Stanford

Sarah Billington

Professor of Civil and Environmental Engineering and Senior Fellow at the Woods Institute for the Environment

CONTACT INFORMATION

- **Administrator**

  Kim Vonner - Administrative Associate

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Bio

BIO

Our group studies the impact of building design, materials, and symbols on human wellbeing including stress, physical activity, creativity, sense of belonging, and pro-environmental behavior. We are exploring how buildings can include both physical and digital adaptations to improve wellbeing outcomes including new methods of bringing nature and the experience of nature into buildings. We are interested in how building management systems can be extended beyond providing energy savings, thermal comfort, and security to support and maintain a broader set of human wellbeing outcomes while preserving occupant privacy. Further, we are studying the impact of built features, including historic structures, on community wellbeing and methods of design for community wellbeing that support the equitable development of affordable and permanent supportive housing.

Our group also has a long history of expertise in the design and evaluation of sustainable, durable construction materials, their application to structures and construction, including damage-tolerant, high-performance fiber-reinforced cementitious composite materials, and bio-based fiber-reinforced polymeric composites and insulating foams that have a closed loop life-cycle.

ACADEMIC APPOINTMENTS

- Professor, Civil and Environmental Engineering
- Senior Fellow, Stanford Woods Institute for the Environment

ADMINISTRATIVE APPOINTMENTS

- Associate Chair, Department of Civil & Environmental Engineering, (2009-2015)

HONORS AND AWARDS

- Milligan Family University Fellow in Undergraduate Education, Stanford University (2012-present)
- American Concrete Institute Fellow, American Concrete Institute (2006-present)
- ACI Structural Engineering Award, American Concrete Institute (2002)
- Fiona Li and Donald Li Excellence in Teaching Award, College of Engineering, Cornell University (2002)
- ARC Career Development Award, ASCE's Civil Engineering Research Foundation (2000)

- NSF Early Career Award, National Science Foundation (2000)
- Fulbright Fellowship, ETH, Zurich, Switzerland (1990-1991)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Board Member, Structural Engineers Association of Northern California (2012 - 2014)
- Board Member, Network for Earthquake Engineering Simulation, Inc. (2006 - 2009)

PROFESSIONAL EDUCATION

- PhD, University of Texas at Austin , Structural Engineering (1997)
- MSE, University of Texas at Austin , Structural Engineering (1994)
- BSE, Princeton University , Civil Engineering & Operations Research (1990)

PATENTS

- J.V. Olsson, Y.-L. Chung, R.J. Li, R. Waymouth, E. Sattely, S.L. Billington, C.W. Frank. "United States Patent 9567432 Lignin poly(lactic acid) copolymers", Leland Stanford Junior University, Feb 14, 2017
- W.V. Srubar III, S.L. Billington. "United States Patent 8759424 Coated Biodegradable Building Article", Leland Stanford Junior University, Jun 24, 2014
- W.V. Srubar III, S.L. Billington. "United States Patent 8507588 PHBV/Ground Bone Meal and Pumice Powder Engineering Biobased Composite Materials for Construction", Leland Stanford Junior University, Aug 13, 2013
- S.L. Billington, C.S. Criddle, M.C. Morse, S.J. Christian, A.J. Pieja. "United States Patent 7887893 Bacterial poly(hydroxy alkanoate) polymer and natural fiber composites", Leland Stanford Junior University, Feb 15, 2011

LINKS

- Billington Lab: https://sites.google.com/stanford.edu/stanford-billington-lab

Teaching

COURSES

2020-21

- Engineering the Built Environment: An Introduction to Structural Engineering: CEE 80N (Aut)
- Materials for Sustainable Built Environments: CEE 223 (Spr)
- Structural Design: CEE 182 (Win)

2019-20

- Engineering the Built Environment: An Introduction to Structural Engineering: CEE 80N (Aut)
- Intro to Solid Mechanics: ENGR 14 (Win)
- Materials for Sustainable Built Environments: CEE 223 (Spr)

2018-19

- Advanced Structural Concrete Behavior and Design: CEE 285A (Aut)
- Engineering the Built Environment: An Introduction to Structural Engineering: CEE 80N (Aut)
- Intro to Solid Mechanics: ENGR 14 (Win)
- Materials for Sustainable Built Environments: CEE 223 (Spr)

