



SSRC 2012 Annual Meeting
Tuesday April 17th, 2pm – 8pm

SS1: Tu 2:00-3:00 Technical Presentations: Topics in Stability Research

Moderator: Benjamin Schafer

Flexural and Axial Behaviour of CFRP Strengthened Steel Circular Hollow Section Beams and Short Columns

Jimmy Haedir, Xiao-Ling Zhao, Monash University, Clayton, VIC, Australia

Effects of Splice Configuration on Web Crippling of Lapped Cold-Formed Steel Channels Subjected to Interior Two-Flange Loading*

R. Quzzafi, K. Sennah, Ryerson University, Toronto, ON, Canada, S. Fox, Canadian Sheet Steel Institute, Cambridge, Canada

3D Second-Order Analysis of Industrial Buildings

Zacarias Martin Chamberlain Pravia, Ricardo A. Ficanha, University of Passo Fundo, Passo Fundo, Brazil

SS2: Tu 3:15-4:15 Technical Presentations: Angle and Cruciform Columns

Moderator: Ronald Ziemian

Flexural Buckling of Simply Supported Columns with "Rigid End Links" - the Key to Interpret Simply Supported Angle Column Test Results?

Enio Mesacasa, Jr., University of Sao Paulo, Sao Paulo, Brazil, Dinar Camotim, Pedro Borges Dinis, Technical University of Lisbon, Lisbon, Portugal, Maximiliano Malite, University of Sao Paulo, Sao Paulo, Brazil

Buckling, Post-Buckling, Strength and Design of Angle Columns

Pedro Borges Dinis, Dinar Camotim, Nuno Silvestre, Technical University of Lisbon, Lisbon, Portugal

Local Inelastic Buckling Behavior of HPS Cruciform Columns

Perry S. Green, Consultant, Myrtle Beach, USA

SS3: Tu 4:30-5:40 Task Group Meetings (Parallel breakout sessions for Task Groups)

Table 1: TG02 Members: stability of steel members

Chair: Don White

Table 2: TG03 Systems: stability of steel systems, especially frames

Chair: Chris Foley

TG Chairs Report at ~ 5:30

SS4: Tu 5:50-7:00 Task Group Meetings (Parallel breakout sessions for Task Groups)

Table 1: TG04: Stability of metal bridges and bridge components

Chair: Dan Linzell Vice-Chair: Qihong Zhao

Table 2: TG05 Thin-walled: Stability of thin-walled metal structures

Chair: Cris Moen, Vice-Chair: Cheng Yu

Table 3: TG06 Extreme Loads: stability under extreme loads, seismic, fire,

Co-Chairs: Amit Varma, Robert Tremblay

TG Chairs Report at ~ 6:50

SS5 Tu 7:00-7:15 SSRC Annual Business Meeting

SS6 Tu 7:15-8:00 SSRC Social Hour

**SSRC Annual Stability Conference / SSRC Track at the 2012 NASCC –
Wed. April 18th – Fri. April 20th - Preliminary Program**

S1 W 3:00-4:00 Advances in Stability Analysis and Design

Moderator: Ronald Ziemian

Welcome to the 2012 SSRC Annual Stability Conference

R. Ziemian, Bucknell University, Lewisburg, PA, USA

Stability Analysis and Design of Steel-Concrete Composite Columns*

Mark D. Denavit, University of Illinois at Urbana-Champaign, Urbana, IL, Jerome F.
Hajjar, Northeastern University, Boston, MA

First-Order Plastic Hinge Analysis of Thin-Walled Steel Beams using Generalized Beam Theory

Cilmar Basaglia, Dinar Camotim, Technical University of Lisbon, Lisbon, Portugal

S2 W 4:15-5:45 Stability of Purlins and Joists

Moderator: Clarence Miller

Flexural Strength of Exterior Metal Building Wall Assemblies with Rigid Insulation

Tian Gao, Cristopher D. Moen, Virginia Tech, Blacksburg, VA

GBT-Based Assessment of the Buckling Behavior of Cold-Formed Steel Purlins Partially
Restrained by Sheeting*

Andre Graca, Cilmar Basaglia, Dinar Camotim, Technical University of Lisbon, Lisbon,
Portugal, Rodrigo Goncalves, Universidade Nova de Lisboa, Lisbon, Portugal

Computational Studies Aimed at Defining Bridging Requirements for Steel Joists During
Erection*

Jonathan Eberle, Virginia Tech, Blacksburg, VA, Ronald D. Ziemian, Bucknell University,
Lewisburg, PA, Drew R. Potts, Pennsylvania College of Technology, Williamsport, PA

Capacity of Open-Web Joists Braced by a Standing-Seam Roofing System*

Luke Cronin, Ryan Fehr, Cristopher D. Moen, Virginia Tech, Blacksburg, VA

S3 Th 8:00-9:30 Bridge Stability and Bracing

Moderator: Donald White

Curvature Limitations of Non-Composite Girder Bridges at Construction Stage*

Imad Eldin Khalafalla, Khaled Sennah, Ryerson University, Toronto, ON, Canada

Optimizing Cross Frame Plan Orientation in a Horizontally Curved Steel Bridge - Is it Worth it?*

