START YOUR BUILDING SCIENCE DISCUSSION IN THE MIDDLE.

Atlas® polyiso products are an important part of the building envelope discussion. In one simple package, you can meet the highest requirements for your commercial and residential projects with Atlas solutions. Let's start the discussion today.
Welcome to BEST4
Henry L. Green, Hon. AIA
President, National Institute of Building Sciences

Welcome to Kansas City
David Herron, AIA
Chair, Building Enclosure Council–Kansas City

Meet the BEST4 Technical Committee
• Mark T. Bomberg, DSc, PE
• David W. Yarbrough, PhD, PE
• Jan Kosny, PhD
• Stanley Yee

General Information

Conference Program at a Glance

Day One: Monday, April 13

Day Two: Tuesday, April 14

Day Three: Wednesday, April 15

Hotel Floorplan

Sponsors and Exhibitors Directory

About the Institute
Dear BEST4 Attendees:

Thank you for joining us in Kansas City for the fourth BEST Conference Building Enclosure Science and Technology™ (BEST4). The National Institute of Building Sciences and its Building Enclosure Technology and Environment Council (BETEC) are excited to join our local host, the Building Enclosure Council–Kansas City (BEC-KC), to bring together industry professionals where Science meets Design™ as we explore the concept of Performance-Driven Architectural Design.

Choosing the overall theme of performance-driven design allows us to create a framework through which to offer discourse and presentation of some of the most pressing contemporary issues surrounding high-performance buildings. These include building envelope commissioning processes and practices, net-zero energy buildings, NFPA 285 and fire testing, dynamic daylighting and glare control, and exciting new generations of fenestration and wall materials. You will find technical sessions highlighting each of these areas.

The BEST Conference, now held triennially, exemplifies the Institute’s mission to bring together representatives from the entire building community to develop solutions—with input from leading industry experts. For three days, you will be party to the work of some of the finest minds in the building enclosure arena, as they generously share their breakthrough work from the lab, the classroom, the drawing board and the field. The BEST4 speakers, presentations, discussions, exhibits and events are carefully chosen to enlighten, motivate and inspire collaboration, idea sharing and problem solving. It is our hope that you all will participate to the fullest by taking advantage of our networking and social events in addition to the technical sessions.

I would like to thank our sponsors and exhibitors who have made this event possible through their generous support, as well as the many speakers and volunteers who contributed their efforts toward making BEST4 a success. The leadership and volunteers of BEC-KC, from the city known as “the Heart of America,” put their hearts and their heads into assembling this conference venue and developing the logistics to make it work.

And of course, without the tireless and discerning work of the BEST4 Technical Program Committee, we wouldn’t have the truly excellent content that has become the hallmark of the BEST Conferences. Starting with BEST1 in Minneapolis in 2008, to BEST2 in Portland, Oregon, in 2010, to BEST3 in Atlanta in 2012, BEST4 has built onto a firm foundation of solid research and evidence-based design.

On behalf of the National Institute of Building Sciences, BETEC, BEC-National and staff, I wish you a fulfilling and enlightening Conference. We hope you find BEST4 a thoroughly enjoyable experience.

Sincerely,

Henry L. Green, Hon. AIA
President, National Institute of Building Sciences

PS. We value your feedback as we plan for BEST5 in 2018. Please take a moment to fill out one of the evaluation forms available at the Registration Desk. Tell us how we did and give us your suggestions for improvement.
Dear BEST4 Attendees:

The Building Enclosure Council–Kansas City (BEC-KC) is proud to welcome all attendees, sponsors and visitors to our city and to the fourth BEST Conference Building Enclosure Science and Technology™ (BEST4). As the host chapter for BEST4, BEC-KC hopes that you will make the most of both.

Our work on BEST4 began back in 2012, even before BEST3 in Atlanta was crossed off the calendar. As BEC-KC worked on its proposal to have Kansas City serve as the venue for BEST4, we received strong support from many local civic groups—the Greater Kansas City Chamber of Commerce, Mid-America Regional Council and the City Manager’s Office were among those who offered their enthusiasm for a program that would bring knowledge for designing and building better buildings to the community. It truly is gratifying to see the BEST Conference series recognized as a trusted provider of high-quality technical education.

Equally gratifying is the support of the Kansas City building industry, many members of which put in long hours to shape the Conference’s BEC-sponsored Plenary Session and raise necessary funds. As always, AIA Kansas City has proved to be our biggest ally and strongest supporter.

Finally, a sincere thank you to our sponsors and exhibitors for believing in our message of building excellence and providing the funding without which, frankly, there would be no BEST4. Continuing the BEST Conference tradition, one of BEST4’s outstanding features is an on-site exhibition of the latest building enclosure products and services offered by these exhibitors and sponsors. The Conference schedule allows ample time during breaks for one-on-one demonstrations and conversations, so please stop by to enjoy this learning opportunity and express appreciation for their support.

Yours truly,

David Herron, AIA
herron + partners
BEST4 Conference Chair
Meet the BEST4 Technical Committee

Mark T. Bomberg, DSc, PE
Dr. Mark Bomberg has been active in the field of building physics for 40 years, including 25 years at the National Research Council of Canada and 15 years in academia. Bomberg earned the title of Technology Doctor at the Lund University, Sweden, for research on moisture transport in building materials. He also obtained a Doctor of Science (Engineering) degree from Warsaw Technical University, Poland, where he previously graduated in civil engineering. Bomberg currently serves as a visiting professor at Cracow Technical University, Cracow, Poland, and at Southeast University in Nanjing, China. He also has taught at McMaster University in Hamilton, Ontario, and Syracuse University, Syracuse, N.Y., and has served as principal of TI Research, a consulting company in Syracuse, for a quarter century. In addition to his research work and teaching, Bomberg has served as the editor in chief of the prestigious Journal of Building Physics, published by Sage Publications, Gloucester, Ontario, Canada, since 1984. Bomberg himself has more than 200 research papers and several book chapters, notably ASTM STP 1039, Water Vapor Transmission through Building Materials and Systems (co-edited with Heinz Trechsel) and Spray Foam in External Envelopes of Buildings (with coauthor J.W. Listburek). Long active in ASTM since 1976, he is also a long-term member and leader of the Institute’s Building Enclosure Technology and Environment Council (BETEC); he is one of the founders of the Building Enclosure Science and Technology (BEST) Conference series, and has served as a technical program chair since the conferences’ inception in 2008.

