

Sustainability, Energy & Climate Change Strategy (Turley)



Sustainability, Energy & Climate Change Strategy

Silfield Garden Village

March 2020

Turley
Sustainability

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Orbit Homes is committed to delivering a new settlement at Silfield Garden Village which demonstrates exemplar sustainability, energy and climate change performance including net zero carbon to create a long-term legacy for both the existing and new local community.

Silfield Garden Village

Net Zero Carbon Vision

Orbit Homes proposes the delivery of a new community at Silfield Garden Village with exemplar sustainability, energy and climate change performance - including net zero carbon. This will support the Greater Norwich Development Plan (GNDP) vision and objectives for integrated economic and housing growth which minimises environmental impacts and promotes net sustainability benefits.



Renewable Energy

The new homes and other buildings at Silfield Garden Village will feature high levels of energy efficiency together with integrated low carbon and renewable energy technologies such as heat pumps and solar panels. A solar farm is also proposed to further enhance energy and carbon performance and provide potential opportunity for community investment and ownership.



Low Carbon Transport

Silfield Garden Village has the opportunity to facilitate a genuine and significant modal shift towards sustainable and low carbon transport modes such as walking, cycling, bus, rail and Electric Vehicles. Digital infrastructure will help minimise the need to travel through enabling remote and home working.



Embodied Carbon

Carbon emissions during construction will be assessed and reduced through appropriate materials selection and specification including potential opportunities to utilise modern methods of construction (MCC) and/or off-site fabrication.



Low Energy Infrastructure

To reduce energy and carbon emissions in use, the development will include low energy infrastructure such as LED street lighting and energy efficient appliances. Control and good management practice will be employed to further reduce unregulated energy consumption on site.



Woodland Creation

The masterplan provides extensive areas of green infrastructure including approximately 15 hectares of new woodland. The opportunity exists to utilise some of this woodland planting for local carbon offsetting for example via the Woodland Carbon Code.



Sustainable Homes

All new homes at Silfield Garden Village will be designed to meet and exceed new national standards including the Future Homes Standard. As well as being energy efficient and water efficient, the dwellings will be designed to provide high quality, healthy and comfortable indoor environments with due consideration of daylight, air quality and natural ventilation.

Silfield Garden Village

A Sustainable Community

Silfield Garden Village will be a highly sustainable new community which responds to environmental imperatives beyond climate change. Biodiversity, sustainable transport, sustainable water management and health & wellbeing will all be promoted through high-quality design.



Biodiversity Protection & Enhancement

Existing watercourses, hedgerows, trees and other features will be retained and incorporated into the development wherever feasible. Biodiversity net gain will be targeted through the retention of existing features wherever possible and the use of native and Biodiversity Action Plan species as part of the extensive landscaping proposed across the masterplan.



An Accessible Location

The Silfield Garden Village site has excellent strategic transport connections, located adjacent to the A11 providing direct links to Norwich and Cambridge and close to Wymondham town centre, Bus Interchange and Railway Station by sustainable travel modes including bicycle and on foot.



Sustainable Transport

The Garden Village will enjoy strong connections to the wider area with excellent pedestrian, cycle and public transport links including a Green way to Wymondham town centre supporting the town's role as a sustainable transport hub. The proposed scale of development will support local facilities and sustainable infrastructure, thereby promoting self-containment in accordance with Garden Village principles



Reducing the Risk of Overheating

Extensive green and blue infrastructure and careful building design and orientation will be used to mitigate the urban heat island effect and reduce potential summertime overheating risk.



Flood Risk and Surface Water Drainage

A network of minor drains and watercourses traverse the site which will be incorporated into the sustainable drainage system (SuDS). As well as managing surface water run-off and providing flood protection, these features will be integrated with the landscape to provide additional benefits to wildlife and the community including enhanced amenity and biodiversity.



Water Efficiency

Water efficiency measures such as water meters, dual flush WCs, aerated taps, flow controlled showers and water butts will contribute to achieving low water consumption rates below the national standards set by Building Regulations Part G

1. Introduction

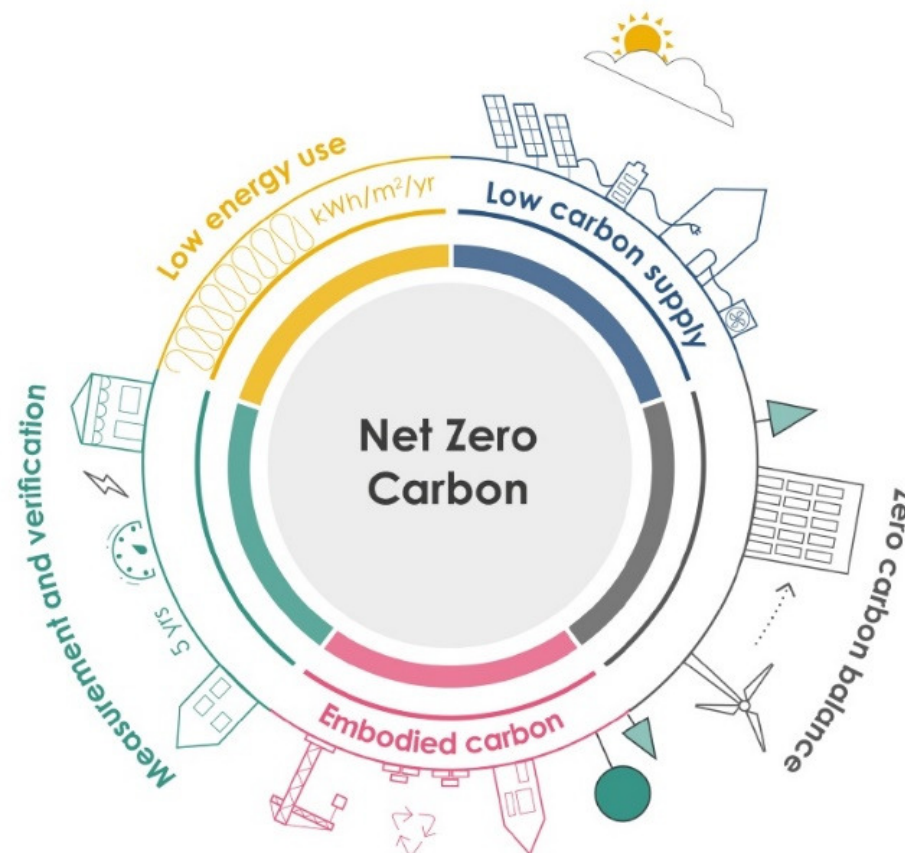
This Sustainability, Energy & Climate Change Strategy sets out the range of measures that will be incorporated into the Silfield Garden Village proposals to ensure exemplar sustainability, energy and climate change performance including net zero carbon.

1.1 Introduction

This Sustainability, Energy & Climate Change Strategy has been prepared by Turley Sustainability on behalf of Orbit Homes and Bowbridge Strategic Land. It supports representations to the Regulation 18 Greater Norwich Local Plan consultation and sets out the range of measures proposed as part of Silfield Garden Village to ensure exemplar levels of sustainability, energy and climate change

performance. This includes targeting net zero carbon in accordance with the UK Green Building Council Net Zero Carbon Buildings Framework (see **Figure 1**).

Figure 1: Net Zero Carbon Buildings [UKGBC/LEI]



The UK has committed to become net zero carbon by 2050, the world's first major economy to do so. This target is legally-binding under the Climate Change Act, resulting in substantial new national policy and regulations that seek to drive down emissions in pursuit of this goal.

The Future Homes Standard 2025, for example, proposes a 75-80% reduction in CO₂ emissions relative to homes built today. These future homes will feature low carbon heating and benefit from the significant ongoing decarbonisation of the UK electricity grid.

At the local level, public and political climate change concern has increased significantly, with Norwich City Council declaring a climate emergency in January 2019. The Greater Norwich Development Plan (GNDP) Joint Core Strategy spatial vision rightly recognises that zero carbon will be the standard to be achieved for new development through advances and innovation in the design, construction and management of sustainable communities.

The vision for Silfield Garden Village is to combine the proposed scale of development with the master developer approach and patient capital delivery model to exceed these national standards and target net zero carbon.

This performance can be achieved through enhanced building fabric performance, optimised building-integrated low and zero carbon energy technology, together with the significant opportunities presented by the masterplan such

as significant zero carbon power generation (and potentially also storage) via a solar farm, and potential carbon offset opportunities via substantial woodland creation.

Construction carbon will be reduced through the use of natural and lower carbon materials where feasible, potentially also use of modern methods of construction (MMC) and/or off-site fabrication.

The sustainability, energy and climate change strategy set out in the Statement seeks not only to deliver net zero, but also to holistically meet other key outcomes including: high quality and healthy internal and external environments; resilience to climate change impacts such as flood, heat and drought; sustainable transport and modal shift, and; biodiversity protection, enhancement and net gain.

1.2 Application Site

The proposed Site of Silfield Garden Village occupies approximately 451 hectares of predominantly agricultural land to the south of the town of Wymondham, South Norfolk. It is located around 13 km south-east of central Norwich straddling the A11 and within easy reach of two railway stations at Wymondham and Spooner Row.

The Site comprises arable field enclosures extending from the urban edge of Wymondham to Bays River in the west. It is well located for a range of sustainable transport modes, being 1km

from Wymondham town centre and bus interchange, and within walking and cycling distance of the railway station.

