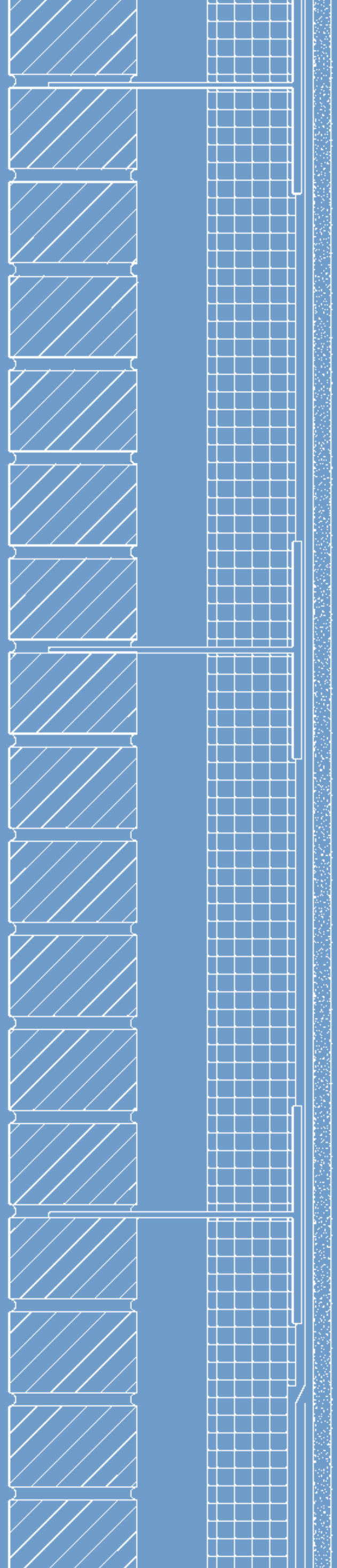


# WAGDY ANIS SYMPOSIUM ON BUILDING SCIENCE

## **Building Enclosures That Last**

October 26, 2023



# Wagdy Anis FAIA (1941-2018)



Wagdy Anis served the architectural profession as a skilled problem solver, teacher, and advocate for the integrity and performance of the building enclosure in a career that spanned more than five decades.

During his 40-year tenure at Shepley Bulfinch Richardson & Abbott, Anis became a leader in the application of building science principles to the practice of building enclosure design. In 2008 he joined Wiss, Janney, Elstner as a building enclosure consultant. Seven years later he established his own practice, Anis Building Enclosure Consulting.

Anis's thought process was a synthesis of careful observation through rigorous field work, learning from colleagues, working through design challenges, and sharing what he had learned with others, with the ultimate goal of assuring the integrity and performance of building enclosures.

His zeal for sharing what he had learned extended beyond the firms where he worked. He was highly regarded and well known for his presentations at regional and national forums such as ABX, BEST, and the AIA Convention. Wagdy Anis FAIA delighted in developing expertise across disciplines, and his ability to teach non-architects in the design and construction industry was remarkable. His passion was contagious. Through his explanations of basic concepts, materials, and the essential detail required to control the movement of heat, air, and moisture through exterior assemblies, he kept audiences engaged, curious, and eager to continue the discussion.

Anis worked with national and state code officials and standards organizations to improve the energy code, championing requirements for the control of air infiltration and exfiltration through exterior walls and roofs. His work with the National Institute of Building Sciences (NIBS) included leading roles in the establishment of Building Enclosure Councils across the country, production of the Journal of Building Enclosure Design, and the development of building enclosure commissioning guidelines and training. Anis was also a major contributor to the Boston Society of Architects, where he was a leader in the Indoor Air Quality Committee and Building Enclosure Council.

In this symposium, we aim to cover topics that were at the heart of Anis's work, pointing to the future as we build on his legacy.

