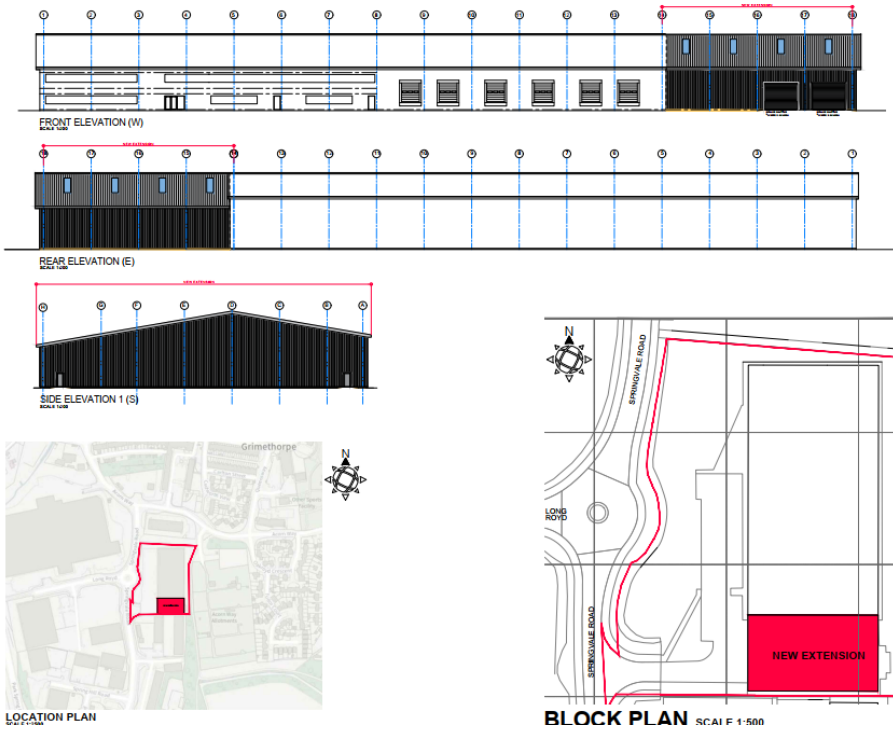
Factory Extension: Ultima Furniture Systems Ltd, Grimethorpe

Energy & Sustainability Statement



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Contents

1.0 Introduction

1.1 Purpose

This Energy & Sustainability Statement sets out how the design, planning, implementation and ongoing operational management of the proposed new factory extension for Ultima Furniture Systems Ltd. at Parksprings Industrial Estate, Long Royd, Grimethorpe, Barnsley, S72 7PT responds to and supports the range of drivers to deliver a sustainable approach to development.

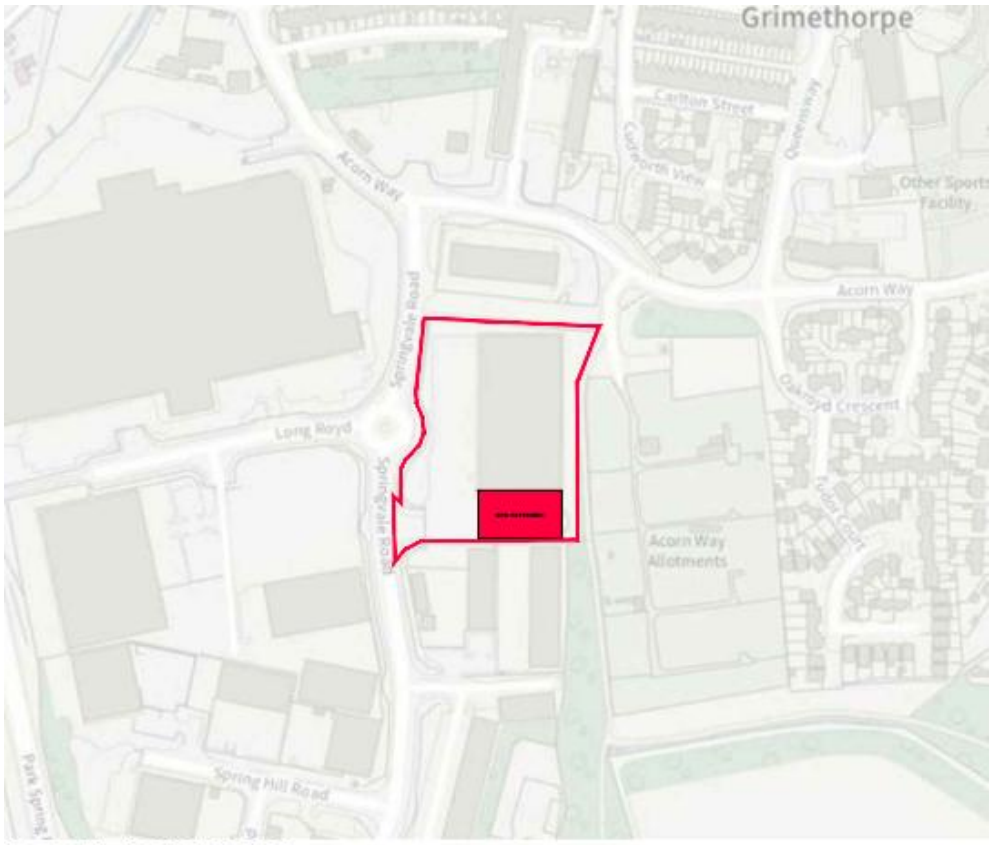
The statement is set out to provide details of the approach taken to addressing the various factors which influence sustainability performance of the proposed development, in the context of national and local planning and sustainability policy. It should be read in conjunction with the statutory planning and accompanying documents provided in support of the planning application.

