Gateway 36, Phase 3, Barnsley.

BREEAM 2018 Pre-Assessment Report

Revision -

SYNERGY BUILDING SERVICES

LOW CARBON CONSULTANTS

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Summary of Building's BREEAM 2018 Assessment

BREEAM
BREEAM, the Building Research Establishment Environmental Assessment Method, is the world's longest established method of assessing, rating, and certifying the sustainability of buildings. A range of categories are evaluated, including energy, land use, ecology, water, health and wellbeing, pollution, transport, materials, waste, and management.

This Summary details the expected interim design stage performance of the aforementioned development as measured against the BRE Environmental and Sustainability Standard, BREEAM 2018 (Issue 3).

The proposed scheme will potentially achieve an interim score of **61.35%** against the BREEAM 2018 Version 3 Environmental and Sustainability Standard. This translates into an interim BREEAM rating of **Very Good.**

Building name	Gateway 36 Barnsley
Indicative building score (%)	61.35%
Indicative BREEAM rating	Pre-Assessment result indicates potential for BREEAM Very Good rating
Indicative minimum standards level achieved	Pre-Assessment result indicates the minimum standards for Very Good level

Environmental Section	% Credits Achieved	Weighted % Score Achieved
Management	83.33%	9.16%
Health & Wellbeing	60.00%	4.80%
Energy	33.33%	4.66%
Transport	66.67%	7.66%
Water	75.00%	5.25%
Materials	64.29%	11.25%
Waste	77.78%	5.44%
Land Use and Ecology	30.77%	4.61%
Pollution	83.33%	7.50%
Innovation	10.00%	1.00%
Indicative Building Score (%)		61.35%

1.0 Management Credits

This category encourages the adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare. This ensures that robust sustainability objectives are set and followed through into the operation of the building. Issues in this section focus on embedding sustainability through the key stages of design, procurement and initial occupation, from the initial project brief stage to appropriate provision of aftercare.

MAN 01 – Project Brief and Design

To optimise final building design through recognising and encouraging an integrated design process and robust stakeholder engagement.

Total indicative BREEAM credits achieved	4

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Stakeholder Consultation (Project Delivery)	Yes	1	1
Stakeholder Consultation (third party)	Yes	1	1
Sustainability Champion (design)	Yes	1	1
Sustainability Champion (monitoring progress)	Yes	1	1

Current Status

Credits Awarded

Early stakeholder engagement ensures that key project stakeholders are identified and engaged to determine end user requirements and operational adaptability, allowing them to be taken into account throughout the project.
Research highlights that when project stakeholders are not satisfied with the project management quality of the final project, the project team will need to adjust the scope, time and cost to meet stakeholder requirements and expectations on quality issues.
Adopting an integrated design and engagement processes has been demonstrated to result in improved operational performance, greater project efficiencies, and reduced risks to performance, time and cost, whilst following the process has been shown to maximise the opportunities for performance and minimise the risks of design conflicts appearing later on in a project when risks to time and cost are higher.

As a means of monitoring and reporting on the sustainability requirements of the project, Synergy BSS, who hold valid Accredited Professional (AP) BREEAM status, have been appointed as the BREEAM assessors for the project. It will be Synergy's role to provide regular updates on compliance with the sustainability issues, and to report any failings or risks that may prevent the team from meeting the requirements to the client and his team.

MAN 02 – Life Cycle Cost and Service Life Planning

To promote the business case for sustainable buildings and to deliver whole life value by encouraging the use of life cycle costing to improve design, specification, through-life maintenance and operation.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Capital Cost Reporting	Yes	1	1

Current Status

Credits Awarded

The client has agreed to report the capital cost of the project, both at design stage and post construction to the BRE.

MAN 03 – Responsible Construction Practices

To recognise and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner

Total indicative BREEAM credits achieved	6
Total indicative BREEAM innovation credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Legal and sustainable timber	Yes	-	-
Environmental Management	Yes	1	1
BREEAM AP	Yes	1	1
Responsible Construction Management	Yes	2	2
Utility Consumption	Yes	1	1
Transportation Impacts	Yes	1	1

Current Status

Credits Awarded

All timber used within the construction process is to be legally harvested and procured, with associated FSC/PEFC certification being provided.

As construction activities can create many local ground, water and air quality pollution risks affecting workers on site as well as others in the surrounding area, it will be ensured that all aspects of PPG6 are to be followed during all construction phases of the site. Preventing pollution during the construction is a major priority for the client.

The health and safety of the site operatives is a major concern within the construction sector. Within the UK construction sector, 43 workers were fatally injured in 2015/16 and 66,000 non-fatal workplace injuries were reported. Mental health is also a major cause of sickness and lost productivity in the construction sector with a CIOB survey indicating almost a third of respondents felt that stress at work was impacting on their health and wellbeing. In addition to the human cost of unaddressed mental health issues, there is also a financial one; absences due to sickness cost British businesses £26bn a year in lost productivity. As such the main contractor will be required to ensure that the health and wellbeing of all site operatives is a high priority within his site management plans, with onsite provision of safe, clean and organised facilities being provided within the site boundary, as well as management practices being in place to promote equality, fair treatment and respect.
As a means of monitoring progress against these goals, the site will be signed up to the Considerate Constructors Scheme.

It is known that construction can also impact on health and safety off site: approximately 19% of cyclist and 15% of pedestrian fatalities in the UK involve large goods vehicles over 3.5 tonnes, many of which are related to construction traffic. It is therefore an employer's requirement that the main contractor evaluates and mitigates all of the risks associated with vehicle movements both on site, and associated with the delivery of materials and the collection of waste from site.

MAN 04 – Commissioning and Handover

To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants.

