

# **International Conference on Sustainable Infrastructure 2017**

Technology

New York, New York, USA  
26 – 28 October 2017

**Editors:**

**Lucio Soibelman  
Feniosky Pena-Mora**

ISBN: 978-1-5108-5275-4

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



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

Copyright© (2017) by American Society of Civil Engineers  
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact American Society of Civil Engineers  
at the address below.

American Society of Civil Engineers  
1801 Alexander Bell Drive  
Reston, VA 20191  
USA

Phone: (800) 548-2723  
Fax: (703) 295-6333

[www.asce.org](http://www.asce.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# Contents

<b>A Case Study and Recommendation for Large Scale Floating Wetlands .....</b>	<b>1</b>
M. McCarty, J. Ceci, and C. Streb	
<b>A Novel Method for Laying Sustainable Separate Sewer Systems .....</b>	<b>13</b>
Alaa Abbas, Felicite Ruddock, Rafid Alkhaddar, Glynn Rothwell, and Robert Andoh	
<b>A Practical Engineering Approach to Interpreting Measurement Data in Uncertain Contexts.....</b>	<b>26</b>
Ian F. C. Smith and Sai G. S. Pai	
<b>A Sustainable Foundation for Doyle Drive IJKL Outfall, San Francisco, CA .....</b>	<b>39</b>
Mahmood Momenzadeh and Tim Pokrywka	
<b>A Systems Approach to Water Infrastructure Planning in Urban Watersheds .....</b>	<b>53</b>
Mark R. Norton	
<b>Accounting for the Co-Benefits of Green Infrastructure.....</b>	<b>65</b>
Matthew Jones, John McLaughlin, and Sandeep Mehrotra	
<b>Adaptive Risk Management for Future Climate/Weather Extremes .....</b>	<b>76</b>
Bilal M. Ayyub, Richard N. Wright, Ana P. Barros, J. Rolf Olsen, Ted S. Vinson, and Daniel Walker	
<b>An Assessment of Benefits of Using BIM on an Infrastructure Project.....</b>	<b>88</b>
Bimal Kumar, Hubo Cai, and Makarand Hastak	
<b>An Information System for Real-Time Critical Infrastructure Damage Assessment Based on Crowdsourcing Method: A Case Study in Fort McMurray.....</b>	<b>96</b>
Yuan Faxi, Liu Rui, and Mejri Ouejdane	
<b>Application of Corrosion Potential as a Tool to Assess Sustainability of Indigenous Concrete Mixes in Bangladesh.....</b>	<b>104</b>
T. Manzur, B. Baten, Md. J. Hasan, and B. Bose	
<b>Behavior of Sustainable Prefabricated Bamboo Reinforced Wall Panels under Concentrated Load.....</b>	<b>116</b>
Vishal Puri and Pradipta Chakraborty	