2017-18

- Advanced Structural Concrete Behavior and Design: CEE 285A (Aut)
- Engineering the Built Environment: An Introduction to Structural Engineering: CEE 80N (Win)
- Intro to Solid Mechanics: ENGR 14 (Spr)

- Materials for Sustainable Built Environments: CEE 223 (Spr)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Hai Haham

Doctoral Dissertation Advisor (AC)

Basma Altaf

Master's Program Advisor

Tamika Bassman, Ana Moura-Cook, Justin Tennenbaum

Doctoral Dissertation Co-Advisor (AC)

Wenhao Chen

Doctoral (Program)

Isabella Douglas

Publications

PUBLICATIONS

- **Flexural performance of steel-reinforced engineered cementitious composites with different reinforcing ratios and steel types** *CONSTRUCTION AND BUILDING MATERIALS*
  Shao, Y., Billington, S. L.
  2020; 231
- **Comparison of nanocrystalline cellulose dispersion versus surface nucleation in poly (3#hydroxybutyrate#co#3#hydroxyvalerate) crystallization** *SPE Polymers*
  Haham, H., Shen, M. Y., Billington, S. L., Frank, C. W.
  2020; 1 (1)
- **Effect of Fiber Content Variation in Plastic Hinge Region of Reinforced UHPC Flexural Members** *RILEM-fib International Symposium on Fibre Reinforced Concrete*
  Pokhrel, M., Shao Yi, Billington, S., Bandelt, M. J.
  2020
- **Predicting the two predominant flexural failure paths of longitudinally reinforced high-performance fiber-reinforced cementitious composite structural members** *ENGINEERING STRUCTURES*
  Shao, Y., Billington, S. L.
  2019; 199
- **Mechanics and failure characteristics of hybrid fiber-reinforced concrete (HyFRC) composites with longitudinal steel reinforcement** *ENGINEERING STRUCTURES*
  Nguyen, W., Bandelt, M. J., Trono, W., Billington, S. L., Ostertag, C. P.
  2019; 183: 243–54
- **Simulation of Deformation Capacity in Reinforced High-Performance Fiber-Reinforced Cementitious Composite Flexural Members** *JOURNAL OF STRUCTURAL ENGINEERING*
  Bandelt, M. J., Billington, S. L.
  2018; 144 (10)
- **Finite element models of reinforced ECC beams subjected to various cyclic deformation** *COMPUTERS AND CONCRETE*
  Frank, T. E., Lepech, M. D., Billington, S. L.
  2018; 22 (3): 305–17
- **Experimental Testing of Reinforced ECC Beams Subjected to Various Cyclic Deformation Histories** *JOURNAL OF STRUCTURAL ENGINEERING*
  Frank, T. E., Lepech, M. D., Billington, S. L.

2018; 144 (6)

- **A lignin-epoxy resin derived from biomass as an alternative to formaldehyde-based wood adhesives** *GREEN CHEMISTRY*
  Li, R., Gutierrez, J., Chung, Y., Frank, C. W., Billington, S. L., Sattely, E. S.
  2018; 20 (7): 1459–66

- **Biocomposite Fiber-Matrix Treatments that Enhance In-Service Performance Can Also Accelerate End-of-Life Fragmentation and Anaerobic Biodegradation to Methane** *JOURNAL OF POLYMERS AND THE ENVIRONMENT*
  Ryan, C. A., Billington, S. L., Criddle, C. S.
  2018; 26 (4): 1715–26

- **Integrating a Digital Textbook into a Statics Course**
  Anagnos, T., Sheppard, S. D., Billington, S. L., IEEE
  IEEE.2018

- **Simulation of reinforced ductile cement-based composite beams under cyclic loads**
  Billington, S. L., Shao, Y., Frank, T. E., Bandelt, M. J., Moreno, D. M., Meschke, G., Pichler, B., Rots, J. G.
  CRC PRESS-BALKEMA.2018: 805–12

- **4D BEYOND CONSTRUCTION: SPATIO-TEMPORAL AND LIFE-CYCLIC MODELING AND VISUALIZATION OF INFRASTRUCTURE DATA** *JOURNAL OF INFORMATION TECHNOLOGY IN CONSTRUCTION*
  Zhang, Z., Hamledari, H., Billington, S., Fischer, M.
  2018; 23: 285–304

