



UNIVERSITY OF MISSOURI-ROLLA

DIRECTOR: ROGER A. LABOUBE, PH.D., P.E.  
FOUNDING DIRECTOR: WEI-WEN YU, PH.D., P.E.

VOLUME 16, NUMBER 1  
SPRING 2007

## 18th International Specialty Conference Was Held in Orlando, Florida

The 18th International Specialty Conference on Cold-Formed Steel Structures was held on October 26 and 27, 2006 in Orlando, Florida. The Conference was presented by the Wei-Wen Yu Center for Cold-Formed Steel Structures. Other conference sponsors included American Iron and Steel Institute, Metal Building Manufacturers Association, Metal Construction Association, Rack Manufacturers Institute, Steel Deck Institute, and Steel Stud Manufacturers Association. This event was designed to bring together leading scientist, researchers, educators, and engineers who have engaged in the field of research and design of cold-formed steel structures for discussion of recent research findings and design considerations.

As in previous specialty conferences which have been held since 1971, this conference included presentations of technical papers and the publication of a volume of conference proceedings. A total of 45 papers were scheduled for presentation in several areas of interest to include: Element Behavior, Flexural Members, Floor Joists and Floor Assemblies, Compression Members, Rack and Frame Structures, Wall Studs and Wall Assemblies, Building Roof Systems, Design Standards and Guides Development, and Connections. For a brief abstract of the papers refer to the Spring 2006 Edition of the CCFSS Technical Bulletin at [www.umn.edu/ccfss](http://www.umn.edu/ccfss).

For more information regarding the conference visit the Center's website at [www.umn.edu/ccfss](http://www.umn.edu/ccfss), or contact the Center by e-mail at [ccfss@umn.edu](mailto:ccfss@umn.edu) or phone 573-341-4471.

## AISI Committee on Framing Standards Update

**Jay W. Larson, P.E., F. ASCE**  
**American Iron and Steel Institute**

The AISI Committee on Framing Standards (COFS) met in conjunction with the 18th International Specialty Conference on Cold-Formed Steel Structures in the fall of 2006, and continued its work towards development of a full suite of new and updated standards.

In the fall of 2006, the COFS released a Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings, 2001 Edition

with Supplement 2 and a Code of Standard Practice for Cold-Formed Steel Structural Framing, 2006 Edition with Commentary.

In early 2007, the COFS gained ANSI approval of a new North American Standard for Cold-Formed Steel Structural Framing - Product Data, and updated North American editions of its standards on General Provisions, Header Design and Truss Design. Work by the COFS continues on North American editions of its standards on Lateral Design and Wall Stud Design,

along with new standards on Floor and Roof System Design and Load and Span Tables.

These documents provide a suite of documents intended to help sustain the growth of the cold-formed steel structural framing industry. Committee activity is also directed towards the necessary research and development to support the maintaining and periodical upgrading of these documents. Research proj-

continued on page 3 -  
See Framing Standards

# AISI Committee on Specification Meets

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

Research reports were presented on several AISI sponsored research projects. Direct Strength Method for Perforated Members is the focus of a study reported on by Dr. Ben Schafer. Chia-Ming Uang reported on a study that is focused on seismic design of cold-formed steel structures. A report on the progress of the second edition of the AISI Cold-Formed Steel Framing Design Guide was provided by Tom Trestain. Dr. Steve Fox updated the committee on the study of the stud bottom track connection. The Virginia Tech study of deep cellular deck diaphragms was the topic of discussion by Dr. Sam Easterling. Dr. Perry Green discussed the topic of structural integrity/progressive collapse and the on going activities of the NCSEA ad hoc committee. Dr. Helen Chen and Jay Larson, AISI staff, provided an overview of the new AISI website.

The Committee is working toward the development of a 2007 edition of the Specification. A major focus of the meetings was the review of potential new specification changes. Several enhancements to and/or additions to the Specification were adopted at the meetings. These enhancements or additions pertained to the following:

1. Section E4 - change to the screw head geometry
2. Sections A9 and D4 - the AISI cold-formed steel framing standards were adopted
3. Section B2.2 - reformatting of the provisions for uniformly compressed stiffened elements with holes
4. Section C4 - editorial change
5. Section D3.3 - A new provision for design of bracing of axially loaded compression members.
6. Section C3.1.5 - Revision to the design for standing seam roof panel systems
7. Section A2.1 - Modifications to several ASTM referenced materials.

In addition to the above changes, the Committee agreed to a reformat of the Specification that will alter the order or sequence of provisions in the Specification.