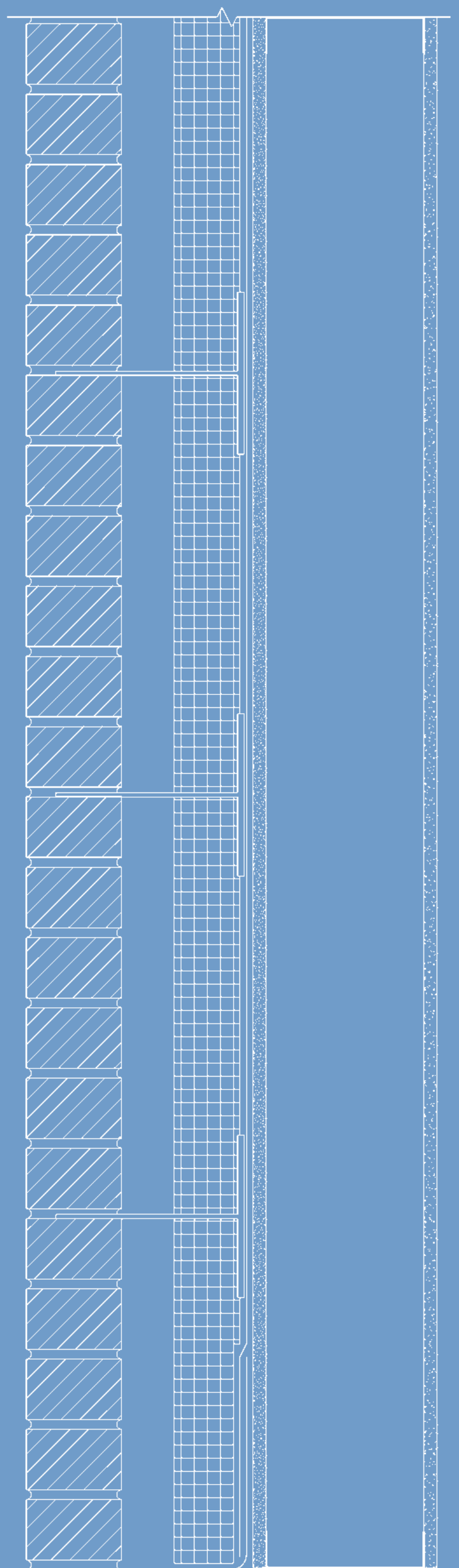
# The Wagdy Wall

Developed by Wagdy Anis FAIA  
for his work at Shepley Bulfinch

During the 1990s, Wagdy was looking at what Canadians were doing to control moisture and improve energy performance in building enclosures. He found that preventing infiltration of moisture-laden air within exterior walls was critical to eliminating a significant cause of condensation. In response, he developed a basic wall section, which his colleagues at Shepley Bulfinch referred to as the Wagdy Wall. This wall controls air infiltration, water vapor diffusion and liquid water by incorporating a continuous, airtight, waterproof membrane such as sheet rubberized asphalt barrier (SRAB) on the exterior face of sheathing or CMU backup wall. Continuous thermal insulation is installed to the exterior of that membrane to prevent condensation within the backup wall.

For the past two decades, versions of this wall section have been implemented successfully throughout the design and construction industry, thanks in large part to Anis's success in educating and promoting the use, appropriate materials and detailing of air barrier membranes within exterior wall assemblies.

Thank you to Shepley Bulfinch and Greta Eckhardt for providing this drawing and information on Wagdy's work.



# Morning

## **Registration & Opening Remarks**

Building Enclosure Council, Symposium Committee

**8:00AM-9:00AM**

## **Session 1: Continuing the Life of Lasting Buildings**

### **Session 1A: Resolving Preservation and Modernization Challenges at Gordon Bunshafts's Hirshhorn Museum**

Niklas W. Vigener PE | Senior Principal, Simpson Gumpertz & Heger  
Kirill Pivovarov AIA | Associate Principal, Page Southerland Page

**9:00AM-10:30AM**

### **Session 1B: Staying in Style: Renewing Historic Building Enclosures for Contemporary Performance**

Justin Dufresne AIA, NCARB | Associate, Goody Clancy  
Olivia Huang AIA, LEED AP, BD+C | Associate, Goody Clancy  
Thomas McClellan Haskell AIA, LEED AP | Architect & Senior Project Manager, University of Connecticut  
Heather Walters LEED AP, BD+C, Fitwel Amb., WELL AP, LFA | Vice President, Thornton Tomasetti