Jan Kosny, PhD
Dr. Jan Kosny leads Building Enclosure Research at Fraunhofer CSE in Cambridge, Mass. He is a Polish-born building envelope researcher with more than 30 years of experience in the building sciences and civil engineering. Dr. Kosny holds a PhD in Building Physics from the Polish Academy of Sciences; his doctoral research was in the area of passive solar systems. Prior to joining Fraunhofer CSE, Dr. Kosny spent 12 years teaching building science and building technologies at Rzeszow Technical University in Poland, and 18 years at Oak Ridge National Laboratory (ORNL), where he developed a number of high-performance wall, roofing and building integrated photovoltaics concepts. Holding a number of adjunct faculty positions, he has published over 120 technical articles and numerous patents related to advanced building concepts. Kosny has represented the U.S. at many international organizations and standards bodies, including the International Energy Agency. He has extensive experience collaborating with industry to commercialize advanced building technologies. From 2002 to 2010, while at ORNL, he developed the first ever dynamic thermal insulations — phase change material (PCM)-enhanced cellulose and fiberglass insulations. In 2009, PCM-enhanced cellulose became commercially available on the U.S. building market. Dr. Kosny is a winner of a 2009 R&D 100 Award for the development of phase change materials.

David W. Yarbrough, PhD, PE
David W. Yarbrough is the vice-president of R&D Services, Inc., a Cookeville, Tennessee-based company founded in 1994 to provide consulting and testing services to the insulation industry. A professional engineer registered in Tennessee and Florida, he earned chemical engineering degrees from the Georgia Institute of Technology in 1960 (BChE), 1961 (MS), and 1966 (PhD) and was elected to membership in Sigma Xi, Phi Kappa Phi, Tau Beta Pi and Pi Mu Epsilon. Currently professor of Chemical Engineering Emeritus at Tennessee Technological University in Cookeville, Yarbrough was a chemical engineering faculty member from 1968 – 1987, and chair and professor of Chemical Engineering from 1987 – 2002. He was a part-time member of the research staff at the Oak Ridge National Laboratory from 1978 – 2010. He has served as a consultant for many years to insulation producers and research groups in the U.S. and abroad. He has served as an organizer and presenter at technical conferences, been an active member of ASTM, the International Thermal Conductivity Conference and the Tennessee Academy of Science. He has authored or co-authored more than 100 papers, and regularly serves as a reviewer for scientific journals, and serves on the editorial boards of the Journal of Building Physics and the Journal of the Tennessee Academy of Science. He is a Fellow of the International Thermal Conductivity Conference, a Fellow and Past-President of the Tennessee Academy of Science and a member of the BETEC Board.

Stanley Yee: Fenestration Tracks
Stanley Yee, a LEED-accredited professional, is a facade design and construction specialist for the Dow Corning Corporation, Beaverton, Oregon. He graduated from Concordia University, Montreal with a Bachelor of Engineering degree in Building Engineering and has worked in the building enclosure industry since 1994. He spent eight years in Hong Kong, where he worked for internationally based curtain wall contracting and facade consulting firms, accumulating experience, exposure and knowledge from both the contracting side and the consulting side. His specialties are waterproofing, testing and glass performance.
What You Need to Know

Registration
During the Welcome Reception on Sunday, April 12, 6:30 pm – 8:30 pm, the Conference Registration Desk will be open in the Century Ballroom Foyer, one level up from reception, two levels up from the lobby. Please check in at the Registration Desk to register or to pick up your registration package.

From Monday – Wednesday, the Conference Registration Desk will be open for registration and to answer all of your questions from 7:00 am – 5:00 pm each day.

Conference Name Badges
Your name badge is your ticket to each event during the Conference. Please wear it at all times while in the Conference facility for admission into each event, including meals.

Session Locations
General and Plenary sessions take place in Century Ballroom C, while Technical Sessions are held in Century Ballroom A (sessions designated X.1) and Century Ballroom B (sessions designated X.2), all on the Ballroom Floor Level.

Exhibit Hall
The Exhibit Hall is located in Pershing Place, North and South, on the Ballroom Level. Hours are:

Monday: 7:00 am – 6:30 pm
Tuesday: 7:00 am – 3:45 pm

Please visit our Conference sponsors and exhibitors in the Exhibit Hall on Monday and Tuesday during breakfast and coffee breaks, as well as for the Exhibitors Reception on Monday evening, 5:30 pm – 6:30 pm.

Meals and Snacks
Breakfast and morning/afternoon refreshment breaks will be served in the Exhibit Hall (Pershing Place, Ballroom Level) on Monday and Tuesday, and in the Century C Foyer (on the Ballroom Level) on Wednesday.

Lunch will be served everyday from noon – 1:00 pm in the General Session room (Century Ballroom C).

The Conference Dinner will be held on Tuesday, April 14, from 7:00 pm – 9:00 pm in the General Session room (Century Ballroom C).

Cell Phone Usage
Please silence your cell phones during the Conference and refrain from using your cell phones while attending any of the sessions, meetings or events.

WIFI
Conference participants are offered free WIFI in guestrooms and in the Technical Session rooms.

Program at a Glance

Pre-Conference: Sunday, April 12
6:30 pm – 8:30 pm Welcome Reception (Garden Terrace) sponsored by Sto Corp.

Day One: Monday, April 13
7:00 am – 5:00 pm Registration
7:00 am – 8:00 am Breakfast
8:00 am – 9:45 am Session 1: Welcome and Plenary Session
9:45 am – 10:10 am Coffee Break
10:10 am – 11:55 am Session 2
Noon – 1:00 pm Lunch
1:00 pm – 1:30 pm Free Time to Visit Exhibits
1:30 pm – 3:15 pm Session 3
3:15 pm – 3:40 pm Afternoon Break and Exhibits
3:40 pm – 5:25 pm Session 4
5:30 pm – 6:30 pm Exhibitors Reception (Exhibit Hall, Pershing Place)

Day Two: Tuesday, April 14
7:00 am – 5:00 pm Registration
7:00 am – 8:00 am Breakfast
7:00 am – 3:40 pm Exhibits Open
8:00 am – 9:35 am Session 5: BEC-sponsored Plenary Session
9:35 am – 9:55 am Coffee Break
10:00 am – 11:55 am Session 6
Noon – 1:00 pm Lunch
1:00 pm – 1:30 pm Free Time to Visit Exhibits
1:30 pm – 3:15 pm Session 7
3:15 pm – 3:40 pm Afternoon Break and Exhibits
3:40 pm – 5:25 pm Session 8
7:00 pm – 9:00 pm Conference Dinner (General Session room, Century Ballroom C)

Day Three: Wednesday, April 15
7:00 am – 9:00 am Registration
7:00 am – 8:00 am Breakfast
8:00 am – 9:45 am Session 9
9:45 am – 10:10 am Coffee Break
10:10 am – 11:55 am Session 10
Noon – 1:00 pm Lunch
1:00 pm – 2:30 pm Session 11
2:30 pm – 2:55 pm Afternoon Break
2:55 pm – 4:45 pm Session 12

Post-Conference: Thursday, April 16
8:00 am – Noon BECx Education Workshop Preview
DAY ONE: Monday, April 13

