factsheet **Cre8 Barn** Stirley Community Farm

Radical low energy barn refurbishment

Certified to the exacting EnerPHit (Passivhaus retrofit) standard

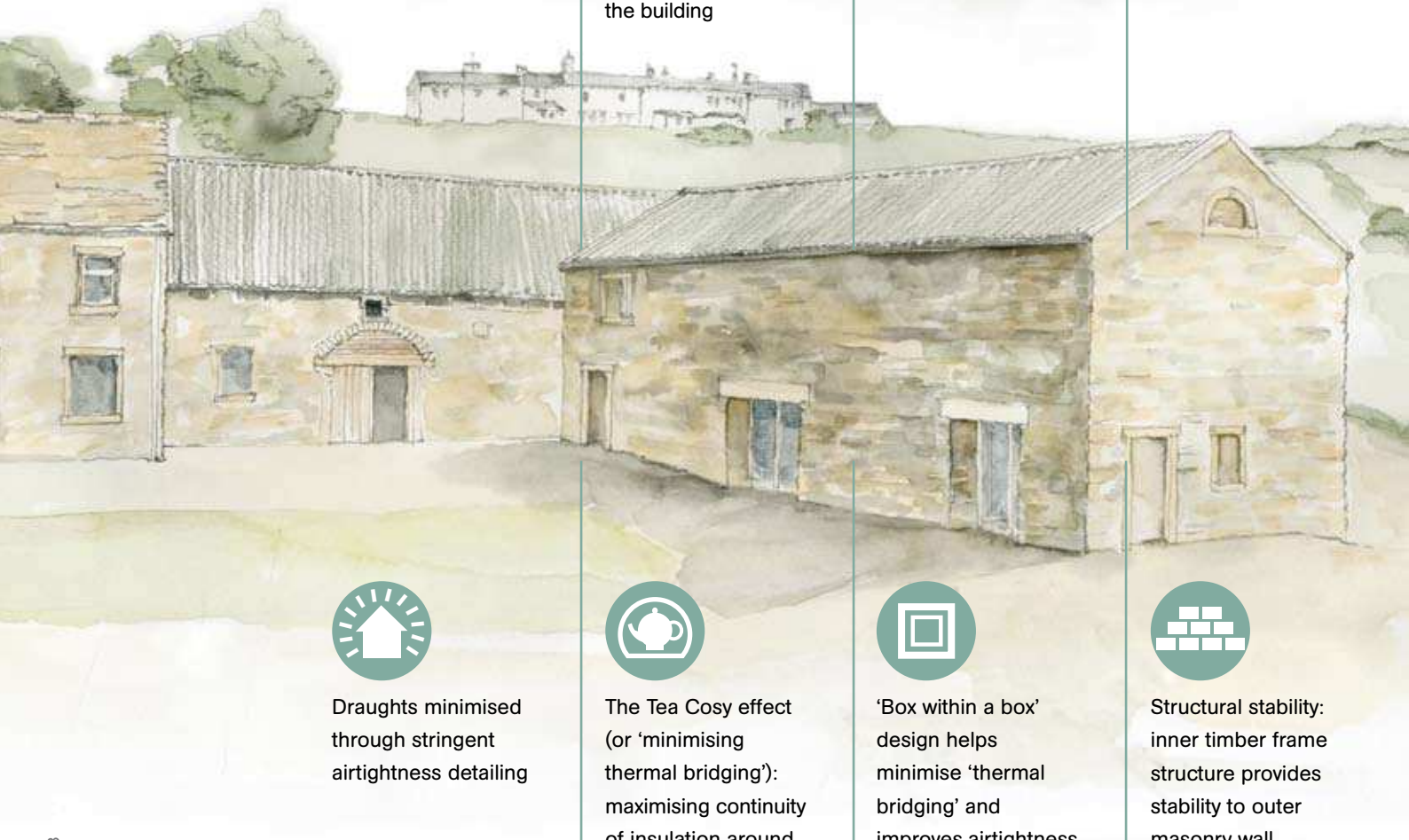
Ultra low heating bills expected

Building retains heat from sun and occupants' activities

Mechanical Ventilation with Heat Recovery (MVHR) provides constant fresh air and retains heat inside the building

Triple glazed doors and windows, with insulated frame

Super-insulation in timber frame walls, roof and floor



Draughts minimised through stringent airtightness detailing

The Tea Cosy effect (or 'minimising thermal bridging'): maximising continuity of insulation around the building to minimise any breaks or cold spots

'Box within a box' design helps minimise 'thermal bridging' and improves airtightness

Structural stability: inner timber frame structure provides stability to outer masonry wall through specially designed insulated wall ties

What is Passivhaus?

Developed in Germany in the 1990s, Passivhaus is a quality assured standard and methodology for low energy building which can create buildings which use around 90% less energy than standard UK buildings.

Based on well researched and proven building physics, the Passivhaus approach has been applied to over 37,000 buildings worldwide and is now beginning to take off in the UK.

What is EnerPHit?

The EnerPHit standard was developed by the Passivhaus Institut for retrofit projects in recognition of the difficulty of achieving a full Passivhaus standard in existing buildings.

The EnerPHit standard has slightly relaxed requirements for airtightness and space heating demand compared to the Passivhaus standard, which is usually only applied to newbuild projects.

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- Heating costs for the barn expected to be minimal.
- Energy savings of around 75-90% compared to the UK average.

- Heat from the sun, occupants' body heat and activities, like cooking, are usually all that is needed to heat the building.
- On very cold days, the building will require a small amount of additional heating, which will be provided by an ordinary domestic energy-efficient condensing gas boiler.

- Mechanical Ventilation with Heat Recovery (MVHR) supplies clean, filtered air to the barn and removes stale air.
- The MVHR system retains up to 90% of the heat from the outgoing air by transferring heat to the incoming air through a high efficiency heat exchanger.

- Triple glazed doors and windows, with insulated frame.
- Whole window U value: 0.77 W/m^{2}K.

- To reach the EnerPHit standard the project needs to be at least 10 times more airtight than a standard UK new-build.
- Airtight measures include: use of airtightness tapes and membranes at junctions in the timber frame structure (including around windows); use of special airtight timber boarding in walls and OSB board in the roof.

- Retains heat in the building through super insulation.
- 310mm in walls.
- 485mm in roof.
- 200mm in ground floor.

- The Tea Cosy Effect (or 'minimising thermal bridging') means reducing any breaks in the insulation to an absolute minimum.
- Careful attention is given to ensuring continuity of insulation, including around window and door installation.

- Timber framed insulated inner wall built within existing masonry barn wall to make it easier for the retrofit to achieve high airtightness levels and maximise continuity of insulation.

- Inner timber frame structure shores up and supports the original outer building through the use of specially adapted 'wall connectors' with low thermal conductivity.

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Yorkshire Wildlife Trust

www.ywt.org.uk

For more information and to register for a free technical briefing on the project, go to:
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