



APTNE
17

Annual Meeting and Symposium

Coming of Age: **Preserving Buildings of the Modern Era**

THE EGG | Center for the Performing Arts
Albany, NY | February 3

Who We Are

Originally founded as the APT New York Chapter in the mid-1980s, the organization was restructured in 2003 as the **Association for Preservation Technology Northeast Chapter** (APTNE) encompassing New England, New York State, and northern New Jersey. At present, we have approximately 165 members.

APTNE is committed to this large geographic community with regional and local preservation events. We conduct workshops, co-sponsor events with local and statewide preservation organizations, and sponsor symposia including our annual meeting. We support preservation students by offering scholarships and outreach for student chapters. We invite you to learn more about our organization at www.aptne.org.

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APTNE

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Schedule of Events **Friday, February 3, 2017**

8:30 - 9:15	Registration & Breakfast	1:50 - 2:10	Reglazing Modernism: The American and European Experience to Date Part 1: Steel Frame Assemblies Angel Ayon
9:15 - 9:30	APTNE Welcome Address Chris Dabek	2:10 - 2:30	Architectural Precast Concrete Wall Panels: Their Technology, Evolution, Significance and Preservation Grace Anne Meloy
9:30 - 10:00	<i>Keynote Speaker:</i> Time Marches On: Preserving the More Recent Past Michael Lynch	2:30 - 2:45	Afternoon Q&A
10:00 - 10:20	Docomomo/APT TC Modern Heritage David Fixler	2:45 - 3:00	Coffee & Refreshment Break
10:20 - 10:40	Monumental Mid-Century Modernism: Managing and Maintaining Rockefeller's Masterworks Elisabeth Bakker Johnson	3:00 - 3:20	Kevin Roche's University of Massachusetts-Amherst Fine Arts Center and Brutalism's Monolithic Concrete Construction Performance Perception Penalty Carl Fiocchi
10:40 - 10:55	Coffee & Refreshment Break	3:20 - 3:40	Dalle de Verre—20th Century Innovation; 21st Century Conservation Issue Art Femenella Sr.
10:55 - 11:15	Reaping the Whirlwind: Practical and Theoretical Problems in Preserving Modern Buildings Robert Russell	3:40 - 4:00	Restoring the Met Breuer Amanda Trienens, Miriam Kelly
11:15 - 11:35	<i>Student</i> Managing Transparency in Post-War Modern Architecture Makenzie Leukart	4:00 - 4:25	Final Q&A/Open Discussion
11:35 - 12:10	The Rehabilitation of Saarinen's Legacy at MIT—Kresge Auditorium and the MIT Chapel Gary Tondorf Dick, Katherine Wissink, Eric Ward	4:25 - 4:45	Annual Meeting/Chapter Highlights/Closing Remarks
12:10 - 1:30	Lunch	5:00 - 7:00	Reception New York State Museum
1:30 - 1:50	The Devil is in the Details: Issues with and Rehabilitation of Mid-Century Cavity Wall Construction David Artigas		

For tour information please see page 26.

Coming of Age: **Preserving Buildings of the Modern Era**

Speaker Abstracts



Time Marches On: Preserving the More Recent Past

*Keynote
Speaker*

**Michael
Lynch**

When I first raised the question “What are we going to do with the recent past in the not too distant future?” it was 1986 and I was talking about 50 year old pre-war buildings from the 1930s-40s. I returned to the NY SHPO in 2016 to discover that the staff there had already listed a building built in 1986. Time, and history with it, marches on. What are the new challenges we face as we work to identify cultural resources from the post WWII and Cold War eras? It was a time of rapid growth and construction. There is so much of it. More of the recent past than ever before. We can’t possibly save it all, can we? If not, how do we decide? Who gets to decide? And how do we continue to manage change in an ever-more rapidly moving world? ●

About the Keynote ...

Michael Lynch has led a charmed professional life, having grown up in the historic Hudson Valley and started his preservation career just before the American Bicentennial in the office of John Milner & Associates in West Chester, PA. After the Bicentennial he moved to the New York State Historic Preservation Office where he honed his technical skills and reviewed hundreds of preservation grant projects, millions of dollars worth of tax credit rehabilitations (including the first certified rehab in the country), and did battle with DOT for 21 years. As he rose through the supervisory ranks at Parks, he also got involved with the Association for Preservation Technology, first as co-founding President of the APT New York Chapter that eventually morphed into the Northeast Chapter, then on to the Board of the Association itself. In his twelve years on the Board he rose through the ranks there too, ultimately serving four years as President from 1991-1994.

Michael departed from Parks and New York state in 1999 to take on a new assignment as the Vice President for Properties and Preservation at SPNEA (now Historic New England), followed by twelve years in private practice, first with Simpson Gumpertz & Heger, then as a partner in the New York City-based firm of Kaese & Lynch Architecture and Engineering. Oh, did I forget to mention that Michael is both a restoration architect and preservation engineer? He returned to the APTNE Chapter Board in 2011 to assist in planning the APT International conference in New York City in 2013 (hosting a NYC conference was the original reason for founding the New York Chapter back in the early 1980s—some good ideas take longer to mature than others). Most recently Michael returned to OPRHP in April 2016 to take on a new role as Director of the Division for Historic Preservation. He now serves as the Deputy State Historic Preservation Officer, where he oversaw the preparation of the National Register nomination for the site of the Woodstock Music Festival, which he attended. Michael thinks he might retire someday, but admits he is not the retiring type. ●

KEYNOTE SPEAKER
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APT Principles for Renewing Modernism

*Presented by***David N.
Fixler**

We are at a pivotal point in addressing the legacy of the built environment of the latter half of the 20th century. In the more than 25 years since the global design and preservation community became aware of the unique and pressing issues raised by the vast corpus of modernism, much has been accomplished in coming to more fully understand the nature and importance of these resources. Whether we in fact are addressing a new paradigm has been the subject of a lively dialogue that has ensued over this period within organizations such as APT, ICOMOS, Docomomo and the Getty Conservation Institute, and among the global community of professionals dealing with the conservation and reuse of modern heritage. This dialogue has in any case greatly expanded our ability to provide methodical, objective criteria for addressing the treatment of these properties. While first tier properties will generally continue to receive treatment comparable to that given to the iconic works of any era, these issues are particularly germane in considering how we should

address what may be labeled second or third tier structures, those “sub-iconic” resources that constitute a large complement of the contemporary built environment. What they may lack in historic or architectural significance does not alter the fact that many of these workmanlike structures nevertheless embody qualities that are representative of the stylistic and technical trends of their era and remain solid building stock. The vastness of this inventory also means that we are dealing with an enormous amount of embodied energy whose retention should be encouraged in the interest of environmental stewardship. Repurposing these structures with maximum re-use of original fabric represents prudent use of finite resources and we should therefore embrace this ethos as sound conservation practice in both the building and the environmental sense of the word. At the same time, every rehabilitation effort should plan for resilience to address future impacts of climate change, programmatic needs, economic shifts and demographics.