1.3 Development Proposals

A new community of around 6,500 homes is envisaged; a level of growth that will support the provision of new on-site primary and secondary schools, local employment and local centres. These uses will be supported with extensive integrated green and blue infrastructure including substantial new woodland, pedestrian and cycle infrastructure including a greenway, and a solar farm.

The Illustrative Masterplan for Silfield Garden Village is presented in **Figure 2**.

1.4 Document Structure

Chapter 2 of this document sets out the existing and emerging planning policy context for the Silfield Garden Village proposals in relation to sustainable development at the national, Greater Norwich and South Norfolk levels.

Chapter 3 reports the proposed sustainability, energy and climate change strategy for Silfield Garden Village.

Chapter 4 summarises key aspects of the measures detailed in Chapter 3 and the related benefits of allocating the land for a Garden Village as a spatial development solution to meeting the needs of the GNDP Area.

Figure 2: Illustrative Masterplan [DLA]



2. Planning Policy Context

2.1 Introduction

This Chapter summarises the planning policy context and related guidance for Silfield Garden Village in relation to sustainability, energy and climate change at the national, Greater Norwich and South Norfolk levels.

2.2 National Policy

Planning policy is set at the national level by the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG) as summarised below.

2.2.1 National Planning Policy Framework

Most recently updated in February 2019, the **National Planning Policy Framework (NPPF)**¹ sets out the Government's planning policies for England.

NPPF paragraph 7 states *“the purpose of the planning system is to contribute to the achievement of sustainable development”*.

The planning system is required to jointly perform three objectives aligned to the ‘three pillars’ of sustainability (see **Figure 3**) as follows:

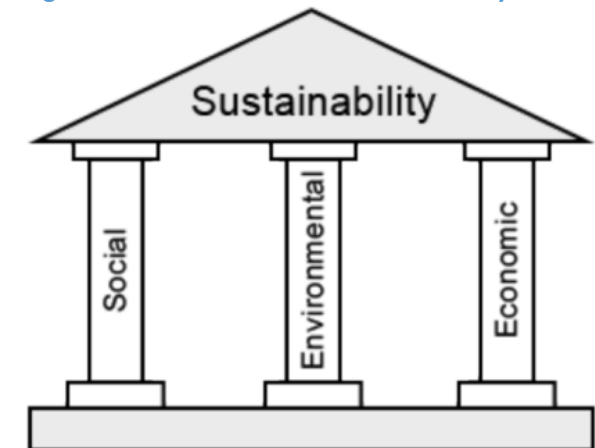
An **economic** objective to build a strong and competitive economy by ensuring sufficient land of the right type is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

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

An **environmental** objective to protect and enhance our natural, built and historic environment; help to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate

change as we transition to a low carbon economy.

Figure 3: The ‘Three Pillars’ of Sustainability



The focus of this document is the environmental aspects of sustainable development.

¹<https://www.gov.uk/government/collections/revised-national-planning-policy-framework>

2.2.2 Planning Practice Guidance

Most recently updated in October 2019, **Planning Practice Guidance (PPG)**² underpins policies within the NPPF and provides guidance on their implementation. As such PPG is a material consideration in planning decisions and should generally be followed unless there are clear reasons not to do so.

2.2.2.1 National Design Guide

The **National Design Guide**³ published in October 2019 forms part of the PPG. It sets out the characteristics of well-designed places and explains what good design means in practice.



The guide explains how well-designed places and buildings conserve natural resources including land, water, energy and materials. Their design also responds to the impacts of climate change such as rising temperatures and increased flood risk, whilst contributing to climate change mitigation through greenhouse gas (GHG) emissions reduction during both construction and operation.

2.3 Climate Change Act

The **Climate Change Act 2008**⁴ is the basis for the UK's approach to tackling and responding to climate change. It requires that emissions of carbon dioxide and other greenhouse gases are reduced and that climate change risks are prepared for.

In June 2019 the Government amended the Act to set a new legally binding target of net zero carbon emissions by 2050, the world's first major economy to do so.

2.4 Future Homes Standard

Whilst not planning policy, the proposed **Future Homes Standard**⁵ will have significant implications to the design, construction and operation of new dwellings from 2025 when the standard is scheduled to come into effect and

construction of Silfield Garden Village is anticipated to commence.

The 2019 Spring Statement included a commitment that, by 2025, Government will introduce a Future Homes Standard for new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency. The Future Homes Standard builds on the Grand Challenge Buildings Mission to at least halve the energy use of new buildings by 2030⁶.

The Future Homes Standard will have very high fabric standards and will mean that every new home will typically have triple glazing and standards for walls, floors and roofs that significantly limit heat losses.

In order to meet the UK's net zero emissions target by 2050, low carbon heating systems will also be required – for example heat pumps or district heating rather than gas boilers.

A new typical semi-detached home built to meet the Standard is anticipated to reduce operational carbon emissions by 75-80% compared to current (2013) Building Regulations Part L standards.

To achieve this performance, new homes built to the Future Homes Standard will typically have a heat pump, a waste water heat recovery system,

²<https://www.gov.uk/government/collections/planning-practice-guidance>

³<https://www.gov.uk/government/publications/national-design-guide>

⁴<http://www.legislation.gov.uk/ukpga/2008/27/contents>

⁵https://www.south-norfolk.gov.uk/sites/default/files/Development_Management_Policies_Document_0.pdf

⁶<https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/industrial-strategy-the-grand-challenges>

solar PV, triple glazing and minimum standards for walls, floors and roofs.

The Future Homes Standard will be set in performance terms (for example minimum levels of primary energy and carbon emissions, limiting fabric standards and building services standards) without prescribing the technologies to be used in order to allow housebuilders the flexibility to innovate and select the most practical and cost-effective solutions in particular circumstances.

As the national electricity grid continues to decarbonise, homes built to the Future Homes Standard will become net zero carbon over time with no need for further adaptations or changes, as they will not be reliant on fossil fuels for their heating.

2.5 The Environment Bill 2020

The Environment Bill was originally introduced into parliament on 15 October 2019 and sets out how Government plans to protect and improve the UK's natural environment. The **January 2020 Environment Bill Policy Statement**⁷

Acting as one of the key vehicles for delivering the bold vision set out in the 25 Year Environment Plan, the Environment Bill brings about urgent and meaningful action to combat the environmental and climate crisis.

⁷<https://www.gov.uk/government/publications/environment-bill-2020/30-january-2020-environment-bill-2020-policy-statement>

⁸https://www.south-norfolk.gov.uk/sites/default/files/JCS_Adopted_Version_Jan_2014.pdf

It sets an ambitious domestic framework for environmental governance as we leave the European Union and is a first step in the delivery of the Government's commitment to be the first generation to leave our environment in a better state.

The Environment Bill introduces among other things a mandatory requirement for biodiversity net gain in the planning system. This seeks to ensure that new developments enhance biodiversity and create new green spaces for local communities to enjoy.

Integrating biodiversity net gain into the planning system will provide a step change in how planning and development is delivered. The Bill will provide new opportunities for innovation as well as stimulating new economic markets. This is expected to result in the creation and the avoidance of loss of several thousands of hectares of habitat for wildlife each year.

This will also increase the public benefits of ecosystems such as improvements in air quality, water flow control, outdoor recreation and physical activity.

The Environment Bill will enable landowners to make long term commitments to conservation through 'conservation covenants' - voluntary but legally-binding agreements between a landowner and a 'responsible body', such as a conservation

charity, to fulfil conservation objectives for the public good.

2.6 Greater Norwich Development Partnership (GNDP)

2.6.1 Joint Core Strategy for Broadland, Norwich and South Norfolk, GNDP (2014)

The **Joint Core Strategy (JCS)**⁸ for Broadland, Norwich and South Norfolk has been prepared by these Council's working together with Norfolk County Council as the Greater Norwich Development Partnership (GNDP).



The JCS sets out the long-term vision and objectives for the area, including strategic policies for steering and shaping development. It identifies broad locations for new housing and employment growth and changes to transport infrastructure and other supporting community facilities.

The JCS recognises that growth in new homes and jobs will be centred in and around Norwich and, whilst brownfield sites will be used wherever possible, developing green fields in Broadland and South Norfolk is unavoidable.

The **spatial vision** of the JCS is for the extended communities of Broadland, Norwich and South Norfolk to be strong, cohesive, creative and forward looking and with at least 36,820 new homes built by 2026. Regarding climate change and sustainability, the JCS spatial vision states:

- regeneration, development and growth will create sustainable places and revitalise areas of deprivation, while minimising the use of global resources, supporting the development of good waste management practices, maximising the use of brownfield land and mitigating and adapting to the effects of climate change;
- people will use less water, the quality of water resources and the aquatic environment will be maintained or improved, and the risk of flooding will be avoided or mitigated;

- zero carbon development will be the standard to be achieved through advances and innovation in the design, construction and management of sustainable communities and new buildings which improve energy efficiency and use renewable energy; and
- a network of green links will connect existing open space and wildlife habitats across urban areas and the countryside, and link to neighbouring areas outside the JCS including the Broads.

Several JCS spatial objectives are of direct relevance to this Sustainability Strategy. **Spatial Objective 1** is to minimise the contributors to climate change and address its impact. High standards of design and sustainable access will be promoted to reduce greenhouse gases and adapt to the impact of climate change. Zero and low -carbon developments will be encouraged.

Water efficiency will be a priority in both new and existing development. New development will be guided away from areas with a high probability of flooding.

Objective 9 meanwhile is to protect, manage and enhance the natural, built and historic environment, including key landscapes, natural resources and areas of natural habitat or nature conservation value.

