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Environmental & Sustainability  
**Carbon Budget Statement**

Former B & Q Unit, Great Stone Road, Stretford, M32 0YP

**A REPORT PREPARED**

**FOR AND ON BEHALF OF ACCRUE (FORUM) 1 LLP**

**29 CURZON STREET, LONDON, W1J 7TL**

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ISSUING OFFICE: Paragon, The Harlequin Building, 65 Southwark Street, London, SE1 0HR  
Tel: 020 7125 0112






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REPORT PREPARED BY: Charlie Knox MSc CEnv

REPORT CHECKED BY: Dan Fitch BSc (Hons) IEMA

SIGNATURE:   
For and on behalf of  
Paragon Building Consultancy Limited

-  **H** *Critical or high risk issue for urgent management attention*
-  **M  
H** *Moderate to high risk issue considered as a significant management item*
-  **M** *Medium risk issue for ongoing management or action*
-  **L  
M** *Low to medium risk issue that may require management or action*
-  **L** *Low risk item or for information only*



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**APPENDIX 1: LEC CARBON BUDGET STATEMENT**





1.2.4	<p>With reference to Trafford Metropolitan Borough Council’s Core Strategy, the CBS sets out an energy strategy for the proposed development demonstrating how it responds to the requirements of Policy L5 within the Core Strategy. Within the strategy, the Council established two distinct carbon reduction targets:</p> <ul style="list-style-type: none"> <li>• Up to 15% reduction over Part L of the Building Regulations for development <b>within</b> a Low Carbon Growth Area; and</li> <li>• Up to 5% reduction over Part L for development <b>not in</b> a Low Carbon Growth Area.</li> </ul> <p>As the proposed development site is not located within a Low Carbon Growth Area, it is therefore required to achieve a 5% carbon reduction in carbon emissions over Part L 2013 Building Regulations.</p>																												
1.2.5	<p>Energy and CO2 emission baselines of 449.66 TCO2/year have been calculated based on the Part L 2013 benchmark and the unit mix proposed, which includes 333 residential apartments across three apartment blocks. The appendices of the CBS should be reviewed for full SAP calculations.</p>																												
1.2.6	<p>In order to propose a strategy of carbon reduction, in line with the Council’s carbon reduction objectives, climate change and the NPPF, the CBS sets out the measures required to deliver an energy efficient, low carbon development. These include ‘be lean’ and ‘be clean’ approaches of the energy hierarchy:</p> <ul style="list-style-type: none"> <li>• Adopting the ‘fabric first’ approach to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.</li> <li>• Provision of energy efficient measures (services) within the development.</li> </ul>																												
1.2.7	<p>The development design will focus on promoting a highly-efficient façade and the proposed fabric efficiency measures are set out in the CBS as follows:</p> <table border="1" data-bbox="613 1576 1646 2131"> <thead> <tr> <th>Element</th> <th>Part L 2013 minimum</th> <th>Great Stone Road</th> <th>Improvement %</th> </tr> </thead> <tbody> <tr> <td>External Walls</td> <td>0.18W/m2K</td> <td>0.14W/m2K</td> <td>22%</td> </tr> <tr> <td>Floor</td> <td>0.13W/m2K</td> <td>0.11W/m2K</td> <td>15%</td> </tr> <tr> <td>Roof</td> <td>0.13W/m2K</td> <td>0.11W/m2K</td> <td>15%</td> </tr> <tr> <td>Windows</td> <td>1.4W/m2K</td> <td>1.0W/m2K</td> <td>29%</td> </tr> <tr> <td>Linear thermal transmittance</td> <td>Default 0.15</td> <td>Calculated</td> <td>Nil</td> </tr> <tr> <td>Airtightness</td> <td>5m3/hm2</td> <td>3m3/hm2</td> <td>40%</td> </tr> </tbody> </table>	Element	Part L 2013 minimum	Great Stone Road	Improvement %	External Walls	0.18W/m2K	0.14W/m2K	22%	Floor	0.13W/m2K	0.11W/m2K	15%	Roof	0.13W/m2K	0.11W/m2K	15%	Windows	1.4W/m2K	1.0W/m2K	29%	Linear thermal transmittance	Default 0.15	Calculated	Nil	Airtightness	5m3/hm2	3m3/hm2	40%
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1.2.8	<p>The above provides a starting point for the design, which is likely to evolve as detailed design commences. LEC note that the commitment to avoid thermal bridges and reduce linear thermal transmittance is of particular importance for consideration by the design team.</p>																												



