C80 solutions
Straightforward Building Compliance

MAYBERRY CAR SHOWROOM & GARDEN CENTRE EXTENSION OLD SHOREHAM ROAD PORTSLADE

SUSTAINABILITY STATEMENT

For:

Folkes Architecture & Design Ltd

September 2020

Project no. 10871

C80 Solutions Ltd
T: 0113 258 8445
E: mail@c80solutions.co.uk
W: www.c80solutions.co.uk
Registered Office: Sanderson House, 22 Station Road, Horsforth, Leeds, West Yorkshire, LS18 5NT

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FOLKES ARCHITECTURE & DESIGN LTD

REVISION	DATE	PREPARED BY	REVIEWED BY	COMMENTS
0	10/09/2020	T Walsh	MH	For Comment

The current report provides a brief overview of the wide range of opportunities for renewable energy and is not intended as detailed design advice. As such data and information should only be treated as INDICATIVE at this stage of the process. Further investigation can be undertaken when more accurate and detailed information is required on specific measures.

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Contents Page

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C80

1.0 Introduction

1.1 About C80 Solutions Ltd

C80 Solutions are independent Sustainability and Energy Consultants providing carbon reduction solutions to help the UK achieve its carbon emission reduction target of 80% by 2050 - as set out in the Government's Climate Change Act 2008.

Our range of affordable but comprehensive solutions for the construction industry are broken down into two sectors; i) Building Compliance and ii) Consultancy.

Building Compliance:

Our Building Compliance services include; Code for Sustainable Homes Assessments, SAP Calculations, On Construction Energy Performance Certificates, Water Efficiency Calculations, SBEM Calculations, Commercial EPCs, Thermal Comfort Calculations, BREEAM assessments, Air Tightness Testing and Sound Insulation Testing.

Consultancy:

Our experience and exposure to building compliance combined with previous experience and IEMA accredited training means we have built up a vast amount of knowledge which enables us to provide our clients with invaluable advice. Our Consultancy services include; Renewable Energy Feasibility Reports, Energy Statements for planning, Sustainability Statements and Building Compliance Advisory Reports.

1.2 Introduction to Developments

C80 Solutions have been instructed by Folkes Architecture & Design Ltd to prepare a Sustainability Statement for the proposed non-residential new build car showroom development and new build extension to the existing garden centre at Mayberry, Old Shoreham Road, Portslade.

The project assessed anticipates the development of a 2 storey new build car showroom and a single storey extension to the existing garden centre on the same site.

The plan of the proposed development can be seen in Figures 1-6 below.