- **Historical Analysis of Hydraulic Bridge Collapses in the Continental United States** *JOURNAL OF INFRASTRUCTURE SYSTEMS*
  Flint, M. M., Fringer, O., Billington, S. L., Freyberg, D., Diffenbaugh, N. S.
  2017; 23 (3)

- **Methodology to assess end-of-life anaerobic biodegradation kinetics and methane production potential for composite materials** *COMPOSITES PART A-APPLIED SCIENCE AND MANUFACTURING*
  Ryan, C. A., Billington, S. L., Criddle, C. S.
  2017; 95: 388-399

- **Assessment of models for anaerobic biodegradation of a model bioplastic: Poly(hydroxybutyrate-co-hydroxyvalerate).** *Bioresource technology*
  Ryan, C. A., Billington, S. L., Criddle, C. S.
  2017; 227: 205-213

- **Experimental testing of reinforced concrete and reinforced ECC flexural members subjected to various cyclic deformation histories** *Materials and Structures*
  Frank, T. E., Lepech, M. D., Billington, S. L.
  2017; 50 (5)

- **Engineering Mechanics: Statics: Modeling and Analyzing Systems in Equilibrium**
  Sheppard, S. D., Anagnos, T., Billington, S. L.
  Wiley.2017

- **Bond behavior and interface modeling of reinforced high-performance fiber-reinforced cementitious composites** *Cement and Concrete Composites*
  Bandelt, M. J., Frank, T. E., Lepech, M. D., Billington, S. L.
  2017; 83: 188-201

- **Influence of carbon feedstock on potentially net beneficial environmental impacts of bio-based composites** *JOURNAL OF CLEANER PRODUCTION*
  Miller, S. A., Billington, S. L., Lepech, M. D.
  2016; 132: 266-278

- **Impact of Reinforcement Ratio and Loading Type on the Deformation Capacity of High-Performance Fiber-Reinforced Cementitious Composites Reinforced with Mild Steel** *JOURNAL OF STRUCTURAL ENGINEERING*
  Bandelt, M. J., Billington, S. L.
  2016; 142 (10)

- **Bond behavior of steel reinforcement in high-performance fiber-reinforced cementitious composite flexural members** *MATERIALS AND STRUCTURES*
  Bandelt, M. J., Billington, S. L.

2016; 49 (1-2): 71-86

- **Integrating durability-based service-life predictions with environmental impact assessments of natural fiber-reinforced composite materials** *RESOURCES CONSERVATION AND RECYCLING*
  Miller, S. A., Srubar, W. V., Billington, S. L., Lepech, M. D.
  2015; 99: 72-83

- **Static versus Time-Dependent Material Selection Charts and Application in Wood Flour Composites** *JOURNAL OF BIOBASED MATERIALS AND BIOENERGY*
  Miller, S. A., Lepech, M. D., Billington, S. L.
  2015; 9 (2): 273-283

- **Incorporating spatiotemporal effects and moisture diffusivity into a multi-criteria materials selection methodology for wood-polymer composites** *CONSTRUCTION AND BUILDING MATERIALS*
  Srubar, W. V., Miller, S. A., Lepech, M. D., Billington, S. L.
  2014; 71: 589-601

- **Nonlinear Constitutive Model for Anisotropic Biobased Composite Materials** *JOURNAL OF ENGINEERING MECHANICS*
  Michel, A. T., Billington, S. L.
  2014; 140 (11)

- **Design Concepts for Controlled Rocking of Self-Centering Steel-Braced Frames** *JOURNAL OF STRUCTURAL ENGINEERING*
  Eatherton, M. R., Ma, X., Krawinkler, H., Mar, D., Billington, S., Hajjar, J. F., Deierlein, G. G.
  2014; 140 (11)

- **Behavior of unreinforced masonry prisms and beams retrofitted with engineered cementitious composites** *MATERIALS AND STRUCTURES*
  Kyriakides, M. A., Billington, S. L.
  2014; 47 (9): 1573-1587

