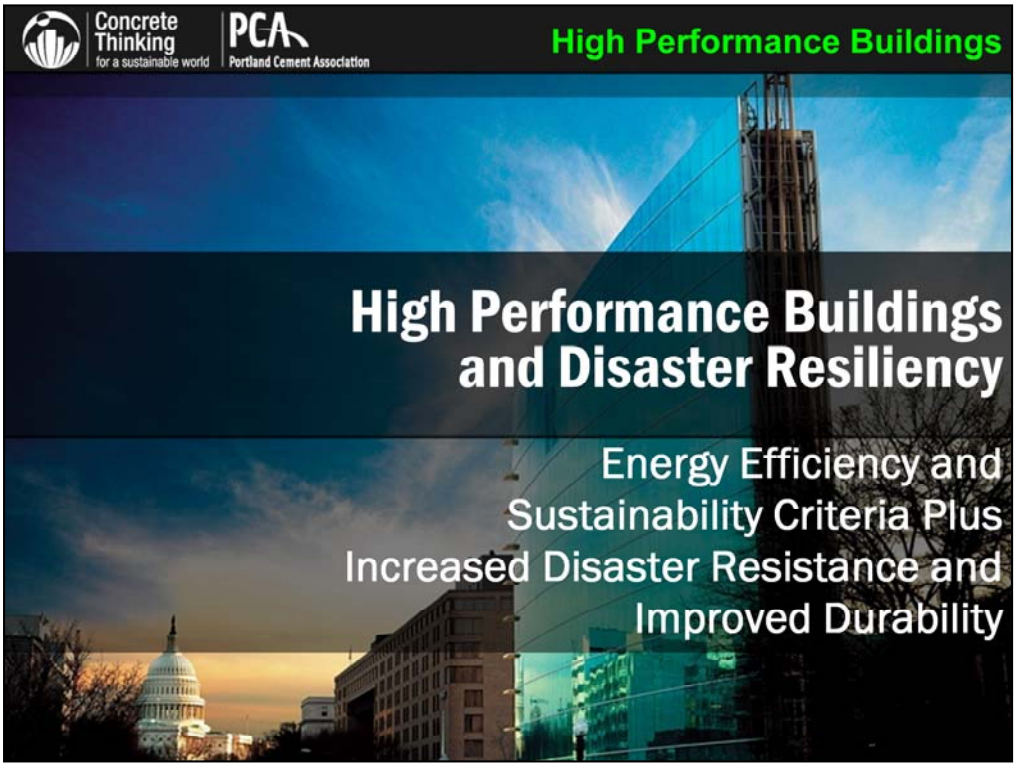
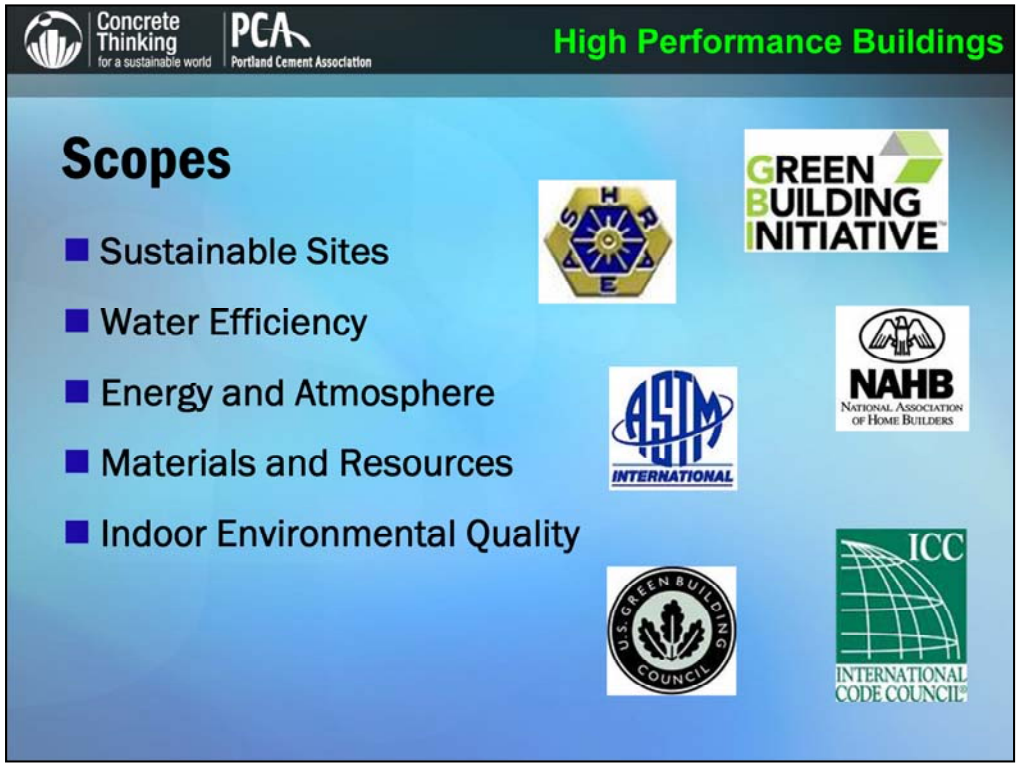
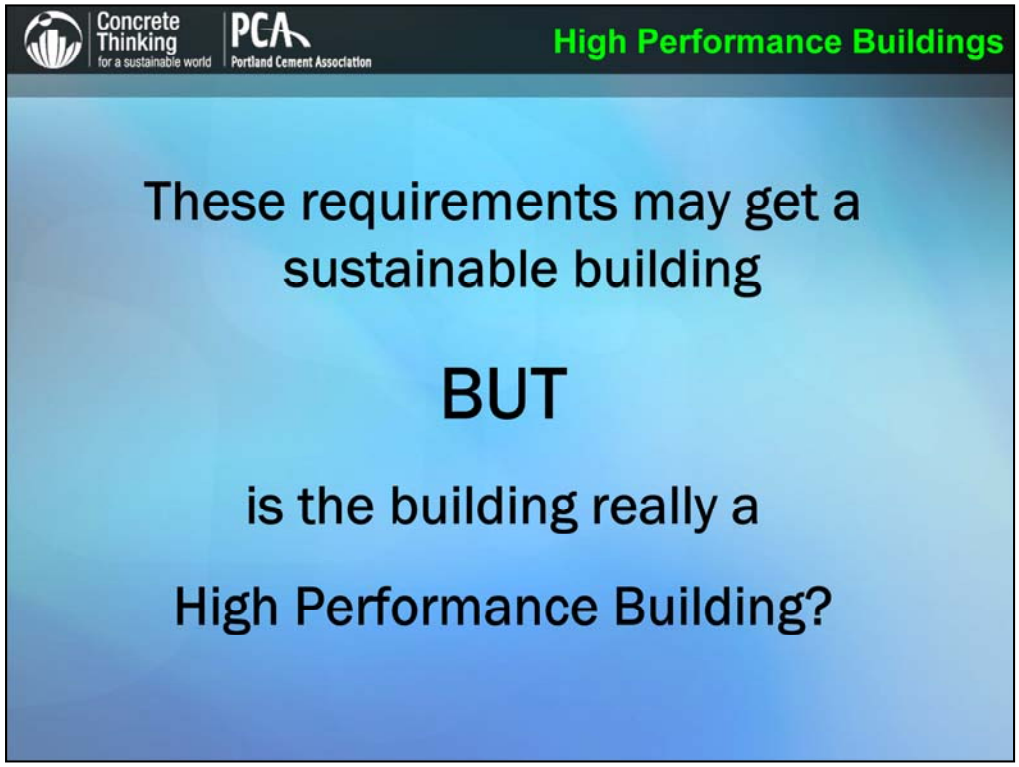


