



An internationally recognized authority on earthquake engineering and champion of disaster resilience, Chris Poland's passion for vibrant, sustainable, and healthy communities drives his consulting practice. He focuses on community resilience and the buildings and systems that contribute to it.

He is the past Chair of the Advisory Committee to the National Earthquake Hazards Reduction Program, and past Chairman of the Advisory Committee on Structural Safety of Department of Veterans Affairs (VA) Facilities. As Chair of the 100th Anniversary Earthquake Conference in San Francisco in April 2006, he shared the stage with California Governor Arnold Schwarzenegger and Senator Dianne Feinstein in an internationally covered event that brought the nation to think proactively about earthquake danger. He served as the Chair of the American Society of Civil Engineers Seismic Rehabilitation of Existing Buildings Standards Committee completing multiple editions both ASCE 31 and ASCE 41, standards for the evaluation and rehabilitation of existing buildings that are used worldwide.

Education

B.S. Summa cum Laude,
Mathematics,
University of Redlands, 1972

M.S. Structural Engineering, Stanford
University, 1974

Registration

California — Civil Engineer, 1977
License No. 27243
California — Structural Engineer,
1980
License No. 2336

Awards

HJ Brunier Award for Excellence in
Design
2006 Alfred E. Alquist Medal
2010 Structural Engineer of the Year,
*The Structural Design of Special and Tall
Buildings Journal*
2017 EERI Housner Medal
Member, National Academy of
Engineering
ACEC National Awards for Various
Projects

He served on the Board of Directors for SPUR, co-chaired their Resilient City Initiative and led the publication of "The Disaster Resilient City". He is a past President, Treasurer, and Director of the Earthquake Engineering Research Institute and is currently co-chair of the Public Policy Committee. He also served on the Board for the San Francisco Chamber of Commerce and was the founding co-chair of the San Francisco Lifelines Council with Mayor Edwin Lee from 2009 through 2014. Chris is a former Vice-Chairman of the American Council of Engineering Companies, member of the Board of Governors of the ASCE Structural Engineering Institute and was appointed to the organizing Executive Committee of the ASCE Infrastructure Resilience Division.

Chris was a Community Resilience Fellow at the National Institute of Standards and Technology (NIST) from 2014 to 2019 and member of the team of authors that developed a Community Resilience Planning Guide. His role is related to defining and preparing the over-arching guidance for the development of Community Disaster Resilience Plans by local communities and assisting in their implementation. That guide is the initiating document for the NIST Community Resilience Program that includes the development of Guide Briefs, analytical tools, and model guidelines for use by cities nationwide to address the natural disasters they face.

Chris was inducted into the National Academy of Engineering in 2009 and is a regular participant in Academy study committees. He is a Fellow of the American Council of Engineering Companies, the Structural Engineers Association of California and the American Society of Civil Engineers Structural Engineering Institute. He is also an honorary member of the Earthquake Engineering Research Institute and the Structural Engineers Association of California.



Chris D. Poland, SE, NAE Consulting Engineer

His structural engineering career spans over 45 years and includes hundreds of projects related to the design of new buildings, seismic analysis and strengthening of existing buildings, structural failure analysis, historic preservation, as well as the development of guidelines and standards that are used worldwide. He was a Senior Principal, Chairman and CEO of Degenkolb Engineers during his 40 years with the firm from 1974 through 2014.

Professional Involvement

Chairman, Risk and Resilience Measurement Committee, ASCE Infrastructure Resilience Division.

Chairman, Advisory Committee on Earthquake Hazards Reduction

Chairman, Seismic Rehabilitation Standards Committee, American Society of Civil Engineers (ASCE)

Chairman, ASCE - SEI Codes and Standards Activities Division

Executive Committee

Chairman, Department of Veterans Affairs Advisory Committee on Structural Safety, Washington, DC

Board of Directors, San Francisco Planning and Urban Research (SPUR)

Chairman, SPUR Seismic Hazard Mitigation Taskforce

Chairman, Council of American Structural Engineers (CASE)

Member ASCE - Structural Engineering Institute Board of Governors

Chairman of the ASCE-SEI Codes and Standards Activities Division

Member of the ASCE Infrastructure Resilience Division Executive Committee

San Francisco Chamber of Commerce, Board of Directors, Executive Committee; Public Policy Committee, Land Use Planning Committee

