# TABLE OF CONTENTS

## VOLUME 1

**2012 ANNUAL GENERAL CONFERENCE**

<table>
<thead>
<tr>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexure of a Layered Composite Plate with Local Defect</td>
<td>1</td>
</tr>
<tr>
<td>A Practical Method for Design of Pile Foundation under Dynamic Loads</td>
<td>9</td>
</tr>
<tr>
<td>Explaining Storm Severity: A New Edmonton Rainfall Rating System</td>
<td>20</td>
</tr>
<tr>
<td>Coordinating the Points in 3D in and Around the Test Tank</td>
<td>30</td>
</tr>
<tr>
<td>An Investigation of Surveys of 195 for Discrepancies of the Tangent Section North and South of CR 512</td>
<td>39</td>
</tr>
<tr>
<td>Sustainability Assessment of Prefabrication Construction Methods with Fuzzy AHP, A Case Study in Residential Building</td>
<td>47</td>
</tr>
<tr>
<td>An Experimental Investigation of Minimising Energy Head Losses in Expansions by Using a Hump</td>
<td>58</td>
</tr>
<tr>
<td>Minimum Source Dilution As A Method To Regulate Discharge Of Toxic Brine From Industries And Mining Processes</td>
<td>68</td>
</tr>
<tr>
<td>Modelling Three-Dimensional Turbulent River Flow Around Bridge Piers</td>
<td>78</td>
</tr>
<tr>
<td>Coupling of Random Field Theory and the Discrete Element Method in The Reliability Analysis of Geotechnical Problems</td>
<td>99</td>
</tr>
<tr>
<td>Viet Tran, Mohamed Meguid, Luc Chouinard</td>
<td></td>
</tr>
<tr>
<td>A Comparison of IRI and Collision Rates in the Province Of Alberta</td>
<td>109</td>
</tr>
<tr>
<td>Vertical Response Behaviour of Stable Unbonded Fiber Reinforced Elastomeric Isolators (SU-FREIs) with Holes in the Loaded Surface</td>
<td>118</td>
</tr>
<tr>
<td>Huixi Xie, Jacques Paynher</td>
<td></td>
</tr>
<tr>
<td>Pulsing Injection System for Optimal Subsurface Treatment Delivery</td>
<td>168</td>
</tr>
<tr>
<td>Material Selection for FRP Bonded-Reinforced Concrete Elements</td>
<td>177</td>
</tr>
<tr>
<td>An Ontology of Energy Efficiency and Renewable Energy Sources in Buildings</td>
<td>183</td>
</tr>
<tr>
<td>Re-Creating the Yukon Ditch Near Dawson City, Yukon</td>
<td>193</td>
</tr>
<tr>
<td>White Pass and Yukon Railway: Yukon’s Path to the Pacific</td>
<td>203</td>
</tr>
<tr>
<td>Gold Dredging in the Klondike and Number 4</td>
<td>211</td>
</tr>
<tr>
<td>Yukon Sternwheelers and the SS Klondike</td>
<td>221</td>
</tr>
<tr>
<td>Experimental and Numerical Integrity Assessment of Cracked RC Beams Using NDT Impact-Echo Technique</td>
<td>231</td>
</tr>
<tr>
<td>SPH Modeling of Tsunami-Like Solitary Waves and Resulting Hydrodynamic Forces on Vertical Walls</td>
<td>241</td>
</tr>
<tr>
<td>A CFD Study of the Selective Withdrawal Scenario</td>
<td>251</td>
</tr>
<tr>
<td>A Proposal for Integrated Safety and Quality Management System Framework in Construction Companies</td>
<td>261</td>
</tr>
</tbody>
</table>