In terms of design development, the project is currently around RIBA Stage 2. As such, this statement is based primarily on the outline design information available at the time of writing, supplemented where appropriate with commitments based on discussions with the Design Team. Detailed thermal modelling (SBEM) and final carbon calculations will be undertaken at RIBA Stage 4 (Technical Design) to confirm compliance with Building Regulations Part L and Barnsley MBC policies.

1.2 Structure

This statement gives an overview of the national and local policy context by way of identifying the broad framework of sustainability and energy challenges and opportunities that are pertinent to the planning and development process in general, and to the site specifically.

It then considers and analyses the response of the development proposals in relation to the energy-related aspects of sustainability detailed in the Barnsley Metropolitan Borough Council (BMBC) adopted planning policy and related guidance.



LOCATION PLAN
SCALE 1:2500

2.0 Scheme proposals

This Energy & Sustainability Statement has been prepared for Ultima Furniture Systems Limited, in support of their application for a proposed extension to their existing factory site at Park Springs Industrial Estate, Long Royd, Grimethorpe. The site is surrounded primarily by industrial buildings to the North, East & south to the West is Park Spring Road & industrial future development sites.

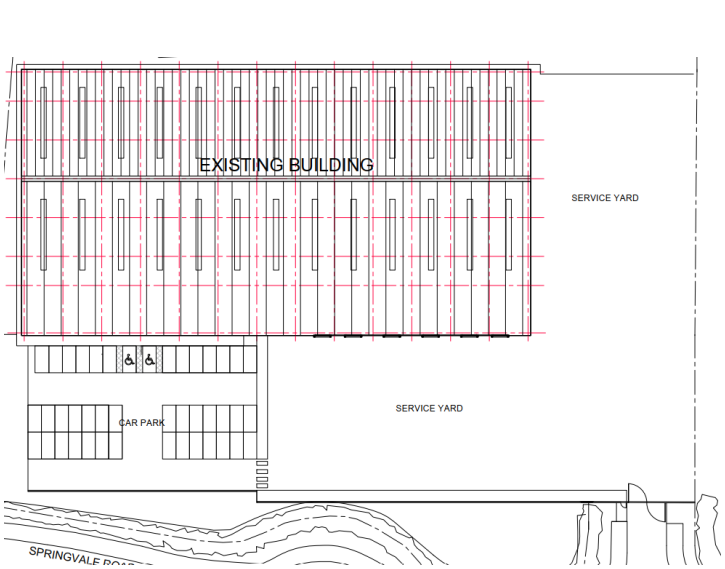
The nearest residential properties are to the North of the site, over 250m away.

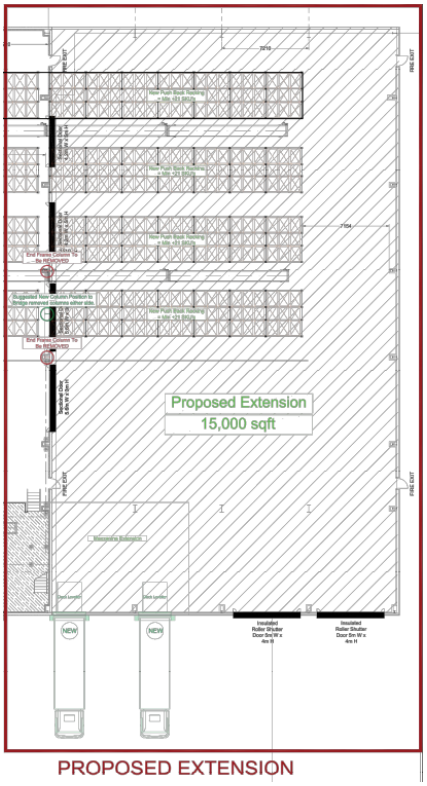
The application site has an area of 2.4 hectare and has three existing industrial buildings, which were built between 2005 & 2017, with the client's existing factory unit being constructed in 2021-2. The proposed extension has a GIFA of approximately 1,404m^2, and comprises an area containing additional push-back racking, dock levellers, and a mezzanine extension.

The site is accessed off Long Royd to a private road, car park areas & service yards which serve the existing in buildings.