Total indicative BREEAM credits achieved	4

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Testing schedule and responsibilities	Yes	1	1
Commissioning	Yes	2	2
Handover	Yes	1	1

Current Status

Credits Awarded

Targets set regarding building energy performance are becoming increasingly challenging. The first difficulty is around making sure that the building performs in practice as expected in terms of energy consumption and performance. The second aspect, directly linked to the first one, is related to achieving thermal comfort and high satisfaction levels for building occupants.

As a result of this building services systems are becoming more complex, which requires extended commissioning processes in place to ensure that they operate as intended. Therefore, it is required that a schedule of commissioning and testing which identifies and includes suitable timescales for commissioning and recommissioning of all complex and non-complex building services and control systems will be produced for the project. The schedule will identify all appropriate standards to which commissioning will be carried out, and an appropriate project team member will be appointed to monitor and programme the commissioning activities and allow for all works to be included within the main program of works.

Prior to handover, two building user guides which include details on how to best control the installed systems, will be produced. One for technical, and one for non-technical building users. In addition, two training schedules will be produced for implementation at handover. Again, one of these will be for technical users and one for non-technical building operators.

2.0 Health & Wellbeing Credits

This category encourages the increased health, wellbeing and safety of building users. Issues within this category reward building design and specification decisions that create a healthy, safe and comfortable internal and external environment.

Hea 01 – Visual Comfort

To encourage best practice in visual performance and comfort by ensuring daylighting, artificial lighting and occupant controls are considered.

Total indicative BREEAM credits achieved	2
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Daylighting	No	2	0
View Out	Yes	1	1
External Lighting	Yes	1	1

Current Status

Credits Awarded

Maximising exposure to natural daylight and providing an external view out provides users with a connection to nature. This can in turn support mental wellbeing, for example by improving people's mood and reducing the symptoms of depression. Increasing the level of daylight within the building also reduces the need for artificial lighting, which can reduce operational costs and environmental impacts of the building. Further to this, naturally lit environments increase occupant productivity and support the regulation of circadian rhythms.

At the time of writing, there have been no daylighting calculations undertaken for the occupied spaces. However, once the space design is finalised the assessor will review.

It is expected that the fenestration design to the occupied spaces will allow for the view out credits to be awarded, and it will be ensured that the external lighting meets the efficacy and switching requirements needed for BREEAM.

Hea 02 – Indoor Air Quality

To encourage and support healthy internal environments with good indoor air quality

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Indoor Air Quality Plan	Yes	-	-
Ventilation	Yes	1	1

Current Status

Credits Awarded

It is widely accepted that the quality of the indoor environment can impact occupant health. Poor indoor air quality can have a range of negative impacts on the physical health of building occupants, including immediate impacts such as eye, nose and throat irritation, headaches, dizziness and fatigue, while also contributing to long-term health issues such as asthma, respiratory diseases, heart disease and cancer.
Further to this, through the Control of Substances Hazardous to Health (COSHH) Regulations (2002), in workplaces employers are required to control any substance in the workplace that may be hazardous to health.
As a result, measures need to be taken to ensure the internal environment maintains good air quality and reduces the presence of common indoor air pollutants such as carbon dioxide, nitrogen dioxide, and volatile organic compounds.

A site-specific indoor air quality plan is to be commissioned, and the requirement for adequate ventilation will be implemented throughout the building.

It will also be ensured that the building is designed to minimise the indoor concentration and recirculation of pollutants by providing fresh air in line with the relevant standards.

Hea 04 – Thermal Comfort

To ensure the building is capable of providing and appropriate level of thermal comfort.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Thermal Modelling	Yes	1	1
Design for Future Thermal Comfort	Yes	1	1

Current Status

Credits Awarded

Research has shown that extreme temperatures are associated with an increased risk of illness and have an immediate effect on health and wellbeing. It is also recognised that measures taken to improve energy efficiency, such as increased airtightness, thermal insulation levels etc. have the potential to result in more instances of overheating in summer. With a changing climate, both under and overheating are an increasing problem in the buildings. Effective temperature regulation is therefore an integral part of ensuring a healthy and comfortable internal environment. Achieving thermal comfort is dependent on the building being designed to allow for seasonal changes and occupier preferences. However, it is also important to consider future temperatures which are expected throughout the lifetime of the building, so as to ensure future thermal comfort. The use of robust thermal modelling supports an energy efficient design while also ensuring environmental comfort in-use. Designing the building with thermal zones and controls ensures building user comfort by enabling a level of occupant control Modelling with consideration of a range of projected climate change environment allows futureproofing of the building for projected climate conditions.

It is therefore a requirement that compliant thermal models will be carried out using software in accordance with CIBSE AM11, to ensure that summer and winter operative temperatures ranges are in accordance with those set out by CIBSE.
The model will also take into account future climate change scenarios, and occupant zoning and control issues.

Hea 05 – Acoustic Performance

To ensure the building is capable of providing an appropriate acoustic environment to provide comfort for building users.

Total indicative BREEAM credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Acoustic Performance	No	1	0

Current Status

Credits Awarded

Noise within buildings can come from various sources, including building systems, occupants, equipment and external sources. Excessive noise can have a range of adverse effects on building users including inconvenience and annoyance, loss of concentration, decreased productivity and sleep disturbance. Therefore, the management of noise within a building, especially one whose main function is for warehousing and distribution, is important to maximise occupant comfort, occupant efficiency and to provide privacy.

The size and the potential use of the unit doesn't fit well with the criteria requirements. The credit is therefore not being sought at this stage; however it will be reviewed as the detailed design progresses.

Hea 06 – Security

To encourage the planning and implementation of effective measures that provide an appropriate level of security to the building and site.

