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Education

University of Genova, Genova, Italy, Civil Engineering, M.S., 1998

Politecnico of Milan, Ph.D., Earthquake Engineering, 2002

Appointments and Professional Experience

2015-present Associate Professor of Structural Engineering, Department of Civil Engineering and Architecture, University of Pavia, Italy

2011 – 2015 Assistant Professor, Department of Civil Engineering and Architecture (until 2012 Dept. of Structural Mechanics), University of Pavia, Italy

2003 – 2011, Researcher, European Centre for Training and Research in Earthquake Engineering (EUCENTRE), Pavia, Italy

2002 – 2003, Post-doctoral Researcher, Dept. Structural and Geotechnical Engineering, University of Genova, Genoa, Italy

2014-present: member of WG10 – “Seismic Aspects of Historical Monument Preservations” of the European Association for Earthquake Engineering

2014-present: coordinator of WP1a “Nonlinear analysis” of CEN TC 250/SC8/WG1

“Masonry” for the preparation of proposals for the revision of Eurocode 8 (EN 1998-1 e EN 1998-3).

2017-present: member of TG7.7 “Sustainable Concrete Masonry Components and Structures” the International Federation for Structural Concrete (CEB-fib).

Résumé

Andrea Penna is Associate Professor of Structural Engineering at the Department of Civil Engineering and Architecture of the University of Pavia, where he is teaching the courses of “Structural Engineering” (structural analysis and steel structures), “Structural Engineering Design” (reinforced concrete structures) and “Design and Rehabilitation of Masonry Structures”.

Dr. Penna has been chairman of sessions in several national and international conferences, member of the organization and scientific committees of some international conferences and regularly serves as reviewer of international journals.

His research activity was initially mainly addressed to numerical modelling of masonry structures, seismic response evaluation of existing buildings, seismic risk analysis and seismic vulnerability of churches, historical buildings and historic centres. Afterwards, he had also the opportunity of performing significant experimental campaigns on masonry structural and nonstructural components as well as entire building prototypes. He coordinated and co-coordinated large research programs characterized by shaking table testing of full-scale and reduced scale stone and brick masonry buildings with different types of diaphragms, also implementing traditional and innovative strengthening solutions.

He is author and co-author of about 200 scientific publications on his research topics and computer programs, mainly dedicated to structural seismic response simulation.

Andrea Penna participated to a number of post-earthquake survey activities in Italy and other world countries (Pakistan, Chile).

He was invited speaker, as an international expert, at the Earthquake Rehabilitation Conference held in Islamabad on 18th and 19th of November 2005, following the earthquake of the 8th of October 2005, he gave keynote lectures at the Vienna Congress on Recent Advances in Earthquake Engineering and Structural Dynamics (VEESD 2013), held in Vienna in August 2013 and at the 14th D-A-CH Tagung, the joint conference on earthquake engineering and structural dynamics of Germany, Austria and Switzerland, held in Zurich.

He has been involved in many research projects, focused on seismic vulnerability and risk of existing masonry structures and heritage buildings as well as on the assessment of the seismic performance of innovative masonry technologies for both structural and non-structural applications.

Recent publications

- Sorrentino L, da Porto F, Magenes G., Penna A (2018) Seismic behaviour of ordinary masonry buildings During the 2016 Central Italy Earthquakes, *BULLETIN OF EARTHQUAKE ENGINEERING*, doi: 10.1007/s10518-018-0370-4
- Malomo D, Pinho R, Penna A (2018) Using the Applied Element Method for Modelling Calcium-Silicate Brick Masonry Subjected to In-Plane Cyclic Loading, *EARTHQUAKE ENGINEERING & STRUCTURAL DYNAMICS* 47(7):1610-1630
- Kallioras S, Guerrini G, Tomassetti U, Marchesi B, Penna A, Graziotti F, Magenes G (2018). Experimental Seismic Performance of a Full-Scale Unreinforced Clay-Masonry Building with Flexible Timber Diaphragms, *ENGINEERING STRUCTURES* 161:231-249
- Vanin F, Zaganelli D, Penna A, Beyer K (2017) Estimates for the stiffness, strength and drift capacity of stone masonry walls based on 123 quasi-static cyclic tests reported in the literature, *BULLETIN OF EARTHQUAKE ENGINEERING*, doi:10.1007/s10518-017-0188-5.
- Guerrini G, Graziotti F, Penna A, Magenes G (2017). Improved evaluation of inelastic displacement demands for short-period masonry structures, *EARTHQUAKE ENGINEERING AND STRUCTURAL DYNAMICS*, 46(9), pp. 1411–1430
- Mendes, N., Costa, A.A., Lourenço, P.B., Bento, R., Beyer, K., de Felice, G., Gams, M., Griffith, M.C., Ingham, J.M., Lagomarsino, S., Lemos, J.V., Liberatore, D., Modena, C., Oliveira, D.V., Penna, A., Sorrentino, L. (2017) Methods and Approaches for Blind Test Predictions of Out-Of-Plane Behavior of Masonry Walls: A Numerical Comparative Study, *INTERNATIONAL JOURNAL OF ARCHITECTURAL HERITAGE*, 11, 59-71.
- Penna A, Senaldi I., Galasco A., Magenes G. (2016). Numerical simulation of shaking table tests on full-scale stone masonry buildings, *INTERNATIONAL JOURNAL OF ARCHITECTURAL HERITAGE*, 10 (2-3): 146-163
- Costa, A.A., Penna, A., Arêde, A., Costa, A. (2015). Simulation of masonry out-of-plane failure modes by multi-body dynamics, *EARTHQUAKE ENGINEERING & STRUCTURAL DYNAMICS*, 44(14): 2529-2549.
- Bracchi S., Rota M., Penna A., Magenes G. (2015), “Consideration of modelling uncertainties in the seismic assessment of masonry buildings by equivalent-frame approach”, *BULLETIN OF EARTHQUAKE ENGINEERING*, 13(11): doi:10.1007/s10518-015-9760-z.
- Penna, A. (2015). Seismic assessment of existing and strengthened stone-masonry buildings: critical issues and possible strategies. *BULLETIN OF EARTHQUAKE ENGINEERING*, 13(4), 1051-1071.
- Penna A., Morandi P., Rota M., Manzini C.F., da Porto F., Magenes G. (2014). Performance of masonry buildings during the Emilia 2012 earthquake, *BULLETIN OF EARTHQUAKE ENGINEERING*. 12(5): 2255-2273.
- Senaldi I., Magenes G., Penna A., Galasco A., Rota M. (2014). The Effect of Stiffened Floor and Roof Diaphragms on the Experimental Seismic Response of a Full-Scale Unreinforced Stone Masonry Building, *JOURNAL OF EARTHQUAKE ENGINEERING*. 18(3): 407-443.
- Rota M., Penna A., Magenes G. (2014). A framework for the seismic assessment of existing masonry buildings accounting for different sources of uncertainty, *EARTHQUAKE ENGINEERING & STRUCTURAL DYNAMICS*. 43(7): 1045-1066.
- Magenes G., Penna A., Senaldi I., Galasco A., Rota M. (2014). Shaking table test of a strengthened full-scale stone masonry building with flexible diaphragms, *INTERNATIONAL JOURNAL OF ARCHITECTURAL HERITAGE*. 8(3): 349-375.
- Penna A., Lagomarsino S., Galasco A. (2014). A nonlinear macroelement model for the seismic analysis of masonry buildings, *EARTHQUAKE ENGINEERING & STRUCTURAL DYNAMICS*. 43(2): 159-179.