

Canadian Society for Civil Engineering

7<sup>th</sup> International Conference  
on Short and Medium  
Span Bridges  
2006

August 23-25, 2006  
Montreal, Quebec, Canada

Volume 1 of 4

Printed from e-media with permission by:

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)



ISBN: 978-1-60423-319-3

Some format issues inherent in the e-media version may also appear in this print version.

## TABLE OF CONTENTS

### VOLUME 1

#### Innovative Design

<b>Boston's Central Artery and It's Interchanges</b> .....	1
<i>Keith Donington, Vijay Chandra</i>	
<b>Design of Mississippi River Bridges Overcomes Environmental, Foundation and Structural Challenges</b> .....	11
<i>Iqbal Husain, Nicolas Theodor, Tony Sangjuliano, Dave McAvoy</i>	
<b>Experience of Innovative Integral Bridges in China</b> .....	21
<i>Xiaoqin Jin, Xudong Shao</i>	
<b>Launching on Supple Skates</b> .....	30
<i>Marco Petrangeli, Marcello Petrangeli</i>	
<b>Approaching the Big Dig: Use of Precast Transition Structures</b> .....	41
<i>Jennifer Hill, Ruchu Hsu, Vijay Chandra</i>	
<b>Automated Weldless Grating for Bridge Decks and the Like</b> .....	51
<i>Dennis M. Imm</i>	
<b>Probablistic Fatigue Assessment of Post-Weld Treated Tubular Truss Bridges</b> .....	60
<i>Scott Walbridge, Alain Nussbaumer</i>	
<b>Innovative Design of Short Span Steel Concrete Composite Bridges with Rolled Beams Some Examples from France to Germany</b> .....	70
<i>Wasoodev Hoorpah, Mark Hever</i>	
<b>A Study on Multi-Stepwise Thermal Prestressing Method for Steel-Concrete Composite Bridges</b> .....	81
<i>Sang-Hyo Kim, Jin-Hee Ahn, Jun-Hwan Kim, Hyung-Ju Kim</i>	
<b>Jointless Abutment Detailing for an Orthogo-nal-ended Structure</b> .....	91
<i>Kelvin L. Fields</i>	
<b>Construction of Shaikh Zayed Arch Bridge in Abu Dhabi</b> .....	101
<i>Parviz Djahani, Jamal Al-Hosani</i>	
<b>Development of a Bridge Expansion Joint with Inflatable Seal System</b> .....	112
<i>Jim Au, Clifford Lam, Bala Tharmabala</i>	
<b>Context Sensitivity in Practice the Design and Construction of the Hillsborough Street Bridge Raleigh, North Carolina</b> .....	123
<i>Christian T. Ray</i>	
<b>Structurally Supported Single Point Urban Interchanges (SPUI)</b> .....	133
<i>Manas Asthana, Craig Smart</i>	
<b>Short and Medium Span Bridges in Ontario Utilizing Sliding Isolation Bearings</b> .....	143
<i>Ronald J. Watson</i>	
<b>Bridge Decks High Speed Waterproofing Systems - Summary of Achievements in Canada</b> .....	152
<i>Sabine Le Bec, Yvan Paquin</i>	

