



National Institute of  
**BUILDING SCIENCES™**

# 2019

**ANNUAL REPORT**  
to the President  
of the United States

Innovative Solutions for the Built Environment



**ABOUT NIBS**

- 6 Strategic Plan
- 8 Board of Directors
- 9 NIBS Staff

**MEMBER SPOTLIGHT**

- 11 Membership Overview
- 12 Organizational Members
- 13 Member Spotlight

**INDUSTRY SOLUTIONS**

- 16 Climate's Changing, and We've Got to Keep Up
- 20 Mapping the Future of Building Information Modeling and Management
- 23 Where It All Starts: Workforce
- 26 Increasing Focus on Alternative Construction Methods
- 27 Keeping the Nation's Built Environment Secure
- 28 Evidence-Based Design and Research in Practice
- 30 It Takes a Team: The Importance of Collaboration

**INDUSTRY ENGAGEMENT**

- 33 Association Collaboration
- 35 Women Executives in Building Summit
- 36 Annual Conference
- 39 ASAE's Power of A Awards

**COUNCILS AND COMMITTEES**

- 41 Building Enclosure Technology and Environment Council/Building Enclosure Councils
- 41 BRIK Advisory Council
- 42 buildingSMART alliance®
- 42 Building Seismic Safety Council
- 42 Consultative Council
- 43 Commercial Workforce Credentialing Council
- 43 Council on Finance, Insurance and Real Estate
- 44 Facility Maintenance and Operations Committee
- 44 Multi-Hazard Mitigation Council
- 45 Off-Site Construction Council
- 45 WBDG Advisory Committee

**MOVING FORWARD**

- 47 Workforce
- 49 Promoting Resilient Communities
- 51 Technology
- 52 2019 Financial Statements
- 54 To Our Dedicated and Hard Working Members – We Thank You
- 55 Member Spotlight



**Joseph B. Donovan**

Dear Mr. President:

The National Institute of Building Sciences is pleased to provide you with this Annual Report to the President of the United States to highlight the work that NIBS has conducted over the past year to help improve the safety, performance and resilience of the nation's buildings and communities.

In 2019, NIBS stayed true to the objectives outlined in our enabling legislation, continuing the mission to provide an open forum for discussion among the various facets of the building sectors.

NIBS continues to establish performance criteria, standards and other technical provisions to maintain life safety, health and public welfare. We develop recommendations suitable for adoption by the jurisdictions and agencies that regulate buildings, including test methods and other evaluative techniques relating to building systems, subsystems, components, products and materials with due regard for addressing consumer problems. Our councils and committees engage with private organizations, institutions, agencies and federal, state, local and other governmental entities, giving particular attention to the development of methods that encourage representation from all sectors of the economy and ensure national interests are protected and promoted for the best results.

2019 was a year of reconnection. We spent a great part of the year, uniting and reengaging 75 different organizations that represent this incredible industry. Convening these experts, building officials, researchers, and partners is no small task, but it was essential. Strengthening these relationships ensures our built environment remains on solid ground.

At the start of 2019, NIBS released the report, Natural Hazard Mitigation Saves: 2018 Interim Report, which updates and expands the multi-year study, Natural Hazard Mitigation Saves. The original study was developed by the Multi-Hazard Mitigation Council (MMC) in 2005 for the Federal Emergency Management Agency (FEMA). This interim report provides local, state and federal entities with necessary data to implement a more robust system of protection for their communities. This information also helps raise the understanding of homeowners, businesses and industry so they can select cost-effective measures to protect their property and assets.

By mid-year, the Mitigation Saves study and another project – the National Earthquake Hazards Reduction Program (NEHRP) Recommended Seismic Provisions – received Power of A Silver Awards from the American Society of Association Executives. The Power of A Summit Awards are ASAE's highest honor for associations that go above and beyond their everyday mission to undertake initiatives that benefit America and the world.

We are honored for the silver level recognition, on behalf of so many who contributed countless hours to these important and successful projects. We hope for continued collaboration, as this work truly is never complete.

For example, our Consultative Council includes a broad base of agencies and organizations knowledgeable in the field of building technology. Council representatives come from private, trade, professional and labor organizations; private and public standards, code and testing bodies; public regulatory agencies; and consumer groups. This council continues to provide guidance and recommendations in areas of importance to the nation and the building industry. At the back of this annual report, you will find the 2019 Report, Moving Forward: Findings and Recommendations from the Consultative Council, which offers a look at various ways to improve the performance of the nation's existing building stock. Our Council breaks down three critical areas within the built environment: resilience, technology and workforce. It is our hope that this Moving Forward report initiate a broader discussion about the future of the industry and its workers.

Throughout 2019, NIBS initiated and continued several projects designed to shape the future of the organization and set in place a greater strategic plan to achieve success for the building community.

We remain committed to leading and addressing the demanding issues that face our built environment. We stand ready for what's to come.

Thank you for this opportunity to share our work with you.

Sincerely,



Joseph B. Donovan  
Chair, Board of Directors



Lakisha A. Woods, CAE  
President and CEO



Lakisha Ann Woods, CAE

## About NIBS

The four walls that you surround yourself with – whether it’s your home, office or out in your community – need to be safe, structurally sound and sustainable. We’re those people.

The National Institute of Building Sciences brings together industry experts in building science, construction and government to lead conversations and find solutions for the built environment. We want to make sure you and your loved ones remain safe in your surroundings.

In 2019, the NIBS Board of Directors developed a new three-year vision, mission and strategic plan to help guide the organization.



### VISION

Improving lives through collaboration to integrate science into the built environment.



### MISSION

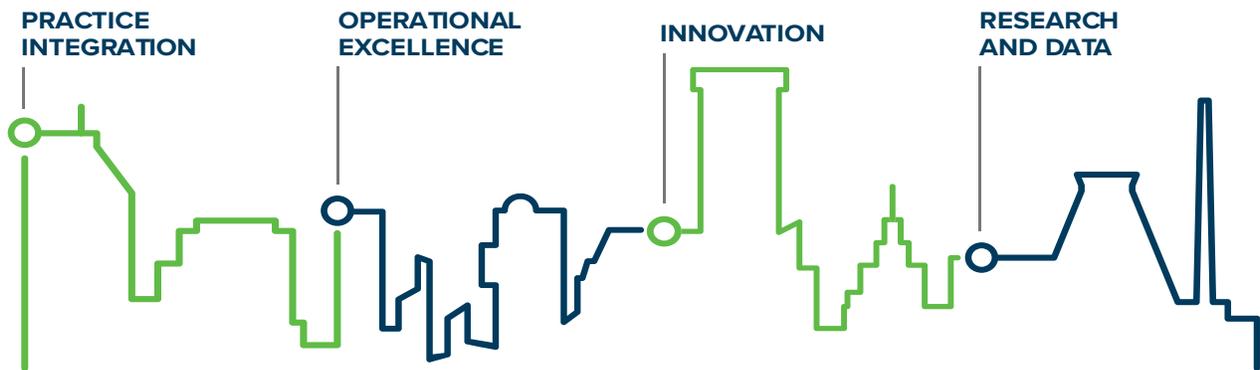
To serve the public interest by advancing building science and technology to improve the built environment.

## Strategic Plan

The plan includes four major categories, each with a separate goal and multiple objectives to achieve maximum impact on the built environment. These categories include practice integration, operational excellence, innovation, and research and data.

The goal of practicing integration is to facilitate cooperation across industry segments to integrate science and technology into the built environment. This will require fostering collaboration among influential people, public and private organizations, industry associations, academic institutions, and federal agencies, including policy makers and thought leaders. It also will require developing a partnership strategy that fosters engagement with NIBS stakeholders.

Under operational excellence, NIBS aims to enhance its organizational norms and expectations to drive efficiency and effectiveness. The approach is four-pronged: diversifying the organization’s business model; enhancing communication of outcomes, impact and value to increase awareness and adoption of innovative solutions; evaluating our programs to maximize stakeholder engagement and perceived value; and validating and enhancing a pricing strategy for products and services. This may be the toughest part of the overall strategic plan, but it’ll be the most important for the longevity and vitality of operations.



With regard to innovation, the goal is to foster new ways to deliver solutions for those who work, manage, and drive performance and sustainability in the built environment. The keys to this innovation involve advancing ideas within the building industry through solution-driven research. Reinvigorating our councils and committees to serve as centers of innovation also is a crucial step in this part of the strategic plan.

Finally, the best research leverages evidence and information to advance the national dialogue on building sciences and technology. Successfully sharing research requires translating data to support the application of research findings within the built environment and developing and promoting research that supports science and technology.

With these actions, NIBS will achieve broader recognition as a trusted, unbiased convener of government and industry officials to come together as partners. NIBS also will achieve greater balance: A more diversified and balanced portfolio of programs, products and services and sustainable business model that provides flexibility for the organization to carry out mission-driven activities.

## INDUSTRY CONNECTIONS



NIBS team member Jiqiu Yuan attended a stakeholder discussion on regulatory barriers to affordable housing, hosted by U.S. Department of Housing and Urban Development and Secretary Benjamin S. Carson in December.

## Board of Directors

The National Institute of Building Sciences Board of Directors is comprised of 21 members. The President of the United States, with the advice and consent of the Senate, appoints six members to represent the public interest. The remaining 15 members are elected from the nation's building community and include both public interest representatives and industry voices. A majority of Board members is required by the authorizing legislation to be in the public interest category.

### CHAIR

**Joseph B. Donovan**

Beacon Capital Partners, Bluemont, VA

### VICE CHAIR

**Carl Hedde**

One Concern, Yardley, PA

### TREASURER

**Anne M. Ellis, P.E., FACI, F. ASCE**

Anne Ellis, LLC, McLean, VA

### SECRETARY

**Thomas Izbicki, P.E., FSFPE**

Rolf Jensen & Associates, Inc., McKinney, TX

### MEMBERS

**Lane J. Beougher, FAIA, FCSI, LEED AP BD+C**

Ohio Facilities Construction  
Commission, Columbus, OH

**Paul R. Bertram, Jr., FCSI, CDT, LEED AP, BD+C**

PRB Connect, Casselberry, FL

**Charlie (Chuck) D. Curlin, Jr., P.E., CEM, CPD**

Shultz Engineering Group, Charlotte, NC

**Brian E. Garbecki, P.E., LEED AP**

Gilbane Building Company, Hampden, MA

**Timothy H. Haahs, P.E., AIA**

Timothy Haahs & Associates, Blue Bell, PA

**Brian Larson, P.E.**

Stantec Consulting Services, Inc., Endicott, NY

**Russell Manning, PhD, LEED AP, CEFP, CRL**

Kaiser Permanente, Denver, CO

**Susan A. Maxman, FAIA**

Philadelphia, PA

**Scott A. McDonald, CPM, CBO**

City of Denton, Denton, TX

**Daniel E. Nichols, P.E., IAAI-FIT**

State of New York's Metropolitan  
Transportation Authority, Hyde Park, NY

**Thomas H. Phoenix, Sr., P.E., FASHRAE, LEED AP**

CPL Architects and Engineers, Greensboro, NC

**Donald L. Pratt**

Wake Pratt Construction Co, Auburn Hills, MI

**Darrell X. Rounds, FMA, CEM**

General Motors Company, Westland, MI

**James "Tim" T. Ryan, CBO**

Overland Park, KS

**Dominic Sims**

International Code Council, Birmingham, AL

**James Timberlake, FAIA**

KieranTimberlake, Philadelphia, PA

**Mary B. Verner, MES, JD**

Washington State Department of  
Ecology, Chehalis, WA

# NIBS Staff

## EXECUTIVE OFFICE

**Lakisha A. Woods, CAE**

President and CEO

**Jennifer Hitzke**

Executive Assistant and Board Liaison

## ADMINISTRATION

**Rebecca Liko**

Vice President of Finance & Controller

**Jeanne Woodhouse**

Accounting Manager

**Sarah Swango**

Senior Director, Business Development

**Kristen Petersen**

Managing Director, Marketing and Communications

**Christine Cube**

Social Media and PR Specialist

**Martha A. Smith**

Receptionist and Office Manager

## TECHNICAL PROGRAMS

**Drew N. Rouland, PMP, CSM**

Vice President

**Roger J. Grant**

Executive Director, BIM

**Jiqiu “JQ” Yuan, PhD, PE, PMP**

Executive Director, MMC & BSSC



**Stephanie Stubbs, Assoc. AIA, PMP**

Program Director, FLM

**Dominique Fernandez**

Project Director

**Kyle Barry, PMP**

Project Manager

**Ric Byrd**

BIM Manager

**Todd Stevens**

BIM Manager

**Bob Payn**

Senior Director, Information Technology

**DeeDee Banks**

Web Production Specialist

**Marisa Webre**

Graphic Designer

# MEMBER SPOTLIGHT



# Membership Overview

The National Institute of Building Sciences serves the public interest by advancing building science and technology to improve the built environment.