Figure 1 – Ground floor plan of the proposed car showroom

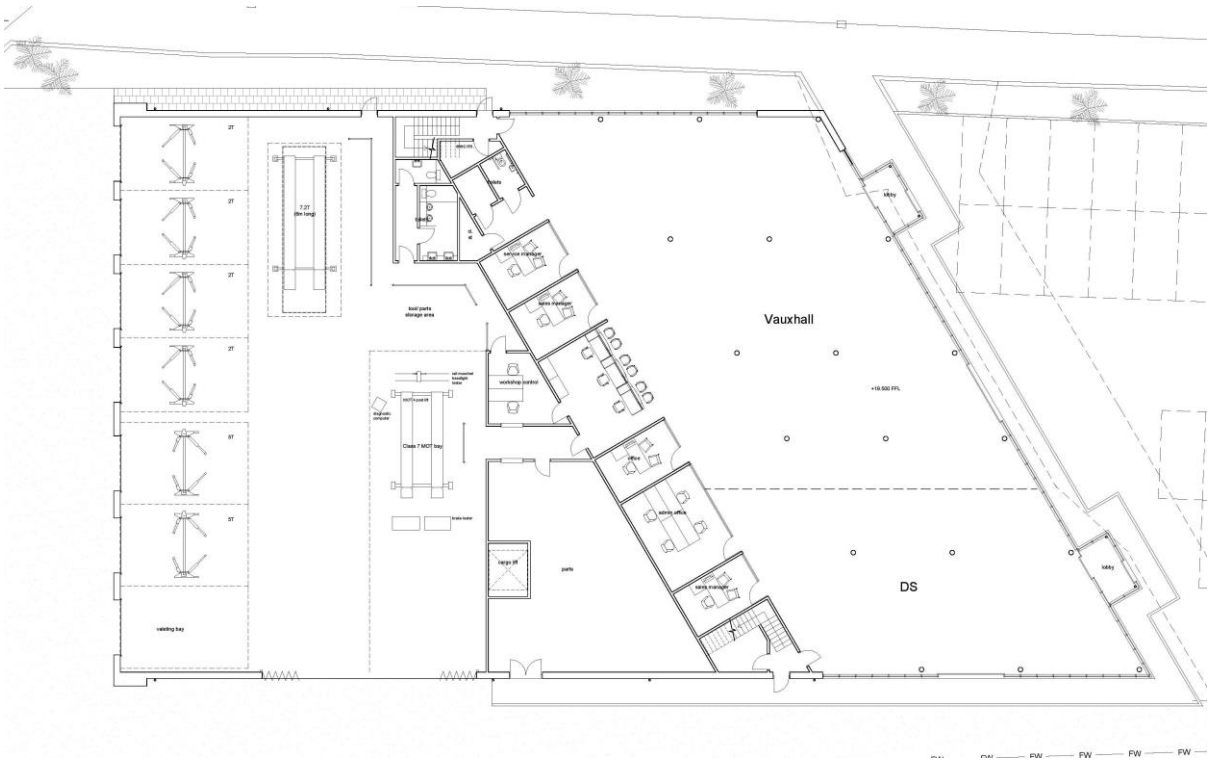


Figure 2 – First floor plan of the proposed car showroom

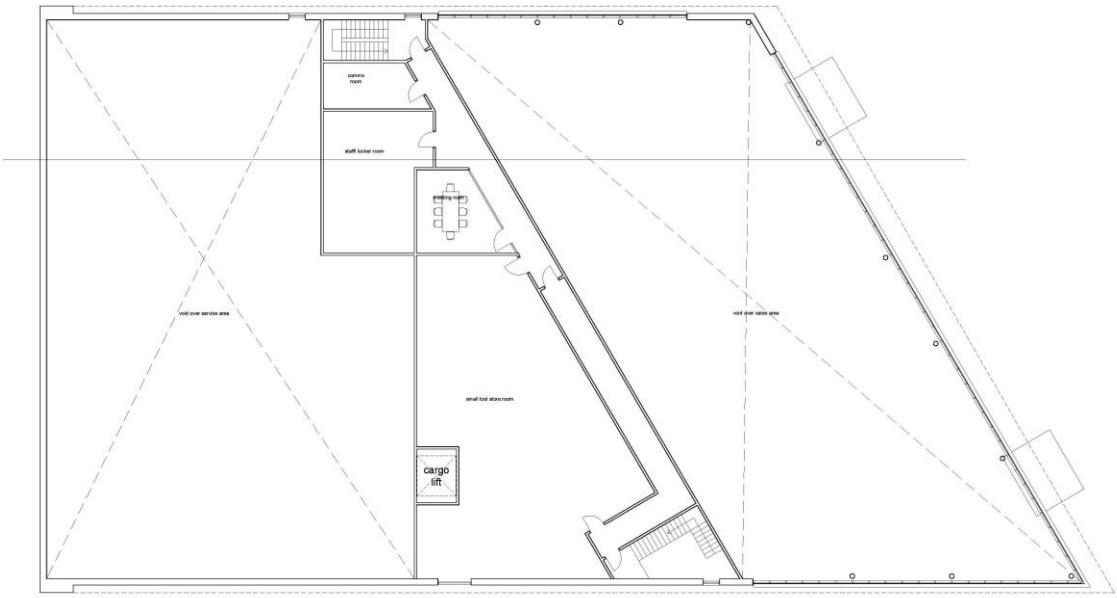