<b>Design of a Triangular Precast Post Tensioned Box Girder .....</b>	<b>163</b>
<i>Takahiko Kimura, Thomas R. Cooper</i>	
<b>Investigating a Change of Structural System from Internal to External Post-Tensioning .....</b>	<b>173</b>
<i>M. W. Paulsen, D. M. Rogowsky, S. D. B. Alexander</i>	
<b>Vancouver Convention Centre Viaduct .....</b>	<b>183</b>
<i>Craig Schaper, Don McCulloch</i>	
<b>Increasing Serviceability of Bridges - Wind Aspects .....</b>	<b>193</b>
<i>Ana Krecak, Petar Sesar</i>	
<b>Wind Engineering Studies for Provencher Pedestrian Bridge .....</b>	<b>203</b>
<i>Jiming Xie, Dezi Yang</i>	
<b>El Enania Bowstring Bridge - Egypt.....</b>	<b>214</b>
<i>Hussein Abbas</i>	
<b>Design and Construction of the SR 836 Flyover Bridges .....</b>	<b>221</b>
<i>Scott W. Dean</i>	
<b>The New Main Street Bridge .....</b>	<b>231</b>
<i>Hans R. Hutton, Jon K. Lindsey, Steven T. Hague</i>	
<b>Innovations in Open Spandrel Arch Bridge Design .....</b>	<b>241</b>
<i>Samanaidu Balakrishnan</i>	
<b>Lessons Learned During the Design and Construction of the North Saskatchewan River Bridge in Edmonton, AB. ....</b>	<b>249</b>
<i>C. P. Rebel, D. J. Middleton</i>	
<b>Discovering the Possibilities of Two Recent Types of Unconventional Cable-Stayed Bridges .....</b>	<b>259</b>
<i>Ana M. Ruiz-Teran, Angel C. Aparicio</i>	
<b>Replacement of a Double Track Railway Carrying Swing Span Over the Richelieu River .....</b>	<b>269</b>
<i>George Nowak</i>	
<b>Tongnan Bridge in Tianjin, China.....</b>	<b>279</b>
<i>Joost Meyboom, W. Victor Anderson</i>	
<b>Unique Design for BP Pedestrian Bridge, Chicago .....</b>	<b>288</b>
<i>Hal Iyengar, Robert Sinn, John Zils, Christopher Rockey</i>	
<b>Design Philosophy and Summary Report: The Palm Jumeirah Gateway Bridge, Dubai, Uae.....</b>	<b>299</b>
<i>Thomas Piotrowski</i>	
<b>Replacement of the Belt Parkway Bridge over Ocean Parkway .....</b>	<b>309</b>
<i>Charles Norrish III, Chris Sklovounakis, Russell A. Pratt</i>	
<b>Development of Corrugated Steel Web T-Shaped Prestressed Concrete Girder Bridges .....</b>	<b>318</b>
<i>Takahiro Kakuta, Atsushi Fujioaka</i>	
<b>Orlando Intermodal Transit System Guideway "The Orlando Experience"- Innovative Design .....</b>	<b>328</b>
<i>Victor Ryzhikov, Antonio Ledesma, Joseph Mitchell</i>	
<b>3 New Flaz River Bridges in Samedan Switzerland.....</b>	<b>337</b>
<i>Andrea Pedrazzini, Eugenio Pedrazzini, Nicola Baserga, Christian Mozzetti</i>	