This is the only place that brings together a unique group of building industry professionals – whether it’s government, nonprofit, public and private sector or the educational world – NIBS aims to develop solutions to the challenges within the built environment.

Our members are critical to this work. Members develop and implement technical and procedural improvements through collaboration on our councils, committees, events and programs.

Membership provides access to weigh in on a great number of projects that shape the future of our communities.

There are a variety of ways to participate as a member, including individual membership levels, organizational membership levels, and sponsorship.

## NIBS MEMBERSHIP BREAKDOWN



### Individual Members

**72%** Public Interest

**28%** Industry Sector

Architects, Engineers, Facility Managers, Code Officials, University Faculty and Students



### Organization Members

**90%** Member Organizations

**10%** Sponsor Organizations

Government Agencies, Associations, Non-Profits, Corporations and Research Institutions

## Organizational Members

### ALLIANCE SPONSOR ORGANIZATION

Dodge Data and Analytics  
FM Global  
NBBJ

### SILVER SPONSOR ORGANIZATION

U.S. Department of Veterans Affairs

### CONTRIBUTING ORGANIZATION

Gilbane Building Company

### SUSTAINING ORGANIZATION

AABC Commissioning Group (ACG)  
American Concrete Institute  
American Institute of Steel Construction  
American Iron & Steel Institute  
American Wood Council  
APA - The Engineered Wood Association

Architect of the Capitol  
ASHRAE  
Building Owners & Managers Assoc., Intl.  
Charles Pankow Foundation  
Component Assembly Systems  
Concrete Masonry Association of California and Nevada  
Construction Specialties, Inc.  
General Motors Company  
Ice Edge Business Solutions  
Insurance Information Institute  
Insurance Institute for Business & Home Safety  
International Association of Plumbing and Mechanical Officials  
International Code Council, Inc.  
International Masonry Institute  
Jaros, Baum & Bolles  
McCarthy Building Companies, Inc.  
Methuen Construction Co., Inc.  
Modular Building Institute  
National Ready Mixed Concrete Association  
National Building Museum  
NAVFAC  
NCSEA  
NEBB  
NASA  
Portland Cement Association  
Professional Roof Consultants, Inc.  
RCI, Inc.  
SEAOC  
Site 1001, Inc  
Structural Engineering Institute  
Testing, Adjusting, and Balancing Bureau  
The Williams Companies, Inc.  
U.S. Green Building Council  
Underwriters Laboratories

### INDUSTRY CONNECTIONS



Why does synergy matter in disaster recovery, and who needs to be involved? A panel addressed this in late 2019, during a meeting organized by the International Code Council for a conference of the Texas General Land Office in Austin, Texas.

## Member Spotlight

### **JUSTIN BOONE, WJE HOUSTON, AIA**

BEC National Chair

Unit Manager and Associate Principal

WJE Wiss, Janney, Elstner Associates, Inc. Engineers | Architects | Materials Scientists  
Houston, Texas

NIBS membership is incredibly meaningful to me in my professional life. Being part of an organization that is dedicated to the betterment of the built world is a point of pride, and signals to our clients that we are committed to being a part of that important cause. More importantly, it has provided the opportunity to work with other like-minded professionals across the country through councils, such as BETEC and affiliated organizations like the Building Enclosure Councils. I have learned a great deal from the diverse membership of NIBS, and many of my mentors and closest colleagues were introduced to me through active participation in NIBS-related events. I have seen firsthand through my 12 years of involvement with BETEC and the BECs what a positive influence these cross-discipline organizations have had on the industry.

NIBS influences a wide-cross section of the building industry, including owners, developers, architects, engineers, consultants, contractors, sub-contractors, and manufacturers. They all have a seat at the table, and through their contributions foster a deeper understanding and collaboration between all of the diverse players that make up the interconnected world that is the construction industry. By fostering greater collaboration, providing quality educational opportunities, and raising the overall expectations and standards of the industry, NIBS is having a tangible positive impact on the quality of our structures, public safety, resiliency, environment, and economy. For these reasons, I am proud to be a part of this organization, and hope to continue contributing in my own small way to its continued success.



**WJE** | ENGINEERS  
ARCHITECTS  
MATERIALS SCIENTISTS

**Wiss, Janney, Elstner Associates, Inc.**



# INDUSTRY SOLUTIONS

# Overview

Some of the most important built environment issues in 2019 focused on climate resiliency, building information modeling/management (BIM), workforce development, alternative construction methods, evidence-based design/research in practice, security preparedness and industry collaboration.

Every piece is critical toward the mission of safety, sustainability, innovation and security of our nation's built environment. They also tie back to NIBS' strategic plan, and the priorities we've set for the organization. Here are some of the solutions that we worked on in 2019.





# CLIMATE'S CHANGING AND WE'VE GOT TO KEEP UP

Climate change plays an important role in the built environment. Weather changes and natural disasters regularly test the innovation and resiliency of new and existing building stock.

Some disaster prevention spending reaps higher rewards than others, reports the *Scientific American* in a mid-2019 story. It found, for example, that protecting against flood and wind yields higher average benefits than fire and earthquakes.

24/7 Wall St. published a special report on the best and worst prepared states for weather emergencies, quoting NIBS' *Mitigation Saves* report on hazard mitigation.

Pew Charitable Trusts also reported an extensive story in June 2019, taking NIBS' *Mitigation Saves* research and calculating mitigation savings in a state-by-state map of the country. Pews' analysis of our research broke down how much states stand to benefit from disaster mitigation investments.

In 2019, the Multi-Hazard Mitigation Council (MMC) continued with and completed the most expansive version of the *Natural Hazard Mitigation Saves* study. MMC looked specifically at the benefits of upgrading existing buildings.

This version of the *Mitigation Saves* report was funded by the U.S. Department of Housing and Urban Development (HUD). It found the United States could cost-effectively invest \$500 billion to retrofit existing building stock with

specific mitigation measures, saving society more than \$2 trillion. Later in 2019, MMC began a case study with the Port of Portland (Oregon) to look into the benefit of a seismically resilient runway for Portland International Airport.

NIBS also provided scientific information and research findings from the Mitigation Saves report, upon the request of U.S. Senator Michael Bennet’s office and the Joint Committee on Taxation related to the Shelter Act.

	ADOPT CODE	ABOVE CODE	BUILDING RETROFIT	LIFELINE RETROFIT	FEDERAL GRANTS
 <b>Overall Benefit-Cost Ratio</b>	<b>11:1</b>	<b>4:1</b>	<b>4:1</b>	<b>4:1</b>	<b>6:1</b>
<b>Cost (\$ billion)</b>	<b>\$1/year</b>	<b>\$4/year</b>	<b>\$520</b>	<b>\$0.6</b>	<b>\$27</b>
<b>Benefit (\$ billion)</b>	<b>\$13/year</b>	<b>\$16/year</b>	<b>\$2200</b>	<b>\$2.5</b>	<b>\$160</b>
 <b>Riverine Flood</b>	<b>6:1</b>	<b>5:1</b>	<b>6:1</b>	<b>8:1</b>	<b>7:1</b>
 <b>Hurricane Surge</b>	not applicable	<b>7:1</b>	not applicable	not applicable	not applicable
 <b>Wind</b>	<b>10:1</b>	<b>5:1</b>	<b>6:1</b>	<b>7:1</b>	<b>5:1</b>
 <b>Earthquake</b>	<b>12:1</b>	<b>4:1</b>	<b>13:1</b>	<b>3:1</b>	<b>3:1</b>
 <b>Wildland-Urban Interface Fire</b>	not applicable	<b>4:1</b>	<b>2:1</b>	not applicable	<b>3:1</b>

Copyright © 2019 The National Institute of Building Sciences

**BUILDING RESILIENCY AGAINST EARTHQUAKES**

In response to the heightened focus on achieving community resilience included in the most recent reauthorization of the National Earthquake Hazards Reduction Program (P.L.115-307), the National Institute of Standards and Technology (NIST) and Federal Emergency Management Agency (FEMA) formed a committee of experts to develop options to improve the performance of the built environment and critical infrastructure to enable a speedy return to service, following an earthquake. CEO Lakisha A. Woods, CAE, was invited to serve on the project review panel to provide input and feedback on the functional recovery report.

Also in 2019, NIBS’ Building Seismic Safety Council approved and finalized a resource paper -- Resilience-Based Design and the NEHRP Provisions. This comprehensive resource paper was developed to address the relationship between future NEHRP Provisions and resilience-based design. It recognizes the role to be played by building codes and standards in providing design criteria related to functional recovery. The paper is part of a much larger, multi-year effort that began in 2016 – the 2020 NEHRP Recommended Seismic Provisions for New Buildings and Other NEHRP Provisions.

This massive project involves over 130 national experts and is being supported by FEMA. A total of 50 code change proposals have been developed and many were approved and finalized in 2019. These include 25 code change proposals vetted by 37 BSSC member organizations, representing the construction materials industry, building owners, earthquake research institutes, architects, and government agencies.

Lastly, in 2019, BSSC also wrapped a collaborative effort known as Project 17. A joint committee of the U.S. Geological Survey, FEMA, and BSSC volunteers and staff was formed in January 2015 through 2018 to conduct this project.



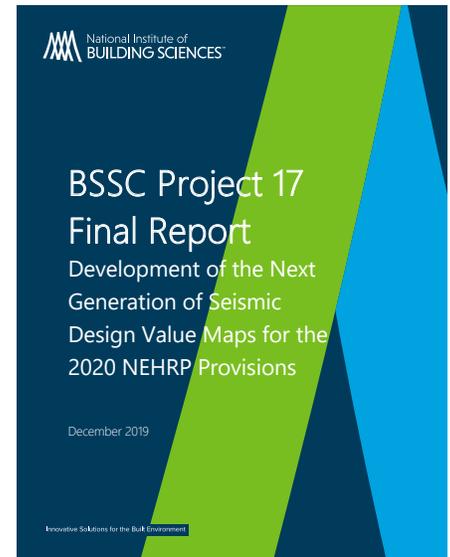
The aim was to make recommendations for next-generation seismic design value maps, using information from USGS national seismic hazard models. These recommendations were developed for adoption by the 2020 (NEHRP Provisions), ASCE/SEI 7-22 and the 2024 International Building Code. By the end of 2019, all mapping-related proposals were vetted and approved, and the Project 17 final report was published. An online tool to check the 2020 NEHRP Provisions Seismic Design Values also was launched.

These are just some of the projects that fall under climate resiliency. But climate change affects many spaces within the built environment, and its reach includes other critical priorities, namely, poverty.

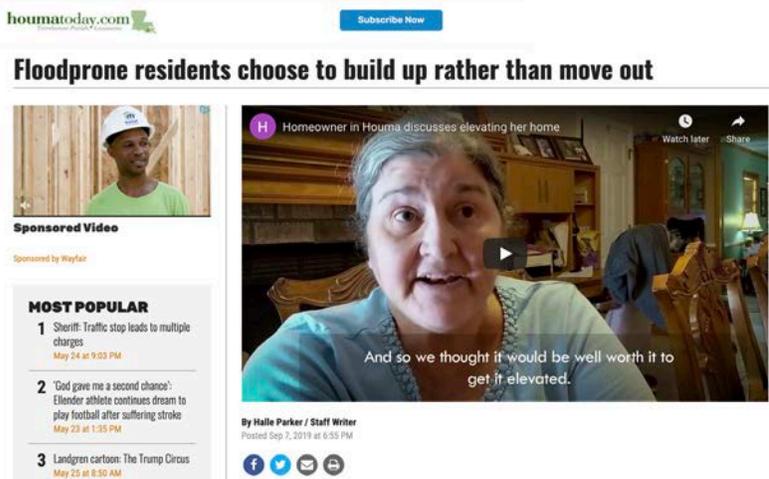
**SCIENTIFIC RESOLUTIONS AND THE FIGHT AGAINST GLOBAL POVERTY**

The Center for American Progress reported on the dual crises of diminishing affordable housing and rising homelessness in August 2019. The story was entitled, The Perfect Storm.

“The loss of housing in low-income communities due to extreme weather events such as Hurricane Michael, which killed 49 people and caused more than \$25 billion in damage, further compounds the nationwide affordable housing crisis,” writes authors Guillermo Ortiz, Heidi Schultheis, Valerie Novack, and Aleah Holt.



**CLIMATE NEWS**



Houma Today reported a story in September 2019 using Mitigation Saves research. Specifically, it cited federally funded grants to acquire or demolish flood-prone buildings.

NIBS took on its first study for the Millennium Challenge Corporation (MCC), an innovative and independent U.S. foreign assistance agency helping to lead the fight against global poverty, in 2019.

The purpose of this series of studies is to identify, evaluate, and document top-level considerations MCC could adopt for use in the planning, design, construction, operation, maintenance, and resilience of buildings funded through its programs. The resilience portion of the studies covers macro and micro levels of concern.

