BRE Environmental & Sustainability Standard

BES 5052: ISSUE 3.0

BREEAM Industrial 2008
Post Construction Assessment Report

Tension Control Bolts, Clywedog Road South, Wrexham Industrial Estate
BREEAM 0041-4136

Prepared for: -
Portal Construction
6th May 2014

AEE-IND-MT03-118

Prepared on behalf of Ambient Energy & Environment by

Name Mark Thompson

Position Director

Date 6th May 2014

Signature

Approved on behalf of Ambient Energy & Environment by

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Signature

Disclaimer

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Executive Summary

Ambient Energy & Environment has been commissioned to carry out a BREEAM assessment of Tension Control Bolts, Clywedog Road South, Wrexham Industrial Estate. This report details the interim design stage performance of the aforementioned building development as measured against the BRE Environmental and Sustainability Standard, BREEAM Industrial 2008 (BES5052 Issue 3.0).

The building has achieved a BREEAM score of 58.03%, which translates in to an interim design stage BREEAM rating of 'Very Good'. The BREEAM assessor has determined this rating using an auditable trail of evidence, all of which is referenced throughout this assessment report.

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BREEAM Certificate Information

Certificate Request Form									
BREEAM rating									
PASS	☐	GOOD	☐	V.GOOD	☒	EXCELLENT	☐	OUTSTANDING*	☐
Percentage score	58.03%			**BREAM Scheme & Version**			BREEAM Industrial 2008 BES 5052: ISSUE 3.0		
BRE ref. no.	AEE-IND-MT03-118 BREEAM-0041-4136								
Stage of assessment	Post Construction Assessment								
Report Date	6th May 2014			**Assessed Net floor area:**			1948m^2		
Project type:									
Shell Only ☐	If shell only, do you require 'Maximum Potential Fitted Out BREEAM score' to appear on the certificate?						**Yes** ☐	**No** ☒	
Fully Fitted ☒	If yes, what is the 'Maximum Potential Fitted Out BREEAM score' (taken from assessment tool)?								
Building and Team Details									
Building name / Plot number and building address	Tension Control Bolts, Clywedog Road South, Wrexham Industrial Estate, Wrexham LL13 9X								
Licensed assessor	Mark Thompson								
Assessor organisation	Ambient Energy & Environment								
Architect	C4 Consulting LLP								
Main Contractor	Portal Construction Ltd								

BREEAM Outstanding Rating		
We Ambient Energy & Environment, agree to provide the relevant building/project information and give BRE Global permission to produce a case study on the design and development.		
It is a condition of awarding an Outstanding BREEAM rating that a case study of the assessed building is produced. The design team/client must therefore agree to provide relevant information about the project to BRE Global for production and dissemination of such a case study. Where permission is not granted or information not provided, the assessed building will be awarded an Excellent rating. **Interim design stage certification** On submission of the interim design stage report the client or their representative agree to provide the relevant information and give permission to BRE Global to produce and disseminate a case study for the assessed building at the final stage of BREEAM certification. The relevant information is not required for or at the interim stage of certification. **Post construction certification** On submission of the final post construction stage report the client or their representative agree to provide the relevant building information and give permission to BRE Global to produce and disseminate a case study of the assessed building.		
BREEAM Approved Innovations		
Have BREEAM *Approved Innovation* credits been awarded in the assessment of the above named building?	**Yes** ☐	**No** ☒
If yes, please state the BRE Global *Approval Number* for each *Approved Innovation* below:		

Introduction

Ambient Energy & Environment has been commissioned to carry out a BREEAM (**BRE E**nvironmental **A**ssessment **M**ethod) Industrial 2008 assessment of Tension Control Bolts, Clywedog Road South, Wrexham Industrial Estate.

The BREEAM Standard

BREEAM (Building Research Establishment's Environmental Assessment Method) is the worlds leading and most widely used environmental assessment method for buildings. It sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance.

The aims and objectives of BREEAM are:

Aims of BREEAM

- To mitigate the impacts of buildings on the environment
- To enable buildings to be recognised according to their environmental benefits
- To provide a credible, environmental label for buildings
- To stimulate demand for sustainable buildings

Objectives of BREEAM

- To provide market recognition to low environmental impact buildings
- To ensure best environmental practice is incorporated in buildings
- To set criteria and standards surpassing those required by regulations and challenge the
- market to provide innovative solutions that minimise the environmental impact of buildings
- To raise the awareness of owners, occupants, designers and operators of the benefits of
- buildings with a reduced impact on the environment
- To allow organisations to demonstrate progress towards corporate environmental objectives

Building projects are assessed at the design and post-construction stages using a system of environmental issues grouped within the following categories:

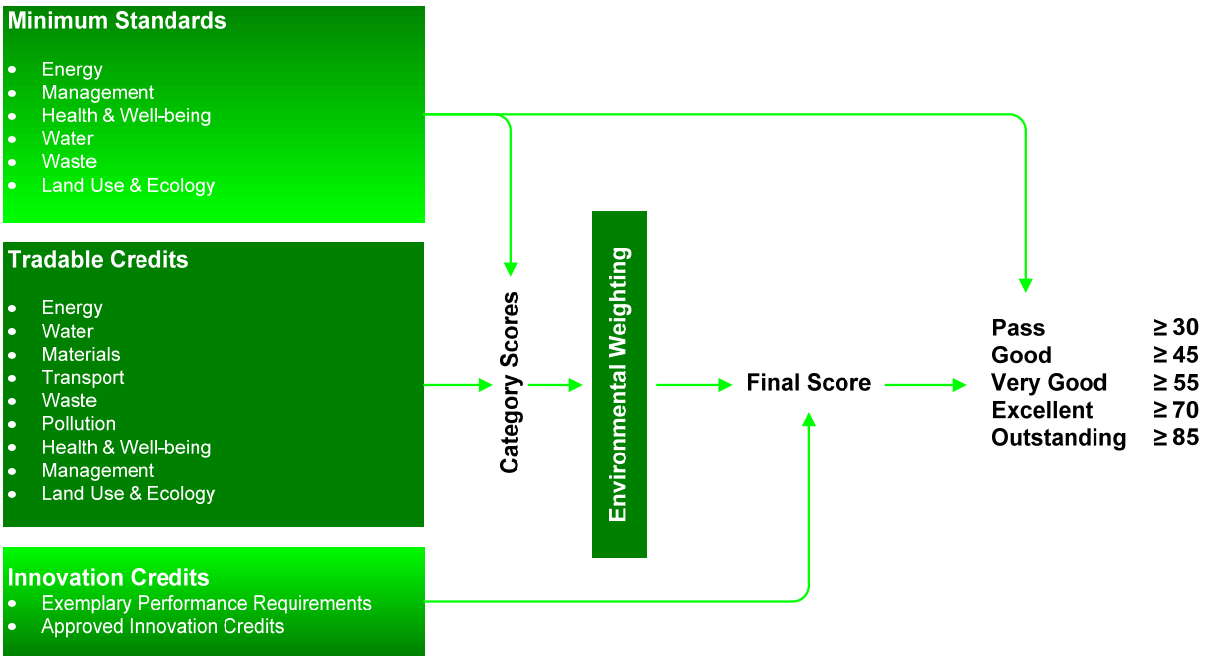
- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use & Ecology
- Pollution
- Innovation

The assessment of the building results in a final report and BRE Global BREEAM certificate detailing the performance of the assessed building against the environmental issues covered by Standard. The building's performance is expressed as a BREEAM rating of PASS, GOOD, VERY GOOD, EXCELLENT or OUTSTANDING.

BREEAM is developed, operated and maintained by BRE Global Ltd and the operation and direction of the method is overseen by an independent Sustainability Board, representing a wide cross-section of construction industry stakeholders. Further information about BREEAM, including copies of the BREEAM standards, can be found at www.breeam.org

BREEAM Scoring & Rating

The diagram and text below describes how BREEAM scores and rates an assessed building:



The BREEAM categories contain a number of environmental issues, which reflect the options available when designing, procuring and constructing a building.

BREEAM issues and credits

Tradable credits

Each environmental issue has a set number of 'credits' available and these credits are awarded where the building demonstrates that it complies with the requirements of that issue.

Minimum standards

A number of issues within a category have set minimum standards, i.e. a minimum number of credits that must be achieved in order for a particular BREEAM rating level to be met.

Innovation credits

Innovation credits provide additional recognition for a building that innovates in the field of sustainable performance, above and beyond the level that is currently recognised and rewarded by standard BREEAM issues. Innovation credits are awarded for either complying with pre-defined BREEAM issue exemplary level requirements, through the appointment of a BREEAM Accredited Professional or Suitably Qualified Assessor or via application to BRE Global to have a particular building feature, system or process approved as 'innovative'.

Environmental weightings, final score and BREEAM Rating

Once each BREEAM issues has been assessed the category percentage scores are determined (based on the number of credits achieved over those available within a category), and an environmental weighting applied (as shown below).

The weighted category scores are then totalled to give an overall score, and any additional score for innovation is added to give the final BREEAM score which is used to determine the BREEAM rating.

The environmental weightings are as follows:

Issue Category	Issue Weighting
Management	12%
Health and Wellbeing	15%
Energy	19%
Transport	8%
Water	6%
Materials	12.5%
Waste	7.5%
Land Use and Ecology	10%
Pollution	10%

The weighting factors have been derived from consensus based research with various groups such as government, material suppliers and lobbyists. This research was carried out by BRE to establish the relative importance of each environmental issue.

Project Team and Building Details

Project Team Details

Name / Position	Company / Address
Damien Horridge, Project Manager	C4 Consulting LLP, The Chapel, Old Cherry Lane, Lymm, Warrington, WA13 0SZ
Tommy Taylor, Architect	C4 Consulting LLP, The Chapel, Old Cherry Lane, Lymm, Warrington, WA13 0SZ
Jackie Bedwell, Contractor	Portal Construction, 31 Wellington Road, Nantwich, CW5 7ED

Building Details

General	**Building**	The building is a new build industrial building with associated office and ancillary areas.
	Site	The building is being developed as part industrial development to the East of Wrexham, located on the site of a former munitions factory.
	Floor area	The building has a gross internal area of 1948m^2.
Building fabric	**Walls**	The walls are constructed from a predominately built up profiled steel cladding system, with areas of composite cladding to the office areas.
	Roof	The roof is constructed from a built up profiled steel cladding system.
	Floor	The development is single storey.
Building Services	**Heating**	Heating is provided to the office areas via low temperature hot water radiator fed by a central gas fired boiler. The production area is to be unheated.
	Ventilation	The office area is naturally ventilated, via openable windows. The production area will be naturally ventilated.
	Cooling	There will be no comfort cooling provided within the development.
	Hot water	Hot water will be provided via the gas fired boiler used to provide heating to the office area.

Summary of Building's Assessment Performance

Tension Control Bolts, Clywedog Road South achieves an interim score of **58.03%** against the BREEAM Industrial 2008 Environmental and Sustainability Standard. This translates into an interim BREEAM rating of **'Very Good'.**

Minimum BREEAM Standards					
Rating Level	**Pass**	**Good**	**Very Good**	**Excellent**	**Outstanding**
Minimum Standards Achieved	**YES**	**YES**	**YES**	**No**	**NO**

Building Performance by Section					
	Environmental weighting	**Credits available**	**Credits achieved**	**% Achieved**	**Weighted Score**
Management	12.00%	10	5	50.00	6.00
Health & Wellbeing	15.00%	7	5	71.43	10.71
Energy	19.00%	22	13	59.09	11.23
Transport	8.00%	11	3	27.27	2.18
Water	6.00%	6	3	50.00	3.00
Materials	12.50%	11	7	63.64	7.95
Waste	7.50%	7	4	57.14	4.29
Land Use & Ecology	10.00%	10	5	50.00	5.00
Pollution	10.00%	9	6	66.67	6.67
				Total	**57.03**
				Innovation credits achieved	**1.00**
				Total BREEAM Score	**58.03**

Detailed Assessment of Building Performance

The following section summarises each of the issue requirements for this BREEAM assessment by environmental section, and the information that has been provided as evidence of the buildings performance against those requirements. On the basis of the documentary evidence provided, the relevant number of BREEAM credits have either been awarded or withheld.

Each issue assessed includes the BREEAM assessor's validation statement. This statement summarises their assessment of the buildings performance against the BREEAM issue requirements, validating the number of BREEAM credits awarded.

Management

Management
Man 1 - Commissioning

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**1**	**1**	**1**	**1**	**2**

Number of credits achieved:	**2**

Aim

To recognise and encourage an appropriate level of building services commissioning that is carried out in a co-ordinated and comprehensive manner, thus ensuring optimum performance under actual occupancy conditions.

Criteria

Two credits available as follows:

Credits	
1	Where evidence provided demonstrates that an appropriate project team member has been appointed to monitor commissioning on behalf of the client to ensure commissioning will be carried out in line with current best practice.
2	Where, in addition to the above, evidence provided demonstrates that seasonal commissioning will be carried out during the first year of occupation, post construction (or post fit out).

