



ENERGY AND SUSTAINABILITY STATEMENT

Land at Penistone Road Fenay Bridge

Prepared for: Engie Ltd

DOCUMENT CONTROL

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1.0 EXECUTIVE SUMMARY

This Energy and Sustainability Statement has been produced in support of the Planning Application for the proposed development at the Land at Penistone Road.

In accordance with Parts L1a: 2013, predicted carbon emissions and energy consumption have been determined using Government approved FSAP 2012 software by a trained and accredited assessor. Results demonstrate that high carbon emission and energy savings can be achieved through the design of a high-performance thermal envelope and building services specification. This has been proposed to incorporate low U-values, detailing to minimise thermal bridging and air infiltration, and energy efficient heating and controls.

In addition, this report has outlined water fittings specification that will exceed the requirements of Building Regulations, Part G2 (2013).

1.1. Results Summary

	Regulated domestic carbon dioxide savings			
	Carbon dioxide emissions (Tonnes CO ₂ per annum)	Stage savings (Tonnes CO ₂ per annum)	Stage CO ₂ savings (%)	Cumulative savings (%)
Baseline: Part L 2013 of the Building Regulations Compliant Development	108.11	–	–	–
Be Lean: After energy demand reduction	102.15	5.96	5.5%	5.5%

Table 1. **Predicted Carbon emissions savings after 'Lean' (Fabric) measures**

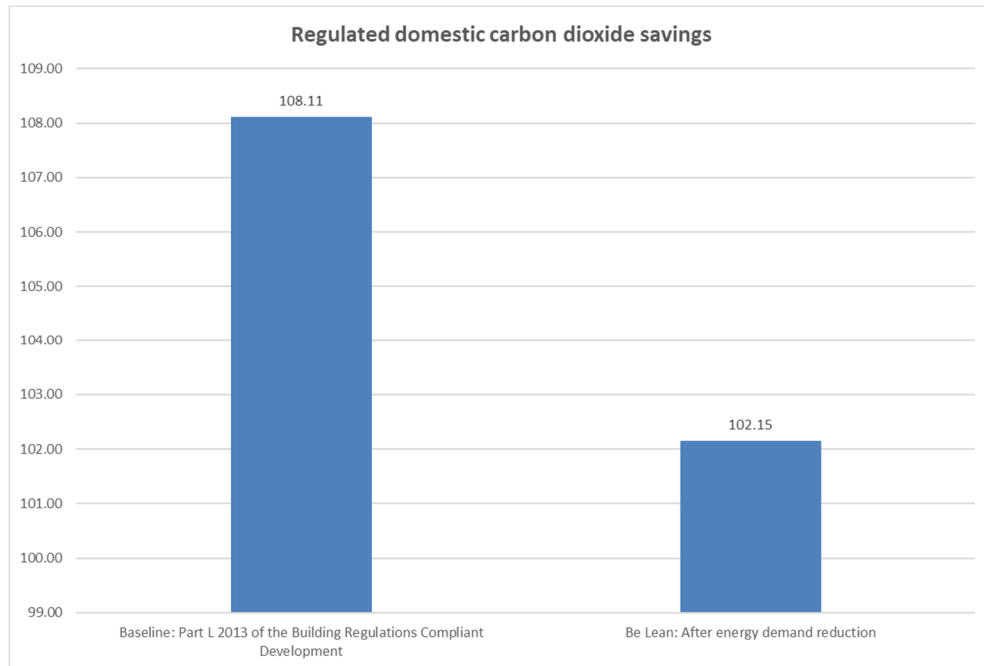


Figure 1. **Site wide carbon emissions savings**

	Predicted regulated energy consumption - domestic			
	Predicted energy consumption (kWh per annum)	Stage savings (kWh per annum)	Stage energy savings (%)	Cumulative savings (%)
Baseline: Part L 2013 of the Building Regulations Compliant Development	454,198	–	–	–
Be Lean: After energy demand reduction	416,018	38,180	8.4%	8.4%