Also in 2019, NIBS continued its Scientific Resolution Panel (SRP) work with FEMA.

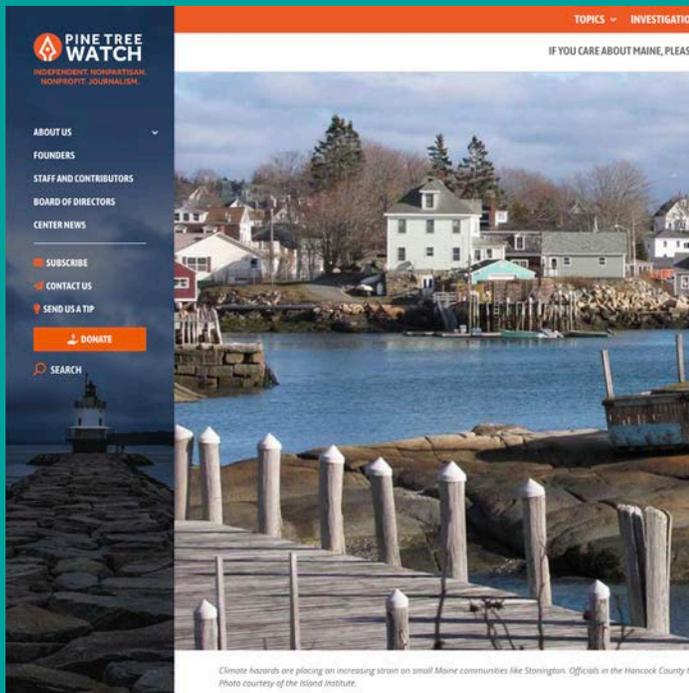
SRPs are independent panels of experts in hydrology, hydraulics, and other pertinent sciences established to review conflicting scientific and technical data and provide recommendations for resolution. An SRP is an option after FEMA and a local community have been engaged in a collaborative consultation process for at least 60 days without a mutually acceptable resolution of the appeal.

In 2019, NIBS was asked to convene two SRPs – a Riverine Appeal for the Township of Wayne, in Passaic County, New Jersey located in FEMA Region II and a Coastal Appeal for the Town of Kiawah Island, in Charleston County, South Carolina located in FEMA Region IV. The Township of Wayne Panel held a kick-off meeting in early fiscal 2019 and delivered its final report and determination, within the SRP’s statutory 90-day review and evaluation period, in mid-February 2019. The Kiawah Island SRP initiated its kick off in February 2019 and delivered its consensus report and rationale to the community and FEMA in late April 2019.

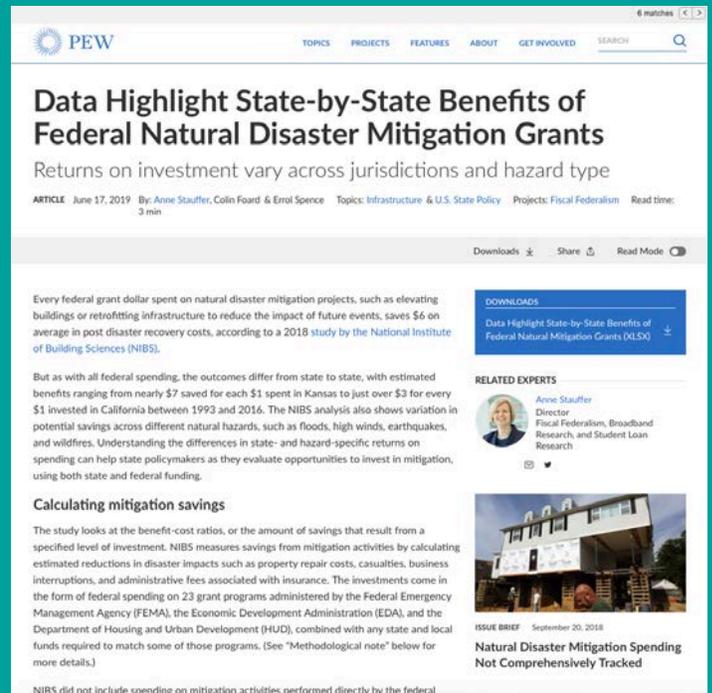
In 2020, NIBS will convene SRPs on an as-needed basis to address community appeals and/or FEMA concerns and update the SRP website with an intended release during Building Innovation 2020. By late 2019, FEMA forwarded two coastal and three riverine Scientific Resolution Panel requests to NIBS.

Climate change resiliency is just one major concern for the building industry. Another issue of increasing importance in the role of building information/management, or BIM.

## IN THE NEWS



Pine Tree Watch reported a story using NIBS research about mitigating potential disasters. "Most communities only have access to federal help following disasters," Pine Tree Watch reported.



Pew Charitable Trusts reported an extensive story in June 2019, taking Mitigation Saves research and calculating state-by-state mitigation savings.



# MAPPING THE FUTURE OF BUILDING INFORMATION MANAGEMENT

The building environment of the future lies in effective building information modeling (BIM).

“The U.S. certainly doesn’t lack a BIM culture,” reports ENGINEERING.com, in a story about why the U.S. won’t follow the UK’s lead on BIM from May 2018. “But, in the absence of federal regulation on BIM, the culture has evolved piecemeal, driven by local governments, individual agencies, and even agencies in the private sector.”

But the lack of a federal mandate hasn’t slowed BIM’s adoption, reports Construction Dive in a story entitled, *The U.S. has No BIM Mandate. Does It Matter?*

According to Construction Dive, research from the past 10 years shows steady growth in BIM adoption and implementation. In a recent study of U.S. non-residential contractors, including general contractors, construction managers and specialty trades, Dodge Data & Analytics found that 89% of respondents use BIM on at least some of their projects, with 47% reporting that they use BIM on more than half of their projects.

This translates into NIBS’ work with the buildingSMART alliance® (bSA), developer of the national computer-aided design (CAD) and BIM standards – the United States National CAD Standard® (NCS) and National BIM Standard–United States® (NBIMS-US™). In 2019, bSA assembled a planning committee to plan the next edition of the NBIMS and formed work groups to address NBIMS-US™ content, supporting tools and publication format for the planned update to the standard to be released in part in 2020.

The NCS Subcommittee anticipated completing the review of the NCS by early 2020 and will conduct a Project Committee ballot on proposed changes. The Construction-to-Operation Building information exchange (COBie) Committee reconvened to finalize COBie 3, which is due for release in 2020, as part of the updated NBIMS-US.

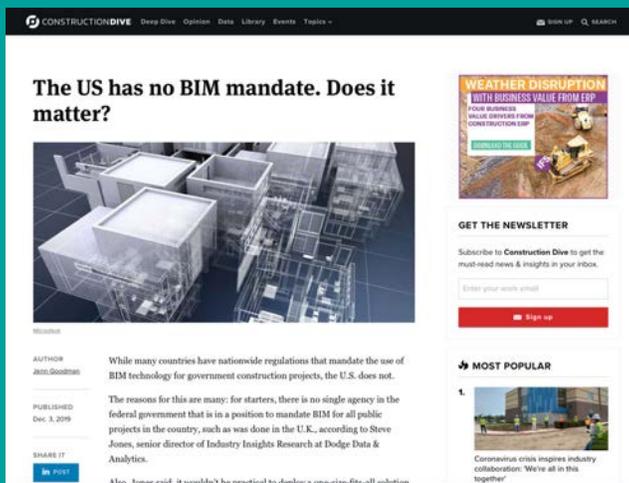


In other buildingSMART news, NIBS Executive Director of BIM Roger Grant led the buildingSMART International (bSI) Product Room and assisted with operations of the buildingSMART Data Dictionary (bSDD) to support connections between IFC and a wide range of building industry information to deploy procedures for harmonizing terminology used in models with applications and programs around the world. Grant was made a Fellow of buildingSMART International at its March 2019 Standards Summit.

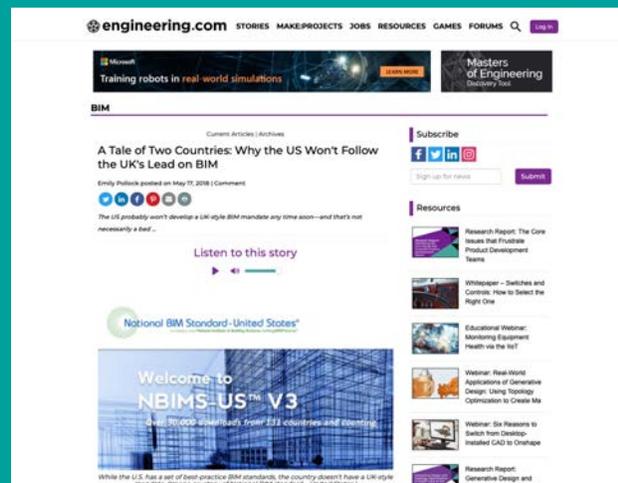
Advancing BIM for federal government facilities in 2019, NIBS worked on implementation of the BIM roadmap developed for the U.S. Department of State Overseas Building Operations (OBO). Following the roadmap, the NIBS project team helped OBO create integrated workflows for OBO space planning and asset management systems. In addition to data management support, the team worked with OBO to revise OBO BIM standards, create space plan templates for BIM, identify and implement integrated digital design review procedures, and develop record modeling practices for existing and historic buildings. NIBS will continue to support implementation of space planning, model authoring, design review, existing building record modeling and asset management BIM uses, while also continuing development of the OBO BIM Roadmap to encompass related construction and operations phase uses.

In addition to advancement of BIM for buildings, BIM is playing out in other places. An example of this: the nation's bridges.

## IN THE NEWS



While many countries have nationwide regulations that mandate the use of BIM technology for government construction projects, the U.S. does not, reports Construction Dive.



As BIM grows in popularity, there's a growing faction in the industry who think that in not setting a mandate, the U.S. is falling behind, reports ENGINEERING.com.

### SUPPORTING THE FEDERAL SECTOR

NIBS worked with the Federal Highway Administration (FHWA) and WSP, Inc. to complete the AASHTOWare-IFC integration and prepare bridge modeling demonstration projects for the Utah Department of Transportation. NIBS also provided advisory support on bridge model standardization to the AASHTO Subcommittee on Bridges and Structures (SCOBS) Technical Committee on Technology and Software (T-19) for a BIM for Bridges pooled fund project to continue to develop and deploy BIM for design and construction of bridges.

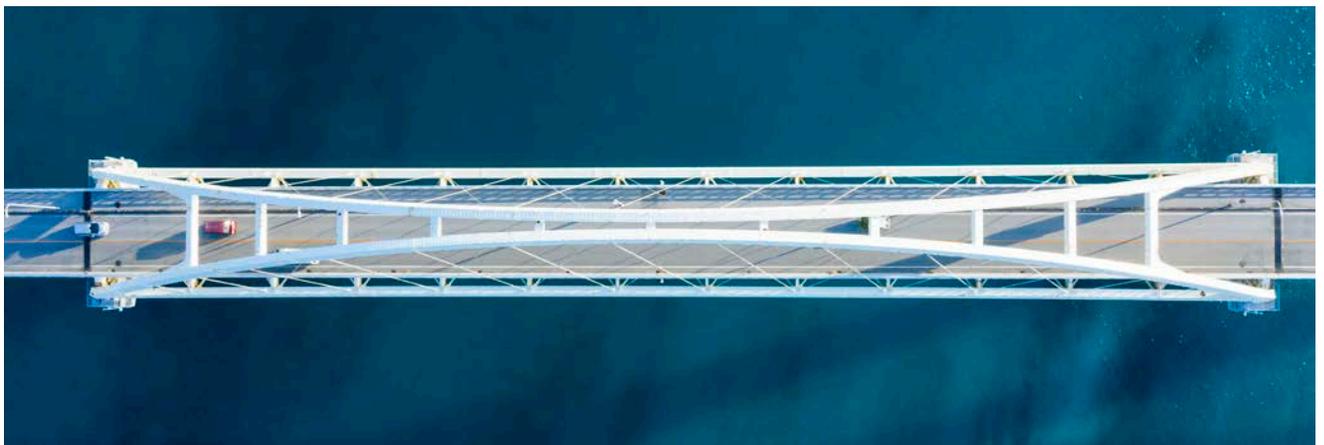
Expanding from bridges to roads, NIBS supported a FHWA Global Benchmarking Study on BIM for Infrastructure, organizing and participating in a study trip and report development.

NIBS also manages ProjNet™, a secure integrated, internet-based suite of design and construction tools, providing licensing support, overseeing hardware, software, networking, information assurance, programming and customer support activities.

During the second half of 2019, the ProjNet™ team updated the ProjNet.org Operating System (OS) to MS 2018 to meet United States Army Corps of Engineers (USACE) security requirements. In 2019, more than 29,000 public and private design and construction stakeholders worldwide used the accredited, secure, online project design and review tool. The ProjNet™ framework is widely used by federal and state agencies, private firms and education institutions.

