

ADVANCED STEEL CONSTRUCTION

An International Journal

Volume 3 Number 3

September 2007

CONTENTS

Technical Papers

Design Method for Light-Gauge Steel Shear Walls Sheathed with Flat Steel Plates

L.A. Fülöp and I. Hakola

FE Simulation of Space Steel Frames in Fire with Warping Effect

Zhan-Fei Huang and Kang-Hai Tan

Numerical Simulation of Hollow and Concrete-Filled Steel Columns

Shengbin Gao and Hanbin Ge

Dynamic Stability Analysis of Beam String Structures under Earthquake Loads

Qinghua Han, Chenyin Ma, Jingyu Zhang

MINLP Optimization of Steel Frames

Uroš Klanšek, Tomaž Žula, Zdravko Kravanja and Stojan Kravanja

ISSN 1816-112X

Copyright © 2007 by :

The Hong Kong Institute of Steel Construction

Website: <http://www.hkisc.org/>

ADVANCED STEEL CONSTRUCTION

ADVANCED STEEL CONSTRUCTION

an International Journal

ISSN 1816-112X

Volume 3 Number 3

September 2007



VOL.3, NO.3 (2007)

Editors-in-Chief

S.L. Chan, *The Hong Kong Polytechnic University, Hong Kong*

W.F. Chen, *University of Hawaii at Manoa, USA*

R. Zandonini, *Trento University, Italy*

EDITORS-IN-CHIEF

Asian Pacific, African and organizing Editor

S.L. Chan

*The Hong Kong Poly. Univ.,
Hong Kong*

American Editor

W.F. Chen

Univ. of Hawaii at Manoa, USA

European Editor

R. Zandonini

Trento Univ., Italy

INTERNATIONAL EDITORIAL BOARD

F.G. Albermani

The Univ. of Queensland, Australia

F.S.K. Bijlaard

Delft Univ. of Technology, The Netherlands

R. Bjorhovde

The Bjorhovde Group, USA

M.A. Bradford

The Univ. of New South Wales, Australia

D. Camotim

Technical Univ. of Lisbon, Portugal

C.M. Chan

Hong Kong Univ. of Science & Technology,
Hong Kong

S.P. Chiew

Nanyang Technological Univ., Singapore

K.F. Chung

The Hong Kong Polyt. Univ., Hong Kong

G.G. Deierlein

Stanford Univ., California, USA

L. Dezi

Univ. of Ancona, Italy

D. Dubina

The Politehnica Univ. of Timisoara, Romania

R. Greiner

Technical Univ. of Graz, Austria

G.W.M. Ho

Ove Arup & Partners Hong Kong Ltd.,
Hong Kong

B.A. Izzuddin

Imperial College of Science, Technology
and Medicine, UK

J.P. Jaspart

Univ. of Liege, Belgium

S. A. Jayachandran

SERC, CSIR, Chennai, India

S. Kitipornchai

City Univ. of Hong Kong, Hong Kong

D. Lam

Univ. of Leeds, UK

G.Q. Li

Tongji Univ., China

J.Y.R. Liew

National Univ. of Singapore, Singapore

X. Liu

Tsinghua Univ., China

E.M. Lui

Syracuse Univ., USA

Y.L. Mo

Univ. of Houston, USA

J.P. Muzeau

CUST, Clermont Ferrand, France

D.A. Nethercot

Imperial College of Science, Technology
and Medicine, UK

D.J. Oehlers

The Univ. of Adelaide, Australia

K. Rasmussen

The Univ. of Sydney, Australia

T.M. Roberts

Cardiff Univ., UK

J.M. Rotter

The Univ. of Edinburgh, UK

C. Scawthorn

Scawthorn Porter Associates, USA

P. Schaumann

Univ. of Hannover, Germany

G.P. Shu

Southeast Univ. China

J.G. Teng

The Hong Kong Polyt. Univ., Hong Kong

G.S. Tong

Zhejiang Univ., China

K.C. Tsai

National Taiwan Univ., Taiwan

C.M. Uang

Univ. of California, USA

B. Uy

The Univ. of Wollongong, Australia

M. Veljkovic

Univ. of Lulea, Sweden

F. Wald

Czech Technical Univ. in Prague, Czech

Y.C. Wang

The Univ. of Manchester, UK

D. White

Georgia Institute of Technology, USA

E. Yamaguchi

Kyushu Institute of Technology, Japan

Y.B. Yang

National Taiwan Univ., Taiwan

B. Young

The Univ. of Hong Kong, Hong Kong

X.L. Zhao

Monash Univ., Australia

General Information

Advanced Steel Construction, an international journal

Aims and scope

The International Journal of Advanced Steel Construction provides a platform for the publication and rapid dissemination of original and up-to-date research and technological developments in steel construction, design and analysis. Scope of research papers published in this journal includes but is not limited to theoretical and experimental research on elements, assemblages, systems, material, design philosophy and codification, standards, fabrication, projects of innovative nature and computer techniques. The journal is specifically tailored to channel the exchange of technological know-how between researchers and practitioners. Contributions from all aspects related to the recent developments of advanced steel construction are welcome.

Instructions to authors

Submission of the manuscript. Authors may submit three double-spaced hard copies of manuscripts together with an electronic copy on a diskette or cd-rom in an editable format (MS Word is preferred). Manuscripts should be submitted to the regional editors as follows for arrangement of review.

Asian Pacific, African and organizing editor : Professor S.L. Chan
American editor : Professor W.F. Chen
European editor : Professor R. Zandonini

All manuscripts submitted to the journal are highly recommended to accompany with a list of four potential reviewers suggested by the author(s). This list should include the complete name, address, telephone and fax numbers, email address, and at least five keywords that identify the expertise of each reviewer. This scheme will improve the process of review.