Earthquake Engineering Research Institute (EERI) President, 2001-2002; Treasurer and Director 1994-2000; Public Policy Committee Co-Chair; Honorary Member, 1995

Structural Engineers Association of California (SEAOC), Fellow

Structural Engineers Association of Northern California (SEAONC), College of Fellows, 2003; Honorary Member, 2009

Relevant Experience

A representative sample of professional activities and projects

Advisory Committee on Earthquake Hazard Reduction

Organizing Chair of ACEHR

Served as the organizing Chair of ACEHR and continued in that role for his entire 6 year term. Routinely set the committee agendas with the National Earthquake Hazard Reduction Program (NEHRP) Secretariat and facilitated stimulating meetings. The Advisory committee met for the first time in May 2007 and wrote their first report in May 2008. Since their organization, the committee has met every year and provided an annual report to the ICC. In those reports, the committee has made a number of recommendations that have been incorporated in the program.

ASCE 31

Actively and continuously involved in the development and standardization of ASCE 31 - Seismic Evaluation of Existing Buildings. Was the principal investigator for ATC 14, the guideline document that formed the basis for the standard, and has served in a leadership position in the three subsequent guidelines that refined and expanded the basis for this internationally used standard. He led the final standardization process for ASCE as the Chairman of their Seismic Rehabilitation of Existing Building Standards Committee. ASCE 31 was fully incorporated into the recently published ASCE 41-13 also under his leadership.

ASCE 41

Participated in the development of the guideline document FEMA 273: *Guidelines for the Seismic Rehabilitation of Buildings*, served as the ASCE Principal Investigator for the conversion of FEMA 273 to the pre-standard, FEMA 356: *Prestandard and Commentary for the Rehabilitation of Buildings*, led the subsequent effort by the ASCE Rehabilitation Standards Committee to convert the document in to a ANSI compliant standard, ASCE 41-06: *Seismic Rehabilitation of Existing Buildings*, and recently completed leading the development of the second edition, ASCE 41-13: *Seismic Evaluation and Retrofit of Existing Buildings*.

ATC-14

Principal Author

ATC-14 *Evaluating the Seismic Resistance of Existing Buildings* sponsored by the Applied Technology Council (ATC). This guideline document established a new procedure for evaluating existing buildings and is the basis for seismic evaluation documents worldwide including a national standard ASCE 31 Seismic Evaluation of Existing Buildings.

Vision 2000

Chairman

Chris served as the Chairman of the Structural Engineers Association of California, Vision 2000 Committee. Under his leadership, and with the sponsorship of FEMA and the California Office of Emergency Services, a 500-page document entitled *Performance Based Seismic Engineering of Buildings - Interim Recommendations*, was published in April 1995. The work defines the conceptual framework for seismic codes that permit performance-based engineering and is referenced worldwide.

ATC-35, United States Geological Services Research Utilization Projects

Project Principal

Mr. Poland participated in a variety of research utilization projects including the development of tech-briefs and serving as a speaker at five USGS regional seminars in San Francisco, Los Angeles, Memphis, New York and Seattle on the topic *Implications for Seismic Design of Buildings in View of Developments in Ground Motion Estimation by USGS*.

RP8 – Standards of Seismic Safety for Existing Federally Owned and Leased Buildings.

Project Principal

Chris assisted in the development of the third edition of Federal Standards related to the Retrofit of Existing federal buildings that provides a common minimum evaluation and mitigation measures for all federal departments and agencies. The standard defines a balanced, agency-conceived and controlled seismic safety program for their existing owned or leased buildings. Chris also served as the principal author of the first edition and co-author of the second.

San Francisco Planning and Urban Research Association (SPUR)

Creating a Framework for Disaster Planning

Chris served and the Co-chair of the Seismic Mitigation Committee that developed a variety of publications related to San Francisco's planning before the disaster, during the emergency response period and during recovery. The publications became foundational tools for defining target states of recovery related for the built environment, defining the practicality of shelter-in-place, and good land use planning. These concepts have been applied worldwide and served as the basis for the Oregon Resilience Plan and the NIST Community Resilience Planning Guide for Buildings and Infrastructure Systems.

National Institute of Standards and Technology Community Resilience

Community Resilience Fellow

Beginning in 2014, Chris has been a development consultant and contributing author to the NIST *Community Resilience Planning Guide for Buildings and Infrastructure Systems* and related implementation tools. His role was related to the development of the overall process, the specific application to buildings, and the overall consistency of the guide as it related to all aspects of the built environment. He also served as an active participant in a variety of related community workshops, served as consultant to the NIST sponsored Community Resilience Panel, and to the Cities of Nashua NH and Boseman MT during their implementation process.