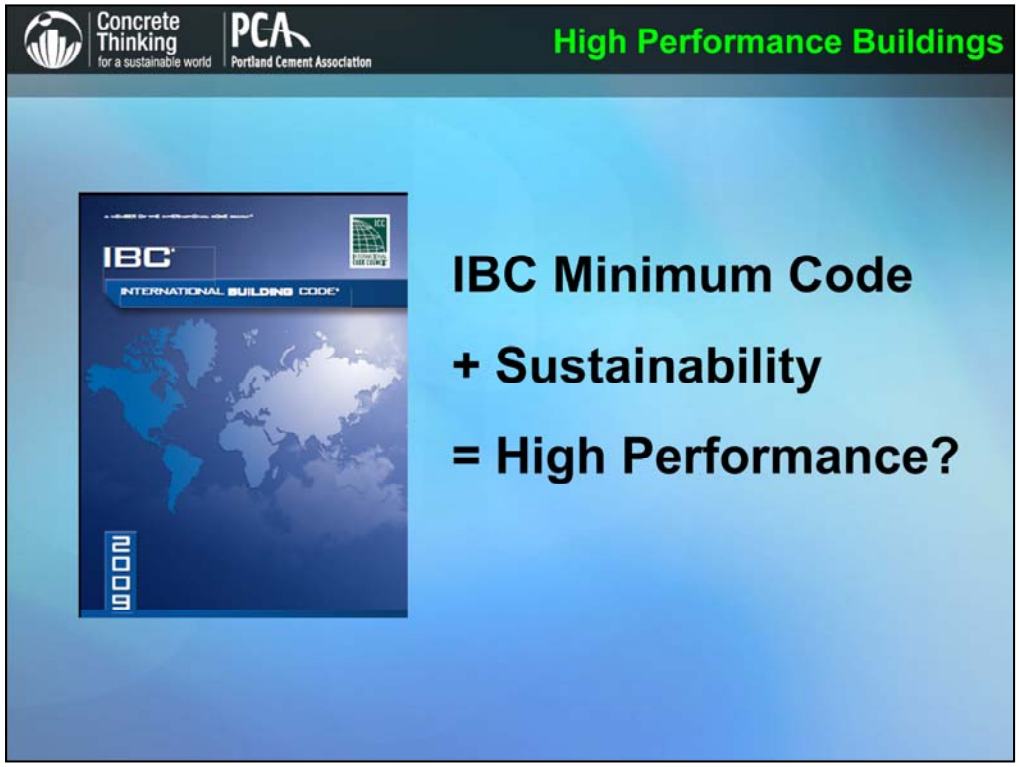
Welcome to our program introducing the High Performance Building Requirements and Disaster Resiliency.

The High Performance Building Requirements for Sustainability go beyond and enhance the key concepts of most other national efforts intended to address green or sustainable building design and construction. Some of these other initiatives include the joint National Association of Home Builders (NAHB) International Code Council (ICC) *National Green Building Standard* (ICC 700); American Society of Heating refrigerating and Air-Conditioning Engineers (ASHRAE) proposed standard 189.1 *Standard for the Design of High Performance Green Buildings Except Low-rise Residential Buildings* (ASHRAE 189.1); International Code Council draft of the *International green Construction Code* (IgCC); a variety of standards under the purview of the American Society for Testing and Materials (ASTM International) Committee E60 on Sustainability; the US Green Building Council (USGBC) *Leadership in Energy and Environmental Design – New Construction* (LEED-NC); and Green Globes *Green Building Initiative*

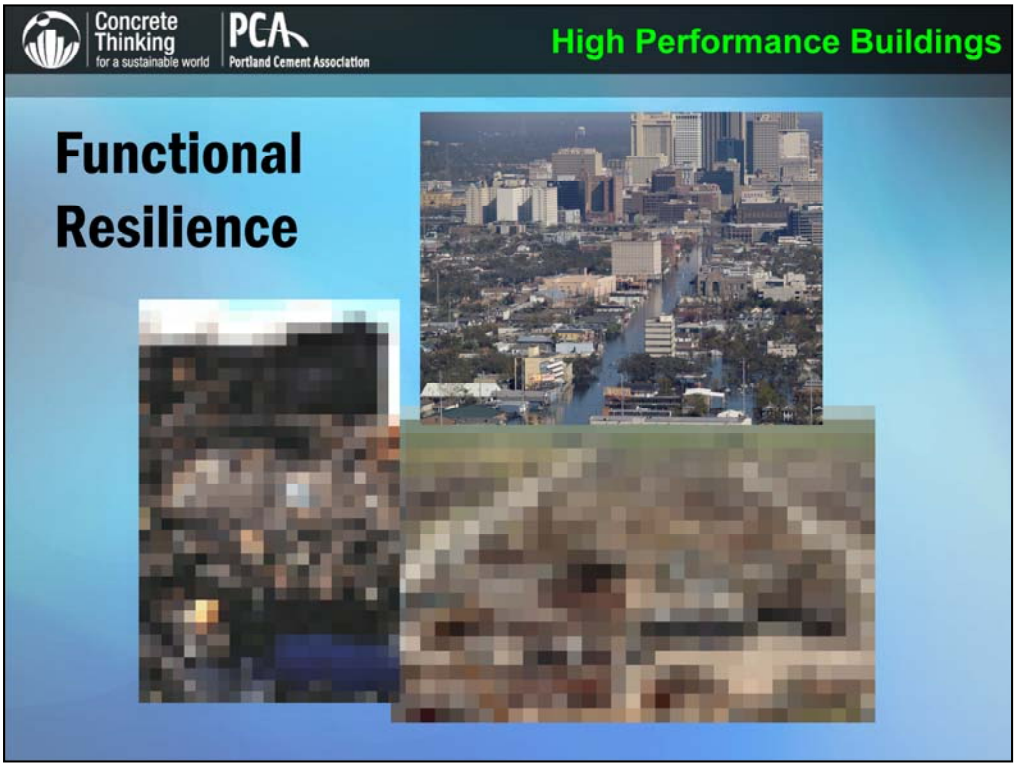


The scopes of each of these efforts is for the most part limited to sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor air quality provisions being added to a building that could be built to the minimum life safety provisions of the state or local building code or less.