Schedule of Evidence

First Credit achieved? (For full explanation, please refer to Validation Statement)		**Yes**
Ref:		
1	Page 114, Clause 4.23 Commissioning, Mechanical Services Performance Specification, Tension Control Bolts Limited, Clywedog Road South, Wrexham, KGA Partnership, October 2012	
2	Page 114, Clause 4.33 Commissioning, Electrical Services Performance Specification, Tension Control Bolts Limited, Clywedog Road South, Wrexham, KGA Partnership, October 2012	
3	Page 45, Section 14.7, Employer's Requirements, Unit 1, Clywedog Road South, Wrexham Industrial Estate, Wrexham, LL13 9XN, C4 Consulting Ltd, October 2011.	
4	Copies of Commissioning Certificates, Clywedog Road 2013, Clywedog Road South, Wrexham Industrial Estate	
5	Letter received from Jackie Bedwell, Portal Construction, Ref: Clywedog Road Industrial Unit – BREEAM Assessment - Credit Man 1, Commissioning, 2nd February 2014.	
6	Programme of works for TCB Phase 1, Portal Construction Ltd, 2012/13	
Second Credit achieved? (For full explanation, please refer to Validation Statement)		**Yes**
Ref:		
1	Clause 4.23 Commissioning, Mechanical Services Performance Specification, KGA Partnership	
5	Letter received from Jackie Bedwell, Portal Construction, Ref: Clywedog Road Industrial Unit – BREEAM Assessment - Credit Man 1, Commissioning, 2nd February 2014.	

Validation Statement

The building is naturally ventilated using simple cross flow ventilation relying solely on openable windows. As stated in the compliance notes the appointment of a specialist commissioning the use of a specialist commissioning agent is not required to award this credit. There are no renewable energy technologies or BMS present.

The design team have provided copies of the Mechanical and Electrical specification, which include clauses that relate to the commissioning of the development. The specification documents have been developed by KGA Partnership Ltd, who are the consulting engineers for the scheme.

The mechanical and electrical specification confirms that the development will contain the following simple mechanical and electrical systems:

- Lighting
- Heating – gas fired boiler serving LTHW radiator system to offices only
- Water systems

The mechanical and electrical specifications confirm that the contractor once appointed, will be required to be responsible for overseeing all commissioning undertaken on behalf of the client. It is also confirmed that the contractor when appointed, will be responsible for overseeing the following:

- Programme pre-commissioning, commissioning and, where required, re-commissioning
- Monitor the commissioning of all items of plant
- Ensure that the commissioning process is undertaken in accordance with CIBSE Commissioning Codes and BSRIA Application Guides.

The current design does not include any systems that are considered to be complex by the BREEAM criteria. The specific BREEAM requirements for the appointment of a specialist commissioning manager are therefore not required as stated in the BREEAM compliance notes.

In addition, the development does not contain a BMS or cold storage.

The clauses relating to commissioning in the M&E specification confirm that the M&E contractors will be required to undertake commissioning in line with all of the following codes, where appropriate:

<u>CIBSE Commissioning Codes</u>
CIBSE Commissioning Code A: Air Distribution Systems
CIBSE Commissioning Code B: Boilers
CIBSE Commissioning Code C: Automatic Controls
CIBSE Commissioning Code L: Lighting
CIBSE Commissioning Code M: Management
CIBSE Commissioning Code W: Water Distribution Systems

<u>BSRIA Commissioning Guides – July 2000</u>
TM1/88.1 Commissioning HVAC Systems
AG2/89.2 Commissioning of Water Systems in Buildings
AG3/89.3 Commissioning of Air Systems in Buildings
AG1/91 Commissioning of VAV Systems in Buildings
AG20/95 Commissioning of Pipework Systems in Buildings
AG1/2001.1 Pre-Commission Cleaning of Pipework Systems
AG 5/2002 Commissioning Management

A copy of the Employer's Requirements (ref 3) document has been provided, which confirms that the contractor's appointment will include a requirement for them to oversee and carry out all the commissioning as part of their main contract of works.

At the post construction stage it was confirmed that the completed development was procured on a design and build basis. As part of this process Mike Vickers of Portal Construction was appointed to oversee the commissioning process on behalf of Portal Construction.

M Vickers scope of work included, but was not limited to the following:

- Programme pre-commissioning, commissioning and, where required, re-commissioning
- Monitor the commissioning of all items of plant
- Ensure that the commissioning process is undertaken in accordance with CIBSE Commissioning Codes and BSRIA Application Guides.

The completed development contains the following simple mechanical and electrical systems:

- Lighting
- Heating – gas fired boiler serving LTHW radiator system to offices only
- Water systems

It was confirmed in a statement (TBC Portal letter dated 2nd Feb 2014) that Mike Vickers was responsible for the pre-commissioning, commissioning and, where necessary re-commissioning of the simple building services (as defined by BREEAM) present within the development The completed development does not contain any systems which are considered by BREEAM to be complex systems. The building does not have a Building Management System (BMS) installed or any cold storage areas installed or safety cabinets.

It was also confirmed that Mike Vickers of Portal Construction was required to ensure that all commissioning was undertaken in accordance with the following BISRIA and CIBSE commissioning codes/guides:

CIBSE Commissioning Codes - 2003
CIBSE Commissioning Code A : Air Distribution Systems
CIBSE Commissioning Code B : Boilers
CIBSE Commissioning Code C : Automatic Controls
CIBSE Commissioning Code L : Lighting
CIBSE Commissioning Code M Management
CIBSE Commissioning Code R : Refrigeration
CIBSE Commissioning Code W Water

BSRIA Commissioning Guides – July 2000

TM1/88.1	Commissioning HVAC Systems
AG2/89.2	Commissioning of Water Systems in Buildings
AG3/89.3	Commissioning of Air Systems in Buildings
AG1/91	Commissioning of VAV Systems in Buildings
AG20/95	Commissioning of Pipework Systems in Buildings
AG1/2001.1	Pre-Commission Cleaning of Pipework Systems
AG 5/2002	Commissioning Management

Copies of the commissioning records (references 4) have been provided for the installed systems. The commissioning records confirm that the required monitoring actions have been carried out by the nominated commissioning monitor.

The commissioning records also show compliance with the relevant standards as required by BREEAM.

In addition to the above a copy of the project programme (ref 6) was provided to the assessor. The project programme shows an allowance period for commissioning, performance testing and handover.

The first credit has been achieved.

The building is naturally ventilated using simple cross flow ventilation relying solely on openable windows. As stated in the compliance notes the appointment of a specialist commissioning the use of a specialist commissioning agent is not required to award this credit. There are no renewable energy technologies or BMS present.

The Mechanical & Electrical specifications provided confirm that an individual will be appointed to undertake the following seasonal commissioning responsibilities over a minimum 12 month period, once the building becomes occupied:

The scope will include

Simple Systems

- 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 re-commission systems following the review and incorporate any relevant revisions in operating procedures into the O&M manuals.

Confirmation has been provided that Mike Vickers of Portal Construction (TBC Portal letter dated 2nd Feb 2014) will undertake seasonal commissioning during the first 12 months of occupation. His appointment will include, but not be limited to the following:
Simple Systems (building does not contain complex systems)

- Reviewing thermal comfort, ventilation, and lighting, at 3, 6 and 9 month intervals after initial occupation, by measurement or occupant feedback.
- Take all reasonable steps to re-commission systems following the review and incorporate any relevant revisions in operating procedures into the O&M manuals.

The second credit has been achieved.

A total of two out of a possible two credits have been achieved.

Management
Man 2 – Considerate Constructors

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**1**	**2**

Number of credits achieved:	**0**

Aim

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

Criteria

Two credits available as follows:

Credits	
1	Where evidence provided demonstrates that there is a commitment to comply with best practice site management principles.
2	Where evidence provided demonstrates that there is a commitment to go beyond best practice site management principles.

Schedule of Evidence

Number of Credits achieved? (For full explanation, please refer to Validation Statement)	**0 of 2**
Ref:	
N/A	No references as this credit is not being pursued

Validation Statement

The contractor confirmed that they would be unable to pursue this credit and as such this credit may not be included in the assessment.

Management
Man 3 – Construction Site Impacts

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**3**

Aim

To recognise and encourage construction sites managed in an environmentally sound manner in terms of resource use, energy consumption and pollution.

Criteria

Four credits available as follows:

Credits	
1	Where evidence provided demonstrates that 2 or more of items a-g (listed below) are achieved.
2	Where evidence provided demonstrates that 4 or more of items a-g (listed below) are achieved.
3	Where evidence provided demonstrates that 6 or more of items a-g are achieved: a. Monitor, report and set targets for CO_2 or energy arising from site activities b. Monitor, report and set targets for CO_2 or energy arising from transport to and from site c. Monitor, report and set targets for water consumption arising from site activities d. Implement best practice policies in respect of air (dust) pollution arising from the site e. Implement best practice policies in respect of water (ground and surface) pollution occurring on the site f. Main contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site g. Main contractor operates an Environmental Management System.
1	Where evidence provided demonstrates that at least 80% of site timber is responsibly sourced and 100% is legally sourced.

Schedule of Evidence

Number of Credits achieved? *(For full explanation, please refer to Validation Statement)*	**2 of 3**
Ref:	
1	Clause 4.2.9 Employer's Requirements, Contractor's Proposals and Contract Conditions, Unit 1 Clywedog Road, C4 Consulting, October 2011
2	A3 Checklist completed by Mike Vickers, Portal Construction, 2013
3	Copies of Energy & Water Monitoring, Portal Construction, February 2013
4	Induction & Ecology Training Register, Portal Construction, Sept 2012
5	Tool Box Talks Information Sheets, Construction Confederation, 2003.
Fourth (Timber) Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Clause 4.2.9 Employer's Requirements, Contractor's Proposals and Contract Conditions, Unit 1 Clywedog Road, C4 Consulting, October 2011
6	Examples of procurement of sustainable timber certificates, Portal Construction, 2013

Validation Statement

A copy of the Employers' Requirements (reference 1 page 11) documents has been provided, confirming the actions that the contractor was required to implement during construction. The document provided confirms that the contractor was contractually required to undertake the following:

a. The Employers' Requirements documents (Reference 1 page 11) confirms that the contractor was required to monitor all energy use and associated CO_2 emissions arising from site on a monthly basis. This confirms that, as a minimum, they were required to check the meters and display a graphical analysis on site. It was required that the energy consumption was displayed over the course of the project and compared against pre-set targets. The Employers' Requirements documents confirms that the design team / project manager was be responsible for nominating an individual to over see all monitoring on site.

   The completed copy of Technical Checklist A3 (reference 2) confirms that the contractor has committed to monitoring all energy use on site and associated CO_2 emission on a monthly basis. Energy use was compared against pre-set targets and displayed in the site office for the duration of the construction period.

   At the post construction stage copies of the monitoring documents have been provided demonstrating that the energy use on site has been adequately monitored in terms of litres of fuel used per month (converted into total CO2 emissions) and that targets have been set for the entirety of the construction period. Point 'a' has been achieved.

b. No information has been provided relating to the monitoring of transport related emissions and as such, item ‘b’ has not been achieved.

c. The Employers’ Requirements documents (Reference 1) confirm that the contractor will be required to monitor all water use associated through the site on a monthly basis. This confirms that, as a minimum, they will be required to check the meters and display some form of graphical analysis on site. It is confirmed that the water consumption will be displayed over the course of the project and compared against pre-set targets. The Employers’ Requirements documents confirms that the design team / project manager will be responsible for nominating an individual to over see all monitoring on site.

   The completed copy of Technical Checklist A3 confirms that the contractor has committed to monitoring all water use on site on a monthly basis. This is to be compared against pre-set targets and displayed in the site office for the duration of the construction period.

   At the post construction stage copies of the monitoring documents have been provided demonstrating that the water use on site has been adequately monitored and that targets have been set for the entirety of the construction period. Point ‘c’ has been achieved

d. A copy of the Employers’ Requirement documents (Reference 1) has been provided, which confirm that the contractor will be required to implement all appropriate procedures in relation to minimising air / dust pollution on site in accordance with best practice. This includes damping down the site in dry weather and sealing and covering dry / fine materials, skips etc. As all appropriate measures relating to dust and air pollution will be implemented, item ‘d’ has been achieved.

   A completed copy of Technical Checklist A3 has been provided by the contractor confirming that they will be responsible for ensuring that best practice procedures in relation to minimising air / dust pollution. This will include the use of dust sheets, damping down the site in dry weather and covers provided to all skips. The appropriate information relating to pollution control measures will be passed on to all workers and trades on site.

   At the post construction stage Copies of the documented procedures used on site for working to best practice pollution management guidelines were provided to the assessor, this information included PPG guidelines which were issued to operatives and completed toolbox talk logs. Point ‘d’ has been achieved.

   In addition to the above it has been confirmed in a statement from the lead contractor that that best practice procedures in relation to minimising air / dust pollution have been implemented.

e. A copy of the Employers’ Requirement documents (Reference 1) has been provided, which confirm that the contractor will be required to implement all appropriate procedures in relation to minimising watercourse pollution on site in accordance with best practice. This includes carrying out all site works in accordance with Environment Agency guidelines PPG1, PPG5 & PPG6 As all appropriate measures relating to dust and air pollution will be implemented, item ‘e’ has been achieved.