Table 2. **Predicted energy consumption after 'Lean' (Fabric) measures**

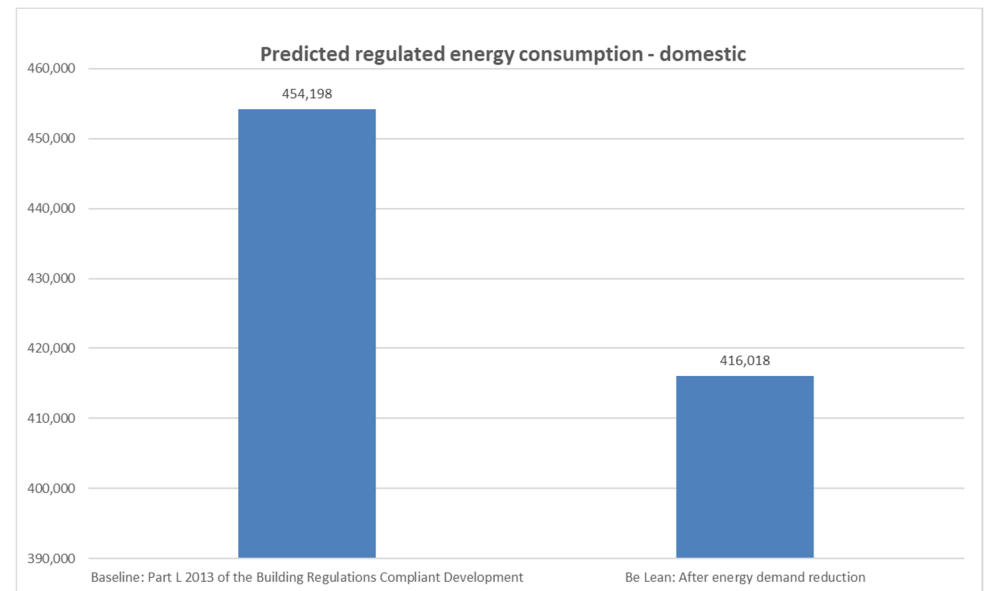


Figure 2. **Site wide energy consumption reduction**

As seen in tables above, the development achieves **5.5%** CO₂ savings and **8.4%** reduction in energy consumption, against a 2013 compliant Part L baseline. This has been achieved through high efficiency services and an enhanced building fabric utilising a specification beyond the minimum requirements of the Building Regulations.

2.0 INTRODUCTION

Stroma Technology has been commissioned by Engie to prepare an energy and sustainability statement to support the planning application for the residential development at the Land at Penistone Road, Fenay Bridge.

The proposed development is located within Kirklees and will therefore need to meet the requirements of the Kirklees Local Plan SD1 (November 2016). Policy PLP 1 'Presumption in favour of sustainable development' will need to be followed, which states "when considering development proposals, the council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. The council will always work pro-actively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area"

In accordance with good practice, a fabric-first approach has been adopted for the development. SAP calculations have been undertaken to ascertain both the baseline energy demand and CO₂ emissions and savings through passive measures.

The energy strategy for the proposed development is as follows:

1. Minimal heat loss through fabric, thermal bridging and air infiltration.
2. Installation of energy efficient building services

3.0 DEVELOPMENT SITE

The development site is located within Fenay Bridge, Huddersfield and is accessed via Penistone Road. The area is semi-rural, predominantly residential to the East of the site and Woodsome Hall Golf Club to the West. The site covers approximately 2.35 Hectares and comprises of 74 residential dwellings of which there will be a mix of affordable rent, rent to buy and shared ownership houses.



