

CARBON REDUCTION REPORT

NEW ROAD, PILLEY



BARRATT DEVELOPMENTS PLC

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Introduction

This sustainability report has been prepared to assess measures introduced by BDW Yorkshire West to reduce carbon emissions for the proposed house development at New Road, Pilley. The reduction has been achieved via a Fabric First approach specifying improved materials and carbon emission reducing products.

A more environmentally aware approach is to reduce the amount of energy we use before we start generating more energy. This shows our respect for the planet and an understanding of how people with modern busy lives live in their homes.

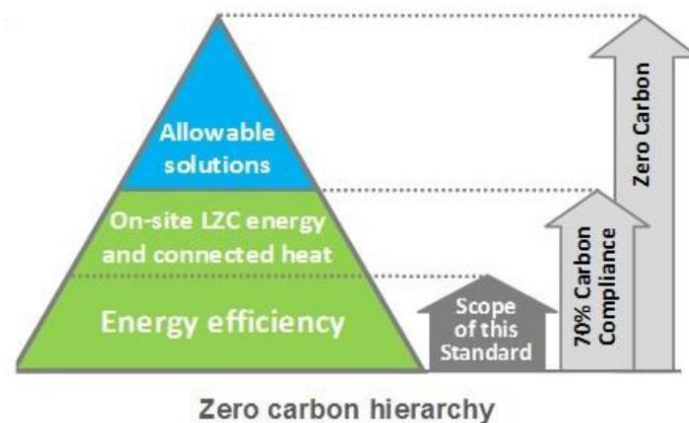
To make the most of potential energy savings in our homes, it is necessary to adopt a 'holistic' approach that encompasses all aspects of a building's fabric. By taking a fabric first approach, essentially we as developers are 'future proofing' our designs and addressing the Renewable Energy Requirement. A fabric first solution means that the energy reduction measures which are being built into the dwelling are there for the life of the dwelling.

The development consists of 56 plots including 53 detached dwellings together with a block of 3 affordable units. A mixture of brick and stone facing materials are being proposed for the development.

This report aims to demonstrate a reduction in carbon emissions across the development as policy CSP5 of the Local Authority Core Strategy produced in 2011.

Design Philosophy

BDW Yorkshire West has proposed to upgrade various elements over the standard build specification to provide an improved energy efficiency across the development. Good design principles have been adopted as promoted by The Zero Carbon Hub, a key advisor within the construction industry. These principle are illustrated in the below chart;



According to the Zero Carbon Hub, ***“Focusing efforts on the comparatively long-lived building fabric helps to ‘future proof’ homes meaning they will be less likely to require difficult and expensive refurbishment upgrades at a later date. This supports the Government’s parallel agendas of carbon reduction, long term energy security and reducing fuel poverty.”***

The following material and product improvements have been made in order to reduce carbon emissions:

- Upgraded heating and hot water control
- Weather compensation device and delayed start controls
- Design air permeability of 5m³/m²
- Bespoke thermal bridging details

Specification Improvements

The system used in a property to supply hot water and heating, as well as control it, are important to the overall energy demand of a property. The 2013 Building Regulations state that all systems and their controls must adhere to the minimum standard shown in the Domestic Heating Compliance Guide.

For a mains gas fired system the minimum boiler efficiency requirement is 86%. BDW Yorkshire West intend to use Ideal Logic condensing boilers through the site for both combination and cylinder based systems. These boilers achieve a SAP 2012 rated efficiency of at least 89% and are recommended by the Energy Saving Trust. Furthermore, weather compensators will be installed on all dwellings.

Where installed, hot water cylinders can lose a significant amount of energy. In order to minimise this energy loss and corresponding carbon emissions BDW Yorkshire West will utilise Kingspan Tribune Cylinders which have higher levels of insulation in comparisons to typical hot water cylinders.

Finally 100% Low-E lighting fixtures shall be fitted to all properties.

