



The Association for Preservation Technology International  
*Association internationale pour la préservation et ses techniques*

## APT Seismic Retrofitting Seminar 2022 Agenda

Day 1 February 22, 1-4:30 pm Eastern

*Each session followed by 10-15 min. Q & A (1 hour total)*

### Welcome

**Introduction: The Seismic Rehabilitation of Historic Buildings.** Antonio Aguilar. Planning for successful seismic rehabilitations of historic buildings. Evaluating historic building risk factors, condition, and general approaches for limiting loss of historic character and materials. Aligning performance expectations with building functions, service requirements, historic significance and budget. Aligning engineering and preservation priorities in assessment, treatment planning, and execution.

Break (15 min)

**Earthquake Hazard Assessment and Risk Reduction: Principles and Approaches (Part 1).** Melvyn Green. How and where buildings fail in earthquakes. Testing, investigative assessment and modifications required by Executive Order 12941 to EO 13717 (2016). IEBC code triggers and appendices. ASCE 41 tiers of evaluation. Incremental retrofit approaches – FEMA 397 (Office Buildings). Prescriptive and performance-based compliance. Specific Issues by building type. Unreinforced Masonry including brick, block, HCT, adobe. Reinforced Masonry and tilt-up.

Break (15 min)

**Earthquake Hazard Assessment and Risk Reduction (Part 2).** Melvyn Green. Building evaluation and ASCE 41 tiering. Overview of retrofit approaches for unreinforced masonry and concrete reinforced masonry that is not compliant. Seismic demand, mitigation measures. Addressing non-structural building elements and contents.

Retrofit approaches to be discussed include

- Adding elements (bracing, shear walls, moment frames, center coring)
- Enhancing existing elements (fiber reinforced overlay or wrap)
- Improving connections
- Reducing seismic demand (base isolation, energy dissipation)



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Wrap up

4:30 Adjourn

**Day 2 February 24, 2022, 12:30-4:30 pm Eastern**

*Each session followed by 10-15 min. Q & A (1 hour total)*

**Welcome**

**Historic URM Construction, Assessment, and Rehabilitation.** Amy Woods.

This session examines the rationale and methodology for condition assessment, repair, and restoration of historic unreinforced masonry (URM) buildings as a precursor to conducting seismic upgrades. Focusing on late 19th and early 20th century unreinforced masonry, its use in exterior construction, and types of deterioration, the presentation will discuss factors contributing to visible deterioration, including ways in which brick has been manufactured, how it was used within the construction, associated building materials/features, exposure to weather, and previous maintenance or repair campaigns. The presentation will provide insight into common types of deterioration and material behavior along with specific intervention methods and materials that may be appropriate and sympathetic to the original materials. A holistic approach to URM facades is critical to technically sound repairs and interventions for seismic upgrades.

Break (15 min)

**Performance Evaluation and Combination Approaches to Preserve Decorative Interiors.**

Terrence (Terry) Paret. Case studies include the Hibernia National Bank (1892) and the Congregation Sherith Israel synagogue (1904) in San Francisco. Projects illustrate coring, carbon fiber and hollow clay tile retrofit reinforcement technologies and will touch on contractor competency, construction oversight and troubleshooting.

Break (15 minutes)

**Collaborating to Promote Effective Team Dynamics.** Naomi Miroglio. Strategies for promoting collaboration between architects and engineers to integrate a preservation perspective into project design. Case studies focus on historic unreinforced masonry buildings where the optimal approach involved a combination of technologies, including coring and other newer retrofit methods.

Wrap up summary

4:30 Adjourn



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## Speaker Bios

Antonio Aguilar, Senior Historical Architect with the National Park Service Technical Preservation Services, revised Preservation Brief 41, retitled “Seismic Rehabilitation of Historic Buildings” in 2016. Originally written by David W. Look, AIA, Terry Wong, PE and Sylvia Rose Augustus and published in 1997 as “The Seismic Retrofit of Historic Buildings: Keeping Preservation in the Forefront,” the brief describes common vulnerabilities of various building construction types and the seismic strengthening methods to remedy them. The updated brief includes guidance for recent past concrete and steel buildings, technical information on newer retrofit technologies, an expanded glossary and new photographs illustrating a range of issues, needs and solutions. Aguilar also co-authored NPS Brief 3, “Improving Energy Efficiency in Historic Buildings.”

Melvyn Green has been a leading preservation engineer in California since the early 1970's, specializing in seamless integration of structural and architectural design with materials conservation. Author of Building Codes for Existing and Historic Buildings (2012), Green is an APT Fellow, past chairman of the ASCE Standards Committee on Seismic Rehabilitation of Buildings, past president of the Structural Engineers Association of California, and former Director of Building and Safety for the City of El Segundo, California. In these roles as a leader in the profession as in his own practice and active professional mentoring, Green advances the development of design methods and building regulatory processes that encourage reuse of historic resources while providing safe buildings.

Amy Woods, P.E. is Director of Technical Education with the International Masonry Institute (IMI), and a licensed Professional Engineer. Her background combines architecture, historic preservation, and civil engineering materials. Ms. Woods has over 20 years of experience in the field of forensic engineering of building materials, both historic and contemporary structures. Her experience includes facade and failure investigations with materials such as brick masonry, terra cotta, stone, concrete, terrazzo, and stucco. Her primary interest is with projects involving the investigation and repair of historic masonry and concrete materials. Ms. Woods holds a BS in Architecture, MA in Architecture Historic Preservation, and an MS in Civil Engineering Building Materials with a focus on cement chemistry. She is a Board member of APT, Co-Chair of APT's Preservation Engineering Technical Committee (PETC), and past Board member of the International Concrete Repair Institute (ICRI) Seattle and Chicago chapters, and founder of Women in Restoration & Engineering (WiRE).

Terrence (Terry) Paret, Senior principal, WJE. Since joining WJE in 1986, Terry Paret has performed hundreds of engineering investigations in the US and abroad, focusing on the evaluation of structures after earthquakes, the prediction of the probable performance of new and existing buildings in future earthquakes, and the design of repairs and rehabilitation to mitigate damage and improve earthquake resistance. He has investigated structures that have been damaged or have collapsed due to natural disasters such as



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earthquakes and floods and has evaluated a multitude of fire-damaged structures as well as defective or deteriorated structural elements, systems, construction materials, and installations. Mr. Paret's projects include historic and contemporary high- and low-rise commercial, institutional and industrial buildings with structural systems of steel, concrete, wood, and masonry.

Naomi Miroglio is a historical architect with Architectural Resources Group, San Francisco Office. Her work includes unreinforced masonry buildings where integrating an architectural point of view into engineering analysis has led to resourceful solutions where multiple technologies were employed to preserve character-defining attributes that make each building unique.

#### **APT Contacts**

Caroline Alderson  
202-302-3528  
[Caroline.alderson@gsa.gov](mailto:Caroline.alderson@gsa.gov)

James Reigle  
APT Western Chapter  
[jgreigle@gmail.com](mailto:jgreigle@gmail.com)

Amy Woods, APT PETC Co-Chair  
646-469-3251  
[awoods@imiweb.org](mailto:awoods@imiweb.org)

Janet Bascom  
Administrative Manager – APTI 217-529-9039  
[administration@apti.org](mailto:administration@apti.org)