PARTY WALLS

"ONE MAN'S CEILING IS ANOTHER MAN'S FLOOR"

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A bimonthly update on Steven Winter Associates, Inc.'s work in the realm of multifamily housing

Newest (and Largest!) Multifamily Energy Star Building

President Carter's Visit

An Open House was held on January 14 at WHEDCo's Intervale Green, to demonstrate the green and energy efficient features of this new 128-unit mixed-use affordable rental building in the Bronx. Located at 1330 Intervale Ave, the building sits on what used to be an abandoned lot, where President Carter once visited and brought attention to the urban blight and devastation of the Bronx.

WHEDCo (Women's Housing and Economic Development Corporation) was determined to build beautiful, healthy homes for low-income and formerly homeless families in this neighborhood. To make these homes truly affordable for the tenants, the buildings needed to be durable, easy to maintain and energy efficient. With the increasing interest in sustainable design, using green building materials was also a priority. This building not only meets the criteria of the **Enterprise Green Communities** program, it will also earn the **EPA**'s Energy Star label, making it the 4th Energy Star Multifamily high-rise in the nation and the largest multifamily building to receive this label to date.

WHEDCO Intervale Green

In 2005, WHEDCo partnered with SWA and **NYSERDA** to participate in the Energy Star Multifamily Pilot, which awarded Energy Star labels to building designs that demonstrated at least 20% energy cost savings when compared to an ASHRAE 90.1-2004 compliant building. SWA worked with the design team to make recommendations that would increase the performance of the building and reduce the utility bills for the tenants. Recommendations included measures such as installing continuous rigid insulation between the brick façade and masonry block in addition to fiberglass insulation between studs on the interior. Four inches of polyisocyanurate rigid insulation on the roof, exterior rigid insulation on foundation walls, proper air-sealing techniques, and double-pane, low-E, argon windows were all incorporated to provide a high performance envelope that would reduce the heating needs of the building.

Sustainable Kitchen Design

To reduce the heating load even further, the design team approached the **Department of Buildings** to request a variance to allow lower exhaust ventilation rates at Intervale Green. The code at the time required significant over-ventilation, which forced heated air to be exhausted out of the building almost immediately. Lower rates were proposed that are supported by ASHRAE 62.2 for good indoor air quality and which are being adopted by the new building code.

Approval of the lower ventilation rates reduced the heating load of the building by about 30%, reducing the number of boilers required, while still providing the indoor air exchange rate needed. Additional savings were achieved since the rooftop exhaust fans will require less power to provide these lower rates. Significant savings were also achieved by using CO sensors on the garage ventilation system, so that these exhaust fans operate only when needed, rather than all day.

Other energy efficient measures included 85% efficient boilers and hot water heaters, low-flow faucets and showerheads, pin-type fluorescent lighting, bi-level lighting in the stairs, Energy Star refrigerators and clothes washers, and occupancy sensors in the common areas and offices. Green features include a green roof system, wheatboard kitchen cabinets, low-VOC paints and sealants, and recycled content flooring.

The 46-unit building adjacent to Intervale Green, Louis Niñé House, boasts similar energy efficient measures, and provides each tenant with an Energy Star air conditioner. Although it did not receive the Energy Star label due to the code required ventilation rates, this building will also achieve significant energy cost savings over a traditional building.

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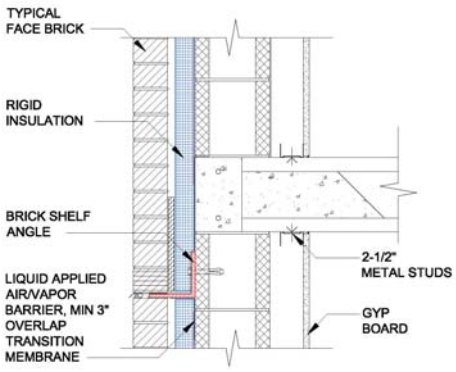
Honest R-values

In our work with developers to improve new multifamily housing, we are constantly faced with the challenge of how to prioritize our design and construction phase activities to make the biggest impact on the actual performance of a particular building. When it comes to building envelope R-value, prioritization is easy: focus on the weakest links. There are diminishing returns associated with adding more insulation to parts of a building that are already well insulated. However, there is a disproportionate benefit to increasing insulation levels in the weakest spots.

The majority of the mid and high rise projects we are involved with are of cavity wall construction, with brick cladding over either a CMU block backer wall (Figure 1) or exterior gypsum sheathing attached to steel studs. In either case, the widely accepted best practice is to locate rigid insulation on the exterior -- i.e. between the brick and the block or between the brick and the sheathing. One of the perceived benefits of this approach is that the exterior insulation covers the edge of the concrete floor slab. However, it is important to keep in mind that a significant degradation in R-value can occur due to the steel shelf angles which hold up the brick at many locations. Since shelf angles are typically bolted directly to the edge of the floor (or just below the edge as in Figure 1), they provide a direct "thermal bridge" through the insulation and into the building.



The table below provides a comparison between the "nominal" R-value that an owner thinks they are paying for compared to the effective R-value that is actually realized with shelf angles. This results were based on SWA's analysis of a cavity wall with 2" rigid XPS insulation and draw on the work presented in: "Real R-value of Exterior Insulated Wall Assemblies."

Nominal versus Effective R-value for a Cavity Wall with Shelf Angles

"Nominal" Wall Rating	w/ Continuous Shelf Angle at Every Floor	w/ Continuous Shelf Angle at Every Other Floor and Above Windows on All Floors
R-16	R-9	R-10

The good news is that skipping shelf angles where possible on every other floor is a simple (and first cost saving!) step to make an incremental improvement in whole wall R-value. At the same time, this table illustrates the limitations in getting a high R-value out of a wall assembly that is full of steel-masonry connections.

The first step in improving envelope thermal performance is to recognize the realities of the "honest" R-values that are going into our buildings. Stay tuned for the discussion in our next newsletter on why that R-40 roof you think is going into your newest project could in reality be a lot closer to R-20…

For more information, contact Marc Zuluaga at marcz@swinter.com.

LEED for Homes Mid-Rise Pilot Underway in Boston

The LEED for Homes Green Building rating system is now being applied to larger-scale residential buildings between four and six stories through the LEED for Homes Mid-Rise Pilot. The pilot is being conducted to test whether LEED for Homes is more appropriate for use on this type of building than LEED NC, which was developed for the commercial market. Many multi-family developers are finding that LEED for Homes is more cost-effective, and that teaming with a Provider streamlines the certification process. Union Crossing in Lawrence, MA, recently featured in High Profile Magazine, is one of several residential mill-conversion projects in the Boston area considering this option.

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