Fabric Improvements

The building fabric for all dwellings is improved from basic compliance within the Building Regulations to an enhanced specification. The improvements have been made through a combination of upgraded materials and increased insulation thicknesses. Enhanced glazing with a larger transmittance factor allowing for increased solar gains will also be used. These fabric improvements reduce the space requirement for a property. Changes to U-Value of external elements are shown in the below table:

ELEMENT	BARRATT 2013 SPECIFICATION	BUILDING REGULATION U-VALUE PARAMETERS
GROUND FLOOR	150mm PUR insulation	
	'U' value $\approx 0.20 \text{ W/m}^2\text{k}$	$0.25 \text{ W/m}^2\text{k}$
EXTERNAL WALLS	100mm cavity with 50mm thick insulation	
	'U' value $0.27 \text{ W/m}^2\text{k}$	$0.30 \text{ W/m}^2\text{k}$
ROOF	400mm thick mineral fibre	
	'U' value of $0.11 \text{ W/m}^2\text{k}$	$0.20 \text{ W/m}^2\text{k}$
CAVITY PARTY WALLS	Fully filled and sealed	
	U Value $0.0\text{W/m}^2\text{k}$	$0.20 \text{ W/m}^2\text{k}$
GLAZING	PVCU windows or similar approved	
	U Value $1.41\text{W/m}^2\text{k}$	$2.0 \text{ W/m}^2\text{k}$
AIR PERMEABILITY	$5.0\text{m}^3/(\text{h.m}^2) @50\text{Pa}$	$10\text{m}^3/(\text{h.m}^2) @50\text{Pa}$
THERMAL BRIDGING	Required to be calculated for each dwelling using sum of psi values for more accurate figures	
BOILER	Gas Boiler SEDBUK 'A' rated at 89.6% system or	
	SEDBUK 'A' rated at 89.0% combi	
	Boiler interlock and Delayed Start Thermostat.	
EFFICIENT SERVICES	Plot specific - Waste Water Heat Recovery	Not Applicable

As improvements are made to the thermal conductivity of main elements, thermal bridging and air permeability becomes increasingly significant in the overall fabric performance. BDW Yorkshire West utilise bespoke thermal bridging designs assessed by H&H Celcon, which achieve much lower heat loss levels in comparison with standard practice.

Hi-Therm Lintels

A significant amount of heating energy is lost through the dwelling lintels. BDW Yorkshire West therefore intend to use IG Hi-Therm lintels on various house types to improve the thermal efficiency of the plots. IG Hi-Therm Lintels achieve a lower linear thermal transmittance (Psi value) of 0.05W/mK, in comparison to the normal IG lintels which achieve a Psi value of 0.23W/mK. Further details can be seen below:



Cavity Wall

Cavity widths from 90mm to 165mm

OUTER LEAF	INNER LEAF
102mm	100mm

If lintels are required to carry loads not indicated on the load tables, please contact IG's Technical Department.

LINTEL HOTLINE
01633 486486

Fax Back Enquiry Forms are also available for download.
www.iglintels.com/technical

IG Fasttrack CAD Database is accessible from iglintels.com

Hi-Therm Lintel

IG leads the way with the development of a completely unique lintel range to address the thermal requirements of new building regulations.



Psi 0.05 W/m-K

Building regulations require that lintels should be assessed for their effect on the thermal performance of a building. The thermal performance of a lintel is expressed in terms of Psi Values (Ψ) i.e. linear thermal transmittance.

Psi COMPARISON CHART

To help understand the immense thermal benefits of the Hi-Therm Lintel it must be compared to other lintel types.

Lintel type comparison	Values
IG Hi-Therm Lintel	0.05 W/m-K
Typical IG Lintel	0.23 W/m-K
Non-plated Steel Lintel (default)	0.3 W/m-K
Plated Steel Lintel (default)	0.5 W/m-K



Testing of IG's Hi-Therm Lintel was carried out by the BRE (Building Research Establishment) using Physibel's thermal analysis software TRISO2 which complies with BS EN ISO 10211-1. The modelling follows the requirements of the BRE conventions document BR497.

KEY BENEFITS

- Up to 5 times more thermally efficient than a steel cavity wall lintel, Hi-Therm outperforms other lintels.
- The significant reductions in thermal bridging due to the GRP component will assist in the building design process to achieve compliance with Part L and The Code for Sustainable Homes.
- The use of Hi-Therm will make a significant contribution to a buildings performance in respect of the Fabric Energy Efficiency Standards (FEES).
- Outperforms Stainless Steel on price and corrosion resistance.
- Hi-Therm has achieved the 1 hour fire resistance test as carried out by Exova Warringtonfire utilising the heating conditions of BS EN 1363-1 1999.