The area is a special place and it is a priority to maintain and improve these special qualities so that everyone can enjoy them.

The scale of development that needs to be accommodated will require the development of some significant greenfield areas, which will affect the existing landscape. Where this is necessary, development must provide environmental gains through green infrastructure, including allotments and community gardens.

Biodiversity, geodiversity and locally distinctive landscapes will be protected and enhanced. Linkages between habitats will be promoted, helping to enable adaptation to climate change. Sustainable access to the countryside will be promoted. Efficient use will be made of minerals, energy and water resources, and the production of waste will be minimised.

Policy 1: Addressing climate change and protecting environmental assets

To address climate change and promote sustainability, all development will be located and designed to use resources efficiently, minimise greenhouse gas emissions and be adapted to a changing climate and more extreme weather. Development will therefore:

- be energy efficient;
- provide for recycling of materials;
- use locally sourced materials wherever possible;

- be located to minimise flood risk, mitigating any such risk through design and implementing sustainable drainage;
- minimise water use and protect groundwater sources;
- make the most efficient appropriate use of land, with the density of development varying according to the characteristics of the area, with the highest densities in centres and on public transport routes;
- minimise the need to travel and give priority to low impact modes of travel;
- be designed to mitigate and be adapted to the urban heat island effect in Norwich; and
- improve the resilience of ecosystems to environmental change.

The environmental assets of the area will be protected, maintained, restored and enhanced and the benefits for residents and visitors improved.

Development and investment will seek to expand and link valuable open space and areas of biodiversity importance to create green networks. Where there is no conflict with biodiversity objectives, the quiet enjoyment and use of the natural environment will be encouraged and all proposals should seek to increase public access to the countryside.

All new developments will ensure that there will be no adverse impacts on European and Ramsar

designated sites and no adverse impacts on European protected species in the area and beyond including by storm water run-off, water abstraction, or sewage discharge.

They will provide for sufficient and appropriate local green infrastructure to minimise visitor pressures. Development likely to have any adverse effect on nationally designated sites and species will be assessed in accordance with national policy and legislation.

In areas not protected through international or national designations, development will:

- minimise fragmentation of habitats and seek to conserve and enhance existing environmental assets of acknowledged regional or local importance. Where harm is unavoidable, it will provide for appropriate mitigation or replacement with the objective of achieving a long term maintenance or enhancement of the local biodiversity baseline;
- contribute to providing a multifunctional green infrastructure network, including provision of areas of open space, wildlife resources and links between them, both off site and as an integral part of the development;
- help to make provision for the long term maintenance of the green infrastructure network; and

- protect mineral and other natural resources identified through the Norfolk Minerals and Waste Development Framework.

Policy 2: Promoting good design

All development will be designed to the highest possible standards, creating a strong sense of place. In particular development proposals will respect local distinctiveness including as appropriate:

- the historic hierarchy of the city, towns and villages, maintaining important strategic gaps;
- the landscape setting of settlements including the urban/rural transition and the treatment of 'gateways';
- the landscape character and historic environment, taking account of conservation area appraisals and including the wider countryside and the Broads area;
- townscape, including the city and the varied character of our market towns and villages;
- provision of landscaping and public art;
- the need to ensure cycling and walking friendly neighbourhoods by applying highway design principles that do not prioritise the movement function of streets at the expense of quality of place;
- the need to increase the use of public transport, including through 'public transport oriented design' for larger development;

- designing out crime;
- the use of sustainable and traditional materials; and
- the need to design development to avoid harmful impacts on key environmental assets and, in particular SACs, SPAs and Ramsar sites

This will be achieved by ensuring that:

- major development areas providing over 500 dwellings or 50,000 sqm of non-residential floorspace, and areas of particular complexity will be masterplanned using an inclusive, recognised process demonstrating how the whole scheme will be provided and ensuring that it is well related to adjacent development and infrastructure;
- all residential development of 10 units or more will be evaluated against the Building for Life criteria published by CABI (or any successor to this standard), achieving at least 14 points (silver standard);
- Design and Access Statements for non-residential development will show how the development will meet similar high standards.

Policy 3: Energy and water

Energy

Development in the area will, where possible, aim to minimise reliance on non-renewable high-carbon energy sources and maximise the use of decentralised and renewable or low-carbon

energy sources and sustainable construction technologies. To help achieve this:

- all development proposals of a minimum of 10 dwellings or 1,000sqm non-residential floorspace will be required (a) to include sources of decentralised and renewable or low-carbon energy providing at least 10% of the scheme's expected energy requirements and (b) to demonstrate through the Design and Access Statement for the scheme whether or not there is viable and practicable scope for exceeding that minimum percentage provision;
- detailed proposals for major developments (minimum of 500 dwellings or 50,000 sqm non-residential floorspace) will be required to demonstrate through the Design and Access Statement that the scheme has seized opportunities to make the most of any available local economies of scale to maximise provision of energy from sources of 'decentralised and renewable or low carbon energy sources';
- all development proposals of a minimum of 10 dwellings or 1,000 sqm non-residential floorspace will be required to demonstrate, through the Design and Access Statement, that all viable and practicable steps have been taken to maximise opportunities for sustainable construction

Provision will be made for strategic enhancement of the electricity and gas supply networks to support housing and employment growth. This will include major investment in existing electricity substations.

Water

The release of land for development will be dependent on there being sufficient water infrastructure to meet the additional requirements arising from the new development and to ensure that water quality is protected or improved, with no significant detriment to areas of environmental importance. This will be achieved by greater efficiency and by providing infrastructure, including strategic interceptor sewers, to address environmental and capacity constraints at strategic wastewater treatment works and at local works. This water infrastructure will be upgraded as required and be operational in time to meet the demands of any development.

To ensure all housing is water efficient, new housing development must reach Code for Sustainable Homes Level 4 for water on adoption of this document and developments of over 500 dwellings must reach Code Level 6 by 2015. All other development should also seek to maximise water efficiency.

Policy 10: Locations for major new or expanded communities in the Norwich Policy Area

Major growth in various locations including Wymondham will be masterplanned as attractive, well serviced, integrated, mixed use development using a recognised design process giving local people an opportunity to shape development.

Development will achieve the highest possible standards of design and aim to address current service and infrastructure deficiencies to benefit existing communities. In addition each major development location will:

- deliver healthy, sustainable communities with locally distinctive design and high quality green infrastructure within the development and contributing to the surrounding network;
- provide for a wide range of housing need including giving serious consideration to the provision of sites for Gypsies and Travellers;
- seek to achieve a high level of self-containment through the provision of services to support the new development while integrating well with neighbouring communities;
- achieve a major shift away from car dependency and be designed around walking

and cycling for local journeys and public transport for longer journeys;

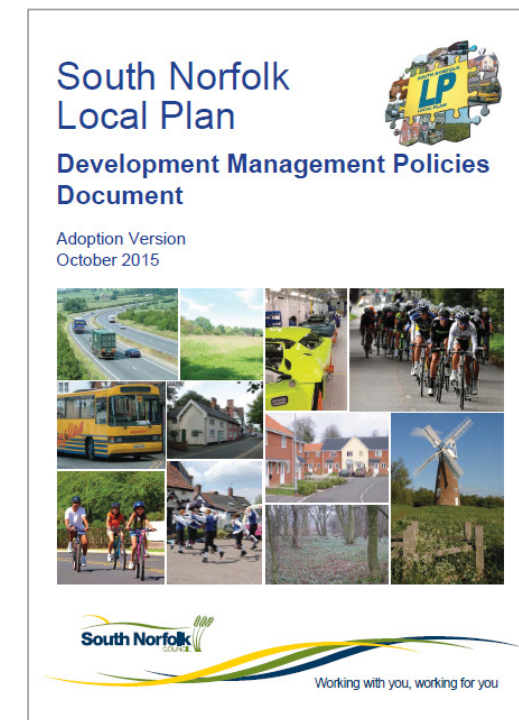
- include Sustainable Drainage Systems (SuDS), on site or nearby renewable energy generation, for example largescale wind turbines/farms and biomass fuelled Combined Heat Power and Cooling (CHPC), and water saving technologies;
- include new or expanded education provision addressing the needs of the 0-19 age range, local retail and other services, community, police and recreational facilities, small-scale employment opportunities and primary healthcare facilities; and
- ensure high quality telecommunications and adequate energy supply and sewerage infrastructure.

The developers of major Strategic Growth Locations will be required to ensure there is an ongoing commitment to support community development throughout the period until the development is completed.

2.7 South Norfolk Council

2.7.1 South Norfolk Local Plan Development Management Policies Document (October 2015)

South Norfolk Council's Local Plan Development Management Policies Document (October 2015)⁹ policies are a material consideration in how the Council will promote sustainable development and determine planning applications.



⁹https://www.south-norfolk.gov.uk/sites/default/files/Development_Management_Policies_Document_0.pdf

Policy DM 1.1 Ensuring development management contributes to achieving sustainable development in South Norfolk

a) The Council will take a positive approach that reflects the presumption in favour of sustainable development.

b) The Council will work proactively with applicants to find solutions so that development proposals can be approved wherever possible, and to secure development that jointly and simultaneously improves the economic, social and environmental conditions in the area.

c) Planning applications that accord with the policies in this Local Plan (and, where relevant, with policies in adopted neighbourhood plans) will be approved without unnecessary delay, unless material considerations indicate otherwise.

d) Where there are no directly relevant Policies to the application or the relevant policies are out of date at the time of making the decision, then the Council will consider the impact of the proposal in each of the economic, social and environmental dimensions jointly and simultaneously, for now and in the future. The Council will grant permission unless material considerations indicate otherwise – taking account of whether any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits when assessed against:

- i. The policies in the National Planning Policy Framework taken as a whole or
- ii. Other national planning policy guidance or iii. The Council's overall Spatial Vision and Objectives for the area as set out in the Joint Core Strategy.

e) The Council will give significant weight to supplementary guidance and community led plans where these are relevant.