Figure 3. **Street view of proposed site**

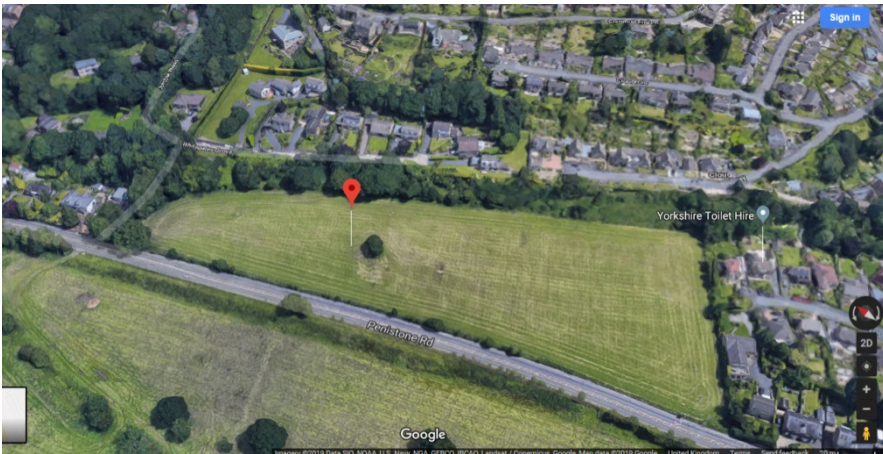


Figure 4. **Ariel View of Site**

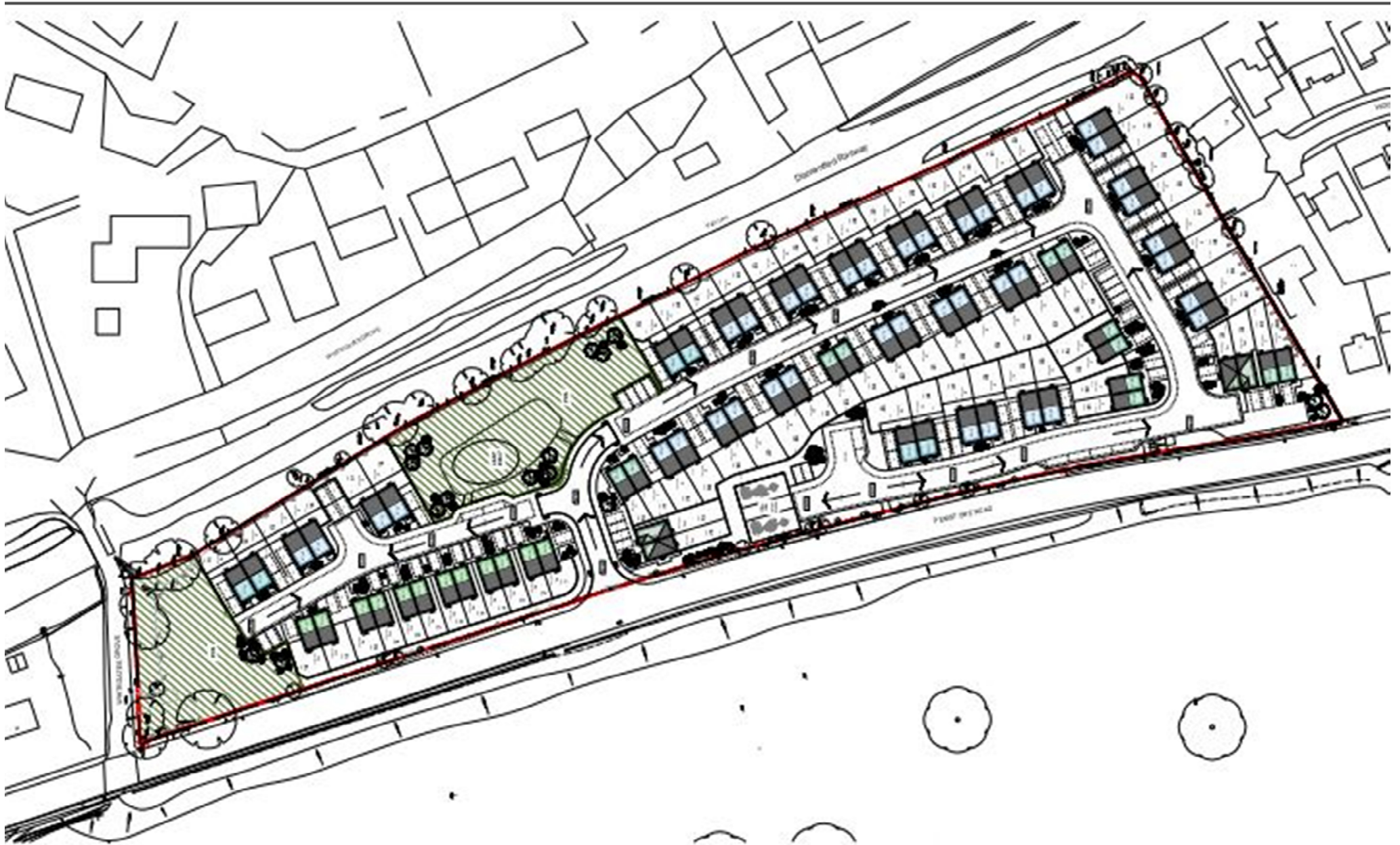


Figure 5. **Proposed site plan**

4.0 PLANNING POLICY

4.1. National Policy – England

The Department for Communities and Local Government (DCLG) released the revised National Planning Policy Framework (NPPF) in July 2018. In revising this framework, the Government's objective is to streamline the process encouraging sustainable development and promoting the needs and priorities of local communities.

This framework is to be used as the base by councils to develop their own local policy. Section 14 of the framework addresses climate change, flooding and coastal change. Considerations include;

- Minimising CO₂ emissions
- Reducing greenhouse gas emissions using landform, layout, building orientation, massing and landscaping
- Vulnerability of fuel supply
- A promotion of decentralised, low carbon and renewable energy sources wherever viable
- Green infrastructure

4.2. Local Policy – Kirklees

POLICY PLP1: Achieving a sustainable development

When considering development proposals, the council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework.

The council will always work pro-actively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.

Proposals that accord with the policies in the Kirklees Local Plan (and, where relevant, with policies in neighbourhood plans) will be approved without delay, unless material considerations indicate otherwise.

Where there are no policies relevant to the proposal or relevant policies are out of date at the time of making the decision then the council will grant permission unless material considerations indicate otherwise – taking into account whether:

a. any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; or

b. specific policies in that Framework indicate that development should be restricted.