- **Mechanical Characterization and Modeling of Poly (beta-hydroxybutyrate)-co-poly(beta-hydroxyvalerate)-Alfa Fiber-Reinforced Composites** *POLYMER COMPOSITES*
  Ben Cheikh, R., Michel, A., Billington, S.
  2014; 35 (9): 1758-1766

- **Tension stiffening in reinforced high performance fiber reinforced cement-based composites** *CEMENT & CONCRETE COMPOSITES*
  Moreno, D. M., Trono, W., Jen, G., Ostertag, C., Billington, S. L.
  2014; 50: 36-46

- **Influence of temporal resolution and processing of exposure data on modeling of chloride ingress and reinforcement corrosion in concrete** *MATERIALS AND STRUCTURES*
  Flint, M., Michel, A., Billington, S. L., Geiker, M. R.
  2014; 47 (4): 729-748

- **Seismic Retrofit of Steel Moment-Resisting Frames with High-Performance Fiber-Reinforced Concrete Infill Panels: Large-Scale Hybrid Simulation Experiments** *JOURNAL OF STRUCTURAL ENGINEERING*
  Lignos, D. G., Moreno, D. M., Billington, S. L.
  2014; 140 (3)

- **Cyclic Response of Nonductile Reinforced Concrete Frames with Unreinforced Masonry Infills Retrofitted with Engineered Cementitious Composites** *JOURNAL OF STRUCTURAL ENGINEERING*
  Kyriakides, M. A., Billington, S. L.
  2014; 140 (2)

- **Simulating bond-slip effects in high-performance fiber-reinforced cement based composites under cyclic loads** *Euro-C Conference*
  Bandelt, M. J., Billington, S. L.
  CRC PRESS-TAYLOR & FRANCIS GROUP.2014: 1059–1066

- **Evaluation of a Modular Framework for Performance-Based Durability Engineering through Assessment of a Coastal Reinforced Concrete Structure** *Durability of Building Materials and Components XIII*
  Flint, M., Billington, S.
  2014

- **Biobased Materials for Sustainable Temporary Disaster-Relief Housing** *3rd International Conference on Urban Disaster REduction, Earthquake Engineering Research Institute*
  Michel, A., Srubar III, W., Billington, S.
  2014
- **Stimulation of High-Performance Fiber-Reinforced Cementitious Composites with Bond-Slip Effects** *EURO-C*
  Bandelt, M., Billington, S.
  2014
- **Evaluation of a modular framework for performance-based durability engineering through assessment of a coastal reinforced concrete structure** *Durability of Building Materials and Components XIII*
  Flint, M. M., Billington, S. L.
  2014
- **Biobased Materials for Sustainable Temporary Disaster-Relief Housing** *Third International Conference on Urban Disaster Reduction*
  Michel, A. T., Srubar, W. V., Billington, S. L.
  EERI.2014
- **A modular framework for performance-based durability engineering: From exposure to impacts** *STRUCTURAL SAFETY*
  Flint, M. M., Baker, J. W., Billington, S. L.
  2014; 50: 78-93
- **Application of multi-criteria material selection techniques to constituent refinement in biobased composites** *MATERIALS & DESIGN*
  Miller, S. A., Lepech, M. D., Billington, S. L.
  2013; 52: 1043-1051
- **A Renewable Lignin-Lactide Copolymer and Application in Biobased Composites** *ACS SUSTAINABLE CHEMISTRY & ENGINEERING*
  Chung, Y., Olsson, J. V., Li, R. J., Frank, C. W., Waymouth, R. M., Billington, S. L., Sattely, E. S.
  2013; 1 (10): 1231-1238
- **Shake-Table Tests of a 3-Story Masonry-Infilled RC Frame Retrofitted with Composite Materials** *JOURNAL OF STRUCTURAL ENGINEERING*
  Koutromanos, I., Kyriakides, M., Stavridis, A., Billington, S., Shing, P. B.
  2013; 139 (8): 1340-1351
- **A micromechanical model for moisture-induced deterioration in fully biorenewable wood-plastic composites** *COMPOSITES PART A-APPLIED SCIENCE AND MANUFACTURING*
  Srubar, W. V., Billington, S. L.
  2013; 50: 81-92
- **Behavior of Concrete and ECC Structures under Simulated Earthquake Motion** *JOURNAL OF STRUCTURAL ENGINEERING-ASCE*
  Gencturk, B., Elnashai, A. S., Lepech, M. D., Billington, S.
  2013; 139 (3): 389-399
- **Improvement in environmental performance of poly(beta-hydroxybutyrate)-co-(beta-hydroxyvalerate) composites through process modifications** *JOURNAL OF CLEANER PRODUCTION*
  Miller, S. A., Billington, S. L., Lepech, M. D.
  2013; 40: 190-198
- **Seismic Retrofit of Steel Moment Resisting Frames With High Performance Fiber Reinforced Concrete Infill Panels: Large Scale Hybrid Simulation Experiments** *ASCE Journal of Structural Engineering, published online*
  Lignos, D., Moreno, D., Billington, S., L.
  2013
- **Bond Strenght and Bond-Slip Behavior of Steel Reinforcement in HIgh-Performance Fiber-Reinforced Cementitious Composites** *Tenth International Conference on Urban Earthquake Engineering*
  Bandelt, M., Billington, S.
  2013
- **Bond of Reinforcement in High-Performance Fiber-Reinforced Concrete** *Seventh National Seismic Conference of Bridges & Highways*
  Bandelt, M., Billington, S.