   A completed copy of Technical Checklist A3 has been provided by the contractor confirming that they will be responsible for ensuring that best practice procedures in relation to minimising watercourse pollution. The measures will be implemented in line with the guidance given in Environment Agency Guidelines PPG1, PPG5 and PPG6. The appropriate information relating to pollution control measures will be passed on to all workers and trades on site. Point ‘e’ has been achieved.

   At the post construction stage Copies of the documented procedures used on site for working to best practice pollution management guidelines were provided to the assessor, this information included PPG guidelines which were issued to operatives and completed toolbox talk logs.

f. No information has been provided relating to the Environmental Materials Policy and as such item 'f' has not been achieved.

g. No information has been provided relating to the Environmental Management System that the contractor operates and therefore item 'g' has not been achieved.

A total of four of points 'a'-'g' have been achieved. As all the evidence provided covers all the points as set out in Checklist A3, this equates to two of the three available credits being awarded.

A copy of the Employers' Requirements document (Reference 1) has been provided, which confirms that the contractor will be required to source all temporary timber on site from FSC and PEFC certified suppliers. As all temporary timber will be responsibly and legally sourced, the final credit in this section may be awarded.

The completed copy of the Technical Checklist A3 has been provided by the contractor, Portal Construction, which confirms that all temporary timber used on site will be 100% legally sourced (not on the CITES list) and that at least 80% of all timber will be responsibly sourced from suppliers who hold full FSC or PEFC certification.

At the post construction stage an email was received from the lead contractor which confirmed that all timber had been procured from a sustainable source and included certificates for all timber procured. The certificates confirm that that all temporary timber used on site was 100% legally sourced (not on the CITES list) and that all timber was responsibly sourced from suppliers who hold full FSC or PEFC certification.

3 of the four available credits have been achieved in this section.

Management
Man 4 – Building User Guide

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**1**	**1**

Number of credits achieved:	**0**

Aim

To recognise and encourage the provision of guidance for the non technical building user so they can understand and operate the building efficiently.

Criteria

Credits	
1	Where evidence provided demonstrates the provision of a simple guide that covers information relevant to the tenant/occupants and non-technical building manager on the operation and environmental performance of the building.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
1	n/a

Validation Statement

At the time of the certification the design team did not provide a copy of the completed building user guide and therefore the credit is withheld.

Management
Man 8 - Security

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage the implementation of effective design measures that will reduce the opportunity for and fear of crime on the new development.

Criteria

Credits	
1	Where evidence provided demonstrates that an *Architectural Liaison Officer* (ALO) or *Crime Prevention Design Advisor* (CPDA) from the local police force has been consulted at the design stage and their recommendations incorporated into the design of the building and its parking facilities (if relevant).

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	

Validation Statement

This credit is withheld.

Health and Wellbeing

Health & Wellbeing
Hea 1 Daylighting

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To give building users sufficient access to daylight.

Criteria

Credits	
1	Where evidence provided demonstrates that at least 80% of the total *occupied* floor area is adequately daylit.

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Letter and associated daylight calculations from Tommy Taylor at C4 Consulting, Ref: Proposed Development at Clywedog Road South, Wrexham Industrial Estate – Credit Hea 1, Daylighting, 11th February 2013
2	“Roof Plan, Clywedog Road (Wrexham)”, Drawing No. 1978 GA1, G. M. Services Ltd, October 2012
3	“Proposed GA Floor Plan Accommodation Block”, Drawing No. 10/036/PL/13, C4 Consulting, October 2012
4	"Proposed Elevations", Drawing No. 10/036/2/PL/05, C4 Consulting, January 2012
5	“Proposed Site Layout”, Drawing No. 10/036/C/01, C4 Consulting, November 2012
6	Section Hea 1, Post Construction Review Assessor’s Site Inspection Report, AEE Ref: 13610, Ambient Energy & Environment, 10th December 2012.
7	Letter received from Jackie Bedwell of Portal Construction, 16th January 2014

Validation Statement

Copies of daylight calculations have been provided which confirm that the office areas achieve an average daylight factor of 3.2%. It has also been confirmed through calculation that the office areas will achieve the room depth criterion and it can be seen from elevation and site layout drawings that the offices will achieve a view of sky from desk level.

A statement has been provided from the architect, C4 Consulting, which confirms that the daylight provision is in compliance guidance in CIBSE Lighting Guide 10 Daylighting and window design, BS8206 Part 2 and the BRE Site Layout Guide.

In addition, the calculations provided confirm that the operational area will achieve a daylight level of 3.1%. The daylighting is achieved through the provision of regular roof lights along the length of the operation space. Using Figure 2.36 from CIBSE Lighting Guide 10, it can be demonstrated that this achieved an uniformity ratio of >0.4 and therefore the daylight level criteria are met in this area.

At the post construction stage site inspection it was confirmed that the window sizes and room layout and dimensions are as per design-stage and that no changes have been made.

In addition to the above it was confirmed by the lead contractor in a statement that the window sizes and room layout and dimensions are as per design-stage and that no changes have been made.

The credit has been achieved.

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Health & Wellbeing
Hea 4 – High Frequency Lighting

Minimum BREEAM Standards					
Rating Level	P	G	VG	E	O
Min. credits to achieve rating	1	1	1	1	1

Number of credits achieved:	1

Aim

To reduce the risk of health problems related to the flicker of fluorescent lighting.

Criteria

Credits	
1	Where evidence provided demonstrates that high frequency ballasts are installed on all fluorescent and compact fluorescent lamps.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Page 96, Clause 4.09 General Lighting, Electrical Services Performance Specification, KGA Partnership, October 2012
2	Section Hea 4, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

A copy of the Electrical Performance Specification has been provided. Clause 5.7 General Lighting confirms that all fluorescent and compact fluorescent lighting will be required to be installed with high frequency control gear.

At the post construction inspection the assessor was able to confirm that all lighting had been installed with high frequency ballasts.

This credit may be awarded.

Health & Wellbeing
Hea 5 – Internal and external lighting levels

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	1

Aim

To ensure lighting has been designed in line with best practice for visual performance and comfort.

Criteria

Credits	
1	Where evidence provided demonstrates that all internal and external lighting, where relevant, is specified in accordance with the appropriate maintained illuminance levels (in lux) recommended by CIBSE.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Letter from Phil Simpson at KGA Design Partnership, Ref: Clywedog Unit 2 – BREEAM Assessment, 6th November 2012
2	Page 96, Clause 4.09 General Lighting, Electrical Services Performance Specification, KGA Partnership, October 2012
3	Section Hea 5, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

Clause 4.09 General Lighting confirms that all he internal illuminance (lux) levels in all internal areas of the building are required to be designed in accordance with the CIBSE Code for Lighting 2009 and that the lighting to the office areas will be designed in accordance with CIBSE LG 7 (specifically sections 3.3, 4.6, 4.7, 4.8 and 4.9)

At the post construction stage a letter has been provided from the consultant M&E engineer which confirms the standards to which all lighting within the development has been designed and installed. The letter provided from KGA Consulting Engineers confirms that the requirements of CIBSE Code for Lighting 2009 covers or exceeds all the requirements of the CIBSE Code for Lighting 2006. In addition, the letter confirms that the external lighting is installed in accordance with CIBSE Lighting Guide 6.

For areas where computer screens are regularly used, the lighting installation complies with CIBSELG7 and in particular sections 3.3, 4.6, 4.7, 4.8 and 4.9.

The statement also confirms that the external lighting installation complies with CIBSE Lighting Guide LG6. In addition, all external lighting has been design and installed in accordance with BS5489 Part 1 - *Lighting of roads and amenity areas*.

As the lighting installation complies with all the relevant CIBSE codes and standards, this credit may be awarded.

Health & Wellbeing
Hea 9 – Volatile Organic compounds

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage a healthy internal environment through the specification of internal finishes and fittings with low emissions of volatile organic compounds (VOCs).

Criteria

Credits	
1	Where evidence provided demonstrates that the emissions of VOCs and other substances from key internal finishes and fittings comply with best practice levels.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team were unable to confirm that the finishes to the development would be specified in line with the required standards and as such this credit may not be awarded.

Health & Wellbeing
Hea 12 – Microbial contamination

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**1**	**1**	**1**	**1**	**1**

Number of credits achieved:	**1**

Aim

To ensure the building services are designed to reduce the risk of legionellosis in operation.

Criteria

Credits	
1	Where evidence provided demonstrates that the risk of waterborne and airborne legionella contamination has been minimised.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Page 54, Clause 3.21 Protection Against Legionaries Disease, Mechanical Services Performance Specification, KGA Partnership, October 2012
2	Letter from Phil Simpson at KGA Consulting Engineers, Ref: Clywedog Unit 2 - BREEAM Assessment - Credit Hea 12, Microbial Contamination
3	Letter received from Jackie Bedwell of Portal Construction, Ref: Clywedog Road Industrial Unit – BREEAM Assessment - Credit Hea 12 Microbial Contamination, 16th January 2014

Validation Statement

A copy of the specification has been provided which the water systems to be installed within the building. In addition to this the specification requires that all water systems within the development will be designed and installed in accordance with the measures outlined in the Health and Safety Executives "Legionnaires disease - The control of legionella bacteria in water systems", Approved Code of Practice and Guidance, 2000 and CIBSE TM13.

A formal statement has been provided from the M&E consulting engineer, which confirms that all water systems within the development will be designed and installed in accordance with the measures outlined in the Health and Safety Executives "Legionnaires disease - The control of legionella bacteria in water systems", Approved Code of Practice and Guidance, 2000. In addition, the formal letter confirms that no humidification is to be installed within the development.

At the post construction stage a formal statement has been provided from the main contractor which confirms that all water systems within the development have been designed and installed in accordance with the measures outlined in the Health and Safety Executives "Legionnaires disease - The control of legionella bacteria in water systems", Approved Code of Practice and Guidance, 2000. In addition, the formal letter confirms that humidification has not been installed within the development.

This credit has been achieved.

Health & Wellbeing
Hea 14 – Office space

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To recognise steps taken to provide a good working environment in smaller office areas within the development.

Criteria

Up to two credits are available as follows:

Credits	
2	Where evidence provided demonstrates that office space within the development that is less than 500m^2 achieves best practice in terms of occupant comfort and control.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Second Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
1	"As Built GA Floor Plan Accommodation Block", Drawing No. 10/036/AB02, C4 Consulting, May 2014
2	"As Built Elevations", Drawing No. 10/036/AB03, C4 Consulting, May 2014
3	AS FITTED “Heating, Ventilation, Sanitary & Plumbing, Office Area", Drawing No. 27545 1 AO, Gradwood Heating, Ventilation, Air Conditioning Systems, February 2012
4	As Fitted “Office Areas Lighting & Power”, Drawing No. BM-3300-E-02, Barlows Electrical, July 2013

Validation Statement

The completed building contains one small cellular office on the ground floor.

The design team have provided evidence confirming that the following measures have been achieved, as follows:

a. View Out
As Built Floor plans (Reference 1) and elevation drawings (Reference 2) have been provided which show the cellular office on the ground floor. The floorplans also shows a notional workstation layout and the elevations show the window opening areas. An As Built site plan is also provided which shows the building location and proximity to external obstructions. The drawings provided confirm that all relevant building areas within the development are within 7m from an external window and the window opening is more than 20% of the total inside wall area. The drawings also confirm that there are no obstructions to the view out therefore point ‘a’ has been achieved.

b. Glare Control
The design team were unable to confirm that the development would have glare control fitted to the office glazing and as such, point 'b' has not been achieved.

c. Lighting Controls & Zones
Copies of As Built lighting layout diagrams have been provided (Reference 3) which confirm the lighting zoning and associated switching for the development. The lighting layout drawing also confirms the floor plan of the development and the uses of all room areas. This demonstrates that in the office areas, the lighting zone will be split into areas of <40m^2 which will cover no more than 4 workstations. The cellular office areas will all have individual lighting zones. All lighting within the development will be controlled via local manual switching. As all office areas within the development will have appropriate zoning, point ‘c’ has been achieved.

d. Potential for Natural Ventilation
the design team could not confirm that the required level of ventilation has been provided to the development, point 'd' has not been awarded.

e. Indoor Air Quality
Floor plan and mechanical services drawings have been provided which confirm that the office areas are naturally-ventilated, but that openable windows are within 10m of sources of external pollution. Point ‘e’ has not been achieved.

f. Thermal Comfort
The design team were unable to confirm that a full dynamic thermal model has not been carried out using a CIBSE AM11 compliant software programme. Point ‘f’ has not been achieved.

g. Thermal Zoning
Mechanical layout drawings have been provided by the mechanical contractor, which confirms that all heating to the office areas of the development will be provided via LTHW perimeter radiators fed by a gas fired condensing boiler.

