels** - Structural Behavior of Members Consisting of Flat and Curved Elements - 9th Progress Report, Jun. 1987 by M.B. Parks & W.W. Yu

**(88-2) Load and Resistance Factor Design of Cold-Formed Steel** - Calibration of the AISI Design Provisions - 9th Progress Report, Feb. 1988 by L.W. Hsaio, W.W. Yu & T.V. Galambos

**(88-3) Resistance Factor Design of Cold-Formed Steel** - Load and Resistance Factor Design Specifications for Cold-Formed Steel Structural Members with Commentary - 10th Progress Report, Feb. 1988 by L.E. Hsaio, W.W. Yu & T.V. Galambos

**(88-4) Load and Resistance Factor Design of Cold-Formed Steel** - Comparative Study of Design Methods for Cold-Formed Steel - 11th Progress Report, Feb. 1988 by L-E. Hsaio, W.W. Yu & T.V. Galambos

**(88-5) Design of Automotive Structural Components Using High Strength Sheet Steels** - Structural Strength of Cold-Formed Steel I-Beams and Hat Sections - 10th Progress Report, Jun. 1988 by S-H. Lin, L-E. Hsaio, C-L. Pan and W.W. Yu

**(88-6) Load and Resistance Factor Design of Cold-Formed Stainless Steel** - Statistical Analysis of Material Properties and Development of the LRFD Provisions - 4th Progress Report, Oct. 1988 by S-H. Lin, W.W. Yu & T.V. Galambos

**(89-4) Design of Automotive Structural Components Using High Strength Sheet Steels** - The Effect of Strain Rate on Mechanical Properties of Sheet Steels - 11th Progress Report, Jan. 1989 by M. Kassar & W.W. Yu

**(89-5) Load and Resistance Factor Design of Cold-Formed Steel** - Load and Resistance Factor Design Specification for Cold-Formed Steel Structural Members with Commentary - 12th Progress Report, Aug. 1989 by L-W. Hsiao

**(90-1) Design of Automotive Structural Components Using High Strength Sheet Steels** - Structural Strengths of Cold-Formed Steel Members Under Dynamic Loads - 12th Progress Report, May 1990 by M. Kassar & W.W. Yu.

**(90-2) Design of Automotive Structural Components Using High Strength Sheet Steels** - Effect of Strain Rate on Material Properties of Sheet Steels and Structural Strengths of Cold-Formed Steel Members - 14th Progress Report, May 1990 by M. Kassar & W.W. Yu

**(90-3) Design of Automotive Structural Components Using High Strength Steels** - Structural Strength of Cold-Formed Steel Members Under Dynamic Loads - 15th Progress Report, Nov. 1990 by CL. Pan & W.W. Yu

**(90-4) Load and Resistance Factor Design of Cold-Formed Steel** - Reliability-Based Criteria for Cold-Formed Steel Members - 14th Progress Report, Aug. 1990 by L-E. Hsiao, W.W. Yu & T.V. Galambos

**(91-2) Illustrative Examples Based on the ASCE Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members** - Final Report, Dec. 1991 by S-H. Lin, W.W. Yu & T. V. Galambos

**(91-3) Tensile Strength of Welded Connections** - Final Report, Jun. 1991 by R.A. LaBoube & W.W. Yu

**(91-4) Design of Automotive Structural Components Using High Strength Sheet Steels** - Structural Strength of Cold-Formed Steel Beams Under Dynamic Loads - 16th Progress Report, Sept. 1991 by C-L. Pan & W.W. Yu

**(92-1) The Effect of Flange Restraint on Web Crippling Strength** - Final Report, Mar. 1992 by B.H. Bhakta, R.A. LaBoube & W.W. Yu

**(92-3) Design of Automotive Structural Components Using High Strength Sheet Steels** - Influence of Strain Rate on Material Properties of Sheet Steels and Structural Strengths of Cold-Formed Steel Members - 18th Progress Report, Dec. 1992 by C-L. Pan & W.W. Yu

**(94-1) Tensile and Bearing Capacities of Bolted Connections** - 1st Summary Report, May 1994 by J.L. Carril, R.A. LaBoube & W.W. Yu

**(94-2) Behavior of Web Elements with Openings Subjected to Bending, Shear and the Combination of Bending and Shear** - Final Report, May 1994 by M-Y. Shan, R.A. LaBoube & W.W. Yu

**(94-3) Structural Behavior of Perforated Web Elements of Cold-Formed Steel Flexural Members Subjected to Web Crippling and a Combination of Web Crippling and Bending** - Final Report, May 1994 by J.E. Langan, R.A. LaBoube & W.W. Yu

**(95-2) The Effect of Flange Restraint on Web Crippling Strength of Cold-Formed Steel Z- and I-Sections** - Final Report, May 1995 by D.E. Cain, R.A. LaBoube & W.W. Yu