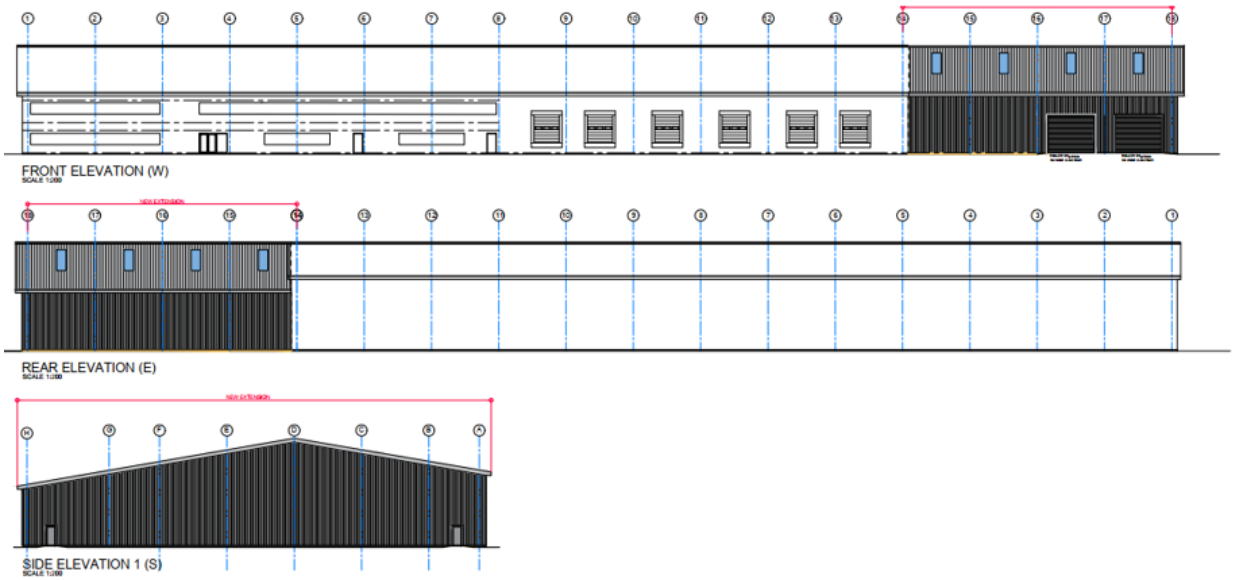
Location of site – Park Springs Industrial Estate, Grimethorpe, Barnsley

Existing site – proposed Factory Extension





Existing and Proposed site plan



Proposed elevations

3.0 Sustainable development policy

3.1 National Policy

3.1.1 The National Planning Policy Framework

The NPPF (updated December 2024) sets out the role of the planning system in delivering sustainable development. Chapter 2: *Achieving sustainable development* defines the purpose of the planning system and sets out the "presumption in favour of sustainable development."
The key excerpts are set out below:

1. The Purpose of the Planning System

Paragraph 7 defines the core purpose:

"The purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development and supporting infrastructure in a sustainable manner. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs."

2. The Three Overarching Objectives

Paragraph 8 sets out the three interdependent objectives that must be pursued in mutually supportive ways:

"Achieving sustainable development means that the planning system has three overarching objectives..."

- a) an economic objective – "to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;"
- b) a social objective – "to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and"
- c) an environmental objective – "to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

3. The Presumption in Favour of Sustainable Development

Paragraph 11 is the operational heart of the framework regarding decision-making and plan-making:

"Plans and decisions should apply a presumption in favour of sustainable development."

For local plans this means that:

"a) all plans should promote a sustainable pattern of development that seeks to: meet the development needs of their area; align growth and infrastructure; improve the environment; mitigate climate change (including by making effective use of land in urban areas) and adapt to its effects;" "b) strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas..."

In determining whether proposals should proceed, this means that LPAs should be:

"c) approving development proposals that accord with an up-to-date development plan without delay; or" "d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless: i. the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for refusing the development proposed; or ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole..."

While Chapter 2 provides the definition, sustainability is threaded throughout the document in other thematic chapters:

- Chapter 9: Promoting sustainable transport (Paragraphs 109-118) – Focuses on reducing the need to travel and offering a genuine choice of transport modes.
- Chapter 11: Making effective use of land (Paragraph 124) – Promotes the effective use of land while safeguarding the environment.
- Chapter 12: Achieving well-designed places (Paragraph 131) – States that "Good design is a key aspect of sustainable development".
- Chapter 14: Meeting the challenge of climate change (Paragraph 161) – Supports the transition to a low carbon future.
- Chapter 17: Facilitating the sustainable use of minerals (Paragraph 222) – Ensures sufficient supply of minerals while securing their long-term conservation.

3.1.2 Building Regulations Part L2 (2021)

The current version of Part L – which the proposed design must meet - was launched in June 2022 (and last amended February 2023). Volume 2 references non-domestic developments such as the application proposal.

Part L2 is split into 5 criteria that must be met to achieve compliance. These are as follows:

- Criterion 1 – The Building Emission Rate (BER).
- Criterion 2 – Limits on design flexibility.
- Criterion 3 – Limiting solar gains in summer.
- Criterion 4 – Building performance consistent with the BER.
- Criterion 5 – Provision for energy efficient operation of the building.

Criterion 4 & 5 are considered in detail during technical design and post-construction stages.