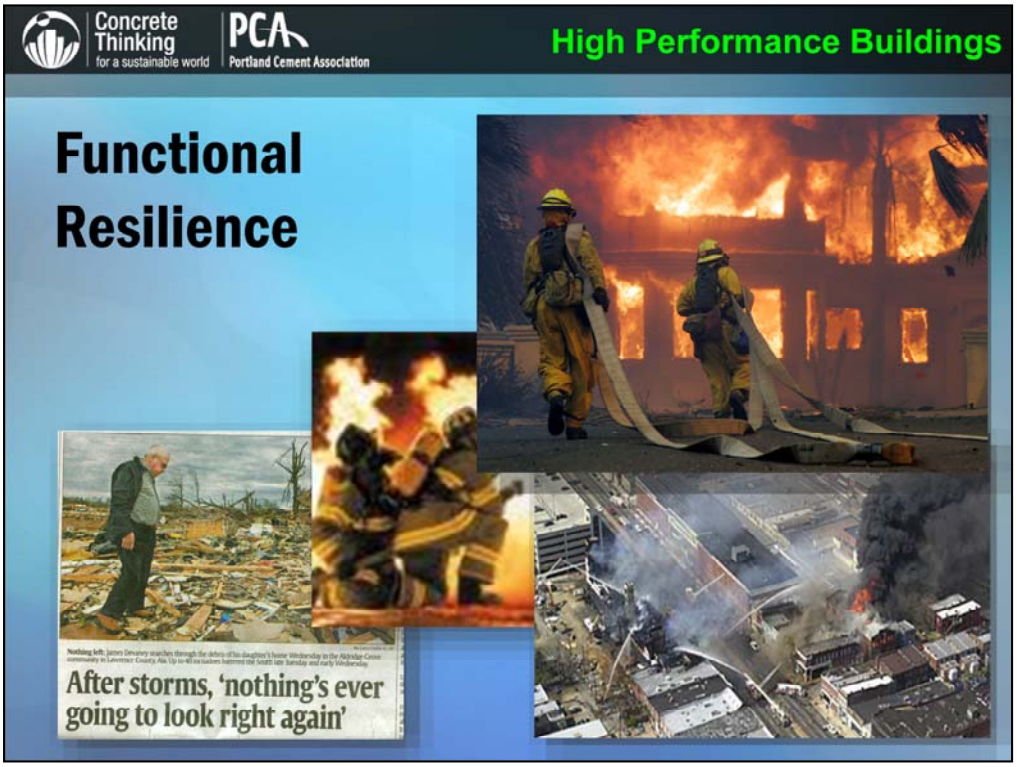

Concrete Thinking for a sustainable world
PCA Portland Cement Association
High Performance Buildings
These requirements may get a sustainable building
BUT
is the building really a
High Performance Building?



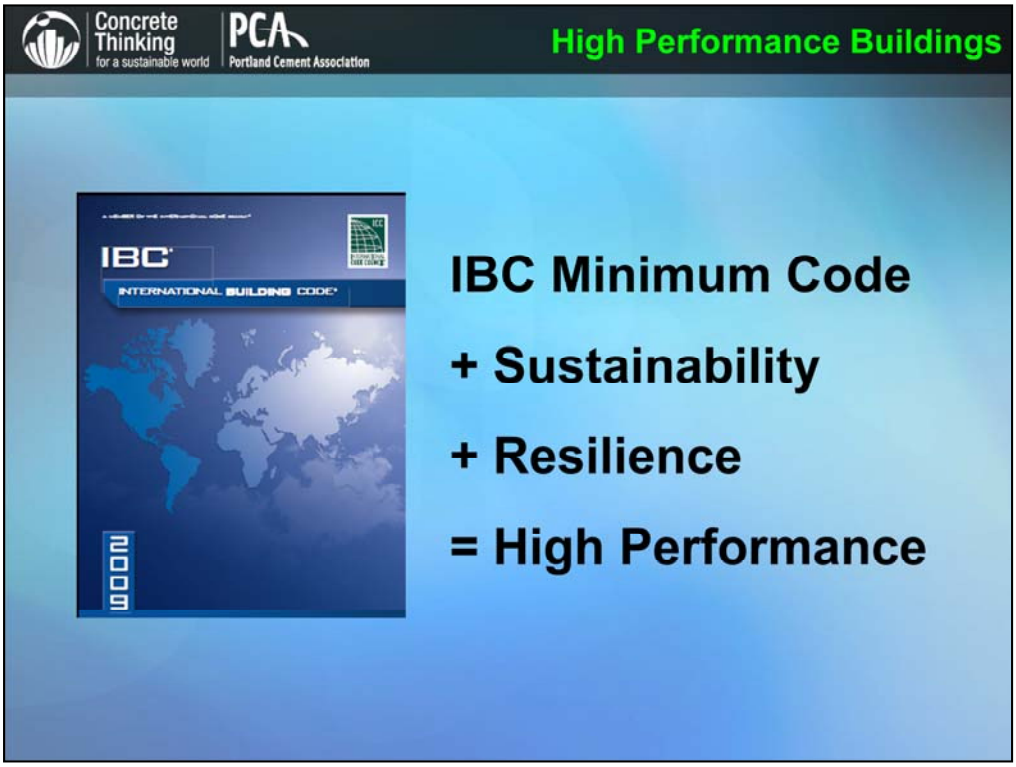
Sustainable requirements combined with minimum construction requirements do not add up to high performance



Buildings that are built to satisfy the minimum life safety code, regardless of the extend of energy conservation, water conservation, site development, material resources, and indoor environmental quality should not be considered green, sustainable, or high performance. Truly high performance, green, or sustainable buildings should be long lasting and durable. Whether there are frequent repairs due to routine wear and tear or damage due to disasters such as wind storms including hurricanes and tornadoes, earthquakes, winter storms, flooding, wildland fires, construction fires, or conflagrations high performance buildings should not be designed and constructed in such a manor that they minimize the contribution to pollution and landfills. Truly sustainable buildings must be functionally resilient!



High performance buildings should not be a burden on their communities. They should not be capable for readily initiating conflagrations. They should have sufficient functional resilience to assure ensure nearly continuous operation and not place excess demand on community resources including emergency responders and charities when disaster occur. The more functionally resilient the buildings, the more likely communities will have continuous operation of hospitals, schools, and businesses, and public services; homes for employees; commerce and tax revenue; and the ability to attract new businesses and residents.



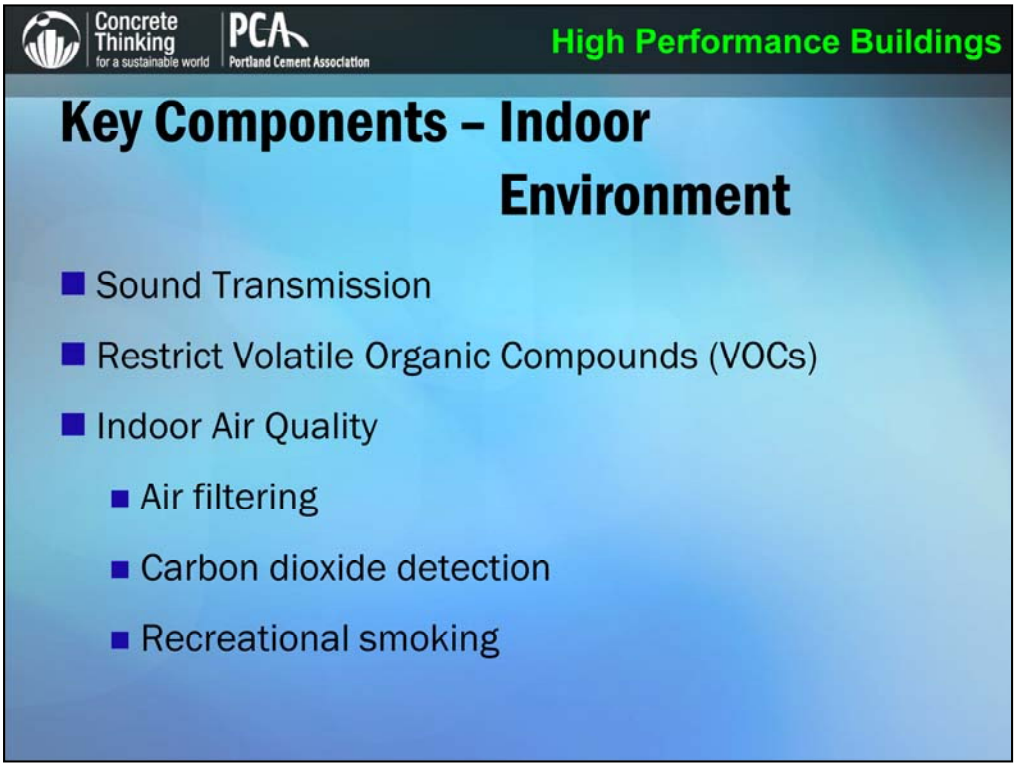
High performance buildings should not be designed and constructed in such a manor that they contribute to pollution and landfills. While some refer the a buildings ability to resist disaster and allow continuous or near continuous operation as passive survivability, PCA is trying to stay away from that term because of the degree of success or previous passive efforts such as passive solar and passive fire protection.