7:00 am – 5:00 pm  
**Registration**

7:00 am – 8:00 am  
**Breakfast**

*Exhibit Hall, Pershing North & South*

*sponsored by DuPont Building Innovations*

8:00 am – 9:45 am  
**Session 1: Plenary**

*Century Ballroom C, Ballroom Level*

**Welcome**

- David Herron, BEST4 Conference Chair, BEC-KC
- Henry L. Green, President, National Institute of Building Sciences
- James “Tim” Ryan, Code Administrator, City of Overland Park, Kansas, and National Institute of Building Sciences Board of Directors Chair
- Mark Bomberg, Technical Committee Chair

**Technical Presentations**

**Session Chair: Philip Schneider, AIA**

- **P-1: Keeping Energy Confined and Making Information Flow – The Smart Building of Tomorrow**
  Christian Hoepfner, Center Director, Fraunhofer CSE
- **P-2: On Joints, Junctions and Membranes**
  Ed Retzbach, NA Manager, Tremco

9:45 – 10:10 am  
**Coffee Break**

*Exhibit Hall, Pershing North & South*

10:10 am – 11:55 am  
**Session 2**

**2.1 Commissioning and Quality Management in Design**

*Century Ballroom A, Ballroom Level*

**Session Chair: Brian Stroik**

- **Commissioning and Building Envelope Commissioning (BECx) in LEED Programs**
  H. Jay Enck, CxGBS
- **On Evaluating Building Envelope Performance**
  John Runkle, Architectural Testing, Inc.
- **Specific, Practical Methods to Improve BECx Programs**
  Bill Nash and Ben Townsend, WDPA

2.2 Next Generation of Midwest Integrated Enclosures

*Century Ballroom B, Ballroom Level*

**Session Chair: Mark Bomberg**

- **Constructing a Model for Ultra Energy-Efficient Affordable Housing in the Midwest**
  Mike Steffen (invited paper)
- **Use of Thermal Inertia for Reduction of HVAC Energy Consumption in Cooling Dominated Climates**
  Jan Kosny and Ali Fallahi, Fraunhofer CSE; Elizabeth Kossecka, Polish Academy Sciences
- **Performance of Sealed Curtain Wall Spandrel Panels and Directing Natural Sunlight Deep into Multistory Buildings**
  Patrick Roppel, Radu Postole, Neil Norris, Morrison Hershfield Ltd.
- **Holistic Approach to Achieving Low-Energy High-Rise Residential Buildings**
  Christian Cianfrone, Dieter Hardock, Patrick Roppel, Morrison Hershfield Ltd.

Noon – 1:00 pm  
**Lunch**

*Century Ballroom C, Ballroom Level*

*sponsored by ROXUL, Inc.*

1:00 pm – 1:30 pm  
**Exhibits Open**

*Exhibit Hall, Pershing North & South*

1:30 pm – 3:15 pm  
**Session 3**

**3.1 Living Building Challenge**

*Century Ballroom A, Ballroom Level*

**Session Chair: Jim Hanford**

- **Building Enclosure Design in an Integrated High Performance Building**
  Jim Hanford, The Miller Hull Partnership
- **The Bullitt Experience: The Light Dynamic—Measured Performance of Lighting and Daylight Systems**
  Christopher Meek, University of Washington Integrated Design Lab
- **Graywater Management for an Integrated High Performance Building**
  Phillip Thompson, Seattle University
- **Modeling and Measuring Net-Zero Energy**
  Marc Brune, PAE
3.2 Forum: Performance Testing for QA and Commissioning

Century Ballroom B, Ballroom Level

**Moderator: Jan Kosny**

- Invited Panelists: Terry Brennan, John Straube and Fiona Aldous

3:00 pm – 3:40 pm

**Afternoon Break and Exhibits**

Exhibit Hall, Pershing North & South

3:40 pm – 5:25 pm

**Session 4**

4.1 Design Considerations

Century Ballroom A, Ballroom Level

**Session Chair: Dudley McFarquhar**

- Early Phase Design Energy Modeling to Right-Size Building Enclosure and Mechanical Systems
  Jillian Burgess, RA, The Façade Group

- High-Performance Detailing
  Michael J. Heule and Paul E. Totten, Helix Architecture + Design and Halsall, A Parsons Brinckerhoff Company

- The Importance of Translating an Owners Program Requirements (OPR) to a Basis of Design (BOD)
  Paul E. Totten and Andrew Smith, Halsall, A Parsons Brinckerhoff Company

- Design with Consideration of Climate Change
  Paul E. Totten and Alexandra K. Connor, Halsall, A Parsons Brinckerhoff Company

4.2 Fenestration 2

Century Ballroom B, Ballroom Level

**Session Chair: Stanley Yee**

- High-Performance Building Envelopes: Design Methods for Energy-Efficient Façades
  Ajla Aksamija, Associate, Perkins+Will

- A Holistic Process for Predictable Curtain Wall Behavior
  John Hodder, David Thompson, Entuitive Corporation

- Dynamic Façades: Solving the High-Performance Building Challenge without Design Compromise
  Helen Sanders, SAGE, Faribault

- Quantifying Comfort to Assist in the Window Selection Process
  Kerry Haglund, Haglund Design, Inc.; Jim Larsen, Cardinal Glass Industries

5:30 pm – 6:30 pm

**Exhibitors Reception**

Exhibit Hall, Pershing North & South

---

**Thank you to our Sponsors and Exhibitors**

After a long and fruitful day of taking part in Technical Sessions, join us in the Exhibit Hall (Pershing Place, on the Ballroom Level) for a pick-me-up and a chance to say “thanks” to our sponsors and exhibitors as you examine their latest offerings in building enclosure technology products and services.
DAY TWO: Tuesday, April 14

7:00 am – 5:00 pm
Registration

7:00 am – 8:00 am
Breakfast
Exhibit Hall, Pershing North & South

sponsored by Dow Corning

8:00 am – 9:35 am
Session 5

5.1 Plenary Session: High Performance Collaboration
Century Ballroom C, Ballroom Level
Session Chair: David Herron
The Building Enclosure Council–Kansas City is pleased to bring you the Tuesday morning Plenary Session, with a fresh take on the theme of “High-Performance Collaboration.”