### **Session 1C: Detailing the Divide: Integrating Modern Glazing Systems with Historic Façades**

Emily Beam | Building Technology, Simpson Gumpertz & Heger  
Gabriella Simundson | Building Technology, Simpson Gumpertz & Heger

## **Networking Break & Sponsor Displays**

**10:30AM-11:00AM**

## **Session 2: Lifecycle Considerations of Façades**

### **Session 2A: The Northeastern University EXP Project: Exploring the Lifecycle of Building Enclosures for Sustainability, Performance and Resilience**

Wesley Schwartz AIA | Associate Principal, Payette  
Jacqueline Valencia | Senior Capital Project Manager, Northeastern University  
Naciem Nowrouzi AIA | Associate Principal, Building Envelope Consultant, ARUP

**11:00AM-12:30PM**

### **Session 2B: Thinking Through Façade Choices as Carbon Investment**

Jessica Zofchak LEED AP BD+C | Associate Director, Atelier Ten (New York Office)



# Afternoon

## **Lunch & Keynote: Designing for Durability: Six Memos from the Last Millennium**

**12:30PM-1:45PM**

Matthew Bronski, P.E. | Senior Principal and the national practice leader for Preservation Technology at Simpson Gumpertz & Heger Inc. (SGH)

## **Networking Break & Sponsor Displays**

**1:45PM-2:00PM**

## **Session 3: Quantifying Durability**

**2:00PM-3:30PM**

### **Session 3A: Evaluating the Enclosure for Durability: The Role of Standards P100 & CSA S478**

Jason Danielson AIA | GSA Office of Architecture and Engineering; National Advisor Building Enclosures

Bradford J. Prestbo FAIA | Principal, Boston Office Director, Studio NYL

Felipe Francisco AIA | Technical Design Lead, Boston Office, Studio NYL

Will Babbington AIA, P.E. | Principal, Façade Design Director, Studio NYL

### **Session 3B: A Case Study in Panelized Offsite Construction Performance Validation**

Evan Molony | Research Engineer II, CertainTeed

Lucas Hamilton | Manager, Building Science Applications, CertainTeed

## **Networking Break & Sponsor Displays**

**3:30PM-4:00PM**

## **Session 4: New Materials, Assemblies and Processes**

**4:00PM-5:30PM**

### **Session 4A: Building Enclosures that Last are Made of Healthy Building Materials**

Cynthia Staats | Building Enclosure Science

Phil Walsh | Havelock Wool

Rob Conboy | Glavel

### **Session 4B: Improving Energy Efficiency and Sustainability with High-Performance Building Envelopes**

Danial Hadizadeh | CEO, Mitrex

### **Session 4C: Life Cycle of a Building Façade Assembly, from Digital to Realized**

William Paquette | Senior Design Technologist, CBT Architects

Brian Vieira AIA | Project Architect, CBT Architects

## **Reception**

**5:30PM-8:00PM**

**Questions about continuing education? Contact [ce@architects.org](mailto:ce@architects.org)**

## Session 1: Continuing the Life of Lasting Buildings

9:00AM

1.5 LU/HSW

### **Session 1A: Resolving Preservation and Modernization Challenges at Gordon Bunshafts's Hirshhorn Museum**

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### **Session 1C: Detailing the Divide: Integrating Modern Glazing Systems with Historic Façades**

Emily Beam | Building Technology, Simpson Gumpertz & Heger  
Gabriella Simundson | Building Technology, Simpson Gumpertz & Heger

In this session, three expert presentations converge to offer valuable insights on preserving, modernizing, and enhancing the longevity of buildings. In the first presentation, attendees will explore the intricate restoration efforts at the Gordon Bunshaft-designed Hirshhorn Museum, demonstrating how modernization and preservation can harmoniously coexist while upholding the building's original vision. The second presentation shifts focus to the challenges of upgrading historic building enclosures to meet contemporary performance standards, drawing lessons from projects at Cornell University and the University of Connecticut. Finally, in the third presentation, we'll delve into the art of seamlessly integrating modern glazing systems with historic facades, emphasizing the importance of preserving historical character while improving energy efficiency and building performance. Collectively, these presentations will empower attendees with a comprehensive understanding of how to extend the life of lasting buildings while respecting their rich architectural heritage.