3.2 Local Policy

Barnsley MBC supports sustainable development in new developments via policies set out in the current *Barnsley Local Plan (Adopted 2019) Core Strategy* and relevant supporting guidance. The key objectives and policies are set out below.

Policy CC1 states that the Council will seek to reduce the causes of and adapt to the future impact of climate change by (inter-alia):

- Promoting the reduction of greenhouse gas emissions through sustainable design and construction techniques.
- Locating and designing development to reduce the risk of flooding.
- Promoting the use of Sustainable Drainage Systems (SUD's)
- Promoting and supporting the delivery of renewable and low carbon energy, and;
- Promoting investment in Green Infrastructure to promote and encourage biodiversity gain.

Policy CC2 Sustainable Design and Construction:

> Development will be expected to minimise resource and energy consumption through the inclusion of sustainable design and construction features, where this is technically feasible and viable. All non-residential development will be expected to achieve a minimum standard of BREEAM 'Very Good' (or any future national equivalent). This should be supported by preliminary assessments at planning application stage.
>
> 3.15 The Local Plan seeks to implement sustainable development by allocating previously developed land in the first instance and also by making the best use of existing infrastructure, where possible. There is not a large amount of previously developed land in the borough that is considered suitable for allocation.

Policy Poll1 states that development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.

Policy T4 states that new development will be expected to be designed and built to provide all transport users within and surrounding the development with safe, secure and convenient access and movement. If a development is not suitably served by the existing highway, or would create or add to problems of safety or the efficiency of the highway or any adjoining rail infrastructure for users, we will expect developers to take mitigating action or to make a financial contribution to make sure the necessary improvements go ahead.

Policy D1 relates to design and states that development is expected to be of a high-quality design and be expected to respect the distinctive local character and features of Barnsley.

Policy BIO1 states that development will be expected to conserve and enhance the biodiversity and geological features of the borough.

Policy RE1 states that all developments will be expected to seek to incorporate initially appropriate design measures, and thereafter decentralised, renewable or low carbon energy sources in order to reduce carbon dioxide emissions and should at least achieve the appropriate carbon compliance targets as defined in the Building Regulations.

Policy CC3 states proposals over 0.4 hectares within Flood Zone 1 to demonstrate how the proposal will make a positive contribution to reducing or managing flood risk.

Policy CC4 states that all major development will be expected to use SUDs techniques to manage surface water drainage.

Policy I1 states that development must contribute as necessary to meet all on- and off-site infrastructure requirements to enable development to take place satisfactorily.

Policy GS1 states that proposals which involve the loss of green space (including sports pitches) will not be allowed unless an appropriate replacement green space of equivalent or improved quality, quantity and accessibility is provided which would outweigh the loss.

Climate Emergency

In September 2019 Barnsley Metropolitan Borough Council declared a climate emergency, with accompanying programmes to help Barnsley as a whole reduce its carbon emissions:

Zero 40

Barnsley Council will become net carbon zero by 2040, or earlier if possible. Zero 40 will focus on improvements in the council's environmental performance. This will be measured by reducing carbon emissions against agreed milestones. The end result will see us being net zero carbon in our work by 2040.

Zero 45

The borough will become net zero carbon by 2045. Zero 45 is a programme where the council will help the whole of Barnsley including its residents, communities, partners and businesses to support Barnsley's transition to become net zero by 2045.

Sustainable Construction and Climate Change Adaptation SPD (Adopted July 2023).

The SPD sets out that a whole life carbon assessment will be required with full or hybrid applications or assessment of approval of reserved matters for major developments (10 dwellings or above and 1000m^2 or above for commercial developments or change of use developments). Where we receive an outline application, if minded to approve, a condition will be added requiring submission of a Whole life carbon assessment alongside reserved matters. The whole life carbon assessment will be expected to follow the model set out in the RICS professional statement 'Whole Life Carbon Assessment for the Built Environment, 2017', or, if applicable, the latest subsequent

version of this document or other recognised document setting out best practice for whole life carbon assessment.

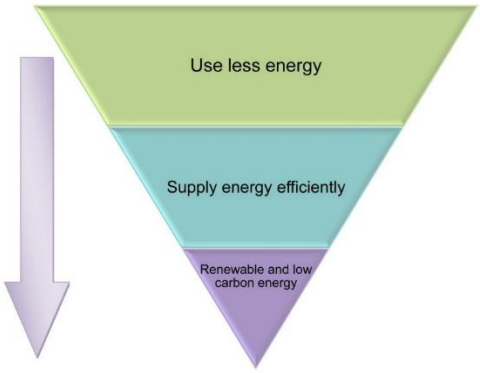
For this application, it is anticipated that this assessment would follow once detailed design is completed.

4.0 The Energy Hierarchy Approach

Tackling climate change by reducing carbon emissions from energy consumption is widely considered to be the defining environmental issue of the current era. The proposed design for the application development has considered this challenge, and adopted a range of measures in pursuit of this aim.