<b>Innovative Bridge Design for the Sea-to-Sky Highway Improvement Project, Design-Build Work Package No. 2, Sunset Beach to Lions Bay</b> .....	346
<i>Monty Knaus, Keith Holmes, Jianping Jiang</i>	
<b>Design of Highly Curved Concrete Ramp Bridges</b> .....	357
<i>Adel Fam, Hank Huitema, Derk Meyer</i>	
<b>Design of Continuous Double Composite High-Speed Railway Bridges</b> .....	367
<i>Chang-Su Shim, Hyun-Ho Kim, Pil-Goo Lee</i>	
<b>Bridges that Combine Function, Economy and Aesthetics</b> .....	378
<i>Yuhe Yang</i>	
<b>Greenway Bridge</b> .....	389
<i>J. Meyboom, M. Sutton, A. Meyboom</i>	
<b>Study on Rigid and Flexible Structure System of Giant Wheel in Cihai Bridge</b> .....	399
<i>Wang Xiaodun, Shi Yongjiu, Wang Yuanqing</i>	
<b>Effect of Initial Bending Moment on Composite Girder under Flexure for Unshored Construction</b> .....	407
<i>V. K. Gupta, Y. Okui, M. Nagai</i>	
<b>Three Spans in One. Bridge in Benicarlo</b> .....	415
<i>Alberto Domingo Cabo, Salvador Monleon Cremades, Carlos Lazaro Fernandez</i>	
<b>Rotation Bridge on Waterway Structure based on Finger Touch Simulation Using Multi-Points Reaction at Joint Support Shell</b> .....	423
<i>Afshin Turk, Shabnam Ghanavatizadeh</i>	
<b>New Type of Composite Bridge Structure with Concrete Filled Steel Tube Girder</b> .....	429
<i>Jae-Yoon Kang, Eun-Suk Choi, Won-Jong Chin, Jung-Woo Lee, Byung-Suk Kim</i>	
<b>Design of the Canada Line Extradosed Transit Bridge</b> .....	438
<i>Andrew Griezic, Christopher R. Scollard, Don W. Bergman</i>	
<b>Time-Dependent Effects in Continuous Composite NU-Girder Bridges</b> .....	448
<i>Walter H. Dilger, Gerd Birkle</i>	
<b>Pretensioned Prestressed Concrete Beam Bridges and Industrial Supply</b> .....	459
<i>Pierre Passeman, Van-Tho Doan</i>	
<b>Continuous Steel-Concrete Composite Construction for Bridges - An Economical Solution</b> .....	471
<i>Pydi Lakshmana Rao</i>	
<b>Standardization of Bridge Detailing</b> .....	482
<i>Jure Radic, Zlatko Savor, Alex Kindij</i>	
<b>Design and Construction of Steel Arch Bridge using Concrete Filled Tubes (CFT) at Thimpu City Bhutan</b> .....	491
<i>S. Sengupta</i>	
<b>Design of Prestressed Concrete Bridge Girders Made with High to Ultra High Performance Fibre Reinforced Concrete</b> .....	500
<i>S. Braike, B. Massicotte, J. P. Charron</i>	
<b>Comparative Analysis of Composite Overpasses</b> .....	511
<i>Jure Radic, Zlatko Savor, Gordana Hrelja, Nijaz Mujkanovic, Andjelko Vlasic</i>	
<b>Proposed Connection Details for Precast Concrete Bulb Tee Girder Bridges</b> .....	521
<i>Khaled Sennah, Bijal Shah, Reza Kianoush, Siyin Tu, Clifford Lam</i>	
<b>Long-Span Steel Plate Girder Bridge Erection</b> .....	532
<i>Jared G. Fasick</i>	

## New Construction

<b>Simulation of the Re-Decking of Jacques Cartier Bridge Considering Spatial Constraints</b> .....	543
<i>C. Zhang, A. Hammad, T. M. Zayed, G. Wainer</i>	
<b>Innovative Concepts for Segmental Concrete Interchange</b> .....	553
<i>Vijay Chandra</i>	
<b>How to Build a 700 ft. \$20M Concrete Bridge in One Year</b> .....	563
<i>James M. Barker, Richard H. Walters</i>	
<b>Study and Design of an Adaptive Tuned Mass Damper for Self-Climbing Formwork in the Construction of Concrete Piers</b> .....	572
<i>Carlos Casado, Alfonso Poncela, Antolin Lorenzana</i>	
<b>Experimental Studies of Prefabricated Bridge Deck Models and Closure Strip Connections</b> .....	582
<i>Alexander Au, Clifford Lam, Bala Tharmabala</i>	
<b>Incorporating Art into Bridge Design - Single and Multiple Span Precast Concrete Arch Applications</b> .....	593
<i>Paul Proctor, John Shall</i>	
<b>Ministry of Transportation Ontario Experience in Bridge Planning</b> .....	606
<i>Quazi M. Islam, Iqbal Husain</i>	
<b>Innovative Building Methods for Bridges with Small and Medium Spans - VFT and VFT-WIB</b> .....	616
<i>Victor Schmitt, Michael Weizenegger</i>	
<b>Manitoba Floodway Expansion Project - Bridge Replacement</b> .....	626
<i>Norman Ulyatt</i>	
<b>East Pascagoula River Post-Tensioned Spliced Girder Bridge, Mississippi, USA</b> .....	637
<i>Teddy Theryo</i>	
<b>Spanning Missiquoi Bay - Simple Yet Complex</b> .....	643
<i>Steve W. Johnson</i>	
<b>Towards 3D BIM for the Bridge Lifecycle</b> .....	653
<i>S. S. Chen, J. W. Li, N. Kannan, R. Patil, K. Potturi, V. K. Tangirala</i>	
<b>The Wupper River Valley Bridge: A State-of-the-Art Composite Bridge</b> .....	664
<i>G. A. Marzahn, M. Hamme, W. Prehn, J. Swadlo</i>	