## Networking Break & Sponsor Displays

10:30AM

1.5 LU/HSW

### **Session 2A: The Northeastern University EXP Project: Exploring the Lifecycle of Building Enclosures for Sustainability, Performance and Resilience**

Wesley Schwartz AIA | Associate Principal, Payette

Jacqueline Valencia | Senior Capital Project Manager, Northeastern University

Naciem Nowrouzi AIA | Associate Principal, Building Envelope Consultant, ARUP

### **Session 2B: Thinking Through Façade Choices as Carbon Investment**

Jessica Zofchak LEED AP BD+C | Associate Director, Atelier Ten (New York Office)

The focus of this session will be the intricate world of building enclosures and their critical role in sustainability and performance. The first presentation will explore the Northeastern University EXP Project, showcasing innovative approaches to optimize building envelopes for environmental protection, user comfort, and energy efficiency. You'll gain insights into design and construction strategies that enhance durability, sustainability, and resilience while navigating the technical challenges posed by environmental factors. The second presentation will illustrate the importance of high-performance building enclosures in reducing environmental impact and fostering indoor comfort. Presenters will delve into the fascinating trade-offs that architectural design choices, particularly 'High-Performance' façade selections, bring to the forefront, including the intriguing interplay between operational and embodied carbon. Together, attendees will gain a comprehensive understanding of how building enclosures impact sustainability and long-term environmental considerations, providing valuable insights into the intricate world of facade design.

## **Keynote: Designing for Durability: Six Memos from the Last Millennium**

0.5 LU/HSW

Matthew Bronski, P.E. | Senior Principal and the national practice leader for Preservation Technology at Simpson Gumpertz & Heger Inc. (SGH)

Construction that is highly durable over the very long-term (e.g., centuries), is inherently sustainable and resilient. Despite major emphasis on sustainability and resiliency in recent decades, we are in the midst of a widespread crisis of rapid building enclosure failures, ranging from highly-publicized and almost immediate failures on prominent commissions by “Starchitects”, to rapid enclosure failures on non-descript developer houses on Any Street, USA. Where did we go wrong? What do we fail to understand about designing for durability? And what pertinent lessons, if any, can we learn from historic buildings that have proven durable for many centuries? Drawing his year-long hands-on research on building durability in Rome, as well as 28 years of experience at SGH investigating durability failures large and small, and designing solutions to address them, Matthew Bronski, will use specific examples to illustrate six key principles for designing more durable buildings.

## Networking Break & Sponsor Displays

### Session 3: Quantifying Durability

1.5 LU/HSW

#### **Session 3A: Evaluating the Enclosure for Durability: The Role of Standards P100 & CSA S478**

Jason Danielson AIA | GSA Office of Architecture and Engineering; National Advisor Building Enclosures

Bradford J. Prestbo FAIA | Principal, Boston Office Director, Studio NYL

Felipe Francisco AIA | Technical Design Lead, Boston Office, Studio NYL

Will Babbington AIA, P.E. | Principal, Façade Design Director, Studio NYL

#### **Session 3B: A Case Study in Panelized Offsite Construction Performance Validation**

Evan Molony | Research Engineer II, CertainTeed

Lucas Hamilton | Manager, Building Science Applications, CertainTeed)

The session focuses on the paramount aspects of building design and construction that contribute to longevity and resilience. The first presentation will delve into the world of design standards and performance criteria, as outlined in the Facilities Standards for the Public Buildings Service (P100) and CSA S478:19 Durability in Buildings. Attendees will discover how these guidelines provide a solid foundation for creating safe and enduring structures. Shifting gears in the second presentation, the speakers will examine a real-world case study in panelized offsite construction performance validation. As offsite construction gains momentum as a sustainable and efficient building method, it becomes crucial to ensure the durability and quality of these structures. Explore how data-driven approaches and hygrothermal modeling validate performance predictions, ultimately contributing to the creation of long-lasting, high-quality buildings. Together, these presentations offer a comprehensive exploration of quantifying durability in building construction, equipping attendees with essential technical insights for resilient and sustainable built environments.