This talk will introduce the *APT Principles for Practice for Renewing Modernism*—a document designed →





to support the philosophy and mission of APT by promoting policies that focus on maintaining viability of the modern built environment; to refine, clarify and expand current practice, and to move the dialogue forward on the treatment of a broad variety of mid and late 20th century resources. The Principles shall complement the existing Charters and Standards such as the ICOMOS Venice and Burra Charters, and the United States Secretary of the Interior's Standards for the Treatment of Historic Properties, that have guided heritage conservation practice in general, and documents such as the Docomomo Eindhoven Statement, and the ICOMOS Madrid Document on *Approaches for the Conservation of 20th Century Architectural Heritage* that address modern properties in particular. The document shall serve as Guidelines for preservation practice and as such shall remain flexible and iterative in order to ensure their continued relevance and use in the future. ●

About the Presenter . . .

David Fixler, FAIA is a Principal at EYP specializing in the rehabilitation of modern structures including works such as Alvar Aalto's Baker House and Eero Saarinen's Kresge Auditorium and Chapel at MIT, Louis Kahn's Richards Laboratories at the University of Pennsylvania and the United Nations Headquarters in New York. David has taught and lectured throughout North America and around the world, his work and writings have been published internationally, and he has helped organize numerous conferences on a wide-range of topics. A Peer Review architect for the GSA, he plays a leadership role in a variety of global preservation organizations, including APT, where he is co-founder and former Chair of the Technical Committee on Modern Heritage, the Society of Architectural Historians and docomomo. ●

Monumental Mid-Century Modernism: Managing and Maintaining Rockefeller's Masterworks

Presented by

**Elisabeth
Bakker
Johnson**

This paper follows the conception, controversy, construction, and custodial care of the two largest New York State public works projects facilitated by Governor Nelson Aldrich Rockefeller in the middle of the twentieth century. The 98 acres of the South Mall in Albany, later renamed the Nelson A. Rockefeller Empire State Plaza, and the 360 acres of the State University of New York at Albany uptown campus, which ultimately became part of the largest public higher education system in the United States, were the nexus of Rockefeller's passion for art and architecture and which left a profound mark on Albany's skyline and landscape.

The Empire State Plaza (1965-1976), designed by Wallace Harrison, was modeled after the Brazilian National Congress building (1956-1960), known simply as Brasília, in Brazil's capital city. University

at Albany (1964-1970), designed by Edward Durell Stone, was modeled after the United States Embassy in New Delhi, India (1959).

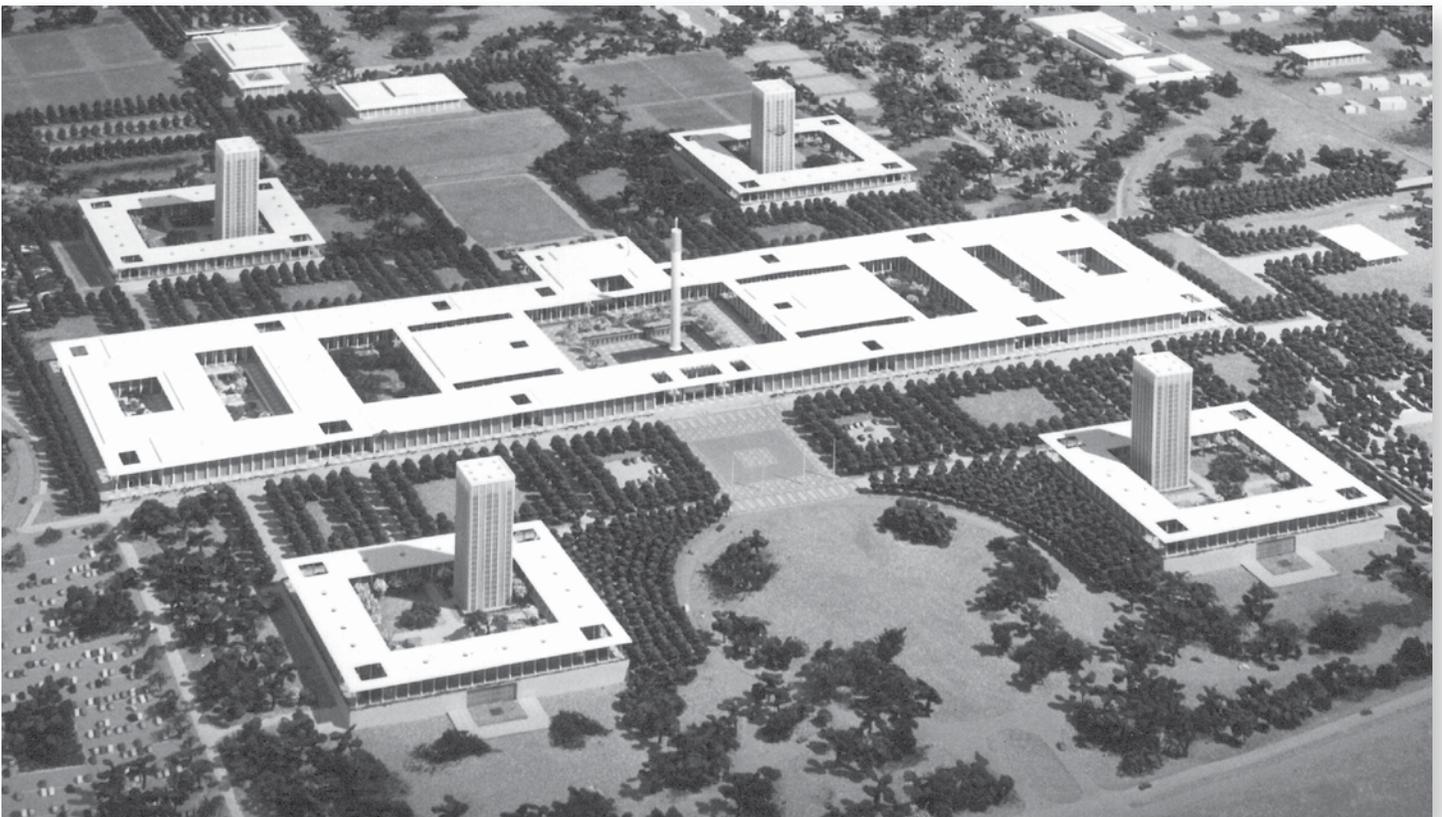
With both institutions now over 50 years old, the wisdom of Harrison's and Stone's design inspirations and choices is challenged as art and architecture clash with climate, modern materials and methods, design/construction defects, policies, competing priorities, and limited budgets, as well as the prevailing culprits, time and physics.

Herein, these two monumental complexes are compared and contrasted, primarily describing the roles of climate on facility use, materials, and facility maintenance/repair, using examples of ongoing issues unique to each institution and common to both while enumerating the challenges involved in their repair and the methodologies used as solutions. ●



About the Presenter ...