Policy DM 1.4 Environmental quality and local distinctiveness

a) The Council will work with developers to achieve high quality and positive environmental improvement. All development proposals must demonstrate an understanding and evaluation of the important environmental assets including locally distinctive characteristics, and justify the design approach.

b) Designated assets will be protected in accordance with their natural and historic significance, as detailed in the Development Management Policies.

c) A net environmental improvement will be sought and all proposals should avoid environmental harm or where this is not possible, adequately mitigate and compensate for the adverse environmental effects of development.

d) All development should take all reasonable opportunities to:

- i. Make a positive contribution to local character and distinctiveness;
- ii. Enhance biodiversity to achieve a net gain for nature;
- iii. Improve the resilience of ecosystems to environmental change including through the provision of improvements to enhance identified environmental sites; stepping stones and corridors;
- iv. Protect environmental and water resources and enhance their efficient use;
- v. Deliver the provision of essential infrastructure including water and wastewater network upgrades, waste facilities', flood defences and green infrastructure;
- vi. Enhance, re-use and better reveal the significance of heritage assets;
- vii. Re-use buildings rather than demolish, recycle building materials and select materials to maximise environmental sustainability and minimise impact on scarce resources and environment;
- viii. Generate and utilise renewable energy in appropriate ways; and
- ix. Work with the characteristics of the location to ensure that the necessary mitigation measures are not

disproportionate to the benefits of the scale of development proposed.

Policy DM 3.8 Design Principles applying to all development

- (1) The Council will work with applicants to achieve high quality design and positive improvement, protect and enhance the environment and existing locally distinctive character and encourage innovation;
- (2) Major development should be masterplanned using an inclusive recognised process demonstrating how the whole scheme will be delivered and related to adjacent areas, including the programming of infrastructure requirements. A masterplan will also be required for sites of less than 500 dwellings in the case of large developments incorporated into a smaller settlement or on sites of particular complexity.
- (3) Dwellings should be designed so that internal spaces are suitable, adaptable and will be able to accommodate a range of residents over time.
- (4) Planning permission will be granted for development that has been designed to, where relevant to the proposed development: respect adjoining structures, spaces, routes and local landscape; provide an attractive, accessible and safe environment; and conform to the following criteria:
 - a) The scale, height, massing, form and appearance of development is designed with a satisfactory relationship of structures,

spaces and routes within the site and a successful integration into the surroundings;

- b) The development is created with high standards of design, building materials, finishes and landscaping reflecting the use of distinctive local building traditions, materials and heritage assets where relevant; or innovative contemporary design solutions reflecting local context and reinforcing or creating local distinctiveness;
- c) Access is provided by routes and public spaces that meet different requirements of accessibility (including pedestrians, cyclists and people with mobility or sensory difficulties) without an unsatisfactory domination of traffic;
- d) A clear distinction is made between public and private spaces within the site; all public and private spaces to be suitable for their purpose, attractive, landscaped, safe; and with adequate lighting where provided that is carefully controlled to minimise overspill;
- e) Visually attractive frontages and hard & soft boundary treatments are created to adjoining streets and public areas, public spaces and the open countryside; all appropriate frontages to contain windows and doors that assist informal surveillance of the public realm by occupants of the site;
- f) Buildings and spaces are orientated to: gain benefit from sunlight and passive solar

energy and wherever possible designed around a Sustainable Drainage system;

- g) The entire development is designed to reduce any actual or perceived opportunities for anti-social activity on the site and in the surrounding area;
- h) Landscaping of the development is designed to retain important existing natural features, reflect the surrounding landscape characteristics of the area and contribute to relevant objectives of the local Biodiversity Action Plan; and
- i) Convenient, safe and visually attractive areas are created for servicing buildings and parking of vehicles and cycles without dominating the development or surroundings.

Policy DM 3.10 Promotion of sustainable transport

- (1) All development should support sustainable transport and development objectives, utilise all opportunities to integrate with local sustainable transport networks, be designed to reduce the need to travel and to maximise the use of sustainable forms of transport appropriate to the location.
- (2) Inside the Norwich Policy Area development should support the proposals of the Norwich Area Transportation Strategy.

(3) Land required for the improvement of the transport network will be protected from prejudicial development.

Policy DM 3.14 Pollution, health and safety

- a) All development should minimise and where possible reduce the adverse impact of all forms of emissions and other forms of pollution, and ensure that there is no deterioration in water quality or water courses.
- b) When assessed individually or cumulatively, development proposals should ensure that there will be no unacceptable impacts on:
- i. Air quality
 - ii. Surface and ground water quality
 - iii. Land quality and condition
 - iv. Health and safety of the public
- c) Permission will only be granted on or near contaminated land if it is subject to remediation which will make it safe for the proposed use. On a contaminated site or one suspected to be contaminated or within 250 metres (or on more if considered appropriate on a risk based approach) of an existing or disused landfill site, applications will need to be accompanied with an assessment of the extent of contamination on the site and any possible risks.
- d) Developments which may impact on air quality will not be permitted where they have an unacceptable impact on human health, sensitive

designated species or habitats, and general amenity, unless adequate mitigation can be ensured.

Development will not be granted in locations where it is likely to result in an Air Quality Management Area being designated or the worsening of air quality in an existing Air Quality Management Area.

e) Permission will not be granted for development on or in the vicinity of hazardous installations including high pressure gas and oil pipelines unless the development would not give rise to additional public risk.

Policy DM 4.1 Renewable Energy

Proposals for renewable energy generating development requiring planning permission other than for proposals for wind energy development will be supported and considered (taking account of the impact of relevant ancillary equipment) in the context of sustainable development and climate change on the wider environmental, social and economic benefits of maximising use of renewable energy.

The Council will encourage the use on-site communal-scale energy generation measures.

(1) The effect of the proposal will be considered on:

- a) The effect on the character and appearance of the landscape;

- b) Designated and undesignated heritage assets; and
- c) The amenities and living conditions of nearby residents by way of noise, outlook, and overbearing effect or unacceptable risk to health or amenity by way of other pollutants such as dust and odour.

Policy DM 4.2 Sustainable drainage and water management

(1) Sustainable drainage measures must be fully integrated within design to manage any surface water arising from development proposals, and to minimise the risk of flooding on the development site and in the surrounding area, unless it can be demonstrated that ground conditions are unsuitable for such measures or there are other exceptional circumstances.

(2) Drainage features should make a positive contribution to amenity and biodiversity.

(3) All developments (including that on previously developed land):

- a) Should include a sewerage capacity assessment and must have a neutral or positive impact on reducing surface water flooding and should include drainage features that will slow the movement of water through the drainage system;
- b) Must not cause any deterioration in water quality and measures to treat surface

water runoff must be included within the design of the drainage system;

- c) Must be served by separate surface water and foul wastewater drainage. No new development (including redevelopment) will be permitted to discharge surface water runoff to foul drainage connections or combined sewers, unless it can be demonstrated that separate surface water drainage is not available and cannot be practicably provided; and
- d) Should maximise use of soft landscaping and permeable surfaces unless the developer can provide justification to demonstrate that this is not feasible.

Policy DM 4.3 Facilities for the collection of recycling and waste

(1) All new developments should ensure that sufficient facilities are available for each property to simply store and dispose of their recycling and waste and is well integrated into the design of the development. Provision must be made for the permanent, on-site storage of the designated receptacles and then their removal and return for collection.

(2) Waste management facilities provided for any residential development should be accessible for all residents and designed to maximise the diversion of waste from landfill and promote recycling, including the provision of accessible

community collection points for the collection of additional materials.

(3) Residential development should include space for waste collection from points accessible by a collection vehicle (32 tonnes).

Policy DM 4.4 Natural environmental assets - designated and locally important open space

Developers will need to work with partners to evolve strategies to enable individual new development sites to contribute most effectively to the opportunities for the establishment and positive improvement of coherent ecological networks, Biodiversity Enhancement Areas and multi-functional Green Infrastructure Networks.

2.8 Summary

The key current and emerging national and local policy elements to which this Statement relates can be summarised as follows:

1. Zero carbon development through innovation in design, construction operation and management including energy efficiency and extensive on-site low carbon and renewable energy technology (NPPF, Future Homes Standard, JCS Policies 1 and 3, and South Norfolk Local Plan Policy DM 4.1);
2. Resilience to potential climate change impacts including flood risk, surface water management and summertime

overheating (NPPF, JCS Policy 1, and South Norfolk Local Plan Policy DM 4.2);

3. Promote sustainable transport by integrating with existing sustainable transport networks, reducing the need to travel and maximising the use of sustainable forms of transport including Electric Vehicles (NPPF, JCS Policies 2 & 10, and South Norfolk Local Plan Policy DM 3.10);
4. Biodiversity protection, enhancement and net gain (NPPF, Environment Bill, JCS Policy 1, and South Norfolk Local Plan Policies DM 1.4 and DM 3.8);
5. Integrated green and blue infrastructure to support wider benefits including amenity, sustainable drainage systems (SuDS), biodiversity enhancement, landscape / townscape character and to minimise the urban heat island effect (NPPF, South Norfolk Local Plan Policies DM 4.2 and DM 4.4);
6. Health and sustainable indoor and outdoor environments (NPPF, JCS Policy 10, and South Norfolk Local Plan Policies DM 3.14 and DM 4.1); and
7. The use of sustainably procured materials with reduced environmental impact (JCS Policies 1 and 2, and South Norfolk Local Plan Policies DM 1.4 and DM 3.8).