5.0 BUILDING REGULATIONS – ENGLAND

APPROVED DOCUMENT L1A - DOMESTIC

Approved document L1A – Conservation of Fuel and Power sets the standard for carbon emissions for new dwellings and was last revised in April 2014 (Part L: 2013). The properties will need to comply with the criteria set out in the document, as follows:

1. The predicted Dwelling Emission Rate of CO₂ emissions from dwellings (DER) are not greater than the Target Emission Rate (TER).
2. The performance of the building fabric and fixed building services should be no worse than the design limits set out in Table 2 of the Approved Document.
3. The dwellings will have appropriate passive control measures to limit the effect of solar gains on indoor temperatures in summer.
4. That the performance of dwellings as-built comply with the DER values achieved, including site testing of a representative sample of dwellings demonstrating that the 'air permeability' rate achieved is as per that specified, or better.
5. The necessary provisions for energy efficient operation of dwellings are put in place, including operation and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand.

5.1. Assessment Methodology

DOMESTIC (SAP)

The Standard Assessment Procedure (SAP) is the Government's approved methodology for assessing the predicted energy consumption and carbon dioxide emissions of new buildings. Results are derived in respect of floor area and consider energy use (kWh/m²/yr) and associated CO₂ emissions (kg.CO₂/m²/yr) from the following:

- ✧ Space heating
- ✧ Domestic hot water
- ✧ Ventilation
- ✧ Lighting
- ✧ Ancillary pumps and fans
- ✧ Energy generating technology

SAP is compliant with the EU Energy Performance of Buildings Directive and is carried out using approved software. A trained and accredited Stroma Energy Assessor has used Stroma FSAP 2012 software 1.0.4.23 to assess compliance and generate the necessary results data.