**TABLE OF CONTENTS**

## VOLUME 1

<table>
<thead>
<tr>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexure of a Layered Composite Plate with Local Defect</td>
<td>1</td>
</tr>
<tr>
<td>A Practical Method for Design of Pile Foundation under Dynamic Loads</td>
<td>9</td>
</tr>
<tr>
<td>Explaining Storm Severity: A New Edmonton Rainfall Rating System</td>
<td>20</td>
</tr>
<tr>
<td>Coordinating the Points in 3D in and Around the Test Tank</td>
<td>30</td>
</tr>
<tr>
<td>An Investigation of Surveys of 195 for Discrepancies of the Tangent Section North and South of CR 512</td>
<td>39</td>
</tr>
<tr>
<td>Sustainability Assessment of Prefabrication Construction Methods with Fuzzy AHP, A Case Study in Residential Building</td>
<td>47</td>
</tr>
<tr>
<td>An Experimental Investigation of Minimising Energy Head Losses in Expansions by Using a Hump</td>
<td>58</td>
</tr>
<tr>
<td>Minimum Source Dilution As A Method To Regulate Discharge Of Toxic Brine From Industries And Mining Processes</td>
<td>68</td>
</tr>
<tr>
<td>Modelling Three-Dimensional Turbulent River Flow Around Bridge Piers</td>
<td>78</td>
</tr>
<tr>
<td>Coupling of Random Field Theory and the Discrete Element Method in The Reliability Analysis of Geotechnical Problems</td>
<td>99</td>
</tr>
<tr>
<td>Viet Tran, Mohamed Meguid, Luc Chouinard</td>
<td></td>
</tr>
<tr>
<td>A Comparison of IRI and Collision Rates in the Province Of Alberta</td>
<td>109</td>
</tr>
<tr>
<td>Vertical Response Behaviour of Stable Unbonded Fiber Reinforced Elastomeric Isolators (SU-FREIs) with Holes in the Loaded Surface</td>
<td>118</td>
</tr>
<tr>
<td>Huixi Xie, Jacques Paynher</td>
<td></td>
</tr>
<tr>
<td>Pulsing Injection System for Optimal Subsurface Treatment Delivery</td>
<td>168</td>
</tr>
<tr>
<td>Material Selection for FRP Bonded-Reinforced Concrete Elements</td>
<td>177</td>
</tr>
<tr>
<td>An Ontology of Energy Efficiency and Renewable Energy Sources in Buildings</td>
<td>183</td>
</tr>
<tr>
<td>Re-Creating the Yukon Ditch Near Dawson City, Yukon</td>
<td>193</td>
</tr>
<tr>
<td>White Pass and Yukon Railway: Yukon’s Path to the Pacific</td>
<td>203</td>
</tr>
<tr>
<td>Gold Dredging in the Klondike and Number 4</td>
<td>211</td>
</tr>
<tr>
<td>Yukon Sternwheelers and the SS Klondike</td>
<td>221</td>
</tr>
<tr>
<td>Experimental and Numerical Integrity Assessment of Cracked RC Beams Using NDT Impact-Echo Technique</td>
<td>231</td>
</tr>
<tr>
<td>SPH Modeling of Tsunami-Like Solitary Waves and Resulting Hydrodynamic Forces on Vertical Walls</td>
<td>241</td>
</tr>
<tr>
<td>A CFD Study of the Selective Withdrawal Scenario</td>
<td>251</td>
</tr>
<tr>
<td>A Proposal for Integrated Safety and Quality Management System Framework in Construction Companies</td>
<td>261</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>A Proposed Downscaling Model for Climate Change Studies</td>
<td>549</td>
</tr>
<tr>
<td>Choix d’une éolienne pour Le Nord Canadien: Analyse Hiérarchique</td>
<td>559</td>
</tr>
<tr>
<td>Sustainable Poverty Eradication Measures: The Interwoven Relationship of Income Poverty and Water Poverty</td>
<td>576</td>
</tr>
<tr>
<td>Use of an Innovative Geocomposite to Reinforce Marginal Fill Soils in Southern Ontario</td>
<td>587</td>
</tr>
<tr>
<td>Influence of Vibro Stone Column Reinforcement on the Seismic Bearing Capacity of Typical Quebec Soils</td>
<td>597</td>
</tr>
<tr>
<td>Geotechnical Aspects of the Seismic Safety Assessment and Retrofit of the Knight Bridge Street</td>
<td>607</td>
</tr>
<tr>
<td>Anomaly Detection with Signal and Image Processing for Structural Health Monitoring</td>
<td>617</td>
</tr>
<tr>
<td>Benchmarking the Learning Curve For BIM: A Case Study</td>
<td>627</td>
</tr>
<tr>
<td>Seismic Analysis of a Two Span Integral Abutment Bridge</td>
<td>637</td>
</tr>
<tr>
<td>A Sustainable Management Approach for Neighbourhoods Prioritization – The City of Edmonton Case</td>
<td>646</td>
</tr>
<tr>
<td>What Is Dynamic Site Layout Planning?</td>
<td>655</td>
</tr>
<tr>
<td>Urban Hydrological Response Units for Modelling Low Impact Development</td>
<td>665</td>
</tr>
<tr>
<td>Reliability Assessment of Ultra-Wide Band for Indoor Tracking of Static Resources on Construction Sites</td>
<td>675</td>
</tr>
<tr>
<td>Exploring the Concept of Bridge Functional Index in the Context of Climate Change Impacts on Transportation Infrastructure</td>
<td>685</td>
</tr>
<tr>
<td>Quesnel Bridge Rehabilitation and Widening</td>
<td>695</td>
</tr>
<tr>
<td>Laboratory Experiments to Determine Frazil Ice Properties</td>
<td>705</td>
</tr>
<tr>
<td>Information Integrating Sustainable Green Roofs with Building Modeling</td>
<td>715</td>
</tr>
<tr>
<td>Analysis of Shear Walls on Piled Raft Under Earthquake Excitations</td>
<td>725</td>
</tr>
<tr>
<td>Effect Of Pouring Techniques On The Structural Performance Of Self-Consolidating Concrete Beams</td>
<td>735</td>
</tr>
<tr>
<td>Modeling the Effect Of Innovative Joining Technique on the Behaviour of Precast Concrete Shear Wall</td>
<td>745</td>
</tr>
<tr>
<td>Calgary Bow River Weir Project</td>
<td>755</td>
</tr>
<tr>
<td>Engineering Characteristics of Strong Motion Records of the Riviere-Du-Loup Earthquake in Quebec, Canada</td>
<td>765</td>
</tr>
<tr>
<td>Analysis of a 1.8 km tunnel in East-West Algerian Corridor for Stabilisation During Construction</td>
<td>775</td>
</tr>
<tr>
<td>Blatchford Field and Hangar #14, Edmonton, Alberta</td>
<td>784</td>
</tr>
<tr>
<td>Location-Aware Resource-Driven Scheduling</td>
<td>791</td>
</tr>
<tr>
<td>Augmented Reality Technologies for Construction Site Progress</td>
<td>801</td>
</tr>
<tr>
<td>High Service Temperature Characteristics of Asphalt Binders and Paving Mixes</td>
<td>810</td>
</tr>
<tr>
<td>Adhesion Of Pseudomonas Aeruginosa To Conditioning Films</td>
<td>820</td>
</tr>
<tr>
<td>Effect Of Tornado Wind Speeds On Typical Traffic Signs</td>
<td>824</td>
</tr>
</tbody>
</table>

