



## **ENERGY REPORT**



**OPUS 40, BIRMINGHAM ROAD, WARWICK**

JSP SUSTAINABILITY LTD  
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## EXECUTIVE SUMMARY

- The proposed Opus 40 development off Birmingham Road, Warwick will see the construction of 101 no. residential properties.
- The developer, Taylor Wimpey, is required by local policy to incorporate LZC technologies equivalent to 10% of the development sites energy requirement.
- Taylor Wimpey proposes the adoption of an enhanced fabric first energy strategy similar to that approved by Warwick District Council at the Academy Drive, Warwick development.
- The proposed strategy will reduce energy consumption by 13.72%, exceeding the requirements of local policy.
- The proposed strategy will reduce CO<sub>2</sub> emissions by 12.04%.



# 1 INTRODUCTION

JSP Sustainability Ltd has been commissioned by Taylor Wimpey to prepare an Energy Report to accompany the planning application for the residential development at Birmingham Road, Warwick. The development includes the construction of 101 no. 2, 3, 4 and 5 bedroom properties.

Warwick District Council's adopted Sustainable Buildings Supplementary Planning Document requires the inclusion of LZC technologies equivalent to 10% of a sites energy demand. However, following Warwick District Council's acceptance of the merits of a fabric first strategy for the Academy Drive development and the approval of application W/13/0435, it is Taylor Wimpey's intention to implement the same fabric first solution for the Opus 40 development. This report will confirm that the fabric first strategy will achieve a greater than 10% reduction in energy consumption and result in the construction of a sustainable development.

A number of documents have been consulted prior to completing the report. These include:-

**National Planning Policy Framework** – The NPPF includes a presumption in favour of sustainable development, and amongst other considerations confirms that development proposals should be in line with the Government's zero carbon building policy and other nationally described standards. At the present time this policy is benchmarked to Part L 2010.

**Approved Document L1A** – The Approved Document sets fabric efficiency standards and together with SAP, establishes a maximum CO<sub>2</sub> emission rate for new build residential properties.



## 2 ENERGY STRATEGY

### 2.1 Policy Background

Warwick District Councils Sustainable Buildings Supplementary Planning Document seeks to deliver energy consumption reductions specifically through renewable technologies. At the time of adoption such an approach may have been appropriate when one considers the less onerous standards of the Building Regulations 2006, which were the national benchmark at the time. However the industry is today building properties to a much higher standard equivalent to a 25% reduction in CO<sub>2</sub> emissions over the standards that prevailed in 2008. There is now a greater awareness within the industry as to the most effective means to deliver CO<sub>2</sub> and energy consumption reductions. Put simply the SPD has been unable to keep up with regulatory and policy changes at the national level. Some of these changes have been detailed below.

- Part L of the Building Regulations was amended in October 2010 and again in April 2014. The current Approved Document is broadly equivalent to a 30% reduction in CO<sub>2</sub> when compared to Part L 2006 and is in line with Code for Sustainable Homes Level 3. Included within the current Part L document are high fabric efficiency standards. These standards were amended to discourage designers and developers from incorporating “excessive and inappropriate” carbon trade-offs in place of weaker fabric performance.
- The Zero Carbon Hub was tasked with researching and defining a deliverable definition of zero carbon. The Hub’s research and publications have drastically changed the meaning of zero carbon development from previous standards such as Code for Sustainable Homes Levels 5 and 6.
- The Fabric Energy Efficiency standard has been incorporated into the definition of Zero Carbon and Part L of the Building Regulations, signalling the Government’s preference for developers to implement fabric first solutions to sustainable construction.
- The National Planning Policy Framework was published in 2012 replacing PPS1 and PPS22, amongst other guidance. The NPPF includes a presumption in favour of sustainable development, and specifically benchmarked this to national prescribed standards, i.e. the Building Regulations.
- The Harman Review, published in 2012, concluded that the Building Regulations remains the best delivery vehicle for Zero Carbon Homes and that a process is in place to deliver this by 2016. It further concluded that any higher standards that can be justified and are set by Local Authorities should be expressed on the common metric, probably CO<sub>2</sub> emissions per square metre, and Councils should avoid prescribing the means by which this is achieved (for example, a set percentage of energy supplied by renewables).



- The Technical Housing Standards Review was published in August 2013. In the Review the Government re-affirmed its commitment to achieve zero carbon homes by 2016. In light of this the Government has confirmed its intention to scrap the Code for Sustainable Homes and remove the various Local Planning Authority CO<sub>2</sub> reduction targets or renewable energy targets. In place of these standards, the Building Regulations Part L will become the primary measure of sustainable construction in England.