SAP calculations have been undertaken for all dwellings and results have been used to determine the predicted energy consumption and CO₂ emissions for the entire development. The SAP Calculations are provided in Appendix A of this report.

An indicative fabric and systems specification has been based upon information provided by Engie.

ENERGY

Demand Reduction

6.0 SPECIFICATION

This section outlines the proposals for specifying building fabric and services beyond the requirements of Building Regulations (the baseline).

Fundamental to achieving energy efficiency in any new building is the specification of a thermally efficient building envelope. Passive design features such as high levels of insulation, designing to maximise solar gain and limiting heat loss through reduced air leakage and enhanced thermal bridging are all proven techniques to reduce energy consumption and emissions.

6.1. Building Fabric

Table 3 shows the proposed building fabric specification applied to the SAP calculations with respect to the upper limits stipulated by Part L: 2013. It can be seen that the values represent in some areas a significant bettering of the mandatory requirements set out in the current Building Regulations. The Target Fabric Energy Efficiency (TFEE) has been achieved by incorporating Concrete Block Association Details into the calculations to reduce heat losses via thermal bridging.

Element	ADL1a: 2013 Limiting U- value	Proposed U-value	Improvement (%)
Ground floor	0.25	0.16	36%
External walls	0.30	0.26	13%
Party walls	0.20	0.00	100%
Roof	0.20	0.11	45%
Windows	2.00	1.40	30%
Doors	2.00	1.40	30%
y-value (thermal bridging)	0.15	0.05-0.0.069	54-66%
Air permeability (m ³ /h.m ² @ 50 Pa)			
All dwellings (tested separately)	10.0	5.0	50%

Table 3. **Building fabric specification**

6.2. Materials

6.2.1. Materials Life Cycle Impacts

Materials should be responsibly sourced by the Main Contractor and be specified to have a low embodied impact. Materials with a low embodied impact as defined within the **BRE Green Guide to Specification** should be selected for use in the building design and construction.

Residential

Whilst there are no mandatory requirements for the residential dwellings to achieve any BRE Global environmental assessment standard, it would be best practice for the contractor to propose materials in line with the BRE Green Guide to Specification, which assesses each building element (such as walls, floors, roof and windows) and assigns an Environmental Impact Rating (from A+ to E). The following Green Guide Ratings should be targeted where possible to ensure the development has a low embodied impact:

Element	Green Guide Rating
Roof	A+
External walls	A+
Internal walls	A
Ground and upper floors	A
Windows	A

Table 4. **Green Guide Ratings**

The Main Contractor should source materials for key building elements from suppliers capable of demonstrating certification to high tier levels in the Chain of Custody certification process.

To achieve this, the major construction elements should be sought from suppliers that have been independently certified by the BRE Framework

Standard for Responsible Sourcing (BES 6001). This is the highest level that can be attained as an independently certified scheme for responsible sourcing of materials available in the UK.

The construction industry is a major consumer of resources and has a large impact on the sustainability of the UK and the wider world. BRE Global has developed a framework standard for Responsible Sourcing (BES 6001) along with an associated independent third-party certification scheme. This standard and certification scheme will help organisations manage and reduce the impacts throughout the supply chain.

The scheme is recognised by the BREEAM family of certification schemes where credits can be awarded for construction products independently certified through BES 6001¹

¹ BRE Global

6.3. Building Services - Residential

Space heating and domestic hot water (DHW) will be provided by a high efficiency gas boiler installed to each dwelling. The system will utilise variable speed circulators and output modulation to minimise overall energy consumption by matching the demand.