The next meeting of the Committee on Specification is scheduled for July, 2007.

## Metal Construction Association Publishes "Understanding the Rainscreen Principle"

February 28, 2007, Glenview, IL – A new resource for the design and construction communities helps clarify the key principles and background of the two accepted rainscreen systems -- drained/back-ventilated (D/BV) and pressure-equalized/compartimented (PER). This valuable document clears up the increasing confusion and misinformation about these pressure equalized rainscreen systems that are metal-based cladding systems rapidly growing in use in domestic commercial building markets.

The document has been prepared by a task force of the Metal Construction Association (MCA) to educate design-

ers and installers on the proper details and basic performance levels of the rainscreen approach to controlling rainwater penetration while offering venting and drying potential.

"MCA members were very concerned that the level of confusion about the different rainscreen principles would cause inferior systems to be designed and used on buildings in a manner that would not be satisfactory to building owners. Because this viable approach to moisture control is quickly growing in use we felt it was important to take action now to correct any misunderstandings about how to create the most effective design and installation

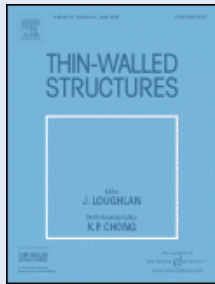
methods for this type of wall construction material," noted MCA Technical Director Scott Kriner.

The document clarifies details of the D/BV and PER rainscreen principles and offers conceptual illustrations for their design. It also notes the importance of coordinating the integral elements of the system, such as outer leaf, insulation, air/vapor barrier and inner leaf, to ensure satisfactory performance. Testing documentation and additional reference sources are also included in the new publication titled

**continued on page 4 -  
See Rainscreen**

# *Thin-Walled Structures* founding editor Rhodes retiring, colloquium to be held

A colloquium will be held to mark the retirement of Professor Jim Rhodes of the Department of Mechanical Engineering, University of Strathclyde, and founding editor of the Thin Walled Structures Journal.



Thin Walled Structures



Institution of Mechanical Engineers

Professor Rhodes has been involved with all aspects of thin-walled structures technology both in industry and in academia throughout his entire working life and so it is fitting that the conference should reflect this theme. The conference is being held at the University of Strathclyde in the Court-Senate Suite and is being sponsored by the Thin-Walled Structures Journal, published by Elsevier, and the Institution of Mechanical Engineers.

#### Scope of Conference

The scope of the conference reflects the aims of the Thin-Walled Structures Journal. Thin-walled structures comprise an important and growing proportion of engineering construction with areas of application becoming increasingly diverse, ranging from aircraft, bridges, ships and oil rigs to storage vessels, industrial buildings and warehouses. Many factors, including cost and weight economy, new materials and processes and the growth of powerful methods of analysis have contributed to this growth, and led to the need for a journal which concentrates specifically on structures in which problems arise due to the thinness of the walls. This includes cold-formed sections, plate and shell structures, reinforced plastics structures and aluminium structures, and the applications thereof. These structures and systems have great relevance to many branches of mechanical and civil engineering.

The principal criterion for consideration of papers in the conference is that they must be concerned with thin-walled structures or the basic problems inherent in thin-walled structures. Papers on theoretical analysis and treatment, experimental techniques and practice, design approaches and analysis, along with the applications and developments of codes and standards are all welcome.

#### Framing Standards - continued from page 1

ects are underway to investigate the Performance of Cold-Formed Steel Strap Braced Walls, Rotational Restraint of Sheathing and Sheathing Braced Design of Wall Studs, and to establish a Wider Range of Options for Sheet Steel Shear Walls.

The next meetings of the COFS will be in Dallas, TX on April 24 and 25, 2007. For more information about the activities of the COFS, please check the AISI website at [www.steel.org](http://www.steel.org) or contact Jay W. Larson at [jl Larson@steel.org](mailto:jl Larson@steel.org).

#### Wei-Wen Yu Textbook

The Third Edition of Cold-Formed Steel Design by Wei-Wen Yu is available at a discounted publishers price of \$115. The order form for this book can be accessed from the Center's website [www.campus.umar.edu/ccfss](http://www.campus.umar.edu/ccfss).

## Teoman Pekoz Receives AISI Award

At the February 20, 2007, dinner of the AISI Committee on Specifications, Professor Teoman Pekoz of Cornell University was honored for his contributions to the cold-formed steel research and development of design specifications. The citation from Teoman's plaque reads "American Iron and Steel Institute presents this Award of Appreciation to Mr. Teoman B. Pekoz in recognition for forty years of outstanding leadership and technical service to the steel industry through participation on the AISI Committee on Specifications."