Total indicative BREEAM credits achieved	0
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Security of Site and Building	No	1	0
Exemplary Security	No	1	0

Current Status

Credits Awarded

Security risks are dependent on the context of a building and, as a result, need to be specifically determined based on a number of variables including function and location. In addition to this, security risks are not static and can change over time. Therefore, consultation with the appropriate professionals is essential in determining the necessary security measures for any development. Through consultation with a suitably qualified security specialist (SQSS), site-specific recommendations can be made to improve the security of the site. This creates a safer and more secure environment that reduces the fear of and risk of crime. This supports the physical and mental wellbeing of building users, and the protection of property and business.

The design team will approach local police ALO and request recommendations with regards to Secured by Design. This credit will be reviewed upon receipt of advice.

Hea 07 – Safe and Healthy Surroundings

To encourage the provision of safe access around the site and outdoor space that enhances the wellbeing of building users.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Safe Access	Yes	1	1
Outside Space	No	1	0

Current Status

Credits Awarded

The external environment of a building plays an important role in the health and wellbeing of building users, and the overall appeal of the building. Safe access to the building, and safe movement around the site are important considerations to ensure the health, safety and general wellbeing of the building and site users. The provision of green recreational space provides numerous benefits to building occupants, and the building's value. It brings an element of biophilia to a building by supporting human interaction with the natural environment. Further to this, green recreational space can promote healthy lifestyles by promoting exercise and reducing stress levels. The UK Government policy recognises the benefits of green recreational space to the health and wellbeing of people, but also the indirect benefits such as alleviating flood risk. Including such a space in development also increases the desirability of the building, thus improving its value.

Latest architects' drawings show that the site access and egress have been designed to meet the requirements of the safe access credit.

The provision of compliant outdoor space will be reviewed as the detailed design stages progress.

3.0 Energy

This category encourages the specifications and design of energy efficient building solutions, systems and equipment that support the sustainable use and management of energy during the buildings operation. Issues in this section assess measures to improve the inherent energy efficiency of the building, encourage the reduction of carbon emissions and support efficient management throughout the operational phase of the building's life.

Ene 01 – Reduction of Energy Use and Carbon Emissions

To minimise operational energy demand, primary energy consumption and CO2 emissions.

Total indicative BREEAM credits achieved	0
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Energy Performance	No	13	0
Exemplary – Beyond Zero Nett Regulated Carbon	No	2	0
Exemplary – Carbon Negative	No	3	0
Post Occupancy Stage	No	2	0

Current Status

Credits Awarded

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

Design stage Part L calculations will need to be run for the scheme, once the detailed design stage is underway. Once these have been produced the assessor will award the appropriate number of credits.

Ene 02 – Energy Monitoring

To encourage the installation of energy sub-metering to facilitate the monitoring of operational energy consumption. To enable managers and consultant's post-handover to compare actual performance with targets in order to inform ongoing management and help in reducing the performance gap.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Sub-metering of End-use Categories	Yes	1	1
Sub-metering of High Energy Load and Tenancy Areas	Yes	1	1

Current Status

Credits Awarded

Through detailed energy metering and monitoring, owners and facilities managers are able to understand how their building is performing in greater detail and take steps to improve deficiencies. Poor energy monitoring and management is the biggest single contributor to higher-than-expected energy use in operational buildings and can present major opportunities to reduce energy consumption.
Appropriate actions such as changing practices and procedures, cutting wastage and managing energy use can reduce operating costs, energy consumption and carbon emissions. Appropriate strategies for metering can also ensure the building owner/occupiers are better informed of the usage figures for the building to optimise energy supply contracts and renegotiate new ones as well as managing facilities management contractors and comparing performance across a property portfolio.

Energy metering systems will be installed which enable at least 90% of the estimated annual energy consumption of each fuel type to be assigned to end-use categories.
By default, this will enable the separate function areas of the building to be separately monitored.

Ene 03 – External Lighting

To reduce energy consumption through the specification of energy efficient light fittings for external areas of the development

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
External Lighting	Yes	1	1

Current Status

Credits Awarded

External lighting is necessary to provide a sense of security at night and clear, safe and attractive access to people and vehicles, however light fittings can often result in relatively high energy usage as a result of poor specification of fittings and controls, as well as inadequate maintenance. Specifying external light fittings with the highest luminous efficacy and their efficient utilisation can reduce the energy consumption and associated costs attributed to essential external lighting while providing a pleasant and safe environment.

Therefore, the designed and installed external lighting scheme will comprise luminaires which have a minimum efficacy of 70 lumens per circuit Watt, and that are automatically controlled to prevent operation during daylight hours.

Ene 04 – Low Carbon Design

To encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Passive Design	Yes	1	1
Free Cooling	No	1	0
Low and Zero Carbon Feasibility	Yes	1	1

Current Status

Credits Awarded

Factors such as building massing, layout, orientation, fabric design, daylighting provision, ventilation strategies and thermal mass have a significant effect on the heat gains and losses in a building.
For example, air-conditioning is a high energy use and can conflict with more biophilic approaches to health and wellbeing, such as opening windows. Where possible its use should be minimised as its adoption will typically increase operational energy costs by around 50% to the running costs of the building.

In addition to the above the range of low and zero carbon technologies that supply electricity and heat is growing rapidly, and capital and operating costs are decreasing with economies of scale. This makes them a cost-effective solution for achieving a reduction in operational CO_2 emissions. A study that investigates which of these technologies would bring the most benefit to the scheme has been commissioned, with a view to incorporating the recommendations made therein.

4.0 Transport

This category encourages provision of and improved access to local amenities and to sustainable means of transport, i.e. public transport and other alternative transport solutions for building users. The aim is to reward locations and solutions that support reductions in car journeys and, therefore, congestion and CO2 emissions over the life of the building.

