



**Land to the West of Chilgrove Drive,  
North of Camp Road and adjoining former  
RAF Upper Heyford, Upper Heyford,  
incorporating former MOD gymnasium**

**Energy Assessment**

**EP Barrus Ltd**

**November 2014**

**Land to the West of Chilgrove Drive, North of Camp Road and adjoining former  
RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium  
Energy Assessment**

Document History

This document has been revised and issued as below:

Version	Date	Description	Created by	Approved by
P1	27/10/2014	Draft issue for comment	MHB	JGT
P2	06/11/2014	Issue for Planning	MHB	JGT
P3	7/11/14	Issue for Planning	MHB	GSM
P4	25/11/14	BREEAM Pre-Assessment information added	MHB	NCF

**Land to the West of Chilgrove Drive, North of Camp Road and adjoining former  
RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium  
Energy Assessment**

## **Contents**

<b>Executive Summary</b>	<b>1</b>
<b>1 Introduction</b>	<b>2</b>
1.1 Proposal	2
1.2 Policy Context	2
1.3 Grants and Incentives	3
1.4 Analysis and Methodology	3
<b>2 Building Design: Base Case</b>	<b>3</b>
2.1 The heated office and welfare accommodation	4
2.2 The unheated warehouse	5
2.3 External Lighting	6
<b>3 Energy Hierarchy Analysis</b>	<b>6</b>
3.1 Reduction of Energy Demand (Policies ESD 1,2 and 3)	6
3.1.1 Building Fabric	6
3.1.2 Sustainable Construction Measures	7
3.1.3 Energy Efficient Building Services	7
3.2 BREEAM (Policy ESD 3)	8
3.3 Decentralised Energy Systems (Policy ESD 4)	8
3.4 Renewable Energy (Policy ESD 5)	8
3.4.1 Photovoltaic Panels	9
<b>4 Conclusion</b>	<b>10</b>
<b>Appendix A: BRUKL Document for heated office/welfare facilities</b>	
<b>Appendix B: Energy Assessment Figures</b>	
<b>Appendix C: BREEAM Pre-Assessment Summary</b>	

## **Executive Summary**

Method Consulting has been appointed to produce an Energy Assessment as part of the Planning Application for the proposed development on the land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford. The development comprises an unheated warehouse storage facility (circa 10,000m<sup>2</sup>) with circa 200m<sup>2</sup> of heated office/welfare accommodation and an associated service yard.

This report provides a detailed description for how the required BREEAM rating of “Very Good” can be achieved and outlines the sustainable features to be incorporated into the design of the building to improve the overall environmental performance through both good building design and the implementation of renewable technologies. This report is written with particular reference to Policies ESD 1- 5 of the Cherwell Local Plan 2006-2013 which was submitted for approval and adoption in January 2014.

Policy ESD 2 of the Cherwell Local Plan seeks to reduce carbon emissions by promoting the ‘energy hierarchy’ set out in the London Plan as follows:

- Prioritise being LEAN – use less energy, in particular by the use of sustainable design and construction measures
- Then CLEAN – supply energy efficiently and give priority to decentralised energy supply, and
- Then GREEN – use renewable energy.

In line with the recommendations for the ‘energy hierarchy’ set out in the London Plan, and referred to under the Sustainability Policies set out in the Cherwell Local Plan, the development has set out to achieve a 40% improvement on the 2010 Building Regulations with a 20% reduction in CO<sub>2</sub> emissions due to the use of on-site renewable energy generation.

Modelling has been carried out using the building regulations approved IES Virtual Environment dynamic modelling software and the baseline energy consumption includes both regulated and non-regulated energy use as required under the London Plan/Cherwell Local Plan assessment guidelines.

The report concludes that the energy hierarchy has been applied (as summarised on the graph overleaf) and through the use of sustainable construction measures and the installation of 65kW<sub>p</sub> (circa 400m<sup>2</sup>) of Photovoltaic panels to provide a 20% reduction in carbon over the energy efficient case, an annual carbon saving of 93 tonnes will be achieved which is equivalent to a 46.5% reduction in carbon emissions.

# Land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium Energy Assessment

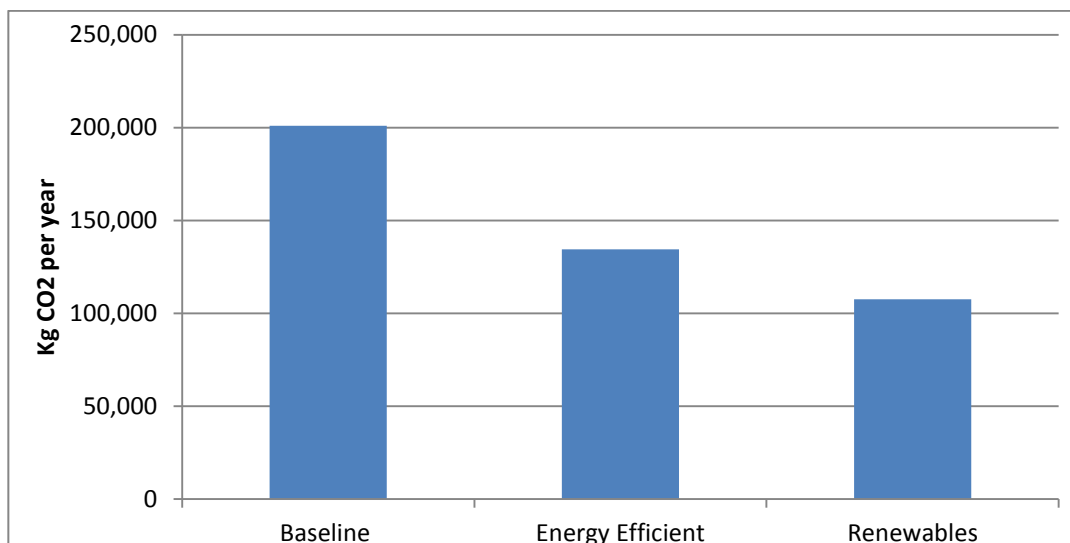


Figure showing the annual carbon emissions for the baseline building, building with energy efficiency measures applied and the further carbon reduction provided by the incorporation of renewable technology (photovoltaics) into the scheme.

## I Introduction

### I.1 Proposal

It is proposed to construct an unheated warehouse storage facility (circa 10,000m<sup>2</sup>) with circa 200m<sup>2</sup> of heated office/welfare accommodation and an associated service yard on the land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford.

### I.2 Policy Context

The Climate Change Act 2008 has an objective of an 80% reduction (from a 1990 baseline) in carbon dioxide emissions by 2050. This can be achieved by, for example, increasing energy efficiency and increasing the use of renewable or low carbon energy sources. As part of our commitment under the Kyoto Protocol to reduce carbon dioxide (CO<sub>2</sub>) emissions, the UK government has set a target of 10% of our electricity to be generated from renewable sources by 2010, with the aspiration that this increases to 20% by 2020 in line with the EU Renewable Energy Directive 2008. In addition, it has put in place several methods of encouraging the increased use of renewable energy, ranging from grants and incentives, to taxation and levies which penalise excessive carbon emissions.

The Cherwell Local Plan 2006-2031 which was submitted for examination in public in October 2014, contains the following policies pertinent to sustainable development:

# Land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium Energy Assessment

- ESD 1: Mitigating and Adapting to Climate Change
- ESD 2: Energy Hierarchy & Allowable Solutions
- ESD 3: Sustainable Construction
- ESD 4: Decentralised Energy Systems
- ESD 5: Renewable Energy

This report concludes the results of our energy analysis to determine how compliance with the above policies is best achieved.

## 1.3 Grants and Incentives

There are two financial incentive schemes currently available in the UK; the Feed-in Tariff scheme and the Renewable Heat Incentive scheme. The Feed-in Tariff scheme rewards the generation of renewable electricity (whether used on-site or exported to the national grid) and the Renewable Heat Incentive rewards the generation of renewable heat. Payments will be made for all electrical or heat energy generated. The generation tariff will be a fixed price per kilo Watt hour, set at different levels for different technologies and installation sizes. The level of the tariff will reduce for new projects in future years, but any individual installation which has started to receive a tariff at a certain level, will continue to receive the same generation tariff level throughout the entire support period (typically guaranteed for 20 years).

## 1.4 Analysis and Methodology

In accordance with the 'Energy Hierarchy' described within the London Plan (referenced within Cherwell Policy ESD 2), a strategy for meeting the following targets is contained within this report:

- 40% reduction in CO<sub>2</sub> emissions compared to 2010 Building Regulations
- 20% reduction in CO<sub>2</sub> emissions through the provision of onsite renewable energy

## 2 Building Design: Base Case

As detailed above, the development comprises an unheated warehouse storage facility (circa 10,000m<sup>2</sup>) with circa 200m<sup>2</sup> of heated office/welfare accommodation and an associated service yard.

Part L2A of the building regulations (2013), clause 2.26 states that *"If part of a building with low energy demand is partitioned off and is heated normally (e.g. an office space in an unheated warehouse), the separately heated area should be treated as a separate 'building' and the normal*

## Land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium Energy Assessment

*procedure for demonstrating compliance (including a TER/BRE calculation) should be followed to demonstrate the heated area complies with the energy efficiency requirements.”*

Clause 2.25 indicates that for areas not covered by the TER/BER (i.e. the unheated workshop space) that “reasonable provision would be for every fixed building service that is installed to meet the energy efficiency standards set out in the 2013 edition of the DCLG Non-Domestic Building Services Compliance Guide”

Thus, in accordance with the guidelines for the preparation of energy assessments set out within the London Plan for minimising carbon dioxide emissions through the use of the ‘energy hierarchy’, the base case building will comprise energy usage and carbon emissions from the following elements:

- The heated office/welfare accommodation
- The unheated warehouse
- External lighting

The methodology for determining the annual carbon emissions associated with each area is explained in the following sections.

### **2.1 The heated office and welfare accommodation**

A dynamic Part L2A simulation using the approved software IES Virtual Environment Calculation Engine 2014.1.1.0 has been used to model the heated office/welfare accommodation to determine the carbon emissions. The model has been constructed based on the following drawings provided by Lyons + Sleeman + Hoare Architects:

- I3087/P-10, Revision: - , dated 09/10/14: Proposed Site Plan – Phase I
- I3087/P-11, Revision: - , dated 09/12/14: Proposed Building Plan – Phase I
- I3087/P-12, Revision: - , dated 09/10/14: Proposed Building Elevations – Phase I
- I3087/P-14, Revision: - , dated 09/19/14: Proposed Sectional Views – Phase I

# Land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium Energy Assessment

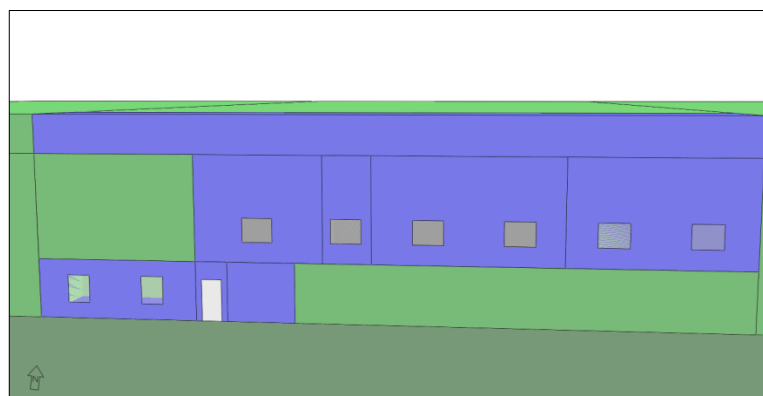


Figure 1: Image taken from IES Virtual Environment showing model construction

The office and welfare facilities will be electrically heated (as no gas is available onsite). Ventilation will be provided by mechanical supply and extract ventilation units incorporating heat recovery. Hot water will be generated by local point of use electric hot water heaters.

As determined by the building regulations, a target emission rate (TER) of 44.4 kgCO<sub>2</sub>/m<sup>2</sup> per year has been calculated for the heated element of the building. Multiplying the TER by the area of the office/welfare accommodation provides a contribution to the total baseline carbon of 8.7 tonnes of CO<sub>2</sub>/year. The BRUKL document is contained within appendix A.

## 2.2 The unheated warehouse

The dominant energy load for the development is provided by the lighting to the warehouse. Due to the storage racking used, the lighting load would not be accurately reflected by the results of a thermal model. Thus, in order to determine a more realistic load, the lighting design for a similar warehouse operated by the same client has been taken and extrapolated in order to determine the number of fittings required. To determine the base case, the following assumptions have been made:

- Luminaires to have an efficacy of 60 lumens/watt (required for compliance with the non-domestic building services guide)
- The hours of operation for the warehouse are assumed to be 06:30-19:30, Monday to Friday.
- Presence detection is included, so the annual lighting loads can be multiplied by 0.9 (in compliance with the factors that would be applied to a Part L model as defined by the National Calculation Methodology (NCM)).

Given the assumptions above, the contribution to the total baseline carbon from the unheated warehouse is predicted to be 186 tonnes of CO<sub>2</sub>/year



## 2.3 External Lighting

It is assumed that the external lighting will be controlled by photocell and timeclock. Thus, based on the sunrise, sunset, dawn and dusk times for London, it is estimated that the external lighting will be on for the following hours throughout the year.

	Dawn	Dusk	Total Hours
Jan	1	3	80
Feb	0.5	2	50
March	0.25	1.5	35
April	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0.5	10
October	0.25	1.5	35
November	0.5	3	70
December	1	3	80
<b>Total Annual Hours</b>			<b>360</b>

Based on the proposals for the loading bay and parking area, it is envisaged that around 8kW of external lighting is required.