**12TH INTERNATIONAL ENVIRONMENTAL SPECIALTY CONFERENCE**

Reduction of Volatile Organic Compound (VOC) Emissions by Experimental Passive Biocovers: The Fate of Toluene as a Model VOC | 829  |
Evaluating Bioventing Scale-Up Factors for Petroleum Hydrocarbons ................................................................. 839
Alamgir Khan, Richard Zytner

VOLUME 2

Does the National Classification System for Contaminated Sites Accurately Characterize Risks? ...................... 849
Ben Thiesen, Gopal Achari

Evaluating Performance of Tire-derived Aggregates When Used As Media for Leachate Collection and Drainage Systems ................................................................. 859
Marchus Mwai, Kristine Wichuk, Daryl McCartney

Sustainable and Beneficial Options for Reusing Treated Wastewater in Muscat, Oman .......................... 871
Mahad Baatwan, Ahmed Sana, Rashid Al-Yahya, Amal Alsabei

Understanding the Effect of Silver Nanoparticles on Wastewater Activated Sludge Microorganisms ............ 881
Xiaohui Sun, Zhiya Sheng, Yang Liu

Assessing the Temperature Contact Time Criteria and Turning Effect in Compost Sanitation ...................... 888
Pulat Isisha, Daryl McCartney, Kristine Wichuk, Norm Neumann

Leaching Characteristics of Cement Kiln Dust from Alberta ............................................................................. 899
Mahmoud Mahmoud, B. Rimes

Uncertainty Analysis of an Equivalence-based Fate and Transport Model Using a Hybrid Fuzzy-probabilistic Approach .................................................................................. 908
Metne D. Betic, Rehan Sadia, Kevin A. Mortin, Solomon Tesfamariam

Photocatalytic Degradation of 2,4-D with a LED-based Photocatalyst .......................................................... 917
Linlong Yu, Gopal Achari, Cooper H. Langford

Pilot Study of UV Disinfection for Trickling Filter/Solids Contact Effluent ...................................................... 926
David Lycon, Michael Celli, Stella Chiu

Comparison of MMS’s Simulations with Other RCMs from the NARCCAP Multi-model Ensemble Simulations in Central Alberta .................................................................................. 936
Chun-Chu Kuo, Janel Hureagh, Tien Gan, Steven Chan

Inactivation of Sarcina 263k by Ozone .................................................................................................................. 946
Ning Ding, Norman Neumann, Luke Price, Shannon Brathwaite, Aru Balachandran, Miodrag Belosevic, Mohamed Gamal El-Din

Application of Ultrasonic Soil Washing for the Remediation of Anthracene Contaminated Soil ...................... 957
Ling Wang, Jianbing Li, Wei Han Song, Shanshan Li, Wen Zhang

Modeling Dry Deposition Velocity of Gaseous Elemental Mercury to Cropland at Central Alberta ................ 965
Guangmao Men, Warren B. Kindzerski, Mohamed Gamal El-Din

Air Quality in Alberta Oil Sands Community of Fort Mckay Compared to Urban Residential Locations in Canada in 2009 ..................................................................................................... 974
Warren Kindzerski, Md. Aymal Bar

Enhancing Energy Recovery from Waste: A Study on Enzyme Addition to Enhance Methane Gas Production .......................................................................................................................... 984
Poornima Jayasinghe, Matthew Steele, Patrick Hettiaratchi, Anil Mehrrotra

K. Yan, S. Yu, D. McCartney, C. Felske, A. Mangory

Analysis Of Approaches To Determine Minimum Water Requirement For Healthy Household Environment .... 999
Jamal Abu-Ashour

Water Reuse in Edmonton .................................................................................................................................. 1006
Heather Zarski, Susan Ancel

Pilot Testing of Restaurant Grease Co-digestion with Municipal Wastewater Sludge ........................................ 1016
Vahid Razaviari, Ian Buchanan, Shahid Malik, Hassan Katalambula

