nerej
CELEBRATING 55 YEARS

Kingspan Insulated Panels provides products for CSTO and Winnâ€™s deep energy retrofit Castle Sq. Apartments

October 25, 2012 - Green Buildings

Faced with a completely outdated, energy-devouring building and a rapidly gentrifying neighborhood, the Castle Sq. Tenants Organization (CSTO) accomplished what few would consider possible: Applying an aggressive the nation's largest "deep energy retrofit" strategy to a 1960s affordable housing development, beautifying the neighborhood in the process, and retaining lowand moderate-income rents for its residents. Even better, the soon-to-be-completed project did not displace a single resident during the extensive construction, and the total energy savings will amount to more than 72%, according to CSTO. Designed by a seasoned project team and featuring insulated metal panels from Kingspan Insulated Panels North America, the Castle Sq. deep energy retrofit program represents a successful partnership between CSTO, which holds majority ownership in the Castle Sq. Apartments, and WinnCompanies, a developer that owns the minority share. The new insulated metal cladding, comprising Kingspan's Mini-Wave and Micro-Rib panels installed over a mineral-fiber blanket backed by a fluid-applied air and moisture barrier, has been attached directly over the original walls of uninsulated brick and concrete. The new overcladding, as it is known, will help deliver the lion's share of the uncommonly high energy savings while also beautifying the neighborhood. Other elements of the project include new high-efficiency boilers, solar collectors for heating water, extensive air sealing within the apartments and central exhaust system, and new refrigerators and light fixtures. Yet observers cite the CSTO and the passion of the individual tenants, for making possible this unusual retrofit project – called by experts the largest deep energy retrofit in the country – and in the process becoming leaders in sustainability and community. This year, the project won the mayor's Sustainability Award for Boston, also earning praise from governor Deval Patrick. Now it is tracking for LEED Gold certification from the U.S. Green Building Council. "Super-Insulated Shell" According to the CSTO, the façade reskinning with Kingspan panels, along with airsealing, reduces Castle Sq.'s heating needs by 61% and cooling needs by 68%. The strategy was developed by Elton + Hampton Architects, Building Science Corp., Biome Studio, Petersen Engineering and Pinck & Co., all familiar with deep energy retrofits. "Yet, the concept of the deep energy retrofit is new to many professionals in architecture and construction," said Paul Bertram, FCSI, LEED AP, Kingspan's director of environment & sustainability. "The residents at Castle Sq. Apartments now know what it is, however. They have achieved it by being active participants, and Kingspan is Solar collectors on the roof (left), and the new "super-insulating shell" with Kingspan panels. proud to be a part of this unique project." Deep energy retrofit, or DER, is an industry consensus term referring to building renovations that attempt to return energy savings of at least 50%, typically by focusing on improving the enclosure's insulating value, sealing against air leaks, and scaling down heating and cooling equipment. By actively choosing this unusually aggressive approach, the residents of Castle Sq. Apartments have made waves in the greater Boston area, and

in the design and construction industries. “It was the members of CSTO who pushed for a deep energy retrofit from the beginning,” says Heather Clark, principal with Biome Studio. “Special recognition goes to Deborah Backus, CSTO’s executive director, who worked tirelessly to see this project completed. But all of the residents wanted to be leaders in green building.” According to CSTO president (and resident) Ann Moy, with 192 of Castle Sq.’s 500 units in the seven-story building involved, this is the biggest such effort in the U.S. “As dedicated residents,” Moy agrees, “we are committed to being trailblazers with the nation’s largest Deep Energy Retrofit.” Indeed, the project’s success has garnered attention and recognition. In May, Backus received the Arthur F. Howe Community Service Award, presented annually to an individual who has made “enduring contributions toward improving and preserving Boston’s unique and historic South End” by the Ellis South End Neighborhood Association. A month earlier, CSTO and Winn Development were both recognized by mayor Thomas Menino at the 6th Annual Mayor’s Green Awards, which celebrates businesses, nonprofits and residences who have worked “to make Boston a greener, more sustainable, and livable city.” Multiple Benefits of Renovation While the projected energy savings are impressive enough, the completed deep energy retrofit will present the residents and their community with a number of secondary benefits as well. “In some ways, the residents felt alienated from their community,” says Moy, referring to residents’ concerns that came to light during design charrettes conducted early in the project to evaluate design alternatives. “The look of affordable housing made them feel separate from their increasingly affluent neighborhood.” In fact, the CSTO had already struggled to retain affordability, having faced the threat of its rents going to market rates at one point in the 1980s. CSTO then acquired the property, and set affordable rents for the next 100 years, helping secure the diversity that is the South End’s heritage. But the CSTO still faced an aesthetic challenge, and most important, the challenge of residents suffering from high energy bills and uncomfortable, unhealthy living conditions. Opting for a “wrap” of Kingspan’s insulated metal panels, the project team led by Biome Studio and CSTO helped solve several challenges at once: Adding exterior insulation and air barriers to greatly improved the thermal comfort without having to vacate residents during construction, and achieving a sleek, modern look that pleased residents and neighbors alike. “Tenants tell us they’re now very proud of the multifamily building’s look,” said Bertram. “But more importantly, the residents now tell us that they feel more comfortable and healthy, and their energy bills are coming down. That makes us feel proud and also grateful, to be invited to help solve one of today’s most pressing challenges.” Applied to the original brick-and concrete envelope with a liquidapplied air barrier and a layer of mineral fiber, and providing an insulative value of R-41 — twice what current codes require — the 5” Kingspan panels accomplish the DER’s enclosure goals while furnishing the building with its beautiful and durable new facade. Perhaps the most significant side-effect of the Castle Sq. DER project is the depth of knowledge regarding green issues and sustainable design acquired by Castle the tenant organization’s residents, a majority of whom are Cantonese and speak English only as a second language. Tenants, Organized “The resident input at our packed-house design charrettes centered around thermal comfort and air quality, which is not typical,” said Biome Studio’s Clark. “Now the tenants understand fully what is involved in improving energy efficiency and IAQ. The CSTO membership is a very active, very involved group.” In fact, participation in the tenant’s organization has risen dramatically since the DER project began in 2008. And in a highly unusual step, the CSTO has even hired its own sustainability manager – an uncommon step even for luxury-priced residences, let alone an affordable-housing property. Other benefits of the deep energy retrofit continue to accrue.

In addition, the retrofit construction work for Castle Sq. created more than 200 jobs. The project was partly funded by the 2009 American Recovery and Reinvestment Act stimulus, through the Mass. Department of Energy Resources High Performance Grant Program, as well as through the U.S. Department of Energy and Department of Housing and Urban Development Green Retrofit Program. On a side note, the U.S. Centers for Disease Control and Prevention have been studying Castle Sq. as well as other building projects around the country to measure the effect of energy retrofits on air quality, and in particular on asthma rates in residents. With the new building exterior finished, Castle Sq.'s retrofit work is nearly complete. All that remains is for retail spaces on the first-floor street frontage to be finished. A ribbon-cutting ceremony is planned for later this year.