



Island Farm Sports Village
Bridgend, Wales

Sustainability Statement

A Development by HD Limited
September 2009

SUSTAINABILITY STATEMENT



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1.0 EXECUTIVE SUMMARY

The Island Farm masterplan has been designed to provide a highly sustainable development.

It is one of the main ambitions of the development to deliver a design which presents the highest standard of environmental quality whilst providing a comfortable, attractive and healthy place for people to visit, watch sport, play sport and work.

A key factor during the design development of the Island Farm masterplan has been the approach to landscaping and the integration of the existing Island Farm POW nature conservation area into the scheme.

The strategy for the Island Farm development aims to address the various sustainability considerations at design and construction stages through a high degree of integration, which ranges from the location and layout of the buildings, the provision of energy, the drainage solution and includes all issues relating to the selection of materials, recycling and landscaping.

To assess whether the objectives and aims which are set out within this Sustainability Statement are achieved and to ensure best environmental practice principles are sustained, this document sets a series of commitments and aspirations. By virtue of this early stage of the development process, a number of issues will be resolved at detailed design stages at a later date. Therefore, this statement provides an opportunity not only to set out any commitments and incentives that the developer is already willing and eager to pursue (of which have already been incorporated into the masterplan), but also to contemplate, detail and offer a number of aspirations for potential incentives which support the fundamental goal of sustainable development.

Indeed, establishing these commitments and aspirations safeguard the aim to provide a sustainable development is fulfilled throughout the development. Welsh Assembly Government's Sustainable Development and Integration Tool Draft (5th December 2008) has, to a certain extent, informed the masterplan and construction aims contained within the document. The Tool has been used to assess how development proposals have addressed the sustainable masterplan design and construction aims contained within the document.

The checklist has been used for the purposes of this Sustainability Statement to outline the 'headline issues' of how sustainable development has been integrated, and a

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fundamental consideration in the masterplanning of the development at Island Farm. The key issues and themes to emerge from this task have determined the structure of this statement.

Table 1.1: Welsh Assembly Government's Sustainable Development and Integration Tool Draft (5th December 2008)

A Social Progress which recognises the needs of everyone	
<p><u>A1 Living communities</u> Promote strong communities and social cohesion.</p>	<p>The central position of the site in Bridgend and in the South Wales region will enhance the community in the area by attracting a range of jobs – from unskilled, skilled, professional, managerial etc.</p> <p>The mix of sports facilities, commercial office space and open space promotes the social interaction of both users and visitors to the site.</p> <p>The promotion of public transport, shuttle buses, park and ride and public open spaces will engender social interaction and cohesion across the development.</p>
<p><u>A2 A Healthy Future</u> Provide safe and healthy environments and promote healthy lifestyles.</p>	<p>The proposed development will have significant positive effects on the health and well being of local communities. The provision of a high quality sports village where people are able to both participate in numerous sports and watch not only Rugby League matches, but football matches and tennis.</p> <p>The masterplan and landscaping strategy aspires to provide an external environment which encourages pedestrian linkage throughout the site. The retention and enhancement of the Island Farm SNIC will provide for a green, healthy and stimulating environment for the users and visitors to Island Farm.</p>
<p><u>A3 A Rich and Diverse Culture</u> Celebrate and enhance our unique culture and the Welsh Language.</p>	<p>The masterplan aspires to achieve an exemplary, landscape-led, high quality business and leisure environment. Within the built environment the masterplan encourages the use of local materials to both reinforce it's identity within South Wales and sustainable sourcing and use of materials in the construction of development.</p>
<p><u>A4 Learning for Life</u> Promotion of high quality learning for life and engagement with sustainable development</p>	<p>The Island Farm development aspires to provide an environmentally and socially sustainable development that will demonstrate to both users and visitors the importance of sustainability.</p> <p>The development will encourage the efficient use of energy and the potentially, the use of renewable energy technologies which will provide education to the users and visitors of the effectiveness of these strategies.</p>

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	The retained Hut 7 and the nature conservation area will provide education in the conservation of natural resources and biodiversity.
<u>A5 A Fair and just Society</u> Promote active citizenship and ensure equality for all.	The development will encourage the efficient use of energy and the potential implementation of Waste Management Plans and Water Strategies to stimulate the participation of the development users and visitors in contributing to the national climate change and sustainability targets. The stadium facilities will allow for a greater sense of civic and local pride, local partnerships and community cohesion.
<u>A6 Housing</u> Enable access to good quality, safe and affordable housing.	n/a
B A Sustainable Economy and Prosperous Society	
<u>B1 Employment</u> Provision of a wide range of employment opportunities and training and the development of greener jobs	The Island Farm development will generate both highly skilled and lower skilled employment. The mix of high-tech based industry along with the service sector will provide a diverse employment mix in the area. The development will encourage the efficient use of energy and the use of renewable energy technologies which will promote employment in the energy saving technologies during construction.
<u>B2 Investment</u> Encourage research and development to promote new economic activities, and create an attractive business environment to support investment and confidence	The Science Park aspires to provide a unique facility in terms of target high-tech and knowledge based industries – potentially for the international market.
<u>B3 Local Economy</u> Strengthen the local economy by stimulating local or community enterprise, and capturing the benefits of inward investment.	The mix of high-tech industry at the Science Park and the service sector at the Sports Village will provide opportunities for links to the local business enterprise to promote inward investment.
<u>B4 Resource Efficiency</u> Promote measures to de-couple resource use and greenhouse gas emissions from economic activity.	The development will encourage the efficient use of energy and the potential implementation of waste management plans and water strategies to reduce the impact of the operation of the sports village and science park on the environment and depletion of natural resources.
<u>B5 A Confident and Successful Region</u> Create a Region with a clear and well articulated vision, communication links and	The aim for the Island Farm development is to deliver a high quality sustainable development which will be an asset to Bridgend and Wales.

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collaborative systems for delivery.	
C Prudent Use of Natural Resources – Reducing our Ecological Footprint	
<u>C1 Climate Change and Energy</u> Promote energy efficiency to achieve 60% reduction of CO ₂ emissions by 2050.	The Island Farm development aspires to reduce carbon emissions by promoting energy efficiency incentives.
<u>C2 Land</u> Promote appropriate and efficient use and re-use of land and soil resources.	The masterplan seeks to make the best use of the land in making provision for the infrastructure, sports pitches and buildings by preserving and enhancing the key natural attributes of the existing land. The nature conservation area and Hut 9 are preserved and are considered integral to the masterplan.
<u>C3 Flood and Water Management</u> Protect our freshwater and marine environment - Reduce water pollution and the risk of flooding.	The development is aiming to achieve 100% attenuation of the undeveloped site's surface water run off at peak times
<u>C4 Air and Atmosphere</u> Reduce all forms of air pollution.	The masterplan also outlines the strategy for reducing dependence on private car transportation to and from the site.
<u>C5 Waste</u> Avoid; minimise; re-use or recycle waste.	The Waste Management Plan will follow the principles of the Waste Hierarchy to achieve the following aims and targets. The development will be registered under the Considerate Constructors Scheme.
<u>C6 Renewable Resources</u> Promote the sustainable use and management of natural resources	The use of renewable energy technologies will be promoted in order to achieve reduced carbon emissions.
D A Sustainable Natural Environment	
<u>D1 Biodiversity</u> Protect and enhance biodiversity and natural ecosystems	The design of the development will aim to protect and enhance the ecological value of the site. The design has been developed in parallel with the architectural aspirations to ensure that the issue of biodiversity as been considered throughout the development.
<u>D2 Landscape</u> Protect and enhance the quality of the landscape.	The landscape strategy within the development seeks to work with the existing topography and thus retain as much of the existing woodlands as possible.
<u>D3 Climate change adaptation</u> Ensure economic, social and environmental infrastructure is secure or can adapt to climate change consequences.	The landscaping strategy includes the provision of green spaces and water features which will help to provide areas of comfortable micro-climate under increasing summer temperatures.
<u>D4 Built Environment</u> Develop and protect the quality of the local environment.	The masterplan aspires to achieve an exemplary, landscape-led, high quality leisure and business environment for the twenty-first century.

2.0 INTRODUCTION

2.1 Preface

2.1.1 This statement seeks to describe how the proposals put forward for the development of the Island Farm site have addressed the issue of sustainability, and in particular, the sustainability objectives established by the Welsh Assembly Government (WAG) within its relevant strategies (see table 1.1), and at the local level by Bridgend County Borough Council (BCBC).

2.2 Purpose of the Statement

2.2.1 This Sustainability Statement summarises the sustainability aims and targets that have been set for the Sports Village and Science Park masterplan. This statement summarises sustainability measures which have informed, have been incorporated and are encouraged within the masterplan strategy – from an early stage of the design process.

2.2.2 Furthermore, this statement provides an opportunity to set out the developer's aspirations for the sustainability of the site which will be considered at the detailed design stage and implementation of the project.

