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BEFORE THE

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

SUBCOMMITTEE ON GOVERNMENT MANAGEMENT, ORGANIZATION, AND
PROCUREMENT

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Chairwoman Watson, Ranking Member Bilbray, and members of the Subcommittee, thank you for the opportunity to speak with you today regarding the state of high-performance and green buildings within the federal government.

The National Institute of Building Sciences (Institute) was established by Congress in 1974 upon recognition of a lack of an authoritative national source to make findings and to advise both the public and private sectors on the use of building sciences and technology to achieve recognized goals (12 USC 1701j-2).

In achieving its mission to support advances in building science and technology to improve the built environment, the Institute has the opportunity to work with federal agencies on their real property programs and within agency mission programs—in fact, agencies are encouraged to work with the Institute when appropriate. Through its engagement with both the public and private sector, and its unbiased focus on building science, the Institute is in the ideal position to evaluate the current state of high-performance buildings and the needs for widespread adoption.

In recognition of the unique position of the Institute, the Energy Policy Act of 2005 (EPAct) called for the establishment of a High-Performance Building Council within the Institute tasked to look at the diversity of codes and standards for buildings and determine the needs necessary for implementation of high-performance buildings. The Council produced its report in 2008 with the participation of representatives from over 70 private sector organizations and public agencies.

As its initial task, the Council identified the eight attributes that define a high-performance building. They are:

- Sustainability
- Cost Effectiveness
- Accessibility
- Productivity
- Historic Preservation
- Aesthetics
- Functionality
- Safety and Security

These attributes are reflected in the definitions of *High-Performance Building* and *High-Performance Green Building* as defined in the Energy Independence and Security Act of 2007 (EISA) which defines high performance as “the integration and optimization on a life cycle basis of all major high performance attributes, including energy conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations.”

As the Subcommittee will note, sustainability or “green” is just one aspect of a high-performance building. Federal agencies have numerous requirements related to these high-performance attributes beyond the energy, water and sustainability requirements in EAct, EISA, and Executive Orders 13423 and 13514. Additionally, these requirements are likely to expand and change due to emerging issues impacting building occupancy and use including those tied to our aging population (e.g., addressing low vision) and to increased interest in technology and sustainability (e.g., flexibility for new technologies and new work environments). A sample of relevant laws and Executive Orders appear below:

- Americans with Disabilities Act
- National Historic Preservation Act
- Public Buildings Act
- National Environmental Policy Act
- E.O. 13006: Historic Properties
- E.O. 12977: Security Standards
- E.O. 12941/12699: Seismic Safety
- Presidential Memorandum on Disposing of Unneeded Federal Real-Estate (June 10, 2010)

With these numerous requirements impacting how federal buildings are designed, constructed, and maintained, achieving a high-performance building can be challenging. This is particularly difficult when we consider the complexities surrounding the interactions among such requirements. While the attributes of a high-performance building are well defined, the tools and criteria to demonstrate achievement of high-performance attributes are not.

As the High-Performance Building Council reported, common metrics are needed to measure and compare achievement of individual attributes and then to understand the interactions across attributes. How do you measure aesthetics and what impact do aesthetics have on accessibility? Further, what level of aesthetics, accessibility or the other attributes are necessary to consider a building high-performance?

Because of the numerous attributes required for high-performance, no one organization or profession alone has the knowledge or expertise to fully integrate the attributes into a clear path to high-

performance. Coordination and cooperation is necessary. The High-Performance Building Council, with the cooperation of the entire building community, serves this coordinating function, but has not had the resources to continue its work following completion of the report under EPAct.

In addition to the fundamental need for metrics and agreed upon performance levels, the underlying standards and research and development—in both the social sciences and building sciences—must be supported.

Federal agencies have additional challenges in meeting the various requirements placed on them. While there is significant resident expertise within agencies on individual aspects of high-performance, there is no single focal point for integrated expertise. For energy related regulation, agencies contact the Federal Energy Management Program (FEMP) within the Department of Energy. For historic preservation regulations, agencies contact the National Park Service. The interaction between these regulations is largely unknown.

This lack of integration cannot be attributed to the agencies themselves, but it reflects the underlying fundamentals of an agency structure—agencies are generally focused on their key mission areas, and resources are focused on areas with current interest by Congress, the President, and the American people. A concerted effort to look at buildings holistically is necessary. Such an effort should coordinate and evaluate how existing policies interact and how new policies can consider the impacts on all high-performance attributes.

Beyond difficulties with integrating existing and future requirements, additional challenges can hinder the achievement of federal high-performance buildings. As indicated above, achieving high-performance will require an integrated design, construction, and operation process that engages key professionals early on in the process and throughout the design and construction. The current budget process where capital and operations budgets are separate and savings in one account cannot be transferred to cover related expenses in the other is not conducive to an integrated and holistic approach to buildings.

