

Structural Engineers Association of California Convention (SEAOC 2020)

Online
2-4 December 2020

ISBN: 978-1-7138-2943-0

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© (2020) by Structural Engineers Association of California
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact Structural Engineers Association of California
at the address below.

Structural Engineers Association of California
921 11th St, Ste. 1100
Sacramento, California 95814
USA

Phone: (916) 447-1198
Fax: (916) 444-1501

info@seaoc.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
Web: www.proceedings.com

Structural Engineers Association of California



2020 SEAOC Virtual Convention Technical Papers

Preface

The following are unedited papers prepared by the authors for the 2020 SEAOC Virtual Convention. Due to the virtual and limited format of the Convention, not all of the papers included in these proceedings were able to be presented.

These papers reflect the opinions, positions, and commentary of the authors and do not represent a consensus viewpoint of the Structural Engineers Association of California. The material presented in this publication should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability, and applicability by qualified professionals. This document is not intended, nor should it establish or define a “standard of care” or a “standard of practice.” Users of information from this publication assume all liability from such use.

Table of Contents

- 1 [Study on the Sensitivity of Mesh Size and Properties in the Analysis of Semirigid Diaphragms](#)
Allen Adams, P.E., S.E., Chief Structural Engineer
Bentley Systems, Inc., Carlsbad, CA

- 14 [Economic Design of SMF Connection Continuity Plate Welds](#)
Adel Mashayekh, Ph.D., Project Consultant
Kevin S. Moore, PE, SE, Senior Principal
Simpson Gumpertz & Heger Inc., San Francisco, CA

- 20 [Innovative Use of FRP in combination with structural steel & shotcrete for retrofit of a non-ductile RC building – A Case Study](#)
Aniket Borwankar, Development, Manager
Simpson Strong-Tie, Pleasanton, California
Sudharshan Navalpakkam, S.E., Vice President
Nabih Youssef Associates Structural Engineers, San Francisco, California
Ravi Kanitkar, S.E., Principal
Külstoff Composite Products, Austin, Texas

- 29 [Understanding the Effects of Varying the Design Parameters of BRBF Global Stability](#)
Brandt Saxey, Technical Director, CoreBrace, West Jordan, Utah



- 50 [Structural Rehabilitation of a Historic Covered Bridge: Bridgeport Covered Bridge](#)
Lawrence E. Jones, S.E., Senior Principal
Brian S. Wiens, S.E., Senior Associate
Buehler, Sacramento, California
- 68 [Replacement of the 115-Year Old Mangaweka Bridge](#)
Amir Mahan, Senior Structural Engineer
Camiel van Schoonhoven, Structural Engineer, GHD Ltd
Brisbane, Australia, and Wellington, New Zealand
- 76 [Considerations Regarding Use of High-Strength Reinforcement in Seismic Applications](#)
Catherine Chen, S.E., Senior Engineer
Kion Nemati, P.E., Engineer
Nate Warner, P.E., Engineer
Arup San Francisco, CA
Jakub Valigura, PhD, Design Engineer
KPF Consulting Engineers San Francisco, CA
Rahul Sharma, S.E., Project Engineer
Hohbach-Lewin, Inc Palo Alto, CA
- 99 [Disaster Resilience and Carbon: How Engineers Can Balance Seismic Design with Embodied Carbon Considerations](#)
Chris Horiuchi, SE, LEED, Associate
Skidmore, Owings & Merrill, ASCE/SEI Sustainability Committee, San Francisco, CA
- 108 [UCSF Wayne and Gladys Valley Center for Vision Enhanced Performance at Developer Prices](#)
Christopher Tung, Engineer
Steve Marusich, Principal
Forell/Elsesser Engineers, Inc. San Francisco, CA
- 114 [Industrial Scale NLRH Analysis Using OpenSees and Comparison with Perform3D](#)
Craig B. Goings, S.E., Principal
Ayush Singhanian, E.I.T., Associate Project Consultant
Benjamin Weaver, S.E. Senior Consulting Engineer
Simpson Gumpertz & Heger, San Francisco, CA
Pearl Ranchal, P.E., Designer
Degenkolb Engineers, San Francisco, CA



- 128 [An Examination of Wood-Framed Parapets Considering Exterior Building Maintenance and Wind Loading](#)
Cree Farnes, PE
Harris and Sloan, Sacramento, CA
- 140 [How Many CMS are Enough for Seismic Response Assessment?](#)
Daniel Gaspar Rodriguez, MS
Degenkolb Engineers, Oakland, California
Andres Torregroza, MS
Carlos Arteta, PhD
Universidad del Norte, Barranquilla, Colombia
Norman Abrahamson, PhD
University of California, Berkeley, Berkeley, California
- 147 [Existing Buildings Over Active Seismic Faults: Implications of the Alquist-Priolo Act on Seismic Ordinances, Triggered Retrofits, and Voluntary Seismic Upgrades](#)
Daniel Zepeda, S.E.
Garrett Hagen, S.E.
Sandy Hohener, S.E.
Peter Maloney, S.E.
Degenkolb Engineers, Oakland, California
- 162 [Policy Findings & Recommendations from the Ridgecrest Earthquake Sequence of July 2019](#)
Fred Turner, SE, F. SEAOC
Retired, Sacramento, CA
- 168 [Comparing Seismic Retrofit Design via RSA and NLTHA for a Multi-Story Non-Ductile Reinforced Concrete Building in Downtown Los Angeles](#)
Hugo Gomez, Ph.D., P.E., Project Engineer
Holmes Structures, San Francisco, CA, USA
Mary Kretschmar, P.E., Design Engineer
Holmes Consulting, Wellington, NZ
- 176 [Design, Construction and Seismic Performance of Non-Structural Elements in New Zealand](#)
Jan M. Stanway Principal Structural Engineer
WSP, Christchurch, New Zealand
Tim J. Sullivan, Professor
Rajesh P. Dhakal, Professor
University of Canterbury, Christchurch, New Zealand