The client and design team have committed to using BREEAM New Construction V6.1 as the principal design tool to drive embedding sustainability into the facility as the design progresses. BREEAM is the world's leading sustainable building design methodology. It provides a holistic framework, focused on early design intervention to ensure that sustainable measures are incorporated from the outset, and that critical environmental performance issues are considered at an early stage, when the relevant design options are still flexible. Although formal certification isn't being sought, the intention is that the building will be designed and constructed with an energy performance level in line with a BREEAM rating of 'Very Good' – which is consistent with Good Practice for this type of building.

BREEAM aligns with an approach to meeting the energy requirements of the building based on the **energy hierarchy**, as shown below.



To achieve a performance in line with a BREEAM 'Very Good' energy rating, the building must operate well in all aspects of energy performance, and the proposed development will target improved energy performance over three key energy metrics, which are compared to a notional building considered compliant with UK Building Regulations Part L2A. These are:

1. The building's heating and cooling energy demand
2. The building's primary energy consumption
3. The total resulting $CO_{2(e)}$ emissions.

The sequential design approach to achieving the target energy performance level is as follows:

4.1 Passive Measures

Passive design measures are those which reduce energy consumption within buildings by designing out energy demand. These are the most effective and robust measures for reducing energy

consumption (and carbon emissions) as they effectively improve the energy performance of the building, by taking a 'fabric first' approach to reducing energy demand.

Well-specified thermal insulation to the building's façade will significantly reduce demand via the provision of an efficient thermal envelope, reducing thermal transmittance of the building and reducing heating requirements.

The design of the fabric will be reviewed throughout the developments design lifespan and will meet, and where feasible, exceed the requirements of Part L2A, as set out in the table below.

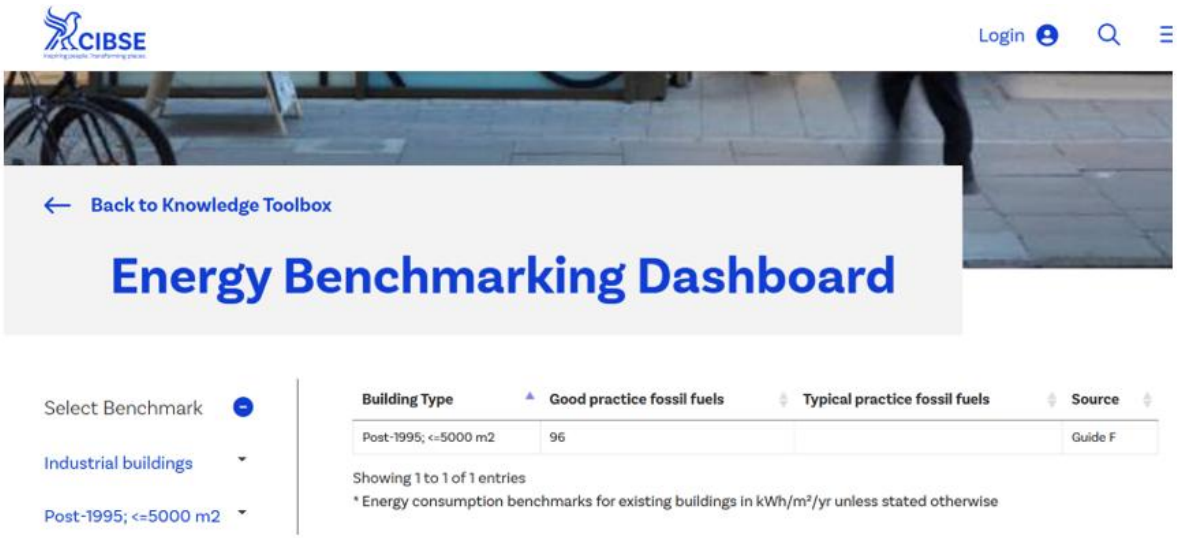
4.1.1 Air Permeability

The air permeability of the building volume is a vital issue in reducing unnecessary heat loss. It will therefore be a key design consideration when developing the building design. An attention to good construction methods and quality will also be essential to delivering good performance against this metric.

Part L2A sets a minimum Limiting value of 8m³/(h·m²) at 50 Pa, with a Notional (Target) of 3m³/(h·m²). It is the intention of the design team to target a performance level as close as possible to the Notional value, although it is acknowledged that this is likely to be difficult to achieve in the context of this extension, particularly with the presence of the large vehicle access doors.

4.1.2 Reduce Energy Demand

The proposed extension is anticipated to have only modest energy demand, as most of the enclosed volume will only be heated to frost-protection levels for the majority of the time. Occupied spaces will be heated, but these form a small proportion of the total proposed space. The design will achieve a performance level in advance of CIBSE Guide F Good Practice levels, as shown below.



(Source CIBSE Guide F (2021). Note – figures for electrical consumption are not available rather than zero, as stated).