The procurement process itself also tends to hamper collaboration—many contractors and sub-contractors are engaged once the initial design of the building is complete and many of the components and systems that address the high-performance attributes are already decided without their input and expertise. While a change in this process is likely to result in increased design costs, design goals can be achieved with greater efficiency and decreased need for changes once construction begins—thus, saving funds in the end.

Some agencies have identified best practices and technologies that contribute to achieving high-performance. These practices and technologies must be shared across federal agencies and with the private sector. Some agencies, including the Department of Defense, are testing and validating products and technologies. The results should be shared across agencies to make procurement officers aware of such results, and to assure consistency and avoid duplication. The Institute's Whole Building Design

Guide (www.wbdg.org), which is supported by 11 federal agencies, could serve as a repository for such case studies and validations.

Some agencies already are using the WBDG to share information across agencies. The “Sustainable Federal Buildings Database,” a compilation of federal (and some state and local) agency policies and guidelines on energy efficient, sustainable government facilities, was recently posted by FEMP. The Environmental Protection Agency (EPA) provided an updated Federal Green Construction Guide and the U.S. Army Corp of Engineers (USACE) published the Energy and Water Conservation Design Guide. As FEMP, EPA, USACE and other agencies continue to contribute content to the WBDG, synthesis of the available information to arrive at a coherent set of best practices will be necessary to facilitate widespread utilization.

One Federal program attempting to integrate the range of attributes in buildings is the Department of Homeland Security’s High Performance Based Design project within the Science & Technology’s Infrastructure and Geophysical Division which is developing high performance requirements for blast resistance, CBR protection along with energy, environmental sustainability, durability, air and water protection and other major building requirements.

The Department of Veterans Affairs (VA) also is focusing its building activities on a more holistic and multi-faceted approach. Their guides and facility manuals are being updated to include integrated design and construction processes including Building Information Modeling (BIM) and commissioning. Secretary Shinseki has begun the VA facility management transformation initiative to address the lifecycle performance of facilities. Facility performance will be maximized through implementation of an enterprise facilities management operation for a new generation of high-performance, sustainable healthcare environments for the changing population of Veterans.

Education and training of all federal personnel engaged in the procurement, design, construction and operation of federal buildings will be critical to realizing the design intent of high-performance buildings. As buildings become increasingly complex to fulfill myriad requirements, a savvy operations and maintenance team is important to assure the buildings operate as intended. Building occupants also must be informed about how their actions impact the overall performance of the building. Procurement officers must have a broad knowledge of potential financing opportunities and available technologies.

Despite the numerous challenges federal agencies face in achieving high-performance buildings, several technologies and practices are currently available to support agency efforts. BIM is a valuable tool that can facilitate a holistic approach to building design, construction, operation, and deconstruction and lead to significant improvements in efficiency. While the General Services Administration is making use of BIM in the design and construction of its new buildings, the model should be expanded for use throughout the building’s life-cycle. The Institute, through one of its councils, the buildingSMART alliance, is working on the underlying standards and criteria necessary to expand the applicability of BIM.

Upon completion of a building, total building commissioning is necessary to assure that the design intent is met when the government takes ownership. Ideally, the commissioning agent should be engaged throughout the design and construction process to identify potential issues early on. Existing buildings should undergo retro-commissioning to assure they are operating correctly. Periodic re-commissioning is essential to assure that buildings continue to perform at the desired levels.

Utilizing integrated design processes will result in a holistic approach to meeting the numerous requirements placed on federal buildings, but the acquisition process must be sufficiently flexible to allow shifts in when and how members of the design and construction team are selected and compensated.

Agencies must be encouraged to engage in the collaboration and coordination necessary to achieve high-performance (similar encouragement is needed in the private sector as well). As private sector organizations develop the standards and practices to achieve high-performance, the expertise of federal agencies will be an invaluable resource.

Through increased focus on a holistic approach to high-performance buildings, the federal government can have a significant positive impact on the building community. The availability of high-performing products and systems will grow as agencies stimulate demand. By establishing performance-based criteria for such products and systems, manufacturers will be able to tailor their products to meet expressed needs and they will be given a level of certainty as to how future needs will be expressed. Ultimately, through the federal government's leadership in specification of high-performance buildings, private sector experience and the demand for high-performance buildings will grow.

As the entity charged by Congress to provide an authoritative source for findings and advice to the public and private sector on the use of building science and technology to achieve national goals, the Institute is pleased to offer its expertise to the Subcommittee, Congress at-large and federal agencies.