1.2.9	<p>It is anticipated that the final design will incorporate the following energy efficient measures:</p> <ul style="list-style-type: none"> <li>• 100% high efficiency low energy lighting;</li> <li>• A full suite of heating controls to allow occupants to efficiently use their heating system;</li> <li>• Energy efficient mechanical ventilation systems with heat recovery; and</li> <li>• Where appropriate, specification of high energy efficient rated appliances that use less energy and water.</li> </ul> <p>It is currently proposed that electric panel heaters (Nobo) will be utilised to provide space heating and efficient electric cylinders (Kingspan Tribune) will provide hot water to each apartment. This will be supported by the use of mechanical Ventilation with Heat Recovery (MVHR) (Ventaxia) to provide fresh air whilst reusing the majority of heat from the dwellings that would otherwise be lost.</p>
1.2.10	<p>The results of these 'be clean' measures have been applied to the SAP calculations and summarised in Appendix B of the CBS. The development is aiming to achieve a 6.2% reduction in CO2 emissions, over Part L 2013 through the use of active and passive energy efficiency measures, to 421.78 tonnes per annum. A 27.88 TCO2 saving.</p>
1.2.11	<p>The final stage of the energy hierarchy is the generation of on-site low carbon renewable energy. The overall planning requirement target to achieve is a 5% improvement over the 2013 Building Regulations. Currently the scheme sits at 6.2%. In addition to the above measures, generating low-carbon energy on site can reduce reliance on fossil fuels, minimises energy lost through transmission, contributes to security of supply and better connections between energy demand and generation. Based upon the calculated 6.2% reduction in emissions (27.88 TCO2) in the CBS, there is a potential to make up the savings with renewables.</p>
1.2.12	<p>A renewables options assessment is provided in the CBS, which states that if further reduction in emissions are desired, then Photovoltaic Solar Panels would be the most suitable solution on site due to the electrical heating dependence. The overall energy fuel use here is electrical and so electrical saving/generation renewables will be more applicable and best suited thus discounting and rendering not applicable all Biomass / CHP and gas fired technologies.</p>
1.2.13	<p>The associated SAP calculations are provided in full in the CBS. However, in summary, based on the estimated carbon emissions, the development will deliver a circa 6.2% reduction in carbon emissions beyond the 2013 Building Regulations. This is achievable through a fabric first approach to design, and inclusion of efficient building services.</p>
<b>1.3</b>	<b>Paragon Opinion</b>
1.3.1	<p>The Carbon Budget Statement that has been provided in Appendix 1 demonstrates how the proposed development complies with the requirements of Policy L5 Climate Change in relation to energy and CO2 emissions.</p>

1.3.2	<p>Providing the following measures are adopted:</p> <ul style="list-style-type: none"> <li>• A 'fabric first' approach to design targeting reduced U-Values, improved detailing to reduce thermal bridges and increased air-tightness to reduce unwanted heat loss through the building fabric;</li> <li>• Mechanical Ventilation with Heat Recovery (MVHR) to provide fresh air and reuse heat that would otherwise be wasted;</li> <li>• Electrification of heat with fully controllable electric heater panels; and</li> <li>• Avoiding the burning of fuel on site, reducing impacts on local air quality.</li> </ul>
1.3.3	<p>On this basis, the CBS sets out that the proposed development will deliver sustainable new dwellings in accordance with the requirements of Policy L5, providing homes that achieve a significant reduction in emissions over the requirements of Part L 2013 by 6.2%.</p>

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APPENDIX 1: CARBON BUDGET STATEMENT



