



Biggar Youth Project Refurbishment Retrofitting to improve energy efficiency



Why retrofit?

- Knocking down old buildings, putting them in landfill and building new ones with better insulation does not make sense.
- Older buildings may have hundreds of years left in them while cheap new may only have design lives of 30 years.
- Preserving older buildings preserves heritage.
- Losing older buildings “doughnuts” towns and cities.
- At the current rate of building it would take 1300 years to fully replace all our existing buildings.
- New buildings using materials such as concrete and steel cause significant emissions



Before and After

Before



After



Design ethos

- Combine the best of traditional technologies with modern heat-retention.
- Focus on healthy, carbon-locking, natural insulation materials avoiding polythene and toxic additives
- Mechanical ventilation with heat recovery to improve the internal environment - a heat-exchanger moves heat outgoing air and warms fresh, incoming air.
- Avoid' fully-sealed buildings which risk condensation in the walls and poor air quality
- Provide a balance between the benefits of building, carbon, energy and heritage retention, and good fabric performance.



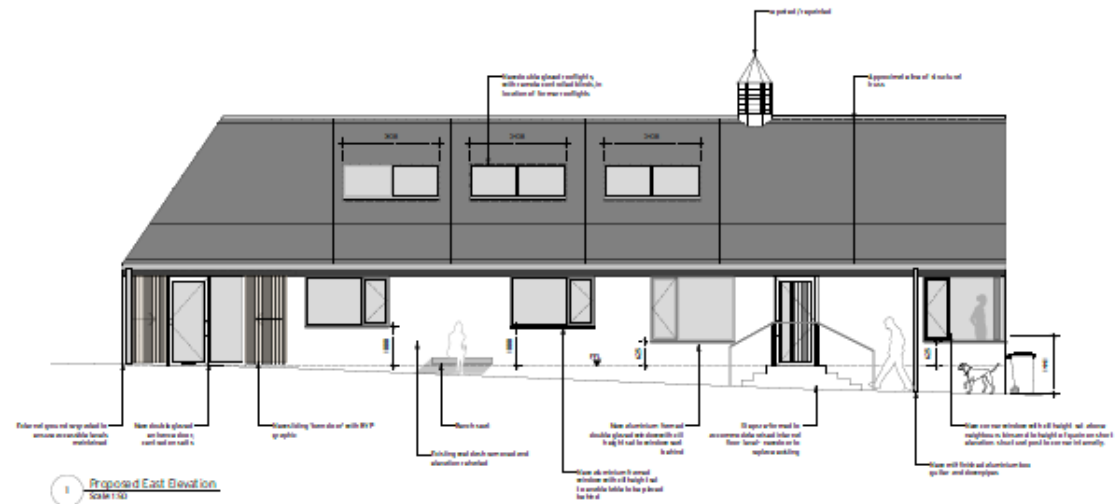
Project timeline

- Jan 2022 - Idea for project
- June 2022 - Tender feasibility/design work
- Aug 2022 - Funding for feasibility/design work
- Sept 2022 - Start of feasibility/design work
- Dec 2023 – Planning application submitted
- Mar 2023 – Planning consent received
- May 2023 – Building warrant received
- Nov 2023 - Tender building work
- Jan 2024 - Contractor appointed
- Feb 2024 – Start of work on site
- Jan 2025 – Practical completion



Feasibility and design

- Led by architects (Fraser/Livingston)
- Energy assessment by Carbon Futures.
- Consultation with Biggar High School Pupils.
- Preliminary surveys for bats, asbestos, drains and structural issues.
- Designs to RIBA Stage 4.



