



Helen Brown, Encraft

LOW COST APPROACHES: PROJECT CASE STUDIES



Coventry Eco House

Orbit Homes

Beattie Passive

Vagdia and Holmes Architects

FORCE

Walker Cotter



Hart Lea, Sandiacre

East Midlands Homes
Lindum Construction
Val-U-Therm

Geoff Carter Architects
Ridge and Partners

Hart Lea, Sandiacre

In-fill site

9 dwellings

7 two storey houses

- 4 semi-detached
- 3 terraced (Passivhaus)

2 bungalows

- Both detached

Planning submitted before Passivhaus was chosen as the preferred standard

Whole life costing analysis of options to meet Code 4 ñ Passivhaus inspired fabric first approach preferred by client

Contractor led certification



Coventry Eco House

In-fill site

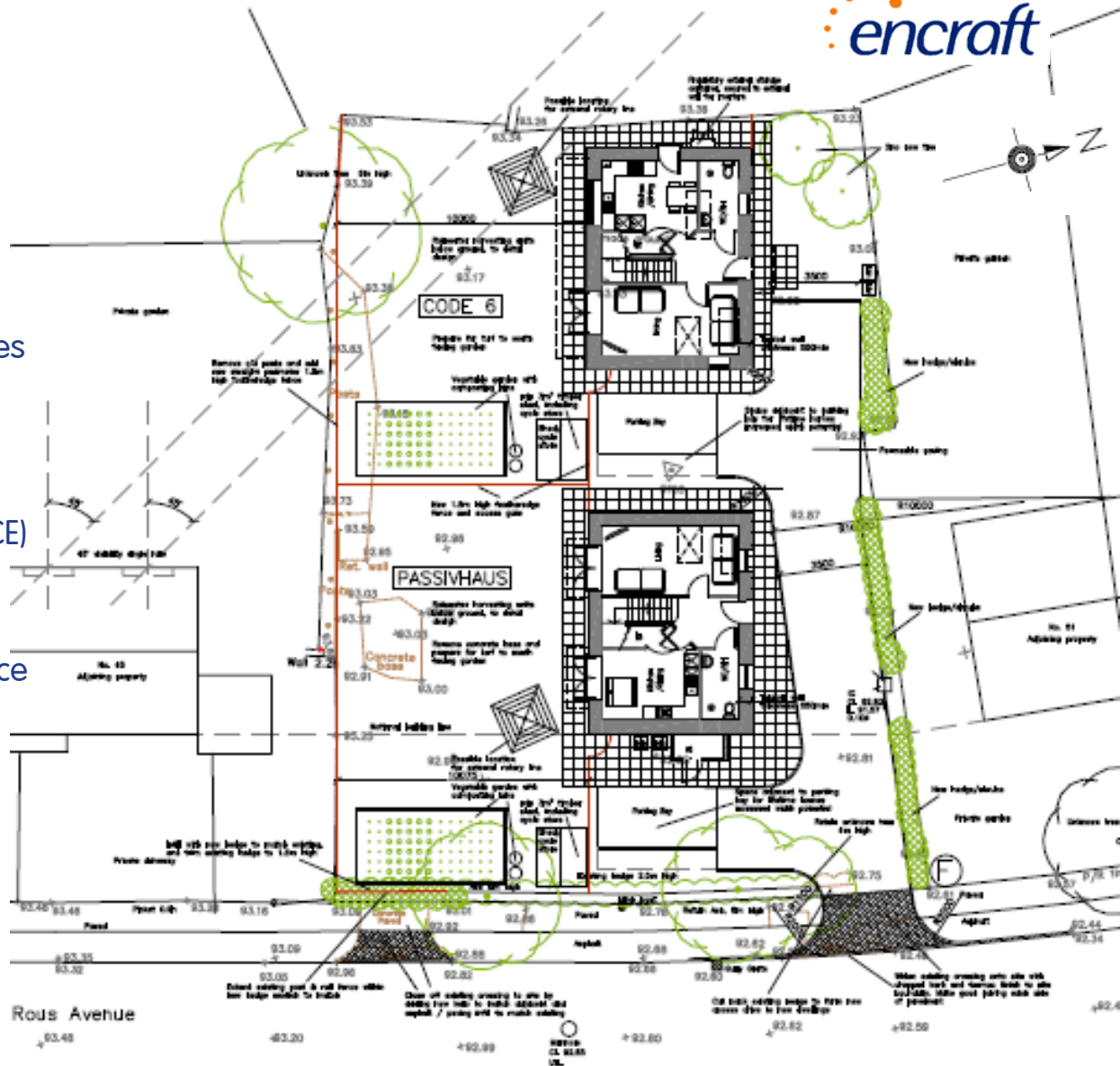
2 dwellings

- Both detached, two storey houses
- Code levels 4 & 6

Project started by the local constructing excellence group (FORCE)

Aim to deliver a learning legacy, transferring new skills and experience to the local construction industry.