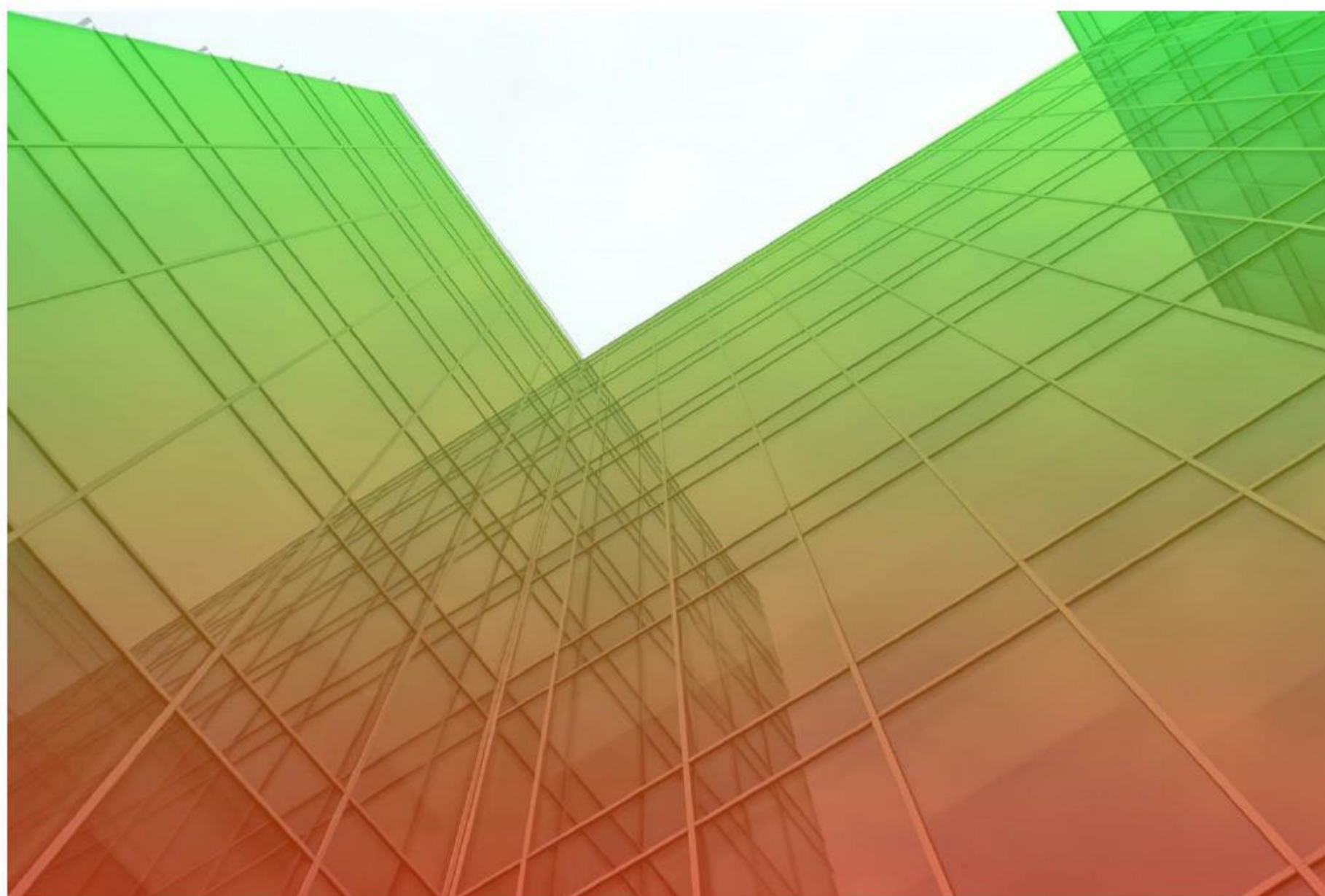


**Low Energy  
Consultancy Ltd**  
A Briggs & Forrester Group Company

# Carbon Budget Statement

## Great Stone Road

Accrue (Forum) 1 LLP



LEC 2773 Rev G

**Low Energy Consultancy Ltd**

Northampton

London

Birmingham

T: 0845 129 1188 | W: [www.lowenergyconsultancy.co.uk](http://www.lowenergyconsultancy.co.uk)

## Document Control

### Quality Control

**Author:** Steven King **Date:** 10/03/2020

**Checker:** Adam Alexander **Date:** 10/03/2020

**Approver:** Adam Alexander **Date:** 10/03/2020

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3	Planning Submission Issue	TO'C	AA	AA	09/05/2018
4	Additional Amendment	TO'C	AA	AA	05/06/2018
5	Site changes	SK	AA	AA	12/02/2020
6	Client adjustment	SK	AA	AA	14/02/2020
7	Apartment change	SK	AA	AA	10/03/2020

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## Preface

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### Non-Disclosure

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- 3 The Local Authority for the site location.
- 4 The Environment Agency.
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# 1 Introduction

**This Carbon Budget Statement has been prepared to communicate the impacts and measures taken to reduce the CO<sub>2</sub> emissions for the proposed development of Great Stone Road, Stretford, Manchester.**

This Carbon Budget Statement has been prepared to support the full application for Great Stone Road, Trafford comprising of 333 residential apartments.

The Carbon Budget Statement sets out details of the energy strategy proposed and how this accords with the energy hierarchy set out in the Core Strategy and Draft Greater Manchester Spatial Framework, as well as an assessment of the carbon emissions of the proposed development in line with the Council's validation requirement and template Carbon Budget Statement.

In this context this report has been structured to demonstrate how the proposed development meets national and local policies as well as the carbon reduction requirements of Trafford Metropolitan Borough Council (TMBC).

## Proposed Development

The proposed development is the demolition of existing retail unit and associated structures; erection of buildings for a mix of use including: 333 apartments (use class C3) and communal spaces ancillary to the residential use; flexible space for use classes A1, A3, D1 and/or D2; undercroft car parking; new public realm; and associated engineering works and infrastructure.

The scheme comprises three blocks of accommodation ranging in height. A mixture of one, two and three bed accommodation is planned within the scheme.



Figure 1 - Location of the Development



## 2 Policy Context

This chapter of the report provides an overview of the relevant planning policy and guidance regarding Climate Change and carbon emissions for new non-domestic developments from a national and local perspective.

### UK Sustainable Development Strategy

In 2005, the Government published an updated strategy for implementing sustainable development across the UK.

This strategy acts as an overarching document from which a range of specific policies and legislation was derived. Although published in 2005, the strategy has taken a recently renewed focus in light of the government's definition of Sustainable Development in the NPPF.

One of the key aims of this strategy is to recognise the threats of climate change and ensure that the UK develops a strategy to mitigate and adapt to this phenomenon.

The document established five key principles that will underpin the national sustainable development strategy:

- Living within Environmental Limits;
- Ensuring a Strong, Healthy and just Society;
- Achieving a Sustainable Economy;
- Promoting Good Governance; and
- Using sound science responsibly.

The strategy will be implemented at a national level through the development of more specific

strategies at a government department or sector level.

With regards to planning and the built environment, this document sets the basis for the development of plans and Policies that promotes development that mitigates and adapts to climate change.

### Climate Change Act

The Climate Change Act (2008) sets a legally binding target for reducing UK CO<sub>2</sub> emissions by at least 80% on 1990 levels by 2050.

At the end of June 2016, the Government published the Fifth Carbon Budget. The budget sets a target for emission cuts of 57% from 1990 levels by 2030.

The House of Lords passed the Carbon Budget Order 2016 on 19 July, making the budget and its target law. A bill passed in early July to abolish the Department of Energy and Climate Change (DECC) and absorb its functions into the new Department for Business, Energy and Industrial Strategy, will not affect the implementation of the Carbon Budget.

### UK Carbon Plan

In 2011, the Government published an updated Carbon Plan setting out how the UK will achieve decarbonisation and make the transition to a low carbon economy. It sets this objective within a framework of mitigating and adapting to climate change and maintaining energy security in a way that minimises costs and maximises benefits to the economy.

With regards to development, the Carbon Plan presents the Government's approach to promoting the delivery of low carbon, resilient and adaptive buildings and enabling sustainable transportation as positive contributions to aid national carbon reduction targets.



In late 2015, the Green Construction Board published, Low Carbon Route map for the Built Environment. This updated the Low Carbon Route map for the Built Environmental prepared in 2013 aimed at delivering an 80% cut in UK built environment carbon emissions by 2050 compared to 1990 levels.

It found that annual emissions in the UK had actually increased since 2009, primarily due to an increase in gas consumption from heating. The report states 'There has been a growing divergence occurring over just a few years (2009 through 2013). Given the steepness of the trajectory required to meet the ambition for built environment carbon reductions (and statutory targets for the UK as a whole), a significant transformation from the ongoing 'status quo' trajectory is needed'.