Elisabeth Bakker Johnson is a Staff Project Manager for the Office of Campus Planning in the University at Albany's Facilities office. She has a Masters of Architecture from SUNY Buffalo and a Masters of Science in Building Conservation from Rensselaer Polytechnic Institute. With nearly 25 years of state service, Elisabeth has extensive experience within all phases of the design and construction industry, where she has worked alongside the Capitol Architect and in many other capacities on dozens of projects, most notably the 49 million dollar Phase 4 New York State Capitol roof and skylight replacement project. She also has several years experience working at the New York State Historic Preservation Office and as an Historic Preservation Restoration Coordinator helping to facilitate restoration projects among the state owned historic sites' inventory in the Capital district. Elisabeth is very active in APT and APTNE, serving for 12 years on the Board of the latter. ●



Reaping the Whirlwind: Practical and Theoretical Problems in Preserving Modern Buildings

Presented by

**Robert
Russell**

This paper is not a case study of any particular 20th-century building, but rather an inquiry into some of the ideas animating modern architecture which lead to difficulties when these buildings need conservation or restoration.

A pressing practical problem for conservators involves the Modernist bias in favor of new 'modern' materials for 20th-century buildings. The starting point for this section of the paper will be Andres Duany's axiom that 'traditional building materials age; modern materials decay.' The purpose here is not to argue the superiority of traditional building materials, but rather to interrogate the assumptions and motivations behind the wholesale adoption of new and largely untried components by architects and the building industry. Reinforced concrete, arguably the most ubiquitous building material of the 20th century, has proven to be a disaster for preservationists. The argument will be made that a not-insignificant part of its adoption and refinement can be ascribed to the increasing



dominance of engineers in the building industry and the engineering profession's unwillingness—almost an inability—to consider the action of time and weather on modern materials. EIFS and elastomeric coverings will also be examined as examples of a particular modernist conceit that the products of the modern industrial age are so perfect as to render Nature innocuous, and that the modern construction industry can largely do away with skill. →



The aspect of Modernist architectural theory that will be highlighted causes an equal amount of difficulty for preservationists and conservators, though it is less obvious than spalling concrete caused by rust jacking. This is the Modernist inability to consider Time. From the time of Le Corbusier's *Towards [a New] Architecture*, modernist designers have steadfastly ignored the reality of time and of a building's existence in time. Despite the title of Giedion's *Space, Time and Architecture*, there is no acknowledgement in the book that time will pass after a building is erected. This assumption that a building will not—cannot—change is fundamental to the Modernist sensibility, and helps to explain the almost fundamentalist intensity against change of any sort on the part of some conservators of modern architecture. Paradoxically then, conservators of Modernism are the most vulnerable to the perennial charge that preservationists are against change.

This talk will not attempt to propose answers or alternatives to the problems raised. Its goal is simply to bring to light some of the often-overlooked background of the Modernist movement in architecture. ●

About the Presenters ...

Robert Russell is a professor in the Cultural and Historic Preservation Program at Salve Regina University, where he has been for four years. Previous to that he directed the Historic Preservation and Community Planning program at the College of Charleston where he was for twenty years. He is an architectural historian with a particular interest in urban form. ●

Managing Transparency in Post-War Modern Architecture

*Presented by
Student*

**Makenzie
Leukart**

The purpose of this thesis is to understand the role of transparency in modern architecture. Specifically, as it relates to our understanding of its interior and the implications of this relationship regarding managing its integrity over time.

Inconsistencies in the application of current preservation policies to modern architecture occur largely because the regulations were developed for these more closed, traditional architectures. In that architectural expression, the separation between outside and inside occurs visually. The dissolution of concrete divisions between exterior and interior that occurred within modern architecture requires the thought process involved in preserving, renovating and reusing these structures to be reconfigured. There is a direct link now between the interior and exterior from the public's perspective. The focus of this thesis will be on buildings which utilize

transparency to reveal the interior, focusing on views from the outside-in.

I will look to rework the generalized questions of stewardship in modern architecture towards the use of transparency specifically. The three main questions wanting to be answered in reference to transparency are as follows:

1. How is transparency used in this building?
2. Does the way transparency is used effect possible future reconfigurations of space?
3. What interior elements (if any), beyond the physical façade, augment the purpose and reading of transparency?

These questions are explored in a series of case studies. The case studies will provide background on the original intent of the building and then continue to explore the building's contemporary history touching on effects of evolving programming and →



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(Beyer Blinder Belle)

Submitted in partial fulfillment
of the requirements for
the degree Master of Science
in Historic Preservation

Graduate School of
Architecture, Planning
and Preservation Columbia
University (May 2016)

About the Student Presenter ...

Makenzie Leukart is a recent graduate of the Columbia Graduate School of Architecture, Planning and Preservation, earning her Master of Architecture and Master of Science in Historic Preservation in 2016. Currently she is working as a designer at Marvel Architects in New York City, focusing primarily in adaptive reuse projects. ●



exploring implications of any physical alterations on the significance of transparency. The lessons learned from these studies as well as identified commonalities will be used to make recommendations of needed expansion of preservation policy to properly preserve this archetype into the future.

Due to the fluid nature of glass and universal principles of modern architecture, a predominantly glass envelope did not predicate a particular use. Instead, the program, scale, and application of glass was highly variable within modern architecture. A wide-ranging group of buildings was necessary for the selection of buildings to study. The three case studies explored in this thesis are Manufacturers Hanover Trust (SOM, New York, NY), Crown Hall (MVDR, Chicago, IL), and The Republic (SOM, Columbus, IN). All three have varying programs, geographic locations, symbolic intent and histories of intervention, but are unified in scale. This allowed me to go beyond regional issues of preservation policy and instead explore the over arching themes that could be identified and used to create a general framework on how to approach the management of this archetype. ●

The Rehabilitation of Saarinen's Legacy at MIT-Kresge Auditorium and the MIT Chapel

Presented by
Gary Tondorf
Dick
Katherine
Wissink
Eric Ward

Designed by Eero Saarinen and dedicated in 1955, the Massachusetts Institute of Technology (MIT) chapel (Building W15) and Kresge Auditorium (Building W16) are unique and iconic examples of an emerging expressionist trend in modern architecture. From 2013-2016, MIT undertook a renovation of both

structures to address sixty years of weathering and deterioration. Changes and repairs to the chapel, a nondenominational space for worship and gathering, included mechanical upgrades, masonry repairs, curtain wall refurbishment, roof replacement, moat replacement, skylight refurbishment, and fall protection. Kresge Auditorium, a venue for events, classes, and performances, received mechanical upgrades, concrete and steel repairs, partial replacement of copper roofing, and curtain wall rehabilitation including glazing upgrade.

This session will address the major technical issues and procurement procedures that were addressed in the refurbishment, and how these fit into a larger, collaboratively developed stewardship plan designed

to restore and enhance Saarinen's vision. These issues writ large start with the forging of a successful process for working—virtually invisibly—with two world famous buildings while protecting their integral works of art and achieving desired performance goals. Of particular interest are the glazing solutions for both buildings. The team developed a structural and building enclosure scheme for the curtain wall of Kresge Auditorium that improves life safety issues, durability, and energy efficiency, while being true to the original design and profiles. By making the new vertical exterior mullions as load bearing members that carry most of the weight of the new glazing, the new heavier glazing bears minimally on the existing steel back-up structure, and decreases the gravity load it needs to support. Reducing the gravity loads on the backup structure also increases the overall wall system's wind load resistance.