Federal Buildings Report

Project Principal

Headed a team made up of engineers that worked with the Construction Engineering Research Laboratory (CERL), U.S. Army Engineer Research and Development Center and all Federal Agencies to establish a program for rehabilitating all federally owned and leased buildings to an acceptable level of seismic performance. The report was requested by Congress, covered over 500,000 buildings and defined a 30-year program.

Seismic Resilient University of Washington

Project Principal

Developed a resilience university program that included recommendations for design and construction standards for the University of Washington's new and existing buildings as part of a framework for disaster resilient planning. Facilities which require resilience planning include research laboratories, emergency operations, IT facilities and networks, instructional space, housing, and administrative offices.

Lawrence Livermore National Laboratory
Project Mentor

Chris worked with the Degenkolb team that assisted LLNL in complying with Executive Order 12941, which requires federal agencies to develop an inventory of their buildings and estimate costs of mitigating seismic risks. The work was divided into two phases for the most efficient assessment of the 200-plus inventory. In Phase I, Degenkolb staff used rapid FEMA 178 screening evaluations to focus on the most critical structures that required further evaluation. In Phase II, more detailed evaluations were performed on a selected sample of the buildings. Based on this information and using FEMA 156 and 157 Typical Cost Studies, an estimate of strengthening costs for all buildings will be developed. A report submitted to FEMA, as well as similar information collected by other agencies, will be considered with the intent that a proactive program of systematic upgrading of federal buildings will be enacted.

The Church of Jesus Christ of Latter-day Saints; Multiple Locations, Worldwide
Principal-in-Charge

Led projects evaluating and designing over 100 religious, administrative and operations support facilities in high seismic regions worldwide. Developed a seismic design and mitigation criteria that use site-specific hazard information and advanced displacement-based analysis to predict the expected performance and need for rehabilitation.

Iris & B. Gerald Cantor Center for Visual Arts, Stanford University
Project Manager

The Stanford Museum was the first partially reinforced concrete building constructed on the west coast in the late 1800's. The 60,000 square-foot historic building was damaged in the 1989 Loma Prieta earthquake and posted with a red tag. Degenkolb provided a seismic analysis and an alternative strengthening proposal for the building that considered the building's unique ability to resist earthquakes and devised a strengthening scheme that saved Stanford several million dollars over schemes previously proposed. In addition to this cost savings, no existing program space was lost and unique architectural characteristics remained substantially intact. The project also included the design of a 37,000 square-foot new addition. The project won Honor Awards from CELSOC and ACEC for engineering excellence.

Hotel Del Coronado Seismic Strengthening
Project Mentor

The project focuses on preserving and restoring all historic elements of this National Historic Landmark, and the structural work is carefully designed to incorporate this historic fabric. Work involved the restoration of the original signature Ballroom, Crown Room, and the main building as well as renovation of several ancillary structures. Provided design of new support buildings.

Replacement Hospital Department of Veterans Affairs, Palo Alto
Principal-in-charge

Provided the structural engineering design for a 650,000 square-foot, \$185 million replacement hospital. This two-building complex houses nursing units, diagnostic and treatment areas, administrative and research facilities, a canteen, and an auditorium. The hospital building was designed as an essential structure intended to remain fully functional after a major earthquake. The project included meeting the owner's fast track schedule by preparing early foundation and structural steel bid packages, and developing a design that accommodates construction changes inherent in this process. Degenkolb provided construction support services through project completion.

Memorial Church, Stanford University
Project Manager

Degenkolb provided a post-earthquake evaluation, a seismic analysis and complete rehabilitation design. Degenkolb developed strengthening schemes for this landmark campus building. Constructed around the turn of the century, this Richardson Romanesque Church contains treasures, such as biblical mosaics, intricate stonework, beautiful stained glass, and one of the country's finest pipe organs. Degenkolb's strengthening schemes (developed in close collaboration with the architects and conservator) were designed to be effective without disturbing internal or external finishes and features, and while preserving the architectural integrity of the building. The construction cost was \$10 million. This project won awards from the California Preservation Foundation, CELSOC and ACEC.