Therefore, the contribution to the total baseline carbon from the external lighting is 1.5 tonnes of CO<sub>2</sub>/year

## 3 Energy Hierarchy Analysis

### 3.1 Reduction of Energy Demand (Policies ESD 1,2 and 3)

The following sections explain how sustainability issues have been considered and addressed within the proposed scheme. The implementation of these items is predicted to reduce the annual carbon emissions from 201 tonnes to 136 tonnes (a saving of 33%).

#### 3.1.1 Building Fabric

Although the warehouse is an unheated space, insulation will still be provided in order to protect the building fabric. This will also reduce the heat loss from the heated areas into this space. Due to the nature of the building, the area of wall for the heated space dominates the fabric heat loss and so the focus of the design team has been to improve the u-values for this element as detailed in the table below:

**Land to the West of Chilgrove Drive, North of Camp Road and adjoining former  
RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium  
Energy Assessment**

<b>Element</b>	<b>Limiting 2010 u-value(W/m2/K)</b>	<b>Notional 2013 u-value (W/m2/K)</b>	<b>Proposed u-value (W/m2/K)</b>
Wall	0.35	0.26	0.2
% Improvement of proposed	43%	23%	-

### **3.1.2 Sustainable Construction Measures**

In order to reduce the carbon emissions associated with lighting, and provide a pleasant environment for the building occupants, the provision of natural daylight to the offices has been considered. A summary of the average daylight factor in each office space is summarised in the table below. An industry standard good practice daylight factor is considered to be 2% over 80% of the floor area. The table below demonstrates that the offices have been designed to these good practice daylighting figures.

<b>Room</b>	<b>% of floor applied to</b>	<b>Average daylight factor</b>
GF Office	84%	2.1%
FF Office 1	100%	3.28%
FF Office 2	100%	3.28%
FF Office 3	100%	2.38%
FF Office 4	86%	2.5%

### **3.1.3 Energy Efficient Building Services**

#### **(a) Warehouse Lighting**

Using luminaires such as the Dextra Lighting Verteco fittings (which have been used by the client at other similar warehouse developments) with high efficiency T5 lamps providing 82 Lumens/Watt could reduce the carbon emissions associated with this element by 27%.

However, as the lighting load for the warehouse contributes 93% of the carbon emissions in the baseline case, the design team currently propose to obtain significant further carbon savings by upgrading the lighting in the warehouse to a luminaire using LED lamps such as the Thorn Lighting HiPak Pro LED fitting. These fittings provide an efficacy of 93 Lumens/Watt and therefore reduce the carbon emissions of the baseline case by 35%.

#### **(b) Extract Fans**

The specific fan power proposed for the toilet extract fan is 20% more efficient than the base case fan.

## Land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium Energy Assessment

(c) Mechanical Supply and Extract Ventilation Units with Heat Recovery

The specific fan power proposed for the office heat recovery ventilation units is 5.3% more efficient than the base case efficiency and the heat recovery effectiveness is 20% better.

(d) Controls

Local temperature control will be provided on the heat emitter for each room to improve occupant satisfaction and further reduce carbon emissions.

The table below summarises the energy efficient improvements made to the building services as compared to the base case model

Item	Base case	Proposed Value	% Improvement
Luminaire Efficacy	60 Lumens/Watt	93 Lumens/Watt	35.5%
Specific Fan Power (SFP) for mechanical extract fans	0.5 W//s	0.4 W//s	20.0%
Specific Fan Power (SFP) for mechanical supply and extract fans	1.9 W//s	1.8 W//s	5.3%
Heat Recovery Efficiency for mechanical supply and extract fans	0.5	0.7	28.6%

### 3.2 BREEAM (Policy ESD 3)

In line with the requirements of Policy ESD 3, a BREEAM pre-assessment has been undertaken which demonstrates how a BREEAM rating of “Very Good” could practically be achieved for the development. A credit by credit ‘recipe’ for obtaining a BREEAM rating of “Very Good” is contained within appendix 3.

### 3.3 Decentralised Energy Systems (Policy ESD 4)

As the heating load associated with the development is so small (equivalent to the heating load for two new 3-bedroom houses), connection to a district heating system is not thought to be beneficial.

### 3.4 Renewable Energy (Policy ESD 5)

As the majority of energy use onsite is the electricity for lighting and unregulated electrical energy use, to achieve a significant percentage reduction using onsite renewables, electrical generation onsite is required and thus the following renewable technologies have been

## Land to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium Energy Assessment

discounted: Biomass Boilers, CHP, Ground Source Heat Pumps and Air Source Heat Pumps. There are no local water sources and therefore hydroelectric options have also been discounted.

Although onsite electricity generation could be provided by either wind turbines or photovoltaic panels, it is thought that there may be considerable local opposition to the installation of wind turbines and therefore photovoltaic panels would be the preferred option.

### 3.4.1 Photovoltaic Panels

Solar energy can be converted to electricity using the photo-electric effect. Simply, Photovoltaic (PV) cells use the energy from the sun to induce a current in a circuit. The cells are encapsulated between a sheet of toughened glass at the front and a moisture sealing membrane on the back to make them weatherproof. PV installations have a limited life of approximately 20 years. However, during its life, a PV system needs very little maintenance. In all but exceptional cases modules are self-cleaning with rainfall.



Based on the annual carbon emissions after energy efficient measures have been applied, the annual carbon emissions associated with the development could be reduced by 20% if 65kWp (circa 400m<sup>2</sup>) of photovoltaic panels are installed. Due to the structure (tension membrane fabric) of the roof proposed for the warehouse development, it will not be possible to mount the photovoltaic panels onto the roof and so it is proposed that these panels will either be ground mounted to the North and West of the service yard or mounted on the top of purpose built car ports. The table below summarises the estimated costs associated with the proposed photovoltaic array based on the following assumptions:

- (1) The PV array requires 6.17m<sup>2</sup>/kWp at 800 kWh/kWp (based on panels from Canadian Solar with dimensions of 1954 x 982 (mm)).
- (2) The cost of electricity has been assumed at 12.0p/kWh
- (3) Based on the current feed in tariff of 10.34 p/kWh. Note that this is degression and index linked and is likely to decrease in value over the coming years

Area of PV <sup>1</sup>	Capital Cost	Annual energy generated (kWh)	Annual Carbon savings (kg)	Annual cost saving <sup>2,3</sup>	Simple Payback (years)	£/kgCO <sub>2</sub> saved
400m <sup>2</sup>	£129,391	51,756	26,861	£11,562	11.2	£4.8

## 4 Conclusion

Method Consulting has been appointed to produce an Energy Assessment as part of the Planning Application for the development to the West of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford. The development comprises an unheated warehouse storage facility (circa 10,000m<sup>2</sup>) with circa 200m<sup>2</sup> of heating office/welfare accommodation and an associated service yard.

This report provides a detailed description for how the required BREEAM rating of “Very Good” can be achieved and outlines the sustainable features to be incorporated into the design of the building to improve the overall environmental performance both through good building design and the implementation of renewable technologies in accordance with Policies ESD 1- 5 of the Cherwell Local Plan 2006-2013 which was submitted for approval and adoption in January 2014.

The graph below illustrates how the building has complied with the ‘energy hierarchy’ principles in accordance with the planning guidance. Through the use of sustainable construction measures and the installation of 65kWp (circa 400m<sup>2</sup>) of Photovoltaic panels to provide a 20% reduction in carbon over the energy efficient case, an annual carbon saving of 93 tonnes will be achieved which is equivalent to a 46.5% reduction in carbon emissions.

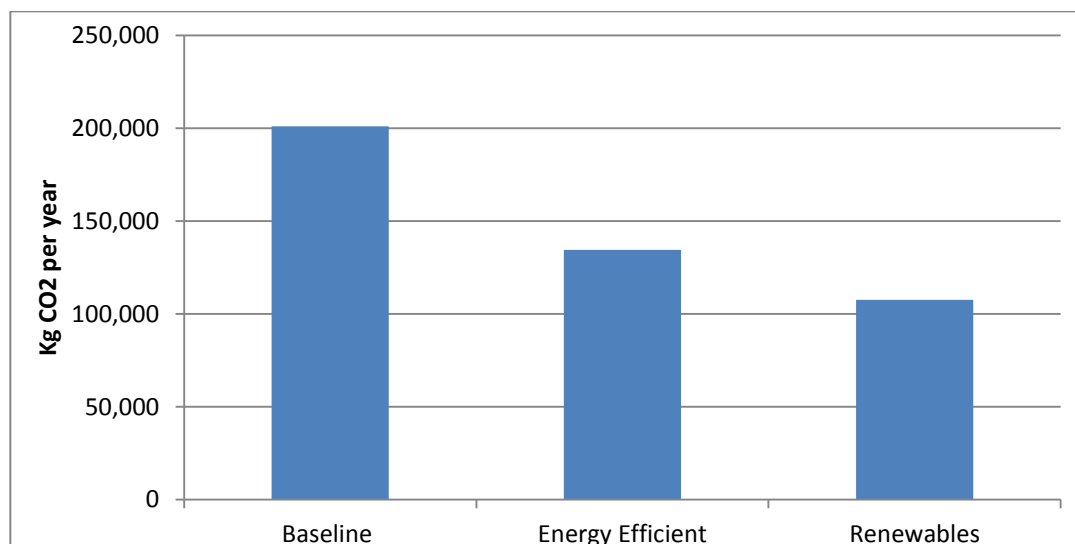


Figure showing the annual carbon emissions for the baseline building, building with energy efficiency measures applied and the further carbon reduction provided by the incorporation of renewable technology (photovoltaics) into the scheme. The tables in appendix B provide the break down for how the carbon and energy savings have been achieved.

**Appendix A: BRUKL Document for heated office/welfare  
facilities**

## Project name

**Development on the land to the West of  
Chilgrove Drive Upper Heyford**

As designed

Date: Mon Oct 27 15:52:16 2014

## Administrative information

## Building Details

Address: Camp Road, Upper Heyford, OX25 5LX

## Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 6.4.0.14

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 6.4.0.14

BRUKL compliance check version: v4.1.e.5

## Certifier details

Name: Melanie Buckley

Telephone number: 01793 836623

Address: Method Consulting LLP, Berkeley House, Hunts Rise, South Marston Park, Swindon, SN3 4TG

Criterion 1: The calculated CO<sub>2</sub> emission rate for the building should not exceed the target

1.1	CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	44.4
1.2	Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	44.4
1.3	Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	41.8
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

## Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

## 2.a Building fabric

Element	U <sub>a</sub> -Limit	U <sub>a</sub> -Calc	U <sub>i</sub> -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	GF000000:Surf[3]
Floor	0.25	0.25	0.25	GF000000:Surf[0]
Roof	0.25	0.25	0.25	RF000000:Surf[0]
Windows***, roof windows, and rooflights	2.2	2.2	2.2	GF000000:Surf[1]
Personnel doors	2.2	2.2	2.2	CR000000:Surf[1]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]				
* There might be more than one surface where the maximum U-value occurs.				
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.				
*** Display windows and similar glazing are excluded from the U-value check.				
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	5

## 2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

### 1- Main system

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
1	-	0	0.7
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			NO

### 1- Hot Water

Heating seasonal efficiency	Hot water storage loss factor [kWh/litre per day]
1	0.006

### Local mechanical ventilation and exhaust

Zone	Supply/extract SFP [W/(l/s)]	HR seasonal efficiency	Exhaust SFP [W/(l/s)]
GF Office	1.8	-	-
GF Dis WC	-	-	0.4
FF office	1.8	-	-
FF office	1.8	-	-
FF office	1.8	-	-
FF office	1.8	-	-

### General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
GF Office	270	-
GF Dis WC	70	-
GF circulation	70	-
FF circulation	80	-
FF office	200	-
FF office	150	-
FF office	310	-
FF corridor	180	-
FF office	370	-

**Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains**

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF Office	NO (-79.4%)	NO
FF office	NO (-84.7%)	NO
FF office	NO (-59.3%)	NO
FF office	NO (-79%)	NO
FF office	NO (-78%)	NO

**Criterion 4: The performance of the building, as built, should be consistent with the BER**

Separate submission



## Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

### EPBD (Recast): Consideration of alternative energy systems

<b>Were alternative energy systems considered and analysed as part of the design process?</b>	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

	Actual	Notional
Area [m <sup>2</sup> ]	196.5	196.5
External area [m <sup>2</sup> ]	487	487
Weather	SWI	SWI
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	5
Average conductance [W/K]	141.16	0
Average U-value [W/m <sup>2</sup> K]	0.29	0
Alpha value* [%]	11.83	10

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

## Building Use

### % Area Building Type

	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
<b>100</b>	<b>B2 to B7 General Industrial and Special Industrial Groups</b>
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	32.65	83.31
Cooling	0	0
Auxiliary	7	3.36
Lighting	39.9	33.36
Hot water	3.38	3.71
Equipment*	42.41	42.41
<b>TOTAL**</b>	<b>82.92</b>	<b>123.74</b>

\* Energy used by equipment does not count towards the total for calculating emissions.