Tra 01 – Transport Assessment and Travel Plan

To reward awareness of existing local transport and identify improvements to make it more sustainable.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Transport Assessment and Travel Plan	Yes	2	2

Current Status

Credits Awarded

The National Planning Practice Guidance indicates that travel plans should be considered in parallel to development proposals and that they should be integrated into the design of a new site.
Based on evidence of the anticipated transport impacts of new developments, Travel Plans are a long term management strategy for implementing the mitigating measures addressed by the Transport Assessments or Statements.
They intend to promote sustainable and active travel. Their purpose is to deliver transport and transport-related benefits to the development itself and the wider community. As they include a package of actions designed to address the needs of the users in that local area, effective but unpopular solutions, such as parking restrictions, can be combined with popular but expensive solutions, such as bus subsidies, to ensure that the negative impacts are neutralised by the benefits.
The transport tools proposed by the Travel Plan are user-focused and ensure the increase and improvement of travel choices to the users, cost savings and improved company image and staff health and wellbeing.

A transport assessment will be undertaken as part of the application process, it includes detail of the current and future environment for cyclists and includes details of location of local amenities and the existing accessibility index for the site.

Tra 02 – Sustainable Transport Measures

To maximise the potential for local public, private and active transport through provision of sustainable transport measures appropriate to the site.

Total indicative BREEAM credits achieved	6

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Transport Options Implementation	Yes	10	3

Current Status

Credits Awarded

Transport accounts for around a quarter of UK greenhouse gas emissions, significantly affecting air quality at the roadside. Public transport offers a route to addressing transport-related greenhouse gas emissions. The emissions from trains and buses can be up to eight times lower than car travel. The National Planning Policy Framework places significant emphasis on sustainable transport options, stating that planning should "make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable".

Air pollution is estimated to cause 29,000 deaths each year and reduces life expectancy by 6 months on average in the UK, at a cost of £16 billion per year. It also damages plants and animals, affecting biodiversity and crop yields.
By reducing air pollution levels, the burden of disease from stroke, heart disease, lung cancer and both chronic and acute respiratory diseases, including asthma, can be lessened.
While the role of strategic policies is key, the need to address these issues with careful planning and design remains key to the creation of urban environments that are healthier and more pleasant to work and live in.

There will be a number of initiatives incorporated within the design of the scheme to promote a reduction in car use. These will include on site facilities for cyclists, and information on local amenities which are within walking distance of the site.

5.0 Water

This category encourages sustainable water use in the operation of the building and its site. Issues in this section focus on identifying means of reducing potable water consumption (internal and external) over the lifetime of the building and minimising losses through leakage.

Wat 01 – Water Consumption

To reduce the consumption of potable water for sanitary use in new buildings through the use of water efficient components and water recycling schemes.

Total indicative BREEAM credits achieved	3
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Water Consumption	Yes	5	3

Current Status

Credits Awarded

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

It has therefore been agreed that sanitaryware specifications are to be such that a minimum 25% improvement over baseline figures for water consumption is to be achieved.

Wat 02 – Water Monitoring

To reduce the consumption of potable water in new buildings through the effective management and monitoring of water consumption.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Water Monitoring	Yes	1	1

Current Status

Credits Awarded

Due to increasing population densities and relatively high levels of water consumption, much of the UK is at risk of water shortages which are likely to increase over time as rainfall patterns due to climate change reduce.
Reducing water consumption in the UK is, therefore, crucial. Sub-metering water usage means that water consumption can be better accounted for. Large water consumers can be identified with the aim of encouraging the reduction in water use where practical. Moreover, changes in consumption can be identified and dealt with as appropriate, thereby minimising the risk of systems failures which can have costly and disruptive consequences.

It will therefore be ensured that the main incoming water main to the unit will be fitted with a pulsed water meter, capable of being connected to a BMS system for ongoing monitoring. Furthermore, sub-meters will be specified to cover any areas of the scheme that are expected to consume more than 10% of the total water use.

Wat 03 – Water Leak Detection

To reduce the consumption of potable water for sanitary use in new buildings through minimising wastage due to water leaks

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Leak detection System	Yes	1	1
Flow control devices	Yes	1	1

Current Status

Credits Awarded

Water leakage within customers' properties represents 6% of the total public water supply in England and Wales. This is equivalent to 25% of the total water leakage, with the rest being attributed to water distribution systems of the supply companies. Water leaks in building systems can be responsible for major damage to property resulting in major disruption and costs. It is, therefore, important to ensure that water leaks are detected and controlled on a building level as early as possible.

In order to achieve this the unit will be specified with a water leak detection system and automatic sanitary supply shut off valves within each toilet block.

6.0 Materials

This category encourages decisions which reduce the environmental and social impact of construction products used on a project. It takes a 'whole life cycle' approach to construction product impacts, encouraging consideration of impacts during manufacture, design, procurement, installation, in-use and end-of -life. The issue focuses on construction product efficiency, environmental impact, responsible sourcing, and product durability.

Mat 01 – Environmental Impacts from construction products – Building life cycle assessment (LCA)

To reduce the burden on the environment from construction products by recognising and encouraging measures to optimise construction product consumption efficiency and the selection of products with a low environmental impact (including embodied carbon), over the life cycle of the building.

Total indicative BREEAM credits achieved	3
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Superstructure	Yes	7	3

Current Status

Credits Awarded

The use of construction products leads to a wide range of environmental and social impacts across the life cycle through initial procurement, wastage, maintenance and replacement. Taken together, construction products make a highly significant contribution to the overall life cycle impacts of a building. In some cases, they may even outweigh operational impacts (such as energy consumption). The introduction of Part L into the building regulations has led to reductions in the operational energy consumption of buildings and these regulations are being progressively tightened As a result, greenhouse gas emissions from other aspects of buildings, such as embodied emissions, are becoming increasingly important in terms of reducing the overall emissions in terms of reducing the overall emissions that lead to climate change and arise from the procurement, maintenance and replacement of construction products over the building's lifetime.
In addition to climate change, there are several other embodied environmental impacts associated with construction products and the processes that occur during and after construction that should be considered during design, for example corporate social responsibility and other regulatory obligations.