## Building Regulations

Whilst not planning policy, in April 2014 the Part L regulations changed and it is now a requirement for new homes to deliver a 6% reduction in carbon emissions compared to equivalent 2010 Part L standards. This change aims to strike a balance between the commitments to reducing carbon emissions and improving energy efficiency and ensuring that the overall effect of regulation upon consumers and businesses does not stifle growth. This is now set at the regulations Part L 2013.

The Government has stated that developers and house builders' should have full flexibility in how they meet carbon reduction targets and that in accordance with the energy hierarchy the emphasis should be on a Fabric First approach towards the design and construction of new homes.

## The Housing Standards Review (HSR)

On 27 March 2015 the Government confirmed a new approach to the setting of technical housing standards in England and published a written Ministerial Statement which outlined the policy on the application of these technical standards.

The Statement set out that from the date the Deregulation Bill 2015 is given royal Assent (30 March 2015) '*local planning authorities should not set any additional local technical standards or requirements relating to the construction, internal layout or performance of new dwellings*'.

This includes the winding down of the Code for Sustainable Homes (The Code). It also sets out that local planning authorities may need to review their local information requirements to ensure that technical detail that is no longer necessary is not requested.

The National Planning Practice Guidance was also updated in March 2015 to reflect the Ministerial Statement and now highlights that planning authorities need to take account of government decisions on the Housing Standards Review when considering local sustainability requirements relating to new homes.<sup>1</sup>

## Fixing the Foundations

Following the general election in May 2015 the government has produced a number of policy documents including 'Fixing the Foundations' published in July 2015.

The document sets out the Government's plan for future carbon reduction requirements in new development and outlines the government's intention to no longer continue with the Allowable Solutions scheme and postpone any increases in on-site energy efficiency standards in 2016 which were planned as part of the national zero carbon building policy.

It is understood that the Government aims to keep energy efficiency standards under review, recognising that existing measures to increase energy efficiency of new buildings should be allowed time to become established.

<sup>1</sup><http://planningguidance.planningportal.gov.uk/blog/guidance/climate-change/what-are-governments-national-standards-for-a-buildings-sustainability-and-for-zero-carbon-buildings/>



## National Planning Policy Framework

Following its publication in March 2012, national planning policy is now provided by the National Planning Policy Framework (NPPF) which sets out the government's planning policies for England and how these are expected to be applied. It also sets out the requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The government has made clear its expectation that the planning system should positively embrace well-conceived development to deliver the economic growth necessary and the housing we need to create inclusive and mixed communities.

The NPPF states that: *'the purpose of the planning system is to contribute to the achievement of sustainable development'*.

It states clearly that in order to deliver sustainable development, the planning system must perform three distinct roles, aligned to the three pillars of sustainability, which must not be taken in isolation and should be pursued jointly:

**An economic role** contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; by identifying and coordinating development requirements, including the provision of infrastructure;

**A social role** supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and

**An environmental role** contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution and

mitigate and adapt to climate change including moving to a low carbon economy.

Demonstrating Sustainable Development –

Paragraph 6 of the Framework states that:

*'The purpose of the planning system is to contribute to the achievement of sustainable development. The policies in paragraphs 18 to 219, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system'*.

## Planning Policy Guidance (The Guidance)

The revised Planning Practice Guidance (PPG/The Guidance) provides further advice on various planning issues associated with development, including those linked to sustainability and renewable energy and underpins the policies within the NPPF.

The Guidance is an important material consideration in planning decisions and should generally be followed unless there are clear reasons not to. It sets out how local authorities should include policies that protect the local environment and strategies to mitigate and adapt to climate change and supports developments that are functional and adaptable for the future.

The Guidance reiterates that local authorities should set sustainability policies for new housing that are in line with the government's Housing Standards Review.

The latest update to the PPG in April 2016 confirms Local Authorities have the option to set technical requirements exceeding the minimum requirements of the Building Regulations in respect of access, water and space where sufficient evidence is produced to justify the target.

The Guidance also states that the distribution and design of new development and the potential for servicing sites through sustainable transport





solutions, are particularly important considerations.

## The Local Development Plan

The Local Development Plan for Trafford Metropolitan Borough Council includes the Core Strategy which sets the overarching development principles for Trafford to guide development until at least 2026.

## Trafford Metropolitan Borough Council Core Strategy

The Core Strategy was adopted in 2012 and will continue to act as a guide for development over the next 10 years. It provides the strategic framework against which decisions about the use of land can be planned.

The Core Strategy is split into a number of Core Policies relevant to sustainable development including Policy L5 – Climate Change.

**Policy L5 – Climate Change** – The Council recognises that Climate Change is one of the biggest challenges we face and therefore encourages development to consider a number of measures and mitigate its impacts.

The policy sets out a number of key considerations including: Carbon emissions reduction, minimising pollution and water efficiency.

The section on carbon emissions reduction sets out reduction targets for new development, including:

- 15% reduction over current Building Regulations for development within a Low Carbon Growth Area (LCGA); and
- 5% reduction over current Building Regulations for development outside of a LGA.

The Council's Policy and Local Validation Checklist states that a Carbon Budget Statement is required alongside applications to demonstrate compliance with policy L5.

Current Building Regulations are Part L 2013 and the proposed development sits outside of the



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LCGAs, requiring a reduction 5% over this standard.

Revised Supplementary Planning Document 1:

Planning Obligations 2014

In 2014, the Council adopted a Community Infrastructure Levy for Trafford and as a result of the introduction of CIL, planning obligations were scaled back to cover specific measures that are required to make a development acceptable under Regulation 122 of the CIL Regulations.