2013

- **Bond of Reinforcement in High-Performance Fiber-Reinforced Concrete** *Seventh National Seismic Conference on Bridges & Highways*
  Bandelt, M. J., Billington, S. L.
  2013

- **Characterizing the effects of ambient aging on the mechanical and physical properties of two commercially available bacterial thermoplastics** *3rd International Conference on Biodegradable and Biobased Polymers (BIOPOL)*
  Srubar, W. V., Wright, Z. C., Tsui, A., Michel, A. T., Billington, S. L., Frank, C. W.
  ELSEVIER SCI LTD.2012: 1922–29

- **Extruded foams from microbial poly(3-hydroxybutyrate-co-3-hydroxyvalerate) and its blends with cellulose acetate butyrate** *POLYMER ENGINEERING AND SCIENCE*
  Liao, Q., Tsui, A., Billington, S., Frank, C. W.
  2012; 52 (7): 1495-1508

- **Moisture diffusion and its impact on uniaxial tensile response of biobased composites** *COMPOSITES PART B-ENGINEERING*
  Christian, S. J., Billington, S. L.
  2012; 43 (5): 2303-2312

- **Characterization of poly-hydroxybutyrate films and hemp fiber reinforced composites exposed to accelerated weathering** *POLYMER DEGRADATION AND STABILITY*
  Michel, A. T., Billington, S. L.
  2012; 97 (6): 870-878

- **Modeling the kinetics of water transport and hydroexpansion in a lignocellulose-reinforced bacterial copolyester** *POLYMER*
  Srubar, W. V., Frank, C. W., Billington, S. L.
  2012; 53 (11): 2152-2161

- **Simulation of Unreinforced Masonry Beams Retrofitted with Engineered Cementitious Composites in Flexure** *JOURNAL OF MATERIALS IN CIVIL ENGINEERING*
  Kyriakides, M. A., Hendriks, M. A., Billington, S. L.
  2012; 24 (5): 506-515

- **Mechanisms and impact of fiber-matrix compatibilization techniques on the material characterization of PHBV/oak wood flour engineered biobased composites** *COMPOSITES SCIENCE AND TECHNOLOGY*
  Srubar, W. V., Pilla, S., Wright, Z. C., Ryan, C. A., Greene, J. P., Frank, C. W., Billington, S. L.
  2012; 72 (6): 708-715

- **Tension-Stiffening in Reinforced High Performance Fiber-Reinforced Cement-Based Composites under Direct Tension** *6th International RILEM Workshop on High Performance Fiber Reinforced Cement Composites*
  Moreno, D. M., Trono, W., JEN, G., Ostertag, C., Billington, S. L.
  SPRINGER.2012: 263–270

- **Hybrid Simulation o fa 2-Story Steel MRF Retrofitted with HPFRC Infill Panels** *7th International Conference on Behavior of Steel Structures in Seismic Areas*
  Lignos, D., Moreno, D., Billington, S.
  2012