Since 1965, Teoman has conducted and directed numerous research projects on cold-formed steel structural members, connections, and structural framing systems. He has authored major portions of the Specifications and Recommendations on Cold-Formed Steel Structures in the United States and Europe. He is currently a member or chair of several committees working on the American and European design specifications and recommendations. In 2003, Teoman received the Structural Engineering Institute's Shortridge Hardesty Award in recognition for his sustained and substantial contributions to the field of stability during his career of active teaching and research. He was also awarded an Honorary Professorship by Xian Institute of Metallurgy and Construction Engineering, Xian, People's Republic of China. At Cornell, Teoman was elected Chi Epsilon Outstanding Professor of the year in 1981. He was a visiting professor at several universities in Europe, and over the years has conducted short courses both in the United States and abroad.



**Professor Teoman Pekoz, right, pictured here with Dr. Wei-Wen Yu, was honored February 20, 2007, at the AISI Committee on Specifications dinner for his contributions in the field of cold-formed steel and design specification development.**

### Rainscreen - continued from page 2

"Understanding the Rainscreen Principle." It is available for download on the MCA Web site at [www.metal-construction.org/pubs/pdf/mca07\\_Rainscreen.pdf](http://www.metal-construction.org/pubs/pdf/mca07_Rainscreen.pdf).

Members of the MCA task force who researched the topic and authored the document include: J. David Clapperton, principal of Austell, GA-based The Miller-Clapperton Partnership, Inc.; Bill Yannetti, senior manager-technical service, for Chesapeake, VA-based ALPOLIC Mitsubishi Chemical America, Inc.; Arthur Pinkham, AIA, director of technical services for Cambridge, MA-based RHEINZINK America Inc.; and Keith D. Boyer, P.E., director/design and development for Moon Township,

PA-based CENTRIA.

MCA is an organization of manufacturers and suppliers whose metal products are used in structures throughout the world. The association promotes the use of metal in construction through education, marketing support, technical programs, monitoring of industry issues and achievement awards. For more information about MCA, visit [www.metal-construction.org](http://www.metal-construction.org).

MCA's flagship event is METALCON International, a trade show and conference with a 38-session educational program and product exhibits from more than 400 companies. The 18th annual METALCON is slated for October 3-5, 2007 at the Las Vegas Convention Center. For more information visit [www.metalcon.com](http://www.metalcon.com).

## Metal Construction Association Elects New Board Members

January 30, 2007, Glenview, IL -- At their recently held annual meeting, members of the Metal Construction Association (MCA) elected three members to its current Board of Directors. They are: Bill Croucher, Fabral, Lancaster, PA; Brian Partyka, Drexel Metals Corp, Ivyland, PA; and Joel Voelkert, Rigid Building Systems, Houston, TX. Partyka and Voelkert have not previously served on the board of directors but Croucher was an MCA board member from 2000 to 2003. Partyka serves on MCA's Program Committee and Voelkert is co-chair of The Metal Initiative, an MCA-backed coalition of manufacturers, individuals and associations providing information about metal in construction to the professional building owner community.

Other members of the 2007-2008 board include: Ken Buchinger, MBCI, Houston, TX; Patrick Bush, US Steel Corp., Fairfield, AL; Peter Croft, Metro Roof Products, Oceanside, CA; Dave Hunt, Revere Copper Products Inc., Rome, NY; Todd Miller, Classic Products, Inc., Piqua, OH; John Peters, Alply, LLC, DeKalb, MS; Sid Peterson, Alcoa Architectural Products, Lisle, IL; Doug Pickens, Metl-Span I Ltd., Lewisville, TX; Renee Ramey, Steelscape, Inc., Kalama, WA; and Norbert Schneider, Umicore Building Products USA Inc., Raleigh, NC.

Continuing in their role as officers are: President, T.A. "Dick" Bus, ATAS International, Inc., Allentown, PA; Vice President, Jeff H. Irwin, MeTecno-Benchmark, Columbus, OH; Secretary, Randy Ridenour of Atlas Bolt & Screw Co. Ashland, OH; Treasurer, William H. Hippard, Precoat Metals, St. Louis, MO; Past President, Paul "Kit" Emert, Jr., Fabral, Lancaster, PA.

The MCA's 2007 annual meeting, held January 13-15 in Scottsdale, AZ, was attended by 124 current members, and 32 guests and potential members. The meeting focused on council and committee sessions to address technical and marketing programs.

