

# Mid Street - Achieving Code Level 5

Colin Mitchell

Divisional Director  
Osborne



# Contents

- Mid Street
  - Background
  - What is Code 5?
  - Option Appraisals
- Design & Technical Solution
- Component Information
- Costing Information
- Monitoring
- The Future



# Our experience

- Osborne was founded in 1966
- Current Turnover for 07/08 is £300m
- Employing over 1000 employees
- Subsidiary Company
  - Innovare Systems - SIPS
- Design and Build for RSLs & Local Authorities
- Care Homes, housing for the Elderly & Children's Homes
- Land Remediation
- PFI & Estate Regeneration
- Demonstration House at BRE





# Mid Street Background

- Raven Housing Trust's visit to Osborne demonstration house at BRE
- A SIPS-built house with modern components. In excess of Eco Homes excellent.
- For Mid Street we embraced four key principles in order to deliver a Code Level 5 scheme
  - Reduce energy demand
  - Maximise passive solar gain and capture
  - Maximise renewable energy
  - Minimise fossil fuel usage



# Mid Street Background

Partners and Funders:

- Raven Housing Trust
- Tandridge District Council
- Housing Corporation
- The Energy Saving Trust
- BERR (former DTI)
- Osborne



# What is Code 5?

- Achieve a minimum of 84 points under the rating system (code 3 is 57)
- Two areas are mandatory
  - 100% reduction on carbon emissions
  - Reduction of water consumption to 80 litres per person per day
- Remaining
  - Materials
  - Waste
  - Surface Water Run-off
  - Pollution
  - Health & well-being
  - Management
  - Ecology



# Option Appraisals

- Objective was to find the most cost effective solution to deliver Code 5
- All options focused on getting the building fabric right to begin with (common across all options)
- Chose a Structural Insulated Panel System (SIPS) via Innovare:
  - High thermal performance
  - Low air leakage
  - Minimal thermal bridging





# Option Appraisals

- Renewables:
  - Solar water heating
  - Photovoltaics
  - Heat Pumps
  - Biomass Boilers
  - Wind turbines
  - Mechanical ventilation heat recovery
- Maintenance and usage implications
- BRE sponsored by EST assisted in assessments of the options to ensure compliance with Code 5





# Design & Technical Solutions

- Structural Insulated Panels
- Jablo insulation
- Upgraded roof insulation
- High Performance Windows
- Air leakage sealing
- Heat recovery unit
- Biomass Boiler
- Photovoltaic Panels
- Rainwater Harvesting
- Water saving devices

- Data link
- Environmental planting
- Traditional Elevations



# Wall Construction

## Innovare Structurally Insulated Panel System (SIPS)

SIPS Panels for external walls – made up of a 'sandwich' of: 12mm • Orientated Strand Board either side of 150mm Low lambda Expanded Polystyrene (EPS) insulation. Total thickness 174 mm

On the outside of the SIPS panels is a further 50mm layer of EPS • insulation within the cavity, with the final cladding of facing brickwork

The extra layer of insulation was needed to achieve the U-Values of • 0.14W/m<sup>2</sup>K

Building erected and watertight in 7 working days•



# Electricity

Photovoltaic Modules (PV) generates approx. 900 kWh/year of electricity directly from sunlight

A electric current is generated by the PV cells then converted for use by passing through an Inverter

The system is fully automated, operates silently and is without any moving parts or batteries

The 'Green' Power is treated no differently than Grid supplied Electricity within the building.

Every unit (kWh) generated by the PV saves over half a kilogram of CO<sub>2</sub> emissions



# Water saving features

Rainwater from the roof of the property is collected and filtered in an underground storage tank

It is then pumped to cylinders in the roof space, where it serves the W.C's, washing machines and garden tap

Use of rainwater harvesting results in less mains water consumption - the system will always draw on the rainwater first

Through monitoring via the Energy Saving Trust we will be able to gauge mains water usage in the homes

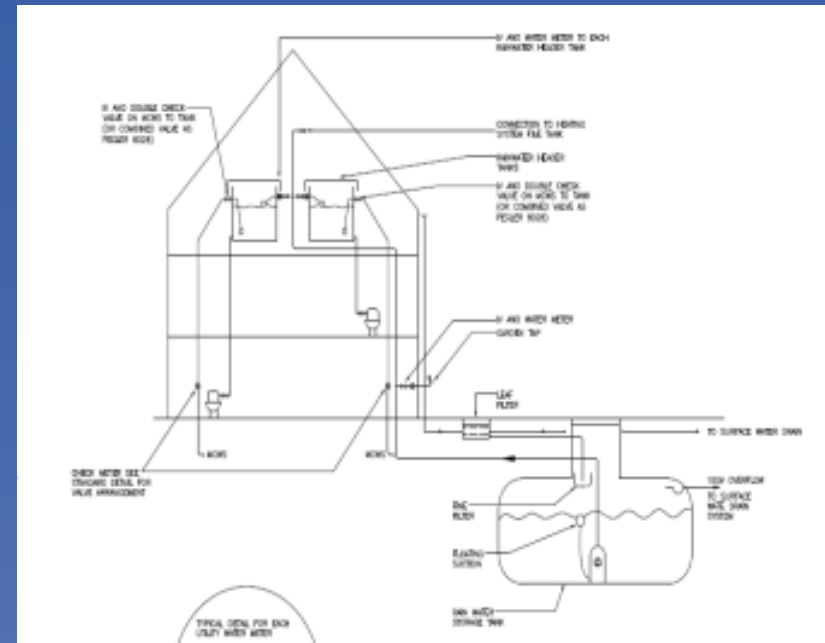
Also fitted low water usage sanitary ware:

Galerie Flushwise W.C - UK lowest flushing WC using 2.6 -4 Litres of water per flush saving 6 litres per flush compared to standard W.C

Shallow bath

Digital shower to monitor water usage

Aerated flow and and thermo static mono sink mixer taps





# Heating System

A Xpelair Xcell 270 Long Life Heat Recovery Unit has been installed to save energy and function reliably with extremely low running costs

They provide a constant background flow of fresh warmed air to the living spaces whilst extracting condensation, smells, tobacco smoke and volatile organic compounds via kitchens, bathrooms and toilets.

Choice of ten preset performance programmes enables flexible control over air quality

The units have efficient Longlife Low Running Cost DC Fans

The resultant lower humidity deprives the house dust mite the conditions in which to breed, thus contributing to a healthier environment.

Maintenance is kept to a minimum by integral filters which make access to the cell unnecessary



# Heating System - Boiler

Mescoli Combifire2 automatic wood pellet boiler, blown feed hopper and automatic 'de-ash' and automatic clean

Provides heating and hot water via thermal stores in each flat

Utilises locally produced clean carbon neutral wood pellets to DIN standards

Sustainable: wood pellets are produced locally from pure waste sawdust, which generates a saving of approximately 4 tons of CO<sup>2</sup> per annum.

Heat output up to 28KW - fully controllable

Delivery via tanker blown into external store via air-tube with automatic auger feed

Wood pellet consumption will be focused around winter months with little or no consumption from May to September, due to provision of other technologies

Similar to traditional gas-fired boilers, requires single annual maintenance and clean out of storage hopper



# Costing/Funding

- Price for Mid Street is approximately 20% more than the equivalent unit built to Code 3.
- 24% more than current Building Regs
- Osborne Carbon Offset Fund and 'Gap' funding by Partners

## The Osborne Carbon Offset Fund

Help reduce our **Carbon Footprint!**

The Osborne Carbon Offset Fund will be used to reduce the natural resources we use and to improve the environmental performance of our operations and the buildings and structures we construct.

The fund will be in excess of an initial £30,000 annually and this is now available for all staff to apply to. The types of areas the fund is available for include:

- Training courses in energy saving technologies
- Review alternative specifications utilising recycled or low energy products
- Analysis of building construction
- Help a client to achieve an improved BREEM or EcoHomes score.
- Investment in new or alternative technologies
- Assist a local firm to develop a product that we currently source from overseas

These are only a few examples of ways in which the fund could be used and we are looking for practical ideas and suggestions from staff.



If you have any ideas for reducing our carbon footprint, please contact Caroline Oldroyd by email or mobile on 07736 597063

# Monitoring

- Mid Street will be monitored for 2 years
- By the Energy Saving Trust
- Via an ACIS wireless data link
- Monitoring
  - Heating – heat output from Wood Pellet Boiler
  - Water Consumption – meter readings from rainwater harvesting
  - Electricity – generation from photovoltaic panels





# Code 6 and Beyond

- What are the things we have to do to achieve Code 6?
  - Achieve a minimum of 90 points under the rating system
  - All Energy: Zero Carbon producing
  - Water: Reduction of water consumption to 80 litres per person per day
- Some new technologies:
  - Heat Pumps
  - Green energy
  - More efficient Photovoltaic Cells



# Extra over cost £81,700

Innovare Sips & insulation	£12,800
Air Leakage tapes	£ 1,000
Windows	£ 7,000
Sanitaryware	£ 400
Rw harvest & attenuation	£ 6,500
Heat Recovery system	£ 3,600
Biomass Boiler	£12,100
Underfloor heating	£ 6,100
Photovoltaic cells	£19,000
Hw cylinder mods	£ 2,000
Suspended ceiling	£ 1,000
Additional fees	£ 7,600
BWIC	£ 2,500



# Summary

- Code 5 IS achievable!
- Building Fabric is key
- Original design and orientation
- Elevational flexibility
- Partnership working

