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BRET LIZUNDIA, S.E.
Rutherford & Chekene
Principal

With Rutherford & Chekene since 1988, Mr. Lizundia has over 23 years of experience in the structural design of new laboratories, museums, academic centers, libraries, aquariums, and office buildings; seismic evaluation and rehabilitation of existing buildings; peer review and plan checking; and applied research and guideline development. A particular focus has been on unreinforced masonry buildings, including earthquake reconnaissance, loss estimation, and technology transfer of advice to practicing engineers.

His recent portfolio of work includes the seismically-isolated de Young Museum in Golden Gate Park; the Li Ka-Shing Center for Biomedical and Health Sciences at UC Berkeley; Genentech Hall, the first research building at UCSF's Mission Bay campus; and the seismic rehabilitation of Frank Lloyd Wright's Hanna House, a national landmark structure located at Stanford University.

He was the project manager and co-author of FEMA 547 *Techniques for the Seismic Rehabilitation of Existing Buildings* and a co-author of FEMA 306/307 *Evaluation of Earthquake Damaged Concrete and Masonry Wall Buildings*. He is the recipient of the Earthquake Engineering Research Institute's prestigious Shah Family Innovation Prize and the H.J. Brunnier Award from the Structural Engineers Association of Northern California.

Education

B.S., Civil Engineering, Stanford University, Stanford, CA, 1987
M.S., Structural Engineering, Stanford University, Stanford, CA, 1988

Registration

Registered Civil and Structural Engineer, California

Professional Affiliations and Honors

Applied Technology Council (ATC)
- President, 2011-current
- Director, 2009-current
- Secretary/Treasurer, 2010-2011
- 27 February 2010 Chile Earthquake Reconnaissance Team
- 22 February 2011 Christchurch New Zealand Reconnaissance Team

Earthquake Engineering Research Institute (EERI)
- 9 January 2010 Northern California Earthquake Reconnaissance Team
- FEMA 547 Traveling Lecture Series
- Member of 1995 and 2001 Annual Meeting Planning Committees
- Chair of Seismic Ethics Committee, 1997-1998
- Shah Family Innovation Prize, 1998

Structural Engineers Association of California (SEAOC)
- Director, 2006-2009
- Chair of Professional Activities Committee, 1994-2000
- Long Range Planning Committee, 2006
- Excellence in Engineering Award, 2008 (for New de Young Museum)
- Excellence in Engineering Award, 2007 (for FEMA 547)

Structural Engineers Association of Northern California (SEAONC)
- President, 2007-2008
- Director, 1996-98, 2006-09
- Chair of Professional Activities Committee, 1993-94
- H.J. Brunnier Award, 1999

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Excellence in Engineering Award, 2007 (for FEMA 547)
Excellence in Engineering Award, 2006 (for New de Young Museum)
Advanced National Seismic System (ANSS)
Chair of Seismic Response Monitoring Committee, 2005
Structural Instrumentation Committee, 2004
California Geological Survey (CGS)
Building Subcommittee of the Strong Motion Instrumentation Advisory Committee, 2006-current
Guest Lecturer
UC Berkeley, 2010 and 2002
Stanford University, 2009, 2005 and 2000
UC San Diego, 2006 and EERI Visiting Professional Program in 2008
SUNY Buffalo, 2002
Oregon State University, EERI Visiting Professional Program in 1997
San Jose State University, 1996

Experience

Seismic Rehabilitation

Seismic Evaluation and Rehabilitation of Buildings, US Department of State, Foreign Service Posts Worldwide (URM buildings)
Hanna House, Stanford University, Stanford, CA (a national landmark)
487 Bryant Street, San Francisco, CA (URM)
Branner Hall, Stanford University, Stanford, CA
Building 280, Stanford Linear Accelerator Center, Menlo Park, CA
Buildings 42 and 43, Stanford Linear Accelerator Center, Menlo Park, CA
Buildings 90, 100, 110 and Freestanding Arcades, Stanford University, Stanford, CA
Building 02-500, Stanford University, Stanford, CA (URM)
Buildings 02-520 and 02-524, Stanford University, Stanford, CA (URM)
Building 02-610, Stanford University, Stanford, CA (URM)
Building I-001, Stanford University, Stanford, CA (URM)
Calvary Presbyterian Church, San Francisco, CA (URM)
Graduate School of Business, Stanford University, Stanford, CA (URM)
Main Quad Portals, Stanford University, Stanford, CA (URM)
Memphis Post Office, US Customs House and US Courthouse, Seismic Rehabilitation and Conversion to University of Memphis School of Law (with Burr & Cole Engineers), Memphis, TN (URM)
Roble Hall, Stanford University (URM)
San Quentin North Block, San Rafael, CA
Tan Plaza Continental Apartment Building, Palo Alto, CA
Toyon Hall, Stanford University, Stanford, CA
Row House Renovation and Rehabilitations (Durand, Phi Sig, Roth, Sigma Nu, and Xanadu Houses), Stanford, CA
Wilbur Hall, Stanford University, Stanford, CA
VA Hospital, San Francisco, Correction of Nonstructural Seismic Deficiencies