High performance buildings should not be a burden on their communities. They should not be capable for readily initiating conflagrations. They should have sufficient functional resilience to assure ensure nearly continuous operation and not place excess demand on community resources including emergency responders and charities. The more functionally resilient the buildings the more likely communities will have continuous operation of hospitals, schools, and businesses, and public services; homes for employees; commerce and tax revenue; and the ability to attract new business and residents.

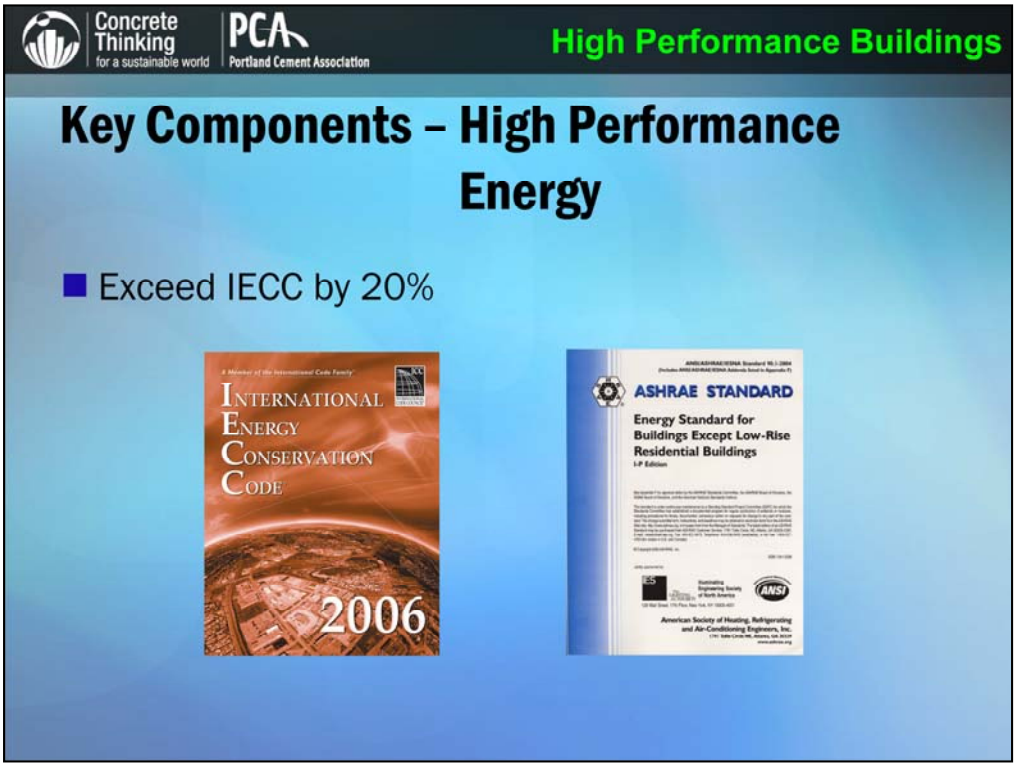
To facilitate adoption by Federal agencies and State and local jurisdictions the high performance requirements have been prepared as a package of amendments and appendices to the 2009 International Building Code. In this manner their adoption makes the high performance requirements a mandatory part of the building code. This method of implementation also limits the requirements to those provisions within the typical purview of the building code enforcement department. For example, many sustainable regulations being developed require a high performance building be located near bus or transit lines or stations. These stipulations are outside of the building department's control and hence are not included in this high performance package. Some high performance requirements, like those of the US Green Building Council, also require additional fees be paid to receive designation or certification as high performance. These requirements that are made a part of the building code do not contain these additional fees.

The High Performance Building Requirements have been posted on the Portland Cement Association website (www.cement.org). They can be found by going to the Building Codes and Standards section of the website and then selecting the HPBRS link.

This new section in Chapter 1 requires that a service life plan be developed and provide to the owner prior to application for a building permit. A service life plan will provide the owner valuable decision making information on what the overall maintenance cost will be based on the material selected. Maintaining the sustainable systems and building components is critical to maintaining a high performance building



The requirements of the IBC for interior environment generally address only the minimum requirements for providing ventilation, temperature control, lighting, sound transmission and effects of materials on the health of the building occupants. The HPBC expands these requirements to address more than the minimum requirements to provide improved indoor air quality and living environment. Enhanced items include sound transmission for more than just residential dwellings, limits in VOCs in building materials, high performance filters for HVAC systems, CO2 detection and specially designed spaces for recreational smoking to allow building owners and tenants to implement no smoking policies.

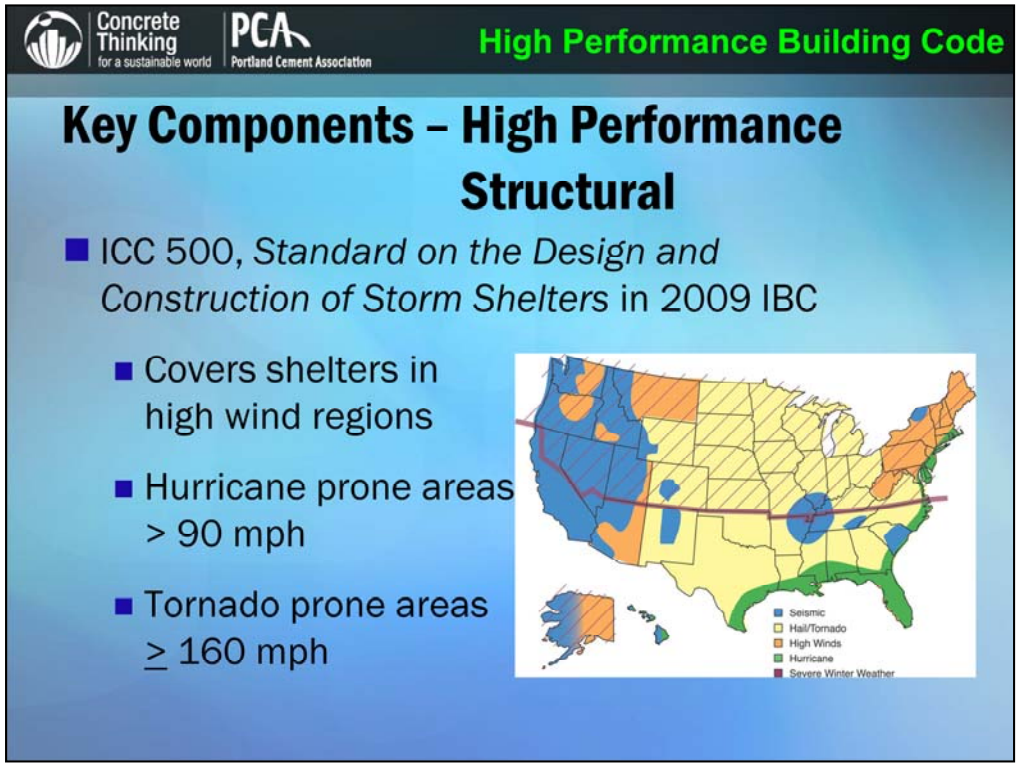


Chapter 13 of the IBC simply refers the code user to the IECC. The IECC covers minimum energy efficient design for all buildings both low-rise residential and all other residential and commercial buildings. The IECC also permits the use of ASHRAE Standard 90.1 as an alternative for all buildings except low-rise residential. The HPBC specifies building performance criteria that high performance buildings must meet. These criteria are set to levels above the minimum presently required by the IECC or ASHRAE Standard 90.1. The HPB is expected to document 20% energy savings below buildings built to these minimum energy standards.