Compare Passivhaus with Code for Sustainable Homes



Coventry Eco House

- Construction
 - Beattie Passive
 - Passivhaus certified timber frame
- U-values
 - 0.07 W/m²K
- Windows
 - Munster Future Passiv

Hart Lea, Sandiacre

- Construction
 - Val-U-Therm
 - Off-site closed panel timber frame walls
- U-values
 - 0.10W/m²K
- Windows
 - Munster Future Passiv

Coventry Eco House

- Build & Quality
 - Low skill using simple, available materials
 - Thermal imaging of Ecobeads
 - PHI certified thermal bridge details
 - PHI approved air barrier design
 - Cheap membrane but expensive tape
 - Tape applied in flat & straight lines



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Hart Lea, Sandiacre

- Build & Quality
 - Walls built in factory conditions
 - Foamed insulation injected into wall panel
 - Thermal bridge details based on ECD
 - Air barrier wraps around adjoining dwellings



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Coventry Eco House

- MVHR
 - Genvex unit installed in bathroom
 - Passivhaus certified but not the most efficient
- Heating
 - Gas combi boiler installed in kitchen
 - Radiators in all rooms



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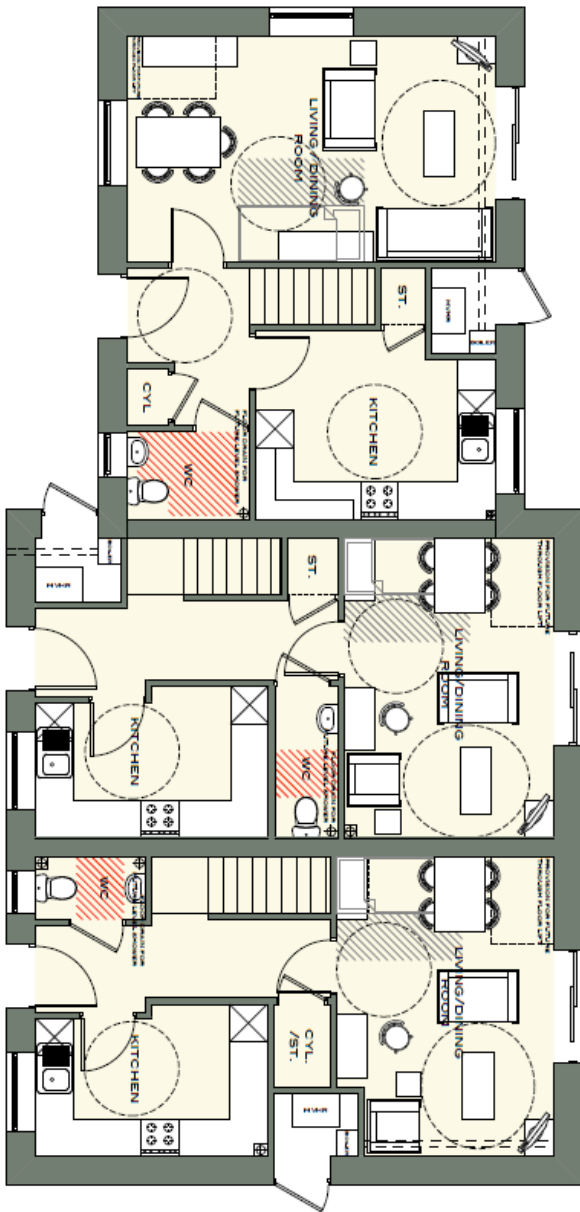
Hart Lea, Sandiacre

- MVHR
 - Airflow DV72 in cupboard next to kitchen/hall
 - Previously Passivhaus certified (as Vent-Axia)
 - 12% penalty in PHPP
- Heating
 - Gas system boiler installed next to MVHR
 - Towel radiator in bathroom and WC
 - Electric duct heater



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GROUND FLOOR PLAN
PLOT 7
3 BEDROOM 5 PERSON HOUSES - 89M²
LIFETIME HOMES COMPLIANT