## Networking Break & Sponsor Displays



# Session 4: New Materials, Assemblies and Processes

1.5 LU/HSW

## **Session 4A: Building Enclosures that Last are Made of Healthy Building Materials**

Cynthia Staats | Building Enclosure Science

Phil Walsh | Havelock Wool

Rob Conboy | Glavel

## **Session 4B: Improving Energy Efficiency and Sustainability with High-Performance Building Envelopes**

Danial Hadizadeh | CEO, Mitrex

## **Session 4C: Life Cycle of a Building Façade Assembly, from Digital to Realized**

William Paquette | Senior Design Technologist, CBT Architects

Brian Vieira AIA | Project Architect, CBT Architects

This session will center on practical insights into advancing construction durability, efficiency, and sustainability. In the first presentation, attendees will explore materials promoting health and reducing toxic exposure, such as wool fiber insulation, foamed glass gravel for under-slab insulation, Shou Sugi Ban wood preservation, and water-soluble wood preservatives. These alternatives offer healthier options for building enclosures that last. In the second presentation, we delve into the realm of energy efficiency and sustainability by integrating Building-Integrated Photovoltaics (BIPV) and high-performance rain screen systems into retrofitting strategies, providing renewable energy sources and enhanced insulation for existing buildings. Leveraging Mitrex's R-value equivalency calculator, we aim for virtually infinite R-values in future building envelopes. Finally, the third presentation offers a practical guide to optimizing digital tools throughout the building façade lifecycle. Learn how to develop adaptable façade frameworks, enabling efficient design changes, material assessments, energy analyses, and seamless coordination with manufacturing and installation, all culminating in substantial cost and time savings. Attendees will gain key insight into actionable strategies for embracing innovative materials, assemblies, and processes in current or future projects.

## Reception

# Speaker Bios



**Will Babbington AIA, P.E. | Principal, Façade Design Director, Studio NYL**



**Emily Beam | Building Technology, Simpson Gumpertz & Heger**

Emily Beam is a member of SGH's Building Technology group in the Washington, DC office. She has over ten years of building enclosure consulting experience in new design consultation, field investigation work, condition assessment, and repair design and rehabilitation projects. She works with architects, building owners, developers, and contractor clients to provide expertise and deliver building enclosure solutions related to below-grade waterproofing, exterior wall cladding systems, air and water barriers, fenestration systems, and roofing.

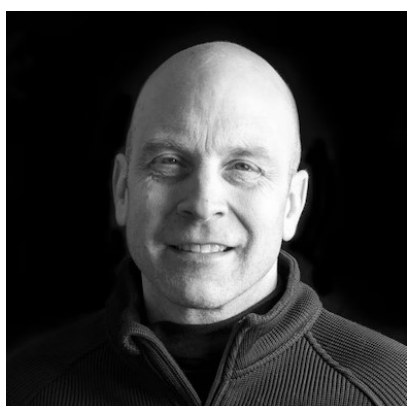


**Matthew Bronski, P.E. | Senior Principal & National Practice Leader for Preservation Technology, Simpson Gumpertz & Heger Inc. (SGH)**

Matthew has led SGH's work on many highly significant historic buildings over the past 28 years, and he also has served as a key investigator of building envelope durability failures in new and recent construction. He has published over a dozen technical papers and articles on building façade and envelope issues, and has served as a guest lecturer or guest critic in architecture or historic preservation courses at numerous universities, including Harvard, MIT, Northeastern, UMass Amherst, Wentworth, and Yale. He holds a bachelor's degree in engineering from Tulane, and master's degrees in both architecture and historic preservation from Penn. In 2009, he became only the second engineer in 113 years to receive the prestigious Rome Prize, and he completed a year-long hands-on study on lessons learned on durability from historic construction.