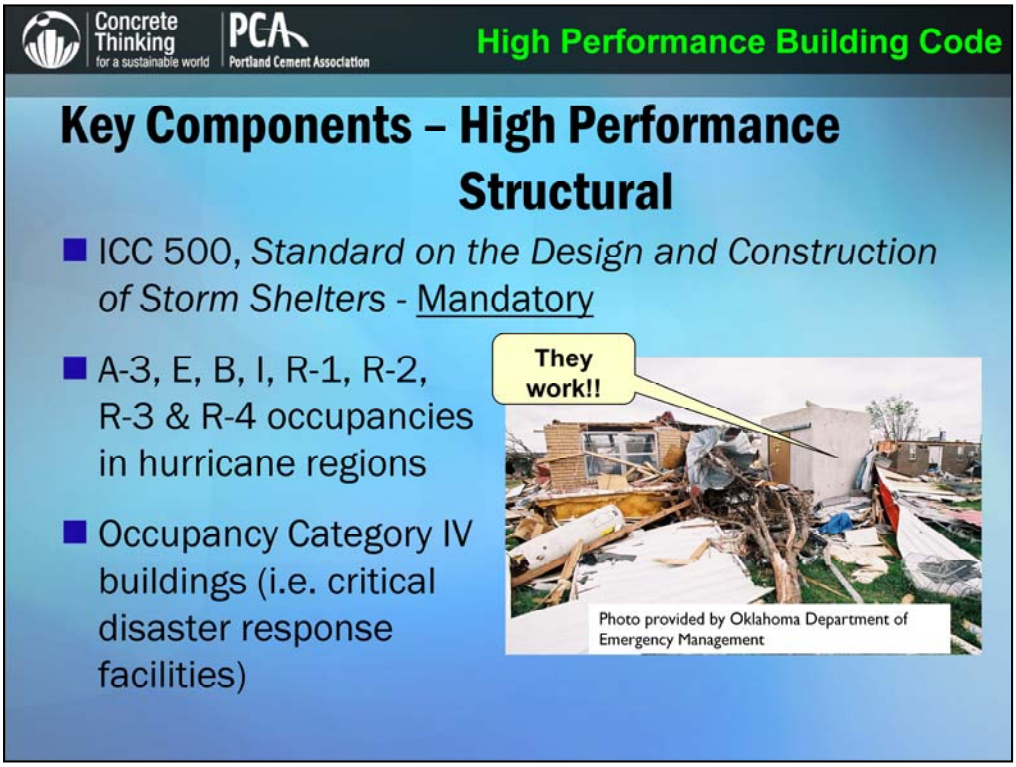
The appendices include provisions for using recycled materials, recycling materials and construction waste management. Regional material requirements are also included as an approach to sustainable or high performance buildings. Here the approach is not distance but fuel use based on fleet mileage. Also, unlike many other efforts which tend to be limited to carbon dioxide, the requirements in this document highlights clean air clean water pollution prevention and noise control. Finally, site selection and development are in an appendix to protect habitats and to preserve or provide open space.

- Minimum building code requirements do not specify that all buildings be provided with automatic sprinkler protection. The high performance building requirements acknowledge that sprinkler protection in buildings enhances fire safety for the occupants and the property. There are exceptions for factories and storage facilities where non-combustible materials are manufactured or stored.
- To further enhance fire protection all high performance building are required to have structural fire resistance.
- Finally, to insure an appropriate level of fire safety consistent with high performance these requirements do not permit fire safety features such as fire resistance, travel distances, egress widths be reduced due to the presence of sprinkler protection. Such reductuions are commonly referred to as sprinkler trade-offs.

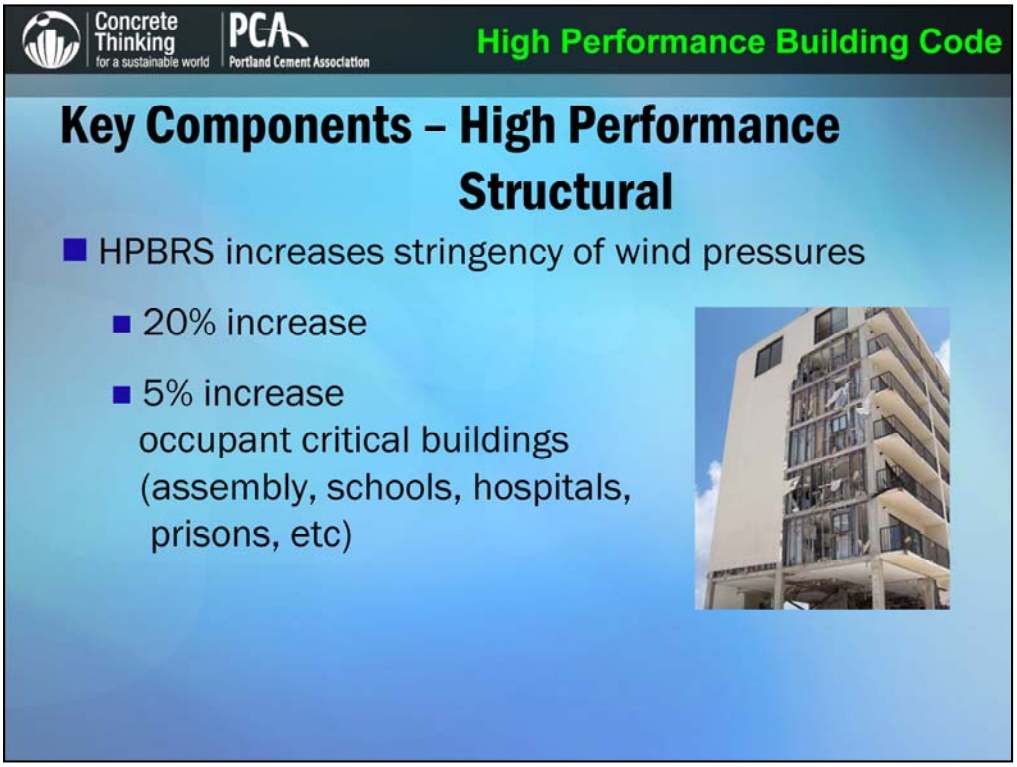
Wildland/Urban interface fires commonly occur throughout the United States and its effects can be catastrophic when the weather and terrain conditions are windy and dry. Jurisdictions which adopt this high performance ordinance will also be adopting the ICC Wildland Urban Interface Code (WUIC). The WUIC is introduced in Chapter 1 as a mandatory requirement. Hazard mitigation is based on differing degrees of forage, available water, access and prevailing weather conditions.