Seismic and Structural Evaluation

318 Lambton Quay, Wellington, New Zealand (with Beca)
604 Mission Street, San Francisco, CA (URM)
Aeneas Cannery Building, Monterey, CA
Barnes West Hospital, St. Louis, MO

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Buildings 35 and 44, Stanford Linear Accelerator Center, Menlo Park, CA
California Hall, UC Berkeley, Berkeley, CA (URM)
Cowell Hall, California Academy of Sciences, San Francisco, CA
DeGuerre Aquatics Complex, Stanford University, Stanford, CA
First Church of Christ, Scientist, Menlo Park, CA
First Church of Christ, Scientist, San Francisco, CA (URM)
Lakewood Apartments, San Francisco, CA
Lower Sproul Plaza Master Plan, UC Berkeley, Berkeley, CA
Mt. Umunhum Radar Tower, Los Gatos, CA
Olney Hall, Mills College, Oakland, CA
PG&E 111 Almaden Advanced Seismic Evaluation, San Jose, CA
Roble Gym, Stanford University, Stanford, CA (URM)
Row House Evaluations (Robert Moore South and Storey House), Stanford, CA
Stern Hall, UC Berkeley, Berkeley, CA
Stanford Stadium, Stanford, CA
Tower House, Stanford University, Stanford, CA (URM)
UCSF Oyster Point Laundry Facility Roof Assessment, South San Francisco, CA

<u>Design of New Buildings</u>
900 East Hamilton, San Jose, CA
Digital Arts Facility, UC Santa Cruz, Santa Cruz, CA
EmeryStation East, Emeryville, CA
Genentech Hall, UCSF Mission Bay, San Francisco, CA
Lake Superior Aquarium, Duluth, MN
Li Ka-Shing Center for Biomedical and Health Sciences, UC Berkeley, Berkeley, CA
Long Beach Aquarium of the Pacific, Long Beach, CA
Menlo College Library, Menlo Park, CA
Mills Peninsula Hospital (seismically isolated), Burlingame, CA
New de Young Museum (seismically isolated), Golden Gate Park, San Francisco, CA
New Exhibits Wing, Monterey Bay Aquarium, Monterey, CA
San Joaquin Hospital, Stockton, CA
Sonoma State University Information Center, Rohnert Park, CA
Student Community Center, UC Berkeley

<u>Peer Reviews and Plan Checking</u>
185 Berry Street Seismic Rehabilitation and Vertical Addition (seismically isolated), San Francisco, Chair of Seismic Review Panel for San Francisco Department of Building Inspection
50 UN Plaza, San Francisco, CA, Peer Review for GSA (URM)
Bakewell Building Seismic Strengthening, Stanford University, Stanford, CA, Peer Reviewer (URM)
California Pacific Medical Center Cathedral Hill Hospital, San Francisco, Plan Checker for Structural Design Criteria for the California Office of Statewide Health, Planning and Development
College of the Redwoods, Eureka, CA, Seismic Rehabilitation of Six Buildings to Address Fault Rupture, Peer Reviewer

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Concert Hall, Stanford University, Stanford, CA, Peer Reviewer
Encina Hall East Wing and South Wing Seismic Strengthening, Stanford University, Stanford, CA, Peer Reviewer (URM)
Greene Library West Seismic Strengthening, Stanford University, Stanford, CA, Peer Reviewer (URM)
Peterson Building, Stanford University, Stanford, CA, Peer Reviewer (URM)
Plan Checking Services for the City of Santa Cruz for URM Buildings Damaged in the 1989 Loma Prieta Earthquake, Santa Cruz, CA (URM buildings)
Salinas Courthouse Seismic Rehabilitation (passively damped), Salinas, CA, Peer Reviewer for the California Administrative Office of the Courts
Santa Clara County Hall of Justice Seismic Rehabilitation, San Jose, CA, Peer Reviewer for the California Administrative Office of the Courts
Seismic Evaluation of 620 Post Street for Department of City Planning, San Francisco, CA, Peer Reviewer (URM)
Stanford Hospital and Clinics, Stanford University, Stanford, CA, OSHPD Plan Reviewer
Varsity Theatre Remodel Project, Palo Alto, CA, Structural Consultant for the Environmental Impact Report
Walker Hall, UC Davis, Davis, CA, Peer Reviewer
Washington Hospital, Fremont, CA, OSHPD Plan Reviewer