**Rob Conboy | Glavel**



**Jason Danielson AIA | GSA Office of Architecture and Engineering; National Advisor Building Enclosures**

# Speaker Bios



**Justin Dufresne AIA, NCARB | Associate, Goody Clancy**



**Felipe Francisco AIA | Technical Design Lead, Boston Office, Studio NYL**



**Danial Hadizadeh | CEO, Mitrex**

Danial is a CEO with a passion for sustainable construction and a talent for driving innovation in the industry. His leadership has helped Mitrex become a leading player in building-integrated photovoltaics, with a groundbreaking solar-integrated building material that has captured global attention. Danial's dedication to creating a greener future has earned him numerous awards and made him a respected voice in the field of sustainable construction. Danial has successfully spearheaded the R&D team to develop and introduce the first solar-integrated building material to the world. His 20 years in the construction industry, and Harvard education have taught him that innovation is key and BIPV facades are the future. Danial's idea of a green future and ambition for a sustainable world combined with years in the construction industry have allowed him to push the boundaries of structures and how we energize the world.



**Lucas Hamilton | Manager, Building Science Applications, CertainTeed**

Lucas has a background in physics and over 30 years of experience in construction, building science and building materials manufacturing. His expertise includes forensic building envelope investigations, construction systems testing and the development of non-destructive analysis equipment and techniques. Lucas uses a variety of building performance simulation software including acoustic, moisture, and energy simulations. He has spent the past 18 years working with builders and design professionals on behalf of CertainTeed and Saint-Gobain to achieve more sustainable, durable, and higher performing buildings.



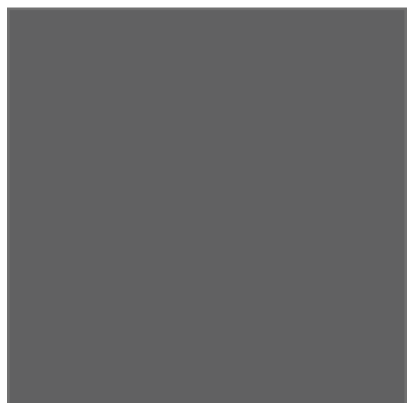
**Thomas McClellan Haskell AIA, LEED AP | Architect & Senior Project Manager University of Connecticut**



# Speaker Bios



**Olivia Huang AIA, LEED AP, BD+C | Associate, Goody Clancy**



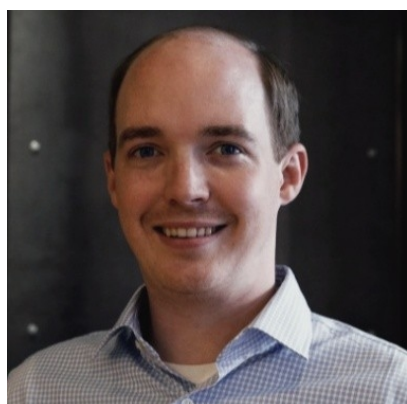
**Evan Molony | Research Engineer II, CertainTeed**

Evan is a mechanical engineer in the CertainTeed research and development organization that focuses on early-stage development of new system-based solutions for the building industry. He specializes in the technical development of CertainTeed's Offsite Solutions business, with a focus on energy efficiency and performance validation, including the instrumentation and monitoring of several panelized prefabricated pilot homes. Prior to joining CertainTeed Evan worked for 8 years with Pratt & Whitney as an aerospace design engineer.



**Naciem Nowrouzi AIA | Associate Principal, Building Envelope Consultant, ARUP**

Naciem is an Associate Principal Enclosure Consultant leading Arup's Boston Façade team with 14 years of experience in the building industry. Holding degrees in Product Architecture Engineering as well as Architecture, and licensed in Massachusetts and New York, Naciem is an expert in innovative façade and waterproofing system design, seamlessly integrating multifaceted requirements and building physics to achieve optimal performance and cost-effectiveness in building envelopes. Her project involvement spans prestigious institutions such as Northeastern University, MIT, Massachusetts General Hospital, and a diverse array of developments worldwide. As Chair of AIA NY Chapter's Building Science Committee, she showcases her commitment to the AEC industry by actively driving advancements in sustainable and energy efficient design and challenges.