As a result, the Revised SPD replaces planning guidance previously issued, including SPD1 – Planning Obligations – Technical Note 3: Climate Change Mitigation and Adaptation.

Technical Note 3 provided developers with guidance on measures which can be incorporated into development to mitigate and adapt to climate change, including a template for Carbon Budget Statements.

The Revised SPD requires that developers ensure that their proposals meet the standards set out in Trafford Core Strategy Policy L5 – Climate Change, but do not prescribe a method for demonstrating compliance.

## The Draft Greater Manchester Spatial Framework

The Draft Greater Manchester Spatial Framework is currently under consultation and sets out the spatial framework for Greater Manchester and key policies for new development.

This includes Policy GM15, Carbon Emissions, which requires development to accord with the Energy Hierarchy. It also requires a detailed carbon assessment to demonstrate how the design and layout of the development has sought to maximise reductions in carbon emissions.

In addition the Plan aims to support the delivery of renewable and low carbon energy for all development with particular regard to decentralised heating and cooling networks in strategic development locations.

## Review of Policy and Implications

At a regional and local level Climate Change is recognised as a key issue for the future and new development should take steps to ensure it mitigates and adapts to the impacts of Climate Change.

Latest national planning policy and guidance confirms the government's approach to sustainable development is being driven through the updates to the Building Regulations.

Local policy recognises the potential impacts of Climate Change and requires new development to adopt sustainable design and construction practices, prioritise energy efficiency and consider opportunities for low carbon and renewable energy. Building Regulations and Part L 2013 require new residential development to achieve an approximate 6% reduction in carbon emissions over Part L 2010.

In this context the following section of this report details the proposed carbon reduction measures including a fabric first approach to design and efficient services to meet the requirements of Part L 2013 and provide significant reductions in emissions compared with Part L 2010.



## 3 Carbon Reduction for Great Stone Road, Manchester

This chapter summarises the sustainable design measures incorporated into the design of new homes to deliver a sustainable, low carbon new development.

Trafford Metropolitan Borough Council recognises that Climate Change is a key consideration for future development and has therefore identified carbon reduction targets for new development to ensure new buildings are able to adapt to and mitigate the effects of Climate Change.

This chapter of the report outlines the energy strategy for the proposed development at Great Stone Road, Manchester demonstrating how the development responds to the requirements of Policy L5 within the Core Strategy.

Policy L5 requires that the effects of climate change are considered at all stages of the development process in order to ensure that development minimises its impacts and mitigates its effects.

The Council has recognised the challenges facing development in achieving different levels of carbon reductions, understanding that the achievable reductions are dependent of the type, scale and location of development. The Council has therefore established two distinct carbon reduction targets:

- 15% reduction over Part L of the Building Regulations 2013 for development within a Low Carbon Growth Area; and
- 5% reduction over Part L for development not in a Low Carbon Growth Area.

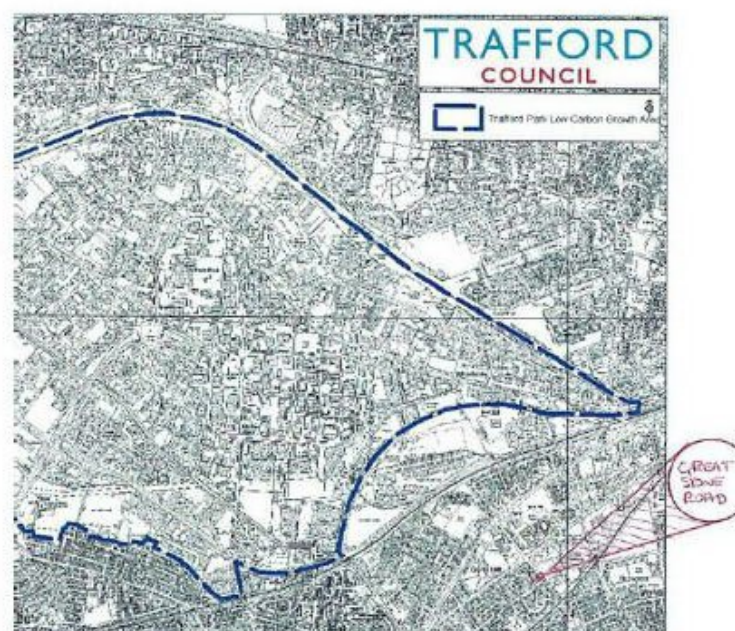


Figure 2 – Great Stone location

The proposed development site is located to the east of Low Carbon Growth Area, as defined in Figure 2 of the Councils superseded SPD Technical Note 3: Climate Change Mitigation and Adaptation; it is therefore required to achieve a 5% carbon reduction in carbon emissions over Part L 2013 Building Regulations.

### 3.1 Baseline Energy and CO<sub>2</sub> Emissions

The current building regulation requirements are set at Part L1A 2013 for residential accommodation.

The energy and CO<sub>2</sub> emissions have been simulated using Elmhurst SAP2012 software and SAP methodology. The full results summarised in **Appendix A – Baseline SAP calculations.**

Energy and CO<sub>2</sub> emissions baselines have been calculated based on the Part L 2013 benchmark and the unit mix proposed, which includes 330 residential apartments across three apartment blocks. Table 1 shows the estimated baseline energy demand and CO<sub>2</sub> emissions associated with the development.



Block	TCO <sub>2</sub> /year
Part L 2013 Baseline	449.66

Table 1: Baseline Energy and CO<sub>2</sub> Emissions

At this stage, baseline CO<sub>2</sub> emissions are estimated at 449.66 Tonnes per annum.