The proposed development will seek to incorporate levels of insulation above those required by Approved Document L2A of the Building Regulations, as well as strong levels of air-tightness. Below

is a table of Part L2A minimum U-values, and indicative enhanced U-values for the proposed development:

Element	Limiting U-Value (W/m^2K)	Notional U-Value (W/m^2K)	Proposed U-Value (W/m^2K)	Proposed Specification
Roof	0.16	0.15	0.15	*120mm (core thickness) Kingspan KS1000RW-LPCB trapezoidal composite roof panel with firesafe core*
Walls	0.26	0.26	0.23	*Horizontal Flat panel / Micro rib Wall Cladding system to match existing building, 80mm thick Kingspan composite wall panel with firesafe core*
Floor Slab	0.18	0.15	0.15	*Concrete floor slab on 40mm Kingspan Greenguard GG300 insulation; 2000g Visqueen DPM; 25mm sand blinding; 150mm well-compacted type 1 granular material*
Rooflights	2.20	2.10	2.20	*Kingspan Quadcore daylight panel roof trapezoidal KS1000 DLTR roof light to be installed to 10% of roof. Double-skin safety type*
Vehicle Access Doors	1.30	1.30	1.30	*Overhead sectional insulated doors (colour Merlin Grey) to achieve U-value of 1.3W/m²K; electrically operated with manual operation in case of power failure*
Personnel Doors	1.60	1.60	1.50	*Omegati-supplied; structural opening of 1023mmW x 2110mm H. Including double rebated frames, extruded aluminium thresholds & doors seals. Door to achieve installed max U-value of 1.5W/m²K*

4.2 Active Measures

4.2.1 District Heating

The design team has undertaken an initial review of opportunities to connect to existing heating networks, or to establish a Combined Heat and Power system. Research shows that Grimethorpe is in general considered to be an area with low potential to develop local heat networks, as set out in the National Heat Map, which was previously published by the Department for Business, Energy & Industrial Strategy (BEIS).

Following the discontinuation of the BEIS National Heat Map in 2018, the government (now led by DESNZ) moved away from a static national map towards a more granular, data-driven model designed specifically to support the new Heat Network Zoning policy. The successor National Zoning Model and its associated digital tool Heat Network Zoning Digital Tool has been tested in 28 pilot

cities and towns to date (including Sheffield) but does not current cover the application site and its environs.

As such, it is the understanding of the design team that the proposed site is not within sufficient proximity to the nearest identified potential heat clusters. As such, it is considered that no currently viable opportunity exists in this regard. The heat demand of the development and the scale of the design mean that other energy technologies (as set out below) represent better options.

4.2.2 Space heating and domestic hot water

At this stage of the design process, it is anticipated that the extension will be serviced via similar HVAC systems as are present in the existing building, which has 2no. efficient condensing gas boilers supplying heating to the office areas, and providing domestic hot water. These are recently installed and have not been used to date.

The existing warehouse has 6no. gas-fired suspended warm air heating units. These are controlled via integrated thermostats to provide frost-protection and a minimal temperature uplift in colder weather. This approach will be mirrored in the extension.

All boiler plant will be specified with efficiencies of a minimum 90% (in accordance with the NCM Product Characteristics Database (PCDB)). If any condensing gas combi boiler plant is specified, this will have an efficiency rating in the region of 95%, and would be low NOx. Cylinders (if required) will be specified as highly efficient models to limit standing heat losses.

Heating plant controls will incorporate time, temperature and zone controls appropriate to the usage patterns and requirements of the building users. Weather Compensation Controls will also be considered, again, in line with the PCDB.

4.2.3 Ventilation

Adequate ventilation is critical to maintain good indoor air quality by providing fresh air and extracting vitiated air. Providing fresh air minimises the risk of stale and stagnant air and limits the risk of condensation or mould-growth.

Only natural and limited mechanical ventilation is anticipated for the proposed development. Although not currently part of the proposed design, should any office spaces ultimately be included, it may be possible to combine high levels of air tightness with Mechanical Ventilation with Heat Recovery (MVHR), subject to a more detailed assessment. MVHR systems provide fresh filtered air into the serviced area, whilst recovering heat from the extract air which would normally be lost by using traditional ventilation systems. This reduces heat demand for the services space. MVHR units are efficient and work best in airtight spaces.

4.2.4 Lighting

The design seeks to maximise the use of natural daylight by incorporating rooflights to the proposed extension. These will reduce the demand for electric lighting, and are anticipated to be installed to comprise 10% of the proposed roof area.

The development will utilise energy efficient LED lighting in all areas. Fittings will be connected to

light sensors which will activate / deactivate the lights, based on the lux levels internally provided by the natural light entering the building via the roof lights. As such, over-lighting and energy wastage will be minimised.

4.2.5 Sub-metering

Sub-metering of significant energy using systems and high load areas will be implemented to facilitate accurate energy monitoring during operation and the identification of abnormal consumption patterns by building managers.

4.3 Energy from Low Carbon Sources

4.3.1 Solar Photovoltaics

The design team have confirmed that a solar PV panel array will be specified for the proposed extension's roof. Energy consumption data for the existing facility to date suggest a peak summer consumption rate of just below 5,000kWh.