Style of manuscript

General. Author(s) should provide full postal and email addresses and fax number for correspondence. The manuscript including abstract, keywords, references, figures and tables should be in English with pages numbered and typed with double line spacing on single side of A4 or letter-sized paper. The front page of the article should contain:

- a) a short title (reflecting the content of the paper);
- b) all the name(s) and postal and email addresses of author(s) specifying the author to whom correspondence and proofs should be sent;
- c) an abstract of 100-200 words; and
- d) 5 to 8 keywords.

The paper must contain an introduction and a conclusion. The length of paper should not exceed 25 journal pages (approximately 15,000 words equivalents).

Tables and figures. Tables and figures including photographs should be typed, numbered consecutively in Arabic numerals and with short titles. They should be referred in the text as Figure 1, Table 2, etc. Originally drawn figures and photographs should be provided in a form suitable for photographic reproduction and reduction in the journal.

Mathematical expressions and units. The Systeme Internationale (SI) should be followed whenever possible. The numbers identifying the displayed mathematical expression should be referred to in the text as Eq. (1), Eq. (2).

References. References to published literature should be referred in the text, in the order of citation with Arabic numerals, by the last name(s) of the author(s) (e.g. Zandonini and Zanon [3]) or if more than three authors (e.g. Zandonini et al. [4]). References should be in English with occasional allowance of 1-2 exceptional references in local languages and reflect the current state-of-technology. Journal titles should be abbreviated in the style of the Word List of Scientific Periodicals. References should be cited in the following style [1, 2, 3].

Journal: [1] Chen, W.F. and Kishi, N., "Semi-rigid Steel Beam-to-column Connections, Data Base and Modelling", Journal of Structural Engineering, ASCE, 1989, Vol. 115, No. 1, pp. 105-119.

Book: [2] Chan, S.L. and Chui, P.P.T., "Non-linear Static and Cyclic Analysis of Semi-rigid Steel Frames", Elsevier Science, 2000.

Proceedings: [3] Zandonini, R. and Zanon, P., "Experimental Analysis of Steel Beams with Semi-rigid Joints", Proceedings of International Conference on Advances in Steel Structures, Hong Kong, 1996, Vol. 1, pp. 356-364.

Proofs. Proof will be sent to the corresponding author to correct any typesetting errors. Alterations to the original manuscript at this stage will not be accepted. Proofs should be returned within 48 hours of receipt by Express Mail, Fax or Email.

Copyright. Submission of an article to "Advanced Steel Construction" implies that it presents the original and unpublished work, and not under consideration for publication nor published elsewhere. On acceptance of a manuscript submitted, the copyright thereof is transferred to the publisher by the Transfer of Copyright Agreement and upon the acceptance of publication for the papers, the corresponding author must sign the form for Transfer of Copyright.

Permission. Quoting from this journal is granted provided that the customary acknowledgement is given to the source.

Page charge and Reprints. There will be no page charges if the length of paper is within the limit of 25 journal pages. A total of 30 free offprints will be supplied free of charge to the corresponding author. Purchasing orders for additional offprints can be made on order forms which will be sent to the authors. These instructions can be obtained at the Hong Kong Institute of Steel Construction, Journal website: <http://www.hkisc.org>

The International Journal of Advanced Steel Construction is published quarterly by non-profit making learnt society, The Hong Kong Institute of Steel Construction, c/o Department of Civil & Structural Engineering, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.

Disclaimer. No responsibility is assumed for any injury and / or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein.

Subscription inquiries and change of address. Address all subscription inquiries and correspondence to Member Records, IJASC. Notify an address change as soon as possible. All communications should include both old and new addresses with zip codes and be accompanied by a mailing label from a recent issue. Allow six weeks for all changes to become effective.

The Hong Kong Institute of Steel Construction

HKISC

c/o Department of Civil and Structural Engineering,

The Hong Kong Polytechnic University,

Hunghom, Kowloon, Hong Kong, China.

Tel: 852- 2766 6047 Fax: 852- 2334 6389

Email: ceslchan@polyu.edu.hk Website: <http://www.hkisc.org/>

ISSN 1816-112X

Copyright © 2006 by:

The Hong Kong Institute of Steel Construction.



ISSN 1816-112X

EDITORS-IN-CHIEF

**Asian Pacific, African
and organizing Editor**

S.L. Chan
*The Hong Kong Polyt. Univ.,
Hong Kong*

American Editor

W.F. Chen
Univ. of Hawaii at Manoa, USA

European Editor

R. Zandonini
Trento Univ., Italy

Advanced Steel Construction

an international journal

VOLUME 3 NUMBER 3

SEPTEMBER 2007

Technical Papers

- | | |
|---|-----|
| Design Method for Light-Gauge Steel Shear Walls Sheathed with Flat Steel Plates
<i>L.A. Fülöp and I. Hakola</i> | 628 |
| FE Simulation of Space Steel Frames in Fire with Warping Effect
<i>Zhan-Fei Huang and Kang-Hai Tan</i> | 652 |
| Numerical Simulation of Hollow and Concrete-Filled Steel Columns
<i>Shengbin Gao and Hanbin Ge</i> | 668 |
| Dynamic Stability Analysis of Beam String Structures under Earthquake Loads
<i>Qinghua Han, Chenyin Ma, Jingyu Zhang</i> | 679 |
| MINLP Optimization of Steel Frames
<i>Uroš Klanšek, Tomaž Žula, Zdravko Kravanja and Stojan Kravanja</i> | 689 |