Figure 3 – Elevations plan of the proposed car showroom

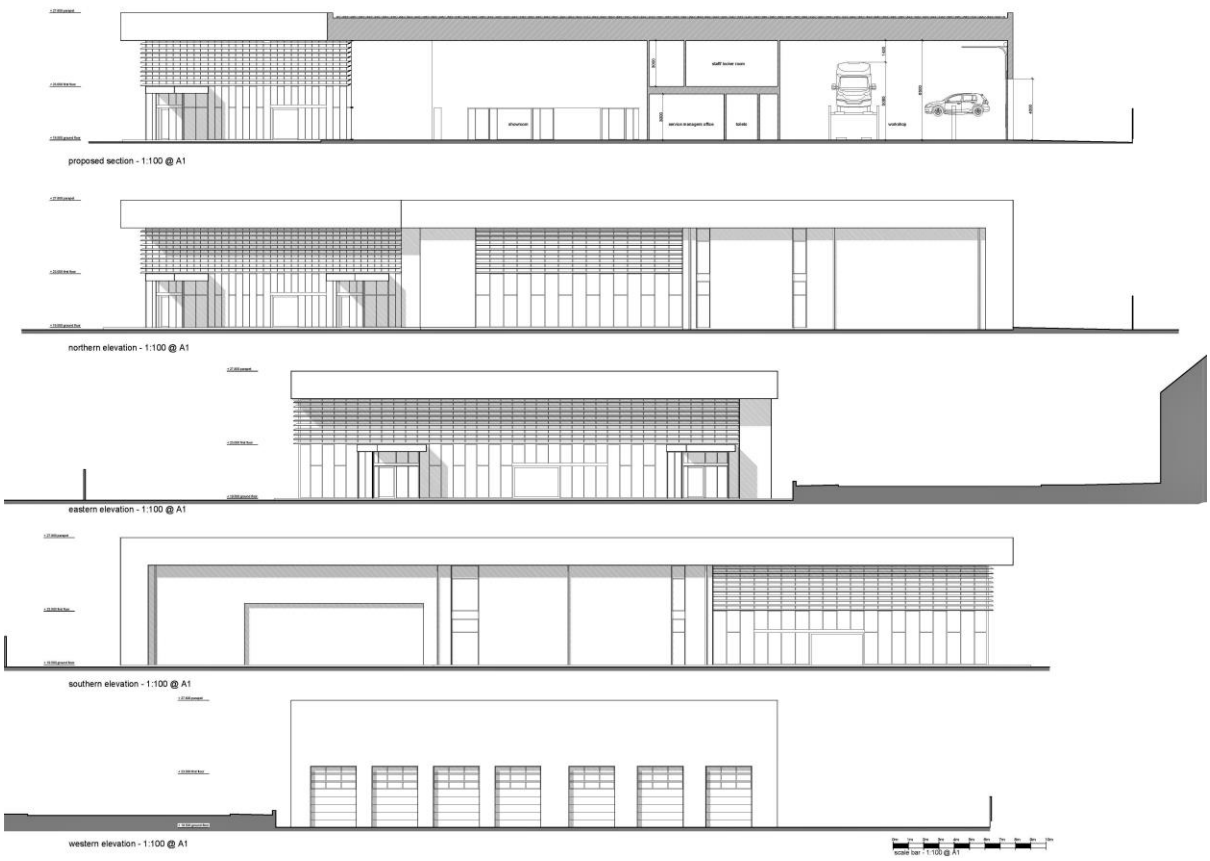


Figure 4 – Floor plan of the proposed garden centre extension

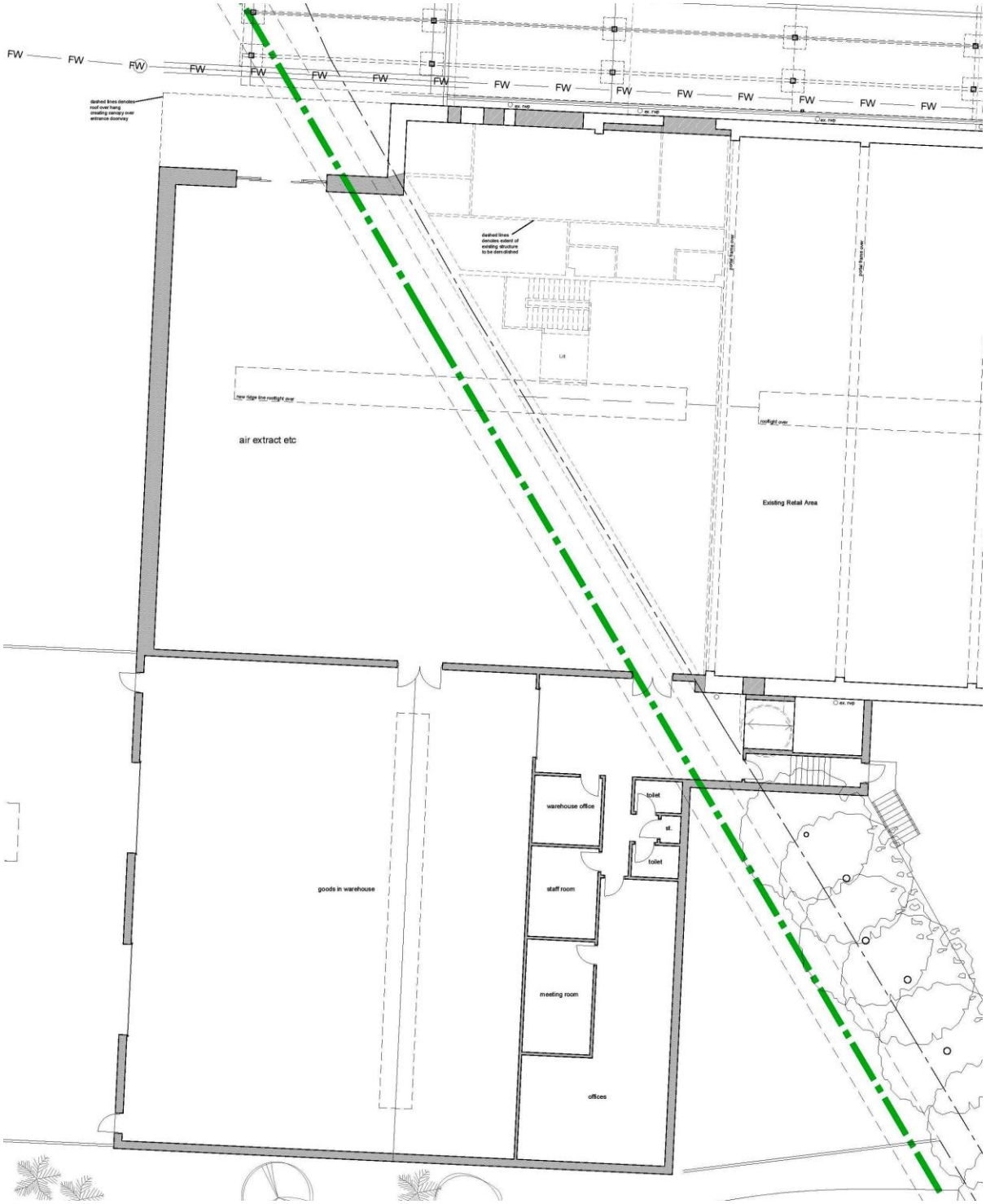
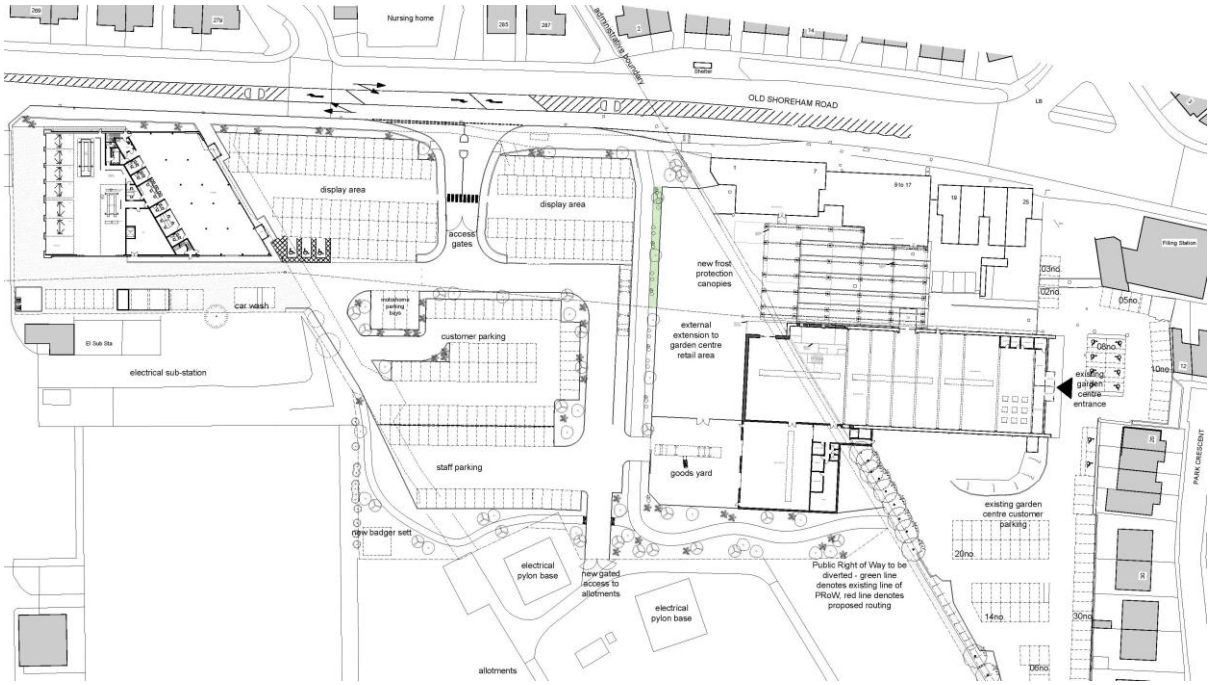


Figure 5 – Elevations plan of the proposed garden centre extension

Figure 6 – Site plan



1.3 Planning Policy

This statement will demonstrate how the projected development meets sustainability criteria for Adur District Council.

SUSTAINABLE DESIGN POLICIES

Sustainable Design

4.15 Building-related energy consumption is a significant contributor to greenhouse gas emissions. The need to achieve higher levels of energy efficiency and locally produced clean, low carbon and renewable energy related to new development is an important aspect of sustainable construction. However, sustainable construction for new and refurbished buildings incorporates more than just aspects of energy use. It also relates to other environmental impacts that buildings and inhabitants cause, for example, on water drainage and usage, waste generation, and the use of unsustainable construction materials. Improved design of buildings and developments can also lead to benefits in terms of ecology and quality of life for residents.

4.16 As part of the Housing Standards Review, the Government have withdrawn the Code for Sustainable Homes and confirmed that energy efficiency in new homes will be dealt with via a "Building Regulations only" approach, with no optional additional local standards in excess of the provisions set out in Part L of the Regulations. This approach will be implemented through an amendment to the Planning and Energy Act 2008 which is anticipated in late 2016. The energy efficiency requirements under Building Regulations are currently set at a level equivalent to Level 3 of the Code for Sustainable Homes.

4.17 Given that the South East is an area of serious water stress,[6] it is important that new development has a specific focus on water efficiency measures. Again, as part of the Housing Standards Review, the Government has confirmed the introduction of a new, optional water efficiency standard into the Building Regulations to be set at 110 litres/person/day (lpd), (which is lower than the current standard of 125 lpd). However, this optional standard can only be applied in areas with specific local needs (such as water stress).

The area to the west of the River Adur is defined as "water not available for licensing".[7] This scenario highlights water bodies where flows are below the indicative flow requirements to help support Good Ecological Status (as required by the Water Framework Directive). No new consumptive licenses for abstraction will therefore be permitted in this water body. Given this and that Adur lies within an area of serious water stress, it is considered that the Council should adopt this standard and this is reflected in the policy.

Decentralised Energy, Standalone Energy Schemes and Renewable Energy

4.20 With regard to efficient energy supply, decentralised energy systems and networks can provide an extremely cost effective approach to minimising CO2 emissions, especially where networks can be expanded to accommodate new and existing developments over time. Such networks could include, for example, specifically designed Combined Heat and Power systems (CHP) linked to district heating networks or utilising existing waste heat from industrial uses/ existing power stations through a district heating network. These types of systems represent a particularly efficient use of energy and should be considered by developers in new proposals. The Shoreham Harbour Heat Network Study (2016) identifies particular potential for district heating networks in and around Shoreham Harbour.

4.21 The potential for new standalone renewable energy developments was investigated through the Council's Energy Study (2009). While the potential for new stand-alone technologies has been identified as low within Adur, there may be interest in developing suitable schemes in the area.

4.22 The Planning and Energy Act 2008 allow local planning authorities to impose reasonable requirements for:

(a) a proportion of energy used in development in their area to be energy from renewable sources in the locality of the development;

(b) a proportion of energy used in development in their area to be low carbon energy from sources in the locality of the development;

(c) development in their area to comply with energy efficiency standards that exceeds the energy requirements of building regulations.

Although the Government have stated their intention to repeal part (c); part (a) and (b) will remain. Therefore, in order help reduce carbon emissions all major development should incorporate renewable and low carbon energy production equipment to meet at least 10% of predicted energy requirements. Such energy generation could take the form of photovoltaic energy, solar-powered and geo-thermal water heating and energy crops and biomass.

GREEN INFRASTRUCTURE

4.85 The NPPF states that the planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities. It also states that planning should contribute to and enhance the local and natural environment.

4.86 Planning policies can have direct and indirect effects on both human health as well as the health of many other forms of biodiversity. The provision of a green infrastructure network is a key way of improving health and biodiversity across Adur through the planning system.

4.87 The Government, in its White Paper 'The Natural Choice: Securing the Value of Nature[24]' defines Green Infrastructure (GI) as the following:

"Green Infrastructure is a term used to refer to the living network of green spaces, water and other environmental features in both urban and rural areas. It is often used in an urban context to cover benefits provided by trees, parks, gardens, road verges, allotments, cemeteries, woodlands, rivers and wetlands.

Green Infrastructure is also relevant in a rural context, where it might refer to the use of farmland, woodland, wetlands or other natural features to provide services such as flood protection, carbon storage or water purification. Green Infrastructure maintains critical ecological links between town and country."

4.88 Government guidance supports a strategic approach to the identification and delivery of green infrastructure. Green infrastructure is a 'multifunctional' resource. As well as conserving and enhancing biodiversity as it can provide benefits in terms of recreation, water management, climate change adaptation, and social and cultural benefits to help promote health and well-being.

4.89 Key areas of green infrastructure in Adur District include the South Downs National Park, the River Adur SSSI and Cissbury Ring.[25] In addition the countryside between Worthing-Sompting/ Lancing and Sompting/ Lancing – Shoreham-by-Sea is also part of Adur's GI network. In addition to these sites there are a number of Local Wildlife Sites (LWSs) and Local Nature Reserves, public rights of way such as the Downs Link, as well as undesignated sites that make an important contribution. Other forms of open space, including parks, play areas, and private gardens, also contribute to the overall 'GI' network.

4.90 The Green Infrastructure Wildlife Corridors Study (2009) and the Shoreham Harbour Joint Area Action Plan Assessment of Open Space and Recreation (2009) proposed the creation of a network of 'green corridors' linking town centres, communities, open spaces, the coast and countryside. Green

BIODIVERSITY

4.93 The NPPF states that Local Planning Authorities should aim to conserve and enhance biodiversity, and sets out how biodiversity issues should be addressed when determining planning applications.

4.94 All new developments will be required to take account of and incorporate biodiversity features at the design stage.

4.95 Conserving biodiversity is not just about protecting rare species and designated nature conservation sites. It also encompasses the more common and widespread species and habitats, all of which make an important contribution to quality of life. The Council will work with partners to conserve and enhance the biodiversity and geological diversity of Adur.

4.96 There are five Biodiversity Opportunity Areas (BOAs) in the district (although some lie outside of the area covered by the Local Plan). These include Shoreham Estuary and Beach, Adur to Newtimber including Mill Hill (South Downs National Park), Central Downs Arun to Adur (South Downs National Park), and Crooked Moon to Thundersbarrow (South Downs National Park). The BOAs are regional priority areas of opportunity for restoration and creation of Biodiversity Action Plan (BAP) habitats and are a spatial representation of the BAP targets and area.

4.97 Coastal squeeze is a particular issue in the south east of England and poses a significant threat to coastal habitats. Over the next twenty years coastal squeeze is likely to result in the loss of a significant amount of intertidal flats and saltmarsh. This is an issue for Adur due to its coastal location, the Adur Estuary SSSI and the compact nature of the district. New development that could result in further coastal squeeze will need to demonstrate how it is addressing this issue.

1.4 Methodology

The assessment was carried out based on the information provided by Folkes Architecture & Design Ltd, following the guidance provided by the Adur District Council Local Plan.

Mitigation and compensation measures were selected based on the guidance provided in the Code for Sustainable Homes Technical Guide, Carbon Trust, Energy Saving Trust, Zero Carbon Hub, Sustainable Design and Construction and CIRIA guides, and other relevant industry literature.

2.0 Sustainability Assessment

The Sustainability Assessment demonstrates how the proposed development will meet the sustainability criteria set by the Adur District Council Local Plan. The assessment is divided into the following key sections:

- **Energy Efficiency**
- **Decentralised energy & combined heat & power**
- **Renewable energy**
- **Water Efficiency**
- **Sustainable Use of Materials**
- **Flooding**
- **Environmental Impact**
- **Adapting to Climate Change**

2.1 Energy Efficiency

Emissions from buildings account for 37% of total UK greenhouse gas emissions. These are made up of 45% direct emissions due to the burning of fossil fuels for heat, and 55% indirect emissions related to electricity use. Factors such as the thermal insulation, air permeability, shading and glazing areas should be carefully considered in the early design stages, as they can be used to reduce heating, cooling and lighting demands.

Key Requirements:

- All developments are to be designed to reduce carbon dioxide emissions by being as energy efficient as is feasible and viable
- Energy strategies are to be designed following the steps set out by the energy hierarchy
- Developments involving 1 or more dwellings and/or 500 sm (gross internal) floorspace or more are required to submit the energy statement which demonstrates how carbon dioxide emissions will be reduced in line with the energy hierarchy

Compliance:

The following hierarchy is applied in the building design:

1. Use less energy
2. Supply energy efficiently
3. Use renewable energy

Figure 4: The Energy Hierarchy

2.1.1 Use Less Energy

The proposed development has been designed to reduce the amount of energy needed by the occupants whilst still maintaining or even improving the comfort conditions. These effects will be achieved by:

- Incorporating systems into design that can make the most of the naturally occurring energy
- Ensuring high thermal performance of the building
- Incorporating energy efficient mechanical systems where required
- Introducing complementary energy-saving measures.

A. Natural systems

The proposed development has been designed to make the most of the sunlight/daylight and thus reduce the energy used for artificial lighting and heating:

- Window openings are sized and positioned to ensure the absolute maximum distribution of light possible and all larger glazed areas are on the North and East elevations in order to assist with the reduction and elimination of higher solar gains.
- The internal layout of the proposed building was designed to make to best of daylight. The rooms utilised less frequently and requiring less light are located in the middle of the building, while rooms requiring daylight, such as retail spaces, have all glazed areas to maximise the use of daylight.
- The building will feature high performance double glazing: Overall 2.2 W/m2K

B. Thermal performance

The thermal performance of the building will be enhanced by:

Applying efficient thermal insulation - a high level of insulation is the most effective way to ensure new buildings are energy efficient. Therefore, the building's floors, walls AND roofs will be insulated as follows:

External Walls	0.35 W/m2K
Roof	0.25 W/m2K
Ground Floor	0.35 W/m2K

Adopting principles of airtight construction and minimising air leakage – the building will be constructed of high efficiency Kingspan cladding. The developer aims to take these specific approaches to minimise air leakage:

- **Jointwork** - care will be taken to make sure all structural movement joints are suitably sealed and that all joints are carefully installed.

- **Windows and door frames** –All installed glazing will be double-glazed.

Using high thermal mass building materials for construction – materials with a high thermal mass e.g. concrete absorb and retain heat produced by the sun. The above ground structure will be made of thermally effective materials, reducing the embodied CO2. The external walls will be constructed with high efficiency materials to maximise thermal insulation. This reduces the need for secondary heating and cooling equipment which has been shown to significantly reduce the CO2 emissions of a dwelling over its nominal lifetime.

C. Other energy efficient measures & technology

Other measures technologies include aimed at reducing energy consumption include:

- Energy-efficient lighting: 100% of all new lighting to be energy efficient (CFLs and LED) will be installed across the building
- Heating controls: Time & temperature zone control
- Energy efficient appliances
- Installation of a 7Kwp PV system to the car showroom
- Installation of a 2.5Kwp PV system to the garden centre extension

2.2 Decentralised Energy & Combined Heat & Power

Decentralised energy is not yet a widely understood term, but broadly refers to energy that is generated off the main grid, including micro-renewables, heating and cooling. It can refer to energy from waste plants, combined heat and power, district heating and cooling, as well as geothermal, biomass or solar energy.