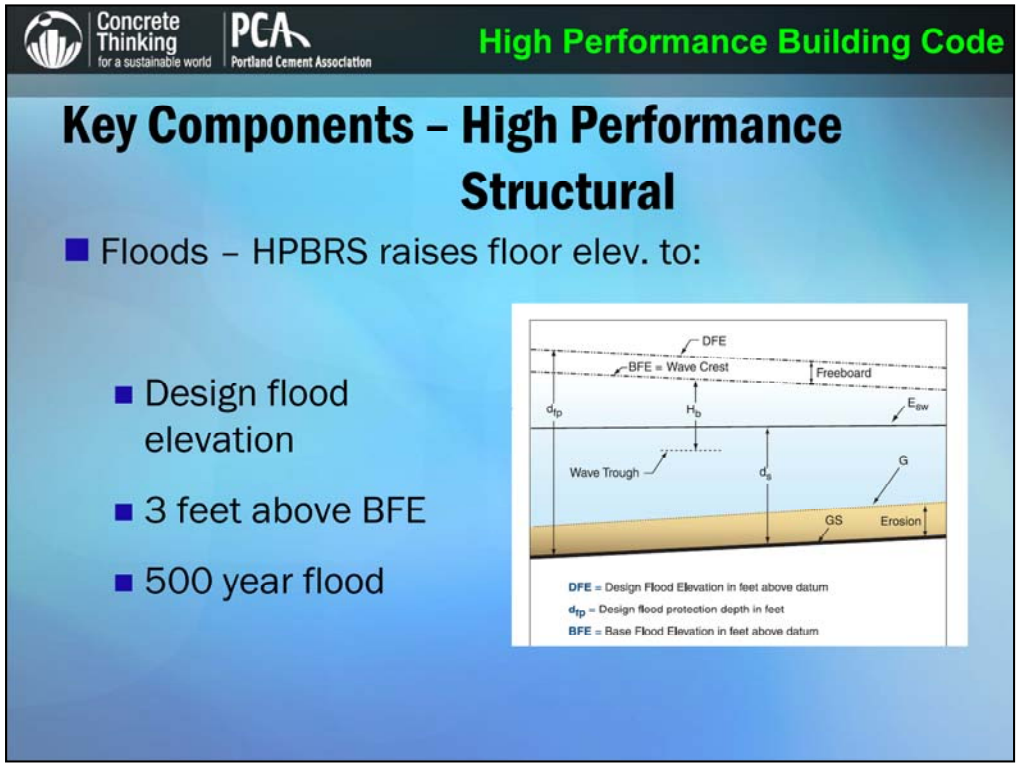
The 2009 IBC includes a new reference to the recently developed ICC Standard for construction of storm shelters. This standard tells someone how to build an effective storm shelter in high wind regions. High wind events include hurricane regions like the Atlantic and Gulf coasts and the interior regions of the country for tornados. The map for tornado regions is different than the design wind speed map in the IBC.



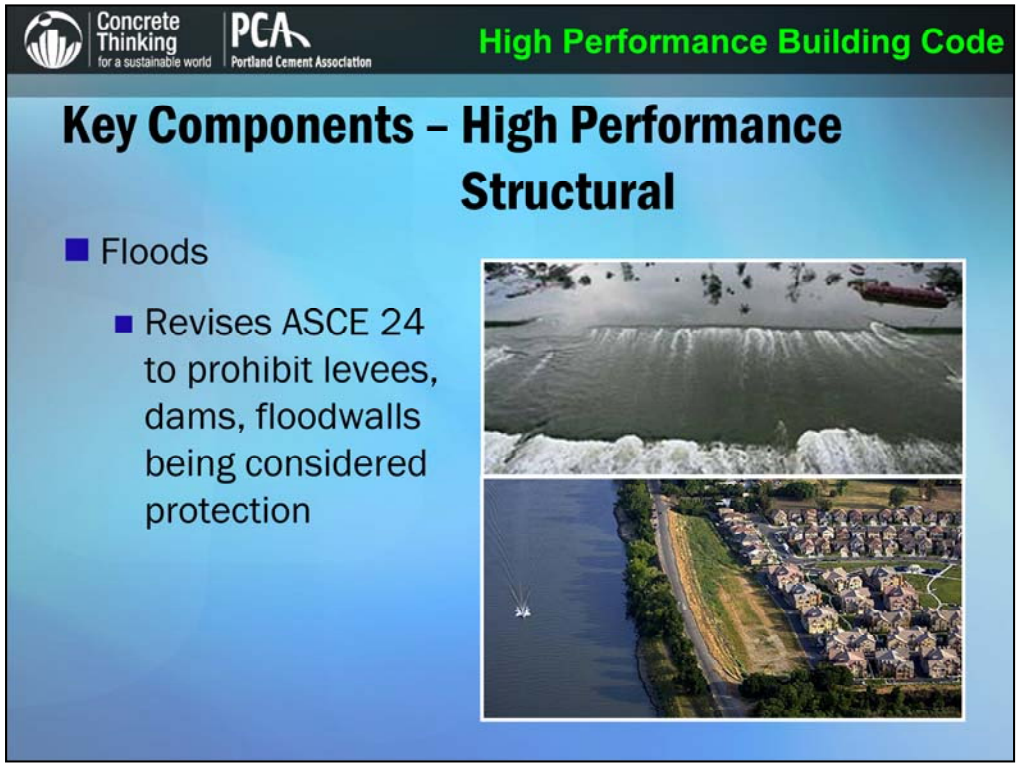
The 2009 IBC includes the new reference to ICC Standard in the code but does not include a mandatory requirement that it must be followed in high wind regions. That is left to the adopting authority to decide. The HPBRS makes that decision by requiring that it be followed. Buildings designed and built using the standard are better prepared to withstand high wind events with reduced risk to damage and be able to serve the community during and after these events.



The HPBRS increases the wind pressures to be used in the design of all buildings to increase the resiliency of the building in high wind events. For most buildings the increase is set at 20%. For buildings with large occupant loads, or with occupants that need extra protection, the increase is 5%. Note that wind loads in these types of buildings have already been increased by a factor of 1.15 above most common buildings. Finally if the designer uses the simplified prescriptive requirements in the code the HPBRS requires that the wind speed used to determine the design wind loads shall be increased by 10%.

