



Ingleton Wood completes pioneering new housing scheme in Chelmsford

Code for Sustainable Homes Level 6

architecture
building surveying
building services
planning
interior design
environmental design

Vision, form and function

Ingleton
Wood

Pioneering scheme

Ingleton Wood designs first affordable housing scheme nationally to achieve level 6 of the Code for Sustainable Homes



Ingleton Wood's 10 unit scheme at Mendip Place, in Chelmsford for CHP and Flagship Housing Group, has just received its certification to level 6 of the Code for Sustainable Homes. This is the highest level of the UK's standard measurement of the environmental quality of new homes, and it is the first affordable housing scheme nationally to achieve this accolade. It is also the first Code 6 scheme in the Eastern Region, and the largest Code 6 scheme completed to date.

With heating from communal biomass boilers, and powered by photovoltaic cells on the roofs, the units are defined as zero carbon. This means they use a dramatically reduced amount of

energy, and in fact generate as much electricity as they consume.



Jon Boon (right), Partner and Jason Page, Code for Sustainable Homes Assessor from Ingleton Wood at the opening ceremony of Mendip Place, Chelmsford.

"The new Government has reaffirmed the previous government's commitment that by 2016 all new homes will be built to zero carbon

standard," says Jon Boon, partner at Ingleton Wood, the scheme's architects and environmental designers. "This scheme achieves this innovative landmark six years ahead of that target. It will be an invaluable source of experience for advancing the environmental housing agenda towards this ambitious goal."

The building fabric is super insulated, meeting 'U' values of 0.11W/m²K for the walls and roof, and 0.7W/m²K for the triple argon-filled glazing, with low 'E' to maximise solar gain. Also by using timber structural insulated panel (SIP) construction, the buildings are around ten times more airtight than traditional construction. Higher than normal air tightness



Client
CHP

Contract Value
£1.6m

Contract Period
2008 - 2010



means mechanical whole house ventilation is installed to maintain air quality. This uses heat exchangers to reduce energy costs, and maintain a continuous trickle ventilation for year-round thermal comfort. The system also prevents condensation, often an issue for social housing schemes.

“All this is achieved at a predicted energy cost for heating, power and lighting of less than half that of a typical house built to current Building Regulations standards,” says Jon Boon.

Ingleton Wood’s Chartered Energy Engineer, Robert Diamond, developed the energy strategy to achieve Code 6 zero carbon by specifying a biomass district heating and hot water system in conjunction with solar photovoltaic panels.

The generation of all the required electricity by photovoltaic cells was a challenge, resulting in 4kWp/house and 2.5kWp/flat, using almost all the available south facing roof area. The power requirement for each property needs to meet the lighting loads, ventilation equipment and all the cooking and electrical appliances.

Two biomass boilers in a central plant room provide heating and hot water via an underground pre-insulated pipework distribution system to each of the homes, via heat exchange boxes fitted with smart meters.

Mendip Place has a green roof area to encourage biodiversity, as well as recycling bins and composting areas to reduce waste to landfill. Rainwater harvesting is provided as well, reducing water use to a design figure

of 76l/person/day for flushing WC’s and washing machines. Water butts provide a sustainable form of irrigation.

The total cost of the scheme was £1.6m, about 40% more than a standard Code 3 scheme. An economic way to achieve zero carbon homes is a major challenge, and although the government has sent out the right signals to put this on the agenda, in reality the high cost to achieve this has to be taken into account in the current difficult financial climate.

There is no doubt that creating zero carbon homes is a major challenge, but this development demonstrates that the technology and construction knowledge is already available, and the CHP scheme at Mendip Place, Chelmsford has proved it can be done ■

A pioneering development

The rationale for the Mendip Place project



By Carl Hockey

Regeneration Manager at CHP

CHP commissioned the Green Space project in Mendip Place, Chelmsford, as part of its land bank programme. This allowed the company to explore the relative merits of new methods of construction and the renewable technologies available.

The Government has a target that all new housing will be built to zero-carbon standards by 2016. Green Space will help achieve this goal – and perhaps most importantly for the company – it will help tackle fuel poverty by providing lower energy costs for its residents.

It is a pilot project and CHP will monitor fuel usage at the development. We will also monitor how satisfied residents are with the new technologies over the coming years. This will allow CHP to learn from the project and share best practice across the housing sector.

The former garage site provided an ideal opportunity for this pioneering development which came to fruition thanks to the skills and experience of the company's dedicated project team.

The Green Space project demonstrates that, through vision, partnership and hard work, it is possible to obtain a Level 6 Code for Sustainable Homes rating within the affordable housing sector.

Carl Hockey, Development and Regeneration Manager, said "Our first zero carbon affordable housing development demonstrates our commitment to reducing carbon emissions along with our aim of helping to reduce residents' energy consumption and fuel costs"

"We have all worked exceptionally well to overcome the challenges associated with such a pioneering project. It has helped to show that the construction and renewable energy technologies



(From left to right) Carl Hockey, Development and Regeneration Manager, resident Nadine Matthews and daughters and Director of Development David Cotteril at the opening ceremony of Mendip Place, Chelmsford.

Client	CHP
Client's Development Agent	Flagship Housing Group
Architects	Ingleton Wood
Project Managers	Oxbury & Co
Contractor	McCann Homes
SIP Supplier	Kingspan Offsite
Renewables	SolarTech

are available to achieve a Level 6 scheme."

For more information please email CHP's Development and Regeneration Manager, Carl Hockey, on carl.hockey@chp.org.uk





Working in partnership

Flagship Housing Group's role in the partnership behind the Mendip Place scheme.