Energy generated by centralised power stations and transmitted through the national grid can be highly inefficient and wasteful. One of the top priorities for reducing CO2 emissions is to reduce the reliance on centralised power stations. This means increasing the use of local, low carbon energy supplies through decentralised energy systems. In 2010, residential, commercial and public sector buildings represented over 40% of UK greenhouse gas emissions; reducing the carbon content of the heat and electricity supplied to these buildings is clearly a vital undertaking in efforts to mitigate climate change. In broad terms, Decentralised Energy is the local or sub-regional supply of heat and electricity from a central source, known as the Energy Centre, to end users via a District Heating network.

Decentralised Energy will play a key role in developing a more sustainable, secure and cost-effective energy supply for London and help target a number of important problems such as climate change and fuel poverty.

CHP generates electricity whilst also capturing usable heat that is produced in this process. This contrasts with conventional ways of generating electricity where vast amounts of heat is simply wasted. In today's coal and gas fired power stations, up to two thirds of the overall energy consumed is lost in this way, often seen as a cloud of steam rising from cooling towers.

By using waste heat, CHP plants can reach efficiency ratings in excess of 80%. This compares with the efficiency of gas power stations, which in the UK which range between 49% and 52%. Coal-fired plant fare less well with an efficiency of around 38%.

2.3 Renewable Energy

In order to reach a significant reduction in CO2 emissions, as well as an improvement in fabric and heating specifications, the addition of 7.5 Kwp of Photovoltaic panels will be installed across the site.

Photovoltaics (PV) is the conversion of light into electricity using semiconducting materials that exhibit the photovoltaic effect, a phenomenon studied in physics, photochemistry, and electrochemistry.

A photovoltaic system employs solar modules, each comprising a number of solar cells, which generate electrical power. PV installations may be ground-mounted, rooftop mounted, wall mounted or floating. The mount may be fixed, or use a solar tracker to follow the sun across the sky.

Solar PV has specific advantages as an energy source: once installed, its operation generates no pollution and no greenhouse gas emissions, it shows simple scalability in respect of power needs and silicon has large availability in the Earth's crust.

Photovoltaic systems have long been used in specialized applications as stand-alone installations and grid-connected PV systems have been in use since the 1990s. Photovoltaic modules were first mass-produced in 2000, when German environmentalists and the Eurosolar organization got government funding for a ten thousand roof program.

Advances in technology and increased manufacturing scale have in any case reduced the cost, increased the reliability, and increased the efficiency of photovoltaic installations. Net metering and financial incentives, such as preferential feed-in tariffs for solar-generated electricity, have supported solar PV installations in many countries. More than 100 countries now use solar PV.

2.4 Water Efficiency

In England, the average person uses about 150 litres of water a day for a range of uses including sanitation, where significant savings are possible. Given that climate projections forecast half as much rainfall in summer in the South East of England by 2080, it is important to build water efficiency into our building stock and minimise the need for major infrastructure enhancements to meet these pressures as well as growing demands. Under these scenarios and with the expected high population growth, unless adaptation interventions are made, deficits are expected to be already widespread by the 2050s. The UK is expected to be in deficit by up to 16% of the total water demand in the 2050s and of up to 29% in the 2080s leading to major impacts on cost and resource levels

Key Requirements:

- The local Council expects all developments to be designed to be water efficient by minimising water use and maximising the re-use of water

Compliance:

The greatest and most cost-effective reductions in water use can be achieved through simple water reduction measures.

In order to reduce water demand, all units will be equipped with water efficient appliances, along with flow regulators to water fixtures, for example:

- Dual flush WCs with a flushing volume of 4/3 litres
- Flow regulators fitted to kitchen and basin taps
- Showers with a flow rate of less than 6 litres/minute

The gardens will be planted and contain native vegetation adapted to local climate conditions and relying on natural rainfall. No water-intensive plant schemes are planned for the site.

A Rainwater Harvesting tank will be utilised for external water supplies only, car washing, garden watering etc.

2.5 Sustainable Use of Materials

Determining the overall environmental impact of construction materials requires an assessment of the lifecycle of each relevant product. This takes into account: durability; energy and other resources used in manufacture; pollution. For each element of a building, the guide provides a rating of 'A+' to 'E* for each of the construction types commonly used to build that element. Materials and construction methods with a rating of 'A+' have the lowest impact in their overall lifecycle compared with alternative construction methods available.

The use of construction products leads to a wide range of environmental and social impacts across the life cycle through initial procurement, wastage, maintenance and replacement. Taken together, construction products make a highly significant contribution to the overall life cycle impacts of a building. In some cases, they may even outweigh operational impacts (such as energy consumption).

Most construction products involve long and complex supply chains that result in a wide range of impacts locally and globally. These might include environmental (e.g. toxicity or biodiversity), economic (e.g. corruption) or social (e.g. slave labour, equality) issues and can occur during the extraction, processing, manufacturing or supply chain stages. The increasing globalisation of supply chains increases the difficulty of tracing the supply chain and mitigating negative impacts caused by it.