These credits require comparison LCA's to be undertaken on a variety of significantly different proposed superstructure designs.

Mat 02 – Environmental Impacts from Construction Products – Environmental Product Declaration (EPD)

To encourage availability of robust and comparable data on the impacts of construction products through the provision of EPD.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Product Specification	Yes	1	1

Current Status

Credits Awarded

A variety of construction product environmental claims are offered by manufacturers, other industry sources and in guidance, but the results presented are often inconsistent and therefore not suitable for making comparisons. In addition, even comparable information is difficult for a non-specialist to understand. Such information will often be biased towards presenting the benefits of a construction product and avoid or reduce the emphasis on negative impacts. This risks designers, clients and constructors being misled by the information provided, leading to incorrect decisions being taken that could result in increased environmental impacts. As a result, available information can often be misleading to designers and specifiers.
Specifiers can make better informed decisions using comparable EPD and generic LCA data in a recognised building LCA tool that presents results at the building level and over the life cycle of the building. Increasing numbers of EPD are being produced by construction product manufacturers. However, many construction products do not have an EPD, meaning generic LCA data must be used when carrying out a building LCA. While helpful in making basic construction product choices at the early design stage, this does not assist in specifying lower impact construction products during detailed design and construction stages. Further accuracy can be gained when carrying out LCA or specifying construction products by using EPD specific to a manufacturer's product range or, better still, the specific construction product.

On this project it will be ensured that the manufacturers of the main building materials associated with the superstructure, will have undertaken 'cradle to cradle' LCA's and therefore have compliant Environmental Product Declarations in place.

Mat 03 – Responsible Sourcing of Construction Products

To facilitate the selection of products that involve lower levels of negative environmental, economic and social impact across their supply chain including extraction, processing and manufacture.

Total indicative BREEAM credits achieved	2
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Legal and sustainable timber	Yes	-	-
Enabling Sustainable Procurement	Yes	1	1
Measuring Responsible Sourcing	Yes	3	2

Current Status

Credits Awarded

Most construction products involve long and complex supply chains that result in a wide range of impacts locally and globally. These might include environmental (e.g. toxicity or biodiversity), economic (e.g. corruption) or social (e.g. slave labour, equality) issues and can occur during the extraction, processing, manufacturing or supply chain stages. The increasing globalisation of supply chains increases the difficulty of tracing the supply chain and mitigating negative impacts caused by it. Credible certification schemes exist to increase confidence to specifiers that risks are being minimised or avoided and their use ensures that specifiers are able to demonstrate the responsible nature of their selection decisions.

As well as it being an Employer's Requirement that all timber used on site will be 'legal' and 'sustainable', as per the UK Government's Timber Procurement Policy, there will be a compliant sustainable procurement plan is in place, which will be followed throughout the design process, and will be passed onto the main contractor for their implementation during the construction stages.

It is assumed at this stage that at least 30% of material manufacturers will have environmental certification in the form of BES 6001 in place.

Mat 05 – Designing for Durability and Resilience

To reduce the need to repair and replace materials resulting from damage to exposed elements of the building and landscaping

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Protecting vulnerable parts of the building from damage	Yes	1	1
Protecting exposed parts of the building from material degradation	Yes		

Current Status

Credits Awarded

Exposed elements of a building or landscaping are at risk of damage through impact or wear and tear. This can result in significant and unnecessary materials use and waste generation across the life of a building. This can be minimised by risk areas being identified and designed out, and suitable protection measures being provided. The inclusion of this issue within BREEAM highlights the need to consider future repairs and replacements, as well as their associated costs, when designing and specifying materials for a new building.
In addition, climate change can significantly accelerate the deterioration of materials used in a building. It is therefore important to consider the impact of climate change and its associated environmental changes on the vulnerable elements within the built environment. Impacts of climate change can be mitigated by good design and specification so that stakeholders can have increased confidence in the durability of new buildings and their individual elements.

Adequate protection measures will be designed into the scheme, which will mitigate any potential damage to the building fabric from manoeuvring vehicles.

In addition key exposed building elements will be designed and specified to limit both long and short term degradation due to environmental factors. A report, which will be produced by the project architects, will detail the hazards identified and the processes in place to mitigate the risks.

Mat 06 – Material Efficiency

To avoid unnecessary materials use arising from over specification without compromising structural stability, durability or the service life of the building.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Material Efficiency	Yes	1	1

Current Status

Credits Awarded

The construction industry accounts for approximately 55% of the total annual material use, and buildings contribute 50% of total emissions of CO_2-eq. They are also responsible for 30% of total UK water use and 35% of arising waste.
The breakdown of global industrial carbon emissions shows that 55% comes from the manufacturing and processing of five stock materials: steel (25%), cement (19%), paper (4%), plastic and aluminium (3%).
Building standards and institutional requirements are often based on standardised, tried and tested design solutions which can result in significant over specification of elements and hence material use. Some of this is to allow for future flexibility in use that will never in reality be used and more is the result of conservative evaluation of risk. Therefore, optimising material use in the context of a specific project is one of the key resource efficiency goals for any sustainability strategy. This can be achieved through careful consideration of current and future project demands to maximise the efficient use of materials, waste prevention and reduction, minimal damage to the environment and reduced depletion of natural resources.

In light of the above, it has been agreed that during all stages of this project, the design team will meet to discuss, set targets and report on opportunities and methods to optimise the use of materials.