Individual heating controls will be installed in each dwelling which will incorporate a programmer with independent time and temperature zone controls in line with the Domestic Building Service Compliance Guide (DBSCG). Further to this Thermostatic Radiator Valves (TRVs) will be utilised throughout.

Low energy lighting will be specified throughout. In line with the DBSCG this means having a luminous efficacy of greater than 45 lumens per circuit watt and an output of greater than 400 lamp lumens. Typically, this will be achieved with LEDs or compact fluorescent lights and not low voltage Halogen variants.

Element	Specification (Apartments)
Boilers	Energy efficient, individual gas boilers - 89% efficiency (Worcester Bosch Greenstar 30i Erp)
Heating emitter	Radiant – low surface temperature.
Heating control	Time and temperature zone control.
Domestic hot water	From main heating system.
Water consumption	≤120 litres/person/day
Internal fixed lighting	100% low energy.
Ventilation	dMEV system – Envirovent ECO
Thermal bridging	Concrete Block Association Details
Thermal mass parameter	Calculated – 93.8 – 105 kJ/m ² K

Table 5. **Building services specification**

6.4. Results Summary

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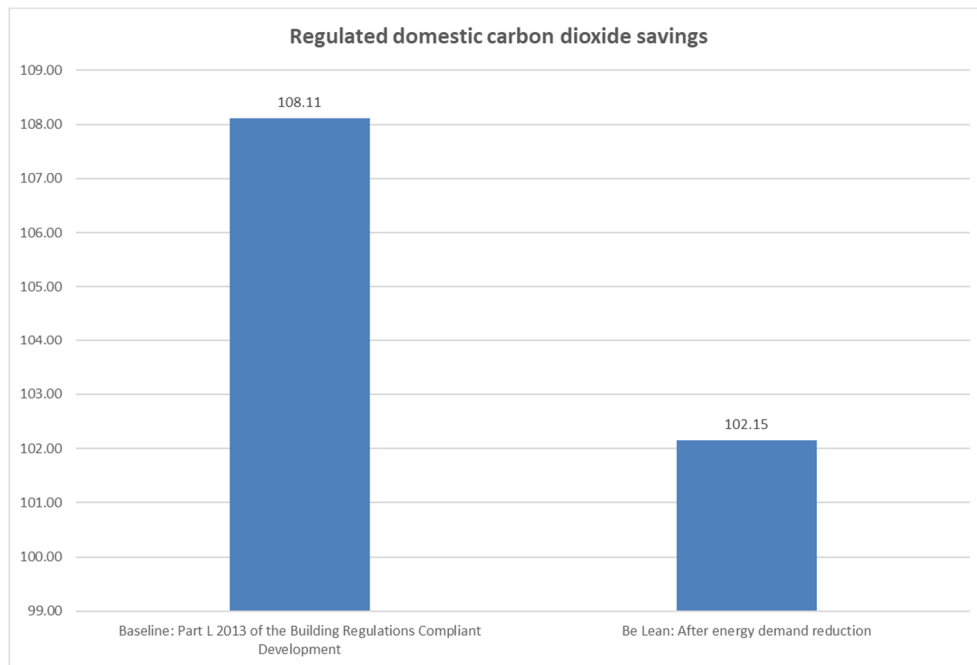


Figure 6. **Site wide carbon emissions savings**

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Table 7. **Predicted energy consumption after 'Lean' (Fabric) measures**