Grab your coffee and join the following speakers for a lively discussion on the changing and integrated roles of project stakeholders. This forum is made possible by the generous sponsorship of JE Dunn Construction, founded in Kansas City and going strong nationally for the past 86 years. Speakers are:

- Architect James Timberlake, KieranTimberlake, Architects
- Building Scientist John Straube, University of Waterloo
- Mechanical Engineer Steve Kemp, MMM Group

During the forum, the BEC will also answer the burning question: “Where in the World is BEST5?” Come and catch a brief glimpse into 2018 as they make the big reveal.

sponsored by JE Dunn Construction

9:35 am – 9:55 am
Coffee Break
Exhibit Hall, Pershing North & South

10:00 am – 11:55 am
Session 6

6.1 Smoldering Issues of Fire Performance Evaluation
Century Ballroom A, Ballroom Level
Session Chair: Richard Keleher

- State of the Art of the NFPA 285 Fire Test
  Brian Kuhn, Simpson Gumpertz and Heger
- The NFPA 285 Fire Test’s Impact on Architectural Design and Energy Performance
  Richard Keleher, Thompson & Lichtner Co, Boston
- NFPA 285 in the Field: An Update on Local Adoption
  Keith P. Nelson, ATI/Intertek
- Exterior Combustible Wall Project of the Fire Protection Research Foundation
  Amanda Kimball, Fire Protection Research Foundation

6.2 Fenestration
Century Ballroom B, Ballroom Level
Session Chair: William Dupont

- The Effects of #4 Surface Low-e Coatings on Fenestration Condensation Resistance
  Tracy G. Rogers, Quanex Building Products
- The Reality of Quantifying Curtain Wall Thermal Performance: 2D, 3D and Hotbox Testing
  Stanley Yee, Lawrence D. Carbary, Patrick Roppel, Neil Norris and Phillip Ciantar
- Performance-Driven Façade Design: Articulated Glazing and Case Study Projects
  Won Hee Ko, Buro Happold Façades

Noon – 1:00 pm
Lunch
Century Ballroom C, Ballroom Level

sponsored by
Tremco Commercial Sealants & Waterproofing

1:00 pm – 1:30 pm
Exhibits Open
Exhibit Hall, Pershing North & South
1:30 pm – 3:15 pm

Session 7

7.1 New Masonry Material
Century Ballroom A, Ballroom Level

Session Chair: Dariusz Gawin

- State of the Art in Evaluation Durability of Exterior Plasters
  Dariusz Gawin, Lode University of Technology (invited paper)

- Thermal and Energy Performance of Aerated Autoclaved Concrete (AAC) in Northern U.S. Climates
  Nitin Shukla, Diana Elliott, Bryan Urban, Ali Fallahi and Jan Kosny, Fraunhofer Center for Sustainable Energy Systems

- Panel Discussion: Jan Kosny, Moderator; Mark Bomberg; Dariusz Gawin

7.2 Glazing and Fenestration
Century Ballroom B, Ballroom Level

Session Chair: Stanley Yee

- History and Future of Fenestration
  Steven Selkowitz, LBNL

- A Detailed Study of Sunshades and their Effects on Performance
  Joe Fong, Walter P Moore

- Re-Glazing of All Glass Curtain-Wall Buildings
  Graham Finch, Brian Hubbs, Ed Thiessen and Michael Aoki Kramer, RDH Building Engineering Ltd.

- Implementation of Multiple Efficiency Strategies Including Dynamic Daylighting and Glare Control for Two Net-Zero Low Rise Office Buildings
  Brandon Tinianov

3:15 pm – 3:40 pm

Afternoon Break and Exhibits
Exhibit Hall, Pershing North & South

3:45 pm – 5:25 pm

Session 8

8.1 Multi-Unit Residential Buildings: Management, IAQ and Retrofits
Century Ballroom A, Ballroom Level

Session Chair: Ali Fallahi

- Finding an Optimal and Sustainable Mix of Time-Based Maintenance and Condition-Based Maintenance for the Enclosure System
  David Albrice, David Young and Matthew Branch, RDH Building Engineering Ltd.

- Energy-Efficient Retrofit of a High-Rise Multi-Unit Residential Building
  Brittany Hanam, Lorne Ricketts and Andrew Pape-Salmon, RDH Building Engineering Ltd.

- Airflow in High-Rise Multi-Unit Residential Buildings
  Lorne Ricketts and Graham Finch, RDH Building Engineering Ltd. and John Straube, University of Waterloo

- Glare Study of Highly Reflective Cool Roofing Membrane
  Joe Fong, Walter P Moore

8.2 The Passive Side of Active Houses
Century Ballroom B, Ballroom Level

Session Chair: Stephanie Stubbs

- North American Way to Passive House-Based NZEB
  Katrin Klingenberg, Passive House Institute (invited paper)

- A Critical Analysis of the Passive House Standard for the Climates of the U.S.
  Ryan Abendroth

- Production Homebuilder + Passive House: Lessons Learned
  Duncan Prahl, IBACOS

- Mission Cliffs (Passive House 2013/2014) in Kansas City
  David Schleicher and David Hawkins, Prairie Design Build

7:00 pm – 9:00 pm

Conference Dinner
Century Ballroom C, Ballroom Level

Featured Dinner Speaker:

André Desjarlais
Oak Ridge National Laboratories

André Desjarlais is the Program Manager for the Building Envelope Systems Research Program at the Oak Ridge National Laboratory (ORNL). He earned his degree in aeronautical engineering from Boston University in 1973. He has been involved in building envelope and materials research for over 40 years, first as a consultant and, since 1991, at ORNL. His areas of research include in-situ testing protocols, the development of standardized means of determining the long-term thermal performance of closed cell plastic foams and the impacts of moisture in low-slope roof systems. His numerous awards and recognitions include a lifetime achievement award from the Polyisocyanurate Insulation Manufacturers Association.
DAY THREE: Wednesday, April 15

7:00 am – 5:00 pm
Registration

7:00 am – 8:00 am
Breakfast
Century Foyer C, Ballroom Level

sponsored by Atlas Corporation

8:00 am – 9:45 am
Session 9

9.1 Performance of Materials and Systems
Century Foyer A, Ballroom Level

Session Chair: Paul Totten

• Challenges and Opportunities in Deep Envelope Retrofitting
  Paul Bertram, Kingspan

• Experimental Synthesis of Hollow Silica Nano-spheres for Application as Super-insulation in the Buildings of Tomorrow
  Bjørn Petter Jelle, Tao Gao, Linn Ingunn, Christie Sandberg, Bente Gilbu Tilset, Mathieu Grandcolas and Arild Gustavsen

• Field Performance Study of EIFS System Using Vacuum Insulation Panels
  Ali Fallahi, Nitin Shukla, Toni Fontanini, Fraunhofer CSE; Larry Carbary, Dow Corning; Roland Serino, Dryvit; Jan Kosny, Fraunhofer, CSE

• Thermal Bridging: Observed Impacts and Proposed Improvement for Common Conditions
  Andrea Love, Payette Associates

9.2 High-Performance, Ecological Building Envelopes
Century Foyer B, Ballroom Level

Session Chair: Mark Perepelitza

• Testing for Development of Simulation Tools, Methods and Façade Assemblies
  Steve Selkowitz, LBNL (invited presentation)