In April 2004 the Essex Development Partnership was set up between Flagship Housing Group and CHP. It works to bring development forward and increase CHP's housing stock.

Mendip Place, Chelmsford was a former garage area owned by CHP. It was out of sight of the road so any new development didn't have to fit in with what was already in the street. This meant the houses could have a contemporary design and use innovative technologies.

With the government's drive for zero-carbon homes by 2016, this was the ideal site to build a Code Level 6 scheme.

Ingleton Wood was selected as the architect because of their reputation for delivering innovative and practical energy-saving designs. Planning permission was granted in April 2008 for four one-bedroom flats, three two-bedroom houses and three three-bedroom houses.

Work began on site in April 2009. The homes were constructed using Kingspan timber frame and Structural Insulated Panels. This makes the building extremely airtight with the high insulating values needed for Code Level 6 housing.

All electricity needed for the new homes is produced on site by

photovoltaic panels. The heating and hot water are generated by two bio-mass boilers. A rain water harvesting system reduces water consumption.

The affordable rent homes have had tenants since July 2010. Heat, power and light use by the houses and flats will be monitored long term. However, it is expected to be considerably less than the energy used in a traditionally constructed home. This will help tenants save money and is better for the environment.

Oxbury & Company were project managers for the scheme and McCann Homes, the contractors ■



Employer's Agent and CDM Co-ordinator

How the project was overseen by Oxbury & Company



Oxbury & Company oversaw the scheme in its entirety - from the site's appraisal, through a two stage tender process to the handover of the dwellings. The Mendip Place project was managed from the Chelmsford Office.

development. Alongside the client - and in negotiation with contractor McCann Homes at the second tender stage - cost-effective means of achieving Code Level 6 were explored and developed to maintain the scheme's financial viability.

were also responsible for coordinating all parties to ensure the project was handed over smoothly and Code Level 6 certification was achieved ■

The scheme involved negotiations with adjacent land owners and residents to secure access to the site and its viable

Oxbury & Company acted as employer's agent and CDM co-ordinator on behalf of CHP. They



Zero carbon scheme

McCann Homes' role in this exciting and challenging project



McCann Homes' involvement in the Mendip Place scheme has involved members of staff from varying disciplines within the company working together on what can only be described as an exciting yet challenging project.

technologies were and proved to be a steep learning curve for even the most experienced members of staff.

The specification provided by Ingleton Wood gave a solid starting point but moving into the design and development stage of the project highlighted how advanced the new

Working as a team, using the combined experience of the renewables suppliers, and with Ingleton Wood on hand for advice and guidance, McCann Homes have managed to complete a high quality scheme. It fulfils all of the requirements for Code for Sustainable Homes Level 6 Certification.

More importantly, McCann Homes, on behalf of CHP, has successfully achieved a zero-carbon scheme that is welcoming and user-friendly. It is also one of the first of many sustainable homes for the future ■

Industry leaders in low-energy timber systems



High performance TEK® Building system used at Mendip Place

Kingspan Off-Site, industry leaders in low-energy timber systems, has supplied its high-performance Kingspan TEK® Building System to the Mendip Place project.

The Kingspan TEK® Building system is a SIPs (Structurally Insulated Panel) based solution. The panels consist of two layers of OSB/3 sandwiching a

layer of high performance CFC/HCFC-free rigid urethane insulation.

The Kingspan TEK® Building System is the only SIPs based system to have been through the Building Research Establishment's environmental profiling process. The system easily achieves an A+ rating (the best possible).

The Kingspan TEK® Building System used on the Mendip Place project delivered a U-value of 0.11 W/m²K, in conjunction with additional Kingspan Thermawall TW55, for the walls and roof ■



Unique multi-technology approach

SolarTech's role as the renewable energy partner



SolarTech is proud to have been the renewable energy partner on the Mendip Place project. Our team worked closely with the design and construction teams to help deliver the first new-build multi-occupancy Code for Sustainable Homes Level 6 project in the UK.

Our unique multi-technology and independent approach enabled us to design a scheme that achieved the requirements of the Code while considering whole-life cost, ease of operation and ease-of-use for tenants.

Our solution included a dedicated PV system to each property so that all tenants would benefit from reduced fuel bills, helping reduce fuel poverty. Our design used a number of leading PV brands to optimise the available roof areas and ensure the requirements of Code were achieved.

Each array is monitored remotely via a site-wide monitoring system, GSM lined to the client's office. This enables the client to automatically monitor PV generation. This data

is 'bill gradable' and can be used for obtaining payments under the Government's feed-in tariff scheme. In the first year we estimate the development will make savings of £12,000 under this scheme, with a 25-year 'whole life' benefit of £390,000

In addition to the PV systems, we installed a centralised bio-mass boiler room linked to a heat distribution unit in each property. The heat distribution units were supplied via a distribution network of pre-insulated pipework.

The site monitoring system is also linked to heat meters in each property. Again these units are linked back to the landlord via the GSM connection, enabling each tenant to be billed based on the energy they use.

The central boiler house includes 100% standby of all critical components including boilers, pumps and fuel augers. To maximise energy savings the primary circulation pumps include variable speed control dependent on heating load.

The boiler system will qualify for an annual payment under the governments 'renewable heat incentive' scheme - again providing a low carbon solution and a significant income stream.

The boiler house is monitored remotely for critical and low-fuel alarms enabling condition-based maintenance to be used across the site on key systems. The boilers were fitted with an automatic ash-extraction system to minimise maintenance visits. This integrated multi-technology approach has helped provide an industry-leading integrated solution on this prestigious project ■



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