7.0 Waste

This section encourages the reduction of waste from construction and throughout the lifetime of the building. It rewards sustainable waste management, as well as waste reporting, reduction and diversion from landfill during construction, but also encourages sustainable practices during the building operation. Finally, this section encourages waste minimisation through optimised design methods, which consider current and future needs, and respond to functional requirements and climate change adaptation. It includes recognition of measures to reduce future waste as a result of the need to alter the building in light of future changes to climate.

Wst 01 – Construction Waste Management

To reduce construction waste by encouraging reuse, recovery and best practice waste management practices to minimise waste going to landfill.

Total indicative BREEAM credits achieved	3
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
SWMP Measurements and Reporting	Yes	3	2
Diversion from Landfill	Yes	1	1

Current Status

Credits Awarded

One-third of all waste in the UK, i.e. 120 million tonnes of waste per year, is generated by the construction and demolition sector, which is the largest contributor of waste in the nation.
Best practice solutions include off-site construction, where construction waste can be halved, the adoption of waste management methods such as the waste hierarchy, and the implementation of the circular economy concept, which provides an alternative to a traditional linear economy (make, use, dispose). This approach is adopted by certain manufacturers that offer a 'take back' scheme and by design teams that use the concept of 'design for deconstruction'.

Reducing waste simultaneously reduces the environmental impact as well as the cost of the construction process.
The true cost of waste encompasses the cost of the product or material that is wasted, the cost of handling waste and the cost of waste management. While there may be revenue associated with the recycling of certain material streams, typically construction sites have to pay for collection or processing of the waste. Legislation in this area has changed over time, however the benefit to the developer and the environment of avoiding unnecessary materials use and waste remain the same.

It will be an Employer's Requirement that the main contractor has a compliant site waste management plan in place for the duration of the construction works. The plan will identify, and quantity the different waste streams expected, and detail what waste minimisation measures will be implemented to ensure that both hazardous and non-hazardous construction waste is kept to a minimum.

The client's target for non-hazardous construction waste arising is no more than 6.5 tonnes per 100m², and a divert from landfill target of 90%.

Wst 02 – Use of Recycled and Sustainably Sourced Aggregates

To encourage the use of more sustainably sourced aggregates, encourage reuse where appropriate and avoid waste and pollution arising from disposal of demolition and other forms of waste.

Total indicative BREEAM credits achieved	0
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Project Sustainable Aggregate Points	No	2	0

Current Status

Credits Awarded

The use of secondary and recycled aggregate in higher value situations should be rewarded as a means to discourage their devaluation as a material resource or their disposal to landfill. Owing to the Aggregates Levy and the Landfill Tax, recent evidence indicates that the amount of aggregates being disposed of in landfill and being used as low grade fill has decreased markedly in recent years. However, sourcing of aggregates remains an issue in terms of the range of environmental and social impacts that arise from the extraction and transport of aggregates in the UK. Therefore, primary aggregates can still be considered a sustainable option, where locally sourced, sustainably transported and from a region where that aggregate type is abundant. In addition, the use of secondary aggregates resulting from other processes such as marine dredging can also be considered sustainable under certain circumstances.

On sites where demolition of existing buildings or hard landscaping forms part of the enabling works, these credits should always be encouraged, however the credits cannot be targeted until the quality of resulting aggregates is known.

Wst 03 – Operational Waste

To encourage the recycling of operational waste through the provision of dedicated storage facilities and space.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Operational Waste	Yes	1	1

Current Status

Credits Awarded

It is a statutory requirement for local authorities and private sector organisations to meet higher recycling targets. The aim is to recycle, reuse and reprocess more waste into useful products and materials. It is therefore important to provide sufficient storage areas within the building to reflect the recyclable waste streams that are generated and then collected by the local waste authority. This makes it as clear and convenient as possible for the building users to separate waste at source and encourage the reduction of waste to landfill.

It will be ensured that dedicated and clearly labelled spaces will be allowed for within the site boundary, to enable the segregation and storage of operational recyclable waste generated by the day to day running of the unit.

At the time of writing, it is not envisaged that the unit will generate large amounts of packaging or compostable material, so balers or composting facilities are not required.

Wst 05 – Adaptation to Climate Change

To minimise the future need of carrying out works to adapt the building to take account off more extreme weather changes resulting from climate change and changing weather patterns.

Total indicative BREEAM credits achieved	1
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Resilience of structure, fabric, building services and renewables installation.	Yes	2	1

Current Status

Credits Awarded

The annual average UK temperature was 0.9°C higher during the period 2005-2014 compared with 1961-1990.
Moreover, sea levels around the UK have risen by 15-20 centimetres since 1900. These figures are forecast to continue to change as a result of climate change. At the same time, there are upward trends in rainfall across the UK.
Higher levels of winter rainfall have been experienced often in increasingly heavy rainfall events leading to more flooding and damage to buildings and infrastructure. These patterns are consistent with projections of more and heavier rainfall for the UK in a warmer global atmosphere.

These changes increase health and safety risks to people and the built environment, increasing costs and disruption for repair and adaptation. The building stock will largely remain as it currently is for the next 50 to 60 years, given the relatively low levels of replacement that are likely to occur. Therefore, there is a need for strategies to mitigate the impact of these events on our building stock overall and in particular to ensure that new buildings are designed and constructed to minimise future risks while avoiding over specification and resource use in the meantime.

It has therefore been decided that a climate change adaptation strategy appraisal will be undertaken which uses a systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle.
The results of the appraisal will be used to drive material specifications.