GROUND FLOOR PLAN
PLOTS 5 & 6
2 BEDROOM 4 PERSON HOUSES - 78M²
LIFETIME HOMES COMPLIANT

Cost per m² of TFA

	Coventry Eco House	Hart Lea, Sandiacre
Demolition	N/A	£49
Site Clearance	£10	£9
Substructures	£12	£71
Build Cost Frame & Upper Floors, Roof, Walls, Windows, Doors, Internals, MVHR, Heating, Electrical	£885	£800
Other Direct Labour Costs External Works, Drainage & Services, Contractor's Prelims, Air Testing	£92	£433
Other Costs Performance Bond, Design/Consultants/Other Surveys Fees, Contractor Overheads & Profit	£92	£114
Total (excl. Demolition)	£1,091	£1,427

PHPP Verification

Coventry Eco House

Hart Lea, Sandiacre

Specific building demands with reference to the treated floor area		
	Treated floor area	74.9 m ²
Space heating	Annual heating demand	12 kWh/(m ² a)
	Heating load	10 W/m ²
Space cooling	Overall specific space cooling demand	kWh/(m ² a)
	Cooling load	W/m ²
	Frequency of overheating (> 25 °C)	0.0 %
Primary Energy	space heating and cooling, dehumidification, DHW, Auxiliary Electricity and household electricity.	107 kWh/(m ² a)
	DHW, space heating and auxiliary electricity	63 kWh/(m ² a)
	Specific primary energy reduction through solar electricity	112 kWh/(m ² a)
Airtightness	Pressurization test result n ₅₀	0.5 1/h

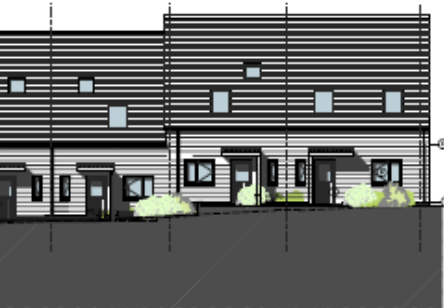
	Treated floor area	236.3 m ²
Space heating	Annual heating demand	19 kWh/(m ² a)
	Heating load	10 W/m ²
Space cooling	Overall specific space cooling demand	kWh/(m ² a)
	Cooling load	W/m ²
	Frequency of overheating (> 25 °C)	5.2 %
Primary Energy	space heating and cooling, dehumidification, DHW, Auxiliary Electricity and household electricity.	111 kWh/(m ² a)
	DHW, space heating and auxiliary electricity	76 kWh/(m ² a)
	Specific primary energy reduction through solar electricity	kWh/(m ² a)
Airtightness	Pressurization test result n ₅₀	0.5 1/h

Thanks for listening

And here is a snapshot of things to come

If you'd like to know more about our projects
please visit our exhibition stand

Next year?



- Materials Key
1. Red / Brown Kevlar bricks
 2. Tensar reinforcement geogrid for basement as an integral solution for OED stability
 3. Clay roof tiles
 4. Tensar GFRG reinforcement geogrids
 5. Exterior plaster (including GRC) of cavity wall at finish
 6. Tinted Kevlar Kevlar glass windows, and Kevlar Kevlar or Kevlar Kevlar Kevlar glass doors, all supplied with integrated Kevlar framing
 7. Tinted window controls, same as integrated Kevlar framing
 8. Insulation across all perimeter wall joints
 9. Polycarbonate glass metal rooflights
 10. Tensar geogrids and non-welding self-anchored sheet connections



PROPOSED SECTIONS & ELEVATIONS OF BLOCK A

Type	Size	Overall Size	Structure	Section	Scale
1st floor	1000	1000	1000	1000	1000
2nd floor	1000	1000	1000	1000	1000
3rd floor	1000	1000	1000	1000	1000
4th floor	1000	1000	1000	1000	1000
5th floor	1000	1000	1000	1000	1000
6th floor	1000	1000	1000	1000	1000
7th floor	1000	1000	1000	1000	1000
8th floor	1000	1000	1000	1000	1000
9th floor	1000	1000	1000	1000	1000
10th floor	1000	1000	1000	1000	1000



Next year?



Next year?



2. Layout Package PK 10.03.2014
 3. Plans reworked, pending PK 08.08.2014



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 Tel: 0118 206 5800 Fax: 0118 206 5801
 email: rap@rap.co.uk www.rap.co.uk

Project: Redwood Road Extension (Phase 2) - Bournemouth
 Client: Redwood
 Date: 10/11/2013
 Scale: 1:500 @ A1
 Drawn: DM
 Checked: JMB

All dimensions are in millimetres unless otherwise stated. The architect is not responsible for the accuracy of the information provided by the client.

Next year?



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