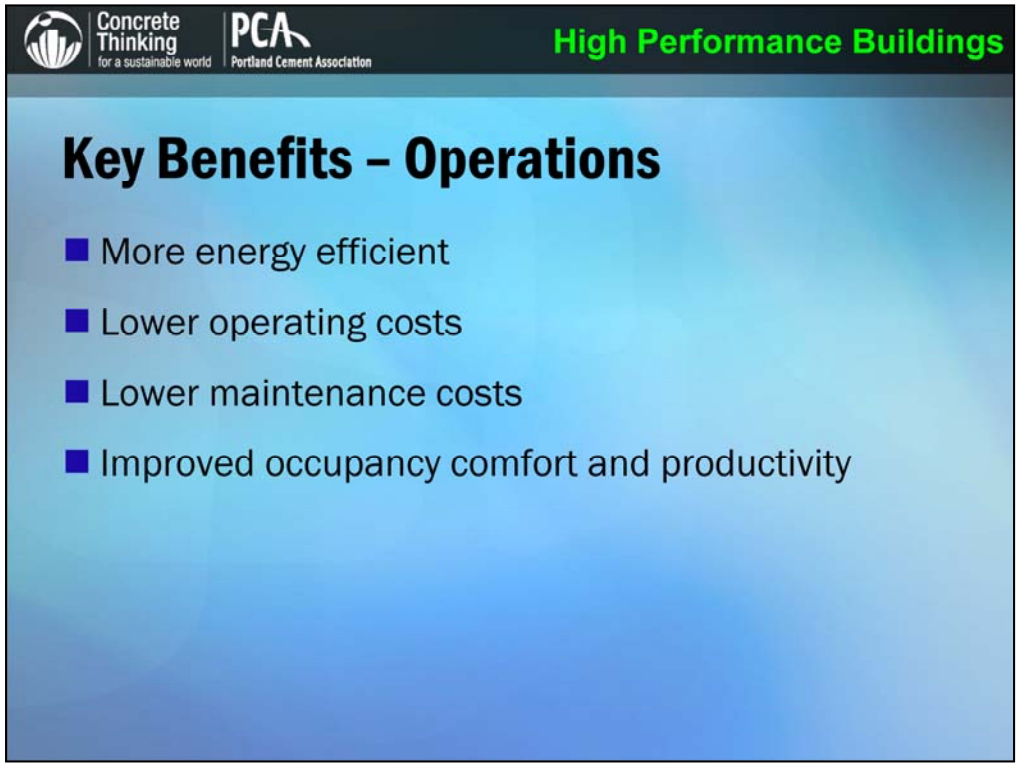


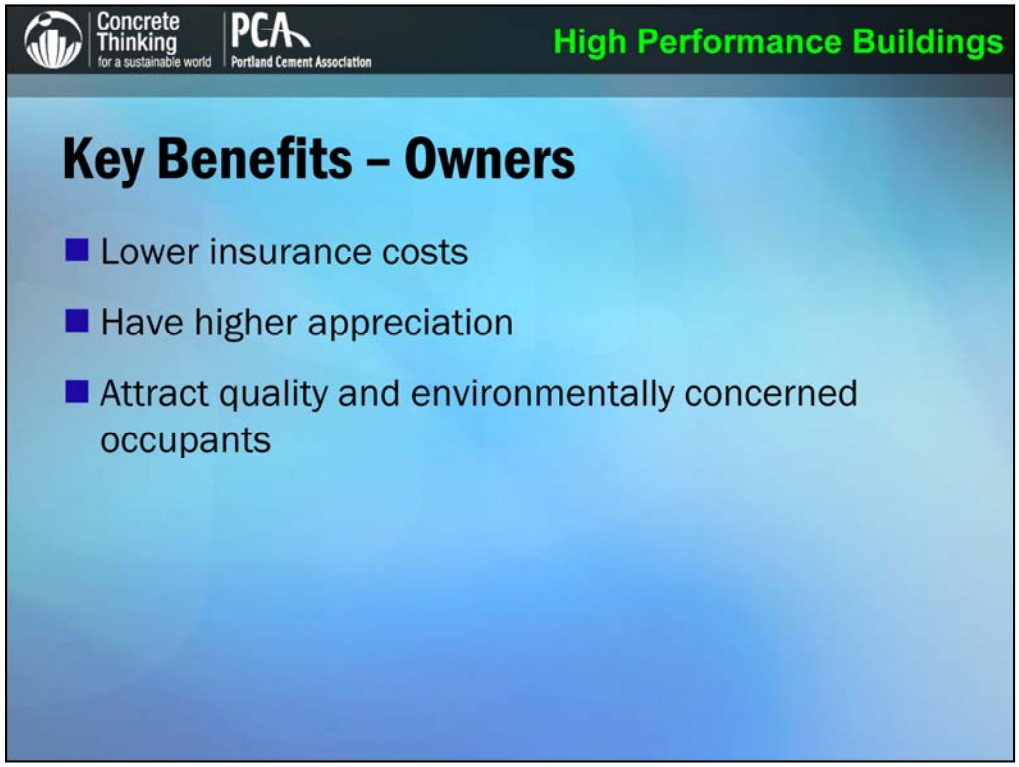
The HPBRS raises the elevation of the lowest floor and horizontal support members to the design flood elevation for the location where the building is sited, or 3 feet above the base flood elevation or the 500 year flood elevation, if known. The end result is that more buildings will be required to use durable foundation systems to support the floors above in areas prone to flooding.

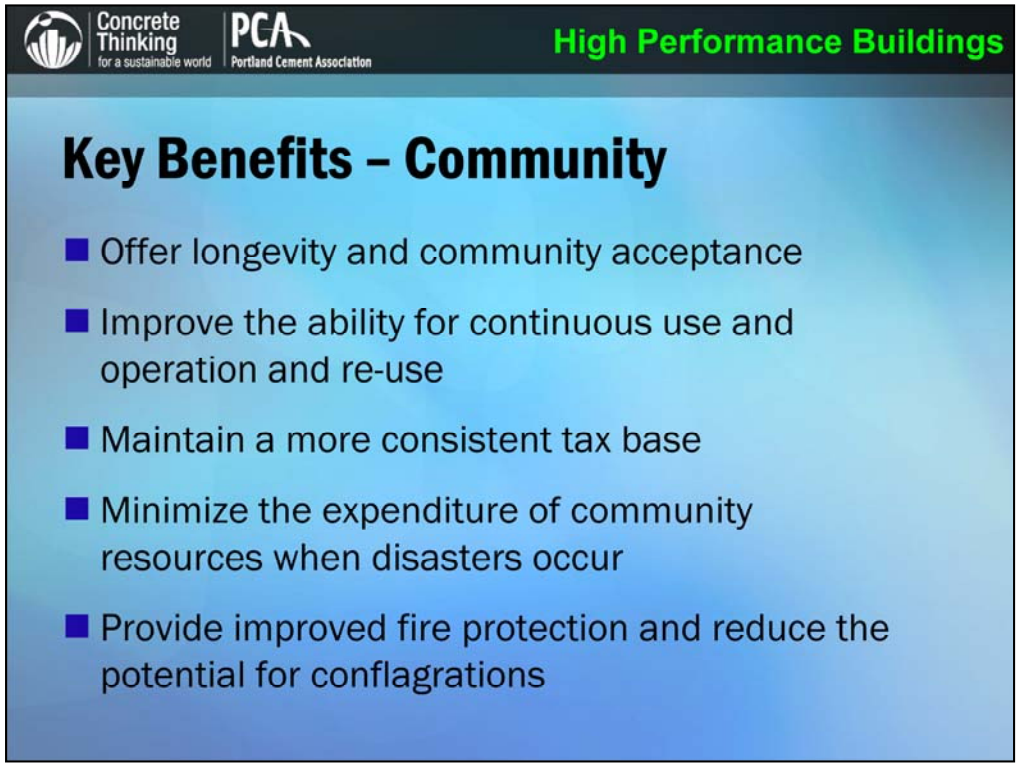


The HPBRS provisions also require modifications to ASCE 24, Flood Resistant Design and Construction. ASCE 24 allows physical elements such as levees, dams and floodwalls to be considered as providing protection to buildings from floods. However recent flooding events have demonstrated that these manmade structures are subject to overtopping or failure. The modification prohibits the use of manmade structures to provide flood protection. Building design must follow the design requirements for areas subject to flood hazards.

Minimum building code requirements plus sustainable requirements plus increased structural and fire safety requirements will more likely equal a high performance building.


Concrete Thinking for a sustainable world
PCA Portland Cement Association
High Performance Buildings
Key Benefits – Operations
More energy efficient
Lower operating costs
Lower maintenance costs
Improved occupancy comfort and productivity


Concrete Thinking for a sustainable world
PCA Portland Cement Association
High Performance Buildings
Key Benefits – Owners
Lower insurance costs
Have higher appreciation
Attract quality and environmentally concerned occupants


Concrete Thinking for a sustainable world
PCA Portland Cement Association
High Performance Buildings
Key Benefits – Community
Offer longevity and community acceptance
Improve the ability for continuous use and operation and re-use
Maintain a more consistent tax base
Minimize the expenditure of community resources when disasters occur
Provide improved fire protection and reduce the potential for conflagrations