\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

## Energy & CO<sub>2</sub> Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m <sup>2</sup> ]	94.02	250.03
Primary energy* [kWh/m <sup>2</sup> ]	242.13	199.47
Total emissions [kg/m <sup>2</sup> ]	41.8	44.4

\* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

## HVAC Systems Performance

System Type	Heat dem MJ/m <sup>2</sup>	Cool dem MJ/m <sup>2</sup>	Heat con kWh/m <sup>2</sup>	Cool con kWh/m <sup>2</sup>	Aux con kWh/m <sup>2</sup>	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	94	0	32.6	0	7	0.8	0	1	0
Notional	250	0	83.3	0	3.4	0.83	0	----	----

### Key to terms

Heat dem [MJ/m <sup>2</sup> ]	= Heating energy demand
Cool dem [MJ/m <sup>2</sup> ]	= Cooling energy demand
Heat con [kWh/m <sup>2</sup> ]	= Heating energy consumption
Cool con [kWh/m <sup>2</sup> ]	= Cooling energy consumption
Aux con [kWh/m <sup>2</sup> ]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

# Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

## Building fabric

Element	U <sub>i-Typ</sub>	U <sub>i-Min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.2	GF000000:Surf[3]
Floor	0.2	0.25	GF000000:Surf[0]
Roof	0.15	0.25	RF000000:Surf[0]
Windows, roof windows, and rooflights	1.5	2.2	GF000000:Surf[1]
Personnel doors	1.5	2.2	CR000000:Surf[1]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
U <sub>i-Typ</sub> = Typical individual element U-values [W/(m <sup>2</sup> K)]		U <sub>i-Min</sub> = Minimum individual element U-values [W/(m <sup>2</sup> K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	5

**Land to the West of Chilgrove Drive, North of Camp Road and adjoining former  
RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium  
Energy Assessment**

## Appendix B: Energy Assessment Figures

Total energy efficiency savings vs baseline scheme (annual figures)	Baseline scheme		Proposed Scheme (including energy efficient design and technology)		Change	
	kWh	CO <sub>2</sub>	kWh	CO <sub>2</sub>	kWh	CO <sub>2</sub>
<b>Heated office/welfare facilities</b>						
Electricity (regulated)	7,215	3,745	9,216	4,783	-2,000	-1,038
Heating & Hot Water	17,099	5,096	7,080	3,674	10,020	1,421
Cooling	0	0	0	0	0	0
Electricity (unregulated)	8,334	4,325	8,334	4,325	0	0
<b>Unheated warehouse</b>						
Electricity	359,199	186,424	231,742	120,274	127,458	66,151
<b>External Lighting</b>						
Electricity	2,880	1,495	2,880	1,495	0	0
<b>Total</b>	<b>394,728</b>	<b>201,085</b>	<b>259,251</b>	<b>134,551</b>	<b>135,477</b>	<b>66,534</b>

Energy Efficiency Savings Summary	Amount	%
Reduction in energy demand	135,477	34.3
Reduction in CO <sub>2</sub> emissions	66,534	33.1

Renewable Energy Saving (20% CO <sub>2</sub> ) provided by 65kWp (400m <sup>2</sup> of photovoltaic panels)	26910	kgCO <sub>2</sub>
	51850	kWh

## **Appendix C: BREEAM Pre-Assessment Summary**

Land to the west of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium



BREEAM New Construction 2014

Design Stage Pre-Assessment

Based on the BREEAM New Construction 2014 Design Stage Criteria (Issue 2.0)

Industrial Buildings (Fully fitted)

Revision P1, Date 25 November 2014

BRE Reference Number: TBC



## BREEAM Pre-Assessment Summary

BREEAM, the UK's Building Research Establishment's Environmental Assessment Method, is used to rate the environmental performance of new or existing buildings, as designed and constructed and/or in operation. A BREEAM rating of 'Pass', 'Good', 'Very Good', 'Excellent' or 'Outstanding' can be awarded where sufficient credits have been gained on the basis of meeting environmental performance criteria in each of the categories: Management, Health and Wellbeing, Energy, Transport, Water, Materials, Waste, Land Use and Ecology, Pollution and Innovation.

This pre-assessment has been carried out based on the BREEAM 2014 New Construction Design Stage Criteria for Industrial buildings. This scheme is applicable to new build projects. In addition to a range of standard issues assessed for all building types, this also includes requirements specific to Industrial buildings which have been included in the pre-assessment.

Please note that this pre-assessment includes a summary of the requirements for each credit but the BREEAM Technical Manual should be referred to for full details.

### Scoring and mandatory requirements

BREEAM requires the achievement of a minimum percentage score in order to achieve a particular rating. This is determined through achieving credits which are assigned to issues under each of the sections noted above. These sections are all weighted differently so credits in different sections equate to a different percentage score to those in other sections. The percentage contribution of each credit to the final score is noted at the end of each section in the following pages.

In addition to the achievement of a minimum score, BREEAM also contains mandatory credits/requirements which MUST be achieved in order to obtain a particular rating. If these are not achieved, the required rating cannot be obtained regardless of the percentage score achieved. In BREEAM 2014, there are also 'pre-requisites' which do not carry a score, but must be achieved in order to award a credit and/or rating. Where a pre-requisite or mandatory credit is present, this is clearly highlighted in the main summary spreadsheet below.

The following table shows the mandatory credits and requirements for the project and indicates whether these have been met in the targets below. Please note that sufficient evidence will need to be provided to demonstrate that each of these requirements is achieved.

Credit Title	Summary of mandatory requirements	Rating level (based on targets)
Man 03 Responsible Construction Practices.	CCS scores of 25-34 (one credit) or 35-39 (two credits).	Outstanding
Man 04 Commissioning and Handover	A Building User Guide is produced	Outstanding
Man 05 Aftercare	Seasonal Commissioning	Very Good
Ene 01 Reduction of Energy Use and Carbon Emissions	Minimum Energy Performance Ratio (EPR) calculations	Outstanding
Ene 02 Energy Monitoring	Sub-metering of major energy consuming systems	Outstanding
Wat 01 Water Consumption	Efficiency of building's domestic water consuming components	Outstanding
Wat 02 Water Monitoring	A water meter on the mains supply to each building.	Outstanding
Mat 03 Responsible Sourcing of Materials	All timber used on the project is 'legally harvested and traded timber'.	Outstanding
Wst 01 Construction Waste Management	A compliant Construction Resource Management Plan (CRMP) is produced and the relevant resource efficiency and/or diversion from landfill benchmarks are met.	Outstanding
Wst 03 Operational Waste	A compliant dedicated space for storage and segregating recyclable waste is provided.	Outstanding
LE 03 Mitigating Ecological Impact	The change in ecological value of the site is no less than minus nine i.e. a minimal change.	Outstanding



# Land to the west of Chilgrove Drive, North of Camp Road and adjoining former RAF Upper Heyford, Upper Heyford, incorporating former MOD gymnasium

## Design Stage Pre-Assessment Summary

**MINIMUM BREEAM RATING REQUIRED: Very Good. This equates to a score of 55% and requires the achievement of certain mandatory credits.**

It should be noted that until sufficient evidence is provided by the project team to the BREEAM Assessor to demonstrate that the full requirements have been met, none of these scores can be assumed to have been achieved, but remain as targets until the assessor confirms otherwise.

<b>Base Target</b>	This column shows the minimum credits anticipated to be achieved for the development. This column gives a score of 56.59% which is a BREEAM rating of Very Good.
<b>Optimum Target</b>	This column shows which credits could potentially be gained for the development, although the feasibility of achieving some of these credits will require further investigation by the project team. This column gives a score of 66.54% which is a rating of Very Good.

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>MANAGEMENT</b>								
<b>Man 01</b>	<b>Project Brief and Design</b>			<b>To recognise and encourage an integrated design process that optimises building performance</b>				
<b>Project brief and design</b>								
<b>Stakeholder Consultation (Project Delivery) (1-3)</b>	1	0	0	<p>Credit awarded where, prior to completion of the RIBA Stage 2 (Concept Design), the client, building occupier, design team and contractor contribute to the decision making process for the project. As a minimum this includes meeting to identify and define their roles, responsibilities and contributions during each phase of the project.</p> <p>Show that consideration was given to all topics as listed in the guidance (requirements 2a-g).</p> <p>The project team should demonstrate how the project delivery stakeholder contributions and outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.</p>	Although roles and responsibilities have been considered, no formal meeting has taken place prior to the end of RIBA Stage 2 and therefore this credit can not be obtained.	-		RIBA Stage 2
<b>Stakeholder Consultation (Third Party) (4-7)</b>	1	0	0	<p>Credit awarded where, prior to completion of the RIBA Stage 2 (Concept Design), all relevant third party stakeholders have been consulted by the design team on the minimum consultation content. Refer to the guidance for full details.</p> <p>The project must demonstrate how the stakeholder contributions and outcomes of the consultation exercise have influenced or changed the Initial Project Brief and Concept Design.</p> <p>Prior to completion of RIBA Stage 4 (Technical Design), consultation feedback must be given to, and received by, all relevant parties.</p>	Although consultation has been undertaken, it may not meet the specific BREEAM requirements and therefore this credit is not targeted.	-		RIBA Stage 2/3/4
<b>Sustainability Champion (BREEAM AP) (Design) (8-10)</b>	1	0	0	<p>Credit awarded where a Sustainability Champion is appointed to facilitate the setting and achievement of BREEAM performance target(s) for the project during project preparation and brief stages (RIBA Stage 1). There should be a contractual agreement of BREEAM performance targets between the client and design team by RIBA Stage 2 (Concept Design).</p> <p>To achieve this credit at the interim (design) assessment stage, the agreed BREEAM performance target(s) must be demonstrably achieved by the project design. This is demonstrated via the BREEAM Assessor's design stage assessment report.</p>	A sustainability consultant has been appointed to carry out energy and BREEAM pre-assessment services but as this appointment occurred after the end of RIBA stage 1, this credit can not be obtained.	-		RIBA Stage 1/2
<b>Sustainability Champion (BREEAM AP) (Monitoring Progress) (11-12)</b>	1	0	0	<p>If the previous credit (criteria 8, 9 and 10) have been achieved, credit awarded where the Sustainability Champion is appointed to monitor progress against the agreed BREEAM performance target(s) throughout the design process, and formally reports progress to the client and design team. The Sustainability Champion must attend key project/design team meetings during the design stages (RIBA Stages 2, 3 &amp; 4), reporting during, and prior to, completion of each stage, as a minimum.</p>	As criteria 8-10 have not been satisfied, this credit can not be obtained.	-		RIBA Stage 2/3/4
<b>Man 02</b>	<b>Life cycle cost and service life planning</b>			<b>To deliver whole life value from investment and promote economic sustainability by recognising and encouraging the use of life cycle costing and service life planning to improve design, specification and through-life maintenance and operation.</b>				

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Elemental Life Cycle Cost (LCC) (1-2)</b>	2	0	0	Two credits awarded where an Elemental LCC analysis and design option appraisal is carried out in line with 'Standardized method of life cycle costing for construction procurement' PD 156865:2008, at RIBA Stage 2.  The LCC analysis must show an outline LCC based on buildings basic structure and envelope, a range of options and based on multiple cash flow scenarios (e.g. 20, 30, 50+ years)  It must also show the fabric and servicing strategy, outlining services component and fit-out options over a 15yr period in an 'elemental LCC Plan'.	Although the design team will refer to life cycle costing information to aid the design process, the formal analysis and associated credits are not currently targeted.	-		RIBA Stage 2
<b>Component Level LCC Plan (3-4)</b>	1	0	0	Credit awarded where a component LCC plan is developed to include envelope, services, finishes and external spaces, where present, before the end of RIBA Stage 4.  Demonstrate how the component level LCC plan has influenced building and systems design/specifications to minimise life cycle costs and maximise critical value.	Although the design team will refer to life cycle costing information to aid the design process, the formal analysis and associated credits are not currently targeted.	-		Before end of RIBA Stage 4
<b>Capital Cost Reporting (5)</b>	1	1	1	Credit awarded where the project team reports the predicted capital cost for the building in £k/m2.. At the design stage, this can be awarded based on confirmation of the predicted cost, and a client commitment to provide the information on the final cost at the end of the project.	The project team will provide this information to the BRE in confidence at the end of the project. Credit targeted.	Client		Before end of RIBA Stage 4
<b>Man 03</b>	<b>Responsible Construction Practices</b>			<b>To recognise and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner.</b>	<b>Mandatory minimum requirement: One credit for Excellent and two credits for Outstanding for Considerate Construction.</b>			
<b>Pre-requisite</b>	0	Y	Y	All timber, and timber based products, used in the project must be 'Legally harvested and traded timber'.	The contractor shall be required to source legally harvested and traded timber.			
<b>Environmental Management (1-2)</b>	1	0	1	Credit awarded where the principal contractor operates an EMS covering main operations. The EMS must be either third party certified to ISO14001/EMAS standard, or structured in compliance with BS 8555 2003, having reached phase four of implementation stage.  The principal contractor must implement best practice pollution prevention policies on site, in line with PPG 6.	This credit is not currently targeted as the job is likely to be completed by a smaller contractor who may not have a accredited EMS policy in place.	QS		RIBA Stages 4/5/6 - include in tender
<b>Sustainability Champion (BREEAM AP/BRE SSM) (Construction) (3-5)</b>	1	0	0	Credit awarded when a Sustainability Champion is appointed to monitor the project to ensure compliance with performance/process criteria and BREEAM targets during Construction, Handover and Close Out stages (RIBA stages 5 and 6). Defined BREEAM performance targets form a requirement of the principal contractors contract. BREEAM related targets must be demonstrably achieved via BREEAM Assessor's final post-construction stage assessment report.  Note that to achieve this, the Sustainability Champion must be site based or visit the site regularly to carry out spot checks, with sufficient frequency. They will attend regular progress meetings and report progress against the BREEAM targets.	Method Consulting is providing BREEAM advice and assessment services throughout the project and will work closely with the design team to assist them achieve their target rating. In order to maximise the benefits to the project without significant cost implications, additional attendance at meetings and formal collation of evidence is not currently planned and therefore this credit is not targeted.	-		RIBA Stages 5/6/7
<b>Considerate Construction (6)</b>	2	2	2	Credit awarded where the principal contractor has used an independently assessed 'compliant' organisational, local or national considerate construction scheme. One credit awarded where a CCS score of 25-34 is achieved with 5 in each section. Two credits awarded where the score is between 35-39 with 7 in each section.	Contractor to register site with the CCS and commit to achieving a score of at least 35 with a minimum of 7 in each section. Two credits targeted.	QS		RIBA Stages 4/5/6 - include in tender
<b>Monitoring of Construction Site Impacts (Utility Consumption) (7-13)</b>	1	1	1	Responsibility for monitoring all on-site energy use and potable water consumption from construction processes (and dedicated off site monitoring) should be assigned to an individual.  Monitor and record principal and sub-contractor potable water consumption (m <sup>3</sup> ) and energy consumption (kWh/litres of fuel) used by construction plant, equipment (fixed and mobile) and site accommodation. Report the CO <sub>2</sub> emissions (total kgCO <sub>2</sub> /project value) and total net potable water consumption (m <sup>3</sup> ) from construction processes.	Contractor to be required to monitor and report on all onsite energy use and potable water consumption. Credit targeted.	QS		RIBA Stages 4/5/6 - include in tender