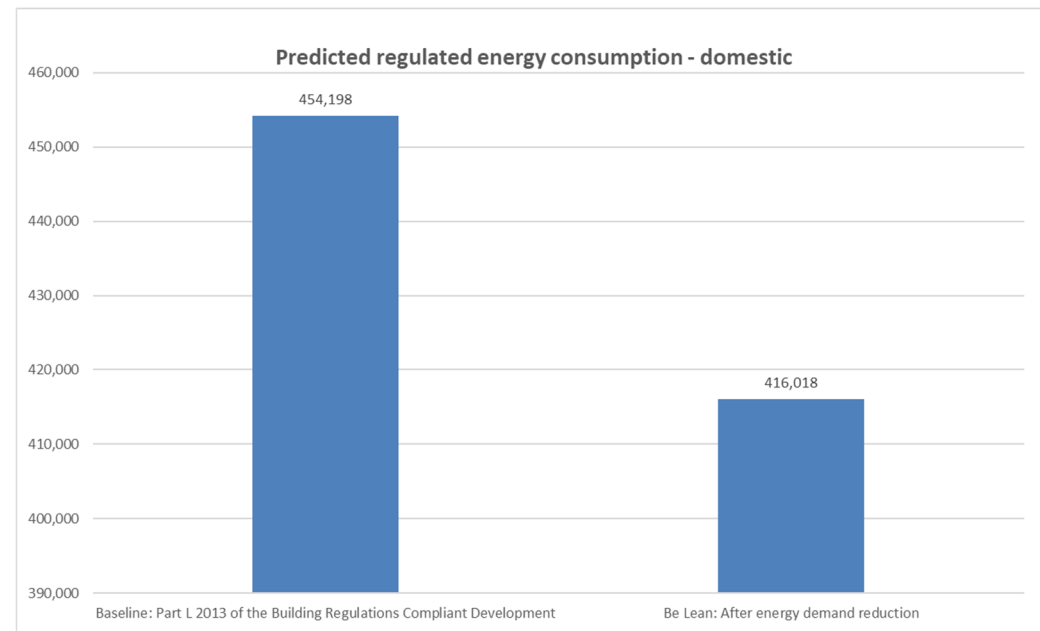


Figure 7. **Site wide energy consumption reduction**

WATER CONSERVATION

7.0 Water Conservation

Objective

Building Regulations 2013 states that new dwellings must meet water conservation targets by limiting projected water usage in a dwelling to 125l/person/day. This can be achieved through the use of water efficient fittings such as flow restrictors and water efficient appliances. However, this development has been calculated to achieve a maximum water consumption target of 120 l/person/day.

It should be noted that methods such as rainwater harvesting and greywater recycling would not be required to achieve the indoor water usage targets associated with this development and therefore the installation of water butts for irrigation purposes may be a suitable solution if external water storage is required for the dwellings.

Approach

Water efficiency calculations have been appended to this report which demonstrates compliance using a standard specification (below).

Type of fitting/appliance	Flow rate/Water Consumption
W/C	Dual flush -6 litres (full)/ 3 litres (part)
Taps (excluding kitchen)	5 litres per minute
Bath	180 litres capacity (to overflow)
Shower	10 litres per minute
Kitchen taps	6 litres per minute
Washing machine	Default - 8.17 litres/kg
Dishwasher	Default - 1.25 litres/place setting
Water softeners	None
Greywater recycling	None
Rainwater harvesting	None
Total Consumption (Building Regulations 17.K Compliance)	119 l/person/day Yes (<125 l/person/day)

Table 8. **Standard sanitary specification**

8.0 Conclusions

This energy and sustainability statement has outlined the proposed specification for the development and the resulting savings in carbon emissions and predicted energy consumption.

The local planning authority hasn't set specific targets with respect to carbon and energy reduction beyond the requirements for Building Regulations 2013. As such the development has aimed to improve upon these values as best as feasibly possible. A fabric-first approach combined with high efficiency building services achieves considerable savings against the current Building Regulations baseline.

The development achieves **5.5%** CO₂ savings and **8.4%** reduction in energy consumption, against a 2013 compliant Part L baseline. This has been achieved by incorporating low U-values, detailing to minimise thermal bridging and air infiltration, and energy efficient heating systems and controls.

As seen in section 7.0 the water consumption target can be achieved using water fittings with flow rates similar to those recommended in this section of the report.

The development will make best use of resource efficiency and *take* opportunities to use sustainable materials in the construction process, avoiding products with a high embodied energy content; and minimise construction waste'.

APPENDIX