M. Sharafbayani, D.G. Linzell, Pennsylvania State University, University Park, PA

Axial Strength and Stiffness of Tubular Members with T-Stem and Cast Steel Connections*

Anthony Battistini, Weihua Wang, Todd Helwig, Michael Engelhardt, University of Texas at Austin, Austin, TX, Karl Frank, Hirschfeld Industries, Austin, TX

Study of Improved Cross Frames Behaviors by Full Size Laboratory Tests and FEM*

Weihua Wang, Anthony Battistini, Todd Helwig, Michael Engelhardt, University of Texas at Austin, Austin, TX, Karl Frank, Hirschfeld Industries, Austin, TX

S4 Th 10-11:30 Stability of Steel Shear Walls

Moderator: LeRoy Lutz

Special Plate Shear Wall

David J. Webster, University of Washington, Seattle, WA

Modified PFI Method for SPSWs with Moderate LYP Steel Infill Plates*

Tadeh Zirakian, Jian Zhang, University of California, Los Angeles, Los Angeles, CA

Cold-Formed Steel Sheet Sheathed Shear Walls in Mid-Rise Construction

C. Yu, N. Yanagi, University of North Texas, Denton, TX

Cold-Formed Steel Shear Walls in Ledger-Framed Buildings*

P. Liu, Northeastern University, China, C. Yu, University of North Texas, Denton, TX, B.W. Schafer, Johns Hopkins University, Baltimore, MD

S5 Th 1:15-2:15 Cold-Formed Steel Member Stability

Moderator: Roger LaBoube

Cross-Section Optimization using Simulated Annealing of Cold-Formed Steel Channel Columns

Zacarias Martin Chamberlain Pravia, Moacir Kripka, University of Passo Fundo, Passo Fundo, Brazil

Post-Buckling, Strength and Design of Cold-Formed Steel-Lipped Channel, Zed and Hat-Section Columns Affected by Local-Distortional Interaction*

Rui Fena, Pedro Borges Dinis, Dinar Camotim, Technical University of Lisbon, Lisbon, Portugal,

Stability of Sheathed Cold-Formed Steel Studs under Axial Load and Bending*

K.D. Peterman, B.W. Schafer, Johns Hopkins University, Baltimore, MD

S6 Th 3:00-4:00 Member Stability

Moderator: Dinar Camotim

Computed Strength of Uni-Axially Loaded Battened Columns Composed of Four Cold Formed Angles

Mohamed A. El Aghoury, Adel H. Salem, Ain Shams University, Cairo, Egypt, Maged T. Hanna, National Housing and Building Research Center, Cairo, Egypt, Essam A. Amoush, Higher Technological Institute, Cairo Egypt

Influence of Imperfections in FEM Modeling of Lateral Torsional Buckling

N. Boissonnade, College of Engineering and Architecture of Fribourg, Fribourg, Switzerland, H. Somja, National Institute of Applied Sciences of Rennes, Rennes, France

Influence of Weak-Axis Flexural Yielding on Strong-Axis Buckling Strength of Wide Flange Columns

Christopher D. Stoakes, University of Iowa, Iowa City, Iowa, Larry A. Fahnestock, University of Illinois at Urbana-Champaign, Urbana, IL

S7 Th 4:15-5:15 Member Stability under Fire

Moderator: Amit Varma

Enhancing the Stability and Fire Performance of HSS Columns through Light-weight Concrete Filling

V.K.R. Kodur, T. Haan, Michigan State University, Lansing, MI

On the Influence of the Constitutive Law on the DSM Design of Cold-Formed Steel Columns Failing Distortionally under Fire Conditions

Alexandre Landesmann, COPPE, Federal University of Rio de Janeiro, Brazil, Dinar Camotim, Technical University of Lisbon, Lisbon, Portugal

Cross-Sectional Stability of Structural Steel at Elevated Temperatures

M. Seif, T. McAllister, National Institute of Standards and Technology, Gaithersburg, MD

S8 F 8:00-9:30 Castellated/Cellular and Corrugated Web Beams

Moderator: Andrea Surovek

Lateral Torsional Buckling of Cellular Steel Beams*

J. Nseir, College of Engineering and Architecture of Fribourg, Fribourg, Switzerland, M. Lo, National Institute of Applied Sciences of Rennes, Rennes, France, D. Sonck, Ghent University, Ghent, Belgium, H. Somja, College of Engineering and Architecture of Fribourg, Fribourg, Switzerland, O. Vassart, ArcelorMittal Commercial Sections, Esch-sur-Alzette, Luxembourg, N. Boissonnade, College of Engineering and Architecture of Fribourg, Fribourg, Switzerland

Assessment of Buckling Stability of Elastically-Braced Castellated Beams

Hossein Showkati, Urmia University, Iran, Tohid Ghanbari Ghazijahani, Islamic Azad University, Iran, Amir Noori, Bu-Ali Sina University, Iran, Tadeh Zirakian, University of California, Los Angeles, CA

Failure of Eccentrically Loaded Cellular Steel Members*

D. Sonck, Ghent University, Zwijnaarde, Belgium, N. Boissonnade, College of Engineering and Architecture of Fribourg, Fribourg, Switzerland, R. Van Impe, Ghent University, Zwijnaarde, Belgium

Ultimate Capacity of Slender Section Beam-columns with Corrugated Webs

M. El Aghoury, Sherif A. Ibrahim, Ain Shams University, Cairo, Egypt, M.M. Nader, Senior Structural Engineer, Cairo, Egypt

S9 F10:00-11:30 Beedle Presentation Session

Moderator: Benjamin Schafer

Beedle Presentation:

Experimental Studies of Stability: Have we solved the problem?

