




Is “performance-based” fire protection the best way to work towards sustainable building goals?

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An aerial photograph of a dense urban skyline, likely Hong Kong, featuring numerous high-rise buildings and a large body of water in the foreground. The image is slightly hazy, and the text is overlaid on the lower portion.

Performance-based design is an approach to fire protection based on establishing fire safety objectives and functional statements and fire scenarios and assessment of designs based on those objectives and functional statements.

WHAT IS 'SUSTAINABILITY'?

A close-up photograph of a person's hands holding a globe of the Earth. The hands are positioned on either side of the globe, with fingers gently resting on its surface. The globe shows the continents of North and South America, with the Atlantic Ocean in between. The background is a soft, out-of-focus green and blue, suggesting an outdoor setting. The overall image conveys a sense of global responsibility and care for the planet.

SUSTAINABILITY DEFINED

- CONDUCTING BUSINESS AND COMMERCE IN A MANNER SUCH THAT OPERATIONS DO NOT COMPROMISE THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS

DRIVERS FOR CHANGE

- CLIMATE CHANGE
- WATER
- ENERGY
- WASTE
- DEMOGRAPHICS
- URBANISATION

SUSTAINABLE FIRE PROTECTION

Achieve life safety and property protection goals while minimizing the use of resources.....

- DON'T INSTALL SYSTEMS OR EQUIPMENT THAT AREN'T NECESSARY
- IMPROVE SPACE UTILIZATION
- USE RENEWABLE SOURCES
- LOW OPERATIONAL ENERGY
- LOW COSTS TO DEVELOPER/OCCUPIER/SOCIETY

PERFORMANCE BASED DESIGN CAN SUPPORT THIS THROUGH...

- DESIGNING FOR THE RISK
 - FIRE RESISTANCE
 - EVACUATION
 - SUPPRESSION AND ALARM
 - SMOKE CONTROL

PBD METHODOLOGY

- ALLOWS US TO LOOK AT THESE THINGS, AND MAINTAIN AN ACCEPTABLE LEVEL OF SAFETY

Case Study





Structural fire engineering analysis to support unprotected steel canopy supporting PV cells



Fire and smoke modeling to inform the smoke control design and egress design



- Achieved sustainability goal
- Provides a safe environment
- Maximizes space utilization
- Increased functionality
- Achieved aesthetic goals

CHALLENGES



- PBD is great for emblematic and high profile projects
- What about PBD for small projects or specific design features?

CHALLENGES (Clients)

- Upfront cost with no guarantees
- Can be seen as an onerous process
- Approval of designs that can yield more sustainable buildings carry more risk



CHALLENGES (AHJs)

- Reluctance to spend the time to agree on goals and set parameters
- Don't want to “stick their necks out”





Was there more PBD before the
Performance Based Design Code?

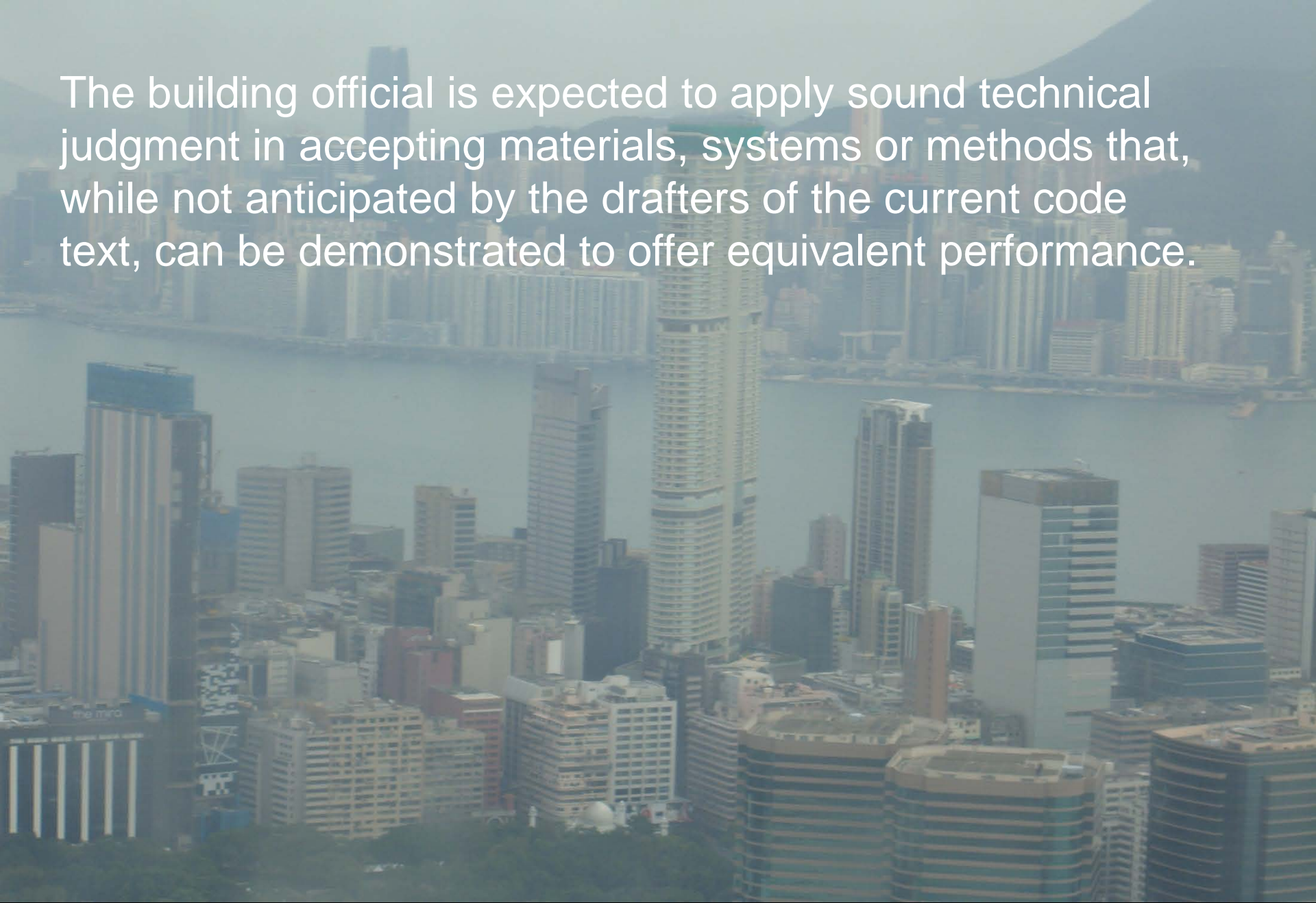
- Atria
- Malls
- Convention centers



Alternative materials and methods allowed by code.

The code is not intended to inhibit innovative ideas or technological advances. A comprehensive regulatory document, such as a building code, cannot envision and then address all future innovations in the industry.

The fact that a material, product or method of construction is not addressed in the code is not an indication that such material, product or method is intended to be prohibited.

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The building official is expected to apply sound technical judgment in accepting materials, systems or methods that, while not anticipated by the drafters of the current code text, can be demonstrated to offer equivalent performance.



Where do we go from here?

- *More code development participation*
- *More education*
- *More push for PBD to achieve sustainability and fire safety goals*



Thank you

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