Resilient Design Performance Standards for Infrastructure and Dependent Facilities.

Community Resilience Consultant

A partnership of Boulder County, Colorado, communities formed a collaborative to spearhead recovery planning and assist with the acquisition of Community Development Block Grant Disaster Recovery (CDBG-DR) funds from HUD. One of the requirements for receiving the funds was the need to identify and implement resilience performance standards that could be applied to each infrastructure project. That requirement led to the development of the performance standards by a consulting team that utilized the NIST Guide as a tool to identify and appropriate set of time-to-recovery goals. The standard included a score sheet that rates every project based on its ability to meet the performance goal and the additional criteria established in the Colorado Resiliency Framework. The standard integrates resilience indicators with sustainability principals to qualify and prioritize projects. Communities using the Guide may find this process helpful in prioritizing their construction solutions and after a hazard event obtaining HUD funding.

Selected Publications and Presentations

Since the early 1970s, Mr. Poland has written over 40 publications and gives scores of presentations related to Structural Engineering, Earthquake Engineering, and Community Resilience each year. A listing of his most recent and significant activities follows:

Functional Recovery: What is it and Why are we here. Opening remarks at the ICC/CALBO Seismic Workshop. Sacramento CA, July 2019.

Communicating a Building's Contribution to Community Resilience. Lecture at the Eleventh U.S. National Conference on Earthquake Engineering. Los Angeles. Earthquake Engineering Research Institute. June 2018

Resilience Based Performance Standards for Buildings and Lifeline Systems. Lecture at the Eleventh U.S. National Conference on Earthquake Engineering. Los Angeles. Earthquake Engineering Research Institute. June 2018

Strengthening the Disaster Resilience of the Academic Biomedical Research Community: Protecting the Nation's Investment. Consensus Study Report co-authored with others. National Academies of Science, Engineering, and Medicine. Washington DC, 2017

From Resilient Infrastructure to Resilient Communities: how can emerging technologies support community efforts to become resilient? Keynote lecture at the Advanced Technologies in Structural Engineering for more Resilient Communities Workshop, The National Academies. September 2017

Insights into the New US NIST Community Resilience Planning Guide for Buildings and Infrastructure Systems. Keynote Lecture, New Zealand Society of Earthquake Engineering Annual Meeting, Christchurch, 2016

EERI Earthquake Reconnaissance Team Report: M7.8 Gorkha, Nepal Earthquake of April 25 2015 and its Aftershocks. Co-authored with others. Earthquake Engineering Research Institute, May 2016.

EERI Resilience Observatory Case Study Report: Use of Data for Measuring and Monitoring Recovery following the Canterbury Earthquake Sequence. Co-authored with others. Earthquake Engineering Research Institute, February 2016

Structural Engineer's Role in Creating Disaster Resilient Communities. ASCE Structures Congress, Portland OR, April 2015

Disaster Resilient Communities: Good for People, Good for Business. Portland Cement Association Annual Board Meeting, Scottsdale AZ, November 2014.

Resilient Communities: Growing Stronger Places. NACO County Leaders Forum, San Francisco, May 2014.

A Framework for Creating Disaster Resilient Communities. Plenary Lecture (invited), 10th US National Conference on Earthquake Engineering, Anchorage, Alaska, 2014

Creating Disaster Resilient Communities. Proceedings of the 15th World Conference on Earthquake Engineering. Lisbon, Portugal, 2012.

ASCE 41-13: Seismic Evaluation and Retrofit of Existing Buildings. Co Authored with Robert Pekelnicki. SEOAC 2012 Convention Proceedings. Structural Engineers Association of California. Sacramento California, 2012.

The 21st Century Goal for Seismic Safety: Resilient Cities. Proceedings of the 9th US National and 10th Canadian Conference on Earthquake Engineering. Curran Associates, Inc. Red Hook, New York, 2010.

The Resilient City. Defining What San Francisco Needs from its Seismic Mitigation Policies. San Francisco Planning and Urban Research Association Forum. San Francisco, California, March 2008.

Transparent Seismic Mitigation for Community Resilience. The Joyner Lecture, EERI Annual Meeting, New Orleans, Louisiana, February 2008. Presented this topic more than fifteen times over the course of 2008-2009.

Building Code Complexity and Its Impact on Business Practices and Risk Management. ACEC-CASE Risk Management Convocation, Atlanta, Georgia, November 2007.