The current ProjNet™ customer base distribution is 41 percent DoD agencies, 50 percent non-DoD agencies, and 9 percent non-federal agencies. In 2020, NIBS plans to migrate the current capability from its on-premise environment to the DoD-approved Microsoft Azure Government (MAG) cloud environment. Once the ProjNet™ system is migrated to the MAG cloud, a Federal Risk and Authorization Management Program (FedRAMP) accreditation plan will be developed so that ProjNet™ can be FedRAMP certified by the end of 2020. Additionally, the ProjNet™ Team anticipates completing the first phase of the ProjNet™ code modernization and work on a new ProjNet™ interface designed to provide a modern dashboard and new capabilities to the system while maintaining basic functionalities.

Supporting these projects brings the country closer to a stronger, more resilient – and technologically supportive – future built environment.





## WHERE IT ALL STARTS: WORKFORCE

We learned a lot in 2019 about the critical importance of workforce.

Frankly, it keeps you up at night, according to a CEO questionnaire of NIBS members. The questionnaire found that 80 percent of you say recruiting and new workforce is the singular most important issue keeping you up at night. This was followed by adapting to changing technology (65 percent), climate change (40 percent), and excessive regulations (20 percent).

It all starts with an uphill battle. We have an older workforce and labor shortages, and not enough attractive opportunities for high-schoolers looking for a career path. The image of working in the trades isn't glamorous, and it comes with a somewhat negative stereotype. It also hasn't received a ton of support from schools and/or communities.

"We need to stabilize pride," said CEO Lakisha A. Woods, CAE, during a meeting of the Consultative Council that discussed the importance of getting future workers to feel good about their career direction.

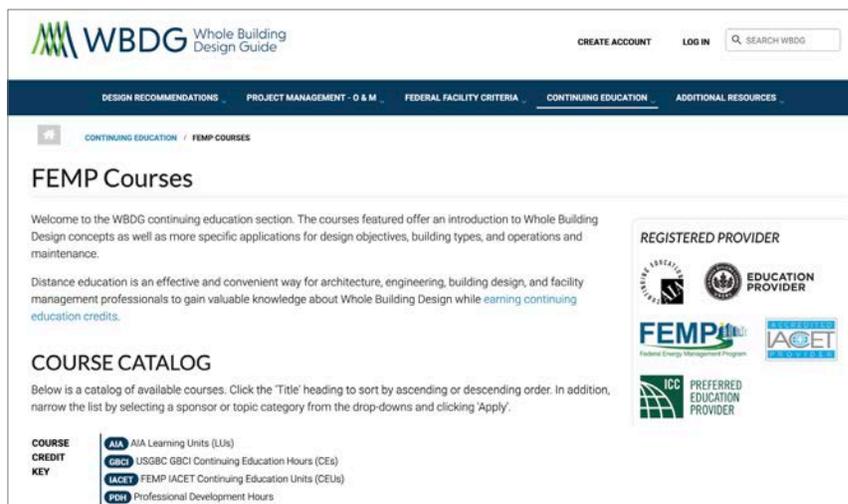
"When the trades were removed from schools, the industry did not effectively showcase the value and importance of the craft work that we do," she said. "You have to inspire people if you want to rebuild pride in the industry."

Automation and technology play a big part. Artificial intelligence ultimately is used to streamline certain building processes, but it quite literally has deleted some jobs.

How do we turn things around? We start with highlighting vocational and other training opportunities, discussing gender and racial disparity in the building industry and the need to recruit across the whole spectrum of available workers.

## CRITICAL TRAINING AND SUPPORT

NIBS' Building Enclosure Commissioning (BECx) workshops program is creating and delivering an 8-module series of workshops that will lead to a certificate, developed in cooperation with the ASTM and International Institute of Building Enclosure Consultants (IIBEC, formerly RCI). Two of the modules in this workforce area on increasing performance were delivered at Building Innovation 2019 in Washington, DC, in January, and three modules were delivered at the CxEnergy conference in Orlando in April. NIBS and our team of subject matter experts hope to find funding to complete the remaining three modules in 2020.



Additionally, NIBS supports the Federal Energy Management Program (FEMP), which provides live and on-demand training to foster and maintain a high-performance workforce that constructs, operates, and maintains energy-efficient and cost-effective federal facilities. The FEMP Workforce Development Program is accredited by the International Association for Continuing Education and Training (IACET).

NIBS supports the FEMP Workforce Development Program in the management of its accreditation, including ensuring

that the program as a whole, as well as each individual course, adheres to the policies and procedures required for that accreditation. As part of this accreditation, the NIBS Whole Building Design Guide serves as the host for all accredited FEMP training. All FEMP training hosted on the WBDG is provided at no cost to the public, and the WBDG serves as the record-holder for all individuals. In 2019, the FEMP Workforce Development Program received an award from the IACET as an Exemplary Training Organization.

Finally, in 2019, the Commercial Workforce Credentialing Council planned to support the DOE Better Buildings Workforce Guidelines (BBWG), through outreach with the public and private sectors, coordination with credentialing bodies on BBWG certifications and certificates and support for educational programs. The CWCC also planned to support Blast Protection Professional credentialing materials. Due to resource constraints at DOE and NIBS, these planned activities could not be pursued in 2019. Direction for the CWCC in 2020 is pending Board action.

## STRAIGHT TALK: WOMEN EXECUTIVES DISCUSS ISSUES AND STRATEGY

We closed 2019 with a new event aimed at opening doors to female executives who lead nonprofits within the built environment.



On Oct. 4, NIBS hosted the first Women Executives in Building Summit.

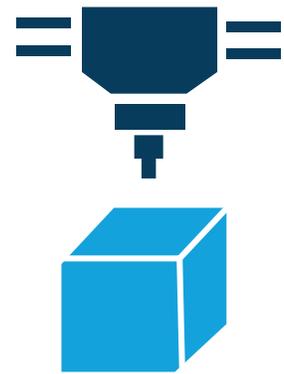
“It starts with us,” said CEO Lakisha A. Woods, CAE, “We have to talk with each other. Fifty-one percent of this country is female and over 90 percent of the building industry is male – there are not enough of us at this table.”

Woods was joined by a strong panel of CEOs to talk strategy and solutions around balancing work and family, reaching career counselors and youth in high school and college to recruit into the industry, and whether companies are doing a good job taking care of women entering the workforce.

The expert panel included Paula Glover, of the American Association of Blacks in Energy; Andrea Rutledge, with the Construction Management Association of America; and Dawn Sweeney, of the National Restaurant Association. The event was held at the restaurant association headquarters and attended by roughly 50 people.

The inaugural WEB summit was just the first of many steps in planning. Other WEB meetings being planned include a panel discussion that will take place at the Building Innovation Conference and Expo in August 2020.

**“We need to lead the change in the industry. Fifty-one percent of this country is female and over 90 percent of the leadership in the building industry is male – there are not enough of us at the table.”**  
-CEO Lakisha A. Woods, CAE.



## INCREASING FOCUS ON ALTERNATIVE CONSTRUCTION METHODS

Whether it's artificial intelligence, drone use in construction, 3D printing of building components – or the world's first 3D-printed neighborhood in rural Mexico – alternative construction methods really dominated headlines in 2019.

One of the most noteworthy developments was how modular building made major headway in the commercial construction market, reports Construction Dive.

In 2019, NIBS helped the General Services Administration's Office of Design and Construction to develop a workshop called "Innovations in Project Delivery."

This was the sixth year that NIBS worked with GSA to develop a reverse-industry workshop and subsequent guidance documents to enable GSA employees to better understand industry concerns and best practices in developing federal projects. The "Innovations in Project Delivery" workshop was held in May at the GSA Central Office in Washington, DC. It centered on offsite and modular construction as delivery methods for GSA to pursue.

A couple months prior, NIBS and the American Institute of Architects released a new modular design guide. The NIBS Off-Site Construction Council and AIA released the Design for Modular Construction: An Introduction for Architects. The guide highlights the value and opportunities of modular design, pitfalls designers should be wary of, and case studies that exemplify successes and obstacles.

Architects, designers, and engineers will continue to develop alternative construction materials and methods that will capture national headlines. This is an area that will expand as our nation's buildings grow in sustainability and resiliency.



## KEEPING THE NATION'S BUILT ENVIRONMENT SECURE

Designing buildings with safety and security in mind has taken on the term, “crisis architecture.”

A December 2019 story by the website War on the Rocks entitled, *Crisis Architecture: Building to Defend Against Active Aggressors*, discusses how this form of architecture increases the likelihood that individuals will survive an active aggressor incident.

“While advances are being made to develop design paradigms to mitigate the impact of large-scale terrorist attacks like 9/11, comparatively little effort is occurring to counter acts of active aggression,” the story says. “These incidents have occurred at schools in Columbine, Sandy Hook, and Parkland, Florida. They happen at workplaces, like in the Washington Navy Yard or the terrorist attack in San Bernardino.”

In 2019, NIBS worked with the U.S. Department of Homeland Security (DHS) Science & Technology (S&T) Office of Safety Act Implementation (OSAI), supporting the Best Practices for Anti-Terrorism Security (BPATS) assessment tool for commercial facilities to help assessors and building owners conduct facility security assessments. NIBS hosted the BPATS Tool, provided training in its use and supported the application process for commercial facility owners and assessors.

We likely will be called to do much more to ensure a safe and secure built environment. Stay tuned.



## EVIDENCE-BASED DESIGN AND RESEARCH IN PRACTICE

Evidence-based design – the process of constructing a structure or environment based on scientific research to achieve the best outcome – is seen today with growing regularity.

An August 2019 story by Inside Indiana Business speaks to the common theme of building and construction to increase efficiency. The piece – Four Components Shaping Commercial Construction – discusses lean construction, offsite construction, design build, and advanced technology.

In 2019, NIBS completed its second year of on-site Post Occupancy Evaluations (POEs) of the GSA's Office of Design and Construction. In these evaluations, a team of subject matter experts collects firsthand data through direct observations and on-site interviews to determine how an existing GSA facility actually is functioning. The SME team then shares its findings through a "Lessons Learned" report that is widely distributed within the agency. The team completed seven POEs in 2019.

Also, the Building Research Information Knowledgebase (BRiK), a joint project of NIBS and the American Institute of Architects, increases AIA members' awareness and use of research with the goal of creating evidence-based design. NIBS and AIA staff showcased the BRiK research portal at the two associations' conferences, in Washington, DC, and Las Vegas, respectively. BRiK Council members and NIBS staff presented

an educational session about BRIK at the AIA convention. The BRIK Council also continues to work on a new, streamlined format for case study presentations on BRIK to encourage AIA members to submit research projects.

Finally, significant movement was made in 2019 by the Building Seismic Safety Council (BSSC) and the NEHRP Recommended Seismic Provisions for New Buildings and Other Structures (NEHRP Provisions), which has been developed by NIBS/BSSC for FEMA for the past 40 years.

The NEHRP Provisions is the state-of-the-art document for seismic-related design and construction and serves as a national resource for design professionals and the U.S. standards and code-development agencies. It is one of the most important products under the Congressionally-authorized National Earthquake Hazard Reduction Act.

In 2019, a total of 30 significant code change proposals were finalized in the BSSC consensus process. The 2020 NEHRP Provisions will be the 10th publication of this important document; it is being developed by the BSSC.

Adapting to changing conditions lies at the heart of evidence-based design.

NJ.com reported a story in October 2019, about the wrath of Hurricane Sandy, which literally obliterated towns across the garden state eight years ago.

Three NJ mayors called for investment and adaptation before more floods and storms occur, impacting sea rise.

PBS NewsHour covered a similar story that same month about how cities are rebuilding to be more resilient to natural disasters.

“Cities, residents and businesses across the U.S. and the world are seeking ways to end the expensive cycle of rebuilding after natural disasters,” the story reads. “Instead, they are boosting efforts to design buildings and local infrastructure to withstand hurricanes, floods or wildfires.”





## IT TAKES A TEAM: THE IMPORTANCE OF COLLABORATION

So much of what we do is because of the people we bring to the table, and the work taken on by the dedicated members of our councils and committees. 2019 was no different.

The WBDG Advisory Committee devoted 2019 to examining and ultimately rewriting its Mission and Vision statements to align with those of NIBS. The committee consists of representatives from federal agencies, who collaborate to guide the development of the WBDG. Its new vision statement reads: Integrating collaborative, dynamic resources to advance the high-performance built environment. The new mission statement: To foster communication and knowledge-sharing among federal, industry and academic partners by leveraging WBDG-Whole Building Design Guide services to advance high-performing facilities.

In May 2019, NIBS partnered with the General Service Administration's Public Buildings Service (PBS) Office of Design & Construction (ODC) to facilitate the fifth in a series of one-day forums to streamline and improve design and construction. GSA invited other federal owners and industry partners to participate and discuss ways to improve GSA's project delivery process. Participants collaboratively defined issues and suggested steps for more cost effective and better project delivery.