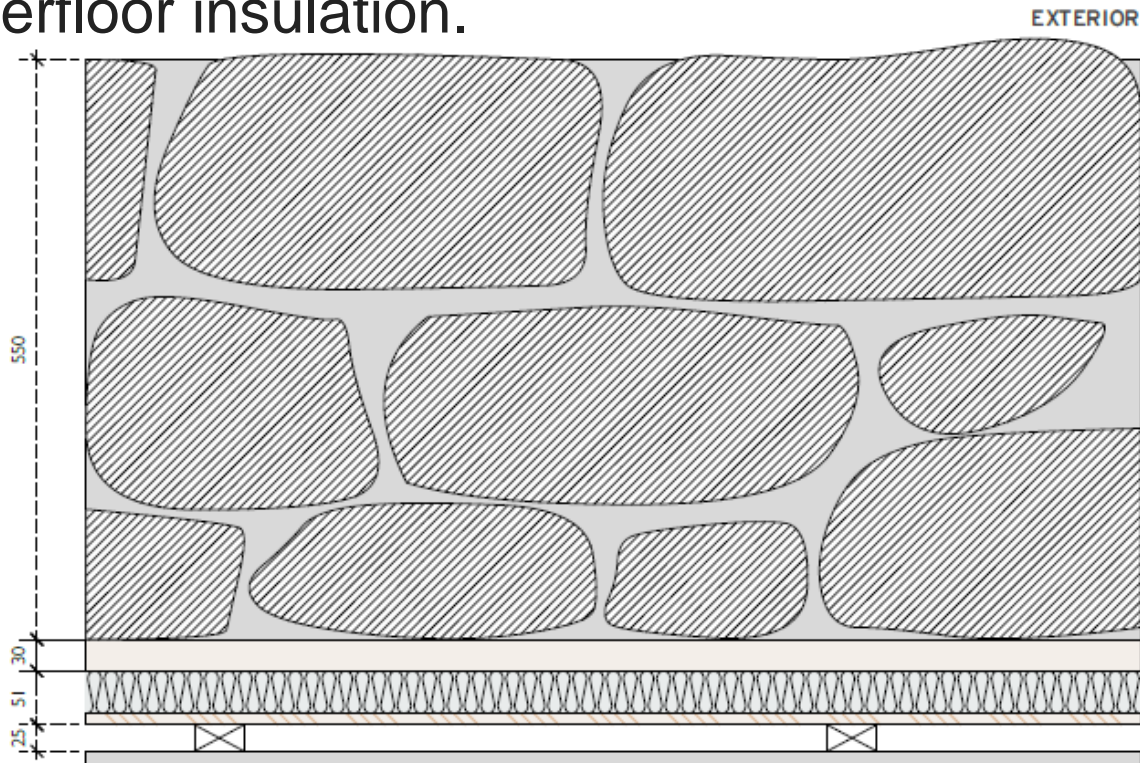
Carbon considerations



Result	Existing Building	After Retrofit
Energy Consumption (kWh/annum)	20,650	7,682
Energy Use Intensity (kWh/m ² /annum)	125	47
Utility Cost (£/annum)	£2,693	£1,518
Grid Averaged Carbon Emissions (kgCO ₂ /annum)	3613	1022

Insulation, insulation, insulation

- Baunit natural plaster to avoid moisture-creating wall cavities.
- Natural Paratex carbon-locking wood-fibre insulation in different wall situations.
- Indinature hemp insulation from a Scottish start-up in the roof pitches.
- Underfloor insulation.



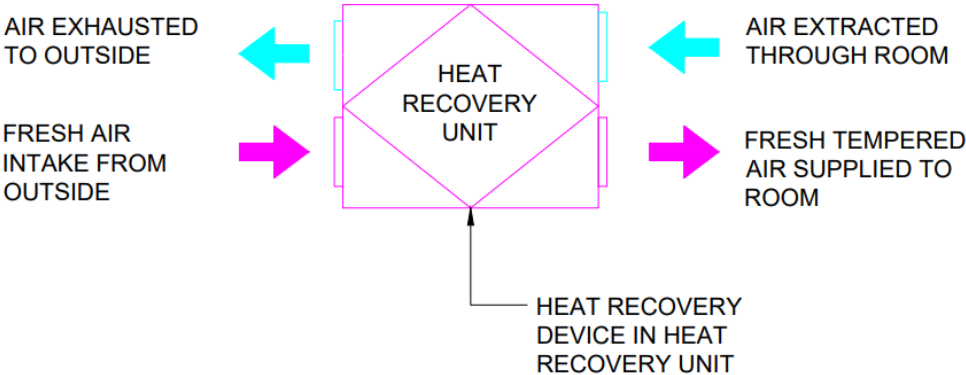
EXW-01
EXTERNAL WALL - EXISTING STONE
U-Value: 0.51W/M²K

- 550mm solid rubble stone wall (thickness assumed, TBC following opening up), repointed/repared as required
- 30mm Baunit DP 85
- 51mm Pavadry
- 25mm service void framed with timber
- 12.5mm taped and filled plasterboard with paint finish or G-plywood (refer to wall finishes drawing)

All products to be installed in strict accordance with the manufacturer's details and guidance

Heating

Mechanical Ventilation with Heat Recovery warms incoming air.



Air Source Heat Pump heats hot water for radiators and taps.



Key learning

- Be ambitious.
- Do it once, do it right.
- Do the ground work first (feasibility, design, preliminary surveys).
- Consult the community/building users.
- Talk to funders before applying and during the project.
- Get a strong project team together.
- Consider arrangements for continued activity during the build.
- Be prepared to manage the unexpected.
- It's hard work, but rewarding!



Thanks to our

Funders

SSE Clyde Windfarm
Scottish Government Place
Based Investment Programme.
Scottish Government/CARES
Let's Do Net Zero Community
Buildings Programme.
The Garfield Weston
Foundation
National Lottery Awards for All
Nadara Glenkerie Windfarm
RBS Regenerate Fund



• Project Team

- Fraser/Livingston Architects
- McCann's Builders
- Carbon Futures – Energy Performance Assessment
- DKI Services Engineering
- Elliot and Co Structural Engineers
- Hardies Quantity Surveyors
- Graham Harper Project Manager

ARCHITECT:
FRASER /
LIVINGSTONE
ARCHITECTS



CONTRACTOR:
McCann
mccannbuilders.co.uk



MECHANICAL
& ELECTRICAL
ENGINEER:



STRUCTURAL
ENGINEER:

