Sustainability and Energy Statement

Land between Appledore Road and Woodchurch Road, Tenterden, Kent

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Contents

1.0 Executive Summary

This Sustainability and Energy Statement considers the sustainability issues relating to the proposed development on land between Appledore Road and Woodchurch Road, Tenterden and sets out the commitments of the Applicant to the site and the targets to be applied to the development.

The Statement is provided in support of an outline planning application for the development of up to 145 residential dwellings (50% affordable) including the creation of access points from Appledore Road (one all modes and one emergency, pedestrian and cycle only) and Woodchurch Road (pedestrian and cycle only), and creation of a network of roads, footways, and cycleways through the site. Provision of open space including children's play areas, sustainable urban drainage systems, landscape buffers and green links all on 12.35 ha of the site (Matters for approval: Access) and full planning permission for the change of land use from agricultural land to land to be used as a country park (8.66 ha), and land to be used as formal sports pitches (3.33 ha), together with pavilion to serve the proposal and the surrounding area. Including accesses, ancillary parking, pathways, sustainable drainage systems and associated landscaping.

The site is located in a sustainable location close to existing facilities and infrastructure and will provide homes and facilities to meet local need.

Throughout the design process, the applicant and design team members have given careful consideration to the sustainability issues relating to the site, and how these can be enhanced in a marketable and feasible manner. As a result, this Statement demonstrates that the development meets relevant sustainability criteria and in a number of areas exceeds them.

The planning application is for outline consent and detailed drawings have yet to be produced. However the indicative construction specification proposed in the Statement demonstrates how the homes will exceed the requirements of the Building Regulations Part L (2013) and therefore the objectives of the planning policy.

The total site carbon emissions have been estimated by using SAP calculations prepared for homes of a similar scale, design and specification to those proposed. The results have been aggregated across similar unit types to provide an accurate assessment of the total site emissions.

The Applicant is keen to develop a highly sustainable and energy efficient scheme and therefore has imposed a target of achieving a **31% reduction in emissions** across the site (based on Part L – 2013).

The calculations have allowed a variety of different technologies to be tested and the analysis proposes those technologies, which are appropriate and the quantum of each that would be required to meet the self-imposed target.

The following table sets out the reduction in emissions, which could be achieved using the different technologies;

	Carbon Dioxide Emissions	% Reduction
	kg CO_2 /year	%
Baseline Emissions (TER)	215,881	
Emissions after energy efficiency measures (DER)	201,508	**6.66%**
Options		
(i) Solar Hot Water Panels – 22 panels + 300 PV panels	67,221	**31.14%**
(ii) Photovoltaic Panels – 338 panels	67,101	**31.08%**
(iii) Air Source Heat Pumps to 22 det houses + 158 PV panels	67,213	**31.13%**
(iv) Flue-Gas Heat Recovery – to units < 105.0 m^2 + 256 PV panels	67,229	**31.14%**

The key sustainability findings can be summarised as;

- Reduction in carbon dioxide emissions compared to the maximum permissible by the Building Regulations (Part L - 2013) through energy efficiency measures;
- A total reduction in (TER) carbon dioxide emissions of 31% from energy efficiency, low-carbon and renewable technologies will be achieved (based on Part L – 2013);
- The water use to each unit will achieve the enhanced standard required by the Building Regulations of 110 litres per person per day;
- 50% of the homes will be 'affordable' and will be designed to be indistinguishable from other homes;
- Mixed-tenure scheme provides a highly sustainable design with activity throughout the day;
- Outdoor space in the form of private gardens, terraces and private communal spaces as well as enhanced public open space, children's play areas and community orchard;
- A new country park will be provide together with sport pitches and pavilion
- High standards of environmental construction with compliance to the Considerate Constructors Scheme, a Site Waste Management Plan and other construction management principles;
- Secured by Design principles will be followed;
- All dwellings will be built in accordance with Part M4(1) of the Building Regulations).

2.0 Introduction

2.1 Context

2.1.1 Bluesky Unlimited has been commissioned by Wates Developments to prepare a Sustainability and Energy Statement in support of;

a) *Outline application for the development of up to 145 residential dwellings (50% affordable) including the creation of access points from Appledore Road (one all modes and one emergency, pedestrian and cycle only) and Woodchurch Road (pedestrian and cycle only), and creation of a network of roads, footways, and cycleways through the site. Provision of open space including children's play areas, sustainable urban drainage systems, landscape buffers and green links all on 12.35 ha of the site. (Matters for approval: Access)*

and

b) *Full planning permission for the change of land use from agricultural land to land to be used as a country park (8.66 ha), and land to be used as formal sports pitches (3.33 ha), together with pavilion to serve the proposal and the surrounding area. Including accesses, ancillary parking, pathways, sustainable urban drainage systems and associated landscaping.*

2.1.2 This Statement has been prepared to demonstrate how the proposed development meets the requirements of national and local planning policy and guidance in relation to sustainability and provides evidence to confirm compliance or where the development exceeds the required standards. The application proposals have been prepared in consultation with Ashford Borough Council.

2.1.3 The objectives of the Sustainability and Energy Statement are to;

- examine and comprehend the key sustainability themes and associated standards within the national and local planning policy and guidance;
- assess the performance of the development proposals in achieving the sustainability standards; and
- identify any opportunities and appropriate actions required to ensure sustainability is delivered at the detailed design stage.

Study Area

2.1.4 The site is located approximately 14.5 km to the south-west of Ashford and is north-east of Tenterden town centre between Appledore Road and Woodchurch Road.

2.1.5 The site is bounded by existing residential development to its western edge and partially along it's southern edge. The northern boundary is Woodchurch Road and on the eastern boundary are agricultural fields.

2.2 Preamble

2.2.1 Costs for sustainable initiatives and strategies are reducing through improvements in technology, design techniques and construction methods. Utility prices continue to rise and individuals and organisations are starting to value the more intangible benefits associated with 'sustainability'. A greater awareness is becoming apparent about the need for sustainable environments and building owners and occupiers are starting to demand these. A large part of designing sustainably is to do with addressing global warming through energy efficient design and using tools such as life-cycle assessments to maintain the balance between longevity and cost.

2.2.2 Sustainable development is a core principal throughout the proposed development.

3.0 The Policy Context

3.0.1 This Sustainability Statement reflects existing policy frameworks at a number of levels including Homes and Communities Agency Design Standards and Contractual Obligations, National and Local Policy and Guidance. The key component that underpins policy at all levels is the concept of sustainable development. The following provides an overview of the documents that form the basis for the principles and targets.