At the Chapel, the team developed a design to maintain the chapel's iconic steel and glass window wall appearance, while also addressing deterioration and performance issues. The team removed the original seeded glass, laminated it to improve →





safety and breakage resistance, reinstalled the new panels and replaced the corroded steel frame with a custom, painted stainless steel frame matching the original profiles and designed to accommodate thermal movement, preventing the reoccurrence of distortion and buckling. In both buildings, the success of the project was facilitated by a collaborative Design Assist process to develop and expedite the most effective solutions.

While the auditorium embodies virtuosic structural engineering design, the building has been plagued by rumors of structural inadequacy almost since opening. Structural analysis showed that the vertical displacement following formwork removal was very close to analysis predictions from normal factors and consequently structural repairs were ordinary and in-kind after sixty years of weathering, and did not require strengthening. Repairs for the chapel's failed and leaking concrete moat, included reconstructing the structural slab-on-grade, installing a waterproof liner (where one had not existed prior), and constructing a topping slab to recreate the original configuration, texture and finish. In the end MIT received updated facilities with almost no perceptible difference in appearance—except to correct unsympathetic later interventions—which in this case is exactly what was desired. ●

About the Presenters ...

Gary Tondorf-Dick, AIA, LEED AP is a Program Manager in the Capital Projects Group in the MIT Department of Facilities, Campus Planning, Engineering and Construction. Gary's experience in his ten years at MIT has centered on new and renovation program projects for residential life and humanities and development of the restoration standards for the MIT Main Group Buildings constructed between 1912 and 1916. Gary's restoration projects at MIT include the Math and Chemistry renovation and limestone wall restoration and window replication, the restoration of the Building 10 Great Dome and skylight and the restoration of the Barker Engineering Library Rotunda, restoration of Kresge Auditorium, and MIT Chapel, and the limestone and wrought iron balcony and façade at the Walker Memorial. Current research and development regarding MIT's building restorations include the 1916 Main Group buildings, the MIT Chapel leaded glass façade, the Kresge Auditorium curtainwall and the mid-century modern Hayden Library limestone and curtainwall façade. Gary has presented at industry and academic conferences such as SCUP, ERAPPA, Build Boston, the BSA Envelope Committee, Harvard, MIT and the Boston Architectural College. Gary is a registered architect in Massachusetts. ●

Eric Ward, AIA is a Principal and Project Director at EYP, where he focuses on restoration and rehabilitation of historic buildings for institutional and governmental clients. In the course of his 40 year career, Eric has held primary roles in many significant and award winning projects. At EYP, he was the lead architect for the renovation of Widener Library, Harvard University's main library, and the recent addition and renovation of the John F. Kennedy Library and Museum. Eric is also the contract manager for the EYP term contract with the National Park Service, for which he has been working on multiple projects over the past fifteen years, including renovations of Faneuil Hall in Boston and the Frederick Law Olmsted Office/Home in Brookline. EYP has been working with the Massachusetts Institute of Technology for the nearly two decades, primarily in conducting assessments and renovations of its rich trove of historic buildings. Eric has had key roles in leading many of the projects at MIT, including the restoration of the interior of the Lobby of Building 7, MIT's main entrance, as well as the recently completed restorations of the Saarinen designed Chapel and Kresge Auditorium. ●

Katherine Wissink joined Simpson Gumpertz & Heger Inc. (SGH) in 2006 with a Master's of Engineering in Structural Engineering with an emphasis in Historic Preservation from Cornell University. She is a member of SGH's Building Technology group and has experience investigating historic and modern building envelope systems and designing repairs, including plazas, wall systems, windows, and roofing. She has experience investigating and/or designing repairs or rehabilitations of historically significant mid-century modernist buildings. ●

The Devil is in the Details: Issues with and Rehabilitation of Mid-Century Cavity Wall Construction

Presented by

**David
Artigas**

During the Modern period, several aspects of design and construction changed rapidly that made construction faster, lighter, taller, and less expensive, but designers and builders at the time did not always fully understand how these new building techniques would affect the building's performance. Traditional mass walls with small punched window openings managed water by the masonry acting as a sponge that absorbed and slowly released water, and the interlocking masonry units provided a strong and stable wall system. The transition to cavity wall construction created wall systems composed of a "sandwich" of materials: structural backup wall, waterproofing, insulation, flashing, and claddings with ties to the backup wall,

each of which serves a specific function in the wall system. The early designers and builders of these wall systems did not have experience in the integration of the wall components to create structurally sound and durable wall systems with good continuity of waterproofing, flashing, and insulation to prevent water leakage or condensation (and the resulting damage). This presentation will discuss case studies of rehabilitation projects in mid-century cavity wall buildings in which we investigated and documented the existing construction, determined the necessary repairs to improve the wall systems' performance and durability (using knowledge gained in the ensuing decades), and reviewed the construction and installation of these repairs to extend the service life of these buildings and improve their performance. ●



*About the Presenter ...*

David Artigas is a licensed Mechanical Engineer who has worked on several historic and existing building enclosure preservation and rehabilitation projects. After graduating from the University of Pennsylvania's graduate program in Historic Preservation in 2007, he spent the first four and a half years of his career in SGH's San Francisco office before moving to New York City (also with SGH) in 2012. Mr. Artigas specializes in the rehabilitation of the fenestration, roofing, and waterproofing and in the conservation and repair of the building enclosure materials, as well as the hygrothermal performance of the building enclosure systems. ●

Reglazing Modernism: The American and European Experience to Date Part 1 Steel Frame Assemblies