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Monitoring of Construction Site Impacts (Transport) (7, 14-16)</b>	1	1	1	<p>Responsibility should be assigned to an individual to monitor and record transport movements and impacts data from delivery of the majority of construction materials to, and waste from, site. Transport, intermediate storage and distribution of materials from factory gate to building site to be included as minimum.</p> <p>The scope of monitoring must cover materials used in major building elements, groundworks and landscaping materials. Transport of waste groups, outlined in projects WMP, from construction gate to waste disposal processing/recovery centre gate included as minimum.</p> <p>Report separately for materials and waste, the total fuel consumption (litres) and total CO<sub>2</sub> emissions (kgCO<sub>2</sub> eq), plus distance travelled (km).</p>	Contractor to be required to monitor and report on all transport related emissions. Credit targeted.	QS		RIBA Stages 4/5/6 - include in tender
<b>Man 04</b>	<b>Commissioning and Handover</b>			<b>To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants.</b>	<b>Mandatory minimum requirement: Criterion 9 (Building User Guide) for Excellent and Outstanding.</b>			
<b>Commissioning and Testing Schedule and Responsibilities (1-4)</b>	1	0	1	<p>Credit awarded where a schedule of commissioning, identifying a suitable timescale for commissioning and re-commissioning of all building services, control systems and building fabric is produced. The schedule should identify the standards that the commissioning will be in accordance with. These should include current Building Regulations, BSRIA and CIBSE guidelines and any other appropriate standards where applicable.</p> <p>An appropriate project team member(s) should be appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning activities on behalf of the client.</p> <p>The principal contractor should account for the commissioning programme, responsibilities and criteria within their budget and programme of works, allowing for time to complete activities prior to handover.</p>	Due to the simple nature of the systems within the building (mainly unheated space), this credit is not currently targeted.	M&E		Before end of RIBA Stage 6
<b>Commissioning Building Services (5)</b>	1	0	1	<p>Credit awarded where the commissioning criteria above have been achieved and a specialist commissioning manager is appointed at design stage, for all complex building services and systems. Their responsibilities shall include:</p> <ol style="list-style-type: none"> <li>Undertaking design reviews and giving advice on suitability for ease of commissioning.</li> <li>Providing commissioning management input to construction programming and during installation stages.</li> <li>Management of commissioning, performance testing and handover/post hand-over stages.</li> </ol> <p>Where there are simple building services, this role can be carried out by an appropriate project team member (see criterion 3 above), provided they are not involved in the general installation works for the building services system(s).</p>	Due to the simple nature of the systems within the building (mainly unheated space), this credit is not currently targeted.	M&E		Before end of RIBA Stage 4
<b>Testing and Inspecting Building Fabric (6-8)</b>	1	0	1	<p>Credit awarded where the commissioning and testing schedule and responsibilities credit above is achieved, and a post construction thermographic survey and airtightness testing and inspection is completed to assure the quality of the building fabric, including insulation continuity, avoidance of thermal bridging and air leakage paths. Defects identified through testing must be rectified prior to building handover and close out. All testing must be carried out by a Suitably Qualified Professional in line with the relevant standards.</p>	Due to the simple nature of the systems within the building (mainly unheated space), this credit is not currently targeted.	QS		Before end of RIBA Stage 6
<b>Handover (9-10)</b>	0	Y	Y	<b>Pre-requisite:</b> A Building User Guide is developed prior to handover, for distribution to building occupiers and premises managers, covering all functions and uses of the building.	This requirement will be included in the contract documents.	QS		
	1	1	1	<p>A training schedule is prepared for building occupiers/premises managers, timed appropriately around handover and proposed occupation plans, which includes the following content as a minimum:</p> <ol style="list-style-type: none"> <li>The building's design intent.</li> <li>The available aftercare provision and aftercare team main contact(s), including any scheduled seasonal commissioning and post-occupancy evaluation.</li> <li>Introduction to, and demonstration of, installed systems and key features, particularly building management systems, controls and their interfaces.</li> <li>Introduction to the BUG and other relevant building documentation (see guidance).</li> <li>Maintenance requirements, including any maintenance contracts and regimes in place.</li> </ol>	This requirement will be included in the contract documents.	QS		Before end of RIBA Stage 6
<b>Man 05</b>	<b>Aftercare</b>			<b>To provide post-handover aftercare to the building owner/occupants during the first year of occupation to ensure the building operates and adapts, where relevant, in accordance with the design intent and operational demands.</b>	<b>Mandatory minimum requirement: One credit (Seasonal Commissioning) for Excellent and Outstanding.</b>			

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Aftercare Support (1-2)	1	0	1	<p>Credit awarded where there is operational infrastructure and resources in place to provide aftercare support to the building occupier(s), which includes the following as a minimum:</p> <p>a) A meeting programmed to occur between the aftercare team/individual and the building occupier/management (prior to initial occupation, or as soon as possible thereafter) to:</p> <p>i. Introduce the aftercare team or individual to the aftercare support available, including the Building User Guide (where existing) and training schedule/content.</p> <p>ii. Present key information about the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible.</p> <p>b) On-site facilities management training, to include a walkabout of the building and introduction to and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands.</p> <p>c) Initial aftercare support provision for at least the first month of building occupation, e.g. on-site attendance on a weekly basis to support building users and management (this could be more or less frequent depending on the complexity of the building and building operations).</p> <p>d) Longer term aftercare support provision for occupants for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users/management.</p> <p>There is operational infrastructure and resources in place to co-ordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is occupied. This is done to facilitate analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.</p>	Due to the simple nature of the systems within the building (mainly unheated space), this credit is not currently targeted.	QS / Client		Before end of RIBA Stage 6
Seasonal Commissioning (3)	1	0	1	<p><b>Complex systems - Specialist commissioning manager (over a minimum 12 month period after occupation)</b></p> <p>a. Testing of all building services under full load conditions, i.e. heating equipment in mid-winter, cooling/ventilation equipment in mid-summer, and under part load conditions (spring/autumn);</p> <p>b. Where applicable, testing should also be carried out during periods of extreme (high or low) occupancy; c. Interviews with building occupants (where they are affected by the complex services); Recommissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the O&amp;M manuals.</p> <p><b>Simple systems (naturally ventilated) - external consultant/ facilities manager</b></p> <p>a. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback; take all reasonable steps to recommission systems following the review to take account of deficiencies identified and incorporate any relevant revisions in operating procedures into the O&amp;M manuals.</p>	Due to the simple nature of the systems within the building (mainly unheated space), this credit is not currently targeted.	M&E		Before end of RIBA Stage 4
Post Occupancy Evaluation (4-5)	1	0	1	<p>The client makes a commitment to carry out a Post Occupancy Evaluation (POE) one year after building occupation, to gain building performance feedback. The POE should be carried out by an independent party. It should include the following: a review of the design intent and construction process, feedback from building users on the design and environmental conditions of the building, sustainability performance. See guidance notes for full list of what should be included.</p> <p>The client makes a commitment to carry out the appropriate dissemination of information on the building's post occupancy performance in order to share any good practice and lessons learned, and inform changes in user behaviour, building operational processes and procedures, and system controls.</p> <p>Refer to the compliance notes for a definition of appropriate dissemination, this also provides advice on appropriate dissemination where the building or building information is commercially or security sensitive.</p>	Due to the simple nature of the systems within the building (mainly unheated space), this credit is not currently targeted.	Client / PM		Before end of RIBA Stage 4
<b>Sub-Total</b>	<b>21</b>	<b>6</b>	<b>13</b>					
<b>Weighted Sub-Total</b>	<b>12</b>	<b>3.43</b>	<b>7.43</b>	<b>One management credit equals 0.57%</b>				
<b>HEALTH &amp; WELLBEING</b>								
<b>Hea 01</b>	<b>Visual comfort</b>		<b>To ensure daylighting and occupant controls are considered at the design stage to ensure best practice visual performance and comfort for building occupants.</b>					

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Glare Control (1-2)</b>	1	1	1	Credit awarded when the potential for disabling glare has been designed out of all relevant building areas either through building layout (e.g. low eaves) or building design (e.g. brise soleil, bioclimatic design). The glare control strategy avoids increasing lighting energy consumption by maximising daylight levels whilst avoiding disabling glare. System should not inhibit daylight entering the space under cloudy conditions, and the location of shading should not conflict with operating lighting controls.	It is proposed that blinds are fitted to the office windows. Credit targeted.	Arch		RIBA Stage 3/4 - include in tender
<b>Daylighting (3)</b>	1	0	0	One credit is awarded where calculations have been carried out which demonstrate that at least 80% of floor area in occupied spaces is adequately daylit. An additional Innovation credit available - see below	Although 80% of the total office floor area complies with the average daylighting factor, only 80% of two of the larger offices comply and therefore the credit can not be obtained. Credit not targeted.	-		RIBA Stage 3/4 - include in tender
<b>View Out (4-6)</b>	1	1	1	Credit awarded when 95% of floor space within relevant building areas (inc. workstations, close work areas or areas where a view out is deemed beneficial to occupants of the space) are within 7m of a wall which has a window or permanent opening that provides an adequate view out. The window/opening must be equal to, or greater than, 20% of the surrounding wall area. Where the room depth is greater than the 7m requirement, compliance is only possible where the % of window/opening is $\geq$ the values in table 1.0 of BS 8206.	Office are shallow plan and all have windows. Therefore this credit is targeted.	Arch		RIBA Stage 2
<b>Internal and External Lighting Levels, Zoning and Control (7-12)</b>	1	1	1	Credit awarded where high frequency ballasts are fitted to all fluorescent and compact fluorescent lamps. AND All internal and external lighting is designed to provide illuminance levels appropriate to tasks undertaken, recommended by SLL Code for Lighting 2012, CIBSE LG 7 or other relevant industry standard for internal lighting, and BS 5489-1:2013 and BS EN 12464-2:2014 for external lighting. AND Internal lighting must be appropriately zoned and allow for occupant control.	The internal and external lighting shall be designed to comply with the relevant lighting codes. Therefore the credit is targeted.	M&E		RIBA Stage 3/4 - include in tender
<b>Hea 02</b>	<b>Indoor air quality</b>			<b>To recognise and encourage a healthy internal environment through the specification and installation of appropriate ventilation, equipment and finishes.</b>				
<b>Indoor Air Quality Plan (1)</b>	1	1	1	Credit awarded where an Indoor Air Quality (IAQ) plan has been produced, with the objective of facilitating a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following: a. Removal of contaminant sources b. Dilution and control of contaminant sources c. Procedures for pre-occupancy flush out d. Third party testing and analysis e. Maintaining indoor air quality in-use	A compliant indoor air quality plan will be produced.	Arch		RIBA Stage 2
<b>Ventilation (2-5)</b>	1	0	0	Credit awarded where the building has been designed to minimise the concentration and recirculation of pollutants in the building by providing fresh air in to the building in accordance with relevant standards for ventilation. <b>1. In air-conditioned and mixed-mode buildings/spaces:</b> The building's air intakes and exhausts are over 10m apart and intakes are over 20m from sources of external pollution. OR The location of the building's air intakes and exhausts, in relation to each other and external sources of pollution, is designed in accordance with BS EN 13779:2007 Annex A2. <b>2. In naturally-ventilated buildings/spaces:</b> openable windows/ventilators are over 10m from sources of external pollution. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, in line with BS EN 13779:2007. Areas of the building subject to large and unpredictable/variable occupancy patterns should have CO <sub>2</sub> or air quality sensors specified and meet the detailed requirements relating to natural or mechanically ventilated spaces.	Due to the use of the building and the proximity of the loading bays to the offices, it is not possible to obtain this credit.	-		RIBA Stage 2
<b>Volatile Organic Compounds (Emission Levels) (6-7)</b>	1	1	1	Credit awarded where all decorative paints and varnishes specified meet the criteria in the EU Directive 2004/42/CE ('Paints Directive'). At least five of the other seven remaining product categories meet the testing requirements and emission level criteria for Volatile Organic Compound (VOC) emissions.	Low VOC products will be specified.	Arch		RIBA Stage4



Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Volatile Organic Compounds (Testing) (8-12)</b>	1	0	0	Credit awarded where formaldehyde and total volatile organic compound (TVOC) concentrations meet the required standards and are measured via post construction (but pre-occupation) testing in accordance with the relevant standards, and reported using the BRE scoring tool.	Although low VOC products will be specified, post construction testing is not currently planned.	-		RIBA Stage 4
<b>Adaptability - Potential for Natural Ventilation (13-14)</b>	1	0	0	<p>Credit awarded when the ventilation strategy is flexible and adaptable to potential occupant needs and climatic scenarios, and the design shows that occupied spaces are capable of providing fresh air entirely via natural ventilation. Either, room depths are designed in accordance with CIBSE AM10, and the openable window area in each occupied space is 5% of GIFA of that floor plate. OR</p> <p>The natural ventilation strategy provides adequate cross flow of air to maintain required thermal comfort/ventilation rates. Demonstrated using design tool types recommended by CIBSE AM10. For strategies that do not rely on openable windows, or with occupied spaces greater than 15m, the design must demonstrate that the strategy can provide an adequate cross flow of air.</p> <p>The natural ventilation strategy should provide at least two levels of user-control on fresh air supply. Any opening mechanisms must be easily accessible, and avoid draughts.</p> <p>Note: For Industrial buildings, this credit only applies to office areas and not to operational areas. If no office areas are present, this credit is not applicable.</p>	The first floor windows are not currently proposed to be openable and therefore this credit is not currently targeted.	Arch		RIBA Stage 2
<b>Hea 04</b>	<b>Thermal Comfort</b>			<b>To ensure that appropriate thermal comfort levels are achieved through design, and controls are selected to maintain a thermally comfortable environment for occupants within the building.</b>				
<b>Thermal Modelling (1-4)</b>	1	0	0	<p>Credit awarded when thermal modelling has been carried out using software in accordance with CIBSE AM11, and provides full dynamic thermal analysis. For smaller, more basic building designs with less complex systems, alternative simpler analysis methodologies may be used (when in accordance with CIBSE AM11).</p> <p>The modelling should show the building design and services strategy can deliver thermal comfort levels in occupied spaces as follows:</p> <p>a) <b>In air-conditioned buildings:</b> Summer and Winter operative temperature ranges in accordance with the criteria set out in Table 1.5 of CIBSE Guide A or other appropriate industry standard (where this sets a higher or more appropriate requirement/level).</p> <p>b) <b>Naturally ventilated/free running buildings:</b> Winter operative temperature ranges in accordance with Table 1.5 of CIBSE Guide A or other appropriate standard that sets a higher/more appropriate level. AND the building is designed to limit the risk of overheating in accordance with CIBSE TM52.</p> <p>For air-conditioned buildings, the PMV and PPD indices should be provided as evidence.</p> <p>Note: For Industrial buildings, this credit only applies to office areas and not to operational areas. If no office areas are present, this credit is not applicable.</p>	Although thermal modelling has been carried out to assess carbon emissions, due to the simple nature of the building, the small area of office space has not been assessed. However, it is thought that the design of the mechanical ventilation systems will ensure that thermal comfort conditions are maintained within the office spaces. Credit not targeted.	-		RIBA Stage 2
<b>Adaptability - For a projected climate change scenario (5-8)</b>	1	0	0	<p>Credit awarded when the Hea 04 Thermal modelling credit has been achieved, and the thermal modelling demonstrates that the building design and services strategy can deliver the same thermal comfort levels in occupied spaces under a projected climate change environment.</p> <p>Where thermal comfort criteria are not met for the projected climate change environment, the project team should demonstrate how the building has been adapted, or is adaptable in future using passive design solutions to achieve above criteria.</p> <p>For air-conditioned buildings, the PMV and PPD indices are reported, based on the modelling.</p> <p>Note: For Industrial buildings, this credit only applies to office areas and not to operational areas. If no office areas are present, this credit is not applicable.</p>	As thermal modelling to cover points 1-4 has not been carried out, this credit can not be obtained.	-		RIBA Stage 2

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Thermal Zoning and Controls (9-11)	1	0	0	<p>Credit awarded when the Hea 04 Thermal modelling credit has been achieved, and the thermal modelling analysis has informed the temperature control strategy for the building and its users.</p> <p>The strategy for proposed heating/cooling system(s) demonstrates that it has addressed the following:</p> <p>a. Zones within the building and how the building services could efficiently and appropriately heat or cool these areas.  b. The degree of occupant control required for these zones based on discussions with the end user.  c. How proposed systems will interact with each other and how this may affect thermal comfort of building users.  d. The need or otherwise for an accessible building user actuated manual override for any automatic systems.</p> <p>Note: For Industrial buildings, this credit only applies to office areas and not to operational areas. If no office areas are present, this credit is not applicable.</p>	As thermal modelling to cover points 1-4 has not been carried out, this credit can not be obtained.	-		RIBA Stage 2
Hea 05	Acoustic performance			To ensure the buildings' acoustic performance including sound insulation meet the appropriate standards for its purpose.				
Acoustic Performance (1)	3	3	3	<p>Credits awarded where a programme of pre-completion acoustic testing is carried out by a compliant test body to ensure the relevant building areas meet the appropriate acoustic performance standards and testing requirements.</p> <p>First credit: Sound Insulation and Indoor Ambient Noise Levels - Indoor ambient noise levels comply with the design ranges in BS 8233:2014.</p> <p>Second credit: Reverberation (in rooms used for speech or performance) - Achieve the reverberation times compliant with Section 2 of the Acoustic Performance Standard. (Credit can be awarded by default where the relevant areas are not present and the first credit is achieved).</p> <p>Three credits: Where a Suitably Qualified Acoustician is appointed to define a Bespoke set of performance requirements for all function areas in the building, using the three acoustic principles above. The SQA must set out performance requirements for each and the testing regime required.</p>	Resound Acoustics have carried out a background noise assessment and provided a detailed report to accompany this. The report has been submitted as part of the planning application. It is assumed that the construction of the development will be sufficient to achieve these credits and that suitable post-completion testing be undertaken. Three credits targeted.	Aco/Arch/QS		RIBA Stage 2/3/4 - include in tender
Hea 06	Safety and security			To recognise and encourage effective measures that promote safe and secure use and access to and from the building.				
Safe Access (1-10)	1	0	0	<p>Credit awarded where the site is designed to allow for safe access for pedestrians and cyclists. Level of detail is comprehensive - refer to compliance notes for details. Points to consider include: cycle paths and footpaths connecting to any off site paths, drop off areas to be located off/adjoining access road with direct access to footpath, road raised to pavement level at crossings, lighting in line with BS 5489-1:2013.</p> <p>Where delivery access areas and drop off areas exist: delivery areas are not directly accessed through general parking areas and do not cross or share pedestrian and cyclist routes and other outside amenity areas, provide a separate parking/waiting area for goods vehicles, ensure parking/turning areas are designed for simple manoeuvring and provide a dedicated space for refuse skips and pallets, away from delivery areas and staff/visitor parking.</p>	Due to the nature of the building, it is not thought practical to segregate the staff parking and delivery areas for the warehouse in phase one. Therefore the credit is not targeted.	-		RIBA Stage 2/3
Security of Site and Building (11-13)	1	0	0	<p>Credit awarded where an evidence-based Security Needs Assessment (SNA) is conducted by a Suitably Qualified Security Specialist (SQSS) by the end of RIBA Stage 2.</p> <p>The SQSS develops a set of recommendations or solutions during or prior to RIBA Stage 2 which aim to ensure that the design of buildings, public and private car parks and public or amenity space are planned, designed and specified to address the issues identified in the SNA.</p> <p>The recommendations from the SQSS are implemented. Any deviations from the recommendations will need to be justified, documented and agreed in advance with a SQSS.</p>	Although the security of the site and building has been considered, a formal Security Needs Assessment has not been carried out and therefore this credit is not targeted.	-		RIBA Stage 2
Sub-Total	17	8	8	One health & wellbeing credit equals 0.88%				
Weighted Sub-Total	15	7.06	7.06					
ENERGY								
Ene 01	Reduction of Energy use and Carbon Emissions			To recognise and encourage buildings designed to minimise operational energy demand, consumption and CO <sub>2</sub> emissions.	Mandatory minimum requirements: Five credits for Excellent and eight credits for Outstanding.			

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Energy Performance (1)	12	8	8	Up to 12 credits can be awarded where there is an improvement in the building operational related CO <sub>2</sub> emissions. The number of credits is based on the Energy Performance Ratio for New Constructions (using the BREEAM calculator).	Based on the preliminary thermal modelling used to determine the energy strategy, due to the actual heating and cooling demand being significantly less than that of the notional building, and the installation of the photovoltaic array, 8 credits can be achieved under this issue.	M&E		RIBA Stage 3-4
Ene 02	Energy monitoring			<b>To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of operational energy consumption.</b>				
Sub-metering of Major energy Consuming Systems (1-4)	1	1	1	Credit awarded where energy metering systems are installed that enable 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems. This includes the following: Space heating; Domestic Hot Water; Humidification; Cooling; Ventilation; Pumps; Lighting; Small power; Renewable or low carbon systems (separately); Controls and other major energy-consuming systems/plant.  The energy consuming systems in buildings with a total useful floor area >1000m <sup>2</sup> are metered using an appropriate energy monitoring and management system. Smaller buildings are metered either with an energy monitoring and management system or separate accessible sub-meters with pulsed outputs or other open protocol communication output to enable future connection to energy monitoring system.  The end energy consuming use should be identifiable to the building user, for example through labelling or data outputs.	The building services design will incorporate the relevant sub-metering. Credit targeted.	M&E		RIBA Stage 2/3/4-include in tender
Sub-metering of High Energy Load and Tenancy Areas (5)	1	1	1	Credit awarded where an accessible energy monitoring and management system or separate accessible energy sub-meters with pulsed outputs or other protocol communication outputs which enable future connection to an energy monitoring and management system, are provided, covering a significant majority of the energy supply to all relevant function areas or departments within the building/unit.  For a small Industrial unit (<200m <sup>2</sup> ) consisting of a number of small tenanted units, one meter per unit for electricity and one for heating is sufficient. For large Industrial units (>200m <sup>2</sup> ) with one or more large tenanted areas, sufficient sub-metering to allow for monitoring of the relevant function areas within the unit must be specified, in addition to metering the unit as a whole.	The building services design will incorporate the relevant sub-metering. Credit targeted.	M&E		RIBA Stage 2/3/4-include in tender
Ene 03	External Lighting			<b>To recognise and encourage the specification of energy-efficient light fittings for external areas of the development.</b>				
External lighting (1-3)	1	1	1	Credit awarded by default where the building has been designed to operate without external lighting. OR Credit awarded where the average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt.  All external light fittings should be automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	The external lighting design will comply with the requirements. Credit targeted.	M&E		RIBA Stage 2/3/4-include in tender
Ene 04	Low Carbon Design			<b>To encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems.</b>				
Passive Design (Passive Design analysis) (1-3)	1	0	0	Credit awarded when Hea 04 Thermal comfort has been achieved; and the design team conduct an analysis of building design/development by RIBA Stage 2, to identify opportunities for passive design solutions to reduce energy consuming services.  Additionally the building should use passive design measures to reduce the total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with the findings of the passive design analysis and the analysis should demonstrate a reduction in the total energy demand as a result (as a guide, passive design measures should contribute at least 5% of total energy demand).	As thermal modelling in compliance with Hea 04 has not been carried out, this credit can not be obtained.	-		RIBA Stage 2



Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Passive Design (Free cooling) (4-6)</b>	1	0	0	Credit awarded where the Ene 04 passive design credit is achieved, and the passive design analysis includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions. These include: night-time cooling, ground coupled air cooling, displacement ventilation (not linked to any active cooling mechanism), ground water cooling, surface water cooling, evaporative cooling (direct or indirect), desiccant dehumidification and evaporative cooling using waste heat, and absorption cooling using waste heat. The building uses any of the free cooling strategies listed, i.e. does not use active cooling.	As thermal modelling in compliance with items 1-4 of Ene 04 has not been carried out, this credit can not be obtained.	-		RIBA Stage 2/3
<b>Low and Zero Carbon Technologies (LZC Feasibility Study) (7-8)</b>	1	1	1	Credit awarded when an energy specialist conducts a feasibility study by the end of RIBA Stage 2, to establish the most appropriate recognised local (on-site or near-site) LZC energy sources for the development.  A local LZC energy technology/technologies must be specified for the building/development in line with the recommendations of this feasibility study, and this results in a meaningful reduction in regulated CO <sub>2</sub> emissions (as a guide, this should be at least 5%).	The energy statement incorporates an LZC Feasibility study which concludes that photovoltaic panels should be incorporated within the scheme as indicated on the planning drawings. The included array will reduce carbon emissions associated with the scheme by 20%. Credit targeted.	M&E		RIBA Stage 2
<b>Ene 08</b>	<b>Energy Efficient Equipment</b>			<b>To recognise and encourage procurement of energy efficient equipment to ensure optimum performance and energy savings in operation.</b>				
<b>Energy Efficient Equipment (1-3)</b>	2	2	2	Credit awarded where the building's unregulated energy consuming loads are identified and their contribution to the total annual unregulated energy consumption of the building is estimated, assuming a typical/standard specification.  Identify which of the following systems/process that will be responsible for a significant proportion of total annual unregulated energy consumption of the building and demonstrate a meaningful reduction in energy consumption.  Small power, plug in equipment; swimming pool; communal laundry facilities with commercial sized appliances; data centre; IT intensive operating area; residential areas with domestic scale appliances; kitchen and catering equipment.	Energy efficient equipment for the offices will be procured. Two credits targeted.	Client		RIBA Stage 2/3
<b>Sub-Total</b>	<b>20</b>	<b>14</b>	<b>14</b>	<b>One energy credit equals 0.75%</b>				
<b>Weighted Sub-Total</b>	<b>15</b>	<b>10.50</b>	<b>10.50</b>					
<b>TRANSPORT</b>								
<b>Tra 01</b>	<b>Public Transport Accessibility</b>			<b>To recognise and encourage development in proximity of good public transport networks, thereby helping to reduce transport-related pollution and congestion.</b>				
<b>Accessibility Index (1-3)</b>	3	0	0	Up to 3 credits are available where the public transport Accessibility Index (AI) for the assessed building is calculated based on the mode of transport, frequency of services and distance from building entrance to accessible public transport nodes.  Where a development is unable to achieve any of the available credits using the AI, one credit is achieved when the building occupier provides, or commits to providing a dedicated bus service to and from the building relating to shift patterns.	The bus service 25 operates from the bus stop on Camp Road which is over 1000m away from the entrance to the site. Based on the average frequency of buses, the AI is less than 2 and therefore no credits can be obtained under this issue.	-		RIBA Stage 1/2
<b>Tra 02</b>	<b>Proximity to Amenities</b>			<b>To encourage and reward a building location that facilitates easy access to local services and so reduces the environmental, social and economic impacts resulting from multiple or extended building user journeys, including transport related emissions and traffic congestion.</b>				
<b>Proximity to Amenities (1)</b>	1	0	0	Credit is awarded where the building is located within 500m, via a safe pedestrian route, of 3 local amenities likely to be frequently required by the occupants. This should include at least 2 of the 3 core amenities: Appropriate food outlet, access to cash, and access to a recreation/leisure facility for fitness/sports, plus one other amenity. This can be either a core amenity, or one of the following additional amenities: Publicly available posting facilities, community facility; over-the-counter pharmacy; child care facility; access to an outdoor open space (public or private and suitably sized and accessible to building users).  Note: Industrial developments are 'Building Type 1'.	There are not thought to be any local amenities within 500m of the site entrance off Chilgrove Drive and therefore no credits can be obtained under this issue.	-		RIBA Stage 1-2
<b>Tra 03</b>	<b>Cyclist Facilities</b>			<b>To encourage building users to cycle, so promoting exercise and helping reduce congestion and emissions, by ensuring adequate provision of cyclist facilities,</b>				
<b>Cycle Storage (1)</b>	1	1	1	Credit awarded where compliant cycle storage facilities are provided. This requires 1 space per 10 staff.	The maximum occupancy of the warehouse has been confirmed to be 17. Therefore 2no. compliant cycle storage spaces are required in order to obtain this credit. Cycle storage has been included on the planning application drawings. Credit targeted.	Arch		RIBA Stage 2-3