- **Creep Behavior and Modeling of PHBV-Based Composites for Construction Application** *Composites 2012*
  Miller, S., Billington, S.
  2012

- **Ivestigation of Process Improvements on PHBV-Based Composites Using Multi-Criteria Selection** *Composites 2012*
  Miller, S., Billington, S., Lepech, M.
  2012

- **Application of Creep Properties to Service Predicition in Lifecycle Assessment and Multi-Criteria Material Selection** *12th International Conference on Biocomposites*
  Miller, S., Billington, S., Lepech, M.
  2012

- **Overview of US-Norway Collaboration on Bridge Repair Sustainability** *International Congress on Durability of Concrete*
  Flint, M., Michel, A., Gussias, A., Larsen, C., Ostvik, J., Billington, S., Geiker, M.
  2012
- **Tension Stiffening in Reinforced High Performance Fiber Reinforced Cement-Based Composites** *9th International Conference on Urban Earthquake Engineering*
  Moreno, D., Trono, W., Jen, G., Ostertag, C., Billington, S.
  2012
- **A Probabilistic Framework for Performance-Based Durability Engineering** *In Durability o fBuilding Materials and Components*
  Flint, M., Baker, J., Billington, S.
  Springer-Verlag.2012
- **Mechanical response of PHB- and cellulose acetate natural fiber-reinforced composites for construction applications** *COMPOSITES PART B-ENGINEERING*
  Christian, S. J., Billington, S. L.
  2011; 42 (7): 1920-1928
- **Performance-based earthquake engineering assessment of a self-centering, post-tensioned concrete bridge system** *EARTHQUAKE ENGINEERING & STRUCTURAL DYNAMICS*
  Lee, W. K., Billington, S. L.
  2011; 40 (8): 887-902
- **Strain rate dependence of HPFRCC cylinders in monotonic tension** *MATERIALS AND STRUCTURES*
  Douglas, K. S., Billington, S. L.
  2011; 44 (1): 391-404
- **Nonlinear Micromechanical Modeling of Structural Biobased Composite Materials** *Multiscale and Multiphysics Processes in Geomechanics in Geomechanics and Geoengineering*
  Srubar, W., Billington, S.
  2011: 189-192
- **Response of High Performanced Fiber Reinforced Concrete Infill Panels Retrofitting Steel Moment-Resisting Frames** *8th Conference on Urban Earthquake Engineering*
  Moreno-Luna, D., Lignos, D., Hanson, J., Billington, S.
  2011
- **A Probabilistic Approach to Performance-based Durability Engineering** *12th International Conference on Durability of Building Materials and Components*
  Flint, M., Billington, S.
  2011
- **Flexure and Shear Performance of PHBV/Hemp Engineering Biobased Composite Sandwich Panels** *American Composites Manufacturers Association Composites*
  Michel, A., Billington, S.
  2011
- **PHBV/Oak Wood Flour Engineered Biobased Composites: Tensile Properties and Water Absorption Behavior** *American Composites Manufacturers Association Composites*
  Srubar, W., Frank, C., Billington, S.
  2011
- **Engineered Biobased Composites for Construction: Material Development, Multiscale Modeling, and Long-Term Durability** *2011 ASCE Structures Congress*
  Srubar, W., Billington, S.
  2011
- **Large Scale Hybrid Simulation Test of Existing Steel Frame Structures Retrofitted With Infill Panels** *7th National Conference of Steel Structures*
  Lignos, D., Moreno, D., Billington, S.
  2011