<u>Engineering Cost and Loss Estimates</u>
San Francisco Unreinforced Masonry Buildings Study, Department of City Planning, City of San Francisco
Study of Seismic Retrofitting Alternatives for URM Buildings, City of Oakland
Study of Seismic Retrofitting Alternatives for Tuckunder Apartment Buildings, City of San Jose
Corresponding Member, Project Oversight Committee, National Institute of Building Sciences, National Loss Estimation Methodology Project

<u>Applied Research/Earthquake Reconnaissance/Guideline Development:</u>
1994 Northridge Earthquake Case Studies Project, California Seismic Safety Commission, Proposition 122: Product 3.2
Analysis of URM Building Damage Patterns, USGS Research Grant
ATC-43: Evaluation and Repair of Earthquake Damaged Concrete and Masonry Wall Buildings, Applied Technology Council Project, funded by FEMA (also known as FEMA 306, 307 and 308), Unreinforced Masonry Consultant. Also served as seminar presenter on the method following 2001 Nisqually, Washington Earthquake.
ATC-52-2: Community Action Plan for Seismic Safety (CAPSS) for the City and County of San Francisco, Task 3 consultant on earthquake damage repair triggers
ATC-71-1: Simplified Interim Guidelines for Seismic Retrofit of Weak-Story Wood-Frame Buildings, Project Review Panel Member
ATC-83: Improved Procedures for Characterizing and Modeling Soil Structure Interaction for Performance Based Engineering, Project Technical Committee
Background Reports on the 1994 Northridge Earthquake, Governor's Executive Order W-78-94, for Governor Pete Wilson and California Seismic Safety Commission

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CUREE-Caltech Woodframe Research Project, Design of Tuckunder Building Test Specimen at UC Berkeley
Cyclic Test Program Formulation for Wood-frame Shear Wall System Used in Hanna House Seismic Rehabilitation, Stanford University, Stanford, CA
Development of a Framework for URM Rehabilitation Guidelines for Enhanced Performance, National Institute of Standards and Technology
FEMA 154: Rapid Visual Screening of Buildings for Potential Seismic Hazards, project to update the document, Applied Technology Council for FEMA
FEMA 547/ICSSC RP-7: Techniques for Seismic Rehabilitation of Existing Buildings, National Institute of Standards and Technology Project, funded by FEMA
Study of Damage to URM Buildings in the Loma Prieta Earthquake, National Science Foundation and California Seismic Safety Commission
Study of Strengthening URM Buildings with Braced Frames, Consultant to University of Michigan, National Science Foundation
UC Laboratory Vibration Study, for UC Berkeley and UC San Francisco (with Colin Gordon and Associates)