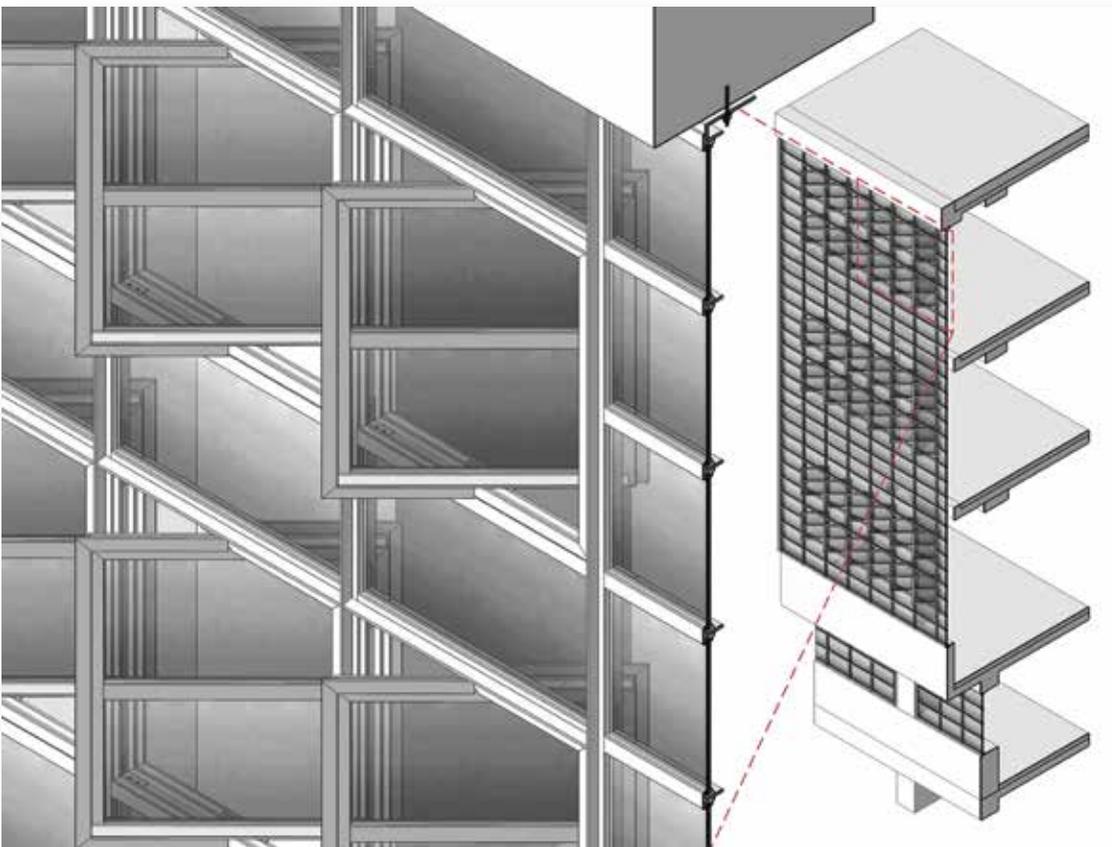
Presented by

Angel
Ayon

The extensive use of metal-framed glazed enclosures is a character defining feature of Modern architecture. After decades of service, many Modern buildings from the pre- and postwar periods of the 20th century have reached an age of maturity and, with it, efforts to preserve them and retrofit them are increasingly becoming a new branch of knowledge bridging the fields of Building Physics and Historic Preservation. To further conservation efforts, the need to assess the approaches, scopes and results of interventions on metal-frame glazed enclosures in Modern buildings has become paramount.

The presentation will summarize the findings of grant-funded research developed in collaboration with Prof. Dr.-Ing. Uta Pottgiesser from the University

of Applied Sciences in Detmold, Germany and Nathaniel Richards from W&W Glass in New York. Through a combination of historic images, accurate 3D details of the glazed enclosures, and photographs of existing conditions before and after the work was performed, the presentation will illustrate both typical failure mechanisms and the repairs implemented at some of the twenty-plus case studies included in the research. The projects to be presented represent various construction typologies and interventions approaches on single-glazed steel-frame curtain-wall and window-wall assemblies on Modern American and European buildings. All case studies to be presented have been retrofitted within the last ten to fifteen years in response to different driving forces, such as increasing energy conservation or comfort requirements, changing functions and re-use, or simply due to materials →



decay. These motivations triggered different approaches that can be broadly categorized as follows using well-established Historic Preservation intervention categories: Restoration, Rehabilitation, and Replacement.

Relevant case studies illustrating each of these three major approaches will be presented along with their sub-categories to portray a range of intervention options and alternatives to unsympathetic wholesale replacement. For instance, Restoration projects to be presented include localized frame repairs with glass replacement either in-kind or with other single-pane options. Rehabilitation case studies include steel frame repair plus glass replacement with insulating glass units (IGU) or steel frame repairs plus secondary glazing. Replacement projects include the installation of new non-thermally-broken steel-frames and single-glazing, thermally-improved steel-frames and single-glaze units, thermally-broken steel frames with IGUs, thermally-improved aluminum-frame systems with IGUs, as well as replacement with stainless steel or other materials.

Conceived as a critical assessment instead of as a catalog or technical guide, the findings to be presented will summarize both common failure mechanisms and approaches to intervening on Modern steel-frame glazed-assemblies. The presentation will evaluate each case study in terms of how the intervention preserves culturally significant features while adhering to current understanding of building physics and contemporary requirements for building-envelope performance. With this broad, collaborative assessment, the authors aim to start laying out the foundation to identify best-practices and develop evidence-based guidelines for intervening on culturally-significant single-glazed steel-frame enclosures. The presentation will also summarize a set of high-performance systems that are becoming available in the marketplace as a response from the fenestration industry to the challenges posed by recent interventions on Modern single-glazed steel-frame exterior enclosures. ●

About the Presenter ...

Angel Ayón has more than twenty years of experience in conservation, adaptive re-use and rehabilitation of historic buildings, including the evaluation and repair of a variety of commercial and residential properties ranging from single-family homes to museums, universities and high-rise buildings. Before founding AYON Studio in 2013, he worked for various Historic Preservation, A/E and Building Envelope consulting firms in New York City, where he worked on a variety of projects including the rehabilitation of the Biltmore theater in the Broadway theater district, the restoration of Frank Lloyd Wright's Guggenheim Museum, and the conversion into a hotel of the former Temple Court Building at 5 Beekman Street in Lower Manhattan. Angel Ayón is the recipient of the 2015 Mid Career Preservation Fellowship awarded by the James Marston Fitch Foundation for a comparative research on the renovation of Modern steel-frame glazed assemblies in the US and Europe. He is a member of various Preservation organizations in New York, including the Municipal Art Society (MAS), the Historic Districts Council (HDC) and Save Harlem Now! Mr. Ayón holds a professional degree in Architecture and a MSc in Conservation and Rehabilitation of the Built Heritage from Havana's Higher Polytechnic Institute, and a Post-Graduate Certificate in Conservation of Historic Buildings & Archaeological Sites from Columbia University in New York. ●

Architectural Precast Concrete Wall Panels: Their Technology, Evolution, Significance and Preservation

Presented by
**Grace Anne
Meloy**

In the mid-twentieth century, the curtain wall system emerged to become one of the most widely adopted building cladding systems. While metal and glass systems pioneered this type of construction, the concrete industry developed its own curtain wall technology: architectural precast wall panels.