<b>Building Smart and Accessible Transportation Hubs with Internet of Things, Big Data Analytics, and Affective Computing .....</b>	<b>126</b>
Jie Gong, Cecilia Feeley, Hao Tang, Greg Olmschenk, Vishnu Nair, Zixiang Zhou, Yi Yu, Ken Yamamoto, and Zhigang Zhu	
<b>Case Study: Canal de Navarra Irrigation Infrastructure Sustainability; A Balanced Economic, Social and Environmental Assessment at Regional Scale .....</b>	<b>139</b>
Jose E. Arizón, Jose A. Alfaro, and David Fernández-Ordóñez	
<b>Comparison of Resilient Modulus of Unbound Layers Obtained from Clegg Hammer and Laboratory Test.....</b>	<b>152</b>
Md. Mehedi Hasan and Rafiqul A. Tarefder	
<b>Decentralized Urban Composting .....</b>	<b>162</b>
Leah Retherford, Gregory P. McCarron, and Marguerite Manela	
<b>Delivering Safe, Cost-Effective, Sustainable Civil Infrastructure Projects under Conditions of Non-Stationarity .....</b>	<b>171</b>
Bill Wallace, Dave Ellison, and Ryan Daugherty	
<b>Design, Simulation, and Assessment of BIPV: A Student Accommodation Building in Australia .....</b>	<b>187</b>
Rebecca J. Yang and Andrew Carre	
<b>Evaluation of Rutting and Stripping Potential of WMA with Different Additives .....</b>	<b>201</b>
Biswajit K. Bairgi, Ivan A. Syed, and Rafiqul A. Tarefder	
<b>Experimental Studies on Effects of Steel Studs in Composite Slabs.....</b>	<b>213</b>
S. K. Eshwari, G. J. Chandrashekar, Ahamed Maaz, N. Mohith, T. N. Manjunath, and T. Raghavendra	
<b>Hydraulic Performance of Pervious Concrete Systems: Eastern Washington.....</b>	<b>225</b>
Liv Haselbach and Brandon Werner	
<b>Identifying and Addressing Gaps for Resilient Infrastructure: A Case of Combined Stormwater Systems .....</b>	<b>234</b>
Jyoti Kumari Upadhyaya, Mirandi McDonald, Nihar Biswas, and Edwin K. L. Tam	
<b>New Standards for Infrastructure Delivery: California High-Speed Rail .....</b>	<b>247</b>
Margaret Cederoth, Melissa DuMond, Julie Sinistore, and Annika Ragsdale	
<b>Numerical Modeling of Early Bio-Contamination in a Water Distribution System and Comparison with Laboratory Experiments .....</b>	<b>258</b>
S. Tinelli and I. Juran	
<b>NYC DEP Green Infrastructure Research and Development Project: Monitoring Strategy and Protocols.....</b>	<b>270</b>
John McLaughlin, Miki Urisaka, Franco Montalto, Fernando Pasquel, and Valentina Paiva Acosta	

<b>Performance Evaluation of Retrofitted Low Impact Development Practices in Urban Environments: A Case Study from London, U.K.</b> .....	<b>282</b>
Mohamad El Hattab, Dejan Vernon, and Ana Mijic	
<b>Promoting Environmentally Sustainable Infrastructure Construction in Latin America and Caribbean</b> .....	<b>295</b>
Robert H. Montgomery and Francesc Beni	
<b>Risk Assessment for Early Water Leak Detection</b> .....	<b>306</b>
Wilmer P. Cantos, Ilan Juran, and Silvia Tinelli	
<b>Refinements of GI Models in New York City Based on Post-Construction Monitoring Data to Estimate GI Performance Citywide</b> .....	<b>319</b>
Pinar Balci, Margot Walker, Jerry Kleyman, Sri Rangarajan, and Sarah Teevan	
<b>Significance of Scale in Spatial Dependencies of Urban Human Mobility and Energy Use: A Decision-Making Perspective</b> .....	<b>328</b>
Neda Mohammadi and John E. Taylor	
<b>Spatial and Geographic Patterns of Building Energy Performance: A Cross-City Comparative Analysis of Large-Scale Data</b> .....	<b>336</b>
Sokratis Papadopoulos, Bartosz Bonczak, and Constantine E. Kontokosta	
<b>Resilience of Road Infrastructure in Response to Extreme Weather Events</b> .....	<b>349</b>
Yvianne B. Valenzuela, Raphael S. Rosas, Mehran Mazari, Mark Risse, and Tonatiuh Rodriguez-Nikl	
<b>Sustainable Pre-Stressed Concrete from Seawater</b> .....	<b>361</b>
Dan Millison and Scott Countryman	
<b>Time Domain Reflectometry (TDR) Sensor for Detecting Groundwater Contamination</b> .....	<b>373</b>
M. Hashim Pashtun and Shad Sargand	
<b>Thermal Performance of Autoclaved Aerated Concrete (AAC) and (CMU) Beams Strengthened with Inorganic Basalt Composites</b> .....	<b>384</b>
Alaa Abd Ali, Husam Najm, and P. N. Balaguru	
<b>Ultra High Performance Concrete-Sustainable Solution for the Next Generation Infrastructure</b> .....	<b>397</b>
Harshith Gowda and B. B. Das	
<b>Using Big Data and Cutting Edge Tools to Optimize the Sustainability of Linear Buried Water Assets</b> .....	<b>406</b>
A. Vanrenterghem and P. Kraft	