URM WEBINAR #3 Unreinforced Masonry Retrofit Fundamentals and Design

Session Title: **Unreinforced Masonry Retrofit Fundamentals and Design**
Date: **Weds Nov 18 2020, 1030a – 1145a**
Credits Offered: **1.25 HSW**

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Presenters and Bios:

Maya Foty, AIA, Principal, *Architectural Resources Group*
Based in Portland, Oregon, Maya's experience includes numerous preservation projects on both the east and west coasts. She has worked in both the public and private sectors, and has taken several large projects through the design, permitting and construction phases. With a passion for historic buildings, Maya has extensive experience in historic documentation, building condition surveys, construction document production and construction management. Maya is the vice-chair of the Portland Historic Landmark Commission and provides leadership and expertise on maintaining and enhancing Portland's historic and architectural heritage.

Dan Say, PE, SE, Principal, *Swenson Say Faget Structural Engineering*
Bio pending

Michael Schuller, PE, President, *Atkinson-Noland & Associates*
Michael Schuller is president of Atkinson-Noland & Associates, a consulting engineering firm specializing in evaluation and repair of existing structures. He has 30 years' experience with masonry engineering including special expertise with nondestructive evaluation and repair procedures. His 100 publications on concrete and masonry include a new book titled "Assessment and Retrofit of Masonry Structures," and he taught masonry structural design at the University of Colorado from 1999 through 2009 and in 2016. Mr. Schuller serves on the Board of Directors of The Rocky Mountain Masonry Institute and The Masonry Society and is a Fellow of The Masonry Society and the Association for Preservation Technology.

Session Description:

This presentation will concentrate on the structural engineering behind URM retrofits. We will describe and illustrate typical URM buildings and will describe when you are required to do retrofits (which could also be elective if desired) and why we do them. A discussion of the various retrofit standards will be included along with the governing codes for seismic retrofits. The process associated with a typical URM retrofits will be presented, which will include a discussion on historical information, photographs and research necessary to do this work. Typical repairs will be illustrated through photographs and drawings along with a discussion and illustrative examples of common URM issues or deficiencies. Examples and discussion of various completed or in process retrofits will be presented which show in situ repairs commonly implemented. Finally examples of common URM failures will be presented to illustrate the types of damage buildings can experience if they are not retrofitted.

An integral component of a seismic retrofit project is a fundamental understanding of construction typologies, current conditions, and engineering properties of existing building materials. Information is gathered using a combination of historic research, visual observations, probes, and material tests, augmented with nondestructive methods to evaluate subsurface conditions. The presentation will include discussion of testing required by the IEBC and ASCE 41, how to plan investigative work necessary for designing a seismic retrofit scheme, and when to turn to specialized diagnostic approaches including surface penetrating radar, flatjack testing, and in-place shear tests.

While not all URM building are eligible for listing as local or national landmarks, many are. Their seismic upgrades need to take into consideration the retention of sensitive and often irreplaceable historic fabric. This presentation will review several seismic upgrade options - including base isolation, center-coring and the use of FRP (fiber reinforced polymer) - that achieve code required strengthening requirements, but with minimal impact to the building. Steps in the decision-making process to select the proper seismic upgrade approach will be discussed, as well as some of the required testing that each upgrade solution entails.