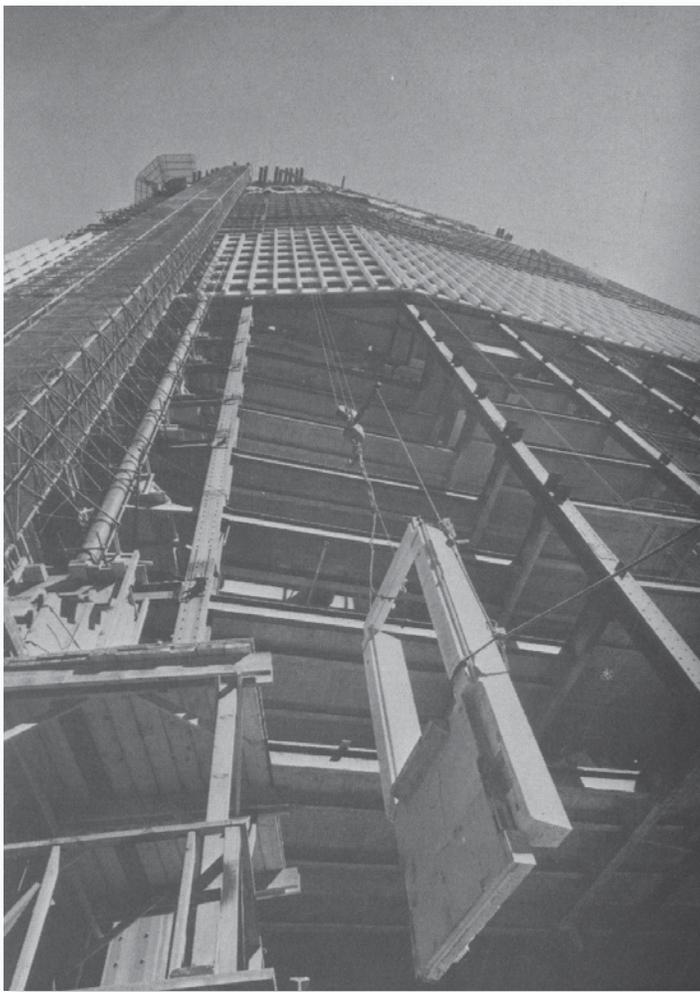
This concrete technology had a number of advantages that helped it to compete successfully in the building industry. One significant advantage was that a variety of architectural expressions could be realized through the precasting process, which enabled the controlled production of expressive facing concrete mixes and surface treatments and finishes. Consequently, architectural concrete wall panels became a prominent and defining feature in mid-twentieth century architecture.

As we begin to assess the significance of our built heritage from this time period, it is important to consider the vulnerabilities and challenges that its conservation will present. The conservation of architectural precast panels, in particular, presents numerous technical challenges. The most significant challenge results from their specially designed

concrete mix and surface finish. Preserving these features is essential to preserving the character of the buildings constructed with this concrete technology. However, it is these features that are also most vulnerable to deterioration and suffer most from the typical retroactive conservation action of applying patches. Therefore, to successfully preserve these character-defining features we must adopt a preventive conservation approach.

Towards this end, this presentation will examine documents published in the United States between 1945 and 1975 that informed the design, production, and assembly of architectural precast wall panels. The information from these documents is used to trace the technological evolution of these panels and to identify potential material vulnerabilities and associated deterioration mechanisms to which they may be subject. Through this assessment, it will become clear that the most significant vulnerability is cracking of the panel. Such cracking is both detrimental to the appearance of the panel and to its structural integrity. The following factors were among those identified as being potentially significant to the production of cracking over time: →





About the Presenters ...

Grace Anne Meloy, Engineer joined Silman in the fall of 2016 as the Silman Fellow for Preservation Engineering for the 2016-2017 year. Her professional experience is focused on historic preservation and preservation engineering and has included projects at the Bar BC Dude Ranch in Grand Tetons National Park, Pennsylvania Academy of Fine Arts in Philadelphia, and the Herbert C. Hoover Building in Washington, D.C. Through these experiences, she has bolstered the following skill set: condition assessments of historic and existing structures, conservation of historic building materials, historic building research and documentation, technical writing, structural evaluation of historic and existing structures, and design of modifications to existing and historic structures. ●

- Shallow concrete cover over the panel's reinforcement;
- Non-corrosion resistant reinforcement material;
- Inadequate reinforcement;
- Differential curing across the panel's cross section;
- Liberal deflection limits ($L/240$) considering the importance of the panel's surface and the thinness of the panel;
- Large stripping and/or handling stresses;
- Constrained panel movement within the wall system; and
- Non-corrosion resistant connection material.

The technological evolution produced from this review and the identification of potential material vulnerabilities that may affect mid-twentieth century architectural precast panels provide the foundation for creating preventive conservation plans for buildings constructed with this concrete technology. Moving forward, it is important to place a particular building's history within the context of this technological evolution and to compare the results of a thorough conditions assessment with the findings of this review. Through this process, successful preventive conservation plans can be created and this important mid-twentieth century building technology may be preserved. ●

Kevin Roche's University of Massachusetts-Amherst Fine Arts Center and Brutalism's Monolithic Concrete Construction Performance Perception Penalty

Presented by

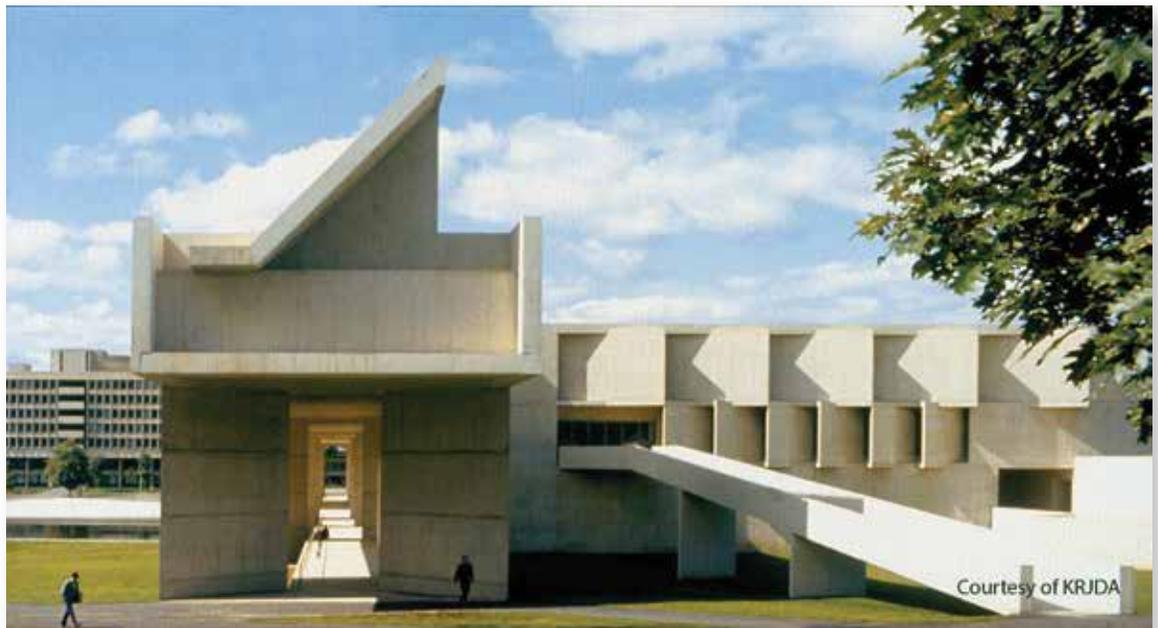
**Carl
Fiocchi**

Studies of buildings belonging to a subset of Modernist architecture, Brutalism, have included discussions pertaining to social and architectural history, critical reception, tectonic form and geometry inspirations, material property selections, period technology limitations, and migration of public perceptions. Evaluations of Brutalist buildings' energy related performances have been restricted to anecdotal observations with particular focus on the building type's poor thermal performance, a result of the preferred construction method, i.e. monolithic reinforced concrete used as structure, interior finish and exterior finish.

A valid criticism, but one that often serves to dismiss the building from any discussion related to an intervention that might improve a building's Energy Use Intensity (EUI) to one that is more in accord with

the energy performance expectations of our built environment's current climate change remedying mandates.