ASCE 41: Taking the Next Step toward Achieving Seismic Safety. SEAONC Spring Seminar, San Francisco, California, March 2007.

A Centennial Challenge for Earthquake Professionals Worldwide. 100th Anniversary Earthquake Conference Commemorating the 1906 Earthquake, San Francisco, California, April 2006.

Future Challenges to Earthquake Engineering. International Engineering Roundtable, Construct Canada/Ecobuild Conference, Toronto, December 2005.

Observations of the San Simeon Earthquake, EERI Annual Meeting, February 2004.

Social Economic Impact of Earthquakes: An Engineering Perspective, National Earthquake Conference, St. Louise, Missouri, September 2004. *Making*

Performance Based Engineering Practical. Keynote paper and presentation, 13th World Conference on Earthquake Engineering, Vancouver BC, August 2004.

Seismic Evaluation of Existing Buildings, with Others. American Society of Civil Engineers Structures Congress, Nashville Tennessee, 2004.

Recognizing and Establishing Acceptable Levels of Seismic Safety, AIA California Council Monterey Design Conference, September 2003.

Putting NEHRP to Use: A Structural Engineer's Perspective. National Academy of Engineering, Natural Disaster's Roundtable Forum, Washington DC, February 2003.

International Vision and Goals for the Earthquake Engineering Research Institute, Earthquake Spectra, Oakland, California, May 2003.

New Trends in Earthquake Engineering: A Practical Perspective. Emilio Rosenblueth, Keynote Lecture, Mexican Society of Earthquake Engineering, February 2002.

Correlating Measured Ground Motion with Observed Damage, 1999 Chi-Chi, Taiwan Earthquake Reconnaissance Report, EERI Spectra, April 2001. Co-author with Jon Heintz.

Updating Corporate Seismic Programs in Response to Recent California Earthquakes, 12th World Conference on Earthquake Engineering, Auckland, New Zealand, February 2000.

Earthquake Aftershocks--Entering Damaged Buildings, ATC TechBrief, 1999. Co-author with Ronald P. Gallagher and Paul A. Reasenber.

Opportunities and Pitfalls of Performance Based Seismic Engineering, Workshop on Seismic Design Methodologies for the Next Generation of Codes, Bled, Slovenia, June 1997. Co-author with Darrick Hom.

Strong Motion Program Requirements to Meet the Needs for Structural Engineering, Vision 2005: An Action Plan for Strong Motion Programs to Mitigate Earthquake Losses in Urbanized Areas, Monterey, California, April 1997.

The Retrofit of an Historic Concrete Structure using a Non-Linear Dynamic Rocking Evaluation, 1996 SEAOC Annual Convention, Maui, Hawaii, September 1996. Co-author with Evan M. Reis.

Approaches to Seismic Rehabilitation of Hospitals in High Seismic Areas, Pan Pacific Conference on Earthquakes, Volcanoes, Tsunamis, Vancouver, British Columbia, July 1996.

Would the FEMA 178 Evaluation Methodology Have Predicted the Damage? FEMA 178 and Kobe Damage, Earthquake Engineering Research Institute, December 1995.

An Overview of Seismic Zonation as it Relates to the Retrofit and Design of New Facilities, Fifth International Conference on Seismic Zonation, Nice, France, October 1995.

Building Performance at Strong Motion Sites: Observations from Northridge and Kobe, Presentation and Paper for the Building Seismic Safety Council - Project 97, Denver, Colorado, August 1995.

Site Specific Studies - How the Disciplines can Work Together, American Society of Civil Engineers, Portland, Oregon, May 1995.



Chris D. Poland, SE, NAE
Consulting Engineer

Vision 2000 - Performance Based Seismic Engineering of Buildings, Structural Engineers Association of California, April 1995. Prepared under Mr. Poland's leadership for presentation to the California Office of Emergency Services.

Simplified Rehabilitation: Standard Solutions Using Simple Calculations, and *SEAOCC's Vision 2000*, Presentation at the Building Seismic Safety Council's Annual Meeting, Atlanta, Georgia, February 1995.

A Comprehensive Approach Towards the Development of a Performance-Based Seismic Source Document, Presentation to the Structures Congress, American Society of Civil Engineers, Boston, Massachusetts, April 1995.

Repair and Retrofit of Health Care Facilities, Earthquake Spectra, Volume 10, No. 1, 1994, Earthquake Engineering Research Institute.