Application of Remote Sensing and GIS Analysis for Investigating Urbanization Induced Surface Water Body Change in and Around Dhaka City, Bangladesh .................................................................................. 1026
Siddhartha Shekar Paul, Khaled Hassan, Sayed Humayan Akhter, Jianbing Li

Biochemical And Physical Characteristics Of Compost And Compost Based Materials Influencing Their Performance As Methanotrophic Biofilter Media .............................................................................. 1034
Uriel Manceho, Patrick Hettiaratchi, Omar Hurtado

Selection of a Sewer Rehabilitation Method: A Risk-based Lifecycle Analysis ................................................ 1043
S. Akhtar, A. Shahriar, R. Sadiq

Best Practices for Managing Surface Water and Flooding: Applying Lessons Learned in the UK to Canada .......................................................................................................................... 1053
Matthew Graham, James Ogilvie, T. Reid, Tamzin Mills

Monitoring of Residential Solid Waste Composting .......................................................................................... 1063
Alireza Rajjoubour Ashkiki, Christian Felske, Daryl McCartney

Degradation of a Model Naphthenic Acid, Cyclohexanonic Acid, by a Solar-Driven Advanced Oxidation Process at a Technical Scale .................................................................................................. 1074
James R. Bulon, Po Yee Chan, Mohamed Gamal El-Din

Micropollutant Removal Using the UV/H2O2 Advanced Oxidation Process for Wastewater Reuse .............. 1079
Zengxiang Shu, James R. Bolon, Rebecca Baldwin, Miodrag Belosevic, Mohamed Gamal El-Din

Vulnerability Assessment of Water Supply Systems: A Fuzzy Qualitative Comparative Analysis (fQCA) Approach .................................................................................................................................. 1088
A. Solangi, R. Sadiq