*“The Building Regulations have surpassed the lower levels of the Code...The Government has set a clear end point for strengthening the Building Regulations...on this basis the Government does not see a need for levels or separate carbon and energy targets in the Code - carbon and energy targets should be set in the Building Regulations.”*

**Technical Housing Standards Review, DCLG**

*“It is no longer appropriate for local plan policies to specify additional standards for how much energy use from home should come from on-site renewables.”*

**Technical Housing Standards Review, DCLG**

It is in recognition of these policy changes that Taylor Wimpey has proposed a fabric first strategy for the Opus 40 development and following the approval of application W/13/0435 it is now apparent that Warwick District Council accepts that this approach is an appropriate solution to energy and CO<sub>2</sub> reduction.



## 2.2 Establishing a Baseline

Before expanding on the strategy proposed by Taylor Wimpey, it is first necessary to calculate the developments Part L compliant emission rate and energy requirement. This task was achieved through house type modelling in SAP. SAP, or Standard Assessment Procedure, is the Government's approved methodology for the calculation of a residential property's energy requirement and corresponding emission rate.

Table 1 below summarises the baseline calculation.

**Table 1 – Opus 40 Baseline**

House Type	No	Energy Requirement (kWh/year)	Target Emission Rate (kg/year)
Heydon	1	11,736.06	2,578.35
Haddenham	3	31,559.76	7,039.30
Kentdale	5	45,861.13	10,190.30
Bradenham	6	53,919.73	11,966.29
Lydford	7	59,014.31	13,200.34
Alton	6	45,763.15	10,366.81
Ardingham	6	47,989.44	10,664.87
Yewdale	3	22,878.11	5,099.22
Flatford	6	38,593.52	8,765.71
Patterdale	3	19,269.53	4,353.35
Canford	13	72,007.85	16,386.24
Bayswater	2	9,197.65	2,105.88
AA24	19	115,152.50	26,251.50
AA32	19	127,064.24	28,910.44
AA42	2	15,133.80	3,438.86
<b>TOTAL</b>	<b>101</b>	<b>715,140.78</b>	<b>161,317.46</b>

Table 1 confirms a Part L energy requirement of 715,140.78kWh/year. As such the SPD requires a development with a net energy requirement of no more than 643,626.70kWh/year.



### 2.3 Proposed Strategy

The strategy proposed by Taylor Wimpey incorporates the lean and clean measures of the Energy Hierarchy and has been labelled by the Zero Carbon Hub as a “fit and forget” strategy – it requires zero maintenance by the eventual occupants and the resulting energy savings will persist for the lifetime of the development. The proposals emphasis the thermal efficiency of the building and the operation efficiency of the installed building services. The aim is therefore to seek permanent reductions in energy consumption and by extension reduce the carbon footprint of the development once occupied.

The table and details that follow summarise the proposed fabric efficiency and building service standards to be included in the strategy.

**Table 2 – Specification Summary**

Element	Part L	Enhanced Specification
Wall	0.30W/m <sup>2</sup> K	0.25W/m <sup>2</sup> K
Party Walls	0.20W/m <sup>2</sup> K	0.00W/m <sup>2</sup> K
Cold Roof	0.20W/m <sup>2</sup> K	0.11 W/m <sup>2</sup> K
Floor	0.25W/m <sup>2</sup> K	0.15-0.17 W/m <sup>2</sup> K*
Glazing & Doors	2.00W/m <sup>2</sup> K	1.40 W/m <sup>2</sup> K
Air Permeability	10 m <sup>3</sup> /(h.m <sup>2</sup> ) @ 50 Pa	5.000 m <sup>3</sup> /(h.m <sup>2</sup> ) @ 50 Pa

\*Dependent on the P/A ratio

In addition to the summary above the following measures are also proposed:-

- Taylor Wimpey’s construction details achieve Y-values of between 0.03-0.06, depending on the house type form. These results are significant betterments over standard ACDs and represent reduced heat loss at non-repeating junctions.
- Efficient and independent gas condensing boilers with a minimum SEDBUK 2009 efficiency of 88% will be installed in each property. The heating system will incorporate time & temperature zone controls and delayed start thermostats. These will allow each owner/occupier to exercise maximum control over the operation of their heating system and therefore reduce energy consumption.
- Energy efficient lamps will be installed in each light fitting.
- Decentralised continuous independent extract fans will be installed in each property to ensure a comfortable internal living environment. The installed systems will have a high efficiency and a low SFP, thereby reducing energy consumption.





## 2.4 Performance of Enhanced Specification

The specification summarised overleaf was modelled in SAP to determine the anticipated energy consumption rate and hence the reduction achieved. The table below summarises the results calculated.