2.2.3 This document focuses on the following elements of sustainability within the masterplan proposals.

- § Energy
- § Transport
- § Water Management
- § Biodiversity
- § Materials
- § Waste
- § Health and well-being
- § Macro-Economics
- § Future adaptation

2.2.4 This Sustainability Statement references, and ought to be read alongside, the following documents being submitted for the Sports Village and Science Park outline planning application:

- § Masterplan and Landscape Design Statement
- § Planning Statement

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- § Design and Access Statement
- § Environmental Statement
- § Movement Assessment

2.2.5 This document summarises information covered in detail in the documents identified above for the purposes of collating the key sustainability features in the masterplan.

2.3 The Development Proposal

The Site

2.3.1 The development area extends to approximately 49 hectares comprising 13.3 hectares owned by Bridgend County Borough Council (BCBC), and 35.8 hectares in HD Ltd control.

2.3.2 The site is located immediately to the south of the A48 and the southern settlement boundary of Bridgend. The site is bounded to the east by the Bridgend Science Park and Vale of Glamorgan rail line, to the west by Merthyr Mawr Road and to the south by New Inn Road.

2.3.3 The BCBC land is sited within the northern sector of the site and formed part of the Crossways Country Club and Second World War prisoner of war camp. A single storey building, the only surviving building from the camp (Hut 9) has been listed (Grade II) and is located in the northeast part of the site.

2.3.4 The remainder of this area predominantly comprises scrub, rough grassland and treed habitat land. The land within HD Ltd ownership is predominately still under agricultural land uses in medium sized arable fields bounded by mature hedges.

The Application

2.3.5 This statement is submitted in support of the outline application for the development of Island Farm, Bridgend. Permission is being sought for a proposed Sports Village, a Science and Technology Park, access roads, strategic landscaping, nature conservation park and related infrastructure. All matters are reserved for subsequent consideration; however, significant detail is submitted regarding use, quantum of development, indicative layout and scale parameters.

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Proposed Development

2.3.6 The scheme is to consist of:

- § Major sporting facilities including:
 - 15,000 seat stadium;
 - 2,000 seat stadium, pitch and ancillary training facilities;
 - 5,000 seat stadium;
 - 3 ancillary outdoor training pitches;
 - Indoor tennis centre and 10 outdoor courts;
 - Indoor 3G training pitch and sports hall;
 - An indoor swimming pool; and
 - Ancillary offices and uses
- § Phase II of the Bridgend Science Park;
- § A Park and Ride facility
- § Heritage centre and museum (Incorporating Hut 9);
- § Pedestrian link from the southwest to the A38;
- § Habitat creation and Country Park;
- § Hard and soft landscaping; and
- § A48 junction improvements.

2.3.7 An overall illustrative Masterplan has been produced as part of this application, and provides a visual representation of the proposed site layout with, where applicable, proposed mitigation measures in place.

2.3.8 Further detail on the site, application and development proposal can be found in the documents that accompany this statement (i.e. the planning statement).

2.4 Statement Structure

2.4.1 The statement is structured as follows:

- § **Section 3** provides a summary of the policy context and guidance in regards to Sustainable Development.
- § **Sections 4 – 12** reports the ways in which the proposals for Island farm have responded to the challenges of sustainability – in accordance with 9 key themes.
- § **Section 13** provides a summary and overall conclusions.

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3.0 POLICIES AND DRIVERS

3.1 Preface

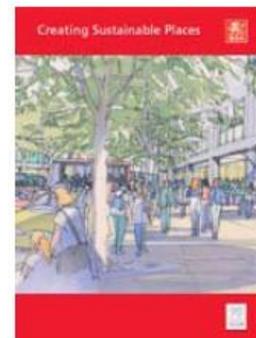
3.1.1 The importance of sustainable design and construction is increasingly the focus of national, regional and local policies and planning guidance. This section summarises the key policy and planning drivers affecting the proposed development.

3.2 Wales National Planning Guidance and Policy

3.2.1 An overview of the Welsh Assembly Government's (WAG) guidance in relation to sustainability is outlined in this section of the statement. WAG's strategic sustainability vision is outlined within a suite of national strategy documents, which include the following:

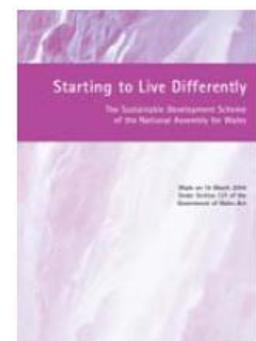
Creating Sustainable Places

3.2.2 This document sets out the sustainability and design quality expectations for all regeneration and development projects in which they are involved. Proposals submitted to WAG are judged against the objectives and requirements set out within the document.



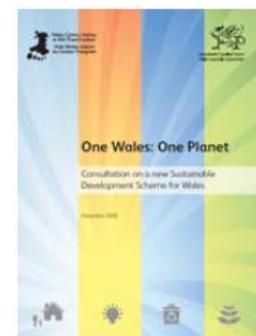
Starting to Live Differently

3.2.3 This document sets out the vision of a sustainable future for Wales focusing on social, economic and environmental improvement to create positive change.



One Wales: One Planet – Consultation on a new Sustainable Development Scheme for Wales

3.2.4 This consultation relates to the draft of a renewed Sustainable Development Scheme under the Government of Wales Act 2006. It sets out how the Welsh Assembly Government intends to promote sustainable development in the exercise of the Welsh Ministers' functions.



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3.2.5 This document sets out the agreement between the Labour and Plaid Cymru Groups in the National Assembly, and outlines the programme for government over the four year term, and includes under 'Sustainable Development':

- § Tackling climate change
- § Supporting rural development
- § Achieving sustainable energy production and consumption
- § Improving the local environment

Planning Policy Wales (PPW) (2002)

3.2.6 PPW contains the national land use planning policies for Wales. It provides the framework for the preparation of local development plans (LDPs) by each local planning authority and may be material to decisions taken by those authorities and the Welsh Assembly Government. PPW contains certain policies on planning for sustainability in the preparation of LDPs and in taking decisions on planning applications. This includes consideration of climate change, energy efficiency, water, materials and design issues relating to the sustainability of development proposals.



3.2.7 PPW is accompanied by a series of topic-specific Technical Advice Notes (TANs). Furthermore, PPW has been amended by Ministerial Interim Planning Policy Statement (MIPPS) 01/2005 on "Planning for Renewable Energy"; while a further MIPPS ("Planning for Climate Change") is currently out to consultation.

Technical Advice Notes (TANs) and Minerals Technical Advice Notes (MTANs)

3.2.8 Other published notes provide technical and procedural advice on a wide range of planning issues. Each note contains information relevant to the planning decision-making process.

People, Places, Futures (November 2004) (Updated 8th July 2008)

3.2.9 The Planning and Compulsory Purchase Act 2004 requires the Welsh Assembly Government to prepare a Spatial Plan covering the whole of Wales. The Plan, which was adopted by the Assembly in November 2004 and subsequently updated in July 2008, complements and helps to translate into practice the



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Welsh Assembly Government's Sustainable Development duty. The recent revision has given greater emphasis to climate change.

3.2.10 The Wales Spatial Plan is designed to guide the development of Wales over the forthcoming 20 year period. It is guided by the following key themes, (upon which the assessment of the proposed development at Island Farm is broadly based):

- § Building sustainable communities
- § Promoting a sustainable economy
- § Valuing our environment
- § Achieving sustainable accessibility
- § Respecting distinctiveness

3.2.11 The Wales Spatial Plan sets out cross-cutting national spatial priorities, which provide the context for the application of national and regional policies, reflecting the distinctive characteristics of different sub-regions of Wales and their cross-border relationships. It is a principle of the Wales Spatial Plan that development should be sustainable. The plan states that

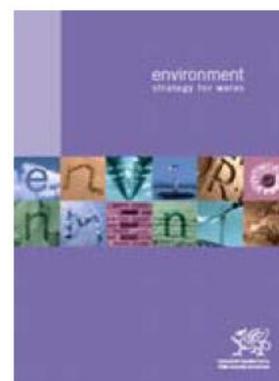
“Sustainable development is about improving wellbeing and quality of life by integrating social, economic and environmental objectives in the context of more efficient use of natural resources”.

3.2.12 Bridgend is located within the 'South East Wales – Capital Region' and is considered to be a 'cross boundary settlement' due to its regional connectivity to the west.

Environment Strategy for Wales (May 2006)

3.2.13 The Environment Strategy is the Assembly Government's long term strategy for the environment of Wales, setting the strategic direction for the next 20 years. It provides the framework to achieve our vision for the environment of Wales. An Action Plan has been published alongside the Strategy. The Strategy has five main themes:

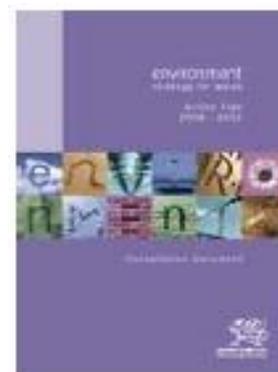
- § addressing climate change,
- § sustainable resource use,
- § distinctive biodiversity, landscapes and seascapes,
- § our local environment, and
- § environmental hazards



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Environment Strategy for Wales Action Plan Consultation Document (2008 - 2011)

3.2.14 This consultation document builds on the work that was undertaken to progress the Environment Strategy since May 2006, driven by both the first Environment Strategy Action Plan and legislative obligations, policies and programmes.