• Photography of Building Spaces to Validate Radiance Daylight Analysis
  Susan Ubbelohde, University of California, Berkeley

• New Developments in Testing of Operable Exterior Shading Devices for Solar Control and Daylight Management
  Sabine Hoffmann, LBNL

• POE Results for the GSA Wyatt Office Building in Portland, Relative to Building Program and Design Analysis Methods
  Mark Perepelitza, SERA

10:00 am – 11:55 am
Session 10

10.1 Performance of Materials and Systems
Century Ballroom A, Ballroom Level

Session Chair: Jan Kosny

• Thermal Resistance of Enclosed Reflective Airspaces in Building Applications
  Hamed H. Saber, NRC Canada (invited paper)

• Field Test Data from Retrofit of a Small Residential House Using EIFS Technology
  John Edgar, STO Corp; Ali Fallahi, Alliston Watts, Jan Kosny, Fraunhofer, CSE; Linda Jeng, Dow Chemical

• Residential Building with Double Walls – Thermal Performance Analysis and Field Testing
  Jan Kosny, Fraunhofer CSE; Som Shrestha and Kaushik Biswas, Oak Ridge National Laboratories; Ali Fallahi and Nitin Shukla, Fraunhofer CSE

• Field Performance of Two Aerogel Blankets in a Hot, Dry Climate
  Bryan Urban, Nitin Shukla, Tony Fontanini and Jan Kosny, Fraunhofer CSE

10.2 Evolving Enclosure Constructions
Century Ballroom B, Ballroom Level

Session Chair: Wahid Maref

• Field Monitoring of Embedded Wood Members in Insulated Masonry Walls in a Cold Climate
  Kohta Ueno and Joseph W. Lstiburek, Building Science Corporation

• Cold Climate Moisture Implications of Air Leakage in Spray Foam Retrofit Attic Assemblies
  Duncan Prahl, IBACOS

• Detailed Monitoring and Energy Model Development of an Existing Multi-Unit Residential Building
  Marianne F. Touchie and Kim D. Pressnail, Department of Civil Engineering, University of Toronto

Noon – 1:00 pm
Lunch
Century Ballroom C, Ballroom Level

sponsored by Knight Wall Systems

1:00 pm - 2:30 pm
Session 11

11.1 New Concepts for Walls
Century Ballroom A, Ballroom Level

Session Chair: Sam Yuan

• Integrated Systems for Building Upgrade and New Construction
  Mark Bomberg, Xing Shi and Michael Gibson

9:45 am – 10:10 am
Coffee Break
Century Foyer C, Ballroom Level
• Materials and Assemblies for Lightweight Building Envelopes in Warm Climates
  Michael Gibson, Kansas State University

• Field Performance of Radiant Barriers and IRCC Systems for Attic Retrofits
  Ali Fallahi, Fraunhofer CSE; David Yarbrough, R&D Services; Jan Kosny, Fraunhofer CSE

11.2 Renovation and Repairs
Century Ballroom B, Ballroom Level

Session Chair: David Yarbrough

• Energy Challenges Related to Re-cladding Existing Glazed Curtain Walls
  Andrew A. Dunlap, Smith Group JJR Inc.

• Competing Performance Criteria in Renovation and Repurposing of Existing Building Exterior Envelopes
  Paul G. Johnson, Smith Group JJR Inc.

• Doing It Right the Second Time – Designing Minimally Invasive, Cost-Effective Solutions for Window Repair vs. Replacement
  David W. Boyer, Building Envelope Analysis; Ron Tatley, Building Envelope Analysis; Stacey Grund, Building Envelope Analysis; Matthew Travis, Building Envelope Analysis

• Risk of Condensation and Mold Growth in Wood-Frame Wall Systems with Different Exterior Insulations
  Wahid Maref, National Research Council, Canada

12.2 Insulation and PCM
Century Ballroom B, Ballroom Level

Session Chair: Mario Medina

• Inward Vapor Drive Analysis of Field Monitored Residential Walls with and without Exterior XPS Insulation
  Jonathan Smegal, BSciConsult

• Low-cost Bio-based Phase Change Materials as an Energy Storage Medium in Building Envelopes
  Kaushik Biswas, Oak Ridge National Laboratory; Nitin Shukla, Energy and Transportation Science Division; Jan Kosny, Fraunhofer CSE; Ramin Abhari, Syntroleum Corporation

• Field Monitoring for Cold-Climate Double Stud Walls with Cellulose and Low Density Foam Insulation
  Kohta Ueno and Joseph Lstiburek, Building Science Corporation

• Thermal Performance and Energy Savings Potential of Attic Radiant Barrier Systems
  Som Shrestha and André Desjarlais, Building Technologies Research and Integration Center, Oak Ridge National Laboratory

4:45 pm
Adjourn

STAY FOR THE PREVIEW!

JOIN US FOR THE
Building Enclosure Commissioning (BECx) Education Workshop Preview
Thursday, April 16, 2015 | 8:00 am – Noon
Century Ballroom C

Attendees will get a detailed overview of the topics that will be taught in the five-day educational course being planned by the National Institute of Building Sciences in response to the industry’s need for testing and certification of Building Enclosure Commissioning Providers and Building Enclosure Commissioning Specialists. Testing and certification is currently being planned for an April 2015 launch by ASTM.

Registration is $175 per attendee. Visit the BEST4 Registration Booth on the Ballroom Level for details and to sign up.
The Westin Kansas City at Crown Center
1 East Pershing Road, Kansas City, MO 64108
Phone: (816) 474-4400
Exhibitor 1

Air Barrier Association of America (ABAA) is a national, not-for-profit trade association that consists of a wide cross section of stakeholders in the building enclosure industry. Our membership includes manufacturers, architects, engineers, trade contractors, researchers, testing and audit agencies, consultants and building owners. ABAA is the national voice of the air barrier industry and has raised the level of quality in the industry through a Quality Assurance Program and offers premier training, certification, product evaluations, contractor accreditation and site quality control audits.

www.airbarrier.org

Wednesday Breakfast Sponsor | Exhibitor 22

Atlas Corporation is an innovative, customer-focused manufacturer of insulation solutions, including continuous wall insulation (CI). Atlas has grown from a single manufacturing facility in 1982 into an industry leader with 19 plants in North America and worldwide product distribution. Atlas offers a full line of polyiso residential and commercial insulation boards, as well as metal building and tilt wall construction insulation solutions.

www.atlaswallci.com

Exhibitor 20

Carlisle Construction Materials (CCM) is a diversified manufacturer and supplier of premium building products for the commercial and residential construction markets. Carlisle has been a recognized leader in the roofing industry for nearly half a century, offering high-performance single-ply roofing solutions that include EPDM, TPO, PVC and roof garden systems. Carlisle also offers a full line of polyiso and expanded polystyrene insulation, as well as a host of steep-slope underlayments, duct sealants, adhesives and hardware.