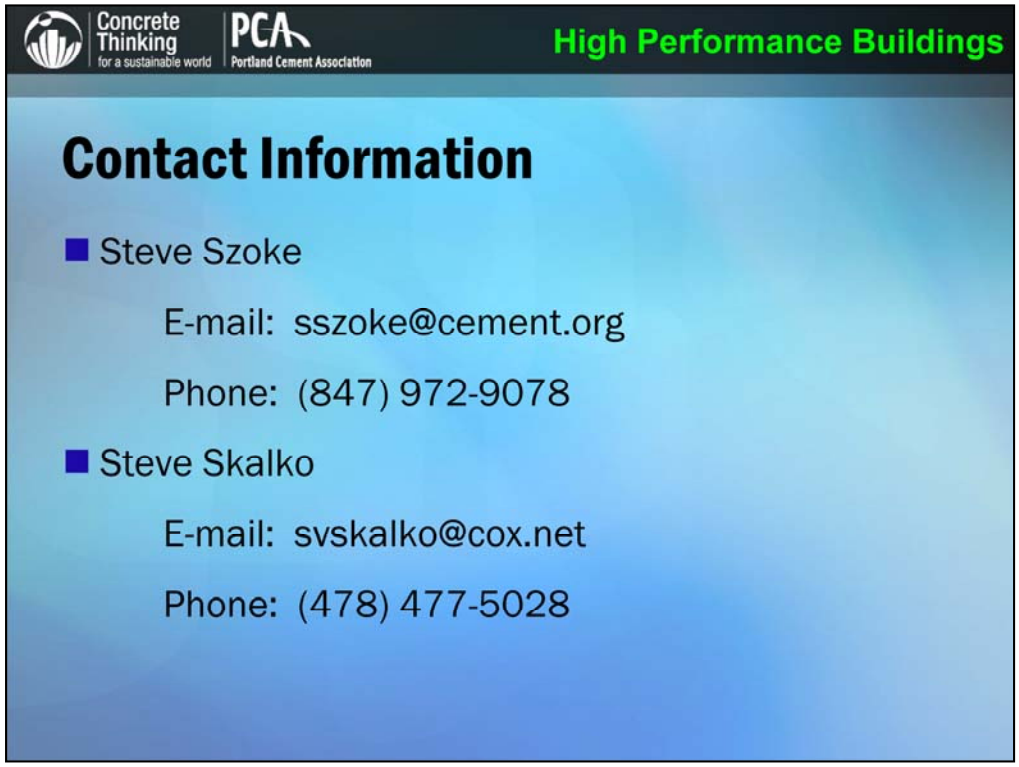
Are the High Performance Building Requirements for Sustainability appropriate for every building in every jurisdiction? Probably not. In some jurisdictions they may only be appropriate for government owned or funded projects. Some jurisdictions the requirements may also be used for buildings to achieve a high performance designation to indicate that they provide the basis for green or sustainable buildings regardless of satisfying additional criteria in a Green Globes or US Green Building Council certification program. However, in jurisdictions where disaster resistance is a high priority or truly sustainable buildings are needed to satisfy the environmental, social, and economic requirements of the community the requirements may be appropriate for all new building construction. In order for code provisions for sustainable buildings to be advanced, state and local advocacy programs are required.

As with any effective grassroots program we need to educate and gain support form other interests that will benefit form the adoption of the High Performance Building Requirements for Sustainability. There are a variety of entities that should be able to support such requirements, unfortunately most are not actively involved in code development at any level, national state or local. Hopefully this concept will influence the way people in general think about sustainability and may even gain needed support at the national level from those who recognize that sustainability must include a long lasting structures with optimal durability and appropriate disaster resistance.

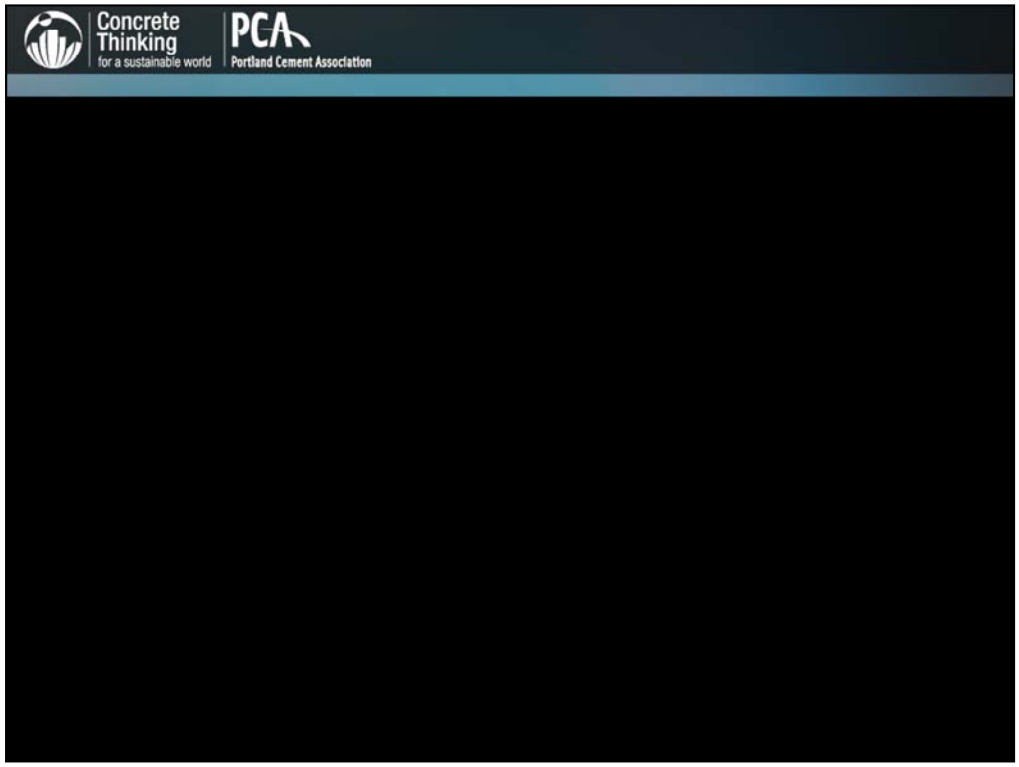
Depending on the jurisdiction, the audiences for this program and who can assist in influencing the state and local law makers is large some of the key categories are:

Energy conservation groups who will recognize the benefits of the improved energy performance over the life of the building and may include the state energy office and local utilities; state and local emergency management and emergency responders who will see the environmental benefits of increased disaster resistance not only as reducing the amount of repair and reconstruction needed after disasters but also the reduction in negative environmental, social, and economic impacts when disaster recovery is expedited. Insurer and insurance commissioners will also see the benefits and be able to provide lower insurance rates for high performance buildings resulting in reduced operating costs and more attractive occupancy by businesses and residents. Environmental interests should be excited to support these efforts that extend beyond the traditional green building programs. Longer lasting buildings with a lesser need to repair and replacement even after disasters should serve as the basis for sustainable buildings – a shift in the current trend in the United States to have the core building be built to minimum life safety requirements at the lowest possible initial cost and thereby continuing the practice of providing disposal buildings. Great for builder sand developers who get to repair, reconstruct, demolish and rebuild – but maybe not so good for the environment or our communities. The National Trust for Historic Preservation reports that 25% of the existing buildings in the United States are demolished and replaced every 30 years. We need to work to change this accepted practice now to benefit future generations.

Organizations representing the elderly, such as the American Association of Retired Persons, will find that these provisions will provide safer buildings which will especially benefit those with physical or mental impairments resulting from aging or degrading health and/or associated medications. Also when disasters occur it is often much more difficult for those on fixed retirement incomes to recover by appropriately replacing or repairing damage property. Charitable organizations such as the American Red Cross should find the requirements necessary to help reduce future expenditures for disaster assistance and recovery. If we do not start to change the design and construction of buildings today, recovery from future disasters will continue to be more difficult. In addition, many meteorologists predict and as historic climate data indicates, weather related disasters – floods, storm surges, hurricanes, tornadoes, hailstorms, droughts and wildland fires – are becoming more extreme. Health and human services department should recognize the benefits of more disaster resistant buildings and communities with regard to being able to better and more quickly reestablish needed social and medical services. Municipal planner should recognize the benefits to longer lasting, quality buildings for maintaining an appropriate community infrastructure. Naturally the elected officials are probably the most influential audiences when it come to state and local rules and regulations. Elected officials in any jurisdiction that has a high potential for disaster or has experienced the difficulties related to disaster recovery or is forward thinking and want to have more sustainable high performance buildings and infrastructure to establish the appropriate balance of long-term economic, social, and environmental responsiveness for sustainability.



Thank you for you consideration of these concepts and this program. For further information please feel free to contact Steve Szoke or Steve Skalko.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