In addition to sharing findings widely within the different departments of the GSA, NIBS staff and a team of subject matter experts offered a keynote presentation in mid-November, sharing lessons learned with the FBI's Finance and Facilities Technology Section.

## WORKING ACROSS INDUSTRIES TO STRENGTHEN BUILDING ENCLOSURE

Members of the Building Enclosure Technology and Environment Council (BETEC) worked with the glass, masonry, and air barriers industries to garner updated material with which to refresh the Building Enclosure Design Guide portion of the Whole Building Design Guide. BETEC members represent every facet of the building industry involved with building facades, from architects and engineers to material suppliers.

The Building Enclosure Councils (BECs): A joint venture between the American Institute of Architects and NIBS under BETEC.



**BECs bring together members of all facets of the building industry**



**4,000 members**



**34 local chapters**

Also in 2019, NIBS leadership met with the new leadership of the International Institute of Building Enclosure Consultants to renew both groups' commitment to collaboratively working to develop educational materials and certificate/certification for Building Enclosure Commissioning (BECx) training.

## COLLABORATION TO SUPPORT OTHER AGENCIES

NIBS continues to support U.S. Department of Defense - Defense Health Agency (DHA) programs that enhance the process of evaluating its military healthcare facilities. By understanding DHA's performance metrics, NIBS can provide valuable analysis that leads to operational excellence within the DHA Facility Enterprise division.

In 2019, NIBS provided DHA with technical support and access to valuable analysis tools to enhance the facility budget cost models of DoD DHA's real property portfolio. NIBS provided guidance to DHA on proposing the framework of the CIDM 6.0 (Capital Improvement Decision Model) process. Additionally, our experts produced recommendations in the areas of space planning of facilities, which led to strategic policies to produce a minimal viable clinic space. In 2020, NIBS will continue working on newly awarded task orders that facilitate DHA's initiative to share data with other federal agencies and consider lifecycle management principles in sustaining and maintaining medical facilities.

In August 2019, CEO Lakisha A. Woods, CAE, joined the board of directors of the U.S. Green Building Council. This is the first time NIBS has had representation on the USGBC board.

Internationally, NIBS continued work on a coordinated set of BIM standards. NIBS worked with AIA, BIM Forum buildingSMART alliance® and the Center for Digital Built Britain to explore needs for a coordinated set of standards that federal agencies could use to issue requirements for the use of building information modeling and management on their projects, exploring the parallels and differences between owner needs and standards in the U.S. and U.K.

Collaboration across different sectors of the built environment is critical to the mission of our organization. As our vision statement states, we aim to improve lives through collaboration to integrate science into the built environment.

**“In August, CEO Lakisha A. Woods, CAE, joined the board of directors of the U.S. Green Building Council. This is the first time NIBS has had representation on the USGBC board.”**



# INDUSTRY ENGAGEMENT



## Association Collaboration

The National Institute of Building Sciences brings together a variety of interests from across the building industry. Each organization and association represents a vital piece and specific constituency of the greater building sciences map.

**AIA Building Performance Committee** – NIBS staff are represented on the advisory group of the AIA Building Performance knowledge community. The committee's purpose is to "promote architects as leaders in designing for better building performance, including criteria, codes, standards, programming and managing. The result: Buildings that are healthier, more energy efficient and more durable."

**BECs/BETEC** – The Building Enclosure Technology and Environment Council is comprised of many members who represent associations from across the industry, including the Air Barriers Association of America, International Masonry Institute, ASHRAE, AIA, ASTM, IIBEC and ICC. The Building Enclosure Councils and their 34 local chapters are a joint project of NIBS, BETEC and AIA. Together, they promote sustainability and resilience of the building enclosure and its components, and share knowledge of latest technologies and practices.

**BECx-Cx Energy Presentation** – In April, NIBS staff and subject matter experts presented three 2-hour modules on building enclosure commissioning (BECx) at CxEnergy, the AABC Commissioning Group (ACG) annual conference. The purpose of the modules was to share information about current practices in building enclosure commissioning through workshops NIBS has created for the building industry.

**BIM** – In 2019, NIBS worked with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) on development of a BIM Standard for Owners.

**BRIK Council** – The Building Research Information Knowledge Base is a research portal supported jointly by NIBS and the AIA. Members of the AIA leadership teamed up with the BRIK Council members and NIBS staff to present an educational session on BRIK for AIA membership.

**BSSC** – Thirty-seven Building Seismic Safety Council member organizations, representing the construction materials industry, building owners, earthquake research institutes, architects and government agencies, are involved in the 2020 NEHRP Provisions development process. Twenty-five code change proposals were vetted by these member organizations in 2019. This process with the NEHRP Provisions prompts wide acceptance by the industry and encourages local jurisdictions and states to adopt the latest in seismic codes and standards.

**GSA Streamlining Policy Project** – Each year, NIBS creates and facilitates a reverse-industry workshop for GSA. Participants included representatives of ASHRAE, Modular Building Institute, and the Design Build Institute of America.

**MMC** – NIBS' Multi-Hazard Mitigation Council was invited to and/or presented at many conferences and events in 2019. These included the 2019 Structural Engineers Association of Northern California (SEAOC) Convention (June), 2019 Resilient Virginia Conference (July), ICC 2019 Annual Conference (October), 2019 National Disaster Resilience Conference of the Federal Alliance for Safe Homes (December), and HUD's Regulatory Reform Roundtable Discussion on Affordable Housing (December).

**ICC Sponsorship** – The International Code Council put a big stamp on the Building Innovation 2020 Conference & Expo by becoming the title sponsor for the upcoming annual meeting. Sponsorship was secured in September 2019. The meeting initially was to be held April 2020, but ultimately was changed to August 2020, due to the coronavirus pandemic. International Code Council CEO Dominic Sims, CBO, said the council “remains committed to events that tackle important issues regarding building performance and sustainability.”

## INDUSTRY CONNECTIONS



Great meeting October 2019 with the leadership of the International Institute of Building Enclosure Consultants to discuss historic and future partnerships. (From left: Brian Pallasch, Lakisha A. Woods, Bob Card, Brian Gardiner, and Scott Hinesley)

# WOMEN EXECUTIVES IN BUILDING



## Women Executives in Building Summit

NIBS hosted the first Women Executives in Building Summit in October, bringing together C-suite executive women from across the built environment nonprofit space.

The event was aimed at opening up dialogue among female executives to find solutions to common industry problems, namely diversity and inclusion, recruitment and workforce retention. We convened a panel of experts that included NIBS CEO Lakisha A. Woods, CAE, Dawn Sweeney, CEO of the National Restaurant Association; Paula Glover, CEO of the American Association of Blacks in Energy; and Andrea Rutledge, CEO of the Construction Management Association of America.

The summit was well attended by nearly 50 association executive women, and the discussion was lively and engaging. It also was clear that the conversation needs to continue. The goal from this event was to bring the women who lead various building industry organizations together.

Our sponsors for the Women Executives in Building Summit include American Society of Association Executives Research Foundation and Dell Technologies. We are already planning more events that will include C-Suite women executives from all areas of the built environment, including architecture, design, engineering and other trades.

These future events include a workforce-related panel discussion that will take place, during Building Innovation 2020 in August. Also, a WEB conference is being planned for September 24–25, 2020, in Nashville, TN.



## Annual Conference

Optimizing for Tomorrow was the theme of the Building Innovation 2019 Conference & Expo – the seventh annual meeting of the National Institute of Building Sciences. Sponsored by the International Code Council, the event took place January 7-10, 2019, and brought hundreds of building industry professionals to the Mandarin Oriental in Washington, DC.

BI2019 included four days of quality programming with 60 speakers, who gave 36 presentations. The event also featured three keynotes, four networking events, and offered 25.5 continuing education credits – either AIA-approved continuing education system/health safety welfare credits or ICC CEU credits.

A highlight of the event was the launch of that Natural Hazard Mitigation Saves 2018 Interim Report.

At the conclusion of BI2019, a follow-up survey reported an overall rating of 8.75 points out of 10 points from conference attendees. NIBS received a great deal of positive feedback on the quality of the conference program and its presenters. Here's a recap of the week:



### **DAY ONE: MONDAY, JANUARY 7, 2019**

#### **Councils and Committees, Welcome and Preview**

The first day of BI2019 was a work day – meetings of the committees and councils. These include morning meetings of the Board of Directors, Off-Site Construction Council (OSCC), Facility Maintenance and Operations Committee (FMOC), and the National Council on Building Codes and Standards (NCBCS). Afternoon meetings included that of the Commercial Workforce Credentialing Council (CWCC), buildingSMART alliance® (bSa), Building Research Information Knowledgebase (BRIK) Research Council, Council on Finance, Insurance and Real Estate (CFIRE), Multi-Hazard Mitigation Council (MMC), Building Enclosure Technology and Environment Council (BETEC), WBDG Whole Building Design Guide Advisory Committee, and Commissioning Industry Leaders Council (CxILC).

The Board discussed typical business activities and voted on several issues. The OSCC released its Report of the Results of the 2018 Off-Site Construction Industry Survey. The rest of the groups held annual business meetings and voted on officers. After the business meetings wrapped, attendees headed to the Welcome Reception – the first networking event of the conference – where they were able to preview the Exhibit Hall.

### **DAY TWO: TUESDAY, JANUARY 8, 2019**

#### **Resilience in New York City, Education Sessions and Exhibits**

Deputy Director Eric Wilson, of the New York City Mayor’s Office of Resiliency, kicked off the first day of education sessions Tuesday with the Opening Keynote Breakfast sponsored by the EPDM Roofing Association. Wilson talked about how New York’s diverse building stock of more than one million buildings is highly vulnerable to the hazards of climate change and how flooding and extreme heat impact at-risk populations. Wilson also referenced the tools and documents the city has available to assist building owners with retrofitting their properties and the opportunities for partners to make a difference.

“It’s all-hands-on-deck and everyone in this room is really needed to drive innovation throughout the country,” said Wilson. Immediately following Wilson’s keynote, NIBS released the Mitigation Saves: 2018 Interim Report, the next chapter in the Natural Hazard Mitigation Saves study, which looks at the benefits of adopting building codes. In addition, NIBS unveiled its refreshed brand with a new logo and tagline.

The technical program was sponsored by the International Association of Plumbing and Mechanical Officials. It included three tracks of educational sessions. Attendees could choose from the morning educational sessions on resilience, intelligent tools and technologies, and building enclosure performance. Then, they had the opportunity to head to the Exhibit Hall Walking Lunch, where they could mingle with 15 exhibitors and learn about the latest technologies and opportunities in the building industry.

In the afternoon, attendees selected from six sessions on a range of topics, including building resilience, affordable housing, managing facilities and assets, science fiction or construction reality, and the past and future of building enclosure. At the close of the day, attendees were treated to an Exhibitor Reception sponsored by Plan Grid.

### **DAY THREE: WEDNESDAY, JANUARY 9, 2019**

#### **Corrosion, Sessions, a Net-Zero Building and Awards**

The third day began with the FEDCon® Breakfast, sponsored by Master Painters Institute (MPI). Addressing the expensive problem of corrosion were Steve Geusic, PE, Senior Professional Engineer for Leidos; Sherri



McMillion, PE, CEM, ASQ LSSBB, Director of Facilities Criteria for the Navy at the Naval Facilities Engineering Command (NAVFAC) Atlantic; and Richard A. Hays, Senior Corrosion Engineer for Excet, Inc., who all support the U.S. Deputy Assistant Secretary of Defense for Material Readiness, Corrosion Policy and Oversight Office. They talked about the laws that govern corrosion, the cost of corrosion on facilities and tools available to assist designers with addressing the problem.

“During some of our research studies ... these items were costing the most money,” McMillion said. “We wanted to look at our design and construction criteria. We knew we needed something to raise awareness with designers.” The presenters gave the example of designing a garage in the Washington D.C. Navy Yard, talked about the potential corrosive factors that could impact the structure, and the criteria available to address the issues.

After breakfast, attendees selected from three morning educational sessions on metrics for project delivery, envelope case studies, and creating a family-centered intensive care unit. During the Plenary Keynote Luncheon, Janice Lachance, Esq., FASAE, Executive Vice President, Strategic and Organizational Excellence with the American Geophysical Union (AGU), spoke about AGU’s renovation to its existing 63,000-square-foot headquarters, transforming it into a showcase for real-world scientific advancement through innovative, sustainable technology.

“The building has its own mission,” Lachance said. “This is all about the building and spreading the word ... we wanted very much to prove a building in a weird footprint, in a small footprint, in an urban area, could achieve or get very close to zero energy. This requires a lot of change. Change in thinking, change in work, change in function.”

In the afternoon, attendees selected from five more sessions on energy storage and tall wood buildings, resilience to wind and flood, information management and exchange, performance metrics for energy efficiency, and construction, commissioning and collaboration.