3.1 National Policies

3.1.1 The UK Government published its sustainable development strategy in 1999 entitled "A better quality of life: A strategy for sustainable development in the UK". This sets out four main objectives for sustainable development in the UK:

- Social progress that recognises the needs of everyone;
- Effective protection of the environment;
- Prudent use of natural resources; and
- Maintenance of high stable levels of economic growth and employment.

Sustainable Communities: Building for the Future, known colloquially as the Communities Plan was published in 2003. The Plan sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas.

The most relevant national planning policy guidance on sustainability is set out in:

- National Planning Policy Framework - 2019

Paragraph 148 states;

"The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure."

3.2 Local Policies

3.2.1 The local policy framework is provided by the **Ashford Local Plan**, adopted in February 2019.

3.2.2 **Ashford Local Plan**. The following policies have been edited for clarity and relevance to the topic area of this Statement.

Policy ENV6 – Flood Risk

Proposals for new development should contribute to an overall flood risk reduction.

Development will only be permitted where it would not be at an unacceptable risk of flooding on the site itself, and there would be no increase to flood risk elsewhere.

Policy ENV7 – Water Efficiency

All new residential development must achieve as a minimum the optional requirement set through Building Regulations for water efficiency that requires an estimated water use of no more than 110 litres per person per day.

Policy ENV9 - Sustainable Drainage

All development should include appropriate sustainable drainage systems (SuDS) for the disposal of surface water, in order to avoid any increase in flood risk or adverse impact on water quality, and to mimic the drainage from the pre-developed site.

Paragraph 9.111 says;

"Previous Local Plan policy and supplementary planning documents have required new residential development, through the implementation of EcoHomes and the Code for Sustainable Homes, to reduce energy emissions. Both of these have recently been superseded by changes to Building Regulations that have come into force for new dwellings. Building Regulations now take into account all regulated emissions, i.e. arising from heating, water heating, fixed lighting and ventilation. The Council is therefore relying upon Building Regulations to reduce energy emissions from new housing development in the future."

3.2.3 The Council also published a Supplementary Planning Document entitled **Sustainable Design and Construction SPD** in April 2012.

However, the Council announced in July 2016 that they no longer require residential development to comply with the guidance contained in the SPD.

3.3 Other Relevant Guidance

Waste Management Plan for England (2013)

3.3.1 The Waste Management Plan for England, published in December 2013 provides an analysis of the current waste management situation in England and aims to bring current waste management policies under the umbrella of one national plan.

BRE Green Guide to Specification

3.3.2 The Building Research Establishment Green Guide to Specification lists building materials and components, and ranks their potential life cycle environmental impact.

4.0 Assessment Methodology and Targets

4.1 Methodology

4.1.1 The methodology involves completing a detailed policy review of current and emerging national and local policy relating to sustainability to provide a specific policy context for the assessment.

4.1.2 Furthermore a review of good practice methods and techniques relating to sustainability has been made.

4.1.3 The key aspects of sustainability are addressed under the following headings and these form the structure of this assessment.

- Climate change
- Community
- Place making
- Transport
- Ecology
- Resources
- Business
- Buildings

4.1.4 The set of targets the site will achieve is set out in section 4.2 below. The subsequent sections propose strategies for meeting the targets and for the development to become an exemplar scheme, which delivers a sustainable way of living by addressing social, economic and environmental drivers.

4.1.5 The energy strategy uses a number of SAP calculations that have been prepared for other homes, which are similar to those proposed in scale, design and specification. The results have been aggregated across similar unit types using the indicative accommodation schedule in order to estimate the total site emissions and allow different low-carbon and renewable technologies to be tested.

Emission Factors

4.1.6 The CO_2 emission factors, where applicable, used throughout this report have been taken from the Building Regulation Approved Document L - 2013.

	kg CO_2/kWh
Mains gas	0.216
Grid supplied and displaced electricity	0.519

4.2 Targets

Schedule of Sustainability Requirements

4.2.1 The following targets have been crafted to enable compliance with current Building Regulations as well as National and Local planning policy.

4.2.2 The numbering in the table relates to the chapters in this Sustainability Statement.

Schedule of Sustainability Requirements		
Ref	**Description of Target**	**Target/Scope**
6.0	**Climate Change**	
	Ensure that peak run off rates are no greater for the developed site than it was for the pre-development site.	Whole Site
	In appropriate areas the use of porous surfaces and minimal hard ground surfaces will be implemented. All additional surface water generated will be attenuated and treated using SuDS prior to discharge.	Whole Site

Schedule of Sustainability Requirements		
Ref	**Description of Target**	**Target/ Scope**
7.0	**Community**	
	All units will be built in accordance with Part M4(1) of the Building Regulations.	All dwellings
	Secured by Design principles will be followed. This will involve consultation with the Architectural Liaison Officer/ Crime Prevention Officer at the detailed design stage.	Whole Site

Schedule of Sustainability Requirements		
Ref	**Description of Target**	**Target/ Scope**
9.0	**Transport and Movement**	
	Information will be provided in Home Owners Guide, giving details of frequency and location of public transport services.	Whole site
	All dwellings will be provided with cycle storage.	Whole Site
	A Travel Plan will be developed which will be used to promote and encourage sustainable forms of transport.	Whole Site

Schedule of Sustainability Requirements		
	Description of Target	**Target/ Scope**
11.0	**Resources**	
	All materials in buildings will be A+, A or B rated according to The Green Guide to Specification, unless deemed impractical or otherwise prescribed.	Whole Site
	All timber for basic elements will be obtained from appropriately certified legal sources. In addition, 80% of building element timber will be procured from sustainably certified forests.	Whole Site
	All kitchens will be fitted with internal recycling bins and dedicated external space (s) will be provided for recyclable storage accessible to all potential users.	Whole Site

Schedule of Sustainability Requirements		
Ref	**Description of Target**	**Target/ Scope**
12.0	**Buildings**	
	Carbon dioxide emissions will be reduced by 20% (based on Part L – 2013) through energy efficiency, low-carbon and renewable technologies	All dwellings
	EU Labelling Information for white goods will be provided to all dwellings and where white goods are to be provided they will be energy efficient.	All dwellings
	100% of domestic fixed internal lighting is to be energy efficient.	All dwellings
	The completed building fabric is to achieve air leakage rates of no greater than 4.5 $m^3/hr/m^2$ for the homes.	4.5 $m^3/hr/m^2$ for dwellings
	Sanitary fittings will be selected that minimise the consumption of mains water and all dwellings will achieve a water efficiency target of 110 l/p/d.	All dwellings to use less than 110 l/p/d

Schedule of Sustainability Requirements		
Ref		**Target/ Scope**
13.0	**Construction Process and Site Management**	
	The scheme is to be registered with the Considerate Constructors Scheme and formal certification achieved. A score of 24 or more points (minimum of at least 5 in each section) will be achieved in the CCS independent site monitors audit.	CCS score of 24 (Min) across whole site
	Waste arising from site will be monitored and segregated into at least five waste streams for recycling throughout the construction period.	Construction Site
	All temporary timber (site hoardings, formwork, and scaffold boards) will be from FSC, CSA, SFI or PEFC sources, or re-used timber.	Construction Site

5.0 Proposal

5.1 The planning application seeks outline consent and detailed design has not been completed for the unit types.

5.2 However, for the purposes for this Statement it has been assumed that the dwellings will be comprised of 1 and 2-bedroom apartments and 2, 3 and 4-bedroom houses and the energy strategy has been based upon the following indicative mix of accommodation:

Unit Type	Number	Area	Total Area
		m^2	m^2
1-Bedroom apartment	20	50.0	1,000
1-Bedroom apartment	4	58.0	232
2-Bedroom apartment	9	70.0	630
2-Bedroom house	18	80.0	1,440
2-Bedroom house	10	85.0	850
2-Bedroom house	10	90.0	900
3-Bedroom house	19	95.0	1,805
3-Bedroom house	29	105.0	3,045
4-Bedroom house	4	110.0	440
4-Bedroom house	6	130.0	780
4-Bedroom house	6	150.0	900
4-Bedroom+ house	6	180.0	1,080
	141		**13,102**

Environmental Considerations

6.0 Climate Change

6.1 Flooding

6.1.1 Climate change projection predicts a decrease in annual rainfall in the South East of England by up to 10% with significantly wetter winters (between 15-20% more winter rain) and an increase in frequency of severe weather. Drier summers may lead to increased flash flooding when sudden storms cause rapid run off over dry ground. Recent research suggests the number of people at risk of localised urban flooding in England could increase fourfold due to climate change.

6.1.2 Sustainable drainage involves the provision of surface water drainage systems that slow down the run off rate to rivers/watercourses and aquifers, thus conserving water as a natural resource.

6.1.3 The Environment Agency Flood Maps show the site is located within Flood Zone 1 with a low flood probability. The flood risk from surface water/ sewers is considered to be low-moderate and the remedial measures will further reduce this risk. The flood risk from groundwater, reservoirs is low.

6.1.4 The proposed development will increase the impermeable area of the site resulting in an increase in surface water runoff. This runoff will be managed using a variety of Sustainable Drainage Systems (SuDS), which will include detention basins, ponds, swales, ditches and areas of permeable paving. These features will be located across the site, taking into account the topography and will provide additional water quality, amenity and biodiversity benefits.

6.1.5 Repairs and improvements will be carried out to the existing surface water drainage systems in Appledore Road to ensure their performance is not compromised.

6.1.6 A Flood Risk Assessment and Surface Water Drainage Strategy has been developed by RSK and accompanies the planning application.

6.2 Surface Water Management

6.2.1 Consideration has been given to the use of grey water recycling. However, the internal infrastructure required would add considerable complexity to the construction. In addition the occupiers' resistance to the appearance of the recycled water and the cost of systems does not currently make them a viable option. They have therefore not been included in the proposed development.

7.0 Community

7.1 Introduction

7.1.1 This Statement has been prepared in support of a new application for the site. An earlier application was refused by Ashford Borough Council and during the determination of the that application the local community and stakeholders were able to raise matters that were important to them. This new, revised application has enabled the project team to address any issues raised. There were no issues in connection with energy efficiency either from the community or the Local Authority.

7.1.2 A newsletter advising the Local Community of the new application and the changes between it and the former application will be issued concurrently with this submission.

7.1.3 A Home Owners Pack will be provided with each dwelling.

7.2. Social Cohesion and Inclusion

7.2.1 The additional homes will enhance support for local services and add to the sustainability of the local area as a whole.

7.3 Accessible Housing

7.3.1 All homes will be built in accordance with Part M4(1) of the Building Regulations.

7.4 Estate Management

7.4.1 An Outline Landscape and Ecology Management Plan (LEMP) has been prepared and accompanies the application. This provides a long-term mechanism for the monitoring and review of landscape management and maintenance practices over time so that they can respond and adapt to changing needs and are sustainable.

8.0 Place Making

8.1 Efficient Use of Land

8.1.1 Residential Intensification, where appropriate, is a key objective of Government policy in order to meet the high housing demand. The layout of the buildings will be appropriate to the location.

8.2 Design Process

8.2.1 High quality design is an integral element to sustainable development, both of internal and external spaces and some key elements, which will be considered within the detailed design of the site and dwellings will include the following:

- Resource efficiency;
- Safety;
- Adequate daylight and minimum overlooking;
- Provision of outside spaces;
- Flexible and functional use of accommodation;
- Aesthetically pleasing.

8.2.2 An initial analysis is provided in the Design and Access Statement by Re-Format, which accompanies the application.

8.3 Passive Solar Gain

8.3.1 The energy required for space heating and lighting can be reduced by using the orientation, form and fenestration to make the most use of passive solar gain.

8.3.2 The application is for outline consent and the arrangement of the dwellings has not yet been determined. However, the site layout will seek to set out the majority of homes with either a southeast/northwest or northeast/southwest orientation. The design will seek to minimise the number of homes with a solely northerly aspect and maximise the homes with an orientation from southwest through to southeast.

8.4 Daylighting

8.4.1 Whilst the building specifications have yet to be agreed the design of the site will seek to maximise the standard of natural daylighting to all units. This will create a high quality internal environment, which will reduce the need for artificial lighting.

8.4.2 Detailed average daylight factor calculations (ADF) will be carried out for a number of homes at the detailed working drawing stage and through provision of floor plates, which are not too deep and the provision of at least dual aspects to the majority of dwellings good standards of daylighting will be achieved. It is anticipated that the ADF will exceed 2% for all kitchens and 1.5% for Living Rooms.

8.5 Open Space

8.5.1 The provision of outside space is considered important for all sustainable developments and the proposed development will provide a range of private, private communal and publicly accessible amenity areas.

8.5.2 The amenity space for the apartments will be provided as a combination of private ground-floor terraces and private communal space. All houses will be provided with private gardens. The proposal opens up the site to pedestrians with new routes crossing the site and will aid integration with the local area.

8.5.3 In addition to the public open space around the residential development the proposal also includes a new country park and sports pitches.

8.6 Adaptability

8.6.1 The homes will be designed to provide the opportunity for residents to work from home with most homes having sufficient space and facilities within a bedroom or living room. These rooms will be equipped with suitable outlets that will enable the occupants to have data access and necessary power supplies.

8.7 Inclusive Communities

8.7.1 The proposed development will contain a mix of unit types and tenures, which will seek to draw in a range of family sizes including single occupants, young couples and families. This will ensure no one demographic forms a disproportionate part of the local population.

8.8 Safety and Security

8.8.1 The scheme will, through detailed design development, aim to incorporate Secured by Design principles, which will put community safety at the forefront and in turn will help to create a high-quality environment for residents and occupiers for the long term.

8.8.2 Consultation with the local Architectural Liaison/ Crime Prevention Officer will be sought during working drawing design development.

9.0 Transport and Movement

The site is located approximately 14.5 km to the south-west of Ashford and is north-east of Tenterden town centre between Appledore Road and Woodchurch Road. The site is bounded by existing residential development to its western edge and partially along it's southern edge. The northern boundary is Woodchurch Road and on the eastern boundary are agricultural fields.

9.1 Public Transport

9.1.1 The nearest rail stations are at Appledore (9 km), Headcorn (14.2 km) and Ashford International (14.5 km). Appledore is on the Brighton to Ashford line and stops at Hastings and Eastbourne. Headcorn provides services to London Charing Cross as well as Dover and Ramsgate via Canterbury. Ashford provides high speed services to London as well as to Dover, Folkstone and the Channel Tunnel.

9.1.2 The nearest existing bus stops are on Appledore Road, approximately 150m from the site entrance and on Woodchurch Road, approximately 250m from the same entrance. Further stops are available on Ashford Road (800m) and Tenterden High Street (approximately 1 km). Routes available include Routes 2 & 2A to Ashford, Route 12 to Maidstone (including Headcorn railway station), Route 297 to Tunbridge Wells, Route 299 to Tonbridge and Route 312 to Rye.

9.2 Cycle

9.2.1 The site has access to National Cycle Route 18, which is approximately 1.8 km from the site. This route provides a 98 km link between Canterbury and Royal Tunbridge Wells. There is also a link to NCR 18 from Tenterden High Street.

9.2.2 The roads surrounding the site are conducive to cycling and the features proposed as part of the development will further enhancement the viability of cycling as a credible alternative means of transport.

9.3 Parking

9.3.1 The provision for car parking within a scheme can directly affect sustainability by restricting or enabling car use. Car parking will be provided in accordance with Kent County Council and Ashford Borough Council standards.

9.4 Travel Plan

9.4.1 A Travel Plan has been developed, which has been designed to encourage residents to travel in a sustainable manner. The Travel Plan sets out the existing transport options and will be used to regularly monitor what residents are using in order to maximise their opportunities to use more sustainable forms of transport. The Travel Plan seeks to incentivise residents to use non-car modes of transport. The Travel Plan Statement prepared by i-Transport accompanies the application.

10.0 Ecology and Landscaping

10.1.1 An Ecological Assessment (EA) has been prepared and accompanies the planning application.

10.1.2 The field survey found that the site is predominantly a landscape of ancient fields and pastures currently grazed by livestock. One field in the southern part of the site is closely mown and used as a sports pitch. The fields are bordered by hedgerows that are mostly unmanaged and have become over-mature. There is a small area of semi-natural broadleaved woodland within the south-west of the site. Most of the site is heavily grazed so there are limited areas of scrub. There are several free-standing scattered trees present around the site and among these are several large Oak and Field Maple trees. There is a small area of semi-natural broadleaved woodland within the south-west of the site.

10.1.3 The EA concludes that the proposed development will deliver biodiversity gain which goes above and beyond the measures required to avoid, mitigate and/or compensate for the potential impacts, thereby delivering biodiversity net gain. Key deliverables include:

- Restoration of retained grassland through plant species diversification to create species-rich lowland meadow grassland (acid and neutral grassland);
- Restoration of retained hedgerows through plant species diversification and positive management;
- Creation of woodland/woodland pasture and dense scrub pockets;
- Restoration of ponds;
- Creation of traditional community orchard using local plant species varieties; and
- Creation of 'country park' style open space areas that will bring people into contact with the natural environment while also providing benefits to biodiversity so that it is maintained and enhanced.

10.1.4 The EA has predicted that, subject to the implementation of the impact avoidance, mitigation and compensation measures, the proposed development will not have any significant negative residual effects on important ecological features, and will conform to all applicable nature conservation related legislation and policy.

10.1.5 As a result of the enhancement measures proposed, biodiversity net gain will also be secured, in accordance with relevant planning and biodiversity policy.

10.1.6 Full details are provided in the Ecological Assessment prepared by Ecology Solutions.

11.0 Resources

11.1 Materials

11.1.1 The Green Guide to Specification is a simple guide for design professionals. The guide provides environmental impact, cost and replacement interval information for a wide range of commonly used building specifications over a notional 60-year building life. The construction will target the use of materials that are A+, A or B rated, unless otherwise agreed or deemed impractical.

11.1.2 Preference will be given to the use of local materials & suppliers where viable to reduce the transport distances and to support the local economy. A full evaluation of these suppliers will be undertaken at the next stage of design.

11.1.3 In addition, timber would be sourced, where practical, certified by PEFC or an equivalent approved certification body and all site timber used within the construction process would be recycled.

11.2 Pollution

11.2.1 All insulation materials to will have a zero ozone depleting potential.

11.2.2 The NOx emissions for the dwellings will be targeted at less than 40 mg/kWh, which is a target easily achieved by the majority of gas boiler manufacturers.

11.3 Noise

11.3.1 The site will be designed (at detailed working drawing stage) to minimise the impact of noise from external sources and the use of Robust Details will ensure the buildings are constructed to reduce sound transmission through party walls and floors. It is proposed to reduce impact and airborne sound transmission below the level required by the Building Regulations (Part E).

11.4 Construction waste

11.4.1 A Site Waste Management Plan will be prepared which will monitor and report on waste generated on site into defined waste groups.

11.4.2 The Plan will indicate the setting of targets to promote resource efficiency in accordance with guidance from WRAP, Envirowise, BRE and DEFRA.

11.4.3 The overarching principle of waste management is that waste should be treated or disposed of within the region where it is produced.

11.4.4 Construction operations generate waste materials as a result of general handling losses and surpluses. These wastes can be reduced through appropriate selection of the construction method, good site management practices and spotting opportunities to avoid creating unnecessary waste.

11.4.5 A Construction Strategy will be developed, once planning consent has been secured which will explore these issues, some of which are set out below:

- Proper handling and storage of all materials to avoid damage.
- Efficient purchasing arrangements to minimise over ordering.
- Segregation of construction waste to maximise potential for reuse/recycling.
- Suppliers who collect and reuse/recycle packaging materials

11.5 Domestic Waste and Recycling

11.5.1 Domestic and operational waste has been considered in the proposed development in the following way:

- External space is provided for storing recyclable materials, for collection by the Authority or private contractors, within the boundary of the site;
- The external space for recyclable material is of sufficient size to accord with Local Authority procedures;
- Internal storage for recyclables is provided within homes at a capacity in excess of 30 litres;
- Internal storage will be provided to all homes for kitchen food waste;
- The Home Owners Guide will be provided to residents giving information about the location of the nearest recycling bank.

12.0 Buildings

12.1 Energy use and CO_2 emissions statement

12.1.1 Introduction

12.1.1.1 The site will be designed and constructed to reduce energy demand and carbon dioxide emissions. The objective is to reduce the energy demand to an economic minimum by making investment in the parts of the buildings that have the greatest impact on energy demand and are the most difficult and costly to change in the future, namely the building fabric.

12.1.1.2. Once cost-effective structures have been designed, renewable and low carbon technologies will be considered for installation to provide heat and electricity.

12.1.1.3 The following hierarchy will be followed:

- Lean reduce demand and consumption
- Clean increase energy efficiency
- Green provide low carbon renewable energy sources

12.1.2 Methodology

Design

12.1.2.1 The energy performance of a building is affected by the building design, its construction and its use. Whilst occupant behaviour is beyond the remit of this statement, better design and construction methods can significantly reduce the life cycle emissions of a building and assist the occupant to reduce consumption.

Passive solar gain

12.1.2.2 Passive measures include allowing for natural ventilation and exposed thermal mass coupled with high levels of insulation, air tightness and the control of solar gain.

12.1.2.3 The application is for outline consent and the arrangement of the dwellings has not yet been determined. However, the site layout will seek to set out the majority of homes with either a southeast/northwest or northeast/southwest orientation. The design will seek to minimise the number of homes with a solely northerly aspect and maximise the homes with an orientation from southwest through to southeast.

Building Envelope (Be Lean)

12.1.2.4 U-values of the dwelling envelope must meet Building Regulations Part L standards with further improvements to U-values reducing the home's heating requirements.

12.1.2.5 The construction type is currently unknown but the development is equally suited to a traditional load bearing brick and block construction or a timber-framed or other system build technique.

12.1.2.6 For the purposes of this Statement the following U-values have been assumed for the building elements as the maximum;

Element	Limiting U values Part L	Proposed	Proposed Improvement
	W/m²K	W/m²K	
External Walls	**0.30**	**0.22**	**27%**
Roofs	**0.20**	**0.10**	**50%**
Sloping Ceilings	**0.20**	**0.15**	**25%**
Floors	**0.25**	**0.13**	**48%**
Windows	**2.00**	**1.40**	**30%**
External Doors	**2.00**	**1.60**	**20%**

Air Leakage

12.1.2.7 Large amounts of heat are lost in winter through air leakage from a building (also referred to as infiltration of air permeability) often through poor sealing of joints and openings in the building

12.1.2.8 The Approved Document L of the Building Regulations (2013) sets a minimum standard for air permeability of 10 m^3 of air per hour per m^2 of envelope area, at 50Pa. Air tightness standards to the new dwellings will average at least a 55% improvement over Building Regulations and the dwellings will aim to achieve a permeability of less than 4.5 $m^3/hr/m^2$.

Thermal Bridging

12.1.2.9 The significance of Thermal Bridging, as a potentially major source of fabric heat losses, is increasingly understood. Improving the U-values for the main building fabric without accurately addressing the Thermal Bridging is no longer an option and will not achieve the fabric energy efficiency and energy and CO_2 reduction targets set out in this strategy.

12.1.2.10 Accredited Construction Details (ACD's) have been developed to provide the performance standards required to achieve the higher energy efficiency requirements of the Building Regulations. The bridging losses will be calculated using SAP Appendix K Table 1.

Ventilation

12.1.2.11 As a result of increasing thermal efficiency and air tightness, Building Regulations Approved Document F18 addresses the possibility of overheating and poor air quality. Mechanical extract ventilation will be used for the control of air quality although maximum use will be made of natural ventilation and night-time cooling. The use of high performance MVHR units will be considered at the detailed stage. These are capable of recovering over 90% of the heat in the exhaust air and can result in an overall reduction in ventilation losses over a standard building with trickle vents and passive ventilation by around 20%.

Lighting

12.1.2.12 Throughout the scheme natural lighting will be optimised.

12.1.2.13 Approved Document L1A requires three in four light fittings (75%) to be dedicated low energy fittings. The development will exceed this and all light fittings will be of a dedicated energy efficient type. All external lighting will be energy efficient.

12.1.3 Establishing Carbon Dioxide Emissions and Energy Demand

12.1.3.1 SAP calculations have been prepared for units of a similar scale, design and specification in order to provide an accurate estimate the total site emissions.

12.1.3.2 SAP calculations have been used for the following units, which are presented as representative of all units proposed;

- 1-Bedroom Ground-floor apartment at 50.0 m^2
- 1-Bedroom Top-floor apartment at 50.0 m^2
- 2-Bedroom Mid-terrace house at 85.0 m^2
- 2-Bedroom End-terrace/ Semi-detached house at 85.0 m^2
- 3-Bedroom Mid-terrace house at 105.0 m^2
- 3-Bedroom End-terrace/ Semi-detached house at 105.0 m^2
- 4-Bedroom Detached house at 150.0 m^2

12.1.3.3 The following tables summarise the carbon dioxide emissions:

1-Bedroom Ground-floor apartment – 50.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	6.79	6.02
Water heating	7.77	7.44
Electricity for pumps, fans and lighting	3.20	3.20
Total	**17.76**	**16.66**

1-Bedroom Top-floor apartment – 50.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	6.90	6.20
Water heating	8.01	7.66
Electricity for pumps, fans and lighting	3.20	3.20
Total	**18.11**	**17.06**

2-Bedroom Mid-terrace house – 85.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	7.85	6.70
Water heating	6.70	6.80
Electricity for pumps, fans and lighting	2.82	2.82
Total	**17.37**	**16.32**

2-Bedroom End-terrace/ Semi-detached house – 85.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	8.98	7.84
Water heating	6.68	6.76
Electricity for pumps, fans and lighting	2.82	2.82
Total	**18.48**	**17.42**

3-Bedroom Mid-terrace house – 105.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	7.81	6.55
Water heating	5.29	5.36
Electricity for pumps, fans and lighting	2.50	2.50
Total	**15.60**	**14.41**

3-Bedroom End-terrace/ Semi-detached house – 105.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	8.97	7.67
Water heating	5.27	5.34
Electricity for pumps, fans and lighting	2.50	2.50
Total	**16.74**	**15.51**

4-Bedroom+ Detached house – 150.0 m^2	CO_2 TER	CO_2 DER
	kg/m^2/yr	kg/m^2/yr
Space heating	9.02	7.88
Water heating	3.62	3.78
Electricity for pumps, fans and lighting	2.01	2.01
Total	**14.65**	**13.67**

12.1.3.4 It is also assumed that the apartments are equally split between ground-floor and top-floor units, that the 2-Bedroom and 3-Bedroom are half Mid-terrace and half End-terrace/ Semi-detached houses. It is assumed all the 4-Bedroom houses are detached units.

12.1.3.5 Using the above results, the emissions can be aggregated across similar unit types to arrive at the total site emissions.

12.1.3.6 The total emissions can be calculated as follows;

	Area	CO_2 TER	CO_2 DER
	m^2	kg/yr	kg/yr
Ground-floor apartments	931	16,535	15,510
Top-floor apartments	931	16,860	15,883
2-Bed Mid-terrace houses	1,595	27,705	26,030
2-Bed End-terrace/ Semi-detached houses	1,595	29,476	27,785
3-Bed Mid-terrace houses	2,425	37,830	34,944
3-Bed End-terrace/ Semi-detached houses	2,425	40,595	37,612
Detached houses	3,200	46,880	43,744
Total	**13,102**	**215,881**	**201,508**

12.1.3.7 The total emissions allowable through the Building Regulations (TER) are calculated as:

- **215,881 kg CO_2 per year**

12.1.3.8 With total actual site emissions (DER) assessed as:

- **201,508 kg CO_2 per year**

12.1.3.9 **The site carbon dioxide emissions are reduced by 14,373 kg CO_2 per year as a result of the energy efficiency measures, which equates to a reduction of 6.66% of the TER emissions.**

12.1.4 Low-Carbon and Renewable Technologies (Be Clean and Be Green)

12.1.4.1 The carbon dioxide emissions and energy demand established above have been used to test the viability of various renewable and low carbon technologies as follows.

12.1.4.2 The Government's Renewable Obligation defines renewable energy in the UK. The identified technologies are;

- Small hydro-electric
- Landfill and sewage gas
- Onshore and offshore wind
- Biomass
- Tidal and wave power
- Geothermal power
- Solar

12.1.4.3 The use of landfill or sewage gas, offshore wind or any form of hydroelectric power is not suitable for the site due to its location. The remaining technologies are considered below;

Wind

12.1.4.4 Wind turbines are available in various sizes from large rotors able to supply whole communities to small roof or wall-mounted units for individual dwellings.

12.1.4.5 The Government wind speed database predicts local wind speeds at Appledore Road to be 4.8 m/s at 10m above ground level and 5.6 m/s at 25m above ground level. This is below the level generally required for commercial investment in large wind turbines. In addition the land take, potential for noise and signal interference make a large wind turbine unsuitable for this development.

12.1.4.6 Roof mounted turbines could be used at the development to generate small but valuable amounts of renewable electricity but the small output and contribution to total emissions means any investment would be small and purely tokenism. In addition the use of wind turbines will have a detrimental aesthetic impact on the appearance of the development.

Combined Heat and Power and Community Heating

12.1.4.7 Combined heat and power (CHP) also called co-generation is a de-centralised method of producing electricity from a fuel and 'capturing' the heat generated for use in buildings. The plant is essentially a small-scale electrical power station. The production and transportation of electricity via the National Grid is very inefficient with over 65% of the energy produced at the power station being lost to the atmosphere and through transportation.

12.1.4.8 Consequently CHP can demonstrate significant CO_2 savings and although not necessary classed as renewable energy (depending on the fuel used) the technology is low carbon.

12.1.4.9 For a CHP plant to be economic it needs to operate for as much of the time as possible (usually deemed to be in excess of 14 hours per day) and therefore the size of the unit are usually based upon the hot water load of the building (s) with additional boilers meeting the peak space heating demand.

12.1.4.10 Whilst the site as a whole may generate sufficient demand the site is insufficiently dense to justify a site wide system. The small number of apartment buildings may be of sufficient density but the numbers are too low to create sufficient demand.

12.1.4.11 Combined heat and power is not an appropriate technology for the development and is therefore not proposed.

Ground Source Heat Pumps

12.1.4.12 Sub soil temperatures are reasonably constant and predictable in the UK, providing a store of the sun's energy throughout the year. Below London the groundwater in the lower London aquifer is at a fairly constant temperature of 12^{o} C. Ground source heat pumps (GSHP) extract this low-grade heat and convert it to usable heat for space heating.

12.1.4.13 GSHP operates on a similar principle to refrigerators, transferring heat from a cool place to a warmer place. They operate most efficiently when providing space heating at a low temperature, typically via under floor heating or with low temperature radiators.

12.1.4.14 Whilst the houses will have private garden areas it is unlikely there will be sufficient external ground area to sustain a horizontal collection system and an installation of ground source heat pumps is likely to require the use of a bore hole collection system to each house. The installation of ground source heat pumps to the apartments is not appropriate.

12.1.4.15 The use of ground source heat pumps with bore-hole collection systems to the houses would be cost prohibitive and therefore ground source heat pump solutions are not appropriate.

Solar

(i) Solar Water Heating

12.1.4.16 Solar hot water panels use the suns energy to directly heat water circulating through panels or pipes. The technology is simple and easily understood by purchasers.

12.1.4.17 Solar hot water heating panels are based generally around two types, which are available being 'flat plate collectors' and 'evacuated tubes'. Flat plate collectors can achieve an output of up to 1,124 kWh/annum (Schuco) and evacuated tubes can achieve outputs up to 1,365 kWh/annum (Riomay).

