Using our latest innovation in our TCosy retrofit system, Beattie Passive has breathed new life into a 1950s block of flats in Great Yarmouth. By constructing a new super insulated layer around the whole property, eliminating thermal bridges, and installing Heat Recovery Ventilation, we have brought this old inefficient building up to EnerPHit standard - the Passivhaus standard for retrofit. Residents faced limited disturbance, were able to remain at home throughout and are now enjoying much lower energy bills. The building is currently undergoing a performance monitoring period, but we know that we have achieved an excellent airtightness result of 0.67 air changes per hour and a permeability of 0.918 at 50 Pa. We anticipate an 80% reduction in heating demands, greatly decreasing the Carbon footprint of the building, and helping to lift residents out of fuel poverty.

One of the most significant developments of this project was that it proved as a proof of concept of our latest TCosy retrofit system, meaning we now have a highly adaptable and flexible system that can easily retrofit any building in the world to the EnerPHit standard, providing a very real opportunity to easily and affordably lift the performance of homes across the world and vastly reduce space heating demand and hence energy usage and carbon emissions.
See more details about this project
https://beattiepassiveblog.wordpress.com/category/great-yarmouth-retrofit/

Photo credit
Beattie Passive

Stakeholders

Contractor
Name : Beattie Passive
Contact : Nathan Beattie, enquiries[a]beattiepassive.com, Norwich, UK
https://www.beattiepassive.com

Construction Manager
Name : Beattie Passive
Contact : Beattie Passive, enquiries[a]beattiepassive.com
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Stakeholders
Function : Environmental consultancy
Enhabit Ltd
Sarah Price, norwich[a]enhabit.uk.com, Norwich
https://www.enhabit.uk.com/

Function : Others
Oxford Brookes University
Rajat Gupta, rgupta[a]brookes.ac.uk
https://www.brookes.ac.uk/architecture/research/low-carbon-building-group/

Contracting method
General Contractor

Type of market
Realization

If you had to do it again?
The fire barrier that we used wasn't particularly easy to install, so going forward we will use an alternative e.g. Rockwall Flexi

Building users opinion
Residents have commented on how much warmer their homes are now, and how much less they use their heating systems, with one resident even being contacted by their energy supplier to enquire about their lower energy use. Residents also note that they no longer experience condensation in their homes and no longer need to use dehumidifiers to remove excess moisture. Additionally, they report that the difference in sound between their homes pre- and post-retrofit is marked and there is now much less noise pollution from the outside in their homes.

Energy

Energy consumption
Primary energy need : 123,60 kWhpe/m².year
Primary energy need for standard building : 221,40 kWhpe/m².year
Calculation method : Other
Envelope performance

More information:
We injected EPS Superbead insulation into the wall cavity, which creates an insulated barrier around the whole property, including the roof: https://energystoreltd.com/energystore-superbead/

Indicator: n50
Air Tightness Value: 0.67

Renewables & systems

Systems

Heating system:
- Individual gas boiler

Hot water system:
- Gas boiler

Cooling system:
- No cooling system

Ventilation system:
- Double flow heat exchanger

Renewable systems:
- No renewable energy systems

Environment

Urban environment

The King Street retrofit project is situated within a sub-urban neighbourhood of Great Yarmouth, on a relatively quiet two-lane road. There are a few commercial businesses operating along the road, with various parks and recreational spaces within easy walking distance. There are three primary schools in the immediate vicinity, and various dentists/opticians a few minutes walk up the road. A bus stop and a National Express Coach stop are also nearby.

Products

Product

TCosyTM

Beattie Passive

Beattie Passive, enquiries[at]beattiepassive.com, 01953 687332

https://www.beattiepassive.com

Product category: Structural work / Passive system

Beattie Passive's TCosyTM is an innovative, whole building approach to large-scale retrofit. It provides a fast, low cost and highly replicable solution for a wide range of buildings. The TCosyTM dramatically reduces energy requirements, creates a healthier living environment and can be delivered whilst residents remain in their homes.Key Benefits of TCosy Retrofit:+ Dramatically improve the energy efficiency – up to 75% reduction in heating requirement+ A completely new external façade+ Increase the value of the property+ Resident stays in their home during the Retrofit+ A healthier, warmer living environmentUsing our new bracketed approach, we can construct a whole new Structural Thermal Envelope that will reach the EnerPHit standard around any existing property, ensuring that the end result performs highly no matter the building you start with. This particular project is still undergoing performance monitoring until September, but previous TCosy projects have delivered up to 84% reduction in energy bills and an estimated 4 tonnes of CO2 savings annually. We offer TCosy retrofit at approximately £600 per square meter of external surface area.
Costs

Construction and exploitation costs

Total cost of the building : 579 750 €

Health and comfort

Indoor Air quality

Mechanical Ventilation with Heat Recovery (MVHR) was installed into each flat as part of the retrofit works. This will filter pollen, dust and pollutants out of the air as it enters the property, and also works to remove excess moisture, dust and CO2 from the air inside the property. This continuous supply of fresh, filtered air means residents are always breathing cleaner air, and also helps to alleviate the symptoms of Asthma and other respiratory illnesses.

Comfort

Health & comfort :

The excellent insulation and airtightness of the building will now ensure that heat does not escape each resident’s home, meaning warmer, more comfortable homes during the colder months, and the aforementioned MVHR also works to regulate indoor temperature to keep it at a regular, comfortable heat during the summer. If too hot, residents can easily open windows or boost their MVHR to release some of the warmer air to help keep them comfortable.

Carbon

GHG emissions

Methodology used :
PHPP

Contest

Reasons for participating in the competition(s)

New, super insulated layer built using a thermal-bridge free design and Passivhaus standard windows and doors now encompasses the entire building. We anticipate an 80% reduction in space heating demand as a result, and a corresponding reduction in energy usage. One resident has even reported that their energy supplier has been in touch to enquire about the much lower energy use.

Before the retrofit, each flat has large amounts of mould and damp, with one flat having to use dehumidifiers to clear away residue on their windows each morning, and this has been overcome by the retrofit.

The super insulated, airtight layer also eliminates noise, what used to be considered a noisy estate can now barely be heard from within the building.

Excellent airtightness - 0.67 air changes, n50, and 0.918 permeability at 50 Pa (m3/h/m2).

Residents endured minimal disruption as they were able to remain at home for the complete duration of the works.

Mechanical Ventilation with Heat Recovery has been installed into each flat, preventing loss of heat, and providing a constant stream of fresh air into the property, filtered before it enters the flat to remove pollen, dust and other pollutants. Damp and dust is also efficiently removed by the MVHR, eliminating indoor mould and condensation. This all results in a much more comfortable, healthier environment for residents.

Building candidate in the category