Activities included a keynote address on Saturday, January 13, by John Anton, manager of steel service for Washington, D.C.-based Global Insight and ferrous metals industry analyst for the firm's cost information service. He discussed the global and domestic economic outlook and the effect on construction activity, including demand, supply, and price for key metals. A Power Point version of his presentation is available on the Members Only section of MCA's Web site, [www.metalconstruction.org](http://www.metalconstruction.org). On Sunday, January 14, a panel of architects provided MCA members with insight into how and why architects use metal and what industry suppliers can do to increase the use of metal in construction.

MCA's next national meeting is July 30-August 2, 2007 in New Orleans, LA. For more details visit [www.metalconstruction.org/join/index.cfm?pg=meet.htm](http://www.metalconstruction.org/join/index.cfm?pg=meet.htm).

MCA is an organization of manufacturers and suppliers whose metal products are used in structures throughout the world. The association promotes the use of metal in construction through education, marketing support, technical programs, monitoring of industry issues and achievement awards. Its flagship event is METALCON International, a trade show and conference with a 38-session educational program and product exhibits from more than 400 companies. The 18th annual METALCON is slated for October 3-5, 2007 at the Las Vegas Convention Center. For more information visit [www.metalcon.com](http://www.metalcon.com).

*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 on the Center's website [www.umn.edu/~ccfss](http://www.umn.edu/~ccfss).*

*To receive the **CCFSS News** and **CCFSS Technical Bulletin** by email, 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 email and physical mailing addresses.*

# Metal Construction Association Makes President's Awards for 2006 Projects

January 30, 2007, Glenview, IL -- At its recently held 2007 annual meeting in Scottsdale, AZ, the Metal Construction Association announced the winners of its 2006 President's Awards, an annual designation given projects submitted by MCA members. Top projects are selected in five categories: residential, commercial-industrial, municipal-institutional, metal roofing, and overall excellence. The awards were made to the MCA member companies as well as the architects and fabricators involved in each of the five winning projects. They honor the work and encourage more like it to show what metal can do and what MCA members have helped achieve with their innovative products. Photos of each winning project are posted on the MCA Web site, [www.metalconstruction.org](http://www.metalconstruction.org).

## Overall Excellence

The Boston Convention and Exhibition Center was voted the project showing overall excellence and most creative use of metal. The goal of this \$550 million project was to create a center to compete with cities across the country for large conventions and trade shows. Four years in the making, this stunning piece of architecture owned by the Massachusetts Convention Center Authority was built within budget and opened on time in June 2004.

The designers chose metal for the flexibility in color selection, the ability to mold it to various shapes and to stay within the established budget. The 1.6-million-square-foot facility used metal for structural support and architectural applications that include sweeping massive curves and support beams. Eighty-five percent of its exterior including the roof and walls was covered with metal. The center's long double-curved metal roof features 325-foot-long panels that were site formed using 455,000 square feet of .040 aluminum with a custom Duranar XLE metallic finish and 31,000 square feet of 24-gauge stainless steel panels. On either side of the curving roof are lower roofs covering the rest of the exhibit halls, meeting rooms and a food court.

MCA member companies involved in the project are MeTecno-Benchmark, Columbus, OH; MeTecno-Morin, Bristol, CT; and Metl-Span, Lewisville, TX. Designwall 2000V laminated architectural panels from MeTecno-Benchmark are used in vertical configurations all around the building, including 29,655 square feet of Designwall 2000V panels in a vertical orientation. The two-inch-thick panels provide an R-Value of 15 for insulating the entire perimeter of the building. The total soffit portion of the building is covered with 63,703 square feet of MeTecno-Benchmark's Designwall 1000V applied in a vertical orientation with a 1 1/8-inch thick expanded polystyrene core that provides an R-Value of five. Both Designwall systems consist of custom 30-inch wide panels made of .040 smooth aluminum with a Kynar 500/Hylar 5000 coating by Valspar in a designer white custom shade.

Metl-Span vertical panels are used in higher parts of the exterior as interior partition walls in two different areas. The first contains 106,770 square feet of Metl-Span CF-42, two-inch thick, 42-inch-wide panels with an exterior profile in Igloo White. The second uses 69,900 square feet of Metl-Span CF-36, a 36-inch-wide striated panel of .032 aluminum in Space Silver metallic finish.

MeTecno-Morin supplied horizontal panels and a standing seam roof that covers part of the structure, including 18-gauge stainless steel gutters and 700 squares of the SSR16 standing seam roof using 16-inch-wide aluminum panels in a silver Duranar XL coating from PPG. The horizontal configuration uses 816 squares of X12 panels in a concealed fastener system of aluminum with a Duranar XL coating from PPG, which clad the higher portions of the building's exterior.