Do Nutrient Fluxes across Sediment Water Interface of Athabasca River Sediment Affect SOD in Winter? ................................................................................................................................. 1098
Kusumakar Sharma, Preston McEachern, Tong Yu, David Zhu
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing Network-wide Traffic Assignment Capability of Improved Travel Demand Model Using Grid-based Space</td>
<td>1406</td>
</tr>
<tr>
<td>Disaggregation: New Brunswick Case Study</td>
<td>1426</td>
</tr>
<tr>
<td>Wireless Sensor Network Based Traffic Surveillance</td>
<td>1418</td>
</tr>
<tr>
<td>The Application and Implications of Using the Critical Strain Method to Design Haul Roads for Extremely Heavy Mining Trucks</td>
<td>1438</td>
</tr>
<tr>
<td>Effect of Public Transit on Neighborhood Crimes</td>
<td>1446</td>
</tr>
<tr>
<td>Improvement of Traffic Speed Dynamics in METANET Model</td>
<td>1455</td>
</tr>
<tr>
<td>Pedestrian Gait Analysis Using Automated Computer Vision Techniques</td>
<td>1465</td>
</tr>
<tr>
<td>The Sustainable Glenmore ComPASS Research Study</td>
<td>1476</td>
</tr>
<tr>
<td>Spatial Arrangement and Morphological Analyses for Extracting Urban Subzonal Land Uses using Very high Resolution Imagery</td>
<td>1485</td>
</tr>
<tr>
<td>Prediction of Particulate Matter Dispersion in Urban Atmosphere Using Neural Network Models</td>
<td>1497</td>
</tr>
<tr>
<td>Fleet Optimization for Aircraft Deicing Trucks</td>
<td>1505</td>
</tr>
<tr>
<td>Analyzing Sensitivity of Freeway Capacity at a Complex Weaving Segment</td>
<td>1515</td>
</tr>
<tr>
<td>Simulation Based Evaluation of Variable Speed Limit Control</td>
<td>1526</td>
</tr>
<tr>
<td>A Review of Future Transit Plans for the Calgary Metropolitan Region</td>
<td>1539</td>
</tr>
<tr>
<td>A Review of Sustainable Alternatives for Asphalt Materials in Saskatchewan</td>
<td>1554</td>
</tr>
<tr>
<td>Automated Classification of Road-User Movement Trajectories</td>
<td>1564</td>
</tr>
<tr>
<td>Database Development for Ontario’s Local Calibration of the MEPDG for Flexible Pavements</td>
<td>1574</td>
</tr>
<tr>
<td>Perpetual Pavement Designs: The Sustainable Alternative for Highway Design</td>
<td>1585</td>
</tr>
<tr>
<td>Innovative Design of Pedestrian and Bicycle Path at Freeway Interchanges</td>
<td>1595</td>
</tr>
<tr>
<td>Evaluating the Effect of Trucks on Roundabout Performance Using Microscopic Traffic Simulation Model</td>
<td>1605</td>
</tr>
<tr>
<td>Safety Innovation: Bike Activated Electronic Warning Sign 1st Canadian Trial Application</td>
<td>1615</td>
</tr>
<tr>
<td>Highway User Costs versus Traffic Volume Used in Provincial Highway Preservation Decision-making in Saskatchewan</td>
<td>1630</td>
</tr>
<tr>
<td>Quantifying the Mobility Effects of Winter Road Conditions</td>
<td>1638</td>
</tr>
<tr>
<td>Adverse Weather Impact on Traffic Mobility and Safety: Case Study for Edmonton in Canada</td>
<td>1649</td>
</tr>
<tr>
<td>A Proactive Road Safety Evaluation Tool of Increasing Bicycle Use: Macro-level Collision Prediction Models</td>
<td>1659</td>
</tr>
<tr>
<td>21st Century Bridge Management Systems – A New Method for Ranking Competing Projects and Programs</td>
<td>1671</td>
</tr>
<tr>
<td>Comparison Of Regression And Artificial Neural Network Models Of Bus Dwell And Passenger Activity Times (Case Study: Tehran)</td>
<td>1681</td>
</tr>
<tr>
<td>Review and Verification of Pavement Distress Models in MTO PMS2 Based on In-Service Pavements Data</td>
<td>1692</td>
</tr>
<tr>
<td>Exploring The Safety Application Of Automatic Vehicle Identification Data</td>
<td>1702</td>
</tr>
</tbody>
</table>
Sloshing Characteristic of Rectangular Concrete Tanks Under Seismic Loading ................................................................. 2004
Investigation and Modeling of Chloride-induced Concrete Corrosion on Highway Bridge .............................................. 2014
Long-term Performance of Reinforced Concrete Beams with GFRP Bars Subjected to Aggressive Environments ............. 2023
Yeonho Park, Guillermo Ramirez, Ali Abrolmaali
Advanced Implementation of Nonlinear Control Algorithms for Shake Table Tests ....................................................... 2033
Tony Tang, Andreas Schellenberg, Thomas Duke
Influence of Modular Ratio on the Bond Stress Distribution along a Reinforcing Bar ...................................................... 2043
Augustine Ransoh, Michael Bartlett
Development of Seismic Hazard Compatible Vulnerability Functions for Stone Masonry Buildings ............................ 2053
Ahmad Abo-El-Ezz, Marie-Jose Nollet, Miroslav Nastev
Numerical Analysis of LIPUS Propagation Through Dentoalveolar Structure ............................................................... 2062
Behzad Vafaiean, Saleh Al-Daghreer, Samer Adeb, Tarek El-Bialy
Fox Drive Retaining Wall: A Staged, Permanent Concrete Tieback Wall with Shotcrete, Soil Nails, and Ground Anchors .......................................................... 2072
Yingyi Li, Gary Krivok
Partially-Repaired Reinforced Concrete Beams with Exposed Flexural Reinforcement .................................................. 2082
Trevor Scott, Michael Bartlett
Rehabilitation of the West Nose Creek Bridge in Calgary, Alberta .................................................................................. 2092
Mohamed Sorour, Yousef Zaher, Desmond Njie
Influence of Shrinkage Restraint on Short Term and Residual Deflection of Reinforced Concrete ................................. 2101
Mohammad Darabi, Peter Bischoff, Troy Stafford
A Reliability Assessment Approach for Real-Time Hybrid Simulation Results ............................................................... 2110
Cheng Chen, Rahul Sharma
Analysis and Testing of Gerber Frames for Lateral Stability ......................................................................................... 2120
Farhood Nowzartash, Nizar Markz, Magdi Mohareb
Material Modeling of High Damping Rubber in Finite Element Method ....................................................................... 2130
Farshad Hedayati Dezfuli, M. S. Alam
Optimal Design of Stay Cables in Cable-Stayed Bridges ............................................................................................... 2140
Amitabh Dar, James Hanna
Estimating Building Slab Deflections Accounting for Typical Construction Practice: An Experimental Study ............. 2150
Perry Adeb
Application of DOE Methodologies to the FEA of a Payload Suspended on Drill Pipe from a Semi-Submersible Drill Rig ........................................................................................................... 2160
Leonard Lye, Duane Hawkins
Beyond Design Basis Seismic Evaluation of Nuclear Power Plants at Bruce Site ................................................................. 2169
Amitabh Dar, James Hanna
Distortional Lateral Torsional Buckling Analysis for Beams of Wide Flange Cross-section .............................................. 2179
Rasul Hassan, Magdi Mohareb
Reliability of RC Beams Considering Shear-moment Interaction .................................................................................. 2189
Wensong Zhou, Ning Zhang
Damage Accumulation in Reinforced Concrete Structures Due to Mainshock and Aftershock Earthquakes .................... 2199
Konrad Duerr, Solomon Tesfamariam
Structural Analysis, Design and Cost Estimate of Different Girder Options for a Swing Type Movable Bridge ............... 2209
A. Khan, A. Naem, P. Behman, W. Sultan, A. Palaganas, S. Salih, K. Sennah
Progressive Failure Analysis of Transmission Lines Under Tornado Loading ............................................................. 2220
Ahmed Alkalmas, Ashraf El Damatty, Ahmed Hamada
For Fixed ACL Lengths, the ACL Force Varies with Relative Bone Orientations: A Finite Element Model...................... 2230
Mohammad Atef, Fatemahi, Mojtaba Kazemi, Josh Rosvold, Leping Li, Cyril Frank, Nigel Shrive
Optimization of Aggregate Gradation Combinations to Improve Concrete Sustainability and Durability ...................... 2241
Mohamad Atef, Fatemahi, Mojtaba Kazemi, Josh Rosvold, Leping Li, Cyril Frank, Nigel Shrive
Seismic Performance of Moment Resisting Steel Frames retrofitted with GFRP Plates ..................................................... 2250
Mohammad Al Amin Siddique, Ashraf El Damatty
Experimental Investigation of Cracking in Two-Way Reinforced Concrete Panels .......................................................... 2262
Armin Ziaei Shalmani, M. Reza Kianoush
Seismic Qualification of Structures, Systems and Components in a Canadian Nuclear Power Plant ........................... 2272
Amitabh Dar, Brian McKinnon, Dimitrios Konstantinidis
Seismic Vulnerability Assessment of Non-structural Components using Bow-Tie Analysis ............................................... 2282
Tammam Sraya, Anjuman Shahriar, Solomon Tesfamariam
Sensitivity Of Guyed Transmission Line Towers To Turbulent Downburst Loads .......................................................... 2292
Mohamed Darwish, Ashraf El Damatty
Performance Assessment of Reinforced Concrete Columns under Fire Loadings .......................................................... 2307
Qusay Al-Chatti, Solomon Tesfamariam
Experimental and Numerical Analysis of Augmented Locking Plate Fixation Repair for Proximal Humeral Fractures .......... 2317
Augustine Ransoh, Montaser Kaimi, Tarek El-Bialy, Steve Haxtounian
Seismic Design Considerations For Underground Station Structures ........................................................................... 2326
Jianzhong Gu, Yi Li
Use of Industrial Waste Materials for Producing Mortar and Concrete Mixes