- 187 [Defining Building Uses for a Future Functional Recovery Standard](#)
Jonathan Buckalew
Nabih Youssef Structural Engineers
Anna Lang
Zylient, Inc., Kalispell, MT
- 202 [Testing for Multiple Performance Objectives: Recent Experiences from PEER-CEA Project Testing](#)
Kelly Cobeen, Associate Principal
Wiss Janney Elstner Associates, Emeryville, California
Tara Hutchinson, Professor
Brandon Schiller, PhD Candidate
University of California, San Diego, San Diego, California
- 218 [Seismic Evaluation of Existing Wood Framed Buildings using ASCE 41-17](#)
Laura Rice, Project Engineer
Devon Lumbard, Principal
Degenkolb Engineers, Sacramento, California
- 224 [Recovery and Lessons Learned from the 2017 Northern California Fire Storm](#)
Luke Wilson SE & Brett Shields PE
ZFA Structural Engineers, Santa Rosa, CA
- 234 [SEAOC's "Recommended Guidelines for the Practice of Structural Engineering in California" 2020 and Future Editions](#)
Mark Gilligan
Matt Melcher
Lionakis
David Kane, Harrell Kane Structural Engineers
Larry Kaprielian, KNA Structural Engineers
Daniel Wang, LPA Inc
Scott Larson
Scott Larson Engineering Services
- 238 [In-Plane Racking Strength Tests of Wood-frame Wood Structural Panel Shear Walls Using 10d "Short" Nails](#)
Philip Line, P.E.
American Wood Council, Leesburg, Virginia
Doug Hohbach, S.E.
Hohbach-Lewin, Inc, Palo Alto, California
Ned Waltz, P.E.
Weyerhaeuser, Federal Way, Washington



- 250 [Millennium Tower: Perimeter Pile Upgrade](#)
Ronald O. Hamburger, SE, Senior Principal
Lachezar, V. Handzhiyski, SE, Senior Project Manager
Simpson Gumpertz & Heger, Inc., San Francisco, CA
John A. Egan, GE
Oakland, CA
- 259 [US Resiliency Council – 2020 Update and New Initiatives](#)
Evan Reis, Co-Founder and Executive Director, USRC
Ronald L. Mayes, Co-Founder and Chair, USRC Board of Directors and Staff Consultant, SGH Inc
Sharyl Rabinovici, USRC Director of Strategic Communications
- 265 [Casa Adelante: Behavior, Design, Modeling Choices, and Performance Insights of a Rocking Mat Foundation System](#)
Sandesh Aher, S.E.
David Mar, S.E.
Mar Structural Design, Berkeley, CA
Prof. Geoffrey Rodgers, Ph.D.
University of Canterbury, Christchurch, N.Z.
- 278 [California Mass Timber Reference Guide – Part 1: Code Development and Fire/Life-Safety](#)
Bevan Jones, PE, Principal and CEO
Mikko Salminen, PhD, Senior Fire Specialist
Parisa Nassiri, PE,
Holmes Fire, San Francisco, CA
Lisa Podesto, PE, Senior Business Development Manager
Lendlease US, Aptos, CA
Mikko Salminen, PhD, Senior Fire Specialist
Holmes Fire, San Francisco, CA
- 288 [California Mass Timber Reference Guide – Part 2: Structural Guidelines and Best Practices](#)
Scott Breneman, PhD, SE, Senior Technical Director
Woodworks - Wood Products Council, Spokane, WA
Erik Kneer, SE, LEED AP BD+C, Associate Principal
Holmes Structures, San Francisco, CA
Nicholas Miley, SE, Senior Engineer
KPF, San Francisco, CA



303 [Calculating the Remaining Life of Buckling Restrained Braces After a Seismic Event](#)

Zac Vidmar, PE, Senior Engineer
Brandt Saxey, SE, Technical Director
CoreBrace, West Jordan, UT
Chao-Hsien Li, Graduate Student Researcher
Mathew Reynolds, Graduate Student Researcher
Chia-Ming Uang, Prof. Department of Structural Engineering
University of California, San Diego, La Jolla, CA

317 [Comparing the Resiliency of Buckling-Restrained Braced Frames to FEMA P-58 Predictions](#)

Zac Vidmar, PE, Senior Engineer
Brandt Saxey, SE, Technical Director
CoreBrace, West Jordan, UT
Ed Almeter, Research Engineer
Curt Haselton, PhD, PE, CEO
Haselton Baker Risk Group (SP3), Chico, CA