Lymo Construction, Manchester, NH installed the exterior metal wall panel systems, standing seam roof, soffit areas, translucent wall systems and all the associated framing systems for each application. The project architect was a joint venture between Rafael Viñoly Architects, New York City and HNTB, Boston. Construction management included Clark Construction of Bethesda, MD, Huber Hunt and Nichols of Indianapolis, and Berry Construction of Boston.

## Residential

The winning residential project was the Joe Shepard residence in Kirkwood, MO owned by Joe Shepard and his wife Claire McCaskill, Missouri's former governor and now its U.S. Senator. The residence, adjoining garage, and separate pool house are topped by a beautiful and incredibly complex roof supplied by MCA member McElroy Metals, Bossier City, LA.

The project used 6,500 square feet of McElroy Medallion Lock panels made of 24-gauge Galvalume with a Tudor brown Kynar 500/Hylar 5000 finish. Most of the panels were trapezoid shapes installed on an 8:12 pitch roof. Architect for the home was Clayton Design Inc., Anacortes, WA; general contractor was Maple Park Development of Kirkwood; and the roof installer was Triton Architectural Metal, St. Louis, MO.

### **Commercial-industrial**

The U.S. Xpress Headquarters Companion Building in Chattanooga, TN was voted the winning project in the commercial-industrial category. It is the first of four buildings in a corporate campus being built by this technologically sophisticated trucking company that chose metal for the building to reflect the company's high-tech image.

The architect chose Alucobond metal composite material (MCM) made by MCA Member Alcan Composites, St. Louis, MO. The building uses approximately 40,000 square feet of MCM in an Express Slate metallic color with a three-coat Duranar XLE finish from PPG. The custom color was made by taking a standard color and increasing the metallic flake and gloss to enhance reflectivity. The panels were installed using the series 200 rout and return caulked joint system by panel fabricator John W. McDougall Company, Inc., Nashville, TN. The architect on the project was SSOE, Inc. of Nashville. General Contractor was EMJ Corp., Chattanooga.

### **Municipal-institutional**

The winning project in the municipal-institutional category was the St. Croix Chapel in West St. Paul, MN, a 6,400-square-foot addition to St. Croix Lutheran High School in West Saint Paul. The structure's crowning glory is the expanse of copper wall panels used on the exterior and interior. MCA member Firestone Metal Products/UNA-CLAD, Anoka, MN supplied 10,000 square feet of UNA-CLAD panels made of 16-ounce architectural grade sheet copper. Project architect was Kodet Architectural Group of Minneapolis. The general contractor was RJM Construction of Plymouth, MN, and the metal panel installer was Berwald Roofing of North St. Paul.

### **Metal Roofing**

Holy Family Catholic Church in Saint Petersburg, FL, was chosen the winning metal roofing project.

The church's unique roof fans out into sections surrounding a cross tower. It consists of 20,000 square feet of two inch Field-Lok Panels made of .032 smooth aluminum supplied by MCA member ATAS International, Allentown, PA. The roof's Kynar 500/Hylar 5000 finish in a premium coppertone color adds a warm and welcoming feature to the massive structure. The double lock standing seam system was installed with concealed clips and fasteners mechanically seamed in the field. The architect on the project was C. B. Goldsmith and Associates of Clearwater, FL. The metal roof installer was F.G. Metals of Largo, FL.

### **About MCA**

MCA is an organization of manufacturers and suppliers whose metal products are used in structures throughout the world. The association promotes the use of metal in construction through education, marketing support, technical programs, monitoring of industry issues and achievement awards.

The President's Awards are just one of MCA's award programs. Others include Scholarship Awards and the Student Design Competition. The Scholarship Awards offer architectural students financial aid and promote educational programs to develop knowledge of the wide range of durable and energy efficient metal construction products. MCA's Student Design Competition offers students in schools of architecture a chance to learn about designing and building with metal. Entrants must address architectural, structural, functional, cultural, and environmental issues in the design of a project that uses metal in sheets or other forms as well as metal structural members. Winning projects can receive up to \$2500 for the student, \$1500 for the school and \$500 for the faculty sponsor from MCA. For more information visit [www.metal-construction.org](http://www.metal-construction.org).

MCA also promotes the use of metal through its flagship event, METALCON International, a trade show and conference with a 38-session educational program and product exhibits from more than 400 companies. The 18th annual METALCON is slated for October 3-5, 2007 at the Las Vegas Convention Center. For more information visit [www.metalcon.com](http://www.metalcon.com).