The mechanical layout drawings confirm that the radiators will be fitted with thermostatic radiator valves which will allow for an appropriate degree of occupant thermal control. Point 'g' has been achieved.

h. Acoustic Performance
No information has been provided relating to acoustic testing undertaken on the development and therefore item 'h' has not been achieved.

A total of 3 of the above points have been achieved and therefore one out of a possible two credits have been achieved.

Exemplary Level Credit:
As the information supplied for the above confirms that not all of the above measures have been achieved for at for least 80% of the development's office space floor area, the exemplary credit has not been achieved.

Energy

Energy
Ene 1 – Reduction of CO_2 emissions

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**6**	**10**

Number of credits achieved:	**10**

Aim

To recognise and encourage buildings that are designed to minimise the CO_2 emissions associated with their operational energy consumption.

Criteria

Up to 15 credits are available:

Credits	
15	Where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO_2 emissions.

Schedule of Evidence

10 of 15 Credits achieved *(For full explanation please refer to Validation Statement)*	
Ref:	
1	Tension Control Bolts, Energy Performance Certificate No. 0230-0034-0979-1897-7006, Meridian Consult Ltd, 12th March 2014

Validation Statement

A copy of the final lodged EPC output for the development has been provided to the assessor. This has been calculated using Design Build SBEM version 3.0 which is a National Calculation Method (NCM) approved software. It has been confirmed on the certificate that the calculation was carried out by Craig Ibbotson of Meridian Consult Ltd who are registered EPC assessors with the assessor number STRO000297.

The output document confirms that the development has achieved a CO_2 Index (EPC Rating) at the AS BUILT stage of 24. This number has been inputted into the BREEAM calculator and achieves a score of 10 credits.

Exemplary Level Credits:
The calculations which have been provided confirm that the development does not meet the requirements of the exemplary credits and therefore these credits cannot be achieved.

Energy
Ene 2 – Sub-metering of substantial energy uses

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**1**	**1**	**1**

Number of credits achieved:	**1**

Aim

To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of in-use energy consumption.

Criteria

Credits	
1	Where evidence provided demonstrates the provision of direct sub-metering of energy uses within the building.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Page 115, Clause 4.34, Sub-Metering, Electrical Services Performance Specification, KGA Partnership, October 2012
2	"Ground / First Floor Plan Warehouse Power Installation 'As Fitted", Drawing No. BM-3300-E-03, Barlows (UK) Ltd
3	Letter from Christopher Lloyd at Barlows UK Ltd, Ref: RE: TCB – Wrexham – BREEAM Assessments Credit Ene 2 Sub-metering of Major Energy Uses, 30th August 2013
4	Section Ene 2, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

A copy of the electrical specification (ref 1 has been provided, which confirms that the development will be appropriately sub-metered in line with the BREEAM requirements.

The specification clause confirms that the following systems are present in the development. The systems present and the associated rated outputs are as follows:

- Lighting & Small Power to office area (Rated Output 25.2kW) (separately sub metered)
- Lighting & Small Power to production area (Rated Output 25.2kW) (separately sub metered)
- Production area process distribution boards (separately sub metered)
- Space Heating (gas meter)
- Domestic Hot water (sub meter)

The building does not have humidification, cooling, major fans or any other major energy consuming items that would require sub metering in accordance with the compliance notes for this credit.

Conformation has also been provided by the contractor (ref 3) that all individual distribution boards will be sub metered to allow for individual area sub metering.

A copy of the as built metering schematic (ref 2) has been provided which confirms the metering strategy of the development and demonstrates that all energy suitable energy uses will be appropriately sub-metered.

At the post construction stage it was confirmed by the assessor at the site inspection that sub-metering has been provided in accordance with the specification. Individual metering has been installed for all energy end uses and areas.

This credit may be awarded.

Energy
Ene 3 – Sub-metering of high energy load and tenancy areas

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of in-use energy consumption by tenant or end user.

Criteria

Credits	
1	Where evidence provided demonstrates sub-metering of energy consumption by tenancy/building function area is installed within the building.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Page 115, Clause 4.34, Sub-Metering, Electrical Services Performance Specification, KGA Partnership, October 2012
2	"Ground / First Floor Plan Warehouse Power Installation 'As Fitted", Drawing No. BM-3300-E-03, Barlows (UK) Ltd
3	Letter from Christopher Lloyd at Barlows UK Ltd, Ref: RE: TCB – Wrexham – BREEAM Assessments Credit Ene 2 Sub-metering of Major Energy Uses, 30th August 2013
4	Section Ene 3, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

The building has been design and constructed for a known occupier (Tension Control Bolts) and therefore has a single occupier / tenancy.

A copy of the electrical specification (ref 1 has been provided, which confirms that the development will be appropriately sub-metered in line with the BREEAM requirements.

Conformation has also been provided by the contractor (ref 3) that all individual distribution boards will be sub metered to allow for individual area sub metering.

It is confirmed in the specification that all of the above end uses will be separately sub-metered with individual energy meters and will be monitored by a BMS system.

A copy of the as built metering schematic (ref 2) has been provided which confirms the metering strategy of the development and demonstrates that all energy suitable energy uses will be appropriately sub-metered.

At the post construction stage it was confirmed by the assessor at the site inspection that sub-metering has been provided in accordance with the specification. Individual metering has been installed for all energy end uses and areas.

This credit may be awarded.

Energy
Ene 4 – External lighting

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To recognise and encourage the specification of energy-efficient light fittings for external areas of the development.

Criteria

Credits	
1	Where energy-efficient external lighting is specified and all light fittings are controlled for the presence of daylight.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	As Installed Ground First Floor Lighting Installation,BM3300-E05, Barlows Ltd, July 2013.
2	Page 103 & 104, Clause 4.14, External Lighting, Electrical Services Performance Specification, KGA Partnership, October 2012
3	Section Ene 4, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
4	Kingfisher Lighting Datasheet, Kingfisher Lighting (taken from Clywedog Road O&M Manual, no date)
5	Ansell Floodlighting Datasheets, Ansell Lighting, no date
6	Dextral Lighting Datasheets, Dextra Lighting, no date
7	Powerstar HQI technical Information, Osram Lighting, no date
8	Venture Lamps Datasheet, Venture Lighting, no date

Validation Statement

A copy of the As Built site plan has been provided (ref 1). The proposed plan shows the area of the landscaping that will be externally lit.

An extract from the electrical specification (ref 2) has been provided, the specification states:
"All external lighting within the development will be fitted with a time switch or daylight sensor to prevent operation during daylight hours.

External lighting for the building, access ways and pathways is to have a luminous efficacy of at least 50 lamp lumens/circuit Watt when the lamp has a colour rendering index (Ra) greater than or equal to 60. ***OR*** *60 lamp Lumens / circuit Watt when the lamp has a colour rendering index (Ra) less than 60.*

External light fittings to car parking areas, associated roads and floodlighting is to have a luminous efficacy of at least 70 lamp lumens/circuit Watt when the lamp has a colour rendering index (Ra) greater than or equal to 60. ***OR*** *80 lamp Lumens / circuit Watts when the lamp has a colour rendering index (Ra) less than 60.*

External light fittings for signs and uplighting is to have a luminous efficacy of at least 60 lamp lumens/circuit Watt when the lamp wattage is greater than or equal to 25W. ***OR*** *50 lamp lumens/circuit Watt when the lamp wattage is less than 25W.*

All external lighting will be designed in accordance with ILE Guidance for the Reduction of Night Time Light Pollution, 2005. The lighting will be able to be automatically switched off from 2300 – 0700 hours.

Where safety or security lighting is provided that will be used between 2300hrs and 0700hrs, this part of the lighting system will comply with the lower levels of lighting recommended during these hours in Table 1 of the ILE's Guidance notes, for example by using an automatic switch to reduce the lighting levels at 2300 or earlier".

A copy of an As Built external lighting drawing has been provided, which confirms the layout and details of all installed external lighting associated with the development.

Manufacturer's information (ref 3/4/5/6/7/8) has been provided for the installed lighting. The installed luminaires, their location and efficacy are shown in the table below:

Supplier	Luminaire Type	Location	BREEAM Requirement	Colour rendering	Efficacy
Kingfisher	Evoluta	Car Park	Car Park (70 l/circuit Watt where RA > 60) (80 l/circuit Watt where RA < 60)	unknown	93.33 lumens / circuit watt
Ansell / Osram	Orion 250w IP65 HQI - T	Building Mounted	Building Mounted (50 l/circuit Watt where RA > 60) (60 l/circuit Watt where RA < 60)	90	82 lumens / circuit watt
Dextra	Avalon	Building Mounted	Building Mounted (50 l/circuit Watt where RA > 60) (60 l/circuit Watt where RA < 60)	20	86 lumens / circuit watt

Electrical layout drawings have been provided which demonstrate that a photocell has been included on the external lighting circuit to control all external lighting for the development. Whilst no confirmation has been provided for the colour rendering achieved, each lighting fitting achieves the higher level of efficacy required for any level of colour rendering and as such this information is not required to demonstrate compliance.

There are no external light fittings associated with signs & uplighting, this issue is not required to be assessed for this credit.

At the post construction stage it was confirmed by the assessor that Photocell control has been included on the external lighting circuit to control all external lighting for the development. In addition to this the assessor confirmed that the manufacturer's details as listed above are installed and therefore the technical specifications are as above.

This credit has been achieved.

Energy
Ene 5 – Low or zero carbon technologies

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**1**	**1**

Number of credits achieved:	**0**

Aim

To reduce carbon emissions and atmospheric pollution by encouraging local energy generation from renewable sources to supply a significant proportion of the energy demand.

Criteria

Up to a maximum of three credits can be awarded as follows:

Credits	
1	Where evidence provided demonstrates that a feasibility study considering local (*on-site* and/or *near site*) low or zero carbon (LZC) technologies has been carried out and the results implemented.
2	Where evidence provided demonstrates that the first credit has been achieved and there is a 10% reduction in the building's CO_2 emissions as a result of the installation of a feasible local LZC technology.
3	Where evidence provided demonstrates that the first credit has been achieved and there is a 15% reduction in the building's CO_2 emissions as a result of the installation of a feasible local LZC technology.

Alternatively a maximum of one credit is awarded as follows:

Credits	
1	Where evidence provided demonstrates that a contract with an energy supplier is in place to provide sufficient electricity used within the assessed building/development to meet the above criteria from a 100% renewable energy source. (Note: a standard Green Tariff will not comply)

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*		**No**
Ref:		
N/A	No references as this credit is not being pursued.	
Second Credit achieved? *(For full explanation, please refer to Validation Statement)*		**No**
Third Credit achieved? *(For full explanation, please refer to Validation Statement)*		**No**
Exemplary Credit achieved? *(For full explanation, please refer to Validation Statement)*		**No**

Validation Statement

The design team confirmed that no renewable technology would be installed to the development and as such this credit could not be awarded.

Exemplary level criteria
No calculations have been provided to demonstrate the reduction in CO_2 emissions achieved by the development, therefore the exemplary credit may not be awarded.

Energy
Ene 6 – Building fabric performance and avoidance of air infiltration

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage measures taken to minimise heat loss and air infiltration through the building fabric.

Criteria

Credits	
1	Where evidence provided demonstrates that appropriate design and as built performance measures are taken to minimise heat loss and air infiltration through the building fabric.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team were unable to confirm that they would undertake all the procedures required to achieve this credit and therefore this credit has not been achieved.

Transport

Transport
Tra 1 – Provision of public transport

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	-	-	-	-	-

Number of credits achieved:	**0**

Aim

To recognise and encourage development in proximity to good public transport networks, thereby helping to reduce transport-related emissions and traffic congestion.

Criteria

Credits	
3	The credits are awarded on a sliding scale based on the assessed buildings' accessibility to the public transport network.

Schedule of Evidence

0 of 3 Credits achieved *(For full explanation please refer to Validation Statement)*	
Ref:	
N/A	No references as this credit is not being pursued

Validation Statement

The assessor was able to confirm via a desktop survey that there was not a compliant transport node within an appropriate safe walking distance of the site and therefore no credits could be awarded in this section.

Transport
Tra 2– Proximity to amenities

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To encourage and reward a building that is located in proximity to local amenities, thereby reducing the need for extended travel or multiple trips.

Criteria

Credits	
1	Where evidence provided demonstrates that the building is located within 500m of *accessible local amenities* appropriate to the building type and its users.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued

Validation Statement

The assessor was unable to confirm that all required amenities were located within 500m of the development and therefore this credit may not be awarded.

Transport
Tra 3 – Cyclist facilities

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**2**

Aim

To encourage building users to cycle by ensuring adequate provision of cyclist facilities.