DESIGN FEATURES

- Patented GRP and Galvanised Steel hybrid design.
- Galvanised steel is used to support the heavier load on the inner leaf of the cavity wall.
- Profiled CFC free insulation ensures the continuity of insulation.

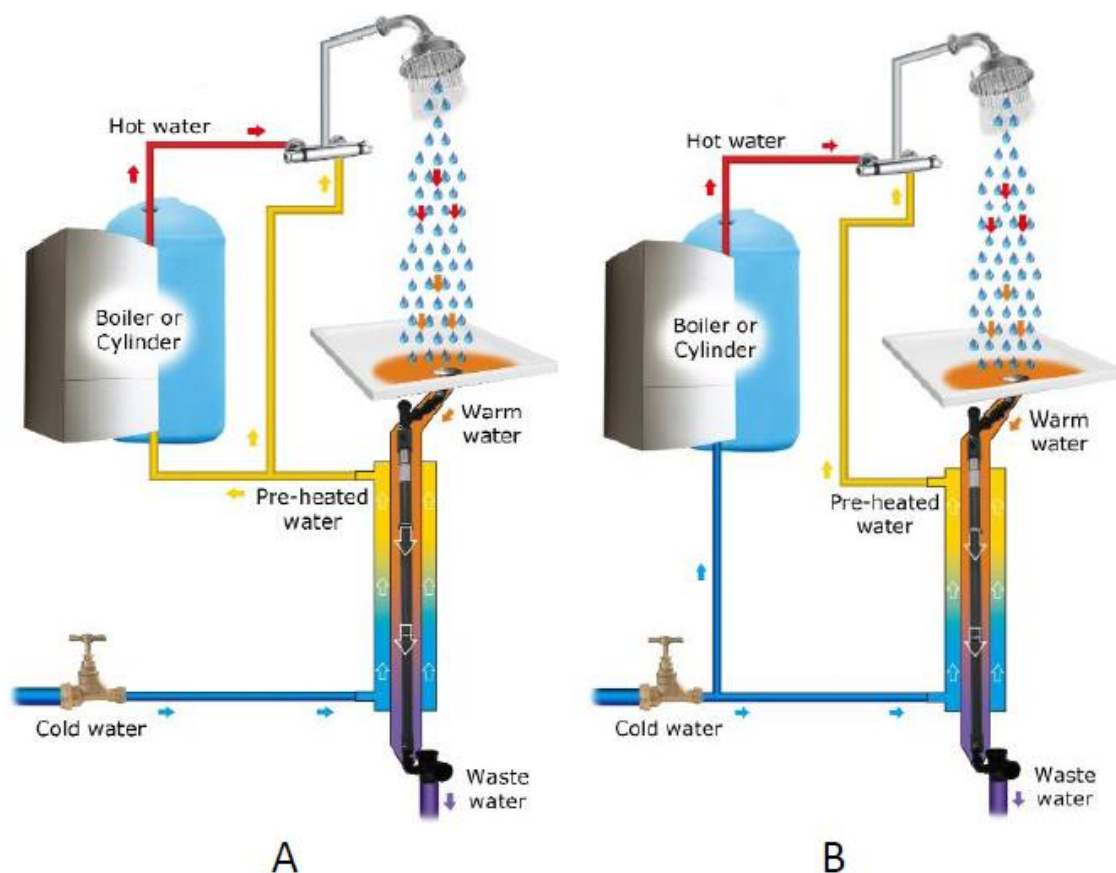
DAMP PROOFING

Not required on Hi-Therm lintels.
*Check severe exposure.

Waste Water Heat Recovery System (WWHR)

WWHR recovers heat from the warm waste water as it passes through a double walled heat exchange, before going in the drainage system. The heat is transferred to the mains cold water feed to the shower and/or a combination boiler or a hot water storage cylinder.