Key Requirements:

- Reduce waste by firstly re-using your building, where this is not possible you should implement the waste hierarchy
- All developments should aim for at least 10% of the total value of materials used to be derived from recycled and reused sources.
- Source your materials legally and responsibly and ensure they are safe to health

Compliance:

In line with the waste hierarchy, during any required demolition phase, the developer is committed to take the following approach:

1. Prioritise on site reuse of demolition materials
2. Recycle materials on site, then off site
3. Disposal to landfill

Likewise, during the construction phase, the following approach will be taken:

1. The use of reclaimed materials
2. The use of materials with high levels of recycled content
3. The use of new materials

The waste arising from new construction will be minimal due to economical use of construction materials (e.g. length of timber is right size and doesn't need cutting) and carefully planned deliveries to the site in order to avoid oversupply. The construction site will be supplied with labelled waste skips.

Figure 11: The Waste Hierarchy

All other materials used in construction will be specified using BRE Green Guide to assure the best environmental performance.

All timber used for construction will be certified by Forest Stewardship Council (FSC) or by The Programme for the Endorsement of Forest Certification (PEFC). The developer is aimed to source certified timber locally (within 35 miles from the site) to reduce energy costs and related CO2 emissions associated with transport.

No products containing Volatile Organic Compounds (VOCs) will be used on site.

Detailed information of the selection of the construction materials will be provided in the separate 'Design and Access Statement' and 'Construction Management Plan.'

2.6 Flooding

Key Requirements:

- All developments are required to prevent or mitigate against flooding
- All developments are expected to manage drainage and surface water
- All developments are expected to manage drainage and surface water on-site or as close to the site as possible, using Sustainable Drainage Systems (SUDS)

Compliance:

In order to prevent the risk of flooding, the developer will implement Sustainable Urban Drainage Systems (SUDS), following the recommended by the Council hierarchy:

1. Use infiltration techniques
2. Collect and store rainwater in ponds or open water features for gradual release
3. Collect and store rainwater in tanks or sealed water feature for gradual release
4. Discharge water direct to a watercourse
5. Discharge rainwater to a surface water sewer/drain
6. Discharge water to the combined sewer

The ground under the building is adaptable to both solid and permeable construction; therefore, installation of permeable grounding will be considered for the majority of the development, although where not feasible, a solid and tarmacked area will be installed where required ie the external car park.

The reduction in water run-off will be achieved though vegetation in the large garden areas, green wall along the garden perimeter and the installation of the rainwater harvesting tank.

2.7 Environmental Impact

Conserving habitats and biodiversity are important for life on earth. It supports the variety of living organisms on the planet as well as the interdependence that exists between them. Development and landscape management can have a significant impact on the broader environment that it supports and can have a potentially positive impact on ecological value. Therefore, it is important to understand the existing ecological value and condition of sites and where possible, use of land that has low value and strive to minimise damage where this is not practical. It is also important to make decisions and take actions that support and, where possible, enhance the ecological value of the site and surrounding areas.

A variety of construction product environmental claims are offered by manufacturers, other industry sources and in guidance, but the results presented are often inconsistent and therefore, not suitable for making comparisons. In addition, even comparable information is difficult for a non-specialist to understand. Such information will often be biased towards presenting the benefits of a construction product and avoid or reduce the emphasis on negative impacts. This risks designers, clients and constructors being misled by the information provided, leading to incorrect decisions being taken that could result in increased environmental impacts. As a result, available information can often be misleading to designers and specifiers.

2.8 Adapting to Climate Change

Climate change refers to the change in global temperature caused via the greenhouse effect by the release of "greenhouse gases" such as carbon dioxide by human activity. There is now scientific consensus that the increase in these emissions is having a noticeable effect on climate. Raised global temperature is expected to cause climatic disturbance, desertification, rising sea levels and spread of disease.

Key Requirements:

- All development is expected to consider the impact of climate change and be designed to cope with the anticipated conditions
- All development should consider how it can be occupied in the future when the weather will be different

Compliance:

Adaptation to warmer temperatures:

- Native plants and vegetation will be introduced to the development to take advantage of their cooling evaporative effect. The green wall made of native climbing species will be installed on site. Additionally, climbing species will be introduced alongside the garden perimeter where possible.
- The building will incorporate carefully selected and designed shading measures to prevent the overheating of the building and the reliance on artificial cooling.

Insulation: construction materials are selected to prevent penetration of heat. The building's floors, walls, party walls and flat roofs will be equipped with adequate insulation.

Thermal materials: materials with high thermal storage and capacity will be selected to absorb heat during hot periods, which can be then dissipated during colder periods.

The most important aspect of an insulation material is its performance – that it consistently provides the designed-for resistance to the passage of heat throughout the lifetime of the building. Though the insulation manufacturer's published performance expectations will be an essential guide, other factors associated with the 'real-life' installation of the material need to be considered as part of the design process.