3. Sustainability, Energy & Climate Change Strategy

3.1 Introduction

High standards of environmental, social and economic sustainability will be embedded into Silfield Garden Village through the application of appropriate targets and approaches to the design, construction and operation for the various development elements. These standards will reflect current, emerging and future policy at the national and local levels including the JCS.

The sustainability strategy will focus on delivering sustainable outcomes that are future proofed and take account of the climate and ecological crisis. This can be achieved by ensuring emerging frameworks such as the **Royal Institute of British Architects (RIBA) Sustainable Outcomes Guide (2019)**¹⁰ (and any subsequent updates) forms a key component of the sustainability strategy.

3.2 RIBA Sustainable Outcomes Guide

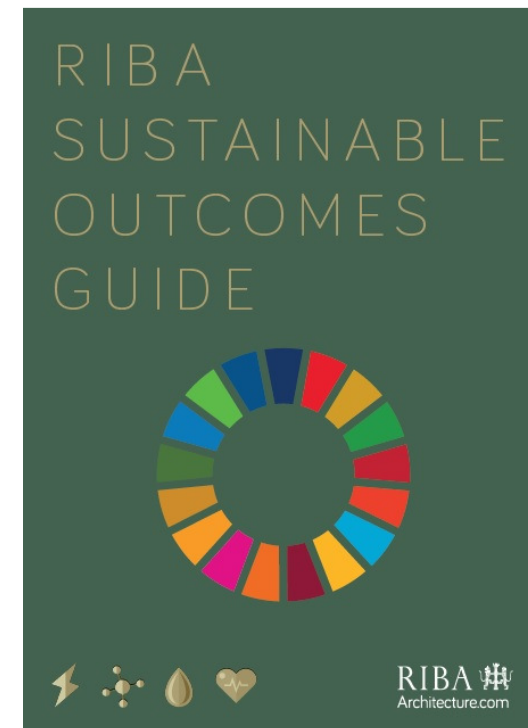
3.2.1 An Outcomes-Based Approach

The RIBA Sustainable Outcomes Guide sets out an outcomes-based design approach which seeks to resolve the common gaps between design intent and in-use performance across a range of metrics to deliver real and lasting reductions in carbon emissions and other impacts.

Sustainable buildings delivered in 2030 may differ significantly to those built today as a result of various factors such as the availability of new or matured technologies (e.g. battery storage), capital cost reductions for sustainable products, the implementation of new standards such as the Future Homes Standard, and the evolution of industry approaches to issues such as embodied carbon and climate resilience.

This imperative to systematically improve upon current 'baseline' performance is recognised by the RIBA Guide which sets stepped targets to be achieved in new buildings by 2020, 2025 and

2030 and which support the net zero ambitions of the UK and JCS.



¹⁰<https://www.architecture.com/-/media/GatherContent/Test-resources-page/Additional-Documents/RIBASustainableOutcomesGuide2019pdf.pdf>

For each outcome, RIBA outlines the key performance metric and a set of design principles the project team will follow. This approach allows creative flexibility in applying sustainable assessment methods and modelling tools to deliver the outcomes and targets.

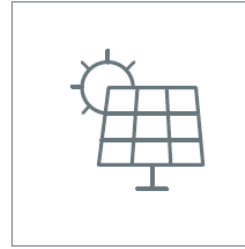
These sustainable outcomes are closely interrelated and will be pursued together. For example, net zero operational carbon and net zero embodied carbon are twin targets under the concept of whole life net carbon as defined by the **UK Green Building Council Net Zero Carbon Buildings Framework (2019)**¹¹ which forms a fundamental component of the sustainability strategy for Silfield Garden Village.

The following sections describe the key sustainability principles and outcomes set by RIBA which will be targeted. These standards and principles will be regularly reviewed and updated to align with any updated versions of the RIBA guidance or local or national standards that may be introduced, for example future updates to Building Regulations Part L and the Future Homes Standard 2025.

Significant work has been undertaken already for certain sustainability outcomes commensurate to this masterplanning design. Responses to other outcomes relating to more detailed aspects of design will be progressed in due course.

3.2.2 Outcome 1: Net Zero Operational Carbon

“The carbon dioxide produced as a result of the production and use of the energy from fossil fuels consumed for the day-to-day operation of the building, including low/zero carbon renewable energy technologies both on and off-site, plus recognised offset schemes where essential.”



Forty percent of global carbon emissions come from powering our buildings and cities. The urgency of reducing these makes a Net Zero Operational Carbon Outcome a critical construction industry target, and net zero operational carbon is achievable now with offsetting.

Net zero operational carbon is a fundamental target of the sustainability, energy and climate change strategy for Silfield Garden Village. This will ensure that the various economic and social benefits that will accrue from the proposals are decoupled from climate change impact.

Orbit Homes has evaluated the requirements of the UKGBC Net Zero Carbon Buildings Framework and are carrying out further detailed feasibility studies to further develop the strategy. The

following principles will be applied to deliver this key outcome.

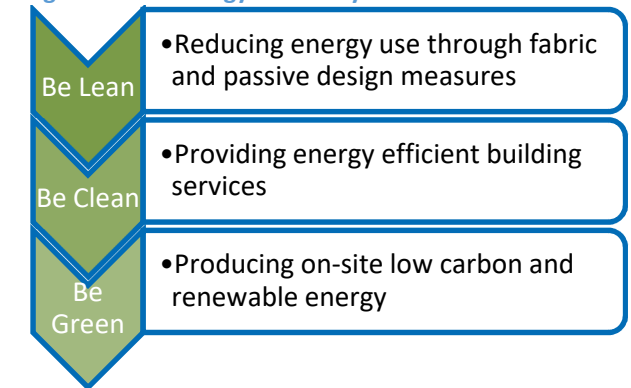
1. Prioritise deep retrofit of existing buildings

Silfield Garden Village will be a new build development however the opportunity may exist however to repurpose existing buildings on site, for example the moated Lower Back Farm could potentially be renovated for community use.

2. Prioritise “Fabric First” principles for building form and envelope

All buildings will be designed in accordance with the Energy Hierarchy or “fabric first” approach (see **Figure 4**), the most cost-effective means to minimise energy demand and CO₂ emissions from a building.

Figure 4: The Energy Hierarchy



¹¹<https://www.ukgbc.org/wp-content/uploads/2019/04/Net-Zero-Carbon-Buildings-A-framework-definition.pdf>

The first “**Be Lean**” stage of the energy hierarchy seeks to minimise the demand for heat and power from the outset through a highly-insulated building envelope and passive design measures.

This approach has several benefits including carbon savings being ‘locked-in’ for the lifetime of the building (60 years or more) rather than the shorter lifespan of renewable energy technologies. There are also virtually no maintenance and/or replacement requirements or costs and no reliance on occupant behaviour.

As part of the detailed design of the new homes, consideration will be given to a range of fabric and passive design measures including:

- Design and layout to promote passive solar gain, natural daylight, sunlight and ventilation with the majority orientated towards the south;
- Optimise natural daylight in habitable spaces via suitable window sizes relative to living spaces and bedrooms whilst limiting overheating risk through appropriate glazing specification;
- Material selection which aims to balance the aesthetics, robustness and durability with optimal thermal benefits for each home; and
- Performance of building U-values and air tightness etc beyond the Building Regulations requirements in force at that time.

3. Fine tune internal environment with efficient mechanical systems

The second “**Be Clean**” stage of the Energy Hierarchy is for remaining energy demand following “Be Lean” measures to be met as efficiently as possible. Measures likely to be incorporate include:

- 100% low energy lighting (e.g. LED);
- Prioritise natural ventilation e.g. no single aspect apartments;
- Explore heat recovery opportunities such as waste water heat recovery (WWHR) and mechanical ventilation with heat recover (MVHR); and
- Prioritise passive cooling options such as external shading.

4. Provide responsive local controls

Responsive local controls for heat and light will be provided for building occupants, for example:

- Zoned temperature controls for simple control of different spaces to condition the environment and minimise heating of unoccupied spaces;
- Zoned lighting controls for suitable non-residential buildings including proximity detection to minimise lighting of unoccupied spaces; and
- Building Management Systems (BMS) for suitable non-residential buildings to promote

occupants understanding of energy usage and promote sustainable management.

5. Specify ultra-low energy sufficient appliances

Any appliances that are provided as part of Silfield Garden Village will be highly energy and also water efficient.

6. Specify ultra-low energy sufficient IT

Any IT equipment that is provided as part of Silfield Garden Village will be highly energy efficient.

7. Prioritise maximum use of on-site renewables appropriate to context

The third “**Be Green**” energy hierarchy stage is to specify on-site low / zero carbon energy technology. By following the two preceding stages, the amount of a given technology that is needed to meet a particular renewables target is reduced with associated costs.

All buildings will benefit from **low carbon heating**, with no gas boilers anticipated. This will ensure the development is not locked in high carbon emissions associated with natural gas.

Low carbon heating systems such as **air source heat pumps (ASHP)** or **ground source heat pumps (GSHP)** are envisaged, whilst the development of a **district heat network** may be viable for sufficiently high density parts of the masterplan with a mixture of uses (e.g. apartments and employment).