Real-time Hybrid Simulation Implementation with a User Programmable Computational/Control Platform

GFRP Tubes As Stay-in-place Formwork to Enhance Column Blast Resistance

Fatigue Truck Calibration for Bi-linear Fatigue Design Curves

Shear Behaviour of SFRC Slabs Longitudinally Reinforced with High-Performance Steel

Plant Life Management and Design of the Prestressed Concrete Bridges Using Advanced Post-Tensioning System

An Assistive Sit-to-Stand Knee-Ankle-Foot-Orthosis

Behaviour of Profiled Composite Walling System Under Elevated Temperatures

Relationships among Mechanical Properties of Concrete Containing Crumb Rubber as Partial Replacement to Fine Aggregate

Active Nondestructive Health Monitoring Using Embedded Multifunctional Piezoceramic Sensors

Measurement of Initial Imperfection of Energy Pipeline using 3D Laser Scanner

Numerical and Experimental Study of Retrofit System to Increase Uplift Capacity of Light-Framed Wood Roofs

Module Rigging Assembly Dynamic Finite Element Analysis

Flexural Stiffness of RC Beams during Fire Events

Influence of Terra Cotta Infill Walls and Partitions on the Seismic Response of Pre-1970 Buildings: A Case-study of a Montreal Hospital

Effect of the Stress-Strain Relationship on the P-M Interaction Diagrams of Partially Grouted Reinforced Masonry Walls

Structural Behavior of UHPFRC Beams without Stirrups

Fracture Energy properties of Ultra High Performance Fiber Reinforced Concrete

Assessment of Reinforced Concrete Bridge Girders with Significant Soffit Spalling

Performance Evaluation of RC Slender Columns under Lateral Loading

Risk Management Framework for Assessment of Seismic Retrofits

Seismic Assessment of Steel Braced Frames Using Advanced Hybrid Simulation Techniques

Wood-frame vs. Compressed Earth Block Construction: Which Alternative is Better?

Shear Behavior of SFRC and SCFRC Beams

Fatigue Testing and Analysis of As-Welded and Retrofititted Web stiffeners in Steel Highway Bridges

Effect of Seismic Detailing and Steel Fibres on the Blast Resistance Behaviour of Reinforced Concrete Columns

Structural Deep Slab Bridge with Fiber Reinforced Concrete

Finite Element Modelling of Beam-Column Joints Strengthened with Steel-Reinforced Polymers for Seismic Resistance

Seismic Design of Concrete Shear Wall Buildings in Canada: the Outlook for 2014

State-of-the-Art in Nonlinear Modeling of Concrete Frame Structures under the Combined Effect of Ultimate Loading and Reinforcement Corrosion
Optimum Design Data Base for Cable-stayed Bridges ............................................................. 2628
Mahmoud Hassan, Ashraf El Damatty, Ashraf Nasim

Anchorage of Stirrups in Prestressed Concrete Bridge Girders ............................................. 2640
Perry Adebar, Macarious Hui, Ian Graham

Comparing Flexural Capacity of Reinforced Masonry Members in Different Codes .................. 2648
Bishoy Alfy Samy, Salah Sarhat, E. G. Sherwood