3.3 Bridgend County Borough Council (BCBC) Policy

Bridgend Supplementary Planning Guidance 12: Climate Neutral Development (2008)

3.3.1 This SPG is intended to encourage developers to consider the importance of sustainability. It sets out objectives that outline the aspects of sustainability and gives greater detail in a series of advice notes.



BCBC Local Development Plan (LDP)

3.3.2 BCBC have developed a set of sustainability objectives for the Sustainability Appraisal (SA) of the emerging LDP. These objectives are based on agreed national definitions of Sustainable Development (as stated in Section 1 of this statement), but adapted using the information gathered at scoping to tailor them to the needs of the Bridgend LDP. These objectives are listed in the table 3.1

Table 3.1: BCBC SA Sustainability Objectives

Concern	Objective
Social progress which recognises the needs of everyone	
Accessibility	To ensure an increase in accessibility to opportunities, transport and to all services and information in the County Borough.
Housing	To provide the opportunity for people to meet their housing needs.
Health, safety and security	To improve overall levels of health and safety, including the sense of security, for all in the County Borough.

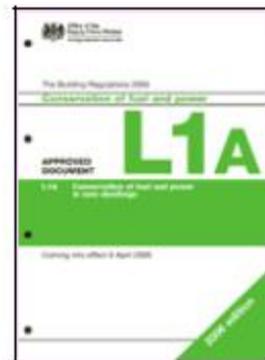
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Community	To maintain, promote and where suitable enhance, the distinctive character of the communities of Bridgend.
Effective protection of the environment	
Biodiversity	To maintain and enhance the diversity and abundance of species, and safeguard areas of significant nature conservation value
Landscape	To maintain and enhance the quality and character of the landscape, including its contribution to the setting and character of settlements
Built Environment	To maintain and enhance the quality of the built environment, including the cultural/historic heritage
Prudent use of natural resources	
Air	To reduce all forms of air pollution in the interests of local air quality and the integrity of the atmosphere
Climate change	To ensure that new development takes into account the effects of climate change
Water	To maintain and improve the quality and quantity of ground waters, river waters and coastal and bathing waters
Land / Soil	To use land efficiently, retaining undeveloped land and bringing damaged land back into use
Minerals and waste	To maintain the stock of minerals and non renewable primary resources
Renewable energy	To increase the opportunities for energy generation from renewable energy sources
Maintenance of high and stable levels of economic growth and employment	
Employment	To ensure that there is a vibrant local economy which is at the forefront of a wider regional economy and provide diversity of employment within the County Borough and support a culture of entrepreneurship
Wealth creation	To achieve a clear connection between effort and benefit, by making the most of local strengths, seeking community regeneration, and fostering economic activity

3.4 National Regulations

Part L Building Regulations, 2006

- 3.4.1 Part L of the Building Regulations, which covers the conservation of fuel and power, was revised in April 2006. Carbon emissions in new buildings will to be significantly better (20-28%) than the previous 2002 Part L standards. The Government proposes to amend the Part L regulations regularly, with further revisions expected in 2010, 2013 and 2016. It is expected that each revision will aim to reduce regulated carbon emissions from new buildings by at least 25%.



Clean Air Act, 1993

- 3.4.2 The release of pollutants to air from biomass combustion is regulated under two main instruments: The Clean Air Act 1993 or Pollution Prevention Control (PPC) Act and their associated regulations. There are a number of CEN standards for the solid fuel heaters and boilers which set out minimum requirements for construction and performance. The standard BS EN 303 Part 5 applies to biomass fuelled boilers up to 300kW in capacity also allows classification of appliances based on particulate emission standards as well as other measures of combustion quality. In smoke control areas, the Clean Air Act – The Smoke Control Areas (Exempted Fireplaces) (England) Order, 2008 states that unauthorised fuels such as wood fuels may be used if the appliance (stove, burner etc) is on the Exempt Appliances list, which means that the appliance has been tested and shown capable of burning an unauthorised solid fuel without emitting smoke.



4.0 ENERGY

4.1 Preface

4.1.1 The pursuit of a zero carbon development at Island Farm will aim to deliver an efficient energy infrastructure to all buildings that has minimal dependency on the national grid and reduce demand for fossil fuels.

4.1.2 In addition to the significant reduction in carbon emissions resulting from the proposed development, it is recognised that there are potential energy and carbon dioxide savings to be achieved through the implementation of passive design, energy efficiency, and renewable energy systems. Although to be determined at a later design stage, this section sets out, with reference to the Energy Hierarchy, the developer's aspirations for achieving a minimal output of carbon emissions.

4.2 Energy Hierarchy

4.2.1 As proposed in the Draft Consultation version of TAN 22: Planning for Sustainable Buildings (2009), the design of a building should look to implement the energy hierarchy (figure 4.1) in order to reduce carbon emissions associated with a development.

4.2.2 This approach outlined to reduce energy consumption and subsequent carbon dioxide emissions follows a simple energy hierarchy: firstly reduce energy demand, then supply energy efficiently, and finally supply energy from low and zero carbon (renewable) energy source(s).

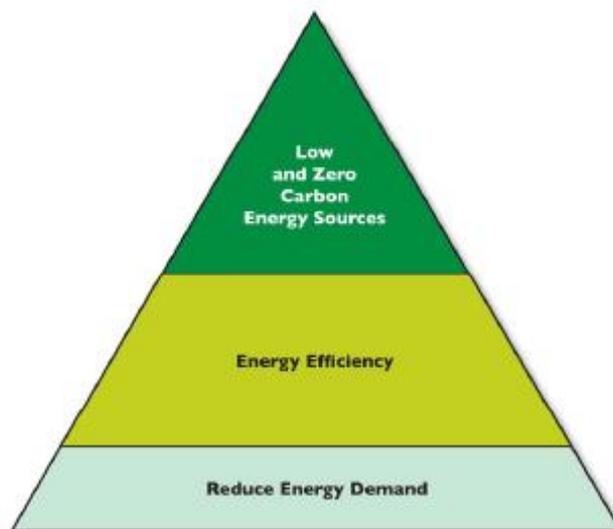


Figure 4.1: Energy Hierarchy (Source: Draft TAN 22, 2009)

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4.2.3 We are aware that this WAG policy recently out to consultation aims to establish ambitious requirements. It is acknowledged that by virtue of the application being submitted prior to the commencement date will not be expected to comply with the standards set out in TAN 22 (i.e. BREEAM standard 'Very Good').

4.2.4 Nonetheless, this development will aim to exceed contemporary building regulations applicable to the development and pursue, where appropriate and viable, the BREEAM Very Good standard, and indeed, the more ambitious ratings of 'Excellent' and 'Outstanding'.

4.3 Energy Efficiency Measures

4.3.1 The following measures will be consider and encouraged at Island Farm:

- § Use of high seasonal efficiency boilers reducing the energy used for heating and hot water.
- § Use of efficient fans (low specific fan power) reducing the energy required for ventilation.
- § Use of heat recovery on air handling plant to reduce heating energy required.
- § Use of energy efficient light fittings reducing the energy required for lighting.
- § Use of daylight dimming control in office spaces, all lights situated in a perimeter zone of 3metres from the façade are connected to a daylight dimming system thus saving electrical energy consumption for lighting.
- § High efficiency motors into all building services.
- § Use of variable speed drives for pumps and fans
- § The use of low energy white goods such as fridges, freezers, washing machines and dryers.
- § Use of individual energy meters to each user (individual retail units, office users etc), enabling effective energy monitoring against benchmarks, raising awareness, and facilitating feedback and appropriate action.

Passive Solar Building Design

4.3.2 This section details some passive design techniques that will be encouraged and adopted where feasible.

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- 4.3.3 The use of passive design measures to reduce the need for mechanical heating, cooling and ventilation within the buildings developed on the site will be promoted. The need for heating, cooling or mechanical ventilation can be achieved chiefly by building orientation, determining appropriate proportions of glazing, providing appropriate external shading features, selecting the most appropriate glass type and providing suitable levels of insulation. In reducing the energy the buildings need to be comfortable, less carbon is consumed and energy bills are reduced.
- 4.3.4 Therefore, from the outset the concept development proposals have given due consideration to the building form, massing and orientation in order to optimise the benefits of the climatic conditions of the site.
- 4.3.5 The planning will seek to promote solar access to buildings and to external spaces throughout the development to make best use of the benefits of natural light, passive heating and to enhance the environment for the occupants and users of the development.
- 4.3.6 Access to sunlight will be important for promoting outdoor activities and to encourage and promote plant growth.

Energy Performance Certificate (EPCs)

- 4.3.7 An EPC provides a rating for the energy performance of a building. The ratings are standard so the energy efficiency of one building can be easily compared with another building of a similar type. EPCs are required for almost all new buildings constructed in Wales, and are similar to the certificates now provided with domestic appliances such as refrigerators and washing machines. The EPC rates the energy efficiency and carbon emissions of a property on a scale of A to G, where A is the best.