www.carlisleconstructionmaterials.com

Exhibitor 14

Cosella-Dörken Products Inc.: With a comprehensive portfolio of premium quality products and services Cosella-Dörken has created its position as one of the leaders in the North American construction-materials market. For over 40 years, high quality products have been produced under the DELTA® brand name, always offering top levels of protection, reliability and energy conservation. Cosella-Dörken Products Inc. is an autonomous subsidiary of Ewald Dörken AG (Germany), that has been a market leader for the building and construction industry in Europe for many decades.

www.cosella-dorken.com

Exhibitor 12

Demilec is an industry-leading manufacturer of spray polyurethane foam insulation and coatings. Using world-renowned technology and science, we have created a line of products that help you realize your dreams of an energy efficient, quiet and comfortable environment, nearly free of dust and allergens. Demilec’s products are all made in the USA and have received numerous awards and certifications for their energy efficiency, as well as for their high renewable and recycled content, including the esteemed GREENGUARD® and GREENGUARD® for Children & Schools Certifications.

www.demilec.com
Sponsor and Exhibitor Directory

Tuesday Breakfast Sponsor | Exhibitor 18

**Dow Corning:** With silicon-based specialty solutions that enable sustainable building designs, Dow Corning offers 70-plus years of global industry experience — and continuing innovations that meet the challenges of the 21st century — to help you meet your construction needs. Look to Dow Corning for answers to your biggest challenges with solutions for high-performance insulation with Dow Corning® HPI-1000 Building Insulation Blanket; building envelope protection via the Dow Corning® Silicone Air Barrier System — the only water-based silicone air barrier complemented by a fully compatible system; and a fast-curing, 1:1 mix ratio structural sealant, Dow Corning® 121 Structural Glazing Sealant. [www.dowcorning.com/construction](http://www.dowcorning.com/construction)

Monday Breakfast Sponsor | Exhibitor 5

**DuPont Commercial Air & Water Barrier Systems:** The DuPont™ Tyvek® Fluid Applied System, Tyvek® CommercialWrap® and Tyvek® CommercialWrap® D offer the best balance of properties to help effectively seal the building envelope. By controlling air and water infiltration and allowing interior moisture vapor to escape, Tyvek® Fluid Applied and mechanically fastened building wrap air and water barrier systems contribute to more sustainable, durable and comfortable structures. And because they help reduce HVAC costs, buildings will operate efficiently, year after year. DuPont is the only manufacturer to offer both fluid applied and mechanically fastened building wrap air and water barrier systems. [www.fluidapplied.tyvek.com](http://www.fluidapplied.tyvek.com)

Exhibitor 8

**Grace Construction Products** offers a wide range of innovative specialty construction chemicals and materials that includes: concrete admixtures and technologies and fibers, architectural concrete products, liquid pigments for colored concrete, cement processing additives, concrete masonry products, air barriers, roofing underlayments, residential building materials, structural waterproofing systems and fire protection products. [www.graceconstruction.com](http://www.graceconstruction.com)

Exhibitor 3

**Henry Company** is a leading innovator of Building Envelope Systems® and understands the principles of integrating air/vapor barrier, roofing and waterproofing systems to ensure superior building performance. Henry professionals offer designers, contractors and building owners a combination of technical experience and a commitment to provide quality products. For more than 75 years, Henry has been the trusted source for complete Building Solutions. [www.henry.com](http://www.henry.com)

Push the envelope.
And seal in the savings.

**High Performance Building Solutions**
Hunter Xci: Founded in 1979, Hunter has brought together a team of industry professionals who know Polyiso inside and out and who care about being technically proficient and customer driven. As an industry leader in Polyiso Roof insulation panels for 17 years – Hunter is proud to introduce its product line for commercial wall applications: Hunter Xci. Hunter Xci products are designed for use in commercial wall applications to provide “ci” continuous insulation within the building envelope. www.hunterxci.com

JE Dunn Construction is in the business of constructing buildings, but we do so with a higher purpose. We maintain a commitment to integrity, collaboration, wisdom, quality, value, sustainability and safety. From coast-to-coast, we’ve staked our reputation on our ability to deliver on each of these and pledge to settle for nothing less. www.jedunn.com

Knight Wall Systems manufactures versatile, ventilated rain screen façade attachment systems that accommodate an expansive array of cladding options. Their expertise is focused on the means and methods of attaching rain screen façade panels to the building while reducing the impact on the insulation (reduced thermal bridging). Knight prides itself on having inventory of all standard rain screen components in stock at all times, ensuring short lead times. www.knightwallsystems.com

PROSOCO, Inc. is a national manufacturer of products for cleaning, protecting and maintaining concrete; making building envelopes air- and water-right; and cleaning, protecting and restoring new and existing masonry buildings. The company strives to provide innovative products and services that improve the appearance and performance of our built environment. PROSOCO has offices and production facilities in Lawrence, Kansas, with an extensive sales and technical support staff throughout the United States and abroad. www.prosoco.com
Exhibitor 13

Retrotec Inc. is the innovative leader in blower door manufacturing since 1980. Retrotec is the only blower door manufacturer that produces a full line of equipment to meet virtually every air infiltration testing need. The company manufactures low flow fans suitable for testing very tight enclosures, residential fans suitable for testing average homes to approximately 5000 sq. ft., and portable high-power (2hp) systems suitable for testing extremely large or leaky homes and multi-fan high power systems for testing commercial spaces.

www.retrotec.com

Exhibitor 19

SIGA is leading in the development, production and distribution of products free from residential toxins for the air and windtight building envelopes. SIGA-sealed buildings are characterized by low heating and ventilation costs, higher standard of comfort without drafts and protection from mold. Know-how, quality, innovation and the consistent striving for sustainability are some of the recipes for the success of the Swiss family business. The company manufactures air- and water-resistant membranes, and door and window frames.

www.sigacover.com/us/

Exhibitor 25

ROXUL Inc. is the North American branch of ROCKWOOL International of Denmark, the world’s leading producer of stone wool insulation made from natural stone and recycled slag. Sustainability is a fundamental pillar of ROXUL’s philosophy. As a fully owned subsidiary of ROCKWOOL International, ROXUL is guided by the same corporate mission and responsibilities. That is especially true in the area of sustainability. The ROCKWOOL report on sustainability is global in scope and includes the group’s efforts in North America.

www.roxul.com

Exhibitor 4

SOPREMA, Inc. is a world-wide leading manufacturer in the commercial roofing and waterproofing industry. Founded in 1908, SOPREMA has specialized in the development and production of SBS (styrene butadiene styrene) engineered asphaltic membrane. SOPREMA’s unique qualifications in SBS technology are built upon an extraordinary track record of innovation and technical expertise. Through our extensive knowledge of chemical engineering, manufacturing, system design and installation, SOPREMA has continued to be an industry leading force in SBS.