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Cyclist Facilities (2-3)	1	0	1	If the first Tra 03 credit has been achieved above, one credit can be awarded where at least two types of the following compliant cyclist facilities have been provided; Showers; Changing facilities; Lockers or Drying Spaces.	Cyclist facilities are not currently proposed for phase 1 of the development. These could be added at a later date if required, or incorporated into the phase 2 design.	Arch/M&E		RIBA Stage 2-3
<b>Tra 04</b>	<b>Maximum Car Parking Capacity</b>			<b>To encourage the use of alternative means of transport other than the private car to and from the building, thereby helping to reduce the transport related emissions and traffic congestion associated with the building's operation.</b>				
Car Parking Capacity (1)	2	1	1	Depending on the building's Accessibility Index (AI) one credit is awarded based on the maximum car parking capacity in relation to the number of building users AI <4 = 1 space per 3 building users AI ≥ 4 - <8 = 1 space per 4 building users AI ≥ 8 = 1 space per 5 building users  To achieve the second credit, the requirements increase as follows: AI <4 = 1 space per 4 building users AI ≥ 4 - <8 = 1 space per 5 building users AI ≥ 8 = 1 space per 6 building users	The maximum occupancy of the warehouse has been confirmed to be 17. As the AI is less than 4 and 5no standard car parking spaces have been provided, 1 credit can be obtained.	Arch		RIBA Stage 2-3
<b>Tra 05</b>	<b>Travel Plan</b>			<b>To recognise the consideration given to accommodating a range of travel options for building users, thereby encouraging the reduction of user reliance on forms of travel that have the highest environmental impact.</b>				
Travel plan (1-4)	1	1	1	Credit awarded where the development of a travel plan and site specific travel assessment or statement has been undertaken (involving occupier, if known) to ensure the travel plan is structured to meet the needs of the particular site and covers the following (as a minimum): the existing patterns and opinions of occupiers cycling and walking to the site/building, to identify issues; the travel patterns and transport impact of future building users; the current environment and facilities of walkers/cyclists; the current public transport and disabled access to the site (accounting for varying levels of disability and visual impairment).  The travel plan should include a package of measure to encourage the use of sustainable modes of transport and the movement of people and goods during the buildings operation and use. The occupier must confirm that the plan will be implemented post-construction.	A detailed transport assessment has been undertaken by Royal Haskoning DHV. The transport assessment concludes that the site layout provides suitable parking and safe transition onto the highways. It also concludes that cycle storage should be provided for both phases. The credit could be obtained if a BREEAM compliant travel plan is developed based on the findings of the transport assessment.	TP		RIBA Stage 1/2
<b>Sub-Total</b>	<b>9</b>	<b>3</b>	<b>4</b>	<b>One transport credit equals 1%</b>				
<b>Weighted Sub-Total</b>	<b>9</b>	<b>3.00</b>	<b>4.00</b>					
<b>WATER</b>								
<b>Wat 01</b>	<b>Water Consumption</b>			<b>To reduce the consumption of potable water for sanitary use in new buildings from all sources through the use of water efficient components and water recycling systems.</b>		<b>Mandatory minimum requirement: One credit for Good, Very Good and Excellent. Two credits for Outstanding.</b>		
Water Consumption (1-5)	5	4	4	Up to five credits are awarded, determined by an assessment of the efficiency of the buildings domestic water consuming components, where the water consumption (l/person/day) is compared against a baseline performance. The efficiency of the following 'domestic scale' components should be included: WCs, urinals, taps (wash hand basins, kitchen taps/waste disposal unit where specified), showers, baths, dishwashers and washing machines (domestic/commercial/industrial sized).  Where a greywater and/or rainwater system is specified, its yield (l/person/day) should be used to off-set non potable water demand from components that would otherwise be supplied using potable water.  Any greywater systems should be specified and installed in compliance with BS 8525-1:2010 Greywater Systems - Part 1 Code of Practice. Any rainwater systems should be specified and installed in compliance with BS 8515:2009+A1:2013 Rainwater Harvesting Systems - Code of Practice.	Low water use sanitaryware will be specified including 4/2.6 litre dual flush WCs. Flow restrictors will be specified on the water supplies to wash hand basins to limit their flow rate to 6 litres per minute. Four credits are targeted.	Arch/M&E		RIBA Stage 3/4
<b>Wat 02</b>	<b>Water Monitoring</b>			<b>To ensure water consumption can be monitored and managed and therefore encourage reductions in water consumption.</b>		<b>Mandatory minimum requirement: Criterion 1 (water meter on mains supply) for Good, Very Good, Excellent and Outstanding.</b>		
Pre-requisite (1)	0	Y	Y	<b>Mandatory pre-requisite - A water meter is specified on the mains water supply to each building, including where water is supplied via a borehole or other private source.</b>	A water meter will be included on the mains water supply to the building. The meter will have a pulsed output.			

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Water Monitoring (2-4)	1	1	1	Credit awarded where water consuming plant or building areas, consuming 10% or more of the buildings total water demand, should be fitted with either; easily accessible sub meters or have water monitoring equipment integral to the plant or area.  Each main and sub meter should have a pulsed output or other open protocol communication output enabling connection to a Building Management System (BMS) for monitoring consumption.  If the site has an existing BMS managed by the same occupier/owner, the pulsed/digital water meter(s) for the new building should be connected to existing BMS.	Due to there being no high water consuming plant onsite, no sub-meters are required. The main incoming water meter shall be fitted with a pulsed output and therefore the credit can be obtained.	M&E		RIBA Stage 3/4
<b>Wat 03</b>	<b>Water Leak Detection</b>			<b>To reduce the impact of water leaks that may otherwise go undetected.</b>				
Leak Detection System (1)	1	0	0	Credit awarded where a leak detection system, capable of detecting a major leak on the mains supply within the building and between the building and the utilities water meter, is installed.  It must be a permanent automated water leak detection system capable of alerting occupants to a leak OR an in-built automated diagnostic procedure for detecting leaks.  It must be programmable by the occupier, avoid false alarms and be capable of identifying different flow/leakage rates. Activation should occur when flow through the meter is at a rate above a pre-set maximum over a pre-set period of time.	Credit not currently targeted.	-		RIBA Stage 3/4 - include in tender
Flow Control Devices (2)	1	1	1	Credit awarded where flow control devices that regulate the supply of water to each WC area/facility according to demand are installed (and therefore minimise water leaks and wastage from sanitary fittings).  An example of a flow control device is a presence detector and controller (i.e. PIR linked to a solenoid valve).	A solenoid valve linked to a PIR shall be fitted on the water supply to the accessible WC. Therefore this credit is targeted.	M&E		RIBA Stage 3/4 - include in tender
<b>Wat 04</b>	<b>Water efficient equipment</b>			<b>To reduce unregulated water consumption by encouraging specification of water efficient equipment.</b>				
Water Efficient Equipment (1-2)	1	1	1	Credit awarded when the project team identify the building's unregulated water demands that could be realistically mitigated or reduced (e.g. for irrigation, vehicle wash plant/equipment).  The project team should then identify the system(s) or processes to reduce the unregulated water demand of the development and its operation, and demonstrate through either good practice design or specification a meaningful reduction in the total water demand of the building.	Landscaping shall rely on manual watering only and no vehicle wash systems are proposed. Therefore this credit is targeted.	LA		RIBA Stage 3/4 - include in tender
<b>Sub-Total</b>	<b>9</b>	<b>7</b>	<b>7</b>	<b>One water credit equals 0.78%</b>				
<b>Weighted Sub-Total</b>	<b>7</b>	<b>5.44</b>	<b>5.44</b>					
<b>MATERIALS</b>								
<b>Mat 01</b>	<b>Life cycle impacts</b>			<b>To recognise and encourage the use of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building.</b> <b>An additional Innovation credit is available - see below.</b>				
Materials life cycle impacts (1-3)	2	1	2	Up to two credits are awarded, determined by the Green Guide to Specification ratings for the external walls and roof elements of the build. Materials with an Environmental Product Declaration (EPD) may enable scores to be further enhanced.	It is likely that the roof (pre-tensioned fabric) and walls (Kingspan insulated cladding panels) will be A/A+ rated using the Green Guide to Specification. One credit targeted pending confirmation of final materials specification.	Arch		RIBA Stage 2/3/4
<b>Mat 02</b>	<b>Hard landscaping and boundary protection</b>			<b>To recognise and encourage the specification of materials for boundary protection and external hard surfaces that have a low environmental impact, taking account of the full life cycle of materials used.</b>				
Hard landscaping and boundary protection (1)	1	0	1	Credit awarded where at least 80% of external hard landscaping and 80% of boundary protection specifications achieve an A or A+ rating, as defined by the Green Guide to Specification.	The specification of the service yard area is not yet known. Asphalt (100mm) over a recycled sub-base would achieve an A+ rating and achieve the credit but it is not yet known if the recycled sub-base will be readily available locally and so this credit is not currently targeted.	Arch/SE		RIBA Stage 3/4
<b>Mat 03</b>	<b>Responsible sourcing of materials</b>			<b>To recognise and encourage the specification of responsibly sourced materials for key building elements.</b> <b>An additional Innovation credit is available - see below.</b>				
					<b>Mandatory minimum requirement: All timber used on the project is 'Legally harvested and traded timber' for Pass, Good, Very Good, Excellent and Outstanding.</b>			

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Pre-requisite (1)	0	Y	Y	Pre-requisite - All timber used on the project is 'Legally harvested and traded timber'	This requirement will be included in the contract documents.	Arch/QS		RIBA Stage 3/4 - include in tender
Sustainable Procurement Plan (2)	1	1	1	Credit awarded where the principal contractor sources materials for the project in accordance with a documented sustainable procurement plan.	This requirement will be included in the contract documents.	Arch/QS		RIBA Stage 3/4 - include in tender
Responsible sourcing of materials (3)	3	1	2	Up to 3 credits can be awarded where the applicable building and hard landscaping materials, in applicable locations, are responsibly sourced in accordance with the BREEAM methodology. Applicable materials categories include: Timber/timber-based products; concrete/cementitious; metal; stone/aggregate; clay-based; gypsum; glass; plastic, polymer, resin, paint, chemicals and bituminous; animal fibre/skin, cellulose fibre; other.  Responsible sourcing accreditations include PEFC, FSC, ISO 14001 and BES 6001.  1 credit where 18% of available points are achieved (2 credits for 36%, and 3 credits for 54%).	This requirement will be included in the contract documents.	Arch/QS		RIBA Stage 3/4 - include in tender
<b>Mat 04</b>	<b>Insulation</b>			<b>To recognise and encourage the use of thermal insulation which has a low embodied environmental impact relative to its thermal properties</b>				
Embodied impact (2-4)	1	1	1	Any new insulation specified for use within the following building elements must be assessed: 1. External walls 2. Ground floor 3. Roof 4. Building services  Credit awarded where the insulation index for the building fabric and services insulation is the same as or greater than 2.5, calculated using the volume of insulation, the thermal conductivity and the Green Guide rating.	The insulation will be specified using the Green Guide to Specification and will comply with these requirements.	Arch/M&E		RIBA Stage 3/4 - include in tender
<b>Mat 05</b>	<b>Designing for Durability and Resilience</b>			<b>To recognise and encourage adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximising materials optimisation.</b>				
Designing for durability and resilience (1-2)	1	1	1	Credit awarded where the following is demonstrated:  Protecting vulnerable parts of the building from damage: The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external building and landscaping elements. This must include, but is not limited to: a) Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares. b) Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen area. c) Protection against, or prevention from, any potential vehicular collision where vehicle parking and manoeuvring occurs within 1m of the external building facade for all car parking areas and 2m for all delivery area.  Protecting exposed parts of the building from material degradation: The relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors (a full list of environmental factors is provided in the guidance).	Vulnerable features of the building will be identified and protected. Credit targeted.	Arch		RIBA Stage 2/3/4 - include in tender
<b>Mat 06</b>	<b>Material Efficiency</b>			<b>To recognise and encourage measures to optimise material efficiency in order to minimise environmental impact of material use and waste.</b>				
Material Efficiency (1)	1	0	0	Credit awarded when opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life have been identified, investigated and implemented by the design/construction team as appropriate in consultation with the relevant parties at each of the following RIBA stages: 1. Preparation and Brief 2. Concept Design 3. Development Design 4. Technical Design 5. Construction	Although the design team will try and minimise the use of material in their design, the formal analysis and associated credit is not currently targeted.	-		RIBA Stages 1-5
<b>Sub-Total</b>	<b>10</b>	<b>5</b>	<b>8</b>	<b>One materials credit equals 1.35%</b>				
<b>Weighted Sub-Total</b>	<b>13.5</b>	<b>6.75</b>	<b>10.80</b>					