Finite Element Analysis of Shear Friction of Concrete Strengthened with External Steel-Reinforced Polymer Composites ...................................................... 2658
Maryam Mahmoodi, Mammadou El-Badry

Design and Construction of a 30-metre-high Glazing Wall Supported by Cable Trusses .......... 2667
Georg Josi, Jim Montgomery, Jeff Dibattista, Gird Anderson, Dejan Erdevicki

Responses of Isolated Building with MR Dampers and Fuzzy Logic ..................................... 2677
F. Khoshmoudiania, A. Molaee Tabrizi, T. Y. Yang

Restained Shrinkage in Concrete Flexural Elements .............................................................. 2684
Michael Bartlett, Graeme Johnston

Development and Validation of a Three Dimensional Finite Element Structure-Tuned Liquid Damper Model System ............................................................... 2694
Islam Soliman, Michael Tait, Ashraf El Damatty

Deck Reconstruction of the Honore Mercier Bridge A Major Rehabilitation Challenge ........... 2704
Sevak Demirdjian, Adel R. Zaki, Guy Mailhot

Behaviour of WT Connections under Combined Shear, Moment, and Tension ....................... 2714
Hossein Daneshvar, Robert Driver

Compressive Arching and Tensile Catenary Action in Steel Shear Connections Under Column Removal Scenario ................................................................. 2725
Hossein Daneshvar, Steven Osterhof, Robert Driver

Uncertainty Modelling of Shear Tab Connections ................................................................ 2735
Smitha Koduru, Robert Driver

Erection of the Deh Cho Bridge .............................................................................................. 2746
T. G. Davies, E. F. Pradilla, R. W. Welch, C. D. A. Ross

Erection Engineering for the BC Place Stadium Roof ............................................................. 2756
Michael Schuma

Fragility Relationships For Probabilistic Performance Based Seismic Risk Assessment Of Bridge Inventories ................................................................. 2765
David Lau, Charlotte L. Waller, Kandasamy Vizhukandhan, Siva Srivashyan

Issues Related to the Design and Construction of Curved Steel Bridges .................................. 2775
Munzer Hassan, Nathalie Chagnon, Dennis Bascom

Condition Assessment of a Timber Bridge Substructure Using Vibration-based Methods and Pattern Recognition Techniques ......................................................... 2785
Cameron Beauregard, Bruce Sparling, Leon Wegner

Deformability and Ductility of Reinforced Concrete Beams Strengthened with NSM-CFRP Reinforcements ................................................................. 2803
Hamid Omran, Raafat El-Hacha

Evaluation of the Post-Fatigue Behaviour of RC Beams Strengthened in Flexure using Prestressed NSM CFRP Rods ............................................................. 2813
Fadi Ouah, Raafat El-Hacha

Effect of Varying Overlap Lengths of SFRP and CFRP Sheets on Confined Concrete Cylinders ................................................................. 2822
Mohammad Mashrik, Raafat El-Hacha

Effect of Age at Loading and Load Arrangement on Immediate Deflections of One-Way Slabs .... 2832
Jeil Lee, Mark Scanlon, Laura Cohen, Andrew Scanlon

Real Time Hybrid Simulation Of Electrical Insulator Posts Using A Smart Shaking Table And Comparison With Full Dynamic Testing ......................................................... 2840
Seim Gunay, Mohamed Moustafa, Khalid Mosalam

P-I Diagrams for Steel Plate Shear Wall Systems ................................................................. 2850
Hassan Moghimi, Robert Driver

Finite Element Modeling and Analysis of Light-gauge Steel Plate Shear Walls ......................... 2860
Arghya Chatterjee, Anjan Bhoomick, Ashtoth Bagchi

Fatigue of Connections with Staggered Rivet Holes ................................................................ 2870
Christian Wokem, Gilbert Grandin

Stability of Straight Steel Plate Girders in Construction .......................................................... 2880
Robert Gale

Beam Axial Force Demand Evaluation for Low-seismic Steel Plate Shear Walls ....................... 2890
Hassan Moghimi, Robert Driver

Implications of the Use of Spectral Acceleration as Intensity Measure in Probabilistic Seismic Demand Analysis ................................................................. 2900
Lan Lin

Designing for Longevity: Hot-Dip Galvanized Steel Performance in Soil and Atmospheric Exposure ..................................................................................................... 2910
Melissa Lindsay, Philip Rahrig, Thomas Langill

The Assessment and Retrofit of a Vulnerable Pin Hanger Bridge in the City of Calgary .............. 2921
Russel Martin, Donald Kennedy