Criteria

Credits	
1	Where evidence provided demonstrates that covered, secure and well-lit cycle storage facilities are provided for all *building users*.
2	Where, in addition to the above, adequate changing facilities are provided for staff use.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	"Proposed Site Layout", Drawing No. 10/036/2/PLO3G, C4 Consulting, October 2012
2	Proposed GA Floor Plan, Accommodation Block, Clywedog Road South, C4 Consulting, October 2012.
3	Clause 4.14 External Lighting, Electrical Services Performance Specification, KGA Design Partnership, October 2012
4	Letter received from Jackie Bedwell, Portal Construction, Ref: Clywedog Road – BREEAM Assessment – Cycle Storage Provision, 11th December 2013.
5	E-mail from Tommy Taylor at C4 Consulting, Ref: TCB Clywedog Road South, Wrexham, 24th January 2014
6	Section Tra 3, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
7	Wardale™ Breeam Compliant Cycle Shelter - BXMW/WAR/bream, Broxap, no date

Second Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
2	"Proposed GA Floor Plan Accommodation Block", Drawing No. 10/063/PL/13, C4 Consulting, October 2012
5	E-mail from Tommy Taylor at C4 Consulting, Ref: TCB Clywedog Road South, Wrexham, 31st October 2012
6	Section Tra 3, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

A site layout plan has been provided which confirms the location of a cycle rack that has been provided for use by building occupants. This confirms that they will be within 50m of the main entrance to the building. The site layout demonstrates that cycle stands will be provided, along with a Broxap cycle shelter. The cycle spaces provided are appropriately sheltered and secure and provide 10no cycle storage spaces.

Confirmation has been provided by the lead contractor (reference 3) that the expected occupancy of the development will be a maximum of 10 people at any one time. As such, cycle storage facilities are provided at a rate in excess of 1 per every 10 building occupants.

A copy of the Electrical Services Performance Specification (ref 3) has been provided, which confirms that the external lighting provided to the development will be designed and installed in accordance with BS5489.

Manufactures details have also been provided of the installed racks (reference 7).

The above information therefore confirms the following:

- The space is covered overhead and protected from the rain
- The covered area and the cycle racks are set in or fixed to a permanent structure (hardstanding) and allow both the wheel and frame to be locked securely
- There is a minimum distance of 1.0m between cycle racks
- There is a minimum distance from any obstruction e.g. wall (located either to the side of the stand or in front of it) of 900mm for double-sided use.

At the post construction stage it was confirmed that the cycle storage facilities have been installed in accordance with the above design information and no changes have been made.

As compliant cycle storage facilities will be provided, the first credit in this section may be awarded.

A copy of a marked up plan layout drawing of the ancillary areas has been provided which confirms that there is a shower located in the development for use by all occupants of the development. A single shower cubicle is provided for use by both male and female building occupants in a mixed use area.

The drawing also confirms the location of lockers and a changing room space within the development, which will be a dedicated area for cyclists to use to change clothes. An e-mail provided from Tommy Taylor at C4 consulting (ref 5) confirms the specification of the lockers to be installed, confirming that they will be of sufficient dimensions for the storage of cycling gear.

At the post construction stage it was confirmed that the additional compliant facilities have been installed in accordance with the above design information and no changes have been made.

As two of the required ancillary features have been included within the development, the second available credit may be awarded.

Transport
Tra 4 – Pedestrian and cyclist safety

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage the provision of safe and secure pedestrian and cycle access routes on the development.

Criteria

Credits	
1	Where evidence provided demonstrates that the site layout has been designed in accordance with best practice to ensure safe and adequate pedestrian and cycle access.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team confirmed that this credit would not be pursued and therefore the credit has not been achieved.

Transport
Tra 5 Travel plan

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

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.

Criteria

Credits	
1	Where evidence provided demonstrates that a travel plan has been developed and tailored to the specific needs of the *building users*.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team were unable to confirm that a compliant travel plan had been developed for the assessment and as such this credit is withheld.

Transport
Tra 6 – Maximum car parking capacity

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To encourage the use of alternative means of transport to the building other than the private car, thereby helping to reduce transport related emissions and traffic congestion.

Criteria

Credits	
2	Where evidence provided demonstrates that the number of parking spaces provided for the building has been limited.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Second Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team confirmed that the development would not achieve the minimum number of car parking spaces required and as such this credit is withheld.

Transport
Tra 8 – Deliveries and manoeuvring

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To ensure that safety is maintained and disruption due to delivery vehicles minimised through well-planned layout and access to the site.

Criteria

Credits	
1	Where evidence provided demonstrates that vehicle access areas have been designed to ensure adequate space for manoeuvring delivery vehicles and provide space away from manoeuvring area for storage of refuse skips and pallets.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	"As Built Site Plan", Drawing No. 10/036/AB01, C4 Consulting, May 2014
2	E-mail from Tommy Taylor at C4 Consulting, Ref: TCB Clywedog Road South, Wrexham, 31st October
3	Section Tra 8, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

A copy of an As Built site plan has been provided, which demonstrates that an area has been set aside to accommodate the turning circle of a large HGV and shows that there are sufficient areas of hardstanding to provide areas dedicated for storage of waste and pallets. There is also sufficient space to allow for adequate provision of waiting areas for waiting vehicles.

The site plan confirms that the delivery routes and areas are not accessed through any car parking areas and do not cross or share any pedestrian routes.

An e-mail has been provided from the Architect which confirms that as the development is an industrial warehousing unit, it is expected that HGV's and delivery vans are likely to require frequent access to the site. It has been demonstrated on the site plans that there is adequate provision for these vehicles to access the site without the need for complex manoeuvres.

It was confirmed at the post construction site inspection that a compliant delivery area has been provided in accordance with the credit requirements.

As the development meets the requirements for manoeuvring vehicles, this credit may be awarded.

Water

Water
Wat 1 – Water Consumption

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**1**	**1**	**1**	**2**

Number of credits achieved:	**1**

Aim

To minimise the consumption of potable water in sanitary applications by encouraging the use of low water use fittings.

Criteria

Credits	
3	Where evidence provided demonstrates that the specification includes taps, urinals, WCs and showers that consume less potable water in use than standard specifications for the same type of fittings.

Schedule of Evidence

2 of 3 Credits achieved *(For full explanation please refer to Validation Statement)*	
Ref:	
1	"As Built GA Floor Plan Accommodation Block", Drawing No. 10/036/AB02, C4 Consulting, May 2014
2	Clause 4.11 Incoming Mains Cold Water Services, Mechanical Services Performance Specification, KGA Partnership, October 2012
3	Manufacturers Details, Option lever WC, Twyfords Bathrooms, no date
4	BREEAM Wat 1 Water Consumption Calculator, 15th February 2013
5	Section Wat 1, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
6	Letter received from Jackie Bedwell of Portal Construction, re: Installed sanitaryware, December 11th 2013.

Validation Statement

As Built drawings have been provided confirming the location of all sanitary facilities within the development, including WCs, sinks and showers.

Clause 4.11, Incoming Mains Cold Water Services (ref 2), from the mechanical specification has been provided which details the specification and water consumption of the following sanitary appliances:

Appliance:	**Water Consumption:**
WCs	6/4l dual flush (flush volume)
Urinals	2 l flush (per bowl)
Taps	4l/min at delivered water pressure (flow rate)
Showers	9l/min at delivered water pressure (flow rate)

The specification clause also confirms that the dual flush WC's will be complete with appropriate user signage and instructions. The development does not contain any grey water or rainwater harvesting.

Confirmation has been provided by the lead contractor of the installed sanitaryware including product details and achieved flowrates. In addition to this manufacturers details have also been provided for the sanitaryware. The following products have been installed:

WC (ref 3): Part Number : OT1148 - Suite/Series : Option - Category : WCs - Sub Category : Close CoupledOT2421 - Option Cistern, Dual Flush, Lever 6/4L. Urinals :S6100 Sanura 50cm wall urinal installed with automatic flushing valves, auto cistern and cistermiser (default value 1.5l / use). Taps: Boss Non Concussive – flow restricted to 4l/minute. Showers: 9l/minute

At the post construction stage the assessor was able to confirm the installation of the above sanitaryware with the appropriate flowrates.

The water consumption for the development has been determined by entering the above flow rates/flush volumes into the BREEAM assessor's Wat 1 Water Consumption calculator. The inputted information confirms annual water consumption per person 5.07m^3 per year. This falls in the range of 4.5 - 5.5m^3 per person per year for which one credit can be awarded.

Water
Wat 2 – Water meter

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**1**	**1**	**1**	**1**

Number of credits achieved:	**1**

Aim

To ensure water consumption can be monitored and managed and therefore encourage reductions in water consumption.

Criteria

Credits	
1	Where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Clause 4.11 Incoming Mains Cold Water Services, Mechanical Services Performance Specification, KGA Partnership, October 2012
2	As fitted "Office Area TCB Wrexham, Heating, Ventilation, Sanitary & Plumbing", Drawing No. 27545 1, Gradwood Heating, Ventilation & Air Conditioning Systems, February 2013
3	Technical Data Sheet, 20mm Single Jet Water Meter, Pulsed option, No date.
4	Section Wat 2, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

Clause 4.11 of the mechanical specification, Incoming Mains Cold Water Services, confirms that the development will be fitted with a pulsed output water meter on the incoming water main to the development.

An As Fitted mechanical layout drawing has been provided which confirms the location of all incoming water supplies to the development and demonstrates that water meter with a pulsed output will be fitted to the incoming water main.

A copy of the manufacturer's technical data sheet for the installed water meter has been provided by the M&E contractor.

At the post construction stage it was confirmed by the assessor that a water meter has been installed which has a pulsed output. The water meter is located in an accessible, easily readable location and wall mounted.

Exemplary Level Credits:
The mechanical services drawings confirm that due to the limited water usages within the development the requirements for additional water metering are not practical and therefore the exemplary credit has not been achieved.

Water
Wat 3 – Major leak detection

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To reduce the impact of major water leaks that may otherwise go undetected.

Criteria

Credits	
1	Where evidence provided demonstrates that a leak detection system is specified or installed on the buildings water supply.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	

Validation Statement

This credit has not been achieved.

Water
Wat 4 – Sanitary supply shut-off

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To reduce the risk of minor leaks in toilet facilities.

Criteria

Credits	
1	Where evidence provided demonstrates that proximity detection shut-off is provided to the water supply to all toilet areas.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Clause 4.16 Sanitary Supply Shut Off ,Tension Control Bolts Ltd Mechanical Services Performance Specification, KGA Partnership, October 2012
2	AS FITTED “Heating, Ventilation, Sanitary & Plumbing, Office Area", Drawing No. 27545 1 AO, Gradwood Heating, Ventilation, Air Conditioning Systems, February 2012
3	Section Wat 4, Post Construction Review Assessor’s Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

Clause 4.16 ‘Sanitary Supply Shut Off’ from the mechanical specification has been provided which confirms that solenoid valves are to be installed on the water supply to each toilet area in the building and that the flow of water through these supplies is controlled by a link to an infra-red movement detector within each toilet facility.

As Fitted Drawings have been provided from the M&E contractor which demonstrate that the incoming water supply to all sanitary areas are controlled by a solenoid valve operated via a ceiling mounted PIR detector. The drawing also shows the location of the toilet facilities.

It was confirmed by the assessor (with photographic evidence) at the post construction review that appropriate proximity detection controls have been installed.

This credit has been achieved.

Materials

Materials
Mat 1 – Materials specification

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**2**

Aim

To recognise and encourage the use of construction materials with a low environmental impact over the full life cycle of the building.

Criteria

Credits	
2	The credits are determined using the *Green Guide to Specification* ratings for the major building elements.

Schedule of Evidence

2 of 2 Credits achieved *(For full explanation please refer to Validation Statement)*	
Ref:	
1	"Clywedog Road South, Wrexham Industrial Estate, As Built Elevations", Drawing No. 10/036/AB/02, C4 Consulting, May 2014
2	"Roof Plan, Clywedog Road (Wrexham), Drawing No. 1978 GA1, G.M. Services Ltd, October 2012
3	BREEAM Mat 1 Materials Specification Calculator, 12th March 2013
4	Section Mat 1, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

The BREEAM Materials Calculator has been completed using information that has been taken from “As Built” plan and elevation drawings, along with the architectural specification. The construction materials used within the development have been compared against the Green Guide to Specification to establish their ratings.

The table below confirms the areas and construction materials that have been used in the development:

Element	Element Construction	Green Guide to Specification Reference	Green Guide Rating	Area of Element (m^2)
External Walls	Coated aluminium composite profiled panel with pentane blown PUR/PIR insulation and steel liner on steel support, structural steel frame with no internal finish	1206600002	A	2189.45
Roof	Galvanised steel rafters and joists, double skin built up profiled roof cladding (coated aluminium inner and outer skin, insulation)	1212550002	A	1978.36

The above information, when entered into the Mat 1 Materials Calculator, confirms that a total of 4.00 points are achieved in the calculator and therefore 2 credits may be awarded in this section

At the post construction stage the assessor confirmed at site inspection that the building has been constructed using the materials as specified above. The assessor was able to collate photographic evidence to confirm the use of the above materials.

2 credits have been achieved

Materials
Mat 2 – Hard landscaping and boundary protection

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

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.

Criteria

Credits	
1	Where evidence provided demonstrates that at least 80% of the combined area of external hard landscaping and boundary protection specifications achieve an A or A+ rating, as defined by the *Green Guide to Specification*.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**

Validation Statement

This credit has not been achieved.

Materials
Mat 3 – Reuse of building facade

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage the in-situ reuse of existing building façades.

