

2015 Building Envelope Forum: *Integration Drives Evolution*

TUESDAY, DECEMBER 15, 2015 | THE MOUNTAINEERS SEATTLE PROGRAM CENTER, 7770 SAND POINT WAY NE, SEATTLE | 98115

** all sessions/speakers subject to change*

This year's full-day forum will focus on the current state of building envelope design, where the field is headed, and the consequences of existing regulations, codes, policies, and practices in building design. The full-day program will include diverse perspectives on the creation and implementation of high-performance building enclosures and highlight opportunities for new approaches and innovation in future delivery methods.

8.00-8.30 am **REGISTRATION + LIGHT BREAKFAST**

8:30-8.45 **WELCOME and INTRODUCTIONS**

Katie Kemezis | Interim Program Manager, AIA Seattle

2015 Building Envelope Forum Planning Task Force

- **David Mead** | Building Performance Specialist, Associate at PAE Engineers
- **Jason B. Miller, AIA**, LEED AP BD+C | Associate / Project Architect at NBBJ
- **Michelle Couture, Assoc, AIA, LEED AP BD+C** | Associate III at Wiss Janney Elstner Associates, Inc.
- **Rob Curry** | Senior Product Manager, Emerging Technology at Northwest Energy Efficiency Alliance
- **Rick Nishino, AIA**, LEED AP | Principal at Weber Thompson
- **Wade Vorley, AIA**, CDT | Senior Associate at Wiss Janney Elstner Associates, Inc.

8.45-9.45 **KEYNOTE**

Stephen Selkowitz | Senior Advisor for Building Science and Group Leader of the Windows and Envelope Materials Group in the Building Technology and Urban Systems Division, Lawrence Berkeley National Laboratory

9.45-10.45 **MORNING SESSION 1: WHERE HAVE WE HAVE BEEN**

Be Aggressive About the Passive Solutions: Integrating Building Envelope Design into Whole Building Energy Goals

Dan Luddy | Senior Energy Engineer, ArchEcology

With careful design, a high performance building envelope can be energy efficient and provide exceptional thermal comfort without relying on expensive or unproven products. Dan Luddy shares experiences from his 8 years of energy consulting and discusses the changing perceptions of how the envelope fits into the broader energy efficiency goals of the building. The presentation will include an overview of thermal envelope design principles, common challenges to surpassing energy codes and key components to maximizing energy savings. A variety of the latest available analytical tools will be discussed as well as methods of integrating the design of the envelope with other disciplines to lock in energy savings early in the design process.

10.45-11.00 **BREAK**

11.00-12.00 **MORNING SESSION 2: THE WHY: ADVANCES IN BUILDING SCIENCE**

Evolution of Enclosure: the Anatomy of Building Performance

Dan Whitmore, CPHC | Building Analyst, Hammer & Hand

Zack Semke, LEED AP | Chief Evangelist, Hammer & Hand

Based on Hammer & Hand's exhibit "Evolution of Enclosure: the Anatomy of Building Performance" recently displayed at Portland's Center for Architecture, Dan Whitmore and Zack Semke will share a

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building science case study of four wall assemblies from built Passive House projects in Seattle and Portland.

Each assembly employs a different approach to achieve a common goal: manage heat, air, and moisture to achieve superior energy performance, durability, and occupant comfort. To engage the audience with the walls' innovative strategies, Dan and Zack will present the assemblies in a compare-and-contrast format, displaying four portable built wall-mockups as well as slides of custom technical illustrations (already created for the Evolution of Enclosure exhibit) that depict the physics and hygrothermal characteristics of the components in each wall. The analysis will be divided into four categories: management of air, heat, water, and vapor. Because each assembly also addressed a unique project imperative ("leave high design unfettered" or "sequester carbon," for example) Dan and Zack will describe how the respective integrated teams aligned those goals with high performance building design. Discussion of each assembly will be accompanied by construction photography.

12.00-1.00 LUNCH

1.00-2.00 **AFTERNOON SESSION 1: THE WHY: NEW PRODUCTS, TECHNOLOGIES, AND SYSTEMS**

Instrumentation and Moisture of Building Envelope Systems

Mark Morden, AIA | Associate Principal, Wiss, Janney, Elstner Associates, Inc.