The University of Massachusetts-Amherst Fine Arts Center (FAC) designed by Pritzker Prize winning architect Kevin Roche, was the Brutalist building used to focus attention on the potential impact →



of performing conductive heat loss mitigating interventions to the interior surfaces of the building's thermal envelope, excepting those spaces dedicated to performance, where aesthetics and acoustics would be negatively impacted.

Analyses was accomplished using DesignBuilder, an EnergyPlus simulation frontend. A calibrated (ANSI/ASHRAE Standard 140) energy model was programed with all requisites, i.e. geo-position, ordinal orientation, building geometry, envelope materiality, construction details, local weather and climate, program activities, mechanical systems, occupancy schedules, etc.

The FAC's EUI, as determined from the baseline model and a potential EUI determined from a model of the FAC inputted with a single energy efficiency measure (improvement of the conductive thermal envelope) was compared with EUI data from "CBECS, 2012 Table C5" and Architecture 2030 Challenge Targets for U.S. National Medians for College/University Campus Level Buildings. This perspective and insight into the building's reality, within the context of measured energy performance aids in clearing some of the haze from one of Brutalist architecture's maligned characteristics. ●

About the Presenter ...

L. Carl Fiocchi, Ph.D. teaches Building Physics, Building Systems, Green Design and Historic Preservation and Energy Modeling at the University of Massachusetts-Amherst. His research focuses on energy usage and conservation in the built environment, specifically on investigating strategies employed in historic structures with emphasis on iconic modernist buildings. He holds a Ph.D. in Building Systems and Masters of Architecture, both from University of Massachusetts-Amherst. ●

Dalle de Verre—20th Century Innovation; 21st Century conservation Issue

Presented by

**Arthur J.
Femenella Sr.**

Dalle de Verre, roughly translated as “slab of glass” is a decorative glass technique that employs one inch thick pieces of glass, cut to a pattern, edges faceted and imbedded in an adhesive matrix, either cement or epoxy. The art form was developed in France in the 1930’s, some think as an attempt to make “blast proof” windows after WWI. The best dalle windows employ the concept of “negative space” or irregular opaque areas between the brilliant pieces of glass. A design is made. The artist cuts the dalles, cast glass blocks of varying colors measuring approximately 12” x 10” x 1”, and sets them onto the design drawing. A thin layer of aggregate or sand is placed on the design drawing. The interspace between the cut dalles is filled; the earliest windows employed concrete and rebar, the modern windows use epoxy. As the epoxy cures, more aggregate may be sprinkled onto the epoxy surface for decorative affect. →



Internal Fractures

Surface Soiling

Typical Damage Found



As these panels age, they are developing myriad problems: infiltration of water through and around the dalles; failure at the perimeter of the panels; warping; glass cracking and fracturing—in the worst case, developing so many breaks that the piece goes opaque; and cracks in the supporting matrix. In the original concrete panels, the matrix is cracking due to corrosion and rust jacking of the internal rebar. The failure of dalle de verre panels is a national and international conservation problem.

Traditional stained glass conservation solutions do not apply to dalle de verre; they call for innovative approaches. This paper will discuss how the panels are made, what can go wrong with them, and innovative techniques that are being used to remedy the problems. A case study will be presented, The Jewel Box, an installation in Miami, comprising 540 dalle de verre panels measuring 3' x 3'. ●

About the Presenter ...

Arthur Femenella Sr. is a veteran of the Vietnam War; his formal education is in physics. Art has been working in stained glass for 44 years starting as an apprentice and later owner of the Greenland Studio of New York and later an owner of the Jack Cushen Studio of New York. Both studios gained international recognition for excellence in the field of stained glass conservation. He is now president of Femenella & Associates, Inc. a stained glass and historic wood & metal window conservation company he founded in 1993. The company has garnered numerous preservation awards for its work across the United States. Mr. Femenella is a current board member of the Association for Preservation Technology International www.apti.org; President, Conservator and Curator of Collections for In Company with Angels, LLC www.incompanywithangels.org; a Professional Associate of the American Institute for Conservation of Historic and Artistic Works www.conservation-us.org; founder, past President and current member of the American Glass Guild, LLC www.americanglassguild.org; past Chair of the Restoration Committee, former Board Member and former Treasurer of the Stained Glass Association of America. Art has written over fifty articles on subjects specific to stained glass and historic window restoration and presented papers at numerous international and national symposiums and conferences. ●

Restoring the Met Breuer

Presented by

Amanda Trienens

Miriam Kelly

**Marcel Breuer's
iconic building**

—originally designed for the Whitney Museum in 1966 - has been restored and transformed

into a new home for The Metropolitan Museum of Art's modern and contemporary art program. The Met's brief to the design team was to improve the efficiency of visitor flow inside the building, create a contemporary presence for The Met Breuer and restore the building as if it were a piece of art within their collection.

Breuer was at the height of his career when he designed what was his first museum. The building is simultaneously bold and intimate, with an integrity of design, materials and execution that places it among the most distinguished mid-century modern buildings in New York. →



Breuer was a master of what he called “close to Earth materials,” particularly stone and concrete. He intended for surfaces to develop a patina—the dignity of time and use. The restoration team considered how to approach a building deliberately designed to weather and age, particularly with regard to the cleaning and repair of crafted, exposed concrete. Restoration work was carefully calibrated with color and tonal relationships between materials, informed by Esto’s 1966 photographs. Through meticulous testing and implementation, Breuer’s masterpiece is restored as “an essay in architectural density, an extremely subtle and revelatory exploration of shades of gray, texture, weight and variation in stone and concrete.”¹

Central to the operation of a modern gallery and the recovery of Breuer’s design intent was the rationalization of MEP systems within a monolithic construction. Fixtures and conduit installed since 1966 were typically surface-mounted and were removed. New life safety and security systems were installed by painstakingly tracing and reusing the original cable routes buried within the concrete walls. Lighting systems were upgraded, reusing historic fixtures with new lamps. A new dimmable LED bulb was specially developed for the iconic dome lights in the lobby, matching the historic design while significantly improving energy efficiency and heat load.

New interventions were limited, contemporary and captured the spirit of Breuer’s design. Interventions made after 1966 that were inappropriate or obsolete were removed. To accommodate a large number of visitors, planning for the lobby focused on enhancing both circulation and the visitor experience. Retail has been minimized to reflect Breuer’s original intent and to facilitate an authentic reuse of his granite book bar. The original information screen in the lobby, originally designed for the display of gallery catalogues, is undisturbed behind a state-of-the-art digital scrim screen displaying today’s exhibits. A new, specially designed ticketing desk recalls Breuer’s use of sculptural forms and natural materials. ●

About the Presenter ...