12.1.4.18 Panels are traditionally roof mounted and for highest efficiencies should be mounted plus or minus 30 degrees of due south. Evacuated tubes can be laid horizontally on flat roofs but flat plate collectors are recommended for installation at an incline of 30 degrees

12.1.4.19 Solar hot water panels are technically considered an appropriate technology and flat plate panels could be installed on the pitched roof of a number of buildings with evacuated tube hot water panels installed on any flat roofs

12.1.4.20 The use of solar hot water panels, whilst feasible would require the use of conventional gas boilers with hot water cylinders. The majority of the homes are likely to be suited to the use of gas combination boilers and the introduction of cylinders would impact on internal space planning and lead to additional costs. In addition the use of solar hot water heating panels in apartment buildings is only really appropriate for the top floor units as routing flow and return pipework to ground floors can be complex.

12.1.4.21 Therefore it is assumed that solar hot water heating panels are only appropriate for the detached houses, which will be equipped with hot water cylinders. The total hot water demand for the (assumed) 22 detached houses is 56,000 kWh and assuming the panels would reduce demand by 50% this equates to a total emissions reduction of 6,048 kg CO_2 per year. When combined with the reduction in emissions from energy efficiency this equates to a total reduction of 9.46% of the total TER emissions. Additional technologies would be required and for example the installation of 300 x 330W photovoltaic panels would reduce emissions by a further 46,800 kg CO_2 per year, which when combined with the reduction from solar hot water heating panels and energy efficiency would equate to a total reduction of **67,221 kg CO_2 per year**, which is **31.14%** of the total emissions.

(ii) Photovoltaics

12.1.4.22 Photovoltaic panels (PV) provide clean silent electricity. They generate electricity during most daylight conditions although they are most efficient when exposed to direct sunlight or are orientated to face plus or minus 30 degrees of due south.

12.1.4.23 PV panels can be integrated into many different aspects of a development including roofs, walls, shading devices or architectural panels.

12.1.4.24 In order to achieve a 31% reduction in (TER) emissions a total of 338 x 330W panels would be required. These would reduce emissions by 52,728 kg CO_2 per year, which when combined with the reduction from energy efficiency measures equates to a total reduction of **67,101 kg CO_2 per year** or **31.08%** of the total TER emissions.

Air Source Heat Pumps (ASHP)

12.1.4.25 Air sourced heat pumps operate using the same reverse refrigeration cycle as ground source heat pumps, however the initial heat energy is extracted from the external air rather than the ground. These heat pumps can be reversed to provide cooling to an area although this reduces the coefficient of performance of the pumps.

12.1.4.26 ASHP tend to have a lower coefficient of performance (CoP) than GSHP but are considerably less costly to install. They work well where there is a large low temperature demand but the efficiency can be impacted on, for example where there is a high hot water demand.

12.1.4.27 Therefore, an air source heat pump installation would work well with the larger houses.

12.1.4.28 A further SAP calculation has been prepared for the 4-Bedroom detached house (150.0 m^2) but with the benefit of an air source heat pump installed.

12.1.4.29 The results from this SAP can be summarised as follows;

4-Bed Detached house – 150.0 m^2 With Air Source Heat Pump	**CO_2 TER**	**CO_2 DER**
	kg/m^2/yr	kg/m^2/yr
	21.61	**12.80**

12.1.4.30 Therefore the reduction in emissions for the modelled house is 1,322 kg CO_2 per year, which equates to 8.81 kg CO_2 per m^2. Assuming ASHPs were installed to all detached houses (assumed 22) the reduction in emissions would be 28,192 kg CO_2 per year and when combined with the reduction from energy efficiency measures equates to a reduction of 19.72%. This falls short of the self-imposed target and therefore 158 x 330W photovoltaic panels could be installed to make up for the difference.

12.1.4.31 The installation of air source heat pumps into each of the (assumed) 22 detached houses when combined with the energy efficiency measures and the installation of 158 photovoltaic panels equates to a total reduction in emissions of **67,213 kg CO_2 per year**, which equates to **31.13%** of the total site (TER) emissions.

Other Technologies

12.1.4.32 New technologies are becoming available, which do not 'fit' into one of the above categories but which need to be considered and are regarded as low-carbon technologies.

Flue Gas Heat Recovery (FGHR)

12.1.4.33 One such system is flue gas heat recovery units. These devices are used in conjunction with gas-fired combination boilers and recover the heat exhausted through the boiler flue.

12.1.4.34 A second set of SAP calculations has been prepared for the apartments and houses of 105.0 m^2 and below (the units modelled with gas combination boilers) but with the benefit of a FGHR installed to each.

12.1.4.35 The results from the SAP calculations and the reduction in emissions as a result of the FGHR units is summarised as follows;

Unit Type – with FGHR	Area	Reduction in Emissions	Total Reduction in Emissions
	m^2	kg CO2 m^2/yr	kg CO2 yr
1-Bed Ground-floor apartments	931	0.94	875
1-Bed Top-floor apartments	931	1.01	940
2-Bed Mid-terrace houses	1,595	1.51	2,408
2-Bed End-terrace/ Semi-detached houses	1,595	1.56	2,488
3-Bed Mid-terrace houses	2,425	1.26	3,056
3-Bed End-terrace/ Semi-detached houses	2,425	1.30	3,153
			12,920

12.1.4.36 The reduction in emissions is 12,920 kg CO_2 per year, which when combined with the reduction from energy efficiency measures equates to a reduction in the total site (TER) emissions of 12.64%.

12.1.4.37 The use of flue-gas heat recovery systems is appropriate but would require additional measures to achieve the self-imposed target. For example, the installation of 256 x 330W photovoltaic panels would reduce emissions by a further 39,936 kg CO_2 per year, which when combined with the reduction from flue-gas heat recovery units and energy efficiency measures would equate to a total reduction of **67,229 kg CO_2 per year**, which equates to a reduction of **31.14%.**

12.1.5 Summary of Calculations and Proposals for Renewable Technologies

12.1.5.1 The total emissions for the site based upon the maximum permissible by the Building Regulations (TER) are estimated as **215,881 kg CO_2 per year**, with DER emissions calculated as **201,508 kg CO_2 per year.**

12.1.5.2 The Applicant is keen to provide a sustainable and energy efficient development and has therefore set a self-imposed target to reduce carbon dioxide emissions by 31%.

12.1.5.3 Various technologies are considered above and whilst wind turbines, combined heat and power and ground source heat pumps are not considered appropriate the use of solar hot water heating panels, photovoltaic panels, air source heat pumps and flue-gas heat pumps are considered feasible, albeit the use solar hot water heating panels, air source heat pumps and flue-gas heat recovery units require additional technologies to meet the target.