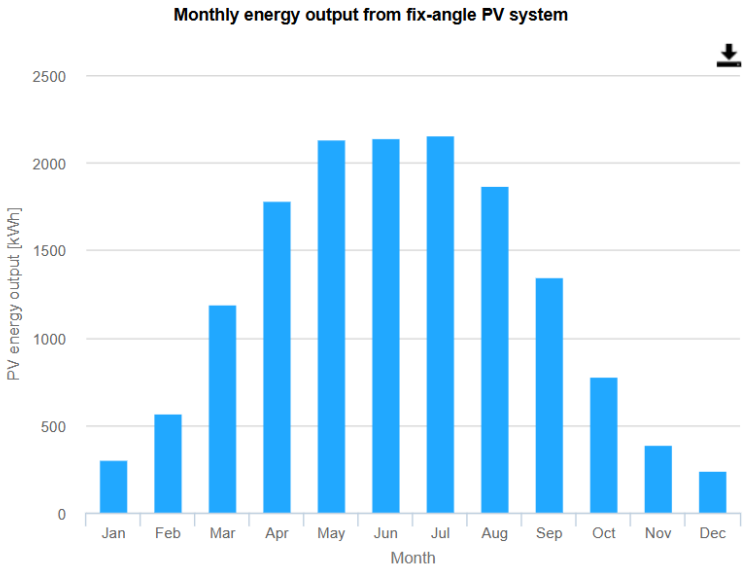
A 40kWp PV installation (at this stage, a notional sizing) would provide slightly less than this, so would be in-line with anticipated demand, whilst avoiding the need for batteries or low-return grid exports. This could be achieved via a 20kW:20kW East-West split installation. We have undertaken initial modelling of such a system, using the industry standard *JRC Photovoltaic Geographical Information System*, with indicative performance as shown below:

20kWp @ 90deg (W) = 14,920.84kWh p.a. (monthly peak ~2,143kWh)

Summary

Provided inputs:	
Location [Lat/Lon]:	53.573,-1.382
Horizon:	Calculated
Database used:	PVGIS-SARAH3
PV technology:	Crystalline Silicon (original)
PV installed [kWp]:	20
System loss [%]:	14

Simulation outputs:	
Slope angle [°]:	30
Azimuth angle [°]:	90
Yearly PV energy production [kWh]:	14920.84
Yearly in-plane irradiation [kWh/m^2]:	963.05
Year-to-year variability [kWh]:	442.79
Changes in output due to:	
Angle of incidence [%]:	-4.24
Spectral effects [%]:	1.65
Temperature and low irradiance [%]:	-7.46
Total loss [%]:	-22.53



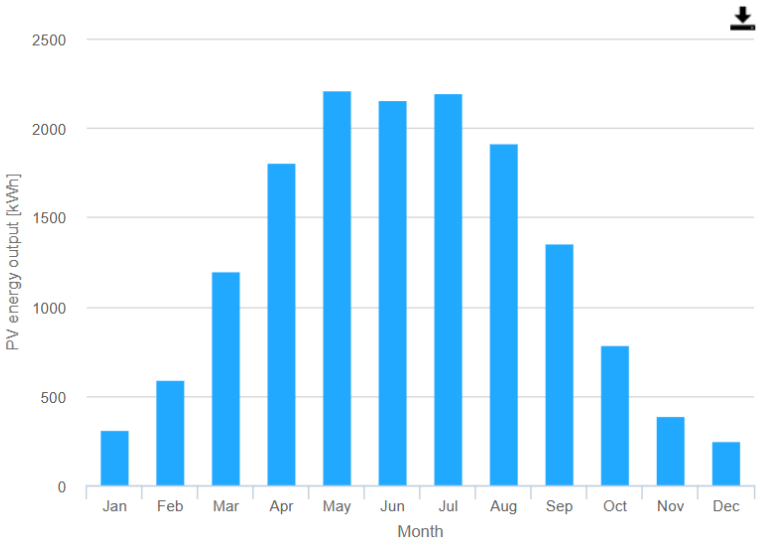
20kWp @ -90deg (E) = 15,169.04kWh p.a. (monthly peak ~2,209kWh)

Summary

Provided inputs:	
Location [Lat/Lon]:	53.573,-1.382
Horizon:	Calculated
Database used:	PVGIS-SARAH3
PV technology:	Crystalline Silicon (original)
PV installed [kWp]:	20
System loss [%]:	14

Simulation outputs:	
Slope angle [°]:	30
Azimuth angle [°]:	-90
Yearly PV energy production [kWh]:	15169.04
Yearly in-plane irradiation [kWh/m^2]:	974.7
Year-to-year variability [kWh]:	549.92
Changes in output due to:	
Angle of incidence [%]:	-4.14
Spectral effects [%]:	1.65
Temperature and low irradiance [%]:	-7.15
Total loss [%]:	-22.19