### 3.2 Emissions Reduction Approach

One of the main challenges facing the UK and new residential development is the need to mitigate and adapt to a changing climate. The Government is committed to tackling climate change and has an ambitious long-term goal to reduce carbon emissions by 80% by 2050.

Climate change will cause the UK to become warmer, winters will become wetter and summers will become drier. Adapting to this changing climate will impact on the design, Construction, location, cost and operation of all new homes and other buildings in the next few decades. One of the NPPF’s core planning principles is to encourage development to consider climate change adaptation and mitigation during the planning process.

Paragon supports the Council’s carbon reduction objectives and will aim to reduce emissions in line with the energy hierarchy (figure 3), prioritising reducing the need for energy before considering low carbon, renewable energy options.

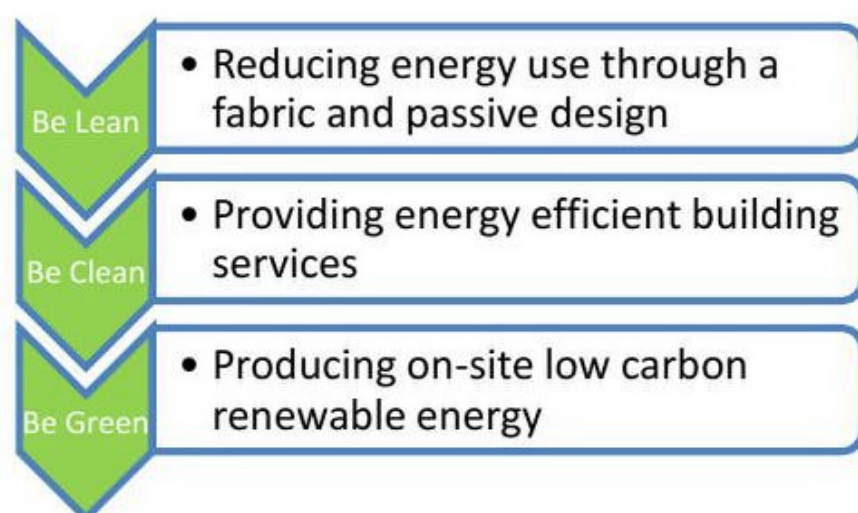


Figure 3: The Energy Hierarchy

The following sections set out the measures included to deliver an energy efficient, low carbon development.

#### 3.2.1 Be Lean

Central to the delivery of low carbon and energy efficient buildings is the ‘fabric first’ principle which recognises the most effective way of minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This ‘fabric first’ approach has a number of distinct benefits including:

- Carbon savings delivered are ‘locked-in’ for the lifetime of the building (60 years or more) rather than the much shorter lifespan (around 25 years) of a renewable energy technology;
- Virtually no maintenance and/or replacements costs to maintain carbon reductions through improved fabric; and
- No reliance on an occupier’s behaviour to deliver carbon reductions. Achieving carbon savings from renewable energy technologies require education, awareness and often, behavioural changes from occupants.

The proposed design aims to reduce energy demand by targeting improved thermal performance and reducing unwanted air leakage over and above the minimum standards set out in current Building Regulations.

Part L 2013 includes a ‘model design’ where if the dwellings are constructed entirely as per the specification indicated, they will meet the Target Fabric Energy Efficiency (TFEE) and Target Emissions Rate (TER) requirements. Table 2 shows how the proposed fabric for Great Stone Road



compares with the fabric measures set out in the Part L 2013.

Element	Part L 2013 minimum (Building Regs)	Great Stone Road (proposed)	% Improvement
External Walls	0.18W/m <sup>2</sup> K	0.14W/m <sup>2</sup> K	22%
Floor	0.13W/m <sup>2</sup> K	0.11W/m <sup>2</sup> K	15%
Roof	0.13W/m <sup>2</sup> K	0.11W/m <sup>2</sup> K	15%
Windows	1.4W/m <sup>2</sup> K	1.0W/m <sup>2</sup> K	29%
Linear thermal transmittance	default 0.15	Calculated with ACD's	n/a
Airtightness	5m <sup>3</sup> /hm <sup>2</sup>	3m <sup>3</sup> /hm <sup>2</sup>	40%

Table 2: Proposed Fabric Efficiency Measures

At Great Stone Road, there is a clear strategy in place to promote a highly-efficient façade before the introduction of mechanical or energy-generating systems. The specification in Table 2 provides a starting point for the design, which is likely to evolve as detailed design commences. Of particular note is the commitment to avoid thermal bridges and reduce linear thermal transmittance.

**Linear Thermal Transmittance** – In addition to heat loss through the main fabric elements, heat is lost in a building through thermal bridges at the junctions where different building elements interface. If no action is taken to address the detailing of these junctions, this can result in greater heat loss than through walls, floors and roofs combined. Whilst the use of Accredited Construction Details can reduce the impact of thermal bridges, this function has not been fully developed at this stage but can have a considerable effect on the fabric improvements and may increase the overall improvement over Part L 2013. This should be considered by the design team.

### 3.2.2 Be Clean

Once energy demand has been reduced, the next stage of the energy hierarchy is the provision of energy efficiency.

The following measures are likely to be incorporated as part of the final design:

- 100% high efficiency low energy lighting;
- A full suite of heating controls to allow occupants to efficiently use their heating system;
- Energy efficient mechanical ventilation systems with heat recovery; and
- Where appropriate, specification of high energy efficient rated appliances that use less energy and water.

It is currently proposed that electric panel heaters (Nobo) will be utilised to provide space heating and efficient electric cylinders (Kingspan Tribune) will provide hot water to each apartment. This will be supported by the use of mechanical Ventilation with Heat Recovery (MVHR – Vent Axia) to provide fresh air whilst reusing the majority of heat from the dwellings that would otherwise be lost.