Selected Journal Articles, Magazine Publications, and Books

Fathali, S. and B. Lizundia, 2011, "Evaluation of Current Seismic Design Equations for Nonstructural Components in Tall Buildings using Strong Motion Records," The Structural Design of Tall and Special Buildings, Wiley Blackwell, in press.
Holmes, W., Lizundia, B. and D. Bonowitz, 2010, Here Today—Here Tomorrow: The Road to Earthquake Resilience in San Francisco, Post-Earthquake Repair and Retrofit Requirements, ATC 52-4 Report, Community Action Plan for Seismic Safety (CAPSS) project by the Applied Technology Council for the City of San Francisco
Bonowitz, D., Dengler, L., and B. Lizundia, 2010, "The Mw 6.5 Offshore Northern California Earthquake of January 1, 2010," Earthquake Engineering Research Institute Newsletter, March
FEMA 547/ICSSC RP-7, 2006, Techniques for the Seismic Rehabilitation of Existing Buildings, prime contractor Rutherford and Chekene, editor B. Lizundia, FEMA, Washington, D.C., September
Lizundia, B., and R. Niewiarowski, 2006, "Regenesis", Civil Engineering Magazine, American Society of Civil Engineers, September, Volume 76, Number 9
Lizundia, B., 2006, "Forever de Young", Modern Steel Construction, American Institute of Steel Construction, Chicago, August
Maffei, J., Comartin, C., Kehoe, B., Kingsley, G., and B. Lizundia, 2000, "Evaluation of Earthquake-Damaged Concrete and Masonry Wall Buildings," Earthquake Spectra, Earthquake Engineering Research Institute, Volume 16, Number 1, February
Lizundia, B., 1999, "Frank Lloyd Wright's Hanna House: Seismic Rehabilitation Revives a Landmark," Wood Design and Building, Fall, Number 9
FEMA 306, 1999, Evaluation of Earthquake Damaged Concrete and Masonry Wall Buildings: Basic Procedures Manual, FEMA, Washington, D.C., author for unreinforced masonry provisions, May
FEMA 307, 1999, Evaluation of Earthquake Damaged Concrete and Masonry Wall Buildings: Technical Resources, FEMA, Washington, D.C., author for

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unreinforced masonry chapter, May

Lizundia, B., Dong, W., Holmes, W., and R. Reitherman, 1998, “A Summary of Unreinforced Masonry Building Damage Patterns—Implications for Improvements in Loss Estimation Methodologies,” in The Loma Prieta, California, Earthquake of October 17, 1989: Performance of the Built Environment: Building Structures, USGS Professional Paper 1552-C, editor M. Celebi, USGS, Washington, D.C.

Somers, P., 1996, “Unreinforced Masonry Buildings," and “Retrofitted Buildings” in "Northridge Earthquake Reconnaissance Report,” Volume 2, Earthquake Spectra, Supplement C to Volume 11, January, contributor to each chapter, overall report editor W.T. Holmes

Shepherd, R., 1990, “Buildings,” Chapter 5 of "Loma Prieta Earthquake Reconnaissance Report," Earthquake Spectra, Supplement to Volume 6, May, contributor to unreinforced masonry section of chapter, overall report editor Lee Benuska

Papers Presented at Conferences

Fathali, S. and B. Lizundia, 2011, “Evaluation of Current Seismic Design Equations for Nonstructural Components in Tall Buildings using Strong Motion Records,” Los Angeles Tall Building Structural Design Council Annual Meeting, Los Angeles.

Lizundia, B., Holmes, W.T., Malley, J., Cobeen, K, and H.S. Lew, 2006, “Techniques for the Seismic Rehabilitation of Existing Buildings,” Proceedings of the Eighth National Conference on Earthquake Engineering, Earthquake Engineering Research Institute, San Francisco

Lizundia, B. and R. Niewiarowski, 2006, “The New de Young Museum,” Proceedings of the Eighth National Conference on Earthquake Engineering, Earthquake Engineering Research Institute, San Francisco

Lizundia, B., 2005, “Use of Prescriptive Seismic Rehabilitation Requirements for Specific Building Types—The Unreinforced Masonry Example,” Proceedings of the International Symposium on Earthquake Engineering, Commemorating the Tenth Anniversary of the 1995 Kobe Earthquake, Japan Association for Earthquake Engineering, Kobe, Japan, January 13-16

Fosse, R., Quigley, D., Curry, J. and B. Lizundia, 2002, “Driven Pile Foundation Design and Construction, Genentech Hall, UCSF Mission Bay Campus,” Proceedings of the 27th Annual Conference on Deep Foundations, Deep Foundations Institute, San Diego

Lizundia, B. and W.T. Holmes, 1998, “Development of Procedures to Enhance the Performance of URM Buildings,” Proceedings of the Sixth U.S. National Conference on Earthquake Engineering, Earthquake Engineering Research Institute, Seattle, May 31-June 4

Lizundia, B., 1998, “Recommended Guidelines for the Practice of Structural Engineering in California: Overview and Chapter 1—Professional Conduct; and Chapter 4—Project Design Peer Review,” Proceedings of the Structural Engineers World Congress, San Francisco, CA

Lizundia, B. and W. Holmes, 1997, “The Performance of Rehabilitated URM Buildings in the Northridge Earthquake,” Proceedings of the Northridge Earthquake Research Conference, California Universities for Research in Earthquake Engineering, Los Angeles, August 20-22