Amanda Trienens is an architecture conservator providing preservation design and implementation services for historic buildings, monuments and sculptures through her firm, Cultural Heritage Conservation LLC. Her experience is gained from many years in the field working with a variety of structures and art, spanning time from the 11th century to the modern age, both locally and internationally. Amanda specializes in concrete and stone conservation documentation, testing, analysis, quality control, and implementation. She received a Masters Degree and an Advanced Certificate in Architecture Conservation from the University of Pennsylvania. ●

Miriam Kelly is a British Architect experienced in the repair and adaptive reuse of historic buildings. In 2006, she won the prestigious Lethaby Scholarship with the Society for the Protection of Ancient Buildings (SPAB) and has since joined the UK’s Register for Architects Accredited in Building Conservation. In 2013, she became a Fellow of the Winston Churchill Memorial Trust and undertook a travelling research scholarship to study post-industrial regeneration. Miriam joined BBB in 2014 and is working on projects for the Metropolitan Museum of Art, TWA Flight Center, Federal Reserve Bank of New York, Green-Wood Cemetery and Longwood Gardens in Kennett Square, Pennsylvania. She holds two Masters Degrees in Architecture from the University of Edinburgh. Before moving to the US, Miriam worked at some of the most sensitive historic sites in the UK including Windsor Castle, the Royal Pavilion Estate, Lowther Castle and Bath Abbey. ●

¹ Michael Sorkin, “Save The Whitney” *Village Voice* 25, June 1985

Annual Symposium Tours

Saturday, February 4

Pre-registration for all tours is required as space is limited. Check with symposium registration for availability.

Tour 1: Edward Durell Stone's SUNY Albany Campus

**Led by Elisabeth
Bakker Johnson**
9:00 a.m.

*Meeting Place: Dutch
Faculty/Staff Lot*



The tour of the University at Albany campus is a continuation of the discussion on the dichotomy between having an architectural and artistic showpiece and the practical, geographic and functional elements of the Edward Durell Stone-designed campus. The tour will focus on the buildings in and around the Academic Podium where attendees will experience the architecture first-hand and observe the challenges of aging materials, well-intentioned and sometimes misguided additions and repairs, and an active student population.

The tour will explore both the exterior and the interior public spaces of the Academic Podium. Walking distance is approximately 1 mile, with frequent starts and stops. Since the struggle between climate and architecture is one of the many challenges that the University at Albany campus faces, be prepared and dress warm!

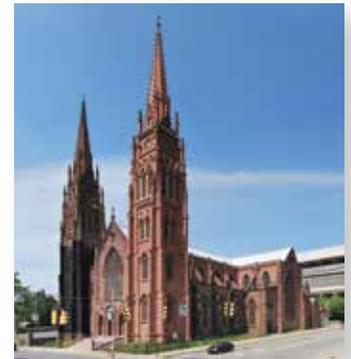
Tour Guide Bio: Elisabeth Bakker Johnson is a Staff Project Manager for the Office of Campus Planning in the University at Albany's Facilities office. She has a Masters of Architecture from SUNY Buffalo and a Masters of Science in Building Conservation from Rensselaer Polytechnic Institute. With nearly 25 years of state service, Elisabeth has extensive experience within all phases of the design and construction industry, where she has worked

alongside the Capitol Architect and in many other capacities on dozens of projects, most notably the 49-million-dollar Phase 4 New York State Capitol roof and skylight replacement project. She also has several years experience working at the New York State Historic Preservation Office and as an Historic Preservation Restoration Coordinator helping to facilitate restoration projects among the state-owned historic sites' inventory in the Capital district. Elisabeth is very active in APT and APTNE, serving for 12 years on the Board of the latter. ●

Tour 2: Cathedral of Immaculate Conception

Led by Laurence Wilson
10:00 a.m.

*Meeting Place: Front
Door of Cathedral*



The firm of Mesick, Cohen, Wilson, Baker Architects, LLP has been working with the Roman Catholic Diocese of Albany since 1974 in the effort to maintain and

restore the Cathedral of the Immaculate Conception. Projects have been phased over many decades and have employed evolving technologies and solutions for repair and reconstruction of building elements including brownstone, stained glass windows, roofs, decorative plaster, decorative painting, woodwork, ADA compliance, thermal insulation, building systems, structure and liturgical alterations. Owing to the long and sustained phasing of projects over

Annual Symposium Tours

decades, the building is in-effect a laboratory of restoration efforts that can be evaluated over time. This tour will expound on these efforts with discussion of successes and failures in dealing with the many aspects of the Cathedral repair, reconstruction, adaptation, and restoration.

Tour Guide Bio: Laurence Wilson has been a partner in the firm of Mesick Cohen Wilson Baker Architects since 1995 and is a registered Architect in New York, Connecticut, Virginia, Tennessee, and Massachusetts. He has been responsible for many projects involving historic preservation, restoration, adaptive use as well as the design of new buildings and additions. He has also studied and researched abroad in England, Scotland, Germany, Italy and Japan. During his tenure with the firm, Mr. Wilson has worked on a variety of prominent projects such as Blair House, Washington, D.C.; Cathedral of the Immaculate Conception, Albany, NY; New York State Capitol, Albany, NY; Davidson County Courthouse, Nashville, TN; and Tennessee State Capitol, Nashville, TN, as well as numerous churches, historic homes, universities, and municipal buildings. ●

Tour 3: **Governor Nelson A. Rockefeller Empire State Plaza Restoration Walking Tour**

Led by Elizabeth Martin and Jim Jamieson
9:00 a.m.

Meeting Place: TBD

Introduction to the walking tour will begin with the presentation of three short videos produced for The Empire State Plaza at its 50th anniversary celebration.

- A Far Reaching Vision (3:41)
- The International Style (2:45)
- The Blueprint (3:13)



Following the videos, the outside walking tour will be conducted by architects Elizabeth Martin and Jim Jamieson. Elizabeth and Jim will lead the group around the Empire State Plaza discussing the design and architecture of the Plaza, the challenges with the preservation and maintenance of 20th century materials and systems; and answer all of your questions. Please dress appropriately for the weather.

Tour Guide Bios: As the Capitol Architect for the NYS Office of General Services Design & Construction Group, Jim Jamieson had the responsibility for all new construction, reconstruction, restoration, and preservation at the Capitol, the Empire State Plaza, and the Executive Mansion in Albany. He was also the agency's Historic Preservation Officer. Jim retired in April 2015 after more than 35 years of service. Jim attended Carnegie Mellon University in Pittsburgh, PA where he received a Bachelor of Architecture degree in 1981. He is also a College Fellow of the State University of New York College of Arts and Sciences in Albany.

Elizabeth Martin picked up Jim Jamieson's responsibilities for the preservation at the Empire State Plaza upon his retirement in 2015. Prior to working with the NYS Office of General Service Design & Construction Group, Elizabeth worked at the NYS Historic Preservation Office (SHPO). At the SHPO, she guided many developers and property owners through the historic preservation tax credit process, focusing on best preservation practices learned at Rensselaer Polytechnic Institute (RPI) where she earned her Master of Architecture and Master of Science in Building Conservation. Elizabeth has served as an instructor in preservation programs at RPI and UMass/Amherst-Hancock Shaker Village. She is also involved in an effort to develop a traditional trades program with the SHPO, expected to launch in 2017. ●

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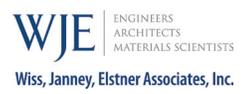
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Annual Meeting and Symposium

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