Wst 06 – Design for Disassembly and Adaptability

To avoid unnecessary materials use, cost and disruption arising from the need for future adaptation works as a result of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a circular economy.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Design for Disassembly and Functional Adaptability - Recommendations	Yes	1	1
Disassembly and Functional Adaptation - Implementation	Yes	1	1

Current Status

Credits Awarded

The construction industry is responsible for approximately 60% of total UK materials use and one-third of all waste produced. At least 17 million tonnes of inert waste are produced by the UK construction industry. Typically, buildings are stripped out or in many cases even demolished considerably earlier than their design life would predict or structural stability require.
In most cases only high value materials are reclaimed or reused and many resources are either used for low grade uses, taken to landfill or, in some cases, even illegally dumped leading to increased environmental damage and costs to local authorities and society. This risk can be reduced by considering building adaptability and also future disassembly to allow easy material separation and reuse. This includes exposed and reversible connections, layer independence and standardisation which can facilitate disassembly.

A study will therefore be commissioned which explores the ease of disassembly and the functional adaptation potential of different design scenarios. Recommendations based on the study, that aim to enable and facilitate disassembly and functional adaptation will be developed.

During technical design, the study will be updated, and the recommendations implemented. A building adaptability and disassembly guide will form part of any future selling package, which can be used by any new incoming tenants to guide future changes to the structure.

8.0 Land Use and Ecology

This category encourages sustainable land use, habitat protection and creation, and improvement of long-term biodiversity for the building's site and surrounding land. Issues in this section relate to the reuse of brownfield sites or those of low ecological value, mitigation and enhancement of ecology, and long term biodiversity management.

Le 01 – Site Selection

To encourage the use of previously occupied or contaminated land and avoid land which has not been previously disturbed.

Total indicative BREEAM credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Previously Occupied Land	No	1	0
Contaminated Land	No	1	0

Current Status

Credits Awarded

As this scheme is being constructed on a greenfield site, with no known areas of significant contamination, these credits cannot be targeted.

Le 02 – Ecological Risks and Opportunities

To determine the existing ecological value associated with the site, including surrounding areas, and the risks and opportunities for ecological protection and enhancement as part of the project.

Total indicative BREEAM credits achieved	2
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Prerequisite – Statutory Obligations	Yes	-	-
Survey and Evaluation	Yes	1	1
Determining Ecological Outcomes	Yes	1	1

Current Status

Credits Awarded

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

It will form part of the Employer's Requirements that all relevant UK and EU legislation relating to ecology will be followed for the duration of the works.

The site will be evaluated using the BREEAM Ecological Risk Evaluation Checklist, and the ecological assessment route will be determined. As the site is predominantly greenfield with limited structures the route that is to be followed will be dependent on the advice of a suitably qualified ecologist. For the purpose of this report, it has been assumed that checklist will indicate that a comprehensive (Route 2) evaluation is required.

A suitably qualified ecologist will be appointed to carry out a site survey to determine the ecological baseline and identify any zones of influence. The resulting report will identify both direct and indirect risks to the current ecological status and detail the capacity and feasibility of mitigating any loss.

Le 03 – Managing Impacts on Ecology

To avoid , or limit as far as possible, negative ecological impacts associated with the site and surrounding areas resulting from the project.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Prerequisite – Ecological Risks and Opportunities	Yes	-	-
Planning and measures on site	Yes	1	1
Managing negative impacts	Yes	2	1

Current Status

Credits Awarded

Programming of works on a site is driven by many factors but can often have a negative impact on the ecology of a site or in the wider area (within the site's 'Zone of Influence'). Many species and habitats are legally protected, and ecological damage can result in prosecution leading to corporate or personal fines, prison sentences and reputational damage. Also, the replacement of lost habitats is not straightforward and takes time to be successful. It is, therefore, important to limit disruption and disturbance to local wildlife or ecological systems, wherever possible. This should be done by following the 'mitigation hierarchy' of 'avoid, protect, reduce or limit and compensate', when making decisions that have ecological impacts. Where disruption is likely to arise during construction works and operation of the asset, the focus should be on minimising disruption to maximise value and ensure that it is sustainable for the longer term.

In light of the above the client is keen to ensure that planning to avoid and manage negative ecological impacts on site will be carried out, and protection measures will be implemented prior to start on site to protect any existing ecology during the enabling works onwards.

Negative impacts from site preparation and construction works will be managed according to the mitigation hierarchy resulting in the loss of ecology being minimised as far as possible.
If any mitigation measures are required, these will be set out by the appointed qualified ecologist, who will monitor their implementation.

Le 04 – Ecological Change and Enhancement

To enhance ecological value of the area associated with the site in support of local, regional and national priorities.

Total indicative BREEAM credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Prerequisite – Managing Negative Impacts on Ecology	Yes	-	-
Ecological Enhancement	No	1	0
Change and Enhancement of Ecology	No	3	0

Current Status

Credits Awarded

Improving the ecological value of a site post-development through the introduction of appropriate flora and fauna, the creation and enhancement of biodiversity (species and habitats) and wildlife corridors, can have major benefits on local, regional or national biodiversity. BREEAM focuses on rewarding enhancement of local biodiversity, on the site under development or, where that is not possible, in the wider area (within the site's 'Zone of Influence'). This issue provides a route for addressing the growing industry and Government drive for biodiversity net-gain, using robust methodologies based on the industry-recognised Defra Biodiversity Metric, which is supported by good and best ecological practice.

All efforts will be made to ensure that any loss of on-site ecological value as a result of the development, will be mitigated as far as possible, however as it is expected that the existing biodiversity baseline of the site is medium to high, there is likely to be limited opportunity to show significant on-site enhancements.

These credits will be reviewed upon appointment of the ecologist.

Le 05 – Long Term Ecological Management and Maintenance

To secure ongoing monitoring, management and maintenance of the site and its habitats and ecological features, to ensure intended outcomes are realised for the long term.