www.soprema.us
**Welcome Reception Sponsor | Exhibitor 23 and 24**

**Sto Corp.** developed the first Exterior Insulation and Finish System (EIFS). In the early 1960s and has become the expert in exterior thermal insulation systems. Today, building science experts agree that continuous exterior insulation such as EIFS is the most effective way to insulate the building envelope for energy savings. Sto’s extensive product line includes advanced cavity wall systems, cladding systems, waterproof air barriers, coatings and an array of EIFS stucco and masonry repair products.  
www.stocorp.com

---

**Exhibitor 15**

**Tamlyn®** was established in May 1971 by Ron Tamlyn, Sr. in Bellaire, Texas, and the company remains family-owned to this day. They are proud to represent the manufacturing end of the building products industry, and remain a competitive manufacturer committed to making products in America; an overwhelming majority of their products are made in the USA. Tamlyn produces framing and hardware including caps and bases, hold-down and tie-back hardware, flashing, trim and vent options.  
www.tamlyn.com

---

**Tuesday Lunch Sponsor | Exhibitor 21**

**Tremco Commercial Sealants & Waterproofing** offers the most comprehensive building envelope protection in the industry today. With a product offering spanning the foundation to the roof, below-grade waterproofing systems, air barrier systems, wall and traffic coatings, high-performance sealants, comprehensive glazing systems, firestopping solutions and engineered transition assemblies are formulated and tested to ensure compatibility and long-term performance. The Tremco Building Envelope Solutions Team (BEST) and knowledgeable local sales representatives work with those in the design/construction process to facilitate integrated design and construction critical to sustainability. www.tremcoinc.com

---

**Exhibitor 7**

**Vaproshield** designs and manufactures high-performance vapor-permeable water resistive barriers (WRB) and air barrier (AB) membranes and accessories, creating a total solution-based approach to protecting the building envelope. The company’s innovative features such as integrated tape on our membranes, permeable hybrid fluid-applied flashing for rough openings, WRB sealant and various other accessories used in a variety of applications have been rigorously tested together to maximize life-long building envelope performance and minimize building failure rates. www.vaproshield.com

---

**Knight Wall Systems**

**Rain Screen Attachment Solutions**  
*Nexus of the Building Envelope*  
*Reduce thermal bridging to meet & exceed energy codes cost effectively*

- Rigid Foam & Mineral Fiber Systems
- Use virtually any siding/panels - supplied by anyone with any insulation*
- Vertical, horizontal & double layer/rail assemblies for maximum versatility
- Low thermal bridging - even compared to composite material brackets & rails
- Spacing up to 32 inches on center
- No trimming or manipulation of exterior insulation saving labor costs

**CI-System™**  
95%-98% wall assembly efficiency

**MFI-System™**  
80%-92% wall assembly efficiency

1.855.KWS.WALL (597.9255)  
knightwallsystems.com  
info@knightwallsystems.com

*Restrictions apply, such as fire ratings, compressive strength, thickness, dead loads, live loads, etc.*
About the Institute

National Institute of Building Sciences

In establishing the National Institute of Building Sciences, the United States Congress created a unique organization that brings together representatives of regulatory agencies, legislators and representatives of the private sector for free and open discussion of building industry issues to seek consensus solutions to problems of mutual concern. For more than 40 years, the Institute has served as an interface between the government and the private sector with a mission to serve the nation and the public interest by supporting advances in building science and technology to improve the built environment.

As a non-profit, non-governmental organization, the Institute collaborates with representatives of government, the professions and the industry, labor and consumer interests to focus on the identification and resolution of problems and potential problems that hamper the construction of safe, affordable structures for housing, commerce and industry throughout the United States. The Institute provides an authoritative source of advice for all sectors of the economy with respect to the use of building science and technology.

Institute Board of Directors

Chair: James “Tim” T. Ryan, CBO, City of Overland Park Kansas
Vice Chair: Stephen Ayers, FAIA, Architect of the Capitol, Washington, DC
Secretary: Joy Marshall Ortiz, AIA, The Marshall Group
Treasurer: Wally E. Bailey, City of Fort Smith, Ark.

Cindy Davis, CBO, Virginia Department of Housing & Community Development
Joseph Donovan, Beacon Capital Partners
Cheryl R. English, FIES, LC, Acuity Brands
Richard Hayter, PE, Kansas State University
Timothy H. Haahs, PE, AIA, Timothy Haahs
Cheryl R. English, FIES, LC, Acuity Brands

Building Enclosure Technology and Environment Council

The Building Enclosure Technology and Environment Council (BETEC) is a voluntary membership council of the National Institute of Building Sciences. BETEC is charged with encouraging optimum energy use of buildings through a better understanding of how overall, complex building components interact with each other and with the environment. BETEC fosters public/private cooperation for environmental quality and energy efficiency in buildings. BETEC-developed publications such as the Building Envelope Design Guide (BEDG) are available on the WBDG Whole Building Design Guide®, www.wbdg.org. Through a cooperative agreement with the American Institute of Architects, BETEC has formed and organized Building Enclosure Councils in numerous U.S. cities.

BETEC Board of Directors

Chair: Judd A. Peterson, AIA, Judd Allen Group
Vice Chair: Theresa Weston, Dupont Building Innovations
Secretary: Whitney Okon, Assoc. AIA, Applied Building Sciences (Chair – BEC-Charleston)
Wagdy A. Anis, Anis Building Enclosure Consulting
David Bates, AIA, OAC Services Inc.
Paul Bertram, Kingspan Insulated Panels
Mark Bomberg, Syracuse University (Honorary Member)
Justin Boone, AIA, Wiss, Janney, Elstner Associates Inc. (Chair – BEC-Houston)
Charles Cottrell, North American Insulation Manufacturers Association
Laverne Dalgleish, Building Professionals Consortium
Andre Desjarlais, Oak Ridge National Laboratory
Craig Drumheller, NAHB Research Center
David Herron, Herron + Partners (Honorary Member)
Richard Keleher, AIA, Richard Keleher, Architect
Kevin Kelly, Jay-K Lumber (Honorary Member)
Ann Kosmal, U.S. General Services Administration (Ex-Officio Member)
Jan Kosny, Fraunhofer Center for Sustainable Energy Systems CSE
Dudley McFarquhar, PhD, PE, McFarquhar Group (Chair – BEC-Dallas)
Ray McGowan, National Fenestration Council
Robert Magoon, NAVFAC Mid-Atlantic
Peter Nelson, PE, Simpson Gumpertz & Heger
Larry Ray, AIA, Consultant
Brian Stroik, Oskar J. Boldt Construction
Co-Chair – BEC-National
Scott Taylor, Construction Specifications Institute – Cleveland Chapter
Steven Thorsell, ICC Evaluation Service Inc.
Theresa Weston, PhD, Dupont Building Innovations
David Yarbrough, PhD, R&D Services
Herbert Yudenfriend, My-Lite Corp.