That evening, NIBS hosted the Annual Awards Reception, followed by the Beyond Green™ Awards Banquet, which was sponsored by the American Concrete Institute, BOMA International and MADCAD.com. At the banquet, NIBS recognized new and retiring board members. 2018 Beyond Green™ Award winners were honored and presented their projects.

### DAY FOUR: THURSDAY, JANUARY 10, 2019

#### Meetings and Workshop Modules

On Day 4, the Consultative Council released its 2018 report, Moving Forward: Findings and Recommendations from the Consultative Council. The report looks at existing buildings, and it will become part of the NIBS annual report, which will go to the President of the United States and Congress. NIBS convened its annual CEO Summit, where industry leaders came together to discuss issues. NIBS also hosted two Building Enclosure Commissioning (BECx) Modules during the BECx Workshop. The first module was on BECx standards and process; the second covered BECx lab testing.





The NIBS team at the Power of A Awards ceremony. From left, Jiqui (JQ) Yuan, Lakisha A. Woods, Kristen Petersen, and Drew Rouland.

## ASAE's Power of A Awards

In July 2019, the National Institute of Building Sciences earned two Power of A Silver Awards from the American Society of Association Executives in Washington. NIBS was honored for its Mitigation Saves study and National Earthquake Hazard Reduction Program (NEHRP) Seismic Provisions.

Mitigation Saves is a collaborative effort organized by the Multi-Hazard Mitigation Council. Thirteen national experts developed the methodology with oversight from 24 independent experts, who peer-reviewed the work and confirmed results. In total, about 130 participants across about 70 organizations participated the study through the coordinated effort under MMC.

Sharon J. Swan, FASAE, CAE, Chief Executive Officer of the American Society of Clinical Pharmacology and Therapeutics and chair of the Power of A Judging Committee, praised NIBS for “creating and implementing such a collaborative initiative that strengthens society.”

“[This] initiative exemplifies how no other sector helps improve lives as comprehensively as the association community,” Swan said, in a release.

The Mitigation Saves study provides scientific evidence that demonstrates that mitigation lessens the financial impact of disasters on local businesses, communities, and taxpayers, enabling individuals and communities to rapidly recover from these events when they occur. Ultimately, the study found that adopting model codes saves \$11 for every \$1 spent on mitigation efforts.



## COUNCILS AND COMMITTEES

The National Institute of Building Sciences brings together representatives from a variety of places – government, the building professions, industry, labor and consumer interests, and regulatory agencies. It's through the work of our councils and committees that we're able to identify and resolve problems and potential problems that stand in the way of safe, affordable, and sustainable structures for the built environment. Here is a list of the dedicated members who played a major role in our 2019 accomplishments.

### INDUSTRY CONNECTIONS



NIBS team member Jiqiu Yuan presented at Resilient Virginia about mitigation, giving an overview of the Natural Hazard Mitigation Saves study.

## Building Enclosure Technology and Environment Council/Building Enclosure Councils

In 2019, BETEC members continued to work together to share knowledge of existing and new technologies and practices, and to integrate technical programs on building safety, durability, resilience and occupant comfort with the thermal performance of building envelopes. The Building Enclosure Technology and Environment Council (BETEC) fosters a better understanding of how building components interact with each other and with the environment in order to optimize energy use. The Building Enclosure Councils (BECs), a joint venture between the American Institute of Architects and NIBS under the aegis of BETEC, host some 4,000 members in 34 local chapters, with BEC-Indiana the latest addition to the family. BEC St. Louis stepped up to the plate in May, hosting the 2019 BEC National Symposium. In November, BEC Boston hosted the Wagdy Anis Symposium 2019: “Building Enclosure Performance for the 21st Century, at ABX Boston.

### REPRESENTATIVES

Chair: David Herron, AIA,  
Principal, herron + partners

BEC National Vice Chair: William  
Babbington, AIA, Principal, Studio NYL

Vice Chair: Steven Shanks, Chief  
Operating Officer, CTI Consultants Inc.

NIBS Board Liaison: Paul R.  
Bertram, Jr., FCSI, PRB Connect

BEC National Chair: Justin Boone,  
AIA, Unit Manager, WJE

NIBS Staff: Stephanie Stubbs,  
Project Manager

## BRIK Advisory Council

NIBS and the American Institute of Architects collaborate on the development of the Building Research Information Knowledgebase (BRIK), an interactive portal to support incorporation of multidisciplinary research in the design, construction and operation of high-performance buildings. BRIK, as a partner site to the Whole Building Design Guide, offers online access to professionally reviewed research and case studies in all facets of building, from predesign through occupancy and reuse. The purpose of this research portal is to heighten awareness of the importance of evidence-based design and research. The efforts to maintain and expand the portal are shared by the two organizations. The BRIK Council serves in an advisory capacity to the project. Members meet annually at the NIBS convention and quarterly via teleconference. BRIK now has more than 3,000 pieces of research contributed by 22 organizational and private partners. Exhibit booths at AIA and NIBS national conventions foster the importance of research in the design and construction industries. An education session was offered to architects the 2019 AIA convention in Las Vegas.

### REPRESENTATIVES

Advisory Council Chair: Debajyoti Pati,  
Professor and Rockwell Endowment  
Chair, Texas Tech University

NIBS Board Liaison: Tim Haahs, AIA,  
Timothy Haahs and Associates, Inc.

NIBS Staff: Stephanie Stubbs,  
Project Manager

## buildingSMART alliance®

The buildingSMART alliance® is a unique organization helping to make the North American real property industry more efficient by leading the creation of tools and standards that allow projects to be built electronically before they are built physically using building information modeling (BIM).

### REPRESENTATIVES

Chair: John I. Messner, PhD., Department of Architectural Engineering, The Pennsylvania State University

Vice Chair: Van Woods, U.S. Army Corps of Engineers

Secretary: Craig Dubler, PhD., DBIA, CEFP, Pennsylvania State University

Past Chair: Paul Audsley, Assoc. AIA, NBBJ

NIBS Board Liaison: Lane Beougher, Ohio Facilities Construction Commission

NIBS Staff: Roger J. Grant, CSI, CDT, Executive Director, Building Information Management

NIBS Staff: Dominique Fernandez, Project Director

## Building Seismic Safety Council

The Building Seismic Safety Council (BSSC) deals with the complex technical, regulatory, social and economic issues involved in developing and promulgating building earthquake risk mitigation provisions that are national in scope. BSSC was established by NIBS in 1979.

### REPRESENTATIVES

Chair: James R. Cagley, P.E., S.E., Cagley & Associates

Vice Chair: Charles J. Carter, PhD., P.E., S.E., American Institute of Steel Construction

Secretary: Jennifer Goupil, P.E., Structural Engineering Institute, American Society of Civil Engineers

Member, At Large: Bahram Zarin-afzar, AIA, NCARB, P.E., Zarin-afzar & Assoc. Inc.

Member, At Large: Michael J. Pfeiffer, P.E., International Code Council

NIBS Board Liaison: Anne M. Ellis, PE, FACI, FASCE, Anne Ellis, LLC

NIBS Staff: Jiqui (JQ) Yuan, P.E., PhD., PMP, Executive Director of the Multi-Hazard Mitigation Council and Building Seismic Safety Council

## Consultative Council

The Consultative Council assembles high-level building community representatives to make recommendations directly to the executive and legislative branches of government to improve our nation's buildings and infrastructure.

### REPRESENTATIVES

Chair: Wanda Edwards, Wanda Edwards Consulting

NIBS Board Liaison: Thomas Izbicki, PE, FSFPE, Rolf Jensen & Associates, Inc., Plano, TX

NIBS Staff: Kyle Barry, Project Manager

# Commercial Workforce Credentialing Council

The Commercial Workforce Credentialing Council (CWCC) was established to lead the development of national guidelines, known as the Better Buildings Workforce Guidelines (BBWG). BBWG was developed by NIBS and the U.S. Department of Energy (DOE) to improve the quality and consistency of commercial building workforce credentials.

---

## REPRESENTATIVES

Francis M. Cain, U.S.  
Department of Defense

Jonathan Flaherty, Tishman Speyer

Brian Gilligan, U.S. General  
Services Administration

Don Gilligan, National Association of  
Energy Service Companies (NAESCO)

Carolyn Sarno Goldthwaite, Northeast  
Energy Efficiency Partnerships

Jerry Kettler, Facility  
Performance Associates

John Lee, New York City Mayors Office

Kim Lenihan, New York State Energy  
Research and Development Authority

Kelly Herbert, The South-  
Central Partnership for Energy  
Efficiency as a Resource

Elizabeth Obregon, U.S. Department  
of Homeland Security

Paul Rode, RXR Construction Services

Priya Swami, U.S. Department of Energy

NIBS Staff: Roger J. Grant, CSI,  
CDT, Executive Director, Building  
Information Management

NIBS Staff: Kyle Barry, Project Manager

# Council on Finance, Insurance and Real Estate

The Council on Finance, Insurance and Real Estate (CFIRE) examines the intersection of finance, insurance, investment and design, construction and ownership to encourage the development and assist in the affordability of high-performance buildings. Banks, insurance companies, appraisers and real estate firms all play a significant role in how such buildings are procured, designed and constructed. How these different segments evaluate the risk associated with particular projects, technologies and practices can have an enormous impact on whether a specific idea gets the funding and insurance needed to move forward to fruition. However, banks, insurance companies, appraisers and real estate firms often lack the necessary data to support building industry efforts to go beyond "business as usual." CFIRE works to address these challenges by promoting a cooperative process and open dialogue among the different parties to support the achievement of cost-effective high-performance buildings.

## Facility Maintenance and Operations Committee

The Facility Maintenance and Operations Committee (FMOC) provides industry-wide, public and private support for the creation of higher quality facilities through improved maintenance and operation and real property management. In order to achieve this purpose, the FMOC has the following objectives: (1) To increase maintenance and operations influence in the facility acquisition process; (2) To promote the sharing and integration of facilities maintenance and operations procedures and information; and (3) To identify and disseminate "best" practices for the maintenance and operations of facilities.

### REPRESENTATIVES

Chair: Casey Martin, AIA, AICP,  
Jacobs Engineering Group Inc.

Vice Chair: Rolf Alexis, Global  
Fixed Capital Asset Manager,  
General Motors Company

Secretary: Emily Herndon, Woolperts  
Strategic Consulting Group

Past Chair: Darrell X. Rounds, FMA®  
C.E.M., Technical Group Manager,  
General Motors Company

Other subcommittee chairs: Lewis  
Matthew Miller, Virtual Design &  
Construction; Deke Smith, DKS  
Information Consulting, LLC;  
Laverne Deckert, Independent

NIBS Board Liaison: Brian Larson,  
PE, Vice President, Stantec  
Consulting Services, Inc.

NIBS Staff: Jiqui (JQ) Yuan,  
Executive Director of the Multi-  
Hazard Mitigation Council and  
Building Seismic Safety Council

## Multi-Hazard Mitigation Council

The Multi-Hazard Mitigation Council brings together a body of experts in a multitude of related fields that address the challenges associated with identifying and implementing effective mitigation and community resilience practices. The work of MMC has informed thousands—perhaps tens of thousands—of mitigation decisions that led to effective public policy on many levels. Its goal is simple: promoting disaster resilience, while becoming a focal point of credible information and whole-building strategies that strengthen individual buildings, businesses, communities and the nation.

### REPRESENTATIVES

Chair: Bryan Koon, IEM

Vice Chair: Keith Porter, PE, PhD, Dept.  
of Civil Environmental & Architectural  
Engineering, University of Colorado

Secretary: Nancy McNabb,  
McNabb & Associates

Member, At Large: Ryan Colker,  
International Code Council

Member, At Large: Bradley Dean,  
Michael Baker International

Past Chair, Communications  
Committee Chair: Kevin Mickey,  
GISP, The Polis Center

NIBS Board Liaison: Carl Hedde,  
Head of Insurance Practice,  
One Concern

NIBS Staff: Jiqui (JQ) Yuan,  
Executive Director of Multi-Hazard  
Mitigation Council and Building  
Seismic Safety Council

## Off-Site Construction Council

NIBS established the Off-Site Construction Council (OSCC) in 2013. The council serves as a research, education and outreach center for relevant and current information on off-site design and construction for commercial, institutional and multifamily facilities.

---

### REPRESENTATIVES

Chair: Tom Hardiman, Modular Building Institute

Secretary: Dean Frank, Precast/Prestressed Concrete Institute

NIBS Staff: Kyle Barry, Project Manager

Vice Chair: Laurie Robert, NRB (a Horizon North Company)

NIBS Board Liaison: Thomas Izbicki, PE, FSFPE, Rolf Jensen & Associates, Inc.