Total indicative BREEAM credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Prerequisite – Statutory Obligations, Planning and Site Implementation	Yes	-	-
Management and Maintenance throughout the project.	Yes	1	0
Landscape and Ecology Maintenance Plan	Yes	1	1

Current Status

Credits Awarded

Many well intentioned design aspirations are not realised in practice if sound management arrangements are not established and maintained during construction, handover and ongoing operation of a site.
This is especially the case where responsibility is transferred throughout different project stages. Appropriate landscape and habitat management arrangements are essential to help ensure the long term sustainability of ecological features in-practice. As well as supporting ecology, this helps to realise the multiple benefits that improving ecological value can contribute to high quality and attractive outdoor spaces associated with the site (including its 'Zone of Influence'). For long-term management arrangements to be valuable, they must be based on a robust understanding of: the site's ecological value, how negative impacts need to be mitigated and where feasible how ecology can be enhanced.

9.0 Pollution

This category addresses the prevention and control of pollution and surface water run-off associated with the building's location and use. Issues in this section aim to reduce the building's impact on surrounding communities and environments arising from light pollution, noise, flooding and emissions to air, land and water.

Pol 01 – Impact of Refrigerants

To reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems.

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Impact of refrigerant	Yes	3	2

Current Status

Credits Awarded

The typical refrigerants used in building cooling systems are major greenhouse gases that are many times more potent than carbon dioxide in their contribution to global warming and climate change. Although released in much smaller quantities they are, never the less, a significant contributor to increasing global temperatures. As such, they are the focus of increasingly strict regulatory controls internationally and nationally. Worldwide agreements such as the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and its extension the Kyoto Protocol commit signatories to reducing greenhouse gas emissions and banning the worst performing gases. The agreements seek to shift use to low impact refrigerants over time and so provide a timescale for the phasing out of more potent refrigerants because the use of the gases is widespread and key to industries across developed and developing countries.
BREEAM seeks to support this agenda and promote more rapid change by creating market value for developments with reduced impact refrigerants by limiting the volume or weight of gases used, their potential impact, and for specifying systems which detect and control leakage of gas to the atmosphere.

At the time of writing it is assumed that R410a is likely to be the refrigerant utilised in any comfort cooling systems installed within the unit, however the charge required is expected to be lower than average, due to the passive design exercises that will be undertaken as part of the envelope design.

Although R410a has a high global warming potential (GWP), it is expected that the small amount of charge required versus the amount of cooling (duty) provided will mean that credits can be awarded under this issue.

Pol 02 – Local Air Quality

To contribute to a reduction in local air pollution through the use of low emission combustion appliances in the building

Total indicative BREEAM credits achieved	2

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Low NOx Emissions	Yes	2	2

Current Status

Credits Awarded

Poor air quality has a detrimental effect on humans, fauna and flora. Gases such as nitrous oxides (NO_x) can react with other gases and environmental factors including sunlight to create substances that have a major impact on health and wellbeing. The resulting substances can be highly detrimental to human health. They can be carcinogenic, affect respiratory function (including asthma and other bronchial complaints), have a sensitising effect for allergy suffers and increase instances of heart disease. Legislation covering the UK sets maximum acceptable limits for measured air pollutants.

DEFRA UK Air information website shows that the proposed site lies in an area of poor air quality, (both NOx and PM10 levels exceed the BREEAM Baseline figures). This is mainly due to the close proximity of busy public highways. As a means of trying to reduce the NOx emissions associated with the operation of the unit, it has been decided that all space and water heating should be provided by either low-NOx boilers, or via electricity.

Pol 03 – Flood and Surface Water Management

To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, thereby minimising the risk and impact of localised flooding on-site and off-site, watercourse pollution and other environmental damage.

Total indicative BREEAM credits achieved	4
Total indicative BREEAM innovation credits achieved	0

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
Flood Risk	Yes	2	2
Surface Water Run-off (Flow Rate)	Yes	2	2
Minimising Watercourse Pollution	No	1	0

Current Status

Credits Awarded

In the UK around 0.5 million homes, offices, factories and warehouses are considered to be at a significant risk of flooding, i.e. they have a greater than one in 75 chance per year of being flooded. Apart from the initial effects of being flooded, i.e. access and use of the building, once flood water is removed significant resources (man hours, time and cost) are usually required to clean, refit and re-open buildings for use. This has major impacts on business continuity that can be costly and time-consuming to manage. With due consideration at an early stage of the location, design and specification of the development (including the building, curtilage and wider site) the risk of flooding, and impact if it is flooded, can be managed.

As such a site-specific flood risk assessment has been commissioned for the site. The assessment is likely to show that the site lies within an area that is deemed to be at a low risk of flooding from all sources (based on EA maps).

Calculations within the report will show how the surface water run off will be limited to 30% below existing rates, taking into consideration the 1- and 100-year storm events and an allowance for climate change.

It will also be ensured that the drainage design is such that the units will not flood in the event of a local drainage failure, caused by lack of maintenance and/or excessive rainfall.

Pol 04 – Reduction of Night-time Light Pollution

To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, thereby reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

Total indicative BREEAM credits achieved	1

Pre-Assessment question/criteria	Response	Credits available	Indicative credits achieved
External Lighting Compliance	Yes	1	1

Current Status

Credits Awarded

The external lighting used by buildings can have a detrimental impact on the use and enjoyment of neighbouring properties, and on the mental and physical wellbeing of individuals in them. It also has a significant and often detrimental impact on local wildlife. The design of lighting installations can reduce the impacts without limiting their functionality and there are a number of appropriate best practice standards for the design and control of such lighting installations that aim to minimise these detrimental impacts. By limiting light pollution the impact and energy use of the building may be reduced making it more acceptable to local communities and reducing impacts on local wildlife.

As such the proposed external lighting will be designed and installed in compliance with Table 2 of the Institution of Lighting Professionals Guidance notes for the reduction of obtrusive light, 2011.

As the function of the building may require night time operation, there is no requirement for the lighting to be switched off between the hours of 23:00 and 07:00.