Be Lean

12.1.5.4 The construction standards proposed include U-values, which demonstrate good practice and improve upon those required by the Building Regulations. Air tightness standards are targeted at a 55% improvement upon the minimum required by the Building Regulations.

12.1.5.5 The emissions are reduced from the maximum by **14,373 kg CO_2 per year**, which equates to a reduction of **6.66%.**

Be Clean and Be Green

12.1.5.6 The self-imposed target could be achieved by each the following;

(i) Solar Hot Water Heating Panels and Photovoltaic Panels

12.1.5.7 A total of 22 solar hot water panels (one to each detached house) would reduce emissions by **6,048 kg CO_2 per year**. In addition, a total of 300 x 330W photovoltaic panels could be installed. This combination of technologies together with the energy efficiency measures would reduce emissions by a total of **67,221 kg CO_2 per year,** which equates to a reduction of **31.14%.**

(ii) Photovoltaic Panels

12.1.5.8 A total of 338 x 330W photovoltaic panels when combined with the reduction from energy efficiency measures would reduce emissions by **67,101 kg CO_2 per year**, which equates to a reduction of **31.08%.**

(iii) Air Source Heat Pumps and Photovoltaic Panels

12.1.5.9 The installation of an air source heat pump into the 22 detached houses (assumed) would reduce emissions by **28,192 kg CO_2 per year**. In addition, a total of 158 x 330W photovoltaic panels could be installed. This combination of technologies including the reduction from energy efficiency measures would reduce total emissions by **67,213 kg CO_2 per year,** which equates to a reduction of **31.13%.**

(iv) Flue-Gas Heat Recovery and Photovoltaic Panels

12.1.5.10 A flue-gas heat recovery system could be installed in all apartments and houses with a floor area of less than 105.0 m^2 (all units with a gas combination boiler). In addition, a total of 256 x 330W photovoltaic panels could be installed. This combination of technologies including the reduction from energy efficiency measures would reduce emissions by a total of **67,229 kg CO_2 per year,** which equates to a reduction of **31.14%.**

12.1.5.11 **Each of the proposals set out above could meet the requirements of the self-imposed carbon reduction target but the preferred option can only be selected once the architecture of the buildings is finalised.**

12.1.5.12 **These are just examples of what could be utilised and there may be further options that may materialise as technology advances. The ultimate solution will depend on commercial availability, viability and the technology available when the reserved matters application is finalised.**

12.2 Water use statement

12.2.1 In the South East of England, water demand exceeds the volume licensed for abstraction, with the shortfall being met from ground water. In excess of 20% of the UK's water is used domestically with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.

12.2.2 The amount of potable water used within buildings can be reduced by using fixed fittings, which reduce water use in WC's, taps and showers.

12.2.3 Throughout the design process for the development the following will be considered as part of the proposal:

- ❖ Reductions in the use of water within homes.
- ❖ Facilities for rainwater harvesting for landscape maintenance.

12.2.4 A water consumption target for the dwellings of less than 110 litres/ person/ day will be achieved.

12.2.5 Water efficient devices will be fully evaluated, and installed to all units. The specification of such devices will be considered at detailed design stage and each will be subject to an evaluation based on technical performance, cost and market appeal, together with compliance with the water use regulations.

12.2.6 Water consumption calculations have been carried out for the dwellings using the Water Efficiency Calculator provided by the BRE. This calculator gives an indication of the probable water use in a dwelling, although this is largely dependent on the way on which occupants use their homes.

12.2.7 Below is a typical specification, which would achieve the 110 Litres per person per day target.

Schedule of Appliance Water Consumption		
Appliance	Flow rate or capacity	Total Litres
WC	4/2.6 litres dual flush	14.72
Basin	1.7 litres/min.	5.98
Shower	9.5 litres/min	28.50
Bath	160 litres	25.60
Sink	4 litres/min	14.13
Washing Machine	Default used	16.66
Dishwasher	Default used	3.90
		109.49

13.0 Construction Process and Site Management

13.1 Where best practice guidance is available dealing with construction methods and standards these will be adopted.

13.2 The effects of construction can be divided into two sections;

- those related to the materials used on site
- those related to the construction process

Considerate Constructors

13.3 The site will be registered with the Considerate Constructors Scheme, which addresses both limiting the effect on the community and the effects on the environment. The Applicant is committed to demonstrate best site management practices, and if practical to go beyond this. The CC scheme monitors the contractor's performance against the eight point Code for Considerate Practice. There is a commitment to score in excess of 24 points.

13.4 To ensure good relations with the local community, the Applicant will ensure that they keep local people informed of works, which might affect them, and provide a method for comments, complaints and required remedial action to be communicated to the developer.

Construction Site Impacts

13.5 Site management procedures will be put in place to monitor water consumption and all site timber used in construction will be sourced from certified suppliers.

14.0 Conclusion

14.1 This Statement demonstrates that the proposed development will provide a highly sustainable development in terms of its economic, social and environmental sustainability. The proposed development will include accommodation of varying types, tenures and sizes, which will create a real and tangible opportunity for the site, providing vitality and diversification to the area.

14.2 Throughout the design process, the applicant and design team have and will give careful consideration to the sustainability issues relating to the site, and how these can be enhanced in a marketable and feasible manner. As a result, this Statement demonstrates that the development meets relevant sustainability criteria and in a number of areas exceeds them.

14.3 The Statement also describes the responsibilities that the applicant, designers and consultant and construction team have in delivering sustainability measures that will contribute to, meet and/or exceed the objectives and targets set out above (in section 4.2.2).

14.4 The key sustainability findings can be summarised as;

- Reduction in carbon dioxide emissions compared to the maximum permissible by the Building Regulations (Part L - 2013) through energy efficiency measures;
- A total reduction in (TER) carbon dioxide emissions of 31% from energy efficiency, low-carbon and renewable technologies will be achieved (based on Part L – 2013);
- The water use to each unit will achieve the enhanced standard required by the Building Regulations of 110 litres per person per day;
- 50% of the homes will be ‘affordable’ and will be designed to be indistinguishable from other homes;
- Mixed-tenure scheme provides a highly sustainable design with activity throughout the day;
- Outdoor space in the form of private gardens, terraces and private communal spaces as well as enhanced public open space, children’s play areas and community orchards;
- A new country park will be provided together with sport pitches and pavilion
- High standards of environmental construction with compliance to the Considerate Constructors Scheme, a Site Waste Management Plan and other construction management principles;
- Secured by Design principles will be followed;
- All dwellings will be built in accordance with Part M4(1) of the Building Regulations).