In addition to low carbon heating, the masterplan and the design of individual buildings will be optimised for solar energy i.e. provide suitable roof spaces on which solar panels can be orientated broadly south-east to south-west.



The provision of **solar water heating** systems may impair the feasibility of low carbon heating systems described above. **Solar photovoltaic (PV)** systems would not, however, and would help reduce electrical demand within buildings as well as supporting emerging requirements such as battery storage to charge electric vehicles (EVs).

In addition to building-integrated low and zero carbon energy technologies, the provision of a **solar farm** is also proposed in which the existing and new community and businesses can invest.



Overall, on-site low and zero carbon energy technology is anticipated to meet a proportion of operational energy demand significantly beyond the minimum 10% target sought by the JCS.

By delivering the solar farm during an early phase, net power exports can be used to offset construction carbon (see **3.2.3 Outcome 2: Net Zero Embodied Carbon**).

Orbit Homes are currently exploring various approaches for the delivery and operation of sustainable energy technologies at Silfield Garden Village, including establishing an **Energy Services Company (ESCO)**. An ESCo is a commercial structure created to produce, supply and manage the local delivery of decentralised energy to a ‘whole site’ development.

High initial capital costs can be seen as an obstacle to the provision of decentralised energy. ESCos enable a long-term view towards attractive energy prices, security of supply and high levels of carbon performance. ESCos typically invest

capital and assume responsibility for design and build, operation, maintenance, billing and customer care. This approach can ensure a community based, secure and environmentally-friendly energy solution with reduced overall costs for residents.

8. Demonstrate additionality of off-site renewables

It is unlikely that zero carbon operational standards will be achieved for all buildings even following the various building-integrated and masterplan-level technologies described above.

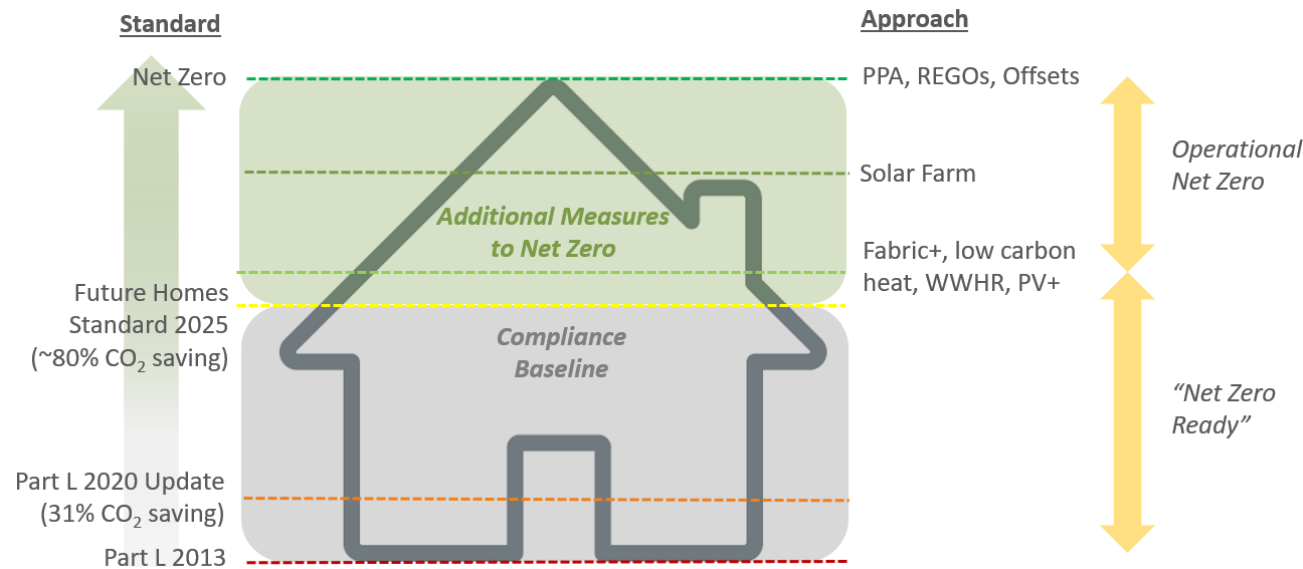
The procurement of renewable electricity from off-site projects may therefore be required, such as direct procurement from specific generators (e.g. Power Purchase Agreements), or retail purchases from suppliers and utilities, and the purchase of stand-alone (“unbundled”) energy attribute certificates such as Renewable Energy Guarantee of Origin (REGO) certificates.

9. Offset remaining carbon through recognised scheme

By applying the above principals, the need to procure carbon offsets to achieve Outcome 1: Net Zero Operational Carbon is not anticipated.

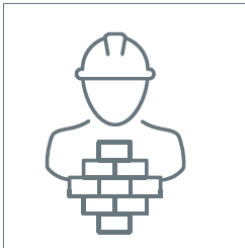
Figure 5 summarises the net zero operation concept and demonstrates how the Future Homes Standard 2025 will significantly reduce the current performance gap.

Figure 5: Net Zero Operation Concept [Turley]



3.2.3 Outcome 2: Net Zero Embodied Carbon

“The carbon dioxide produced from the energy used in the extraction, fabrication and transportation of the materials used in the construction are minimised and offset through recognised schemes.”



Carbon emissions from the construction of new buildings can represent more than half of their lifetime emissions. Silfield Garden Village will

adopt the following principles to drive down construction carbon to net zero.

1. Prioritise buildings re-use

As discussed in **section 3.2.2** above, Silfield Garden Village will predominantly be a new build development. The opportunity may exist however to repurpose existing buildings on site, for example the moated Lower Back Farm could potentially be renovated for community use.

2. Carry out whole life carbon analysis of building elements

Embodied carbon assessments will be undertaken to inform the sourcing and specification of materials.

This will help evaluate the carbon impact of procurement choices, construction methods (e.g. off-site vs on-site), waste mitigation and disposal, and circular economy considerations.

3. Prioritise ethical and responsible sourcing
A **Sustainable Procurement Policy** is envisaged for Silfield Garden Village in accordance with ISO



20400 (2017)¹² or similar. This standard provides guidelines for integrating sustainability into an organisation's procurement processes.

It covers political and strategic aspects of the purchasing process, namely how to align procurement with an organisation's goals and objectives and create a culture of sustainability.

The standard defines the principles of sustainable procurement, including accountability, transparency, respect for human rights and ethical behaviour, and highlights key considerations such as risk management and priority setting.

4. Prioritise low embodied carbon and healthy materials

A range of options to help reduce construction carbon will be explored including:

- Using natural construction materials such as timber frame; and
- Specify healthy materials such as low Volatile Organic Compound (VOC) products to promote good indoor air quality.

5. Minimise materials with high embodied energy impacts

Low carbon versions of high carbon construction materials and products will be specified where

possible, for example steel and concrete that include recycled content.

6. Target zero construction waste to landfill

A target of zero construction waste sent to landfill will be pursued, and this target would be supported by approaches to construction that are under consideration including MMC and off-site fabrication as discussed above.

7. Promote use of local natural materials

The use of local natural materials and services will be promoted during construction as far as is practicable.

8. Consider modular off-site construction

The feasibility of using modern methods of constructions (MMC) and/or off-site fabrication will be evaluated, including potential links to the economic strategy for Silfield Garden Village.

9. Detailing to be long life and robust

All buildings will be designed to be durable and robust. This will help avoid unnecessary cost and material use resulting from the need to repair and replace damaged elements as a result of operational wear and tear. It will also help minimise costs and disruption resulting from environmental degradation to building elements as a result of avoidable weathering and changes to climatic conditions over time.

10. Design for disassembly and the circular economy

Consideration will be given to measures and design options related to adaptability and disassembly to accommodate future changes to the use of buildings over their lifespan.

11. Offset remaining carbon emissions through a recognised scheme

The UKGBC Net Zero Carbon Buildings Framework allows net exports of renewable energy to offset construction carbon. It is envisaged that the solar farm is delivered in an early phase so that net exports of renewable power contribute to offsetting construction carbon.

Significant tree planting across the masterplan is proposed as part of the green infrastructure strategy for Silfield Garden Village. It is envisaged that a significant proportion of this planting will be undertaken in accordance with the **Woodland Carbon Code**¹³.



¹²<https://www.iso.org/publication/PUB100410.html>

¹³<https://www.woodlandcarboncode.org.uk/about/the-basics>

The Woodland Carbon Code ensures that woodland carbon projects:

- are responsibly and sustainably managed to national standards;
- provide reliable estimates of the amount of carbon that will be sequestered (locked up) as a result of the tree planting;
- are publicly registered and independently verified; and
- meet transparent criteria and standards to ensure that real carbon benefits are delivered.

The landowner has extensive areas of local land beyond the masterplan area, some of which may also be suitable for woodland creation. The opportunity exists to align the biodiversity net gain strategy for Silfield with the local carbon offsetting strategy. The funding of existing UK Woodland Carbon Code projects may also be undertaken.

3.2.4 Outcome 3: Sustainable Water Cycle

“The amount of mains water used in the operation of the building including the offset by use of greywater or recycled water to reduce mains water consumption.”



A sustainable water cycle will be promoted through application of the following development principles.

1. Provide low flow fittings and appliances

Operational water demand will be minimised from the outset in all buildings through the specification of water efficient fitting, fixtures and appliances (where provided) such as dual flush WCs, aerated taps and flow controlled showers.