4.4 Low and Zero Carbon Energy Sources

- 4.4.1 The scheme will investigate the potential of utilising renewable energy sources such as wind, solar energy and biomass to generate energy on site to serve the buildings and thus reduce dependency on fossil fuels.
- 4.4.2 It is recognised that Low and Zero Carbon energy sources can play an important part in tackling climate change and minimising the carbon emissions associated with the energy needed to provide heat, electricity and cooling for a building. PPW and TAN8 expects developers to consider the use of low and zero carbon energy sources as part their approach to reducing the carbon emissions associated with their developments.

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Centralised Energy Production

4.4.3 In response to this, it is aspired that provision for a centralised energy production of heating, cooling and electricity to be linked to a district energy distribution network.

4.4.4 The implementation of this strategy will consider the following when assessing its viability:

- § Carbon emissions reductions achievable
- § Integration of low and zero carbon technologies
- § Efficiency of energy production and distribution
- § Access and maintenance
- § Security of fuel/energy supply
- § Future adaptation

4.4.5 This section provides a description of renewable energy sources and their possible application to the Island Farm development. The appraisal of technologies also includes Combined Heat and Power (CHP) and Combined Cooling Heat and Power (CCHP) plants. Although the gas fired versions of these technologies cannot be classed as renewable energy sources as they combust fossil fuel, they do however provide substantial carbon dioxide savings when compared to standard gas fired boilers.

Bio-fuel heating

4.4.6 Bio-fuel heating systems burn biomass material in order to heat water, in the same way that gas boilers burn natural gas. The carbon dioxide emitted from burning bio-fuels is balanced by that absorbed during the plant's growth. Bio-fuel heating therefore approaches a carbon neutral system however it does have some embodied carbon dioxide emissions related to the combustion of fossil fuel during the bio-fuel processing and transport.

4.4.7 There are three different types of bio-fuels which could in theory be utilised at the Island Farm development:

- § Biomass
- § Bio-Diesel
- § Bio-Gas

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Solar thermal heating

4.4.8 Solar water heating systems use heat from the sun to heat hot water. The system requires solar collectors linked to hot water storage cylinders. Solar collectors could be mounted on the roof or actually form part of the roof fabric. They should be facing southeast to southwest and not be shaded in order to maximise annual thermal output. Therefore they should be located away from any obstruction or buildings which might overshadow them and be spaced by a sufficient distance to prevent one array overshadowing the other. Solar collector systems can either use evacuated tubes or flat plate collectors. Evacuated tubes are more efficient but more expensive.

4.4.9 Solar water heating performance depends on the amount of solar radiation and not on direct sunlight so it can work even on cloudy days. A solar heating system requires very little maintenance, with occasional visual inspection and an annual maintenance check, as well as the need to be drained and refilled every five years approximately.

Photovoltaic electricity generation

4.4.10 Photovoltaic materials, also known as solar cells, generate direct current electrical power when exposed to light. Solar cells are constructed from semiconducting materials that absorb solar radiation; electrons are displaced within the material, thus starting a flow of current through an external connected circuit. PV systems consist of solar cells connected together and mounted into modules.

4.4.11 There are two main types to consider:

1. PV Modules

These can be roof or façade mounted.



Figure 4.2: Images of solid PV modules

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2. PVs integrated into glazing

Gaps around the PV cells allow some daylight penetration. This can be used for partial shading in a glazed roof.



Figure 4.3: Images of integrated PV modules

PV modules could be integrated on most of the building roofs or facades however their financial feasibility would have to be assessed in more detail as design progresses.

Wind power

4.4.12 Wind turbines use the wind's forces to turn a rotor which in turn generates electricity. Wind power can be used in large scale wind turbines as well as in small individual or building integrated turbines.

4.4.13 A year of on-site wind data monitoring beforehand would be required to accurately estimate potential yields of any wind turbine installation.

4.4.14 The following issues should however be taken into account if this technology is being considered:

- § Large scale turbines to be located 500m from any residential development (as indicated above).
- § Possible light flicker on other buildings causing nuisance to occupants.
- § Large scale turbines to be located clear of public highway and buildings.
- § Actual outputs can be far less than manufacturers claim due to localised turbulent effects.
- § Small roof mounted wind turbines can have higher capital and maintenance costs compared with larger roof mounted ones.

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Ground source heating and cooling

4.4.15 Ground source heating and cooling can be used to absorb or reject heat from the building to the ground in order to achieve a heating/cooling system which produces low amounts of carbon dioxide.

4.4.16 Ground source heating and cooling can be divided into 3 different system types:

A. Closed Loop Ground Source Heat Pump

Ground source heat pumps can be used to extract heat from the ground by circulating a fluid through a system of pipes to a heat exchanger which transfers the energy to the distribution network. This can provide space heating and/or pre-heat domestic hot water, as well as providing cooling to the buildings. This closed loop system of pipework can be installed using thermal piles (integrated as part of the building substructure) and/or as a closed loop borehole array. In each case, electricity is required to drive the heat pump.

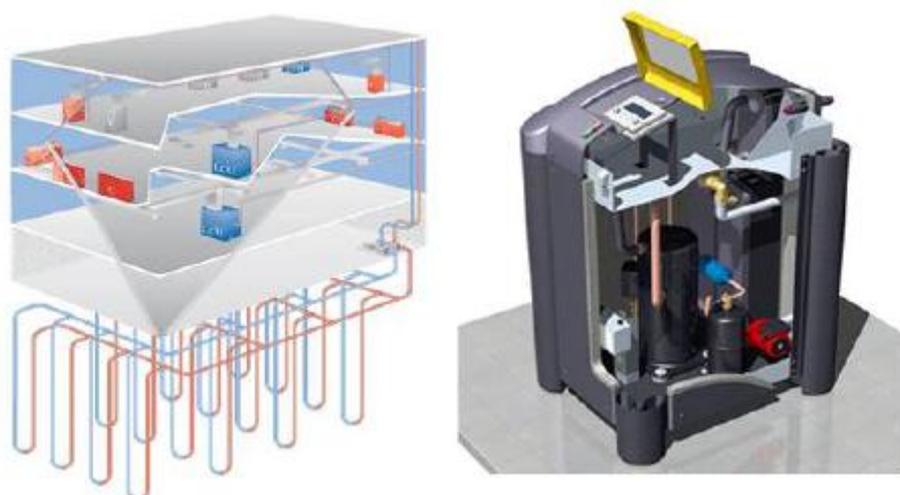


Figure 4.4: Ground Source Heat Pump – 3D image

Fully assessing the feasibility of this option would require an on-site ground investigation survey.

B. Open Loop Ground Source Heating and Cooling

Open-loop Ground Source Heat Pumps involves abstracting water from the underground water reserves (aquifer) far below the ground surface through a borehole (abstraction borehole) and rejecting it through a second one (rejection borehole), unconnected to the first one.

This system is therefore highly dependent on local ground conditions and a full geological survey will be required to verify its applicability to the Island Farm development.

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The system works by rejecting heat from the building using a heat pump and returning the water to the aquifer at a higher temperature via the rejection borehole. The system operates in reverse when in heating mode. In each case, electricity is required to drive the heat pump.

When there is a sufficient temperature difference between that of the ground water in the aquifer and the resultant room temperature in the building then, free cooling can be utilised. This bypasses the heat pump and transfers heat directly from the building to the aquifer. Due to the fact that electricity does not need to be consumed to drive the heat pump the energy efficiency of the system increases dramatically.

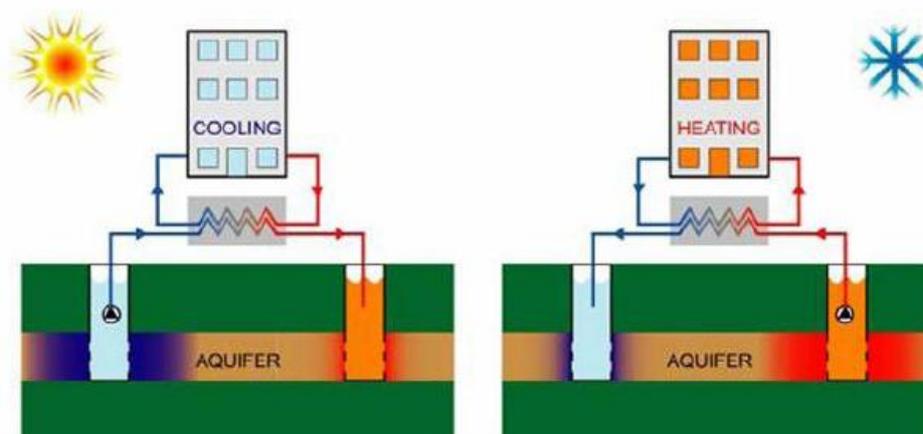


Figure 4.5: Boorhole Heating and Cooling

C. Earth or ground coupling

Ground coupling using air involves passing incoming air to the building through an array of heat exchange pipework placed in the ground where the temperature is relatively constant, thereby precooling the air in summer and pre-heating it in winter.