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>WASTE</b>								
<b>Wst 01</b>	<b>Construction waste management</b>			<b>To promote resource efficiency via the effective management and reduction of construction waste. An additional exemplary credit is available - see Innovation section below for details.</b>	<b>Mandatory minimum requirement: One credit for Outstanding.</b>			
<b>Construction resource efficiency (1-3)</b>	3	3	3	Up to three credits awarded where a Resource Management Plan (RMP) has been developed covering the non-hazardous waste related to onsite construction and dedicated offsite manufacture or fabrication (including demolition and excavation waste) generated by the building's design and construction. Where construction waste related to on-site construction and off-site manufacture/fabrication (excluding demolition and excavation waste) meets or is lower than the benchmarks as follows (per 100m2 GIFA): One credit = 13.3m3 / 11.1 tonnes, Two credits = 7.5m3 / 6.5 tonnes, Three credits = 3.4m3 / 3.2 tonnes.  Dedicated off-site manufacturing or fabrication is defined as the production of a component or material that is carried out in an off-site manufacturing or processing facility that has been specifically set up for a development project.  Where existing buildings on the site will be demolished a pre-demolition audit of any existing buildings, structures or hard surfaces is completed to determine if refurbishment/reuse is feasible and, if not, to maximise the recovery of material from demolition for subsequent high-grade/value applications. The audit must be referenced in the RMP and cover: 1. Identification of the key refurbishment/demolition materials. 2. Potential applications and any related issues for the reuse and recycling of the key refurbishment and demolition materials in accordance with the waste hierarchy.	Due to the Rubb structure (steel frame with insulated cladding panels and a pre-tensioned fabric roof) it is thought that construction waste onsite will be minimal and therefore 3 credits are targeted.	QS		RIBA Stage 2/3/4 - include in tender
<b>Diversion of resources from landfill (4-5)</b>	1	1	1	One credit awarded where 70% by volume/80% by tonnage of non-hazardous construction waste and 80% by volume/90% by tonnage of non-hazardous demolition waste generated by the development will be diverted from landfill and reused or recycled.  Materials should be sorted into separate key waste groups, according to the waste streams generated by the scope of the works, either on or off-site.	This requirement will be included in the contract documents. Credit targeted.	QS		RIBA Stage 2/3/4 - include in tender
<b>Wst 02</b>	<b>Recycled aggregates</b>			<b>To recognise and encourage the use of recycled and secondary aggregates, thereby reducing the demand for virgin material and optimising material efficiency in construction. An additional exemplary credit is available - see Innovation section below for details.</b>				
<b>Recycled aggregates (1-3)</b>	1	0	0	Credit awarded where at least 25% (by weight or volume) of the total high grade aggregate used on site comprises recycled or secondary aggregates. The recycled and/or secondary aggregates are EITHER: 1. Construction, demolition and excavation waste obtained onsite or offsite OR 2. Secondary aggregates obtained from a non-construction post-consumer industrial by-product source. In addition the specification of minimum levels of recycled aggregates applying to different applications is required, see compliance notes.	This credit is not currently targeted.	-		RIBA Stage 3/4 - include in tender
<b>Wst 03</b>	<b>Operational waste</b>			<b>To recognise and encourage the provision of dedicated storage facilities for a building's operational-related recyclable waste streams, so that this waste is diverted from landfill or incineration.</b>	<b>Mandatory minimum requirement: One credit for Excellent and Outstanding.</b>			
<b>Operational waste (1-2)</b>	1	1	1	Credit awarded where there is dedicated space(s) to cater for the segregation and storage of operational recyclable waste volumes generated by the assessed building.  The space must be a) clearly labelled, b) accessible to building occupants for the deposit of materials and collections; c) of a capacity appropriate to the building type, size, number of units and predicted volumes of waste.  Where appropriate, the following facilities are provided as part of its waste management strategy a) Static waste compactor(s) or baler(s); b) Vessel(s) for composting suitable organic waste OR adequate space(s) for storing segregated food waste and compostable organic material prior to collection and delivery to an alternative composting facility; c) Where organic waste is to be stored/composted on site, a water outlet is provided adjacent to or within the facility for cleaning and hygiene purposes.  Note that for small industrial units/a development consisting a number of small units (<200m <sup>2</sup> ), shared facilities that meet the above criteria for the building/development as a whole are sufficient.	A recycling/waste storage facility of around 20m <sup>2</sup> is required to be located within the service yard. Credit targeted.	Arch/Client		RIBA Stage 2/3/4
<b>Wst 05</b>	<b>Adaptation to Climate Change</b>			<b>To recognise and encourage measures taken to mitigate the impact of extreme weather conditions arising from climate change over the lifespan of the building. Exemplary Credit Available.</b>				



Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Adaptation to Climate Change (Structural and Fabric resilience) (1)</b>	1	0	0	Credit awarded when a climate change adaptation strategy appraisal is conducted for structural and fabric resilience by the end of RIBA Stage 2, in accordance with the following approach:  Carry out a systematic risk assessment (specific to structural and fabric resilience) to identify and evaluate the impact of the expected increase in extreme weather conditions arising from climate change on the building over the projected life-cycle of the building, and where feasible mitigate against these impacts. The assessment should cover the following stages: 1. Hazard Identification 2. Hazard assessment 3. Risk estimation 4. Risk Evaluation 5. Risk Management	Although vulnerable parts of the building will be designed to be robust, the formal analysis required to achieve this credit is not currently planned. Therefore this credit is not currently targeted.	-		RIBA Stage 2
<b>Wst 06</b>	<b>Functional Adaptability</b>							
<b>Functional Adaptability (1-2)</b>	1	0	0	Credit awarded when a building specific functional adaptation strategy study is conducted by the client and design team by RIBA Stage 2, which includes recommendations for measures to be incorporated to facilitate future adaption, including:  a. Ability for major refurbishment, including replacing the façade. b. Design for ease of replacement of all major plant within the life of the building e.g. panels in floors/ walls that can be removed without affecting the structure, providing lifting beams and hoists. c. Adaptability of the internal environment to accommodate changes in working practices. d. Adaptability of the internal physical space and external shell to accommodate change in use. e. Local services accessibility, such as local power, data etc.  Functional adaptation measures have been implemented by the end of RIBA Stage 4 in accordance with the functional adaptation strategy where practical and cost effective.	Due to the specialist and purpose built nature of the warehouse, it is thought unlikely that this building would be used for a different purpose and therefore this credit is not currently targeted.	-		RIBA Stage 2
<b>Sub-Total</b>	<b>8</b>	<b>5</b>	<b>5</b>	<b>One waste credit equals 1.06%</b>				
<b>Weighted Sub-Total</b>	<b>8.5</b>	<b>5.31</b>	<b>5.31</b>					
<b>LAND USE &amp; ECOLOGY</b>								
<b>LE 01</b>	<b>Site selection</b>			<b>To encourage the use of previously developed and/or contaminated land and avoid land which has not been previously disturbed</b>				
<b>Previously Occupied Land (1)</b>	1	0	0	Credit awarded where at least 75% of the footprint of the proposed development (including temporary site works) has been previously occupied by industrial, commercial or domestic buildings or fixed surface infrastructure.	Although the land previously housed a MOD gymnasium, this did not cover 75% of the proposed development and therefore this credit is not targeted.	-		RIBA Stage 1
<b>Contaminated Land (2-3)</b>	1	0	0	Credit awarded where a contaminated land specialist's site investigation, risk assessment and appraisal has deemed the land within the site to be affected by contamination. The degree of contamination, sources/types of contamination and remediation options must be identified. There must be a commitment from the client or contractor that all remediation will be in line with the remediation strategy and implementation plan as recommended by the contaminated land specialist.  Adequate remediation of contamination must have taken place prior to development to achieve this credit.	The land is not thought to be contaminated and therefore this credit can not be obtained.	-		RIBA Stage 1 & before any site works commence
<b>LE 02</b>	<b>Ecological value and protection of ecological features</b>			<b>To encourage development on land that already has limited value to wildlife and to protect existing ecological features from substantial damage during site preparation and completion of construction works.</b>				
<b>Ecological value of site (1)</b>	1	0	0	Credit awarded where land within the construction zone is defined as 'land of low ecological value' using either: The BREEAM checklist for defining land of low ecological value OR A Suitably Qualified Ecologist (SQE) who has identified the land as being of 'low ecological value' within an ecological assessment report, based on a site survey.	Although the majority of the land is of low ecological value, it can not be defined as such due to the hedgerow around the site.	-		RIBA Stage 2-3 & before any site works commence

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Protection of Ecological Features (2-3)	1	0	0	Credit awarded where all existing features of ecological value within and surrounding the construction zone and site boundary area are adequately protected from damage during clearance, site preparation and construction activities in line with BS42020: 2013.  In all cases, the principal contractor is required to construct ecological protection prior to any preliminary site construction or preparation works (e.g. clearing of the site or erection of temporary site facilities).	Although the majority of the ecological valuable landscaping will be protected, it is not possible to protect all of the existing hedgerow as this must be removed to create access to the site. The landscaping proposals indicate that this habitat will be reprovided and enhanced, but it is not possible to obtain this credit.	-		RIBA Stage 2-3 & before any site works commence
LE 03	Minimising Impact on existing Site Ecology			To minimise the impact of a building development on existing site ecology.	<b>Mandatory minimum requirements: One credit for Very Good, Excellent and Outstanding.</b>			
Change in Ecological Value (1-2)	2	2	2	One credit is awarded where the change in the site's existing ecological value, as a result of development, is between 0 and -9. Two credits are awarded where there is no negative change in the site's existing ecological value, as a result of development. Credits can be awarded with or without the appointment of an ecologist.	Hyland Edgar Driver have conducted an initial site survey and provided design input into the landscaping scheme for the site. Their preliminary calculations indicate that the species count of site will be increased by +6.96 species and therefore both credits are targeted.	Eco / LA		RIBA Stage 2-3 & before any site works commence
LE 04	Enhancing site ecology			To recognise and encourage actions taken to maintain and enhance the ecological value of the site as a result of development.				
Ecologist's Report and Recommendations (1-3)	1	1	1	One credit is awarded where the Client or project representative has appointed a Suitably Qualified Ecologist (SQE) by the end of RIBA Stage 1 to advise on enhancing the ecological value of the site. The SQE has provided an ecology report with appropriate recommendations for the enhancement of the site's ecology at RIBA Stage 2, based on a site survey/visit. Early stage advice and recommendations of the ecology report for the enhancement of site ecology have been, or will be, implemented in the final design and build.  <b>APPOINTMENT OF SQE BY RIBA STAGE 1 ECOLOGICAL SURVEY TO BE UNDERTAKEN DURING RIBA STAGE 2</b>	Hyland Edgar Driver have conducted an initial site survey (during stage 1) and provided design input into the landscaping scheme for the site. Their preliminary calculations indicate that the species count of site will be increased by +6.96 species and therefore this credit is targeted.	Eco/QS		RIBA Stage 1 & before any site works commence
Increase in Ecological Value (4-6)	1	1	1	The LE 04 Ecologist's report and recommendations credit above has been achieved.  The recommendations of the ecology report for the enhancement of site ecology have been implemented, and the SQE confirms that this will result in an increase in ecological value of the site, with an increase of 6 plant species or greater.	Hyland Edgar Driver have conducted an initial site survey and provided design input into the landscaping scheme for the site. Their preliminary calculations indicate that the species count of site will be increased by +6.96 species and therefore this credit is targeted.	Eco/QS		RIBA Stage 1 & before any site works commence
LE05	Long term impact on biodiversity			To minimise the long term impact of the development on the site and the surrounding area's biodiversity.				
Long Term Impact on Biodiversity (1-3)	2	2	2	To achieve any of the two available credits, a Suitably Qualified Ecologist (SQE) should be appointed prior to commencement of activities onsite and they should confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the design and construction process. A landscape and habitat management plan, appropriate to the site, should be produced covering at least the first five years after project completion in accordance with BS 42020:2013 Section 11.1. This is to be handed over to the building owner/occupants for use by the grounds maintenance staff.  One credit is awarded where, in addition to the above, two of the 'additional measures' in the BREEAM guidance have been met. Two credits are awarded where four of the 'additional measures' in the BREEAM guidance have been met.	A suitably qualified consultant will be appointed to ensure that these requirements are met and the contractor would be required to comply with the additional requirements. Two credits targeted.	Eco/QS		RIBA Stage 2/3 & before any site works commence
Sub-Total	10	6	6	One land use and ecology credit equals 1%				
Weighted Sub-Total	10	6.00	6.00					
<b>POLLUTION</b>								
Pol 01	Impact of Refrigerants			To reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from the building.				
Pre-requisite	0	Y	Y	Where there are refrigerants specified within the installed plant/systems: All systems (with electric compressors) must comply with the requirements of BS EN 378:2008 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.	No refrigerants are currently proposed within the development. Therefore three credits are targeted.	M&E		RIBA Stage 2/3

