



## Navy Yard Building 661: Advanced Energy Retrofit Living Laboratory

### ***Building 661 as Learning Opportunity***

A key objective of the EEB Hub is to provide successful demonstrations of integrated building design methods that lead to deep, reliable cuts in energy use while improving overall asset value overall in real estate markets. The EEB Hub is engaged in a variety of building demonstration projects in the region, but none more prominent than Building 661, a modest two-story 1940s-vintage building that was formerly a gymnasium at the Navy Yard. It has been empty for 15 years and awaits its much anticipated resurrection as the EEB Hub headquarters in 2013, a stand-out advanced energy retrofit.



Both the delivery process and the resulting 661 edifice will serve as examples for future advanced energy retrofit projects in the region. To this end, the Hub is committed to observing and recording this advanced energy retrofit project, capturing what are considered to be best practices in the field.

### ***Unique Approach***

The Building 661 advanced energy retrofit project was initiated with a two-day conference on January 13-14, 2011. One of the purposes of the conference was to develop the strategy for determining the best programming and design methods for assuring successful project completion. A preliminary building vision statement was developed and each EEB Hub task team was asked to provide input on their anticipated programming and physical needs related to Building 661.

On March 4, 2011 the first face-to-face programming committee meeting was held. The committee identified success factors relating to the retrofit of Building 661 and key qualities of a living laboratory for research, development, demonstration, and deployment on building energy efficiency. A programming tool was also developed that was used to collect further inputs from the EEB Hub task teams.

The EEB Hub task team on Integrated Technologies and Systems hosted a two-day expert workshop on March 23-24, 2011. At the meeting, Hub technical subject matter experts provided input on enclosures, HVAC, power generation, lighting, and sensors and controls. Almost 70 individuals participated in this event and identified the key performance specification, components and systems to achieve 50 percent energy savings in existing commercial buildings in climate zones 4 and 5.

### ***Integrated Design Team***

In fall 2011 Hill International was competitively selected as Building 661 project manager, Kieran Timberlake Associates was selected as the project architect, and Balfour Beatty was selected as construction manager. Early in 2012, Aramark Facilities Services was selected as building 661 commissioning agent. To round out the integrated design team, Environmental Construction Services

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was selected to provide mechanical and plumbing expertise, and MC Dean was selected for electrical expertise. These contractors will be ineligible to bid on the construction project itself because of the construction procurement laws in effect in Pennsylvania, but their expertise will help inform the integrated design effort.

### ***Collaboration Within the EEB Hub***

The Building 661 project has provided an opportunity for collaboration across EEB Hub task areas:

- The Integrated Modeling and Design team compiled a report defining potential strategies for design process management for Building 661 and other advanced energy retrofit projects. The report was shared with the Building 661 project team and they are implementing a number of the design management strategies in 661 and considering additional strategies for later phases of the design process.
- The Integrated Technologies and Systems task team collected and evaluated a state-of-the-art technology package and recommended these technologies to be considered for Building 661.
- The Policy, Markets, and Behavior task team tracked this project to help define how the Hub activities and developments can influence the advanced energy retrofit industry as this integrated design process and building product present an exceptional learning opportunity on integrated advanced energy retrofit design.

### ***Integrated Systems Showcase***

On April 2, 2012 the Wharton Small Business Development Center and the Delaware Valley Industrial Resource Center co-hosted an EEB Hub Integrated Solutions Showcase for Energy Efficient Buildings. The aim of the showcase was to allow the Building 661 Integrated Design Team to explore building energy technologies and systems that could help them accomplish the advanced energy retrofit. In particular, novel approaches to deploying off-the-shelf technologies in an integrated manner to reduce energy consumption were sought. Three teams were invited to present and discuss design approaches for Building 661. The event was recorded and a writer from Knowledge @ Wharton will be issuing a summary report.