Combined heat and power plant (CHP) and Combined cooling heat and power plant (CCHP)

4.4.17 Combined Heat and Power (CHP) is the on-site generation of electricity and the utilisation of the heat that is a by-product of the generation process. Due to the utilisation of heat from electricity generation and the avoidance of transmission losses as electricity is generated on site, CHP typically achieves a 30% reduction in primary energy usage compared to the equivalent amount of energy coming from power stations and heat only boilers.

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- 4.4.18 In order for a CHP unit to run effectively it should be sized to run continuously for as many hours as possible, and in particular not to exceed the base annual heating load. It is therefore well suited to applications with a large year round domestic hot water demand. To prevent over-sizing of the CHP unit it is usually specified based on the domestic hot water load although it can also contribute to space heating. Generally bigger CHP units are more efficient and due to the electricity produced they can be used as local power generation plants and link to district heating networks to serve buildings within the vicinity.
- 4.4.19 Combined cooling heat and power (CCHP) is based around a CHP unit, where the heat produced is used to drive an absorption chiller to produce cooling. This allows the CHP unit to run even when there is limited use for the heat. The savings in terms of primary energy use and carbon emissions will largely depend on the efficiency of the absorption chiller and on the nature of the 'conventional' supply of chilled water (i.e. grid electricity and mechanical chiller), and therefore the implementation of this technology needs to be considered carefully on a case-by-case basis, having first reviewed the possible improvements achievable through high efficiency mechanical chillers.
- 4.4.20 As with CHP, the absorption chillers could be centrally located with the cooling distributed within a district network. Alternatively the cooling could be produced locally to the building it serves. This is dependent on space for the associated heat rejection plant and distance between source and use.

District Network

- 4.4.21 District heating is the term used for the distribution of heat via a pipe network that links several buildings to a single energy centre. District heating has several advantages compared to individual heating units:
- § The single energy centre means there is no requirement for each building to house its own heat/cooling generating plant and associated flue/heat rejection plant. There is also no requirement for individual gas supplies to each building.
 - § The single energy centre allows larger, more efficient plant to be used, and can be maintained regularly by specialists. It can produce electricity as well as heat/cooling, which is when large energy savings can occur (as mentioned above).
 - § Finally, having a single energy centre brings flexibility in the future in terms of adaptation to alternative energy sources and changes in heating and cooling needs.

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4.4.22 To enable the buildings within the development to be served from a centrally managed energy centre there is potential to make provision for district energy distribution for heating, cooling and electricity.

4.4.23 Further consideration and potential implementation of this strategy will consider the following when assessing its viability:

§ Carbon emissions reductions achievable

§ Integration with each building

§ Phasing of installation

§ Access and maintenance

§ Efficiency of distribution

5.0 TRANSPORT

5.1 Preface

5.1.1 Transport is an integral part of the Island Farm development masterplan. The site is designed, and will be managed, specifically to accommodate attractive and socially inclusive means of transport to the new development.

5.1.2 This section ought to be read alongside the Movement Assessment for the proposed application (as prepared by Opus).

5.2 Site Location

5.2.1 The site is well located in relation to Bridgend town centre and numerous local facilities including employment area, schools (primary and secondary), a college, shops, a post office and other facilities.

5.2.2 As detailed below, by virtue of its proximity to existing development, its pedestrian and cycle access and its accessibility to public transport, the proposed development is located in an inherent sustainable location.

5.3 Pedestrian and Cycle Facilities

5.3.1 The masterplan creates direct, safe and comfortable pedestrian and cycle routes within the site - between facilities, as well as links to the existing, adjoining Technology Park, Bridgend Industrial Estate and Bridgend Town Centre.

Footpaths

5.3.2 A large proportion of central Bridgend is within the potential walking catchment of 2km, with the railway station being approximately 1.5km, and the bus station approximately 1.85km from the northern boundary of the site.

5.3.3 Footpaths of a minimum width of 1.8m will be provided to both sides the carriageway throughout the development and within its immediate vicinity. Pedestrian priority areas will be provided throughout the scheme.

5.3.4 The scheme includes a link through the site to the existing Technology Park.

Cycle Routes

5.3.5 Almost the whole of Bridgend is included within the 5km cycling catchment.

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- 5.3.6 There is a traffic-free cycle route within close proximity of the site, beginning on the northern carriageway side of the A48 continuing to run parallel along the B4662 and then follows the A473 in a westerly direction until it terminates on High Street near the Wind Street Junction.
- 5.3.7 Similarly, there are 3 no. on-road cycle routes that provide further links to residential and employment areas of Bridgend alike.
- 5.3.8 As part of the proposed development, new cycle facilities are proposed along the improved section of the A48, with cyclist accommodating toucan crossing points provided at the proposed development access junction.
- 5.3.9 Furthermore, cyclists requirements will be considered at the detailed design stages of the internal development to ensure adequate facilities are provided to encourage this mode of transport. Indeed, a total of 373 cycle stands are required throughout the proposed development site.

5.4 Public Transport

- 5.4.1 The developer recognises the need to make provision for additional bus services. Therefore, in consultation with the Council, the potential locations for bus stops will be agreed at the detailed design stage. The internal access roads will be designed to make allowance for the uses of buses. Whether the bus facilities, bus lay-bys, boarders and shelters are provided by the developer or subject of a commuted sum for the Council, will be determined at a later date.
- 5.4.2 Nonetheless, the site is currently served by a bus stop located at the entrance to the existing Technology Park – some 500m from the middle of the proposed science / business park extension.
- 5.4.3 Bridgend (McArthur Glen Designer Outlet) is a principle stop on the National Express coach network with services to and from Bridgend to numerous locations across the country.
- 5.4.4 The nearest train station is Bridgend Station and is located 1.9km to the northeast of the development. The station is served by the Maesteg Line and the Vale of Glamorgan line, providing local services to numerous satellite towns and villages, further to Maesteg, Barry and Cardiff. The station is on the South Wales main line and the London-Swansea First Great Western Line, providing regular services to Swansea, Cardiff, Newport and destinations further afield.

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5.5 Park and Ride

5.5.1 As part of the development, it is proposed to provide facilities for a park and ride scheme to operate from the site.

5.5.2 It is intended that the park and ride facility will operate between the hours of 7.00am and 9.00pm, at intervals of 15 minutes during the peak periods and 30 minutes during off-peak periods. The buses will travel to Bridgend town centre and the bus station on a short circular route, providing a comprehensive coverage of the town with minimal journey times. Detail arrangements will be agreed between the bus operators and the BCBC. The support of the BCBC for the park and ride facility is fundamental to the success of the strategy. In addition to serving the park and ride the buses would also convey passengers from the town centre to the existing and proposed Science Park and Sports Village.

5.5.3 The benefits of the park and ride facility are: -

- § Reduction of traffic within the town, thus reducing the environmental impact;
- § Improving access to the sports village and business park;
- § Substantial improvement to the existing public transport links between the site, town centre and other local districts;
- § Bus services to the town centre and bus station will encourage further use of bus transport from the bus terminus; and
- § Improved public transport serving major events with limited special event parking facilities.

5.6 Shuttle Buses

5.6.1 Shuttle buses are to be provided by developer to provide links to Island Farm from numerous satellite locations on the periphery of Bridgend. This will reduce the need for people living in such locations to drive to the site.

5.7 Modal Splits

5.7.1 As part of the Movement Assessment, an estimation of the traffic generation for the usage of the proposed stadium has been calculated on an assumption that the stadium has is full to 50% of its capacity.

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- 5.7.2 The modal split assumes that just 40% of the total number of spectators will arrive by car. Therefore, 30% of spectators are predicted to arrive by shuttlebus and 25% by chartered coach. Therefore, the number of trips generated is minimised.
- 5.7.3 Indeed, it is known that rugby league matches often attract as many, or more, away-side spectators than home-side fans. Such supporters, who will travel to Bridgend from further afield more commonly travel by chartered coach or by train.

6.0 WATER MANAGEMENT

6.1 Preface

6.1.1 This chapter addresses the water management issues at the proposed development at Island Farm. The first section addresses the flood risk situation on site and the mitigation measures which have been incorporated and/or are being considered to prevent unwanted flooding of the future development. The next section present potential measures to reduce water demand, including water efficiency measures such as fittings and appliances.

6.2 Flood Risk Management and Mitigation

6.2.1 Careful consideration has been given in the design process to protecting the hydrological fluvial regimes on the site.

6.2.2 Chapter 7 of the Environmental Statement contains further detail of the geo-environmental aspects of the proposed development. In summary however, reference is made to TAN 15: Development and Flood Risk which is used to assess flood risk potential for the Island Farm site. The Environment Agency in their scoping consultation report confirmed that the site is wholly within Zone A 'Considered to be at little or no risk of fluvial or tidal/coastal flooding'. Therefore a detailed flood consequences assessment is not required.

6.2.3 Nonetheless, the new development will lead to the creation of hard surface areas where there was previously soft landscaping. This could in theory lead to a net increase in surface water run-off in the area and hence flood risk, however through careful design these effects could be mitigated or removed.