## WBDG Advisory Committee

The WBDG Advisory Committee consists of representatives from federal agencies to guide the development of the WBDG. The Advisory Committee devoted 2019 to examining and ultimately rewriting its Mission and Vision statements to align with those of NIBS. Its new vision statement reads: Integrating collaborative, dynamic resources to advance the high-performance built environment. Its new mission statement: To foster communication and knowledge-sharing among federal, industry and academic partners by leveraging WBDG-Whole Building Design Guide services to advance high-performing facilities. WBDG continues to update its database and add new case studies and resource pages, as well as new FEMP online courses. The Buildings Enclosure Design Guide (BEDG) portion of the site received a major refresh on its Wall Section. Staff promoted WBDG via live presentations at meetings and conferences, including the National Facilities Management and Technology Conference (NFMT) in Baltimore and the AIA national conference in Las Vegas.

---

### REPRESENTATIVES

Advisory Committee Chair: Sherri McMillion, NAVFAC Engineering Innovation and Criteria Office

Advisory Committee Board Liaison: Darrell X. Rounds, FMA, General Motors Company

NIBS Staff: Stephanie Stubbs, Project Manager

NIBS Staff: Bob Payn, Senior Director, Information Technology



## Moving Forward

*Findings and Recommendations from the Consultative Council*

### INTRODUCTION

The National Institute of Building Sciences (NIBS) serves as the unbiased forum for discussing issues and identifying opportunities within the building community. The NIBS Consultative Council assembles high-level building community representatives to make collective recommendations directly to policymakers to improve our nation's buildings and infrastructure.

Each year, the Consultative Council publishes the Moving Forward Report to investigate key challenges, offering solutions to overcoming these challenges. The 2019 Moving Forward Report will examine three critical areas identified by building industry leaders and the Consultative Council:

- Developing, investing in, and maintaining a skilled 21st-century workforce
- Advancing an understanding of the importance of resilience in adapting to climate change and promoting disaster mitigation
- Adapting and driving the use of new technologies and their impact on the built environment

**Nearly 80% of building industry leaders identified recruiting and maintaining a robust building workforce as the No. 1 issue facing the industry.**

## THE STATE OF THE INDUSTRY

In 2019, the National Institute of Building Sciences conducted a survey of CEOs of the organizations that make up the Consultative Council. The survey asked two simple questions, with a goal of identifying what building leaders saw as the industry's immediate critical challenges:

1. What are the top three issues that keep you or your members up at night?
2. What are the three main policy priorities for your organization for 2020-2022?

After compiling responses, the three most critical issues identified by those leaders can be summarized as such: workforce, technology and resilience.

Nearly 80 percent of building industry leaders identified recruiting and maintaining a robust building workforce as the No. 1 issue facing the industry. Fifty percent of respondents identified adapting to changing technology as an important challenge moving forward. Finally, 40 percent of respondents indicated that investment in resilience and responding to climate change will be critical to the building industry's future.

Additional areas identified by building industry leaders include:

- Infrastructure investment
- Effectively advancing energy codes to support state/city climate goals
- Affordable housing and equitable transportation

Policy priorities for building industry leaders for 2020-2022 include the following:

- Workforce development
- Resilience and climate change adaptation
- Using technology in facility management
- Infrastructure investment

## Workforce

### STATE OF THE BUILDING WORKFORCE

The critical issue of promoting and maintaining a viable building and trades workforce has been a continued focus of the Consultative Council. It is no secret that the U.S. is reaching a crisis point, in terms of ensuring that a “full pipeline” of skilled workers is available to meet the needs of a rapidly advancing building industry. The statistics, even during the longest period of sustained economic growth in U.S. history, are stark:

- A survey by AGC and Autodesk found that nearly 80 percent of contractors reported difficulties in finding qualified craft workers for available jobs, while also wanting to expand current hiring.<sup>1</sup>
- According to the same survey, 45 percent described the “adequacy of the local pipeline supplying craft personnel” as “Poor.”<sup>1</sup>
- According to the U.S. Bureau of Labor Statistics (BLS), approximately 240,000 job openings were available in construction, as of December 2019.<sup>2</sup>
- Workers under the age of 25 in construction decreased over the last decade, representing only 9 percent of the workforce in 2018, while the percent of workers over the age of 55 increased by five percentage points between 2011-2018, to 22 percent of all workers.<sup>3</sup>

### CHANGING PERCEPTIONS AMONG YOUNG PEOPLE

Today’s parents, guidance counselors, and society-at-large place a great deal of pressure on young people to enroll in a four-year college and obtain a bachelor’s degree. Evidence of this preference is borne out of public policy: Federal and state education systems provide significant funding to four-year colleges and universities, while community colleges, vocational, and technical schools and programs receive insufficient support from public programs. Policymakers should work to even the playing field for the trades, enabling students to pursue a productive and fulfilling career.

Changing perceptions among young people themselves is also critical: According to a 2017 survey of high school students completed by the National Association of Home Builders, only 3 percent indicated an interest in pursuing a career in the construction trades. The industry needs to make an investment in promoting the potential fulfilling careers available in construction and the trades.<sup>4</sup> Some of this work has already started – groups like [We Are Generation T](#) and many sectors of the trades are highlighting the potential of a career in the trades.<sup>5</sup> They connect people looking to work with opportunities, but more is needed. The industry should continue to invest in recruiting young people to the workforce and train and re-train its existing workforce.



1 AGC and Autodesk. “2019 Workforce Survey Results.” [https://www.agc.org/sites/default/files/WorkforceDevelopment\\_2019\\_National\\_Final\\_1.pdf](https://www.agc.org/sites/default/files/WorkforceDevelopment_2019_National_Final_1.pdf)

2 U.S. Bureau of Labor Statistics. “Job openings levels and rates by industry and region, seasonally adjusted.” [https://www.bls.gov/news.release/jolts.t01.htm#jolts\\_table1.f.2](https://www.bls.gov/news.release/jolts.t01.htm#jolts_table1.f.2)

3 Zhao, Na. “Age Distribution of the Construction Labor Force.” National Association of Home Builders. Sept. 2019. <http://eyeonhousing.org/2019/09/age-distribution-of-the-construction-labor-force/>

4 Rose, Quint. “Young Adults and the Construction Trades.” National Association of Home Builders. March 2017. <https://www.nahbclassic.org/generic.aspx?sectionID=734&genericContentID=255983&channelID=311>

## IMPROVING ACCESS FOR WOMEN AND MINORITY GROUPS

The industry and government need to make a concerted effort to recruit women and minorities into the workforce, including breaking down perceived barriers to entry and enabling opportunities for advancement especially, for this traditionally white, male-dominated industry.<sup>6,7</sup>

Take the example of women in construction: According to the Department of Labor (DOL) Bureau of Labor Statistics (BLS), women make up only 10 percent of construction managers, 5.7 percent of construction and building inspectors, 3.5 percent of construction laborers, and 3.5 percent of first-line supervisors of construction trade and extraction workers.<sup>7</sup> Though these numbers have increased year-over-year for nearly 25 years, additional support is needed from the industry and policymakers to accelerate the rate of change through outreach to women. We must develop training programs specifically designed for women entering the trades and showcase leadership opportunities and broad attempts to change the industry's attitudes toward women in the trades and building workforce.

## EMPOWERING THE CURRENT WORKFORCE

While attracting new workers into the construction trades should be a focus for industry, it is also critically important that the current workforce is ready to meet the needs of the 21st century buildings industry. The deployment of new and advanced technologies into the building space is occurring at a faster pace than ever before. Policymakers and the built environment need to ensure that the current workforce is not left behind by these technological shifts. The importance of this effort goes beyond simple employment numbers: all potential gains from these new technologies depend on the skills and competency of the individuals installing or utilizing them.<sup>8</sup> Investing in training and skills for the current workforce, through credentialing programs or other means, is required for new technologies to be implemented correctly and safely, and to have a continued and sustained impact.



5 Bloom, Susan. "Workforce of the Future: Attracting Young Talent to the Electrical Contracting Field." *Electrical Contractors Magazine*. May 2018. <https://www.ecmag.com/section/your-business/workforce-future-attracting-young-talent-electrical-contracting-field>

6 U.S. Bureau of Labor Statistics. "Women in the Labor Force: a Databook." 2017. <https://www.bls.gov/opub/reports/womens-databook/2017/home.htm>

7 U.S. Bureau of Labor Statistics. 2019. <https://www.bls.gov/cps/cpsaatf1.htm>

8 Royal Institute of Chartered Surveyors. "Future of the Profession: Consultation Response Report." 2019. <https://www.rics.org/globalassets/rics-website/media/news/future-of-the-profession-post-consultation-report.pdf>



# Promoting Resilient Communities

## DISASTER AND CLIMATE RESILIENCE

The Resilience Building Coalition’s 2014 Statement on Resilience defines resilience as “the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events.”<sup>9</sup> Across the country, investing in resilience is a near no-brainer. The NIBS Multi-Hazard Mitigation Council examined the most significant savings associated with various mitigation measures.

- Since 1995, public investment by FEMA, EDA, and HUD will ultimately save the country \$160 billion, at a cost of \$27 billion, or \$6 saved per \$1 invested
- Building codes sets minimum requirements to protect life safety: adopting the latest building code requirements is affordable and saves \$11 per \$1 invested
- Stricter requirements with above-code design can cost-effectively boost life safety and speed functional recovery with a benefit cost ratio of \$4 to \$1
- Our country could efficiently invest, save \$4 per \$1 cost, to upgrade residences
- Upgrading lifelines protect the whole economy, saving up to \$31 per \$1 invested<sup>10</sup>

Policymakers and the building industry must insist on capitalizing on this good deal, not only through these important mitigation programs but also through aligning the

interests and incentives of the building and finance industries. This includes smarter investment in the construction and maintenance of buildings and infrastructure that will help mitigate the impacts of disasters and climate change and adoption of codes, standards, and guidance tools that enable local communities to prepare for and predict potential disasters. Planning and preparation will enable the industry to provide safe and secure spaces for Americans to live and work. Full vulnerability assessments are needed on buildings to ensure property owners and residents understand the risks associated with resilience and are able to make necessary precautions. When disasters do occur, the industry must be able to quickly and effectively respond. This involves consistent coordination with government officials, at all levels, to assess damages and organize recovery efforts as communities rebuild. Special attention should be given to the lifelines and utilities that connect our communities, such as power distribution and water distribution, transportation and communication systems, which are essential to community resilience, with additional investment in protecting vulnerable populations who are at particularly high risk of adverse impact.

## TECHNOLOGY

The rapid pace of technological change will continue to have an impact on the building industry. From changes to the way buildings are designed, constructed, commissioned, maintained and operated, the building industry must continue to evolve to realize the potential of new technologies, as well as prepare for its effects.

9 Building Industry Statement on Resilience. 2014. [http://content.aia.org/sites/default/files/2019-11/Resilience\\_Industry\\_Statement\\_190724.pdf](http://content.aia.org/sites/default/files/2019-11/Resilience_Industry_Statement_190724.pdf)

10 National Institute of Building Sciences. Mitigation Saves. <https://www.nibs.org/page/mitigationsaves>

11 “Cybersecurity.” National Institute of Building Sciences Whole Building Design Guide. 2020. <https://www.wbdg.org/resources/cybersecurity>

12 Symantec. “2019 Internet Security Threat Report.” <https://www.jdsupra.com/legalnews/cybersecurity-in-the-construction-22150/>

## CYBERSECURITY

Today, cybersecurity is an everyday threat. Its potential to adversely affect building and construction is no different from any other industry.<sup>11</sup> Many buildings and campuses are becoming increasingly reliant on connected advanced tools and systems that are used throughout the building lifecycle. Additionally, the amount of data shared among stakeholders responsible for a building throughout its lifecycle is increasing exponentially. We share information not only about particular buildings, but also sensitive personally-identifiable information on employees, vendors and other stakeholders, as well as regular business operations, such as invoicing and correspondence.

Critically important is guidance and training for individuals: A 2019 study by Symantec found that the construction industry ranked third (of 11) in percentage of individuals targeted with malicious email (26.6 percent), as well as seventh in malicious email rate (one of every 382 emails).<sup>12</sup> Additionally, protection of entry points for building controls and operations must increase. The building industry and policymakers should continue to prioritize and invest in cybersecurity, mitigating the risk of cyberattacks and readying companies and individuals up and down the supply chain (and throughout the building lifecycle) for this imminent threat.