The results of these 'be clean' measures have been applied to the SAP calculations and summarised in **Appendix B – Be Lean and Clean results and table 3 below.**

Block	TCO <sub>2</sub> /year	% Reduction
Part L 2013 Baseline	449.66	
Great Stone Road	421.78	6.2% (27.88 TCO <sub>2</sub> saving)

Table 3: Estimated CO<sub>2</sub> Emissions for Great Stone Road

In addition, electric heating is 100% efficient at the point of use, converting every kW consumed into heat. Emissions associated with electricity relate to its generation, transmission and distribution



and are decreasing rapidly over time as the grid is decarbonised.

The development is aiming to achieve a 6.2% reduction in emissions over Part L 2013 through the use of active and passive energy efficiency measures.

### 3.2.3 Be Green

The final stage of the energy hierarchy is the generation of on-site low carbon renewable energy. The overall planning requirement target to achieve is a 5% improvement over Building Regulations. Currently the scheme sits at 6.2%.

The use of a fabric approach to design and construction and provision of energy efficiency measures recognises that the most effective route to delivering long term energy and carbon reductions is through efficient building design.

This approach is reflected by government guidance that aims to improve developments energy use and carbon emissions through changes to the Building Regulations Part L 2013.

Generating low carbon energy onsite can further reduce reliance on fossil fuels and minimises energy lost through transmission and contributes to security of supply and better connections between energy demand and generation. Based upon our 6.2% reduction in emissions (27.88TCO<sub>2</sub>) there is potential to make savings with renewables.

### 3.2.4 Renewable options

**Solar thermal panels** for hot water production might be an immediate option, however this would require on a panel per dwelling if treated separately. There would not be sufficient roof space to accommodate this. This would be better suited to a centralised hot water solution, which we do not have proposed here.

The overall energy fuel use here is electrical and so electrical saving/generation renewables will be more applicable and best suited. Thus discounting and rendering not applicable all **Biomass / CHP and gas fired technologies**.

If further reduction in emissions was desired then **Photovoltaic Solar Panels** would be the most suitable solution here due to electrical heating dependence. To achieve further savings there is sufficient space on the roof to accommodate photovoltaic solar panels.

### 3.2.4 Energy Strategy Summary

In summary, the proposed dwellings will be designed in accordance with the principles of the energy hierarchy to include measures to reduce the primary energy use and CO<sub>2</sub> emissions which aim to go beyond the requirements of Part L 2013.

Table 4 below demonstrates how the proposed specification of new homes is estimated to exceed the requirements of the Part L 2013.

	CO <sub>2</sub> Emissions (TCO <sub>2</sub> /year)	Cumulative CO <sub>2</sub> Savings
Part L 2013 Baseline	449.66	
Great Stone Road estimated improvement over Part L 2013	421.78	6.2% (27.88TCO <sub>2</sub> saving)

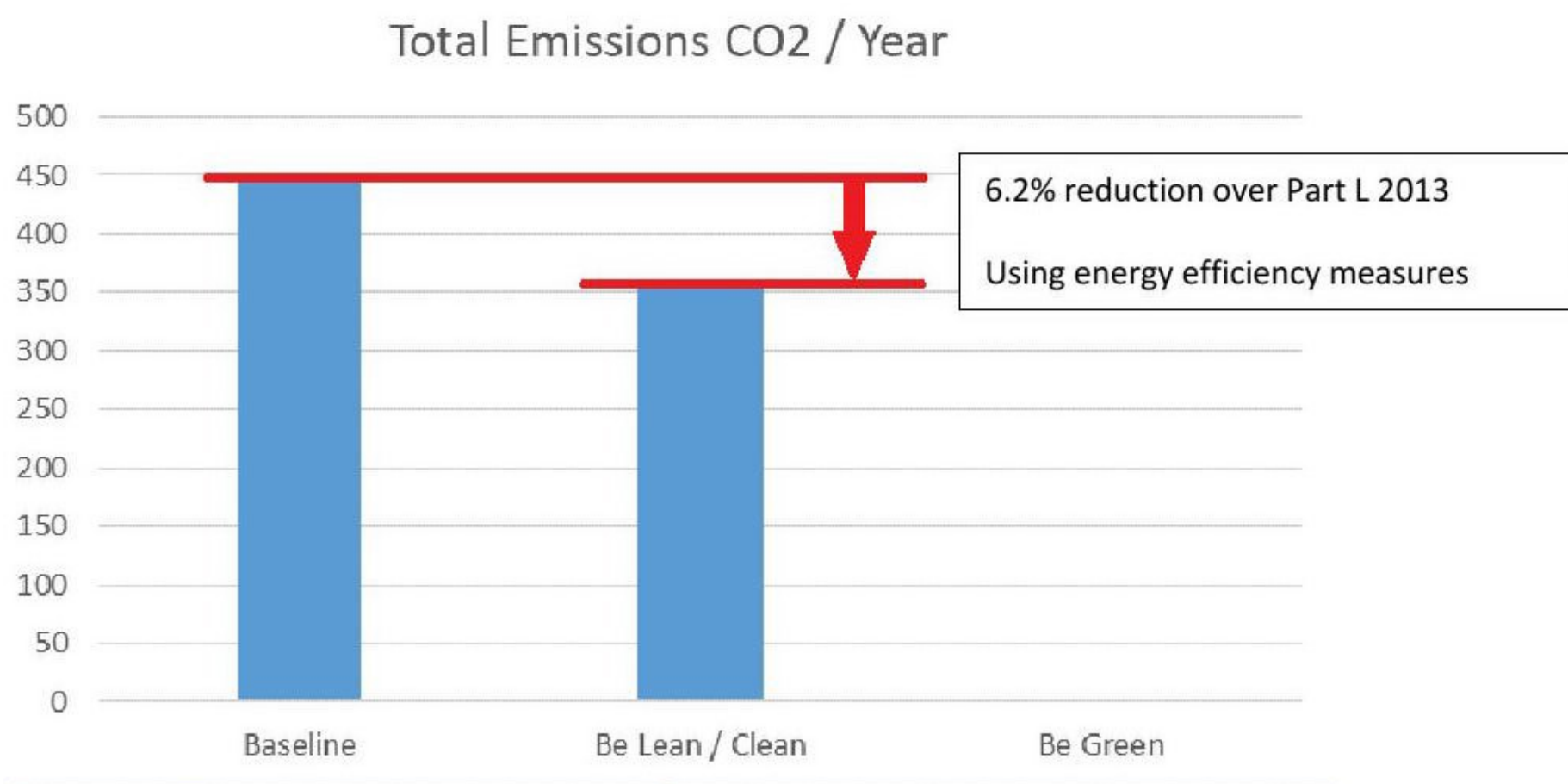
Table 4: Estimated Development CO<sub>2</sub> Emissions