The process results in a significant reduction to the energy demand for providing hot water. The energy recovered depends on the temperature of the cold water fee to the dwelling, which varies by month, and the number of systems which are installed. The WWHR system is installed vertically below the point of demand, i.e. within the waste ducting below the shower of bath. See below simple diagrams of the two systems adopted by BDW:



Conclusion

As a group, Barratt developments are fully on board with the initiative to reduce energy consumption of new homes and we do support the drive towards more sustainable development and recognise your ambitions in setting such conditions. The below table identifies where Hi-Therm lintels and WWHR will be utilised on the development:

Plot	Lintels	WWHR (Single System A)	Secondary System (System B)
1	Catnic	EnSuite	None
2	Catnic	EnSuite	None
3	Catnic	EnSuite	Bathroom
4	Catnic	EnSuite	None
5	Standard	None	None
6	Catnic	EnSuite	Bathroom
7	Catnic	EnSuite	None
8	Standard	None	None
9	Standard	None	None
10	Standard	None	None
11	Catnic	EnSuite	None
12	Catnic	EnSuite	None
13	Catnic	EnSuite	None
14	Catnic	EnSuite	None
15	Catnic	EnSuite	None
16	Catnic	EnSuite	Bathroom
17	Catnic	EnSuite	Bathroom
18	Standard	None	None
19	Catnic	EnSuite	None
20	Catnic	EnSuite	Bathroom
21	Catnic	EnSuite	None
22	Catnic	EnSuite	None
23	Catnic	EnSuite	None
24	Standard	None	None
25	Catnic	EnSuite	Bathroom
26	Standard	None	None
27	Catnic	EnSuite	None
28	Catnic	EnSuite	None
29	Standard	None	None
30	Catnic	EnSuite	Bathroom
31	Catnic	EnSuite	None
32	Standard	None	None
33	Standard	None	None
34	Standard	None	None
35	Catnic	EnSuite	None
36	Standard	None	None
37	Catnic	EnSuite	None
38	Standard	None	None
39	Catnic	EnSuite	None
40	Standard	None	None
41	Catnic	EnSuite	None
42	Standard	None	None
43	Standard	None	None
44	Catnic	None	None
45	Catnic	EnSuite	None
46	Catnic	EnSuite	None
47	Catnic	EnSuite	Bathroom
48	Catnic	EnSuite	Bathroom
49	Standard	None	None
50	Standard	None	None
51	Standard	None	None
52	Standard	None	None
53	Standard	None	None
54	Catnic	EnSuite	Bathroom
55	Catnic	EnSuite	Bathroom
56	Standard	None	None

BDW are convinced that the package of energy measures proposed will exceed the current Building Regulation requirements and comply with the aspirations set by Barnsley Metropolitan District Council.

This approach has been supported by Andrew Burton, BMBC Group Leader:

From: Burton , Andrew [<mailto:AndrewBurton@barnsley.gov.uk>]

Sent: 08 March 2017 09:23

To: Coe, David <david.coe@barratthomes.co.uk>

Subject: *Ext: RE: Pilley condition 24



This email was received from outside the organization.

Please do not click on **LINKS or **ATTACHMENTS** where you are unsure of its origin. In such cases delete the email.**

Morning David,

I confirm that an acceptable way of addressing condition 24 would be to apply a fabric first approach to the construction of the new dwellings.

Kind Regards,

Andrew Burton
Group Leader – Inner Area Team
Development Management
Planning and Building Control
Barnsley MBC
PO Box 634
BARNSELEY
S70 9GG
Tel: 01226 774718
E-Mail: andrewburton@barnsley.gov.uk

Finally, Barratt Developments are the leading national major house builder when it comes to sustainability. Whilst the following press article is over a year old, we continue to win awards and recognition for our efforts. So please be reassured that sustainability is something our company does take seriously.

<http://www.barrattdevelopments.co.uk/media/media-releases/pr-2015/pr-23-12-2015>

I have also attached our companies Sustainability Report for 2016 which again demonstrates the commitment of our business to sustainability and conserving energy.

<http://www.barrattdevelopments.co.uk/~media/Files/B/Barratt-Developments/documents/sustainability-report-2016.pdf>