**Table 3 – Opus 40 Reduced Energy Requirement & Emission Rate**

House Type	No	Energy Requirement (kWh/year)	CO <sub>2</sub> Emission Rate (kg/year)
Heydon	1	9,956.46	2,225.99
Haddenham	3	25,421.71	5,823.97
Kentdale	5	40,316.43	9,092.45
Bradenham	6	44,251.27	10,051.94
Lydford	7	49,343.49	11,285.52
Alton	6	40,294.75	9,284.06
Ardingham	6	41,085.99	9,297.99
Yewdale	3	19,108.65	4,352.86
Flatford	6	33,507.33	7,758.65
Patterdale	3	17,428.32	3,988.99
Canford	13	63,322.27	14,666.49
Bayswater	2	8,387.77	1,945.52
AA24	19	101,451.27	23,538.63
AA32	19	110,152.97	25,562.01
AA42	2	12,967.88	3,010.00
<b>TOTAL</b>	<b>101</b>	<b>616,996.56</b>	<b>141,885.07</b>

Table 3 confirms an energy requirement reduction of 98,144.226kWh/year or **13.72%**. This is 37% greater than that required by the SPD and confirms the inherent benefits of a fabric first strategy.

Furthermore the calculated emission rate is **12.04%** lower than that required by Building Regulations. This is a significant betterment over the current benchmark for sustainable construction.



### 3 EVALUATION

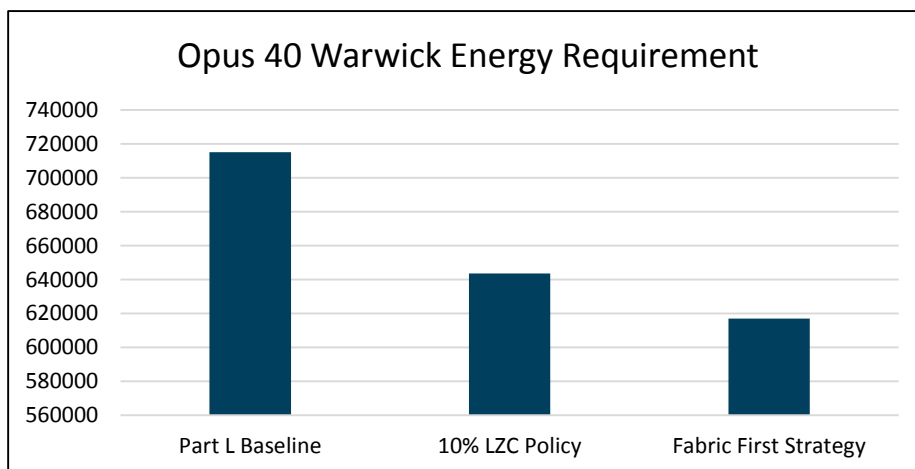
Taylor Wimpey is required by Warwick District Council’s Sustainable Buildings SPD to incorporate LZC technologies capable of generating 10% of a sites predicted energy requirement. In response to this policy and taking account of regulatory changes and best practice guidance provided by such bodies as the Zero Carbon Hub, Taylor Wimpey proposes to adopt a fabric first strategy for the Opus 40 development. This solution to sustainable construction is identical to that approved by Warwick District Council for the Academy Drive, Warwick development. *JSP Sustainability* was commissioned by Taylor Wimpey to review this strategy and confirm that an equivalent or better net energy requirement on national resources is achieved.

Following detailed calculation the following can be confirmed:-

- The development has a Part L compliant energy requirement of 715,140.78Wh/year, meaning Warwick District Council expects the development to achieve a net energy requirement on national resources of 643,626.70kWh/year.
- The proposed strategy emphasizes the efficiency of each property’s thermal envelope and installed building services.
- The proposed strategy will permanently shrink the developments energy requirement by 13.72%. This exceeds the aspirations of the policy and confirms the sustainable merits of a fabric first strategy.
- The strategy will permanently reduce the developments emission rate by 12.04%.

The graph below has been provided to summarise the conclusions of this report.

**Graph – Opus 40, Warwick Energy Strategy Summary**





In conclusion the strategy advanced by Taylor Wimpey takes account of shifts in best practice guidance and will deliver a development with a lower energy consumption rate and CO<sub>2</sub> emission rate than that required by current policy, thereby addressing climate change and energy security. These remain the key objectives of the sustainability agenda and therefore one can conclude that the strategy is in line with national and local policy goals. We therefore recommend the adoption of the Strategy by Taylor Wimpey and its approval by Warwick District Council.