JCS Policy 3: ‘Energy and water’ requires major new residential development to target a water consumption standard equivalent to Level 6 of the Code for Sustainable Homes from 2015, being ≤ 80 litres / person / day.

It is proposed that the tighter water efficiency standard proposed by RIBA for 2030 of <75 litres / person / day is targeted for the dwellings and <10 litres / person / day for non-residential buildings.

2. Provide waterless appliances where possible

The feasibility of providing waterless appliances will be evaluated at the appropriate design stage.

3. Provide leak detection

All buildings will be provided with water meters to support sustainable water use. The provision of sub-meters and leak detection systems for relevant non-residential buildings is also anticipated.

4. Provide rainwater and greywater recycling and attenuation but consider operational implications of complex systems

Rainwater harvesting for all houses is envisaged in the form of water butts for garden irrigation. Rainwater attenuation for non-residential buildings will also be required including the potential use of green / blue roofs.

The feasibility of providing greywater recycling will be evaluated at the appropriate design stage including potential operational implications including cost and maintenance requirements.

5. Provide on-site black water cleansing and recycling if viable

The requirement and feasibility of providing an on-site waste water treatment facility will be evaluated.

6. Create Sustainable Urban Drainage that supports natural aquatic habitats and human amenity

A network of minor drains and watercourses traverse the site which are associated with hedgerows and will be incorporated into the

design of the Garden Village as part of the surface water drainage proposals.

Green and blue infrastructure will be integrated at all scales throughout the masterplan to perform a drainage and flood protection function whilst also promoting amenity, character and biodiversity benefits.

3.2.5 Outcome 4: Sustainable Connectivity & Transport

“Measure the carbon impact of the travel of occupants and visitors to and from a local transport hub or local retail and community facilities.”



1. Create comprehensive green transport plan

The scale of the new community will unlock meaningful improvements to local transport infrastructure – such as a new junction on the A11; improved public transport links with the town centre, key local destinations and into Norwich; and accessibility improvements at Wymondham Railway Station.

The package of measures are envisaged as part of sustainable movement strategy for Silfield including:

- A public transport corridor with a route through the Site from the access on Park Lane to the main access on Silfield Road including 10

bus stops within the Site. A dedicated pedestrian and cycle route is also proposed along this corridor;

- A public transport link to Wymondham using the existing Silfield Road;
- A north-south ‘Green way’ through the centre of the development for pedestrians and cyclists, along the alignment of Park Lane and using the existing bridge over the A11;
- A pedestrian and cycle path network throughout the site;
- A potential pedestrian and cycle link to Spooner Row station from the south of the site; and
- Keeping existing Public Rights of Way and Norwich County Council maintained roads, including the route to the town centre via level crossing and Stayground Way.

A Comprehensive Travel Plan will be developed and implemented for all aspects of the proposed development to encourage sustainable travel within the Site and the surrounding area.

2. Prioritise high quality digital connectivity to avoid need for unnecessary travel

High quality digital connectivity will form a key component of the Garden Village to promote the economic strategy and reduce the need for travel by, for example, facilitating home working.

3. Prioritise site selection with good proximity to public transport;



Silfield Garden Village has the opportunity to facilitate genuine and significant modal shift towards public transport creating strong walking, cycling and bus links towards Wymondham Railway Station and further afield.

Wymondham town centre and Bus Interchange is highly accessible by those travelling by bicycle and by foot, with journey times of approximately 6 minutes and 20 respectively. Wymondham Railway Station is even closer to the site with journey times of approximately 4 minutes by bike and 11 minutes on foot.

The Garden Village will support the area’s currently planned Bus Rapid Transit (BRT) network which could be extended into the site from Wymondham, providing high quality bus travel that will bring faster, more frequent and reliable services.

Priority will be given to buses travelling through the site, utilising Silfield Road to provide efficient access to Wymondham Railway Station. Improvements to Wymondham Station could be provided as a package of sustainable travel measures including platform enhancements.

An integrated public transport system will ensure bus connections will align with the new increased frequency of Greater Anglia rail services.

4. Provide high quality pedestrian links to local amenities

Silfield Garden Village will be designed as a walkable neighbourhood with a comprehensive network of pedestrian and cycling routes connecting all destinations and amenities within the development.

Park Lane will provide a direct pedestrian and cycle route connecting the Garden Village to Wymondham Railway Station where potential enhancements can be made to improve accessibility.

Employment and retail facilities will be located in prominent, accessible points throughout the site, connected by direct and dedicated pedestrian and cycle routes.

5. Provide end of journey provision for active travel runners and cyclists (showers, dry lockers etc)

All dwellings and relevant non-residential uses (employment, community etc) will feature secure cycle parking provision, together with appropriate facilities such as showers and lockers etc.

6. Provide infrastructure for Electric Vehicles as a priority

Electric vehicle infrastructure will be prioritised throughout the development to support the transition away from the internal combustion engine and hybrid vehicles as proposed by Government from 2035¹⁴.



7. Provide car sharing spaces

Provision will be made for car sharing across the masterplan.

8. Provide suitable on-site personal storage

All dwellings and relevant non-residential uses (employment, community etc) will feature secure cycle parking provision, together with appropriate facilities such as showers and lockers etc.

3.2.6 Outcome 5: Sustainable Land Use & Ecology

“A measure of actions taken to maintain, protect and improving the flora and fauna on site”.



This outcome aims to avoid development on sensitive and ecologically rich landscapes. Sustainable development requires a significant increase and enhancement of biodiversity and creating a productive landscape that is capable of food production as well as creating habitats for wildlife. Increasing biodiversity and green infrastructure can also promote climate resilience by minimising the urban heat island effect.

¹⁴<https://www.gov.uk/government/consultations/consulting-on-ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans>

1. Leave the site in better 'regenerative' ecological condition than before development

The Site is predominantly arable land which is of low ecological value and there are no designated sites of wildlife value within its boundary. There are some localised habitat features of value including a large number of ponds, semi-natural deciduous woodland and species rich hedgerows.

The green infrastructure strategy for Silfield Garden Village will seek to protect and enhance the valued features on the Site and create additional features of value both to wildlife and the community. Opportunities to deliver this protection and enhancement include:

- Incorporating existing ponds, woodlands and species rich hedgerows within the green infrastructure strategy for the development;
- Avoiding impacts to species-rich hedgerows when designing the layout of the permanent road infrastructure and temporary construction roads; and
- Provide a buffer zone around the area of scheduled ancient woodland.

The network of hedges, woods and small copses provides a strong base from which initially a strategy and then a detailed plan for the green infrastructure of the Garden Village can be developed. This will create a settlement with an

attractive environment, benefiting wildlife and the well-being of the new residents.

2. Prioritise building and site re-use

Silfield Garden Village will be a new build development however the opportunity may exist however to repurpose existing buildings on site, for example the moated Lower Back Farm could potentially be renovated for community use.

3. Prioritise brownfield site selection

The proposed development site is greenfield in nature however localised brownfield land may be present from former agricultural uses.

4. Carry out sustainable remediation of site pollution

Any ground remediation that is required to deliver the Garden Village is likely to be limited in scale and will be undertaken in accordance with sustainable remediation principles¹⁵.

5. Retain existing natural features

Existing ponds, woodlands and species rich hedgerows will be incorporated within the green infrastructure strategy wherever feasible.

6. Create mixed-use development with density appropriate to local context

The masterplan proposes a mixed-use development that is appropriate to its local context. The combination of relatively gentle

topography, the elevation and location of the Site, and numerous substantial woodland belts means that the site is well screened from many potential viewpoints. There are direct relationships with the existing urban fringe in parts of the wider site area, including with Wymondham Industrial Estate and Park Lane from within the northern parcel of land. The southern parcel of land has visual links to existing residential development along Silfield Road.

As a greenfield site there will be an inevitable degree of landscape and visual impact. However there is extensive scope to mitigate such impacts through a landscape-led approach to shaping the masterplan, avoiding impacts by guiding development away from the most sensitive receptors; and, use of the existing green infrastructure network to guide development and to create a framework for strategic scale landscape proposals.

7. Create a range of green spaces (green roofs, vertical greening, pocket parks, green corridors)

Analysis of the existing green infrastructure network has identified a series of strategic green infrastructure links. In response to this analysis the development parcels have been shaped by the existing field pattern, including their enclosure by hedgerows, tree belts and woodlands. This ensures that the existing

¹⁵<https://www.claire.co.uk/projects-and-initiatives/surf-uk/77-sustainable-remediation>

vegetation, and the scale and pattern of the landscape, is integrated into the layout and that existing green infrastructure across the site is largely retained.

The masterplan will work with the existing scale and pattern of the local landscape character by creating a series of smaller development parcels which together form the overall development envelope. These create a layout which retains as much existing green infrastructure as possible, works within the capacity of the landscape and adds a natural permeability to the overall massing the wider development envelope.

Retained green infrastructure will be reinforced and enhanced through additional landscaping and improved management; the aims of which will consider location, function and also biodiversity objectives.

8. Create habitats that enhance biodiversity

Biodiversity net gain will be a central aim for the green infrastructure strategy with native and local Biodiversity Action Plan (BAP) species prioritised.

9. Create 'productive' landscapes for urban food production

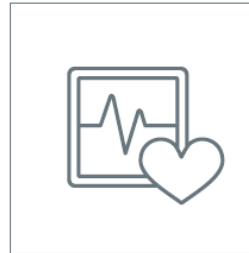
A key principle of the green infrastructure strategy is to create elements of productive landscape which will support the new community and incorporate innovative approaches to food production, environmental management and stewardship.