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Lizundia, B., 1997, “Special Inspection, Structural Observation and Structural Peer Review in California,” Proceedings of Structures Congress XV, American Society of Civil Engineers, Portland, Oregon, April 13-16

Lizundia, B., 1997, “Performance-Based Design and the Seismic Retrofitting of the Stanford University Main Quadrangle,” Proceedings: 65th Annual Convention, Structural Engineers Association of California, Maui, Hawaii, October 1-6

Lizundia, B., Dong, W., Holmes, W., and R. Reitherman, 1994, "URM Building Damage Patterns in the Loma Prieta Earthquake: Implications for Improvement in Loss Estimation Methodologies," Proceedings of the Fifth National Conference on Earthquake Engineering, Earthquake Engineering Research Institute, Chicago, July 10-14

Holmes, W., Lizundia, B., and S. Pyle, 1994, "Techniques Used to Seismically Strengthen Masonry Arcades at Stanford," Proceedings of the Fifth National Conference on Earthquake Engineering, Earthquake Engineering Research Institute, Chicago, July 10-14

Lizundia, B., and D. Provencher,1993, "Out-of-Plane and In-Plane Static Load Testing of Unreinforced Hollow Clay Tile Infill Walls in UC Berkeley's Harmon Arena," Proceedings of the National Workshop on Unreinforced Hollow Clay Tile, San Francisco, CA, September 21-22, 1992, US Department of Energy, Report ES/CNPE-93/1, July

Presentations Given at Conferences and Meetings

Lizundia, B., 2011, “Retrofit of URM Buildings,” 2011 Simpson Seismic Symposium, Stockton, CA, October

Lizundia, B., 2011, “What the 2011-2012 Christchurch, New Zealand Earthquakes Can Teach Us About Improving the Post-Earthquake Safety Evaluation Process,” Structural Engineers of Central California Dinner Meeting, Sacramento, CA, September

Lizundia, B., 2011, “ATC 52-4: Post-Earthquake Repair and Retrofit Requirements,” Canterbury Structures Group Meeting, Christchurch, New Zealand, June

Lizundia, B., Holmes, W. and D. Bonowitz, 2011, “ATC 52-4: Post-Earthquake Repair and Retrofit Requirements,” Earthquake Engineering Research Institute – Northern California Chapter Meeting, San Francisco, CA, April

Fathali, S. and B. Lizundia, 2011, “Evaluation of ASCE/SEI 7-05 Equations for the Seismic Design of Nonstructural Components Using Strong Motion Records,” 2011 Earthquake Engineering Research Institute Annual Meeting, La Jolla, CA, February

Bonowitz, D., Dengler, L., and B. Lizundia, 2010, “The Mw 6.5 Offshore Northern California Earthquake of January 1, 2010,” 2010 Earthquake Engineering Research Institute Annual Meeting, San Francisco, CA

Lizundia, B., 2009, “Roble Hall at Stanford University: A Case Study in the Evolution of Seismic Rehabilitation Standards, 2009 ATC-SEI Conference, San Francisco, CA

Lizundia, B., 2009, “Searching for Grace: The Application of Creativity to the Practice of Earthquake Engineering,” 2009 EERI-WSSPC Annual Meeting, Salt Lake City, Utah

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Lizundia, B., 2007, "FEMA 547: Techniques for Seismic Rehabilitation of Existing Buildings," presentations given at 2007 SEAONC Mini-Seminar, San Francisco; 2007 GSA Seminar, San Francisco; 2007 ICSSC Seminar, Washington, D.C; 2007 ASCE/SEI Structures Congress, Long Beach, CA

Lizundia, B., 2006, "Evaluation, Repair and Enhancement of Earthquake-Damaged Unreinforced Masonry (URM) Buildings," Eighth National Conference on Earthquake Engineering, 2006, San Francisco, co-presenter at tutorial session on FEMA 306, 307, and 308

Lizundia, B., 2006 and 2004, "The Design of the New de Young Museum," presentations given at PTI Annual Meeting, 2006, Reno, Nevada; ACI Northern California and Western Nevada Chapter Meeting, February, 2004; Structural Engineers Association of Northern California Meeting, February, 2004

Lizundia, B., "Seismic Rehabilitation of the Hanna House," presentations given at 2009 and 2000 SEAONC Dinner Meetings, 2003 Frank Lloyd Wright Conservancy Annual Meeting, San Francisco; 2002 California Preservation Foundation Workshop, Stanford University; and 1999 Association for Preservation Technology International Conference, Banff, Canada