6.2.4 In order to reduce the quantity of the runoff from the site (i.e. the water which falls within the site boundary only), the design of the proposed development will seek to provide runoff attenuation, giving consideration to numerous potential measures.

6.2.5 Chapter 14 of the Environmental Statement identifies, in detail the drainage solution proposed for the site. Surface water drainage will be discharged, subject to Dwr Cymru Welsh Water approval, to the existing surface water sewer in the southern verge of the A48.

Sustainable Urban Drainage Systems (SUDS)

6.2.6 The on site surface water drainage will be designed under the ethos of SUDS, comprising of a pipe system feeding to attenuation lagoons. Both surface water from

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the development areas and highways will be discharged to the existing sewer via an attenuation lagoon located at the western side of the site. These lagoons will attenuate flows by storing runoff during the peak flow and releasing it at a controlled rate during and after the peak flow has passed.

6.2.7 Discharge of the A48 and the site access road junction will be via a dedicated highway drain within the A48, without attenuation.

6.2.8 Drainage of the car parking areas will consist of permeable paving discharging to the sub-surface / sub-soil.

6.2.9 Topographically the Application Site falls generally from north to south, but the surface water network discharges in the opposite direction. To mitigate the effects of the long drainage path to the outfall, downpipes will be located as far as is practicable on the northern side of all buildings. Large roofs will be drained by siphonic arrangement, thereby minimising the number of downpipes.

6.2.10 Further to the above, total surface water flows will be mitigated by:

§ Introduction of lagoons and water features

§ The introduction of green roofs

§ Providing permeable car parking surfaces

§ Rainwater harvesting

Lagoons

6.2.11 In order to avoid any contamination of the aquifer below the site in the event that soakaways or other large unlined bodies of water are introduced, it is proposed that lagoons and other water bodies are lined to prevent the flow of potential contaminants into the sub-soil.

Green roofs

6.2.12 The integration of green roofs will be encouraged throughout the Island Farm developments. These can bring a number of benefits, including:

§ Reduced storm water runoff;

§ Increased site biodiversity;

§ Reduced demand for summer cooling due to increased thermal mass;

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§ Added amenity value to the roof area if access and footpaths are provided.

6.2.13 Mainly, green roofs can be 'intensive' or 'extensive'. Semi-intensive" green roofs include a deep soil layer (up to 300 mm thick), which means that they have a greater capacity for storing rainwater and thus reducing runoff. The planting will be more robust to changing weather and artificial irrigation will be avoided for all but the driest summers, meaning that costs will be lower than for thinner green roofs.

6.2.14 The integration of a green roof incurs extra mass on the roof structure, which should be taken into account.

6.2.15 A detailed feasibility study will be required at a later stage in the detailed design process to confirm the potential viability and suitability of green roofs.

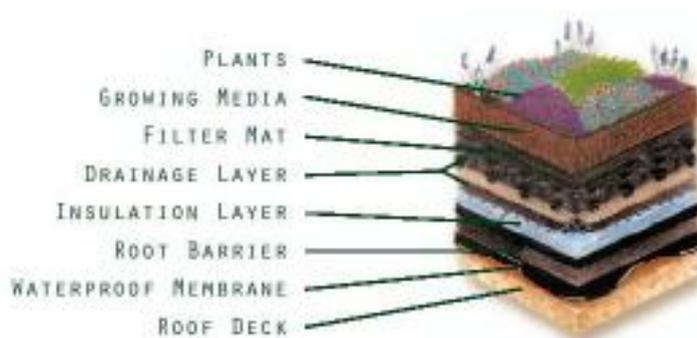


Figure 6.1: Typical green roof section

Permeable Surfaces

6.2.16 In line with emerging legislation on the use of SUDS, the currently proposed piped network will be modified to lined swales wherever possible.

Rainwater Harvesting

6.2.17 Rainwater from roofs and hard surfaces such as car parks can be stored and used in and around properties. The simple rainwater butt, used for watering plants, is a familiar method of storage. There has been a recent growth in the use of the collected water for a range of non-potable uses, particularly for flushing toilets. Stored water is generally held in a suitably sized underground tank and pumped to the point of use. A mains water supply is usually provided as a back-up if rainwater is not available.

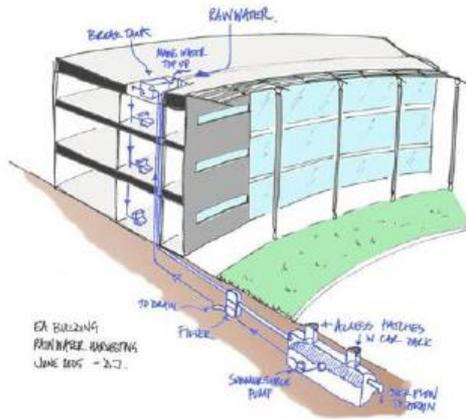


Figure 6.2: Sketch showing rain water harvesting system

6.3 Water Consumption

6.3.1 The Island Farm development aims to be highly water efficient, incorporating measures to reduce mains water consumption. A sustainable water use and drainage strategy will be integral to the design for the development.

6.3.2 The scheme has set water consumption targets for each of the buildings within the development based on the requirements of relevant building regulations. These targets will govern the performance of the water and drainage systems that are ultimately integrated throughout the development.

6.3.3 It is the aim of the Island Farm development to reduce the mains water required significantly through two methods:

1. Reduce demand through education and utilising water efficiency measures
2. Maximise the use of non-potable water (i.e. utilising recycled or brackish water where possible).

6.3.4 The reduction in water demand may be achieved through the use of water efficient fittings and appliances. The following water efficient measures will be considered:

- § Dual Flush WC's (6/4 of 4/2 litre)
- § Low flow aerated shower heads with restricted flow rates
- § Waterless Urinals
- § Aerated taps with flow restrictors and PIR (passive infra-red) or percussion control

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- § Water metering for all individual users of all other buildings
- § Use of leak detection devices

6.4 Water Recycling

6.4.1 Water recycling describes the process of collection, treatment and redistribution of reclaimed water to be used in place of potable water.

Localised Water Recycling

Rain Water Recycling - There is potential for rainwater recycling for irrigation and other non-potable uses locally within the buildings in the development. It will involve the use of a rainwater storage device which can be local to each building or a larger centralised storage tank serving multiple buildings. Figure 6.3 shows typically how a system such as this would operate.

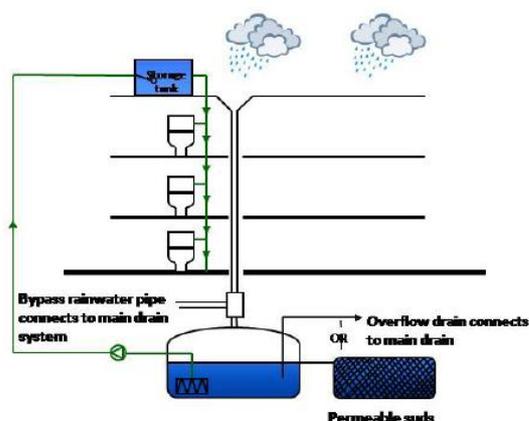


Figure 6.3: Rain Water Recycling Schematic

Grey Water Recycling - There is the opportunity to recycle the grey-water on-site for non-potable water uses. Grey water is defined as 'Water that was previously supplied by a water undertaker as 'wholesome water' but which has already been used in washbasins, baths or showers'.

There are two different systems widely available which could be applied for use on this project:

- (1) Stand-Alone Grey Water Recycling Systems Stand-alone grey water recycling are best suited for detached single residential units (houses or villas). Grey water is collected from the bath/shower and feeds into a recycling unit situated behind the WC. This should have sufficient capacity to supply all the WC flushing

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requirements of a residential unit and is supplied with mains top-up for periods when supply is low.



Figure 6.4: Stand along Grey Water Recycling System

- (2) Centralised Grey Water Recycling System - All grey water would be collected from the shower, baths and wash basins and piped to a centralised storage and recycling unit. From there, water is pumped back up the building(s) to supply non-potable water for WC and urinal flushing and for clothes washing. Any excess can be used for irrigation purposes and top-up will be supplied by mains potable water.

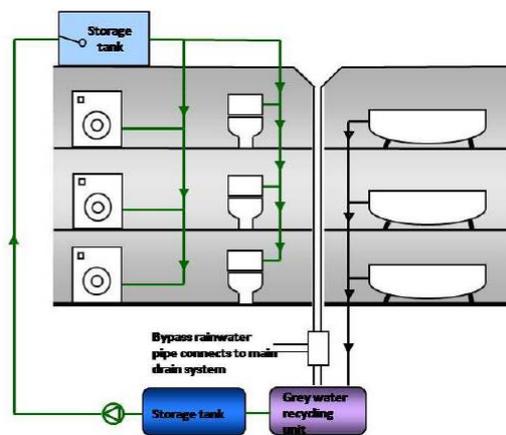


Figure 6.5: Centralised Grey Water Recycling System

7.0 BIODIVERSITY

7.1 Preface

7.1.1 The design of development will aim to protect and enhance the ecological value of the site. The design has been developed in parallel with the architectural aspirations to ensure that the issue of biodiversity has been considered throughout the development.