Based on the estimated carbon emissions above the development will deliver a circa 6.2% reduction in carbon emissions beyond the 2013 Building Regulations through a fabric first approach to design and inclusion of efficient building services.



## 4 CO<sub>2</sub> emissions of Great Stone Road

The graph below demonstrates the estimated CO<sub>2</sub> emissions for the proposed development at Great Stone Road, showing how the new dwellings will reduce energy use and carbon emissions beyond Building Regulations Part L 2013.



## 5 Conclusion

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**This Carbon Budget Statement demonstrates how the proposed development complies with the requirements of Policy L5 Climate Change in relation to energy and CO<sub>2</sub> emissions.**

This Carbon Budget Statement sets out the sustainable design measures incorporated into the development, the layout and design to ensure the delivery of sustainable, energy efficient new homes which meet the requirements of Trafford Core Strategy Policy L5 Climate Change.

- A 'fabric first' approach to design targeting reduced U-Values, improved detailing to reduce thermal bridges and increased air-tightness to reduce unwanted heat loss through the building fabric;
- Mechanical Ventilation with Heat Recovery (MVHR) to provide fresh air and reuse heat that would otherwise be wasted;
- Electrification of heat with fully controllable electric heater panels;
- Avoiding the burning of fuel on site, reducing impacts on local air quality.

The proposed development will deliver sustainable new dwellings in accordance with the requirements of Policy L5, providing homes which achieve a significant reduction in emissions over the requirements of Part L 2013 by 6.2% which was in place at the time of policy adoption.





## Appendix A – Baseline SAP Calculation results

Assessment reference	Calculation type	Property Type	SAP Rating	Environmental Rating	TER	Quantity	TER x Quantity	Total floor area	Total Emissions CO2 / year
Ground 1 Bed	New Build (As Designed)	Flat, MidTerrace	83	84	27.4	14	383.6	45	17.26
Ground 2 Bed	New Build (As Designed)	Flat, MidTerrace	81	83	26.65	24	639.6	63	40.29
Ground 3 Bed	New Build (As Designed)	Flat, EndTerrace	76	79	28.53	7	199.71	82	16.38
Mid 1 Bed	New Build (As Designed)	Flat, MidTerrace	84	85	25.56	80	2044.8	44	89.97
Mid 2 Bed	New Build (As Designed)	Flat, MidTerrace	84	86	20.3	137	2781.1	61	169.65
Mid 3 Bed	New Build (As Designed)	Flat, EndTerrace	84	86	18.8	42	789.6	86	67.91
Top 1 Bed	New Build (As Designed)	Flat, MidTerrace	83	85	26.92	8	215.36	44	9.48
Top 2 Bed	New Build (As Designed)	Flat, MidTerrace	79	81	29.5	18	531	59	31.33
Top 3 Bed	New Build (As Designed)	Flat, MidTerrace	77	79	28.33	3	84.99	87	7.39
						333			449.66



## Appendix B – Be Lean and Clean SAP Calculation results

Assessment reference	Calculation type	Property Type	SAP Rating	Environmental Rating	DER	Quantity	DER x Quantity	Total floor area	Total Emissions CO2 / year
Ground 1 Bed	New Build (As Designed)	Flat, MidTerrace	83	84	25.45	14	356.3	45	16.03
Ground 2 Bed	New Build (As Designed)	Flat, MidTerrace	81	83	25.49	24	611.76	63	38.54
Ground 3 Bed	New Build (As Designed)	Flat, EndTerrace	76	79	28.09	7	196.63	82	16.12
Mid 1 Bed	New Build (As Designed)	Flat, MidTerrace	84	85	23.61	80	1888.8	44	83.11
Mid 2 Bed	New Build (As Designed)	Flat, MidTerrace	84	86	19.16	137	2624.92	61	160.12
Mid 3 Bed	New Build (As Designed)	Flat, EndTerrace	84	86	16.86	42	708.12	86	60.90
Top 1 Bed	New Build (As Designed)	Flat, MidTerrace	83	85	25.01	8	200.08	44	8.80
Top 2 Bed	New Build (As Designed)	Flat, MidTerrace	79	81	29.17	18	525.06	59	30.98
Top 3 Bed	New Build (As Designed)	Flat, MidTerrace	77	79	27.47	3	82.41	87	7.17
						333			421.78