Criteria

Credits	
1	Where evidence provided demonstrates that at least 50% of the total final façade (by area) is reused in situ and at least 80% of the reused façade (by mass) comprises in-situ reused material.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team confirmed that this would be an entirely new build development and therefore this credit would not be pursued.

Materials
Mat 4 – Reuse of building structure

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage the reuse of existing structures that previously occupied the site.

Criteria

Credits	
1	Where evidence provided demonstrates that a design reuses at least 80% of an existing primary structure and, for part refurbishment and part new build, the volume of the reused structure comprises at least 50% of the final structure's volume.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team confirmed that this would be an entirely new build development and therefore this credit would not be pursued.

Materials
Mat 5 – Responsible sourcing of materials

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**3**

Aim

To recognise and encourage the specification of responsibly sourced materials for key building elements.

Criteria

Credits	
3	Up to 3 credits are available where evidence provided demonstrates that 80% of the assessed materials in the following building elements are responsibly sourced: a. Structural Frame b. Ground floor c. Upper floors (including separating floors) d. Roof e. External walls f. Internal walls g. Foundation/substructure h. Staircase Additionally 100% of any timber must be legally sourced.

Schedule of Evidence

3 of 3 Credits achieved	
Ref:	
1	"Clywedog Road South, Wrexham Industrial Estate, As Built Elevations", Drawing No. 10/036/AB/02, C4 Consulting, May 2014
2	"Roof Plan, Clywedog Road (Wrexham), Drawing No. 1978 GA1, G.M. Services Ltd, October 2012
3	Metsec-bes-6001-certificate, BES 582 737, 23rd January 2013
4	Metsec PLC ISO 14001 Certificate No. FM 10201, 18th December 2009
5	Hansons Concrete BES 6001 Certificate, Ref No. CPRS 00028, 30th June 2001
6	Eoroclad, ISO 14001 certificate, EMS 76540, 3rd December 2003
7	British Gypsum ISO 14001 Certificate No. EMS543324, 11th October 2010
8	Mat 5 Responsible Sourcing of Materials Calculator, 24th October 2011
9	Completed Mat 5 Checklist, tension Control Bolts, Portal Construction, 2013
10	Examples of procurement of sustainable timber certificates, Portal Construction, 2013

Validation Statement

As Built floor plans, elevation and section drawings have been provided which include detailed descriptions of each applicable element, the constituent materials, the location of the material and the amount used.

A copy of a materials schedule was provided from the main contractor, Portal Construction, which details the percentage of each material used within the development as well as the source of each material.

For all materials used on site, the design team have provided the environmental management system certification certificates.

The information was inputted into the Mat 5 Responsible Sourcing for Materials calculator in line with the BREEAM Mat 5 Calculation Procedure. The information that was included in the calculator, along with further details of any responsible sourcing information is summarised in the table below:

Building Element:	Type of Construction:	Construction Material:	Percentage	EMS Tier:	EMS Certification Information:
Structural Frame	Steel Frame	Steel Frame Metsec	100%	Tier 1	ISO 14001 BES6001 Very Good
Ground Floor	In Situ Concrete	Concrete	85%	Tier 1	BES 6001 (Very Good) (Hanson's Concrete)
		Mesh Reinforcement	10%	N/A	Capital Reinforcing (No Information)
		Visqueen Membrane	5%	N/A	Capital Reinforcing (No Information)
Roof	Galvanised steel rafters and joists, composite profiled roof cladding (steel inner lining, pentane blown PUR/PIR insulation, coated steel outer skin)	Coated Outer Steel Sheet	61%	Tier 4	ISO 14001 (Euroclad)
		Inner Steel Section	20%	Tier 4	ISO 14001 (Euroclad)
		Light Steel Structure	19%	x	No Information
External Walls 1	Coated steel built up profiled panel with insulation and steel liner on steel support, structural steel frame with no internal finish	Coated outer steel sheet	67%	Tier 4	ISO 14001 (Euroclad)
		Inner steel section	24%	Tier 4	ISO 14001 (Euroclad)
		Light steel structure	9%	x	No information

External Walls 2	Coated steel built up profiled panel with insulation and steel liner on steel support, structural steel frame with no internal finish	Coated outer steel sheet	67%	Tier 4	ISO 14001 (Euroclad)
		Inner steel section	24%	Tier 4	ISO 14001 (Euroclad)
		Light steel structure Steel Section	9%		No Information
Internal Walls	Dense Sold Blockwork with paint	Dense Concrete Block	82%	Tier 4	Thomas Armstrong Concrete Blocks
		Plasterboard	13%	Tier 4	ISO14001 (British Gypsum Plasterboard)
		Plaster	5%	N/A	No Information
Foundation / Sub-structure	In Situ Concrete	Concrete	95%	Tier 1	BES 6001 (VG) (Hanson's Concrete)
		Mesh Reinforcement	5%	N/A	Capital Reinforcing (No Information)
Staircases	None Present	N/A	N/A	N/A	N/A

At the post construction stage an email was received from the lead contractor which confirmed that all timber had been procured from a sustainable source and included certificates for all timber procured. The certificates confirm that that all temporary timber used on site was 100% legally sourced (not on the CITES list) and that all timber was responsibly sourced from suppliers who hold full FSC or PEFC certification.

When the above information was entered into the BREEAM calculator, it confirms that a total of 12.00 points are achieved. Based on 7 building elements being present within the building, this allows 3 credits to be awarded.

Materials
Mat 6 – Insulation

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**2**

Aim

To recognise and encourage the use of thermal insulation which has a low embodied environmental performance relative to its thermal properties and has been responsibly sourced.

Criteria

Up to two credits are available as follows:

Credits	
1	Where evidence provided demonstrates that thermal insulation products used in the building have a low embodied impact relative to their thermal properties, determined by the *Green Guide to Specification* ratings.
1	Where evidence provided demonstrates that thermal insulation products used in the building have been responsibly sourced.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Second Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	"Clywedog Road South, Wrexham Industrial Estate, As Built Elevations", Drawing No. 10/036/AB/02, C4 Consulting, May 2014
2	"Roof Plan, Clywedog Road (Wrexham), Drawing No. 1978 GA1, G.M. Services Ltd, October 2012
3	Clywedog Road, Ambient Checklist, Mat 6, Portal Construction, 17th June 2013
4	EMS-14001-Certificate-Isover-UK-Expires-20150505, Isover, 5th October 2009

Validation Statement

The volume and specification of all insulation used in the development has been confirmed by the design team through the provision of elevation drawings and schedules of building services insulation. Manufacturer's information for the insulation specified has also been provided, allowing the assessor to complete the Mat 6 calculator. Green Guide ratings for all insulants specified have been taken from the website www.thegreenguide.org.uk.

The following values have been entered into the BREEAM Mat 6 Insulation Calculator, based on the information provided:

Insulation Type	EMS Tier	Area	Thickness	Thermal Conductivity	Green Guide Rating
Isover Cladding Mat 40 815320001	14001 Tier 3 (recycled content)	External Walls $2000m^2$ $360m^2$	180mm	0.040	A+
Isover Cladding Mat 40 815320001	14001 Tier 3 (recycled content)	Roof $3450m^2$ $828m^2$	240mm	0.040	A+
Armacell (building services)		Armacell Class O sections $1.5m^3$	(pipe insulation)	0.036	unknown

It was confirmed on the drawings that no ground floor insulation was to be installed in the development

The calculator confirms that the development achieves an Insulation Index of 2.966. This equates to 1 credit being awarded in the first section.

Confirmation was provided by the manufacturer that the Wall and roof Insulation is Isover Cladding Mat. Further technical information has been provided which confirms that The Isover product is made form >80% recycled contact and has 14001 certification. Details of the building services insulation was also provided to the assessor. The Isover insulation is proportionally in excess of 99% of the total insulation used on the scheme.

These details were entered into the MAT6 calculator which allows the second credit to be achieved.

Materials
Mat 7 – Designing for robustness

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage adequate protection of exposed parts of the building and landscape, therefore minimising the frequency of use of replacement materials.

Criteria

Credits	
1	Where protection is given to vulnerable parts of the building such as areas exposed to high pedestrian traffic, vehicular and trolley movements.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

This credit has not been achieved.

Waste

Waste
Wst 1 – Construction site waste management

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**4+ 1**

Aim

To promote resource efficiency via the effective and appropriate management of construction site waste.

Criteria

Credits	
3	Up to three credits are available where evidence provided demonstrates that the amount of non-hazardous construction waste (m^3/100m^2 or tonnes100m^2) generated on site by the development is the same as or better than good or best practice levels.
1	Where evidence provided demonstrates that a significant majority of non-hazardous construction waste generated by the development will be diverted from landfill and reused or recycled.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Second Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Third Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Fourth Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Exemplary Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Clause 4.3 Materials & Workmanship, Employer's Requirements, Contractor's Proposals and Contract Conditions, Unit 1 Clywedog Road, C4 Consulting, October 2011
2	Completed Site Waste Management Plan, Tension Control Bolts, Portal Construction 2013.

Validation Statement

A copy of the Employers' Requirements document has been provided. The Employers' Requirements' confirms that the contractor will be required to develop a site waste management plan which includes, as a minimum, information relating to the following topics:

- The target benchmark for resource efficiency i.e. m3 of waste per 100m2 or tonnes of waste per 100m2
- Procedures and commitments for minimising non-hazardous waste in line with the benchmark
- Procedures for minimising hazardous waste
- Procedures for monitoring, measuring and reporting hazardous and nonhazardous site waste
- Procedures for sorting, reusing and recycling construction waste into defined waste groups either on site or through a licensed external contractor
- The name or job title of the individual responsible for implementing the above.

As the development is an entirely new build construction on a site that was not occupied by existing structures prior to construction, it is not required for a pre-demolition / refurbishment audit to be awarded.

In addition, the Employers' Requirements documents includes a requirement on the contractor to set and achieve the following waste efficiency targets:

Amount of Waste Generated per 100m^2 of GIA	
m^3	Tonnes
<9.2	<4.7

In addition, it is confirmed the in the Employers' Requirements that the contractor will be required to set targets for the amount of waste that will be recycled from site or otherwise diverted from landfill. This confirms that at least 75% by volume (or 65% by weight) will be diverted from landfill by any of the following means:

a. Reused on site (in-situ or for new applications)
b. Reused on other sites
c. Salvaged/reclaimed for reuse
d. Returned to the supplier via a 'take-back' scheme
e. Recovered from site by an approved waste management contractor and recycled.

A copy of the main contractors Site Waste Management Plan has been provided by the lead contractor. This includes target benchmarks for resource efficiency in terms of amount of waste that will generated per 100m^2 of the scheme.

It is confirmed in the SWMP that the plan has been implemented on site by Mike Vickers of Portal Construction, who was responsible for monitoring the amount of waste produced on site throughout construction. In addition to the benchmark figures for the generation of waste, the Site Waste Management Plan also contains a schedule of waste minimisation decisions, outlining how the contractor are proposing to reduce the amount of non-hazardous waste generated (in line with the stated benchmarks), along with procedures in place for minimising hazardous waste. The Site Waste Management plan addresses all the points as required by BREEAM, including the following:

a. The target benchmark for resource efficiency i.e. m^3 of waste per 100m^2 or tonnes of waste per 100m^2
b. Procedures and commitments for minimising non-hazardous waste in line with the benchmark
c. Procedures for minimising hazardous waste
d. Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste
e. Procedures for sorting, reusing and recycling construction waste
f. The name or job title of the individual responsible for implementing the above.

The benchmarks given in the site waste management plan confirm that, based on the buildings GIA of 1929 m^2, the predicted waste generated will equate to 111.7m^3, with waste output reduced to meet this target in line with the recommendations of the contractors waste management policy.

The site waste management plan also includes targets for the total amount of each waste stream that is to be recycled, reused or otherwise diverted from landfill. The site waste management plan confirms that the waste removed from site will be separated and recycled by individual waste stream.

At the post construction stage a completed copy of the SWMP and associated summary datasheets Have been provided which confirm:

- The total waste arising for the development.
- Comparison of the total waste arising against the benchmark
- Quantities of waste by groupings
- The amount and proportion of waste arising that was reused, recycled and landfilled.

The total waste produced from construction equates to 1.00m^3 / 100m2 which is sufficient to obtain 3 credits.

In addition it was confirmed by the completed SWMP that 94.6% of all waste was recovered from site by an approved waste management contractor and recycled.

This demonstrates that at least 80% by volume of all waste generated on site will be diverted from landfill and therefore the final credit in this section may be awarded.

The exemplary credit has also been achieved.

4 out of the 4 available credits have been achieved plus an additional exemplary credit.

Waste
Wst 2 – Recycled aggregates

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage the use of recycled and secondary aggregates in construction, thereby reducing the demand for virgin material.

Criteria

Credits	
1	Where evidence provided demonstrates the significant use of recycled or secondary aggregates in 'high-grade' building aggregate uses.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	

Validation Statement

This credit has not been awarded.

Waste
Wst 3 – Recyclable waste storage

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**1**	**1**

Number of credits achieved:	**0**

Aim

To recognise the provision of dedicated storage facilities for a building's operational-related recyclable waste streams, so that such waste is diverted from landfill or incineration.