10. Zero local pollution from the development

The all-electric energy strategy that is envisaged combined with the prioritisation for Electric Vehicles will help ensure that local pollution from the development (e.g. gas and fuel consumption) is minimised or avoided.

3.2.7 Outcome 6: Health & Wellbeing

"The promotion of key variables of internal occupant health and wellbeing, including indoor air quality, daylight, overheating, acoustic comfort, responsive controls, and physical contact to outside."



An unintended consequence of focusing narrowly on building energy and carbon performance can be increased overheating risk and inadequate natural ventilation. This illustrates the importance of considering sustainability holistically.

This outcome relates primarily to indoor health, visual, aural and thermal comfort, and occupant wellbeing. The vision for Silfield Garden Village is to create places and spaces in which residents, workers and visitors want to spend time. The following principles will be applied at the appropriate stage of building design:

1. Provide spaces with strong visual connection to outside
2. Provide responsive local controls e.g. opening windows, or local control
3. Design spaces with appropriate occupant density for activity
4. Design spaces with good indoor air quality
5. Design spaces with good indoor daylighting, lighting and glare control
6. Design spaces to adaptive thermal comfort standards
7. Design spaces with good acoustic comfort
8. Design spaces that are inclusive and universally accessible
9. Prioritise active circulation routes e.g. stairs, cycling provision, walking routes etc
10. Provide indoor and outdoor planted spaces

3.2.8 Outcome 7: Sustainable Communities & Social Value

“Measure the positive impacts of good placemaking on a local community.”



This outcome relates to the social impact of a development on the end users and wider community. The vision for Silfield Garden Village is to create a new community that supports basic needs of security, shelter, health and employment but also enhances individual and social wellbeing and community identity. The following principles will be applied:

1. Prioritise placemaking that expresses identity and territory
2. Create secure places for privacy
3. Create places for social interaction
4. Create vibrant mixed-use places
5. Provide high quality permeable links to social amenities
6. Provide high quality public realm
7. Inclusive places for community interaction
8. Secure places with overlooking views

3.2.9 Outcome 8: Sustainable Life Cycle Cost

“To ensure a holistic outcome with regards to economic sustainability, the intention is to use Government Soft Landings requirement for measuring operational costs of buildings.”



Considering life cycle costs (not just capital costs) will be an important factor to ensure the Garden Village takes full opportunity of longer-term benefits which can determine building and development performance in such areas as longevity, climate resilience and sustainability.

A long term approach to both the financing and design quality of development is central to our delivery model, which sets Silfield Garden Village apart from other strategic development proposals. The following principles are envisaged:

1. Carry out whole life cycle analysis (LCA)
2. Carry out building handover and aftercare
3. Measure energy costs
4. Management & maintenance costs
5. Measure overall running costs
6. Value occupant health and wellbeing
7. Added value of sustainable building

3.2.10 RIBA 2030 Climate Challenge Targets

The 2030 climate change targets set by RIBA focus on three environmental sustainability outcomes: energy use, embodied carbon and water use with an overall aim to target net zero whole life carbon emissions (or better) by 2030 at the latest. These targets (see **Figure 6**) will be sought for Silfield Garden Village.

3.2.11 UN Sustainable Development Goals

The RIBA sustainable outcomes principles and directly support the following 9 of the United Nations Sustainable Development Goals (UN SDGs).



The UN SDGs are a collection of 17 global goals that were launched in 2015 by all 193 countries of the UN General Assembly. They provide a blueprint for peace and prosperity for people and the planet, both now and in the future, with a date of 2030 targeted for their achievement.

Unlike the Millennium Development Goals which they replace and which only covered developing countries, the UNSDGs are equally applicable to advanced economies such as the UK. As such they are used increasingly when reporting the sustainability performance of UK organisations and development proposals.

Each of the 17 goals sits above a list of targets which are themselves measured by up to 3 indicators. There are 169 targets across the 17 goals and 232 indicators in total.

Many of the SDGs, their targets and indicators, will therefore be directly supported by Silfield Garden Village.

Goal 11 Sustainable Cities and Communities, for example, includes such targets as “ensure access to adequate safe and affordable housing” and “provide access to sustainable transport systems”.

Targets for **Goal 8 Decent Work and Economic Growth** meanwhile include “sustain per capita income growth”, “increase economic productivity through diversification, technological development and innovation” and “promote development that supports productive activities, decent job creation, entrepreneurship and creativity”.



Figure 6: RIBA Climate Challenge Targets

RIBA 2030 Climate Challenge target metrics for domestic buildings

RIBA Sustainable Outcome Metrics	Current Benchmarks	2020 Targets	2025 Targets	2030 Targets	Notes
Operational Energy kWh/m ² /y 	146 kWh/m ² /y (Ofgem benchmark)	< 105 kWh/m ² /y	< 70 kWh/m ² /y	< 0 to 35 kWh/m ² /y	UKGBC Net Zero Framework 1. Fabric First 2. Efficient services, and low-carbon heat 3. Maximise onsite renewables 4. Minimum offsetting using UK schemes (CCC)
Embodied Carbon kgCO ₂ e/m ² 	1000 kgCO ₂ e/m ² (M4i benchmark)	< 600 kgCO ₂ e/m ²	< 450 kgCO ₂ e/m ²	< 300 kgCO ₂ e/m ²	RICS Whole Life Carbon (A-C) 1. Whole Life Carbon Analysis 2. Using circular economy Strategies 3. Minimum offsetting using UK schemes (CCC)
Potable Water Use Litres/person/day 	125 l/p/day (Building Regulations England and Wales)	< 110 l/p/day	< 95 l/p/day	< 75 l/p/day	CIBSE Guide G

RIBA 2030 Climate Challenge target metrics for non-domestic buildings

RIBA Sustainable Outcome Metrics	Current Benchmarks	2020 Targets	2025 Targets	2030 Targets	Notes
Operational Energy kWh/m ² /y 	225 kWh/m ² /y DEC D rated (CIBSE TM46 benchmark)	< 170 kWh/m ² /y DEC C rating	< 110 kWh/m ² /y DEC B rating	< 0 to 55 kWh/m ² /y DEC A rating	UKGBC Net Zero Framework 1. Fabric First 2. Efficient services, and low-carbon heat 3. Maximise onsite renewables 4. Minimum offsetting using UK schemes (CCC)
Embodied Carbon kgCO ₂ e/m ² 	1100 kgCO ₂ e/m ² (M4i benchmark)	< 800 kgCO ₂ e/m ²	< 650 kgCO ₂ e/m ²	< 500 kgCO ₂ e/m ²	RICS Whole Life Carbon (A-C) 1. Whole Life Carbon Analysis 2. Using circular economy Strategies 3. Minimum offsetting using UK schemes (CCC)
Potable Water Use Litres/person/day 	>16 l/p/day (CIRA W11 benchmark)	< 16 l/p/day	< 13 l/p/day	< 10 l/p/day	CIBSE Guide G

4. Summary & Conclusions

The Silfield Garden Village proposals respond positively to emerging national and local policy regarding sustainable development, energy and climate change. They provide a significant opportunity to plan at-scale for the GNDP objectives of integrated economic and housing growth whilst minimising environmental impact and promoting net benefits.

The UK is committed to achieving net zero carbon emissions by 2050, and the concept of net zero carbon development will be a core component of this ambition as recognised by the JCS.

The Future Homes Standard is scheduled for implementation in 2025 when construction at Silfield is anticipated to commence. This standard will deliver a significant (~80%) improvement on current energy / carbon standards for new dwellings.

As we transition towards a decarbonised electricity grid, homes built to the Future Homes Standard will become net zero carbon over time with no need for further adaptations or changes.

The opportunity exists to expedite this trajectory at Silfield Garden Village by targeting the approaches and standards for net zero buildings published recently by the UK Green Building Council and RIBA.

Silfield provides the scale of opportunity necessary to adopt these approaches, for example maximising on-site renewable energy both at the building and masterplan levels (solar farm). This will optimise the energy and carbon performance of the proposed new homes, businesses and associated uses, provide potential investment opportunity for the existing and new community and promote energy resilience.

The anticipated all-electric (or primarily electric) energy strategy, prioritisation of Electric Vehicles and wider sustainable transport measures will help ensure that local air pollution from the development is minimised or avoided.

The emerging masterplan seeks to conserve and enhance the landscape character, retain as far as possible and enhance existing landscape elements and features, optimise screening for visual receptors, avoid loss or damage to

retained landscape features and consequently conserve and enhance ecological fabric.

The significant green infrastructure proposed across the masterplan, and the potential for significant further woodland creation in areas beyond the site that are under the same ownership, opens up the opportunity for local high quality carbon offset projects.

The integration of green and blue infrastructure will support a range of beneficial functions including promoting climate change resilience through surface water and flood risk management and mitigation of the urban heat island effect. At the same time local character, the amenity of residents and worker and site biodiversity will be enhanced.

The proposals will unlock meaningful improvements to local transport infrastructure such as a new junction on the A11; improved public transport links and significant new pedestrian and cycle infrastructure including a Green way.

By embedding the principles and targets of RIBA's Sustainable Outcomes within the design,

construction and handover of each phase, key UN Sustainable Development Goals will be directly supported.

Silfield Garden Village therefore meets the GNDP objectives for integrated housing and employment provision in tandem with exemplar sustainability, energy and climate change performance to create a long-term legacy for the existing and new local community.

1 New York Street
Manchester
M1 4HD

Turley
Sustainability