P. Birkemoe, University of Toronto, Toronto, ON, Canada

Session talks

Experimental Study of Residual Stresses in Thick Steel Plates

R. Thiebaud, J.P. Lebet, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

Geometric Imperfections in Cold-Formed Steel Members*

V.M. Zeinoddini, B.W. Schafer, Johns Hopkins University, Baltimore, MD

S10 F2:15-3:15 HSS and Panel Stability

Moderator: Donald Sherman

Effect of Width-Thickness and Depth-Thickness on the Cyclic Bending Behavior of Hollow Structural Sections*

Matthew Fadden, Jason McCormick, University of Michigan, Ann Arbor, MI

Stability and Strength Prediction of Steel Foam Sandwich Panels

S. Szyniszewski, Johns Hopkins University, Baltimore, MD, B. Smith, University of Massachusetts Amherst, Amherst, MA, J. Hajjar, Northeastern University, Boston, MA, S. Arwade, University of Massachusetts Amherst, Amherst, MA, B.W. Schafer, Johns Hopkins University, Baltimore, MD

Stability of Cylindrical Stiffened Panels

Laurence Davaine, Khanh Le Tran, SNCF, France

S11 F3:30-5 Vinnakota Award Session and Plate Girders

*Note all papers in the SSRC program ending with a * are eligible for the Vinnakota Award*

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Moderator: Todd Helwig

Presentation of the Vinnakota Award

Ronald Ziemian, Bucknell University, Chair SSRC

New Shear Design Criteria for Plate Girders

Sung C. Lee, Doo S. Lee, Dongguk University, Seoul, Korea, Chai H. Yoo, Auburn
University, Auburn, AL

Moment-Shear Interaction in Plate Girders

Sung C. Lee, , Doo S. Lee, Dongguk University, Seoul, Korea, Chai H. Yoo, Auburn
University, Auburn, AL

Moment-Shear Interaction of Longitudinally Stiffened Plate Girders

Darko Beg, Franc Sinur, University of Ljubljana, Ljubljana, Slovakia

** Denotes that the paper is Vinnakota eligible*



2012 Beedle Award Winner

Professor Peter Birkemoe

S9 F10:00-11:30 Beedle Presentation Session

Experimental Studies of Stability: Have we solved the problem?

P. Birkemoe, University of Toronto, Toronto, ON, Canada

Peter C. Birkemoe, Ph.D., P.Eng., Professor Emeritus Department of Civil Engineering, University of Toronto, has over 45 years in experience in structural engineering involving research, practice, and teaching related to design and behaviour of steel structures and is a member of the Canadian Standards Association Committee on Steel Design S16, the Research Council on Structural Connections, the Structural Stability Research Council and served on the Ontario Highway Bridge Design Code (section on Steel Bridges).

Professor Birkemoe's experimental and analytical investigations on the behaviour of HSS members, led to the special strength classification for manufactured cold formed, heat-treated tubular members. Extensive large scale testing and analysis of fabricated circular tubular members examined the effects of weld induced residual stresses and geometric imperfections (including damage) on the behaviour of beam-columns in offshore applications. Other research on stability conducted by Professor Birkemoe includes the examination of safety of curved bridges during construction and the study of sustained plastic deformation beyond development of full yield properties. With particular expertise in research and design practice for connections employing high strength structural bolts and related structural behaviour, he works with various code/specification writing bodies in Canada and the United States. He is currently conducting research on field practices of high strength bolting.

Beedle Award Details

The award has been established in honor of the late Lynn S. Beedle, an international authority on stability and the development of code criteria for steel and composite structures. He was a leader and outstanding contributor to the work of the Structural Stability Research Council for a period of more than 50 years, establishing the council as the preeminent organization worldwide in the area of structural stability. Through Lynn Beedle's dedicated work and leadership in the national and international arenas, the structural engineering profession has seen advanced concepts developed into practical engineering tools. He consistently and successfully endeavored to advance collaboration between researchers, engineers, and code writers worldwide.

Recipients of the Lynn S. Beedle Award must meet the following criteria:

- Longtime member of SSRC.
- A worldwide leading stability researcher or designer of structures with significant stability issues.
- A leader in fostering cooperation between professionals worldwide.
- Significant contributions to national and international design code development.

The SSRC Executive Committee serves as the award committee. The award may be presented as frequently as annually. An individual can only receive the award once. The award is presented at

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the SSRC Annual Stability Conference. It consists of a framed certificate, signed by the SSRC Chair and Vice Chair.