7.1.2 Indeed, an integral element of the proposed development is the nature conservation area which provides 43.4 acres of natural habitats in the north western section of the application site.

7.1.3 An ecology and biodiversity survey of the site has been conducted and the findings are detailed within the Environmental Statement. This section provides a summary of key measures which have been integrated into the masterplan design.

7.2 Protection of Ecological Features

7.2.1 The construction strategy, design, and landscaping of the scheme will have direct impact on the local biodiversity of the site and its surroundings. The Extended Phase 1 Habitat Survey (February 2009) found a total of sixteen habitat types within the site, with Arable Farmland the most dominant of the habitat types.

7.2.2 The construction strategy, design, and landscaping of the scheme will have direct impact on the local biodiversity of the site and its surroundings. The design of the masterplan reflects the ecological designations and constraints of the site.

National Designations

7.2.3 Six SSSIs, one SAC (Kenfig) and one NNR (Merthyr Mawr Warren) are within 3-4km of the site but their interest features are unlikely to be affected by the development at Island Farm, except perhaps if there is population dispersal of dormice from Old Castle Down SSI or if great crested newt is found on-site.

Local Designations / Ecological Constraints

7.2.4 One local wildlife site, the Island Farm POW Camp SNCI, occurs within the north-western part of the boundary of the study area and has been designated for its grassland mosaic and being one of three sites in Bridgend where dormice have been reliably recorded. As detailed below, this wildlife site has been incorporated into the site design.

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7.2.5 Although Bridgend and the Vale of Glamorgan are rich in UK BAP priority habitats, the available ecological data for the Island Farm site suggests that there are no UK BAP priority habitats on the development site. In very broad terms, two main habitat areas are present: 'brownfield' land to the north-west of the site and 'agricultural' land to the south and east. The brownfield area is largely unmanaged and comprises of semi-natural broadleaved woodland, scrub, grassland, rubble/hardstanding and the remnants of the old POW camp (including Hut 9). The agricultural land is actively farmed and comprises of four main habitats: arable fields/pasture, hedgerow, ponds and swallow holes.

7.2.6 Species of particular importance that have been recorded within the Island Farm site include two UK BAP species (dormouse and lesser horseshoe bat), Bridgend BAP species (grey heron) and Red Data Book Species (goldcrest and mistle thrush).

7.3 Mitigating Ecological Impact / Enhancing Site Ecology

7.3.1 The landscaping of the site is designed, in conjunction with the ecologist's report, to include plants of local provenance and habitat features for local wildlife. Important and species-rich hedgerows have been identified and are incorporated into the masterplan. This 'designed-in' mitigation aims to iterate the development proposals in order to retain as many key habitat features as possible, in whole or part, and to minimise impact on the most important habitats, including those on which key species depend.

7.3.2 The landscape strategy within the development seeks to work with the existing topography and thus retain as much of the existing hedgerow as possible. Notwithstanding this, a number of hedgerows will be affected during the development, this is however balanced by avoiding more sensitive ecological issues. Furthermore, the affected hedgerows will be trans-located to alternate locations within the site.

7.3.3 In addition, the development will provide gardens and courtyards as well as green roofs. These green spaces and water features will also help to provide areas of comfortable micro-climate under increasing summer temperatures.

7.4 Island Farm POW SINC

7.4.1 The impact of the proposed development on the Island Farm POW SINC has been carefully assessed. This area is identified as the most ecologically important part of the site and as such, impact has been restricted to the loss of a narrow corridor of habitat that will contain the main access route into the site – this equates to just a 12.3% loss of total area. However, there is a commitment shown in the masterplan and within the mitigation strategy to seek to extend the SINC to incorporate the field to the south-west

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of the site and also to introduce habitat enhancements and favourable management over the SINC as a whole.

7.4.2 Avoidance of a major impact on woodland and scrub within the SINC has largely been achieved by aligning the access road through the grassland area down the centre of the site. Connectivity between the habitats within the SINC and other areas has been maintained by retaining boundary hedgerows on the site perimeter and brownfield boundaries, which will also be enhanced.

7.4.3 Hut 9, which is the only surviving building left at this World War II historical POW site. The masterplan for the proposed development incorporates Hut – which has been listed (Grade II). The bat roost area at Hut 9 is not impacted upon.

7.5 Green Bridge

7.5.1 A pioneering ‘dormouse bridge’ / green bridge is to be provided to enable dormice to cross the main access road through the site, away from traffic. This is because this road could potentially interfere with the movement of dormice and lesser horseshoe bats, both of which are known to be reluctant to cross well used roads.

7.5.2 The bridge will be a steel and concrete construction, 5m wide, planted in hawthorn, hazel and small trees to encourage dormouse movement across it. An example of the similar green bridge is shown in the following illustration.

Figure 7.1: Illustration of the a green bridge



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- 7.5.3 The green bridge is also angled to follow the bat sight line when flying north-south from their Hut 9 home to the river.
- 7.5.4 The bridge will be planted with a mix of target species including hazel, hawthorn, blackthorn, bramble and honeysuckle, with new scrub planting at each site of the bridge, and splayed out into the site so that it connects to existing scrub areas.
- 7.5.5 It will be important that any direct or strong illumination of the green bridge will be avoided. As such, any nearby lighting should be minimal and at a low level to ensure street lighting does not preclude dormice or bats using the green bridge.

7.6 Other Mitigation and Enhancement Measures

- 7.6.1 Dormouse nest boxes and nesting tubs will be appropriately located at parts of the site that will remain undisturbed.
- 7.6.2 Pollution prevention measures will be implemented in order to safeguard sensitive ecological receptors, such as the SINC and the habitats within, and all wetland features.
- 7.6.3 Since the Island Farm site is frequented by a number of light-sensitive species, most importantly dormice and bat species, a lighting plan that avoids the strong illumination of key habitat areas is recommended, including the whole of the SINC and the green bridge, all boundary hedgerows and all wetland features.
- 7.6.4 Given the minor loss of site area for the SINC, a critical part of the mitigation strategy is the commission of an expert ecological design for the south west field, and the field containing the new wetland area in the west, that seeks to provide high-quality wildlife habitats that are appropriate to the setting and that target key species for which this site has maximum potential. In parallel with the design of the nature conservation area, a long-term 25-year management plan should be prepared for the whole of the SINC site.
- 7.6.5 An overall maintenance plan should be compiled for the remainder of the Island Farm site (i.e. the none-SINC area) that provides for the sensitive and appropriate management of the habitats within the wider site, e.g. hedgerows, scrub, trees, pond and wetland features *etc.*.
- 7.6.6 As concluded in the relevant chapter of the Environmental Statement, the habitat provisions / mitigation measures can be expected to impact positively on a variety of wildlife species, both the current residents of the site, and new species that might be attracted, providing a beneficial change overall for the biodiversity of the Island Farm site.

8.0 MATERIALS

8.1 Preface

8.1.1 The design of the Island Farm development will aim to minimise the impact of materials on the environment and on building users.

8.2 Aims and Targets

8.2.1 Whilst detail of the materials procured will be determined at a later stage of the application, the developer has set out the following aims and targets:

- § Maximise local sourcing of materials;
- § Aim for **100%** timber and timber products from Forest Stewardship Council (FSC), or equivalent certified source, and balance from a known temperature source;
- § Aim for **25%** total value of materials used to be derived from recycled and reused content in products and materials selected;
- § No peat or natural weathered limestone used in buildings or landscaping;
- § Prioritise selection of sustainably produced and delivered materials;
- § No construction nor specification of material with high embodied impact to be used (as defined by the summary ratings in the Green Guide to specification) unless compelling whole life energy or technical case for its use exists.

8.3 Sustainable Materials Procurement Strategy

8.3.1 A sustainable materials procurement strategy will be developed for each phase of the scheme. The objectives of the sustainable materials procurement strategy for the development works will include:

- § Use of standardised products and optimum use of pre-fabrication to minimise waste generated on site;
- § Consideration of recycled and reclaimed materials;
- § Minimising embodied energy in construction;
- § Maximise local sourcing of materials;

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§ Avoidance of hazardous/toxic substances in the project.

9.0 WASTE MANAGEMENT

9.1 Preface

9.1.1 The waste strategy at the proposed Island Farm development will aim to minimise the production of waste and encourage recycling, during construction and operation of the buildings. In addition to the environmental benefits of sparingly using finite resources, the proposed development at Island Farm would see long-term benefits from reduced landfill taxes.

9.2 Waste Management Plan

9.2.1 Detailed information on disposal of waste management will be confirmed at a later date. Nonetheless, at this stage, the developer aspires to establish a Waste Management Plan.

9.2.2 The Waste Management Plan will follow the principles of the Waste Hierarchy.



Figure 9.1: The Waste Hierarchy

9.2.3 The plan will consider the following strategies in order to achieve the aspirations set for the development:

- § Incorporate separate dedicated storage space;
- § implement waste management plan;
- § adopt site wide recycling scheme;
- § incorporate waste recovery systems (anaerobic digestion, pyrolysis/gasification).