**(95-3) Behavior of Compression Web Members in Cold-Formed Steel Truss Assemblies** - 1st Summary Report, Aug. 1995 by M.M. Harper, R.A. LaBoube & W.W. Yu

**(95-5) Strength of Flexural Members Using Structural Grade 80 of A653 and Grade E of A611 Steels** - 1st Progress Report, Oct. 1995 by S. Wu, W.W. Yu & R.A. LaBoube

**(96-1) Behavior of Compression Web Members in Cold-Formed Steel Truss Assemblies** - J.A. Riemann, R.A. LaBoube & W.W. Yu

**(96-4) Strength of Flexural Members Using Structural Grade 80 of A653 Steel (Web Crippling Tests)** - 2nd Progress Report, Nov. 1996 by S. Wu, W.W. Yu & R.A. LaBoube

(Continued on next page)

(Continued from previous page)

**(97-1) Design of Automotive Structural Components Using High Strength Sheet Steels, Mechanical Properties (Aging Effect)** - 21st Progress Report, Jan. 1997 by S. Wu, C-L. Pan and W.W. Yu

**(97-3) Strength of Flexural Members Using Structural Grade 80 of A653 Steel (Web Crippling Tests)** - 3rd Progress Report, Feb. 1997 by S. Wu, W.W. Yu & R.A. LaBoube

**(97-4) Screw and Welded Connection Be-**

**havior Using Structural Grade 80 of A653 Steel (A Preliminary Study)** - 4th Progress Report, June 1997 by E.N. Koka, W.W. Yu & R.A. LaBoube

**(97-5) Behavior of Web Elements with Openings Subjected to Linearly Varying Shear** - Final Report, Jan. 1997 by M.R. Eiler, R.A. LaBoube & W.W. Yu

**(97-6) Spacing of Connection in Compression Elements for Cold-Formed Steel Members** - Summary Report, Dec. 1997 by M.L. Jones, R.A. LaBoube, W.W. Yu

**(98-1) Design of Automotive Structural**

**Components Using High Strength Sheet Steels** - Transformed Section Method for Calculation of Yield Moment of Cold-Formed Steel Hybrid Beams - 22nd Progress Report, Feb. 1998 by C-L. Pan & W.W. Yu

**(98-3) Determination of the Tensile and Shear Strengths of Screws and the Effect of Screw Patterns on Cold-Formed Steel Connections** - 1st Summary Report, Dec. 98 by M.A. Sokol, R.A. LaBoube & W.W. Yu.

**(99-1) Design of Cold-Formed Steel Structural Members and Connections for Cyclic Loading (Fatigue)** - Final Report, July 1999 by R. A. LaBoube & W.W. Yu

## Calendar

March 27-28, 2003  
Meeting of the AISI Committee on Framing Standards  
New Orleans, LA  
Contact: madeboyeku@steel.org

March 28, 2003  
LGSEA Meetings  
New Orleans, LA  
www.lgsea.com

April 2-4, 2003  
AISC North American Steel Construction Conference  
Baltimore, MD  
www.aisc.org/Content/NavigationMenu/Events\_Calendar/About\_NASCC/2003\_

April 2-5, 2003  
SSRC Annual Technical Session and Meeting  
Baltimore, MD  
www.aisc.org/Content/NavigationMenu/Events\_Calendar/About\_NASCC/2003\_

June 23-25, 2003  
ASSCCA '03  
Advances in Structures: Steel Composite and Aluminum  
Sydney, Australia  
www.civil.usyd.edu.au/asscca03

July 24-25, 2003  
Meeting of the AISI Committee on Specifications  
Contact: madeboyeku@steel.org

August 5-7, 2003  
Metal Construction Association Semi-Annual Meeting  
Indianapolis, IN  
www.metalconstruction.org

October 14-16, 2003  
18th Short Course on Design of Cold-Formed Steel Structures  
St. Louis, MO  
http://web.umn.edu/~ccfss/conted&seminars.html

October 28-30, 2003  
LGSEA Meetings  
Tampa, FL  
www.lgsea.com

October 28-30, 2003  
Metalcon International  
Tampa, FL  
www.metalcon.com/

June 22-24, 2004  
4th International Conference on Thin-Walled Structures  
Loughborough, Leicestershire, UK  
www.lboro.ac.uk/departments/tt/ictws2004

November 4-5, 2004  
17th International Specialty Conference on Cold-Formed Steel Structures  
Orlando, FL  
http://web.umn.edu/~ccfss/conted&seminars.html

The *CCFSS News* and *CCFSS Technical Bulletin* are published bi-annually to the Center's website. Current and past volumes of each publication may be viewed in PDF format by directing your browser to <http://www.umn.edu/~ccfss/newsletters&bulletins.html>.

To receive the *CCFSS News* and *CCFSS Technical Bulletin* by e-mail, as well as brochures and other announcements by regular mail, please contact the Center at [ccfss@umn.edu](mailto:ccfss@umn.edu) and provide us with both your e-mail and physical mailing addresses.