Criteria

Credits	
1	Where a central, dedicated space is provided for the storage of the building's recyclable waste streams.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	

Validation Statement

This credit is withheld.

Waste
Wst 4– Compactor baler

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To recognise and encourage the provision of facilities which enable efficient and hygienic waste sorting and storage.

Criteria

Credits	
1	Where evidence provided demonstrates that either an industrial waste compactor or baler is installed for compacting/baling waste materials generated on site and a. A water outlet is provided for cleaning b. The development achieves the BREEAM credit for storage of recyclable waste.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

The design team confirmed that this credit would not be pursued.

Land Use & Ecology

Land Use & Ecology
LE1 – Reuse of land

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	1

Aim

To encourage the reuse of land that has been previously developed, and discourage the use of previously undeveloped land for building.

Criteria

Credits	
1	Where evidence is provided to demonstrate that the majority of the footprint of the proposed development falls within the boundary of previously developed land.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Phase 1 Environmental Assessment, Clywedog Road South, Wrexham Industrial Estate, TC Bolts, WSP Environmental Ltd, June 2010
2	As Built Site Plan, Phase 1 Unit 2, TCB Clywedog Road South, 10-036 AB01, C4 Consulting 6-5-14

Validation Statement

A copy of a phase 1 Environmental Assessment for the development has been provided, which examines the existing site on which the development is to be constructed.

The assessment confirms that, until its demolition in 1979, the site had been occupied by a munitions factory and railway sidings along one boundary of the site. The report includes a number of site plans which confirm the layout of the site prior to development and in various points in history.

An As Built site plan has been provided which demonstrates the layout of the site post development, confirming that it has been constructed on previously developed areas of the site.

From the report, it is confirmed that >75% of the development was developed on the site of previously developed land and therefore this credit may be awarded.

Land Use & Ecology
LE2 – Contaminated land

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To encourage positive action to use contaminated land that otherwise would not have been remediated and developed.

Criteria

Credits	
1	Where evidence is provided to demonstrate that the land used for the new development has, prior to development, been defined as contaminated and adequate remedial steps have been taken to decontaminate the site prior to construction.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

This credit is witheld.

Land Use & Ecology
LE3 – Ecological value of site and protection of ecological features

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

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.

Criteria

Credits	
1	Where evidence provided demonstrates that the site's construction zone is defined as land of low ecological value and all existing features of ecological value will be fully protected from damage during site preparation and construction works.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Ref:	
N/A	No references as this credit is not being pursued.

Validation Statement

An ecologist was appointed by the contractor, however they were not able to confirm within their report that the site was of low ecological value and therefore this credit has not been awarded.

Land Use & Ecology
LE4 – Mitigating Ecological Impact

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**1**	**1**	**1**

Number of credits achieved:	**1**

Aim

To minimise the impact of a building development on existing site ecology.

Criteria

Credits	
1	Where evidence provided demonstrates that the change in the site's existing ecological value, as a result of development, is *minimal*.
2	Where evidence provided demonstrates that there is *no negative change* in the site's existing ecological value as a result of development.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Completed and signed copy of Checklist A6, Avian Ecology Ltd, November 2011.
2	Figure 1 Site Before Development, C109 Proposed industrial development, land adjacent to Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal, Marches Ecology, 23-6-10.
3	Figure 2 Site After Development, Avian Ecology, 10-2-2011
4	Wrexham Industrial Estate, Report Verification, Robert Andrew Logan MSc MCIEEM, Avian Ecology, 16th August 2013.
5	Section LE4, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

Copies of existing and proposed site plans (references 2 and 3) have been provided to the assessor. The plans show the landscape and vegetation plot types along with the areas of vegetation plot types.

A copy of a completed BREEAM Ecologist checklist has been provided to the assessor. The checklist has been completed by Stacey Whiteley BSc (Hons.) ACIEEM of Avian Ecology Ltd. Stacey is an associated member of IEEM.

Confirmation has also been provided that the ecologist checklist and recommendations have been verified by Robert Andrew Logan MSc MCIEEM of Avian Ecology. Conformation has also been provided that Robert Andrew Logan meets the requirements of a Suitably Qualified Ecologist in accordance with Section B1.

Robert has a BSc in Applied Zoology and MSc in Ecology and Environmental Management, over nine years' experience (including the last 5 years) and is a full member of the Chartered Institute of Ecology and Environmental Management.

It is also confirmed that Robert has read and reviewed the BREEAM report and found it to:

- Represent sound industry practice;
- Report and recommend correctly, truthfully and objectively;
- Be appropriate given the local site conditions and scope of works proposed; and,
- Avoid invalid, biased and exaggerated statements.

The report has been developed on the basis of the ecologist's site inspection which was undertaken prior to the start of clearance works on the site.

The report provides confirmation of the number of species found on site prior to and following development and allows the total change in the number of species to be calculated, using Ecology Calculator 2.

The following values are given for the number of species on site:

Plot Type	Area of Plot Type [m²]		Species [No.] (from Table 2 or a SQE*)		Species x Area of Plot Type
Neutral Grassland	20,000	x	16	=	320,000
Tall Herb Vegetation	2,000	x	11	=	22,000
Continuous Scrub	3,000	x	7	=	21,000
(1) Total site area =	25,000m2				363,000
Species per plot type before development = Total species x area of plot type / Total site area = (2)/(1) =					14.52

b. Calculation of *ecological value* after development:

Plot Type	Area of Plot Type [m²]		Species [No.] (from Table 2 or a SQE*)		Species x Area of Plot Type
Neutral Grassland	7,500	x	16	=	120,000
Scrub and tree and hedgerow planting	2,500	x	14	=	35,000
Hard Landscaping and buildings	15,000	x	0	=	0
(1) Total site area =	25,000m2				155,000
Species per plot type before development = Total species x area of plot type / Total site area = (2)/(1) =					6.2

c. Change in *ecological value* (c = b – a):

Total no. of species after development		Total no. species before development		Total change in species
14.52	-	6.2	=	-8.32

.
The above values confirm that a total change in species of -8.32 has been achieved overall and therefore 1 credit is achieved.

In addition to this it was confirmed at the post construction site inspection that that the footprint or orientation of the developed area has not altered from that confirmed in the design stage evidence.

Land Use & Ecology
LE5 – Enhancing site ecology

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To recognise and encourage actions taken to maintain and enhance the ecological value of the site as a result of development.

Criteria

Credits	
1	Where the design team (or client) has appointed a suitably qualified ecologist to advise and report on enhancing and protecting the ecological value of the site; and implemented the professional's recommendations for general enhancement and protection of site ecology.
2	Where there is a positive increase in the ecological value of the site of up to (but not including) 6 species.
3	Where there is a positive increase in the ecological value of the site of 6 species or greater.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Completed and signed copy of Checklist A6, Avian Ecology Ltd, November 2011.
2	Figure 1 Site Before Development, C109 Proposed industrial development, land adjacent to Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal, Marches Ecology, 23-6-10.
3	Figure 2 Site After Development, Avian Ecology, 10-2-2011
4	Wrexham Industrial Estate, Report Verification, Robert Andrew Logan MSc MCIEEM, Avian Ecology, 16th August 2013.
5	Section LE5, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

A copy of a completed BREEAM Ecologist checklist has been provided to the assessor. The checklist has been completed by Stacey Whiteley BSc (Hons.) ACIEEM of Avian Ecology Ltd. Stacey is an associated member of IEEM.

Confirmation has also been provided that the ecologist checklist and recommendations have been verified by Robert Andrew Logan MSc MCIEEM of Avian Ecology. Conformation has also been provided that Robert Andrew Logan meets the requirements of a Suitably Qualified Ecologist in accordance with Section B1. Robert has a BSc in Applied Zoology and MSc in Ecology and Environmental Management, over nine years' experience (including the last 5 years) and is a full member of the Chartered Institute of Ecology and Environmental Management. It is also confirmed that Robert has read and reviewed the BREEAM report and found it to:

- Represent sound industry practice;
- Report and recommend correctly, truthfully and objectively;
- Be appropriate given the local site conditions and scope of works proposed; and,
- Avoid invalid, biased and exaggerated statements.

The report has been developed on the basis of the ecologist's site inspection which was undertaken prior to the start of clearance works on the site. The report includes a number of recommendations for improving the ecology on site, including:

- Hedgerow planting
- Trees planting
- Creation of a pond;
- Maintenance of ditch & pond
- A strip of grassland will be retained along boundaries
- Bird & bat nest boxes
- Wildflower grassland

A landscape plan highlighting the implementation of the ecologist's enhancement recommendation within the landscaping of the scheme has been provided confirming that the main contractor has been required to implement the ecologist's recommendations.

In addition, a letter has been provided from the main contractor which confirms that the contractor has included the recommendations of the ecologist in line with the requirements of the ecologists report. In addition to this it was confirmed at the post construction site inspection that that the recommendations of the ecology report have been implemented.

As the recommendations of the suitably qualified ecologist have been implemented, the first credit in this section can be awarded.

1 credit may be awarded in this section.

Land Use & Ecology
LE6 – Long term impact on biodiversity

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	-	-	-	-	-

Number of credits achieved:	2

Aim

To minimise the long term impact of the development on the site's, and surrounding area's, biodiversity.

Criteria

Credits	
1	The client has committed to achieving the mandatory requirements listed below and at least two of the additional requirements.
2	The client has committed to achieving the mandatory requirements listed below and at least four of the additional requirements.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Completed and signed copy of Checklist A6, Avian Ecology Ltd, November 2011.
2	Figure 1 Site Before Development, C109 Proposed industrial development, land adjacent to Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal, Marches Ecology, 23-6-10.
3	Figure 2 Site After Development, Avian Ecology, 10-2-2011
4	Wrexham Industrial Estate, Report Verification, Robert Andrew Logan MSc MCIEEM, Avian Ecology, 16th August 2013.
5	Section LE6, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
6	Programme of works for TCB Phase 1, Portal Construction Ltd, 2012/13

Validation Statement

A copy of a completed BREEAM Ecologist checklist has been provided to the assessor. The checklist has been completed by Stacey Whiteley BSc (Hons.) ACIEEM of Avian Ecology Ltd. Stacey is an associated member of IEEM.

Confirmation has also been provided that the ecologist checklist and recommendations have been verified by Robert Andrew Logan MSc MCIEEM of Avian Ecology. Conformation has also been provided that Robert Andrew Logan meets the requirements of a Suitably Qualified Ecologist in accordance with Section B1. Robert has a BSc in Applied Zoology and MSc in Ecology and Environmental Management, over nine years' experience (including the last 5 years) and is a full member of the Chartered Institute of Ecology and Environmental Management. It is also confirmed that Robert has read and reviewed the BREEAM report and found it to:

- Represent sound industry practice;
- Report and recommend correctly, truthfully and objectively;
- Be appropriate given the local site conditions and scope of works proposed; and,
- Avoid invalid, biased and exaggerated statements.

The above completed checklist confirms that a suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site. The checklist has been developed on the basis of the ecologists site inspection which was undertaken prior to the start of clearance works on the site.

The completed checklist confirms that all works being undertaken comply with all relevant UK and EU legislation relating to protection and enhancement of ecology during the design and construction process.

The ecologist has produced a landscape management plan that will be handed over to the building occupants. It confirms that the landscape management plan covers the management of any protected features on site the management of any new, existing or enhanced habitat. In addition, the landscape management plan will include a reference to the current or future site level.

All the mandatory requirements of this section have been met.

It was confirmed that the following 4 additional requirements will / have been implemented in the development:

Ad. Req. 1
A letter has been provided from the main contractor confirms that Mike Vickers of Portal Construction was appointed as Biodiversity Champion for the development. Mike Vickers was the project manager and therefore had sufficient influence to ensure that any detrimental impacts on site biodiversity were minimised in line with the ecologist's recommendations and current best practice. His role as biodiversity champion included regular inspections of the site to ensure protection measures were in place, keeping regular records of factors which could have effected the ecology and ensuring that the site workforce were made aware of the importance of protecting on site ecology.

At the post construction stage a copy of the relevant sections of the site log book has been provided which demonstrate details of any action / events taken by the biodiversity champion.

Ad. Req. 2
A letter has been provided from the lead contractor Portal Construction which confirms that comprehensive training of the site workforce was undertaken with regards to ecology. This was undertaken as part of the site induction and included project specific details from the ecologist's report and on current best practice relating to avoiding damage to site ecology.

At the post construction stage a copy of the relevant sections of the training records have been provided confirming record of training undertaken by the site workforce, who delivered & developed the training and the scope of the training delivered.

Ad. Req. 3
The contractor could not confirm that they recorded all the actions taken to protect biodiversity on site.

Ad. Req. 4
The completed checklist A6 provides details on the creation of a new ecologically valuable habitat. The attached landscaping plan has been developed in accordance with the ecologists recommendations for the creation of such a habitat. The ecologist has approved the proposed site plan and has confirmed that it is in line with their report and will enhance biodiversity. In addition to the above the landscape management plan refers to the new habitat and requires the occupier to maintain and enhance the biodiversity of the new habitat.