Building Enclosure Council – National

The Building Enclosure Council – National (BEC-National) facilitates a network of affiliated architects, engineers, contractors, manufacturers and others located in major cities across the United States. The local Councils provide a forum for the construction industry to address building enclosures—the exterior systems of buildings that play such a critical role in building performance and energy efficiency. BECs offer industry professionals an opportunity to exchange valuable information relating to successful building enclosure design through meetings and sharing of resources. BEC-National was established as an initiative of the National Institute of Building Sciences Building Enclosure Technology and Environment Council (BETEC) and the American Institute of Architects.

BEC Leadership

BEC-National
Brian Stroik, The Boldt Company
Whitney Okon, Applied Building Sciences, Inc
Justin Boone, Wiss, Janney, Elstner Associates, Inc.
Dudley McFarquhar, McFarquhar Group Inc.
Cheryl Smith, Cope Linder Architects
Fiona Aldeus, Wiss, Janney, Elstner Associates, Inc.

BEC Chapter Chairs

Albuquerque: Gordon Berch, Jaynes Corporation; Gerson Bers, Co-Chair
Atlanta: Charlie Bailey, Dryvit Corporation
Austin: Matt Carlton, Wiss, Janney, Elstner Associates, Inc.
Baltimore: Anne Hicks Harney, Ayers Saint Gross; Dan McKevel, Co-Chair
Boston: Brian H. Neely, Gale Associates, Inc.; Anita Simon, Co-Chair
Charleston: Kenneth Huggins, AIA, Ken Huggins Architects
Chicago: Sara Flock, Raths, Raths & Johnson, Inc.
Cleveland: Ed Taylor, Technical Assurance; Nathan Gamber, Co-Chair
Columbus: William Babington, Studio NYL
Dallas: Dudley McFarquhar, McFarquhar Group Inc.; Brian McKay, Co-Chair
DC: Anthony J. Nicostratos, Simpson Gumpertz & Heger
Detroit: Meredith McLellan, SmithGroup IJR
Houston: Joe Fong, Walter P Moore
Kansas City: David Ford, Walter P Moore
Los Angeles: Judson Taylor, Simpson Gumpertz & Heger
Middle Tennessee: Rick Ziegler, Smith Beckman Reid
Minnesota: Steven Doggett, Built Environments, Inc.; Dave Pederson, Co-Chair
Nebraska: Lenora A. Isom, City of Ashland Nebraska
New York City: Sean O’Brien, Simpson Gumpertz & Heger; Gregory Xikes, Co-Chair
Philadelphia: Cheryl Smith, Cope Linder Architects; Joseph DeAngelis, Co-Chair
Portland: Marty Houston, Walsh Construction Co.
Research Triangle Park: Blake Talbott, Answers for Architecture, LLC
San Antonio: Adam Matthey, Chamberlin Roofing & Waterproofing; Erik Murray, Co-Chair
San Francisco: Christopher Decarreau, Share
St. Louis: John Corson, Simpson Gumpertz & Heger
Tampa Bay: Bob Bitterli, The Ivy Group
Utah: Patrick McLaughlin, MHTN
Western Pennsylvania: Jefi Light, MacLachlan, Cornelius & Filoni, Architects and Planners
Wisconsin: Joe Schultz, KahlerSlater Inc.; Brian Stroik, The Boldt Co., Co-Chair

THE FOURTH BEST CONFERENCE BUILDING ENCLOSURE SCIENCE & TECHNOLOGY
Complete Resources for the Construction Industry

When people in the building industry have questions about design, management, operations and maintenance they go to the National Institute of Building Sciences WBDG Whole Building Design Guide® at www.wbdg.org.

WBDG is one of the largest, most comprehensive online resources in the building construction industry. This web-based portal contains design, construction and facility management information and criteria required by U.S. military and other federal agencies.

**WBDG Whole Building Design Guide:**

- Uses the integrated, whole-building approach to programming, design, construction, operations and maintenance
- Covers a wide range of topics, from sustainability and security to accessibility and historic preservation
- Links information across industries and disciplines
- Is organized into three main categories: Design Guidance, Project Management, and Operations and Maintenance
- Offers a Continuing Education (CE) program for design and facility management professionals

Access the **Building Envelope Design Guide (BEDG)** Today!

**Building Envelope Design Guide (BEDG)**

When you are looking for design guidance for high-performance assemblies, the Building Envelope Design Guide (BEDG) – featured on the WBDG – is your go-to source.

The BEDG is a comprehensive guide for exterior envelope design and construction for institutional and office buildings that covers below-grade, wall, fenestration, roofing and atria systems and includes links to related WBDG Resource Pages.
SOPREMA® offers a comprehensive line of roofing, waterproofing, wall protection and civil engineering solutions combining superior products and systems with decades of proven performance. Our solutions include industry leading SBS-modified bitumen membranes, polymeric PMMA/PMA liquid-applied membranes, and synthetic single ply PVC membranes. For applications as diverse as roofing, below grade waterproofing, plaza deck and balcony waterproofing, air and vapor barriers, and bridge and parking structures, SOPREMA has the solution. SOPREMA's relentless pursuit of technological advancement, sustainability and product quality has been known and respected around the world for over 100 years.

AIR & VAPOR BARRIER PRODUCTS:

**sopraseal® stick vp**
Self-adhered vapor-permeable air barrier membrane used in wall construction

**sopraseal® 1100t**
Self-adhered air/vapor barrier membrane with a three-ply woven polyethylene surface

*Featured in picture above*

For more information on SOPREMA wall systems visit www.soprema.us.
Join us in 2016 as the National Institute of Building Sciences concentrates on *Achieving a Resilient Future* during this fourth Annual Conference and Expo. Plan to be there where *Science meets Design™* for a compelling program featuring various symposia presented by the Institute’s councils and committees. Don’t miss the chance to see the Institute in action and collaborate with building industry professionals. During the week, the entire team of building professionals will find insights into designing and constructing sustainable and resilient buildings, infrastructure and communities that are safe, secure and able to withstand and recover from natural and man-made disasters. Credit-building educational sessions, idea-sharing networking events, inspiring award ceremonies and a products expo are all on the Conference schedule.

**Sponsorship, Exhibitor and Advertising Opportunities Available!**
Call 202-289-7800 or email nibs@nibs.org for more information.

**FIND OUT MORE AND SIGN UP FOR UPDATES:**
[www.nibs.org/conference2016](http://www.nibs.org/conference2016)