9.3 Construction Waste Management

9.3.1 The Site Waste Management Plan for the development will identify opportunities to reduce waste during the construction process.

9.3.2 The project will be registered with the Considerate Constructors Scheme (<http://www.considerateconstructorsscheme.org.uk/home/index-video.html>), covering not only waste but all environmental and local issues of the construction process.



9.3.3 The design will seek to incorporate pre-fabricated elements where possible and recycled aggregates will be specified for a proportion of 'high grade' aggregate uses, as this can reduce the amount of materials used in the construction of a building.

9.4 Waste Minimisation during Operation

9.4.1 The quantity of waste will be reduced by adopting a strategy that seeks to only purchase what is needed for the project. Where feasible, waste streams will be sorted to maximise the recycling and reuse of waste and decrease landfill costs.

10.0 HEALTH AND WELL-BEING

10.1 Preface

10.1.1 This section sets out the how the proposed Island Farm development contributes to the improvement of people's health and well-being. To this effect, the first section refers to the on-site strategies proposed. Secondly, the wider, community effects of the proposed development are discussed.

10.2 External and Internal Conditions

10.2.1 The external and internal conditions within the proposed Island Farm development have a direct impact on the health and wellbeing of those who will use the development – particularly for the local community.

10.2.2 These environmental parameters include noise criteria, access to daylight, wind effects and air temperature.

10.2.3 Careful consideration of the arrangement of buildings can minimise the impacts of excessive external noise either generated within the development or local to the development.

10.2.4 Sunlight access to amenity spaces will be encouraged to promote the environment required to generate ecological growth and to provide attractive external spaces for the users of the development.

Creation of High Quality Public Realm

10.2.5 Access to, and provision of, outdoor amenities and public spaces will also be important for the success of the site. The Nature Conservation Area, the Piazza Open space, the outdoor amphitheatre, maintained hedgerows and open spaces will all contribute to the amenity provision of the development.

10.2.6 Accordingly, the proposals for the layout of the buildings and sports pitches have been developed in order to create a series of meaningful public spaces. Indeed, the proposals seek to create successful and vibrant public spaces in several ways.

10.2.7 The outdoor amphitheatre will provide a central open space used as an outdoor theatre and meeting area.

10.2.8 The piazza open space is intended to be a 'polyfunctional' area used for events and entertaining and also as overspill car parking for media/TV parking or private employee/staff car parking.

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10.2.9 The following are strategies which have been included in the masterplan or which will be encouraged in the detailed design stage:

- § Create places of interest throughout the development and access to the outdoor environment;
- § Provision of defined external amenity spaces;
- § Create a development of varying forms and massing;
- § Create a mixture of high quality architecture;
- § Provide access to daylight for buildings and external areas;
- § Provision of local and easily accessible amenities;
- § Create walking/cycling routes through the site;
- § Provision of public art throughout the site.

10.3 Wider Community Effects

10.3.1 The proposed development, and the provision of new sports facilities, will bring about a number of social benefits to the communities of Bridgend, further to the wider communities of Porthcawl and Cowbridge to the south and to valleys to the north (Ogmore Vale, Llynfi Valley (Maesteg) and Gawr Valley).

10.3.2 The proposed development will bring about and support community development. The mobilisation of local people and resources by enabling individual and groups to develop through participation in sporting activity will play a role in developing community identity and capacity to take action and change. Indeed, sports development is often considered to be an integral component of broader regeneration strategies for localities.

10.3.3 The provision of sports facilities, and the encouragement for people to partake in physical activity and increased social contact, will result in a number of direct and indirect health benefits to local communities. Increased physical activity is proven to improve general health and promote psychological wellbeing. Furthermore, the provision of local facilities, as proposed, will create opportunities for social interaction and community development.

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- 10.3.4 The opportunity to watch 'Super League' Rugby League at the location, will contribute to the creation of a sense of civic and local pride, whilst providing encouragement and impetus for local people to participate in sport themselves.

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11.0 MACRO-ECONOMICS

11.1 Preface

11.1.1 A sustainable economy, alongside society and the environment, is a key component of Sustainable Development. This section outlines the key economic impacts brought about by the proposed development at Island Farm.

11.1.2 The socio-economics chapter of the Environmental Statement provides further detail and information on this matter.

11.2 Employment

11.2.1 In the context of rising unemployment and rapidly expanding population, need for further employment opportunities in Bridgend is very high.

11.2.2 The proposed development will offer a total of 1,093 jobs, plus an additional 1,500 match day jobs.

11.2.3 Furthermore, a number of temporary jobs will be created during the construction of the development.

11.3 Benefit to the Local Economy

11.3.1 Based on the calculations in the Environmental Statement, spectators visiting the stadiums are estimated to generate £4.46m addition expenditure per annum in the study area (including within the stadiums). This is support an additional 91 jobs in the area.

11.3.2 The local economy will benefit from the potential training sports development incentives brought about by the scheme and the use of local purchasing initiatives, where possible, to capture the maximum benefits of the scheme to local construction firms and product manufacturers.

11.3.3 The proposed scheme will be integral to the marketing / place making of Bridgend. The proposed development will provide Bridgend with a high-quality leisure and employment destination, putting the town on the map.

11.4 Local Investment

- 11.4.1 The proposed development will potentially lead to subsequent investment and 'ripple effects'. This ought to support the existing Bridgend Science Park which adjoins the site.

12.0 FUTURE ADAPTATION

12.1 Preface

12.1.1 The development of Island Farm will consider climate change and future adaptation in the design and construction of the infrastructure, each building and the landscaping.

12.2 Strategy

12.2.1 The following strategies will be encouraged for the Island Farm development:

- § **Landscaping** - The landscaping strategy includes the provision of green spaces and water features which will help to provide areas of comfortable micro-climate under increasing summer temperatures.
- § **Centralised energy production and distribution** - The potential facility to integrate centralised energy production and distribution provides flexibility in the future in terms of adaptation to alternative energy sources and changes in heating and cooling needs.
- § **Sustainable drainage** - Provision within the sustainable drainage system to accommodate greater frequency and intensity of peak rainfalls will be encouraged.
- § **Public transport** - The improved bus services, park and ride facility and shuttle bus services will increase public bus usage and reduce the need to use the private car.
- § **Cycle and pedestrian links** - The masterplan includes provision for dedicated cycle and pedestrian links through the site to connect to adjoining development and to the town centre.
- § **Passive design measures** - The integration of passive design measures such as solar shading and thermal mass within the buildings will be encouraged to limit the need for cooling in the event of increasing temperatures in the future.

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13.0 OVERALL CONCLUSIONS

13.1 Conclusions

13.1.1 The Sustainability Statement has set out the sustainability principles and standards that have influenced the masterplanning process for the outline application to date and those which will be taken forward into the detailed design and implementation of the development at Island Farm.

13.1.2 As demonstrated within the opening section of the statement, the proposed development at Island Farm would be in accordance with (and would strongly support) key sustainability objectives from the national through to local level.

13.1.3 The document highlights the key features of the proposal for the following elements of sustainability:

- § Energy
- § Transport
- § Water management
- § Biodiversity
- § Materials
- § Waste
- § Health and well-being
- § Macro-economics
- § Future Adaptation

13.1.4 It is evident that sustainability, to date, has been integral in the design of the masterplan. Furthermore, as the scheme progresses, the developer, HD Limited, seeks to set out his aspirations for sustainability on the site.

13.1.5 The proposed development offers significant social benefits in terms of the health and well-being of local communities and the potential to create a greater sense of civic pride and social interaction in Bridgend. The proposed development offers, not only the opportunity to watch Super League quality rugby league, local rugby union and local football, but also the facility to participate in physical activity.

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- 13.1.6 The masterplan for the proposed development has been determined by the existing landscaping conditions and ecological constraints of the site. Approximately 43 acres of the site is retained and preserved as a nature conservation area, which includes the Grade II listed Hut 9 site. The Island Farm development protects and enhances the existing ecological value of this area of the site through numerous techniques, notably, the provision of the 'green bridge' which will allow for dormice to cross the main carriageway into the site and maintain the existing bat passage across the site.
- 13.1.7 The impact of the development in terms of carbon emissions is to be addressed through and mitigated by energy efficiency measures and the consideration of centralised renewable energy production. Furthermore, the inherent sustainable location of the development, alongside the improved provision of public transport (including the proposed shuttle bus service), will encourage users and visitors to the site to use public transport and reduce their reliance on the private car.
- 13.1.8 The proposed development will have numerous economic impacts – in terms of job creation (for both skilled and unskilled workers, during construction and operation), attracting further investment to Bridgend and assist in the place making of this part of Bridgend.
- 13.1.9 It is considered that the proposed development has a positive effect on each of the recognised, albeit integrated, subjects of sustainable development – the society, the environment and the economy. This Sustainability Statement concludes that the proposed scheme at Island Farm will be recognised as an exemplar leisure and office development for Bridgend and the wider sub-region.