At the post construction stage it was confirmed by the assessor at the site inspection that the ecology measures have been installed in accordance with the recommendations of the ecology report.

Ad Req 5
It has been confirmed by the lead contractor that they programmed site works to minimise disturbance to wildlife. All site preparation, ground works, and landscaping were scheduled at an appropriate time of year to minimise disturbance to wildlife.

A copy of the final project programme was provided which confirms that activities were timed to avoid any impact on site biodiversity in line with the recommendations of a suitably qualified ecologist.

As all 3 of the mandatory requirements and 4 of the additional requirements have been achieved, 2 credits may be awarded in this section.

Pollution

Pollution
Pol 1 – Refrigerant GWP building services

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To reduce the contribution to climate change from refrigerants with a high global warming potential.

Criteria

Credits	
1	Where evidence provided demonstrates the use of refrigerants with a global warming potential (GWP) of less than 5 or where there are no refrigerants specified for use in building services.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
1	Mechanical Services Performance Specification, KGA Partnership, October 2012
2	Section Pol 1, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.

Validation Statement

A copy of the mechanical specification has been provided. The specification confirms that heating will be provided to the office areas only by gas fired boilers.

Section 4, Particular Works of the mechanical and electrical specification does not include any reference to refrigeration. As the building has no refrigerants this credit can be awarded.

It was confirmed by the assessor at the post construction site inspection that the completed building does not contain any refrigerants and therefore the credit is achieved.

Pollution
Pol 2 – Preventing refrigerant leaks

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	-	-	-	-	-

Number of credits achieved:	**1**

Aim

To reduce the emissions of refrigerants to the atmosphere arising from leakages in cooling plant.

Criteria

Credits	
1	Where evidence provided demonstrates that refrigerant leaks can be detected AND that the provision of automatic refrigerant pump down is made to a heat exchanger (or dedicated storage tanks) with isolation valves. Or where there are no refrigerants specified for the development.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*		**No**
1	Mechanical Services Performance Specification, KGA Partnership, October 2012	
2	Section Pol 2, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.	

Validation Statement

A copy of the mechanical specification has been provided. The specification confirms that heating will be provided to the office areas only by gas fired boilers.

The specification does not include any reference to refrigeration. As the building has no refrigerants this credit can be awarded.

It was confirmed by the assessor at the post construction site inspection that the completed building does not contain any refrigerants and therefore the credit is achieved.

Pollution
Pol 4 – NO_x emissions from heating source

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To encourage the supply of heat from a system that minimises NO_x emissions, and therefore reduces pollution of the local environment.

Criteria

Credits	
1	Office & associated areas: Where evidence provided demonstrates that the dry NO_x emissions from delivered space heating energy are ≤70 mg/kWh delivered heating energy or less (at 0% excess O_2).

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*		**Yes**
1	Section Pol 4, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.	
2	Installation and Maintenance Manual, Vailient Ecotech Pro 28, Vailient Ltd, 2013	

Validation Statement

It has been confirmed in a copy of the mechanical and electrical specification that heating will be provided to the office areas via a gas fired boiler.

It was confirmed at the post construction site inspection that heating to the office areas is provided by a Vailiant Ecotech Pro 28 gas fired condensing boiler. A copy of the technical literature for the installed boiler has been provided in the O&M manual (page 64). The stated NOx emissions for the installed boiler are 33.4mg.kWh and therefore the credit is achieved.

The development is being developed as a warehouse and as such the operational area has been designed to be unheated.

The second credit has therefore not been assessed.

Pollution
Pol 5 – Flood risk

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**1**

Aim

To encourage development in low flood risk areas, or to take measures to reduce the impact of flooding on buildings in areas with a medium or high risk of flooding.

Criteria

Credits	
2	Where evidence provided demonstrates that the assessed development is located in a zone defined as having a **low** annual probability of flooding.
1	Where evidence provided demonstrates that the assessed development is located in a zone defined as having a **medium** or **high** annual probability of flooding **AND** the ground level of the building, car parking and access is above the design flood level for the site's location.

One further credit is awarded as follows:

1	Where evidence provided demonstrates that surface water run-off attenuation measures are specified to minimise the risk of localised flooding, resulting from a loss of flood storage on site due to development.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Second Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**
Third Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
1	Unit 2 Proposed Drainage Layout, Clywedog Road South, Wrexham Industrial CL52 100, Tier Consult, October 2011.
2	Letter received from Mike Hughes of Tier Consult, TBC Clywedog Road Industrial Estate, BREEAM Assessment Credit Pol 6, 13th August 2013.
3	Section Pol 6, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
4	Letter received from Jackie Bedwell of Portal Construction, Re Minimising watercourse Pollution, 2nd February 2014.

Validation Statement

The design team could not confirm that a flood risk assessment had been undertaken and therefore the first 2 credits are withheld.

A copy of the site drainage schematic has been provided (ref 1), which confirms all areas at risk of generating watercourse pollution. The drainage plan shows that all hardlandscaping shown is classed as having a high risk of pollution as all areas consist of vehicle manoeuvring areas, goods vehicle waiting areas and roads. This drawing also shows the location of a petrol interceptor in the development, which covers the drainage from all areas at high risk of generating water course pollution.

A letter has been provided from M C Hughes at Tier Consult which confirms that the drainage of the site has been designed in accordance with the requirements of PPG3 and, where appropriate, the relevant chapters of the SUDS manual. In addition to this further confirmation has been provided confirming the storage volume of the attenuation measures and total areas of hard standing and that all calculations have allowed for climate change to be design into the system.

In addition to the above the drainage drawing shows that 100% of all run off will be attenuated on site by the use of attenuation ponds and ditches. The use of attenuation ponds and ditches in the scheme demonstrates effective use of SUDs (Sustainable Urban Drainage System).

A statement has been provided from the lead contractor, Portal Construction, confirming that a copy of the ‘As Built’ drainage drawing will be provided as part of the O&M manuals for the development.

At the post construction site inspection it was confirmed by the assessor that the above attenuation measures have been installed which will result in 100% attenuation on site and therefore the run off rate will be reduced to zero. The assessor was able to confirm the installation of the SUDs attenuation measures.

The third credit is awarded.

Pollution
Pol 6 – Minimising watercourse pollution

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	-	-	-	-	-

Number of credits achieved:	**1**

Aim

To reduce the potential for silt, heavy metals, chemicals or oil pollution to natural watercourses from surface water run-off from buildings and hard surfaces.

Criteria

Credits	
1	Where evidence provided demonstrates that effective on site treatment such as Sustainable Drainage Systems (SUDs) or oil separators have been specified in areas that are or could be a source of watercourse pollution.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Unit 2 Proposed Drainage Layout, Clywedog Road South, Wrexham Industrial CL52 100, Tier Consult, October 2011.
2	Letter received from Mike Hughes of Tier Consult, TBC Clywedog Road Industrial Estate, BREEAM Assessment Credit Pol 6, 13th August 2013.
3	Section Pol 6, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
4	Letter received from Jackie Bedwell of Portal Construction, Re Minimising watercourse Pollution, 2nd February 2014.

Validation Statement

A copy of the site drainage schematic has been provided (ref 1), which confirms all areas at risk of generating watercourse pollution.

The drainage plan shows that all hard landscaping shown is classed as having a high risk of pollution as all areas consist of vehicle manoeuvring areas, goods vehicle waiting areas and roads.

This drawing also shows the location of a petrol interceptor in the development, which covers the drainage from all areas at high risk of generating water course pollution.

In addition to the above the drainage drawing shows that 100% of all run off will be attenuated on site by the use of attenuation ponds and ditches. The use of attenuation ponds and ditches in the scheme demonstrates effective use of SUDs (Sustainable Urban Drainage System).

A letter has been provided from M C Hughes at Tier Consult which confirms that the drainage of the site has been designed in accordance with the requirements of PPG3 and, where appropriate, the relevant chapters of the SUDS manual.

A statement has been provided from the lead contractor, Portal Construction, confirming that a copy of the ‘As Built’ drainage drawing will be provided as part of the O&M manuals for the development.

A site plan drawing provided confirms that there are no areas of liquid or gas storage in the design of the scheme and therefore the points relation to these issues are not required to be assessed.

At the post construction site inspection it was confirmed by the assessor that the above pollution control measures have been installed. The assessor was able to confirm the installation of the petrol interceptor and SUDs attenuation measures.

The assessor was also able to confirm at the site inspection that there were no chemical and gas storage areas installed within the scheme.

As the development has been designed to minimising the risk of watercourse pollution, in line with the requirements of BREEAM, this credit may be awarded.

Pollution
Pol 7 – Reduction of night time light pollution

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	-	-	-	-	-

Number of credits achieved:	**1**

Aim

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.

Criteria

Credits	
1	Where evidence provided demonstrates that the external lighting design is in compliance with the guidance in the Institution of Lighting Engineers (ILE) Guidance notes for the reduction of obtrusive light, 2005.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**Yes**
Ref:	
1	Proposed Pavement Layout, Unit 2 Clywedog Road Industrial Estate, T 11 1034-CL(90)100-P1-Pavement Layout, Tier Consult, October 2011
2	As Installed Ground First Floor Lighting Installation,BM3300-E05, Barlows Ltd, July 2013.
3	Letter received from Jackie Bedwell of Portal Construction, Ref: Clywedog Road – BREEAM Assessment - Credit Pol 7 Reduction of Light Pollution, 14th January 2013
4	Section Pol 7, Post Construction Review Assessor's Site Inspection Report, AEE Ref: 13604, Ambient Energy & Environment, 7th November 2013.
5	Page 103, Section 4.41, Electrical Services Performance Specification, Tension Control Bolts Limited, Clywedog Road South, Wrexham, KGA Partnership, October 2012

Validation Statement

A copy of the proposed site plan has been provided (ref 1). The proposed plan shows the area of the landscaping that will be externally lit as well as nearby properties. In addition to this a copy of the as fitted lighting schematic has been provided showing the installation of the external lighting to the building (ref 2).

A copy of the electrical specification has been provided, which includes a clause confirming that the external lighting to the development will be designed in accordance with the requirements of the ILE's guidance note for the reduction of obtrusive light, 2005.

In addition, it is confirmed that all external lighting associated with the development will be fitted with photocells and timeclocks to control for the presence of daylight and to allow them to be switched off between 2300 and 0700 hours.

The drawings show that no safety or security lighting is being installed to the development.

The drawing also confirms the location of any nearby properties to the development and demonstrates that there are no illuminated adverts / signs associated with the development.

At the post construction stage it was confirmed by the assessor and with photographic evidence that cut off luminaires have been installed to limit spill light. The site inspection also confirmed the installation to timeclock control and photcells.

In addition confirmation has been provided from the lead contractor that the installation of all external lighting systems are in accordance with the compliant design specification and no changes have been made from this specification.

Pollution
Pol 8 – Noise attenuation

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	**0**

Aim

To reduce the likelihood of noise from the new development affecting nearby noise-sensitive buildings.

Criteria

Credits	
1	Where evidence provided demonstrates that new sources of noise from the development do not give rise to the likelihood of complaints from existing noise-sensitive premises and amenity or wildlife areas that are within the locality of the site.

Schedule of Evidence

First Credit achieved? *(For full explanation, please refer to Validation Statement)*	**No**

Validation Statement

This credit has not been achieved.

Innovation

Innovation

Minimum BREEAM Standards					
Rating Level	**P**	**G**	**VG**	**E**	**O**
Min. credits to achieve rating	**-**	**-**	**-**	**-**	**-**

Number of credits achieved:	1

Aim

To provide additional recognition for a procurement strategy, design feature, management process or technological development that innovates in the field of sustainability, above and beyond the level that is currently recognised and rewarded within standard BREEAM issues.

Criteria

A maximum of 10 credits are available in aggregate from any combination of the following:

Credits	
10	Up to ten credits (dependent on building type) are available where evidence provided demonstrates compliance with the Exemplary Performance levels for specific BREEAM issues.
2	Two credits are available where evidence provided demonstrates the use of a *BREEAM Accredited Professional* or *Suitably Qualified BREEAM Assessor* as an integral part of the design team.
10	Up to ten credits are available where evidence provided demonstrates the development and application of *Approved Innovations*.

Schedule of Evidence - Exemplary Performance Levels

BREEAM Issue for which there are exemplary performance levels	Credits Achieved
Man 2 - Considerate Constructors	0
Hea 1 - Daylighting	0
Hea 14 - Office Space (BREEAM Retail & Industrial Schemes only)	0
Ene 1 - Reduction of CO2 emissions	0
Ene 5 - Low or Zero Carbon Technologies	0
Wat 2 - Water Meter	0
Mat 1 - Materials Specification	0
Mat 5 - Responsible Sourcing of Materials	0
Wst 1 - Construction Site Waste Management	1

For assessment reporting (evidence and validation) of the above BREEAM Issues, refer to each individual assessment of that issue within the relevant Building Performance section of this report.

Appendices

BREEAM Assessment Tool and Calculator Print-Outs