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Impact of Refrigerants (1-7)</b>	3	3	3	<p>One credit is awarded where the systems using refrigerants have Direct Effect Life Cycle CO<sub>2</sub> equivalent emissions of 1000kgCO<sub>2e</sub>/kW cooling capacity.</p> <p>Two credits are awarded where the systems using refrigerants have Direct Effect Life Cycle CO<sub>2</sub> equivalent emissions of 100kgCO<sub>2e</sub>/kW cooling capacity OR refrigerants have a GWP of &lt;10.</p> <p>An additional credit is awarded where there is a compliant leak detection system, capable of automatically isolating and containing the remaining refrigerant(s) charge. A system with an automatic shutdown and pump down of refrigerants would comply with this.</p> <p>All three credits awarded where the building is designed in such a way that it avoids the need for refrigerant containing building services, and therefore no 'refrigerant using' building services or systems will be specified for the fit out.</p>	No refrigerants are currently proposed within the development. Therefore three credits are targeted.	M&E		RIBA Stage 2/3
<b>Pol 02</b>	<b>NO<sub>x</sub> Emissions</b>			<b>To contribute to a reduction in national NO<sub>x</sub> emission levels through the use of low emission heat sources in the building.</b>				
<b>NO<sub>x</sub> Emissions (1)</b>	1	1	1	<p>Up to two credits are awarded where the dry NO<sub>x</sub> emissions from plant installed to meet delivered heating and water demand are as follows:</p> <p><b>One credit:</b> Office and associated areas = ≤70 mg/kWh (at 0% excess O<sub>2</sub>)</p> <p><b>One credit:</b> Operational Areas = ≤70 mg/kWh (at 0% excess O<sub>2</sub>)</p> <p>Report the direct and indirect NO<sub>x</sub> emissions in mg/kWh and energy consumption in kWh/m<sup>2</sup>/yr arising from systems installed to meet the building's space heating, cooling and hot water demands.</p> <p>Note: Where no office area is included in the building, the first credit does not apply. Where the operational area of the building is untreated, the second credit does not apply.</p>	Electricity used to heat the welfare facilities will be generated onsite and therefore the NO <sub>x</sub> emissions are zero. The operational areas are not heated and therefore only one credit is available. This credit is targeted.	M&E		RIBA Stage 2/3
<b>Pol 03</b>	<b>Surface water run-off</b>			<b>To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, therefore minimising the risk of localised flooding on and off site, watercourse pollution and other environmental damage.</b>				
<b>Flood Resilience (1-3)</b>	2	2	2	<p>One credit is awarded where the assessed development is located in a zone defined as having a medium or high annual probability of flooding and is not in a functional floodplain AND the ground level of the building, car parking and access is 600mm above the design flood level for the site's location. OR, where final building and site design reflects recommendations made by appropriate consultant, in accordance with BS 8533: 2011.</p> <p>Two credits are awarded where the assessed development is located in a zone defined as having a low annual probability of flooding and there is a low risk of flooding from all sources: fluvial, tidal, surface water, groundwater, sewers, reservoirs, canals and other artificial sources. All current and future sources of flooding must be taken into account.</p>	A flood risk assessment has been carried out by a suitable qualified consultant. The FRA concludes that the site has a low annual probability of flooding from all sources. Therefore two credits can be obtained.	SE/CE		RIBA Stage 2/3/4
<b>Surface Water Run Off (4-14)</b>	0	Y	Y	Pre-requisite: An appropriate consultant is appointed to demonstrate compliance with the following:	A drainage strategy has been developed by a suitable qualified consultant.	SE/CE		
	2	2	2	<p>One credit is awarded where surface water drainage measures are specified to ensure the peak run-off rate is no greater post-development than it was pre-development, in line with 1 year and 100 year return period events, and relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place.</p> <p>A second credit is awarded where flooding of property will not occur in the event of local drainage system failure. In addition the drainage strategy must meet certain other requirements from one of two options detailed in the BREEAM guidance. Maintenance agreements should be in place for the ownership, operation and maintenance of specified SUDs.</p> <p>All calculations must include an allowance for climate change, in accordance with current best practice guidelines.</p>	The preliminary drainage strategy indicates that the development will not increase surface water run off from the site. It is assumed that flooding of the property will not occur in the event of local drainage systems failure. Therefore two credits are targeted.	SE/CE		RIBA Stage 2/3/4



Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
<b>Minimising Watercourse Pollution (15-22)</b>	1	0	1	Credit awarded where there is no discharge from the developed site for rainfall up to 5mm, and where effective on site treatment has been specified in areas that could be a source of watercourse pollution. SUDs, permeable surfaces or infiltration trenches are acceptable for low risk areas. Oil/ petrol interceptors are required for higher risk areas and all systems must be in line with PPG3 and the SUDS manual, and with PPG13 for vehicle wash areas. OR, where this is not possible, a suitably qualified professional should design the system so that the intent of the credit is met as far as possible.  Containment should be fitted to drainage system when chemical/liquid gas storage is on site. A comprehensive up-to-date drainage plan should be made available for building/site occupiers.	The drainage strategy currently includes a rainwater harvesting system and attenuation pond. A class 1 petrol interceptor to cover high risk areas is also included. However although surface water run off from site will be delayed under the current strategy, it will not be eliminated unless percolation tests to be conducted in the future indicate that a soakaway could be included. Therefore this credit is not currently targeted but this will be reviewed at a later date.	SE/CE		RIBA Stage 2/3/4
<b>Pol 04</b>	<b>Reduction of night time light pollution</b>			<b>To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.</b>				
<b>Reduction of Night Time Light Pollution (1-5)</b>	1	1	1	Credit awarded where the external lighting design is in compliance with the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011 and all external lighting (except security lighting) can be automatically switched off between 2300-0700. If safety or security lighting is provided and will be used between these hours, this part of the lighting system complies with the lower levels of lighting in Table 2 of the ILP's guidance notes. Illuminated advertisements must be designed in accordance with ILE Technical Report 5 - The Brightness of Illuminated Advertisements.	The external lighting shall be designed to comply with the ILP guidance notes. Therefore the credit is targeted.	M&E		RIBA Stage 2/3/4
<b>Pol 05</b>	<b>Reduction of Noise Pollution</b>			<b>To reduce the likelihood of noise arising from fixed installations on the new development affecting nearby noise-sensitive buildings.</b>				
<b>Reduction of Noise Pollution (1-5)</b>	1	1	1	Credit awarded where there are, or will be, no noise-sensitive areas/buildings within 800m of the or the development, OR:  A noise impact assessment is carried out by suitably qualified acoustic consultant in compliance with BS 7445, and measures: a) Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed building b) The rating noise level resulting from the new-noise source.  The noise levels from the proposed development, when measured at the nearest/most exposed noise sensitive development, should have a difference no greater than +5dB during the day (0700hrs to 2300hrs) and +3dB at night (2300hrs to 0700) compared to background noise levels. Where changes in noise level exceed this, measures should be installed to attenuate noise at its source in order to comply with these levels.	Resound Acoustics have carried out a background noise assessment and provided a detailed report to accompany this. The report has been submitted as part of the planning application and concludes that noise levels from the operation of the development will be within acceptable guidelines. Credit targeted.	M&E		RIBA Stage 2/3
<b>Sub-Total</b>	<b>11</b>	<b>10</b>	<b>11</b>	<b>One pollution credit equals 0.91%</b>				
<b>Weighted Sub-Total</b>	<b>10</b>	<b>9.09</b>	<b>10.00</b>					
<b>INNOVATION CREDITS/EXEMPLARY LEVEL CREDITS - A maximum of 10 credits are available in aggregate from any combination of the following:</b>								
<b>Man 03</b>	<b>Responsible Construction Practices (17)</b>	1	0	0	Credit awarded where the CCS score achieved is 40 or above with 7 in each section.	Credit not currently targeted.	-	
<b>Man 05</b>	<b>Aftercare (6)</b>	1	0	0	Credit awarded where there is operational infrastructure and resources in place to co-ordinate the following at quarterly intervals for the first 3 years after occupation: a. Collect the occupant satisfaction, energy consumption and water consumption data. b. Analyse the data to check the building is performing as expected and make any necessary adjustments to systems controls or to inform building user behaviours. c. Set targets for reducing water and energy consumption and monitor progress towards these. d. Feedback any 'lessons learned' to the design team and developer for use in future projects. e. Provision of the actual annual building energy, water consumption and occupant satisfaction data to BRE.	Credit not currently targeted.	-	
<b>Hea 01</b>	<b>Visual Comfort (14)</b>	1	0	0	Credit awarded where at least 80% of the floor area in occupied spaces has an average daylight factor of 3% , or a minimum point daylight factor of 1.2%, in multi-storey buildings OR an average daylight factor of 4%, or a minimum point daylight factor of 1.6% in single-storey buildings.	Credit not currently targeted.	-	RIBA Stage 2/3

Credit Title		CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
		Credits Available	Base Target	Optimum Target					
Hea 02	Indoor Air Quality (15-20)	2	0	0	All decorative paints and varnishes specified meet the criteria in EU Directive 2004/42/EC, and all seven remaining product categories meet the relevant testing requirements and emission levels. Two credits awarded where the formaldehyde emission levels for the seven remaining categories have been measured and are less than 0.01mg/m <sup>3</sup> air in accordance with the approved standards. One credit is awarded where levels are lower than 0.06mg/m <sup>3</sup> air.	Credits not currently targeted.	-		RIBA Stage 2/3
Ene 01	Reduction of Energy Use and Carbon Emissions (2-4)	5	0	0	Five credits awarded where the building is 'carbon negative' in terms of its modelled operational energy consumption. (Inc. regulated and unregulated energy)  Up to four credits awarded if the EPR <sub>NC</sub> of 0.9 and has zero net CO <sub>2</sub> emissions. In addition, an equivalent % of the building's modelled 'regulated' operational energy consumption, is generated by carbon neutral on-site, near-site or 'accredited external' sources and used to meet energy demand from 'unregulated' building systems or processes. The equivalent % translate into credits as follows:  4 credits = 80%, 3 credits = 50%, 2 credits = 20%, 1 credit = 10%	Credit not currently targeted.	-		RIBA Stage 3/4
Wat 01	Water Consumption (1-6)	1	0	0	Credit awarded where a 65% improvement over baseline building water consumption is achieved.	Credit not currently targeted.	-		RIBA Stage 3/4
Mat 01	Life Cycle Impacts (4-8)	2	0	0	One credit is awarded where the building achieves at least one point in addition to the total points required to achieve maximum credits under Mat 01.  Two credits awarded where an IMPACT compliant software tool (or equivalent) is used to measure the environmental impact of the building. The design team demonstrate how the use of this software has benefited the building in terms of measuring and reducing its environmental impact. The BIM model from the software is submitted to the BRE.	Credits not currently targeted.	-		RIBA Stage 3/4
Mat 03	Responsible Sourcing of Materials (4)	1	0	0	Credit awarded where at least 70% of the available responsible sourcing points have been achieved.	Credit not currently targeted.	-		RIBA Stage 3/4
Wst 01	Construction Waste Management (6-8)	1	0	0	Credit awarded where the non-hazardous construction waste generated by the building's design and construction is no greater than 1.6m <sup>3</sup> or 1.9 tonnes per 100m <sup>2</sup> GIFA AND the percentage of non hazardous construction and demolition waste (if relevant) diverted from landfill meets or exceeds 85% by volume/90% by tonnage (non-demolition). 85% by volume/95% by tonnage (demolition) and 95% by volume/95% by tonnage (excavation).  All key waste groups are identified for diversion from landfill in the pre-construction stage RMP.	Credit not currently targeted.	-		RIBA Stage 2/3/4
Wst 02	Recycled Aggregates (4-6)	1	0	0	Credit awarded where the total amount of recycled and/or secondary aggregate specified is greater than 35% (by weight or volume) of the total high-grade aggregate specified for the project.  To contribute to the total amount, the percentage of high-grade aggregate specified per application (where present) that is recycled and/or secondary aggregate, must meet the exemplary minimum levels (by weight or volume), as defined in the table within the guidance.  Recycled/Secondary aggregate must travel less than 30km by road transport.	Credit not currently targeted.	-		RIBA Stage 3/4

Credit Title	CREDITS			Summary of Requirements (refer to the BREEAM Guidance Notes for the full credit requirements)	Comments/ Actions	Actionee	Action deadline	Stage for consideration
	Credits Available	Base Target	Optimum Target					
Wst 05 Responding to Adaptation to Climate Change (2)	1	0	0	Credit can be awarded where the Wst 05 credit has been achieved, and where a certain level of credits are achieved under: Hea 04; Ene 01; Ene 04; Wat 01; Mat 05 and Pol 03.	Credit not currently targeted.	-		RIBA Stage 2-4
Inn 01 Special Innovative Feature (2)	10	0	0	Up to ten credits are awarded if a successful application is made to the BRE to have any particular building feature, technology, system or process that can be shown to improve the sustainability performance of a building's design, construction, operation, maintenance or demolition and which is recognised as 'innovative'. Further credits are available if more than one application is successful.	Credits not currently targeted.	-		RIBA Stage 1-7
<b>Sub-Total</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>One Innovation credit = 1%. A maximum of 10% can be awarded in this section.</b>				

**TOTALS**

Base Target	56.59
Optimum Target	66.54
Total required for 'Pass'	30
Total Required for 'Good'	45
Total required for 'Very Good'	55
Total required for 'Excellent'	70

**PROJECT TEAM KEY:**

PM = Project Manager
Arch = Architect
QS = Quantity Surveyor
M&E = Mechanical and Electrical Engineer
LA = Landscape Architect
SE = Structural Engineer

Completed by: Melanie Buckley Date: 25.11.14  
Checked by: Natasha Fox Date: 25.11.14

**Method Consulting LLP**

Berkeley House, Hunts Rise, South Marston Park, Swindon SN3 4TG

Telephone 0845 89 49 169 Email [contact@methodllp.com](mailto:contact@methodllp.com) [www.methodllp.com](http://www.methodllp.com)

A limited liability partnership registered in England number OC362831. VAT Registration number I10714367