**William Paquette | Senior Design Technologist, CBT Architects**

William is the Senior Design Technologist at CBT Architects with experience in fostering design technology and integrating BIM strategies from early conceptual phases all the way to construction. His expertise focuses on using BIM as a platform to respond to a variety of technology needs centered around documentation, collaboration and visualization.



**Kirill Pivovarov AIA Associate Principal, Page Southerland Page**

Kirill is an award-winning architect and Associate Principal at Page Southerland Page, a national architecture firm active in the design and rehabilitation of culturally significant buildings. He served as lead architect and project executive for Smithsonian Hirshhorn Museum Envelope Modernization project and brings an architect's design sensibility to the technical rehabilitation of mid-century institutional buildings.



# Speaker Bios



**Bradford J. Prestbo FAIA | Principal, Boston Office Director, Studio NYL**



**Wesley Schwartz AIA | Associate Principal, Payette**

Wesley is leading the next generation of architects by transforming practice through the integration of performance in design. His award-winning designs are rooted in place and defined by their relationships to natural systems. Since joining Payette in 2005, Wes has demonstrated a wide range of design skills and technical knowledge across award-winning project work in both healthcare and research typologies and has been particularly influential in the design, technical development, and graphic documentation of highly complex facade systems. A 2019 AIA Young Architect award winner, his work for Northeastern University has garnered numerous national design and sustainability awards.



**Gabriella Simundson | Building Technology, Simpson Gumpertz & Heger**

Gabriella a member of SGH's Building Technology group in the Washington, DC office. She works on building enclosure projects that include investigation and repair of existing buildings and new design consulting. Her clients have been architects, contractors, and public and private building owners. She works with project teams to find project-specific solutions to envelope design through field investigation, condition assessments, design consultation and construction administration phases.



**Cynthia Staats | Building Enclosure Science**



**Jacqueline Valencia | Senior Capital Project Manager, Northeastern University**

Jacqueline is a two-time alumna of Northeastern University as a graduate of the School of Architecture and D'Amore-McKim School of Business. She has worked on renovations and fit outs on the Boston campus as well as the university's first international campus in Toronto, Canada. Recent projects include ISEC, the Pedestrian Crossing bridge, and EXP.

# Speaker Bios



**Brian Vieira AIA | Project Architect, CBT Architects**

Brian is a project architect, at CBT Architects, with a wide range of experience in complex projects spanning from large scale urban developments to residential and life science. He is interested in the integration of new materials and building technologies into complex and high performing building facades, while balancing a high level of design aesthetics. A proponent of the integration of emerging digital technology into the design practice, he is always exploring ways to advance how we design and document the built environment. Brian is a member of the AIA, BSA and is a LEED accredited professional.



**Niklas W. Vigener PE | Senior Principal, Simpson Gumpertz & Heger**

Niklas is a Senior Principal at Simpson Gumpertz & Heger, a national engineering firm active in building rehabilitation, enclosure consulting, engineering mechanics, and structural engineering. His particular interest is designing new buildings and carefully rehabilitating historic buildings to incorporate sustainable and efficient high-performance building enclosures.



**Phil Walsh | Havelock Wool**



**Heather Walters LEED AP, BD+C, Fitwel Amb., WELL AP, LFA Vice President, Thornton Tomasetti**



**Jessica Zofchak LEED AP BD+C | Associate Director, Atelier Ten (New York Office)**

Jessica has been an integral member of Atelier Ten's New York office for the past fourteen years. Jessica has consulted on highly ambitious projects, focusing on environmental design, façade optimization, and sustainable master planning. Some of her most significant contributions include leading energy and infrastructure master plans for a wide range of institutions, including ongoing engagement with MIT starting from a campus net-zero masterplan, operational and embodied carbon reduction analysis, the recently occupied Kendall Square development and continued district-scale visioning, and environmental design for the Volpe development. Jessica holds an M.Engineering in High-Performance Structures, a B.S. in Building Technology, and a B.S. in Marketing Science, all from the Massachusetts Institute of Technology.



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