## BUILDING INFORMATION MODELING

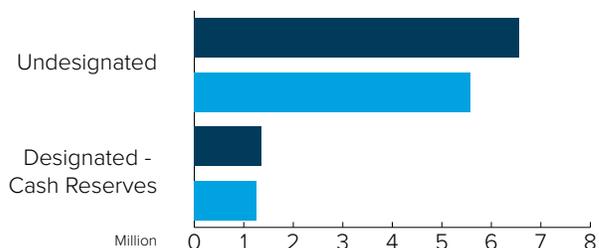
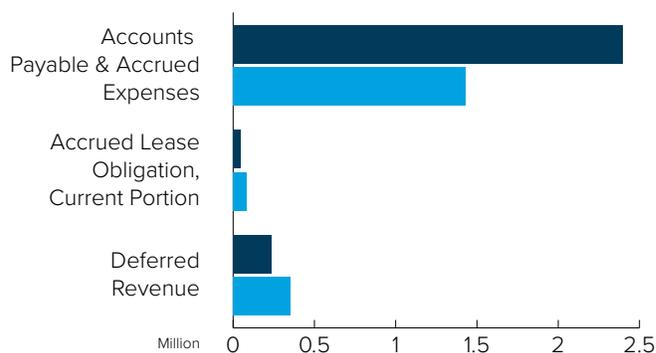
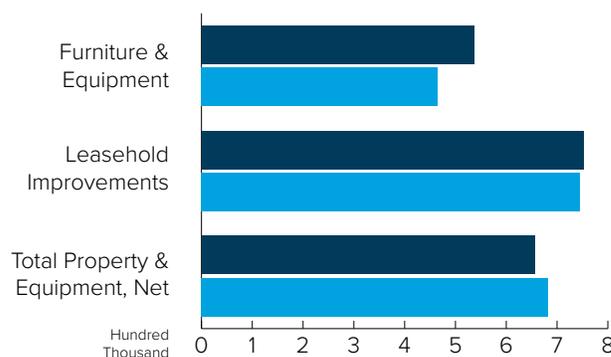
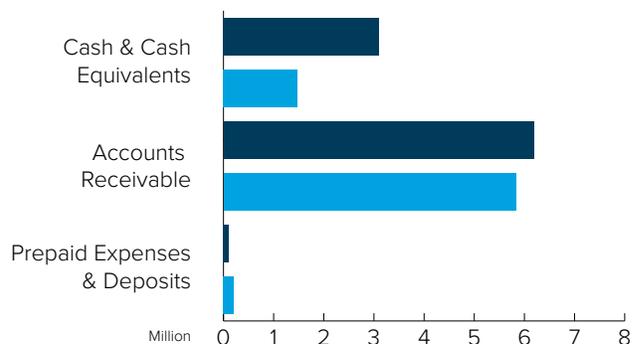
The use of building information modeling (BIM) continues to increase in both frequency and type of use. The benefits of using BIM are now seen not only in the design and construction phase, but throughout the building lifecycle. As stated on the NIBS Whole Building Design Guide, a primary goal of a BIM model is to access all pertinent graphic and non-graphic information about a facility as an integrated resource, thereby eliminating re-gathering or reformatting facility information. Eliminating this need has the potential to greatly reduce waste in the construction industry, which is significantly higher than other sectors. The building sector should come together to work collaboratively to identify common metrics and support the interoperability of data. In 2020, NIBS will update the National BIM Standard. The NBIMS-US™ provides consensus-based standards through referencing existing standards, documenting information exchanges and delivering best business practices for the entire built environment.

## Recommendations

To address the issues facing the 2019 building industry, the Consultative Council makes the following recommendations:

- The Administration, Department of Labor, and the U.S. Department of Education should extend their efforts to advance apprenticeships and workforce development to include careers within the buildings and construction workforce, with additional programs focused on promoting women and minority groups in the trades.
- The DoED, DOE, DOL, EPA and other relevant federal agencies should work with the private sector to create a public service announcement campaign highlighting the importance of the building industry to the economy, the many exciting opportunities available in the industry and potential educational pathways to entering the industry.
- Federal entities, including the Small Business Administration, the U.S. Department of Housing and Urban Development (HUD), the U.S. Department of Agriculture, the U.S. Department of Veterans Affairs and Fannie Mae and Freddie Mac, along with private sector stakeholders, should encourage the development of products and services that facilitate holistic consideration of resilience strategies at the community level.
- Congress, with input from the private sector, should identify and enact policies, including incentive programs, that encourage increased investment in natural and man-made hazard mitigation for existing buildings and other infrastructure. This includes ensuring FEMA mitigation grants and tools receive the funding necessary to effectively capture the significant benefits pre-disaster mitigation provides.
- Congress, working with FEMA and other federal agencies, should enact incentives for state and local jurisdictions to adopt current building codes in order to make communities more resilient in the face of hazards and to reduce the cost of federal disaster cleanup and recovery.
- The Department of Commerce, Department of Homeland Security, and NIST should continue to work with the building industry to deploy existing federal and private-sector tools to assure the cybersecurity of building control systems. This includes training to recognize and address vulnerabilities.

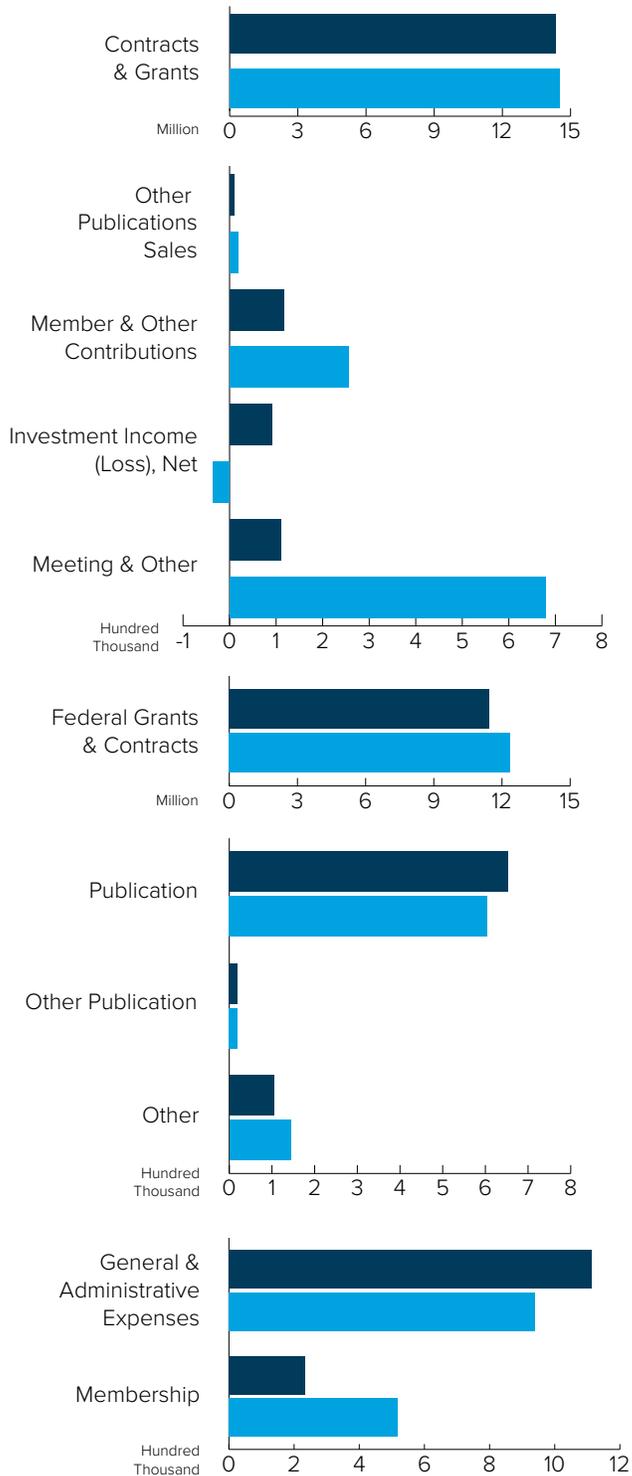
## 2019 Financial Statements



	2019	2018
<b>Current Assets</b>		
Cash & Cash Equivalents	\$ 3,098,366	\$ 1,469,778
Accounts Receivable	6,184,209	5,830,810
Prepaid Expenses & Deposits	105,078	200,481
Total Current Assets	9,387,653	7,501,069
<b>Investments</b>	1,352,414	1,304,080
<b>Property and Equipment</b>		
Furniture & Equipment	536,245	464,845
Leasehold Improvements	751,864	745,251
Total	1,288,109	1,210,096
Less: Accumulated Depreciation & Amortization	(632,331)	(528,040)
Total Property & Equipment, Net	655,778	682,056
<b>Total Assets</b>	<b>\$ 11,395,845</b>	<b>\$ 9,487,205</b>

<b>Current Liabilities</b>		
Accounts Payable & Accrued Expenses	\$ 2,394,914	\$ 1,427,970
Accrued Lease Obligation, Current Portion	45,730	82,326
Deferred Revenue	233,683	349,529
Total Current Liabilities	2,674,327	1,859,825
<b>Accrued Lease Obligation, Net of Current Portion</b>	804,196	800,477
<b>Total Liabilities</b>	<b>3,478,523</b>	<b>2,660,302</b>

<b>Net Assets, Without Donor Restrictions</b>		
Undesignated	6,566,696	5,573,644
Designated - Cash Reserves	1,350,626	1,253,259
Total Net Assets	7,917,322	6,826,903
<b>Total Liabilities and Net Assets</b>	<b>\$ 11,395,845</b>	<b>\$ 9,487,205</b>



■ 2019 ■ 2018

**Revenue**

Contracts & Grants	\$ 14,331,420	\$ 14,503,292
Other Publications Sales	10,458	18,629
Member & Other Contributions	116,728	255,752
Investment Income (Loss), Net	90,239	(35,593)
Meeting and Other	110,058	679,206
<b>Total Revenue</b>	<b>14,658,903</b>	<b>15,421,286</b>

**Expenses**

Program Services:

Federal Grants & Contracts	11,445,010	12,357,920
Publication	652,896	604,558
Other Publication	19,407	19,069
Other	104,393	143,627
<b>Total Program Services</b>	<b>12,221,706</b>	<b>13,125,174</b>

Supporting Services:

General & Administrative Expenses	1,112,598	939,882
Membership	234,180	517,118
<b>Total Supporting Services</b>	<b>1,346,778</b>	<b>1,457,000</b>
<b>Total Operating Expenses</b>	<b>13,568,484</b>	<b>14,582,174</b>
<b>Change in Net Assets</b>	<b>\$ 1,090,419</b>	<b>\$ 839,122</b>

The accompanying notes of the Institute's audited financial statements are an integral part of these financial statements.

For a complete copy, write to: National Institute of Building Sciences, 1090 Vermont Avenue, NW, Suite 700, Washington, DC 20005-4950



## To Our Dedicated and Hard Working Members – We Thank You.

The National Institute of Building Sciences serves the public interest through research, advancing building science and coordinating the talent and expertise necessary to overcome challenges in the built environment.

But our work doesn't happen without you.

The solutions we come up with and the people we bring together is the result of your hard work and dedication. So to our members and all the government agencies who support our mission: Thank you for participating and making this industry better.

We serve the built environment at the pleasure of those who created us: Congress. But we receive no Congressional funding.

Our work is important to the safety and health of the nation's buildings, communities and cities. We know this. And we continue to need your help.

Every dollar that is donated to the National Institute of Building Sciences supports our mission, cause and the U.S. built environment. Our dollars are stretched thin, and there's still so much work left to do.

There are resources, white papers, and design material that must be coordinated and compiled. There are policy laws that need to be hammered out. And, in every corner of this country, there are walls going up, and it's our job to ensure this construction remains smooth, safe, affordable, and sustainable.

We are a 501 c(3) non-profit organization. As such, we rely on donations and contributions to carry out our work. Every dollar donated to NIBS may be tax deductible, please check with your tax advisor.

We bring the industry, private and public sectors, and federal agencies together to make possible this important work. But we need your financial assistance to keep the mission going. Please consider donating to NIBS today.

Thank you for your support.

## Member Spotlight

### **DUDLEY MCFARQUHAR, PH.D.,P.E., DIST. ENG (DR D)**

Long-term BETEC member

CEO + President / Building Envelope Consultant/Engineer I

[www.mcfarquhar.com](http://www.mcfarquhar.com) Secretary - Building Enclosure Technology Environment Council (BETEC)

Past Chair - National Building Enclosure Council (NBEC)

Past Chair - Dallas Building Enclosure Council

MGI McFarquhar Group Inc

Waxahachie, TX



NIBS membership has been great for me in helping to set up Building Enclosure Councils (BECs) across the country. As a board member and a part of the executive team for BETEC and NBEC, it has allowed me to have a holistic approach to addressing the BECs on local matters or questions, as needed.

Being a member of NIBS has allowed me to meet several different professionals from the differing councils. I also collaborate with colleagues in the BETEC council based on their individual expertise in addressing technical questions for projects.

NIBS promotes many technical committees that cover a wide range of topics in the construction industry, and it is good to share ideas with fellow colleagues to help promote better functioning buildings performance.

While knowledge is always key, sharing it with the public for the better good is more important.



1090 Vermont Avenue, NW, Suite 700  
Washington, DC 20005  
Phone: 202-289-7800  
[www.nibs.org](http://www.nibs.org)