Monthly energy output from fix-angle PV system



4.3.2 Electric Vehicle Charging

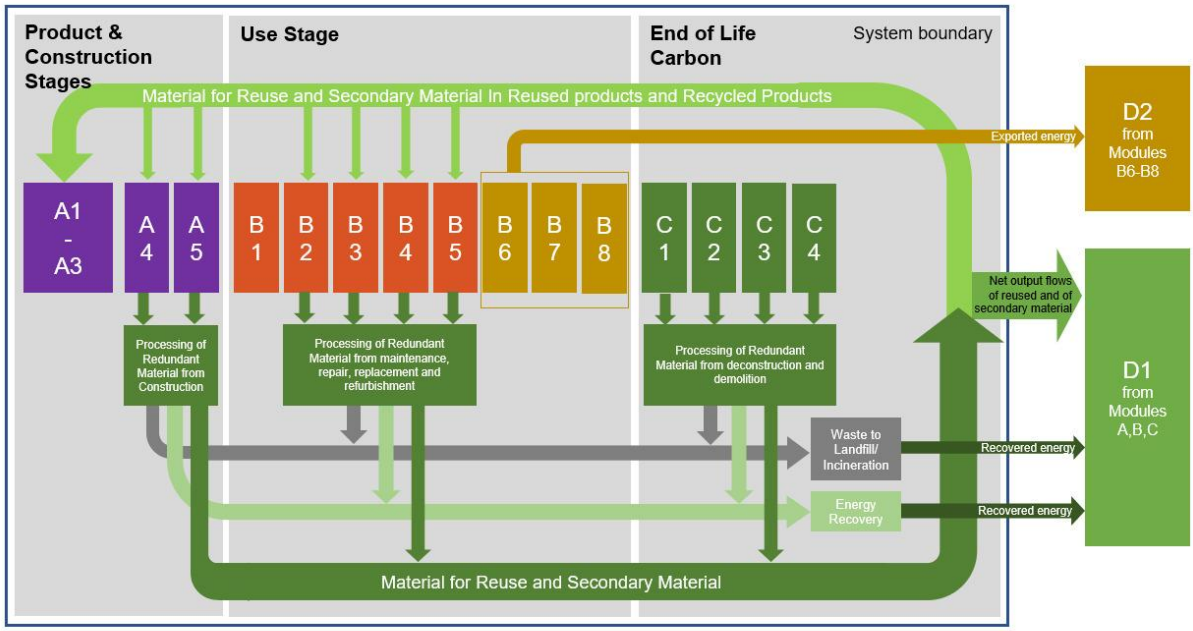
The development will also provide EV (electric vehicle) charging facilities for both cars and company vans. In addition, the facility will operate electric fork-lift trucks. The solar PV installation will therefore contribute to low carbon vehicle charging capacity.

4.4 Design Stage BRUKL (TER/BER) Calculation

The proposed building will be modelled via the *Simplified Building Energy Model* (SBEM) to determine projected CO_2 emissions. SBEM is the government's approved methodology for the calculation of CO_2 emissions for new buildings. These calculations will incorporate details included above to calculate envisaged CO_2 emissions of the development.

Options modelled will include a baseline figure which does not include any low carbon energy sources, and a comparative figure including the use of renewable / low carbon energies. These results will be used to inform the final selection of building services and HVAC specification so as to achieve a strong performance in CO_2 emissions.

4.5 Whole Life Carbon Assessment



Quantifying the Carbon Value of Circularity – Each arrow can be given a kgCO2e value

The *Sustainable Construction and Climate Change Adaptation SPD (adopted July 2023)* requires a Whole Life Carbon Assessment (WLCA) to be undertaken in line with RICS guidance.

This process sets out a cradle-to-grave holistic approach to development and construction, and identifies where opportunities for carbon savings can be implemented.

A WLCA covers both embodied carbon and operational carbon anticipated to be generated by a proposed development. Embodied carbon considers the carbon emissions generated during the manufacturing, processing, and transportation of the materials used in the construction process of the development. This is reviewed over the whole expected lifespan of the building and takes account of any building elements that can / have to be replaced after a certain period of time. An embodied carbon assessment also reviews the end of life by investigating what happens to the deconstructed materials and any carbon emissions released by the final disposal of materials.

The second main aspect reviews the predicted operational energy of the development. This takes into account any energy used within the building, including heating, cooling, process energy etc.

These two elements combined give a carbon equivalent figure for the lifespan of a building or development. When conducted at an appropriately early stage, this allows for greater opportunity to review reductions and allow for greater scope for improvements to be made.

As a minimum, a whole life carbon assessment must be carried out before the commencement of the technical design (RIBA Stage 4 or equivalent) of the project.

The WLCA requires a detailed set of highly project-specific design information. For this application, the design (in terms of final product selection, quantities, supplier etc.) is not sufficiently advanced

to allow a detailed WLCA to be undertaken at the time of submission. It is anticipated that this assessment will follow once detailed design is completed.

5.0 Conclusion

The strategy for the proposed development has the following characteristics, in terms of sustainability:

• A BREEAM-aligned, fabric first strategy, which aims to achieve long term reductions in CO_2 emissions by reducing energy demand.

• An approach to energy based on the Energy Hierarchy, which seeks to minimise demand, utilise energy efficiently, and incorporate low carbon energy sources, including solar photovoltaics, to reduce CO_2 emissions.

- A commitment to Whole Life Carbon Assessment and the reduction of emissions in line with the above principles.