Water infiltration of building envelope systems is the bane of building owners, occupants, architects, and contractors. Leaks can allow water to deteriorate building materials over an extended period of time before anyone realizes that damage is occurring. This can result in costly investigations, repairs, possible litigation and could create health issues for the occupants. For years, engineers have been instrumenting buildings to monitor structural issues e.g. movement, vibration. With the advent of the computer, remote data collection was possible as was remote monitoring of conditions being tested. Further development has created data loggers that do not require advanced training to use. The devices can be placed in buildings to collect temperature and humidity data over extended periods of time with data able to be downloaded onto desktop computers either manually or remotely. While these technologies are useful for monitoring certain conditions, they do not track moisture infiltration in real time. New technologies are emerging that allow more immediate responses to moisture infiltration. These include the installation of moisture detection sensors in key locations of an envelope system and other activities e.g. the use of drones to perform thermographic scans of building facades and roofs. This presentation will review briefly the history of building instrumentation and present emerging technologies that architects can include in new buildings to provide alerts at the earliest presence of water in the envelope systems. Also described will be how building management can use these technologies to better service and maintain the building envelope systems.

2.00-3.00 **AFTERNOON SESSION 2: THE WHY: ADVANCES IN INTEGRATIVE DESIGN**

Building Envelope Commissioning: Next Steps

Jeff Speert | Principal, JRS Engineering

Mina Akhavan, M.Eng, EIT | Building Envelope Consultant, JRS Engineering

Building Envelope Commissioning (BECx) is a quality-driven process that aims to deliver better performing building enclosures through verification by a third party. It has become increasingly common with institutional buildings through North America, but is less common in the multi-family and commercial sectors. We believe this can change in the Pacific Northwest. Because current project delivery methods in the region already commonly include thorough review, inspection, and test of the building envelope,

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the transition to a commissioning process is not as great of a leap as it may be elsewhere. The arrival of LEED V4, which awards 2 credits for BECx, will provide an added incentive for buildings across different market sectors seeking LEED certification to take this next step. The benefits will start to show in the operational performance of enclosures and the related efficiencies of mechanical systems.

This presentation “Building Envelope Commissioning: Next Steps” will provide an overview of the building envelope commissioning process, particularly as it relates to applicable standards and the processes involve. Based on past project experience, presenters Brad Carmichael and Mina Akhavan will discuss results and lesson learned from BECx case studies, and ways that current project delivery methods for non-commissioned projects in the Pacific Northwest can be adjusted for broader implementation of BECx. The presentation will also briefly examine new legislation that other states have recently adopted to mandate building envelope commissioning, and whether similar legislation would make sense in this region.

3.00-3.30 BREAK

3.30-4.30pm **AFTERNOON SESSION 3: SYSTEMS APPROACH TO DESIGN**

Extending Lessons from Net Zero to Standard Practice

Jim Hanford, AIA, LEED AP BD+C | Architect and Associate, The Miller Hull Partnership

Building envelope design contains essential first steps towards achieving net zero energy (NZE) buildings. Energy savings associated with advanced design is part of the “path to net zero”. More importantly, high performance envelopes become integrated with efficient HVAC and lighting systems to create an overall cost-effective approach for delivering thermal and visual comfort within a minimal energy budget. As we move the industry to meet 2030 Challenge goals across our entire project portfolio, we need to build on what we have learned about building envelope design from past successful NZE projects, and what best practices are contributing to this positive change. This presentation focuses on two NZE projects our firm has completed (the Bullitt Center and the San Ysidro Land Port of Entry), and what envelope systems, technologies, or design concepts used to achieve high performance in these projects have been successfully transferred to more typical projects carried out over the last five years. A series of short case studies covering a range of project types and delivery methods will be presented, including a neighborhood fire station, independent school science building, and single-family residential projects. Each will illustrate specific important technologies or design concepts taken from an NZE project, including air tightness, thermal performance, daylighting, shading, ventilation, thermal comfort, and the user experience. The session will explore strategies that have made the transition to standard practice, barriers that exist to widespread implementation of other strategies, important decision points during design, design process changes, and other relevant questions.

4.30-5.00 pm **ADDITIONAL Q+A TIME, CLOSING.**