- **Confinement and Tension Stiffening Effects in High Performance Self-Consolidated Hybrid Fiber Reinforced Concret Composites** *6th International Workshop on High Performance Fiber-Reinforced Cement Composites*
  Trono, W., Jen, G., Moreno, D., Billington, S., Ostertag, C.
  2011
- **Tension-Stiffening in Reinforced High Performance Fiber-Reinforced Cement-Based Composites Under Direct Tension** *6th International Workshop on High Performance Fiber-Reinforced Cement Composites*
  Moreno, D., Trono, W., Jen, G., Ostertag, C., Billington, S.
  2011
- **A Probabilistic Framework for Performance-Based Durability Engineering: Application to Corrosion in Reinforced Concrete** *2011 ASCE Structures Congress*
  Flint, M., Billington, S.
  2011
- **Seismic Retrofit of Existing Steel Moment Resisting Frames with Innovative Materials: Large Scale Hybrid Simulation Test** *COMPDYN 2011 and 3rd ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*
  Lignos, D., Moreno-Luna, D., Billington, S.
  2011
- **Experimental and Analytical Validation of a Seismic Retrofit System for Existing Steel Moment-Resisting Frames** *8th Conference on Urban Earthquake Engineering*
  Lignos, D., Moreno-Luna, D., Billington, S.
  2011
- **IMPLEMENTATION OF MULTISCALE MODELS IN A PROBABILISTIC FRAMEWORK FOR PERFORMANCE-BASED DURABILITY ENGINEERING** *International Workshop on Multiscale and Multiphysics Processes in Geomechanics*
  Flint, M. M., Billington, S. L.
  SPRINGER-VERLAG BERLIN.2011: 173–176
- **Engineered Biomaterials for Construction: A Cradle-to-Cradle Design Methodology for Green Material Development** *International Journal of Environmental, Cultural, Economic and Social Sustainability*
  Srubar, W., V., Michel, A., T., Criddle, C., S., Frank, C., W., Billington, S., L.
  2011; 5 (7): 157-166
- **NONLINEAR MICROMECHANICAL MODELING OF HYGROTHERMAL EFFECTS ON STRUCTURAL BIOBASED COMPOSITE MATERIALS** *International Workshop on Multiscale and Multiphysics Processes in Geomechanics*
  Srubar, W. V., Billington, S. L.
  SPRINGER-VERLAG BERLIN.2011: 189–192
- **Effects of Natural Porous Additives on the Tensile Mechanical Performance and Moisture Absorption Behavior of PHBV-based Composites for Construction.** *Stanford Undergraduate Research Journal*
  Alvarado, A., J., Morales, K., M., Srubar, W., V., Billington, S., L.
  2011; 10
- **Cyclic behavior of precast, self-compacting ductile concrete infill panels for seismic retrofit of steel frame buildings** *ACI Structural Journal*
  Olsen, E., C., Billington, S., L.
  2011; 1 (108): 51-60
- **Modeling Residual Displacements of Concrete Bridge Columns under Earthquake Loads Using Fiber Elements** *JOURNAL OF BRIDGE ENGINEERING*
  Lee, W. K., Billington, S. L.
  2010; 15 (3): 240-249
- **Cyclic Response of Precast High-Performance Fiber-Reinforced Concrete Infill Panels** *ACI STRUCTURAL JOURNAL*
  OLSEN, E. C., Billington, S. L.
  2010; 108 (1): 51-60
- **Retrofitting Unreinforced Masonry Infills with Sprayable, Ductile Cement-based Composites** *ATC US-Japan Workshop on Improvement of Structural Design and Construction Practices*
  Billington, S., Kyriakides, M., Blackard, B., William, K., Stavridis, A., Shing, P.
  2010

- **Mechanical Performance of PHB-Based Composites for Construction Applications Exposed to Accelerated Weathering** *11th International Conference on Biocomposites: Trasition to Green Materials*
  Michel, A., Billington, S.
  2010
- **Hybrid Testing of a Retrofitted Steel Moment Resisisting Frame with Infill Panels** *9th US National and 10th Canadian Conference on Earthquake Engineering: Reaching Beyond Borders*
  Lignos, D., Billington, S.
  2010
- **Experimental and Analytical Investigation of Masonry Beams Retrofitted with ECC Under Out-of-Plane Bending** *9th HSTAM International Congress on Mechanics*
  Kyriakides, M., Hendriks, M., Billington, S.
  2010
- **Simulation of Masonry Beams Retrofitted with Engineered Cementitious Composites** *EURO-C*
  Kyriakides, M., Hendricks, M., Billington, S.
  2010
- **Alternate Approaches to Simulating the Performance of Ductile Fiber-reinforced Cement-based Materials in Structural Applications** *EURO-C*
  Billington, S.
  2010
- **Evaluation of Sequentially Linear Finite Element Analysis to Simulate Nonlinear Behavior in Mortar and Engineered Cementitious Composites in Flexure** *ACI Special Publication*
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