Effect of Seismic Design Level and Building Height on the Robustness of Steel Frame Structures Prone to Progressive Collapse ........................................... 2930
Seyed Javad Mirvalad, Khaled Galal
Investigations for the Retrofit of the Honore-Mercier Bridge, Montreal ........................................... 2940
Probabilistic Wind Model for Regional Reliability-Based Fatigue Evaluation of Sign Support Structures ................................................................. 2950
Joseph Diekjaars, Christopher M Foley
Estimation of Progressive Collapse Potential for Shear Wall Buildings ................................................................. 2960
Omer Yagob, Khaled Galal, Nove Naumoki
Experimental Evaluation of the Robustness of Flexible WT Steel Connections ................................................................. 2974
Christopher Ruelt, Christopher M Foley, A. D. Friedman
Evaluation of Modal Pushover Analysis Procedure for Steel Plate Shear Walls ................................................................. 2983
A. K. Bhowmick
Lessons Learned from the First Large Scale Use of Cross Laminated Timber As Tall Shear Walls in Western Canada ................................................................. 2993
Mark Porter, Robin Zirnhelt, Benny Neylon
Seismic Performance Assessment Of Vertical Irregular R.C. Buildings, For Various Ground Motion Characteristics ................................................................. 3003
Mohamed Elbarkouky, Samer Ezeldin, Ashraf El-Assaly
New Developed FRP-Headed Rebars for Infrastructure Applications ................................................................. 3013
H. M. Mohamed, M. Zakia, B. Bemokrane
Design and Construction of the First Worldwide Two-Way Flat Slab Parking Garage Reinforced with GFRP Bars ................................................................. 3023
Brahim Bemokrane, Ehab Ahmed, Christian Dulude, Eric Boucher
Hybrid Reinforced Concrete Bridge Deck Slab of 410 Overpass Bridge in Quebec: Construction and Testing ................................................................. 3032
Ehab Ahmed, Brahime Bemokrane
Metrics of Bridge Serviceability ................................................................. 3042
Bala Balakrishnan
Effect of Bond Area on Strengthening Efficiency of FRP-stiffened Thin-walled Steel Beams ................................................................. 3049
Ayman Okeil, G Broussard, M. R Ferdous
Analytical Assessment of Stability of Unbraced Column in Two-Panel Concentrically Braced Frames ................................................................. 3057
Ali Imanpour, Tremblay Robert
Retrofit of Structural Steel Columns using FRP-Concrete Composite Systems ................................................................. 3067
Joel Linde, Michael Tait, Saeedeh Razavi, Wael El-Dakhakhni
Vortex Shedding Analysis of a Tapered 13 m Single Davit Light Pole according to CAN/CSA S6-06 and AASHTO LT-5 ................................................................. 3077
Theresa Holden, Bob Ramsay
Mechanical Behavior of Shear Walls: a New Technique for Reinforcement According to the Developed Principal Stresses ................................................................. 3087
A. Kezmarke, S. Bouvais, M. Hamizi, L. Bouzid
Effect of RBS Connection on the Behavior of Steel Plate Shear Walls ................................................................. 3097
Pouya Salem, Mohamad Mehdi Alinia
Fatigue Performance of Coped Steel Beams, Retrofitted with Carbon Fibre Reinforced Polymers ................................................................. 3107
Syed Mobeen, Theresa Holden, Roger Cheng
Load-Slip Response of Gypsum Board-to-Stud Fastener Connections in Shear ................................................................. 3117
Daniel Grenier, Michael Bartlett
Seismic Effects on Deep Beams in a Reinforced Concrete Building ................................................................. 3127
Md Shahnewaz, Ahmad Reiel, Shahria Alam
Validation of the Accuracy of Finite Element Analysis Models of a Gayed Telecommunication Mast with Ambient Vibration Measurements ................................................................. 3136
Mahtab Ghafori Otgogi, Ghyslaine McClure, Xiao Hong Zhang, Daniel Gagnon
Numerical Comparison between FRP and TRM for Seismic Retrofitting ................................................................. 3147
P. K. M. Moniruzzaman, Ahmad Reiel
Fabrication of the Deh Cho Bridge pylons ................................................................. 3157
Paul King, P. Eng.

1ST INTERNATIONAL CONFERENCE FOR SUSTAINING PUBLIC INFRASTRUCTURE

Quantifying Financial Impacts of New Suburban Development: A Case Study ................................................................. 3167
Dina Alex, Bradley Leeman, Konrad Sue
Edmonton’s North LRT Extension: Sustainability throughout the Project Life Cycle ................................................................. 3177
Brad Smid, Mark Perry, Allan Neill, Mike Woodland
Assessing the Ability of Integrated Decision-Making to Improve Canadian Municipal Infrastructure Sustainability ................................................................. 3187
Amy Vaillancourt, Jeff Rankin, Bruce Wilson
Optimizing Infrastructure Renewal – Edmonton’s Risk-Based Infrastructure Management System (RIMS) ................................................................. 3197
Hussein Al-Battainehe, Bradley Leeman, Konrad Sue
The Neighbourhood Renewal Program: A City of Edmonton Sustainable Infrastructure Success Story ................................................................. 3207
Hussein Al-Battainehe, Steve Aguiar
Sustainable Concrete made with FRP Scrap Aggregate (FSA) ................................................................. 3217
Emma Slater, Shahria Alam

A Multi-criteria! Decision-making (MCDM) Framework for Prioritizing Damaged Infrastructure and Services Facilities in Egypt Using Sustainability Objectives ................................................................. 3228
Mohamed Elbarkouky, Samer Ezeldin, Ashraf El-Assaly