Lizundia, B., 2002,"Seismic Rehabilitation of Toyon Hall," 2002 California Preservation Foundation Workshop, Stanford University, Stanford, CA

Lizundia, B., 2001, "Dilemmas in Managing Risk: Issues in the Stanford University Seismic Rehabilitation Program," 2001 EERI Annual Meeting, Monterey, CA

Lizundia, B., 1995, "Repair and Strengthening of Earthquake-Damaged Buildings: Challenges for Engineers," 1995 EERI Annual Meeting, San Francisco, 1995

Selected Publications and Reports

Fathali, S. and B. Lizundia, 2011, "Evaluation of ASCE/SEI 7 Equations for the Seismic Design of Nonstructural Components Using Strong Motion Records," prepared for the California Strong Motion Instrumentation Program, California Geological Survey

ANSS (Advanced National Seismic System) Structural Instrumentation Committee, 2005, "Guideline for ANSS Seismic Monitoring of Engineered Civil Systems," USGS Open File Report 2005-1039

Lizundia, B. and W. Holmes, 2000, "Practical Solutions for Improving the Seismic Performance of Buildings with Tuckunder Parking, " Rutherford and Chekene Consulting Engineers for the City of San Jose, May

Holmes, W., Lizundia, B., Humeny, M., Liu, M., Beveridge, G., and G. Canham, 2000, "Seismic Rehabilitation of Three Model Buildings with Tuckunder Parking: Engineering Assumptions and Cost Information," Rutherford and Chekene Consulting Engineers for the City of San Jose, May

Professional Practice Committee, Structural Engineers Association of California, Lizundia, 1999, Recommended Guidelines for the Practice of Structural Engineering in California, editor B. Lizundia, Structural Engineers Association of California, Sacramento, CA

Lizundia, B., et al., 1999, "Contractual Provisions to Address the Engineer's Liability When Using Performance-Based Seismic Design," Structural Engineers Association of Northern California, San Francisco, CA, June

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Healy, T., Lizundia, B., Comartin, C., Gath, E., Nigg, J., Tobin, T., and M. Greene, 1998, Ethical Issues and Earthquake Risk Reduction, EERI Endowment Fund White Paper, Earthquake Engineering Research Institute, Oakland, CA, January

Lizundia, B., Holmes, W.T., Longstreth, M., Kren, A., and D. Abrams, 1997, Development of Procedures to Enhance the Performance of Rehabilitated URM Buildings, Rutherford and Chekene Consulting Engineers for the National Institute of Standards and Technology, Gaithersburg, MD, NIST Report GCR 97-724, August

Lizundia, B., 1995, “Seismic Strengthening with Steel Slotted Bolt Connections," Steel Tips, Structural Steel Educational Council, Moraga, CA, January

Holmes, W., Ferner, H., Longstreth, M., and B. Lizundia, 1994, “1994 Northridge Earthquake, Buildings Case Studies Project, Proposition 122: Product 3.2,” Rutherford and Chekene Consulting Engineers for the California Seismic Safety Commission, Report Number SSC 94-06, November

Recht Hausrath and Associates, Rutherford and Chekene Consulting Engineers, Risk Management Solutions, and Architectural Resources Group, 1993, "Socioeconomic and Engineering Study of Seismic Retrofitting Alternatives for Oakland's Unreinforced Masonry Buildings," for Building Services Department, Office of Planning and Building, City of Oakland, March

Lizundia, B., Dong, W., and W. Holmes, 1993, “Analysis of Unreinforced Masonry Building Damage Patterns in the Loma Prieta Earthquake and Improvement in Loss Estimation Methodologies: Technical Report to the USGS,” Rutherford and Chekene Consulting Engineers for the USGS, March 31

Lizundia, B., Holmes, W., Brinkman, S., Conrad, J., Reitherman, R., Dong, W., Burton, J., and A. Bailey, 1991, "Damage to Unreinforced Masonry Buildings in the October 17, 1989 Loma Prieta Earthquake," Rutherford and Chekene Consulting Engineers for the National Science Foundation and California State Seismic Safety Commission, February

Holmes, W., Lizundia, B., Dong, W., Brinkman, S., Reitherman, R., Green, M., and W. Robinson, 1990, "Seismic Retrofitting Alternatives for San Francisco's Unreinforced Masonry Buildings," Rutherford and Chekene Consulting Engineers for the San Francisco Department of City Planning, May