

passive house+

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Five years in a
passive house
The occupants' view

Rathgar passive
upgrade

the leading source for:
insulation | airtightness | renewable energy | triple-glazing

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Belfield Homes, Philadelphia, USA



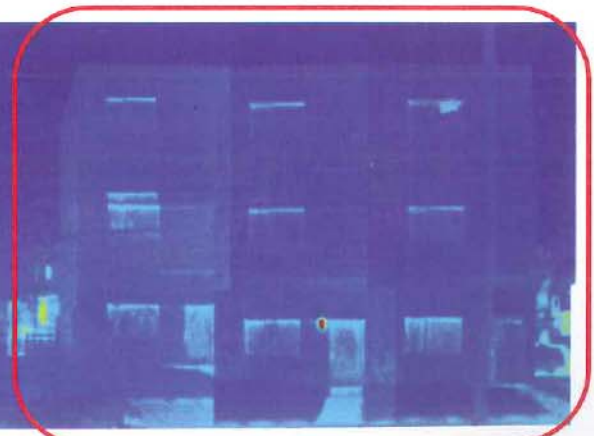
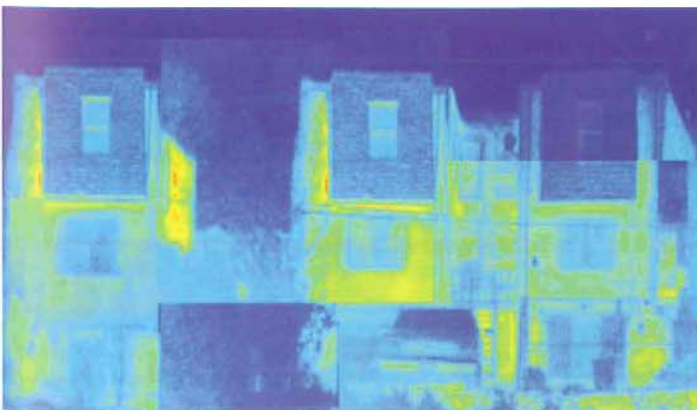
Design and build firm Onion Flats wasn't even asked to meet the passive house standard for this residential social housing project in Philadelphia, which was completed in 2012 — only to build it on time and on budget.

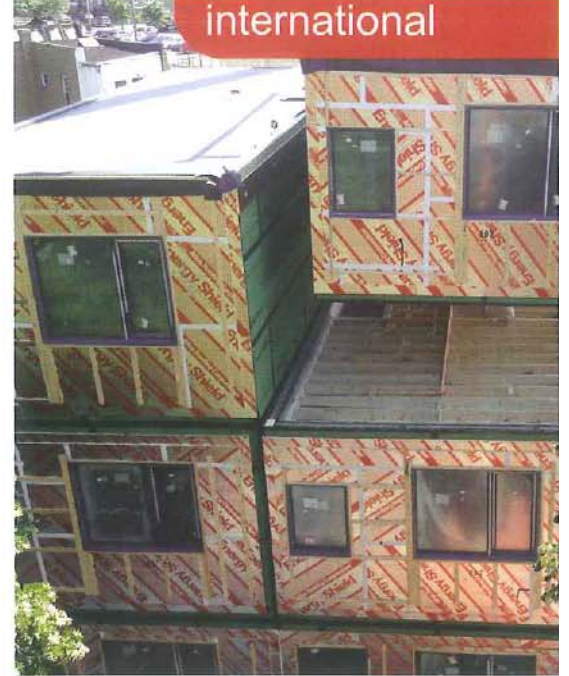
But the firm saw it as an opportunity to show that sustainable housing needn't cost more than standard construction. The team was also keen to develop a system of building passive house that could be easily copied and scaled up in future.

The development features three homes built for formerly homeless families. The building is of modular timber frame construction, insu-

lated with cellulose and PIR board. Triple-glazed windows from Irish manufacturer Munster Joinery sit flush with the airtightness membrane to create a simple airtight seal.

These were the first passive house certified homes in Philadelphia, with a space heating demand of 14kWh/m²/yr and airtightness of 0.4 air changes per hour. But surprisingly, Onion Flats found that in one month (February ►





2013) energy bills for the three units varied between \$72 and \$226. How to explain this huge difference?

It turns out that the home with the highest bill was doing, on average, 104 loads of laundry in 30 days — essentially it had become an ad hoc laundrette for the tenant's friends and family (the non-profit that manages the building doesn't charge tenants for electricity).

But when electricity produced by the rooftop PV panels are factored in, bills average between \$32 and \$93 per month for all utilities.

