BREEAM 2008
Multi Residential Pre- Assessment Report
for a proposed two storey extension at

William Goodenough House





BREEAM 2008 Multi Residential is an assessment method for determining the environmental performance of construction projects.

This document is an initial report compiled after a pre-assessment workshop on 27th January 2010 with the clients Colliers CRE/ Vista Architecture for the extension of Goodenough College's student accomodation Following the meeting, Sustainia has set out the probable credits that can be scored to achieve a 'very good' rating.

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FINAL	22/02/10	Updated Ene5 and Hea9 to show an additional credit following client request at design team meeting on 12/2/10

Contents

Executive Summary

This pre-assessment document sets out the predicted scores that can lead to a BREEAM 2008 multi residential assessment on the proposed Goodenough College extension.

The design team has set the requirement for the BREEAM assessment to score a minimum of 'very good'. To achieve this all elements of the strategy will need to be understood so that all designs / specifications and future documentation, including tenders issued, will include all BREEAM 2008 Multi Residential credits as listed in this document. These elements will require sign off by those responsible for delivery of correct information for the credits sought.

By signing off these items the client representatives of the Goodenough College extension will also be making a commitment to undertake the requirements of the credits as set out in the BREEAM 2008 Multi Residential Technical Guidance. This will be sufficient, along with a covering letter, to be used as an evidence base for the actual design stage BREEAM assessment.

During this pre-assessment we have carried out an evaluation of the risks associated with each credit and have graded the credits accordingly.

The assumed total score (using predicted credits) targeted by the Scheme is 61.30% which equals 'Very Good'. The recommended uplift credits would get the scheme to 71.13%, which is an 'Excellent' rating.

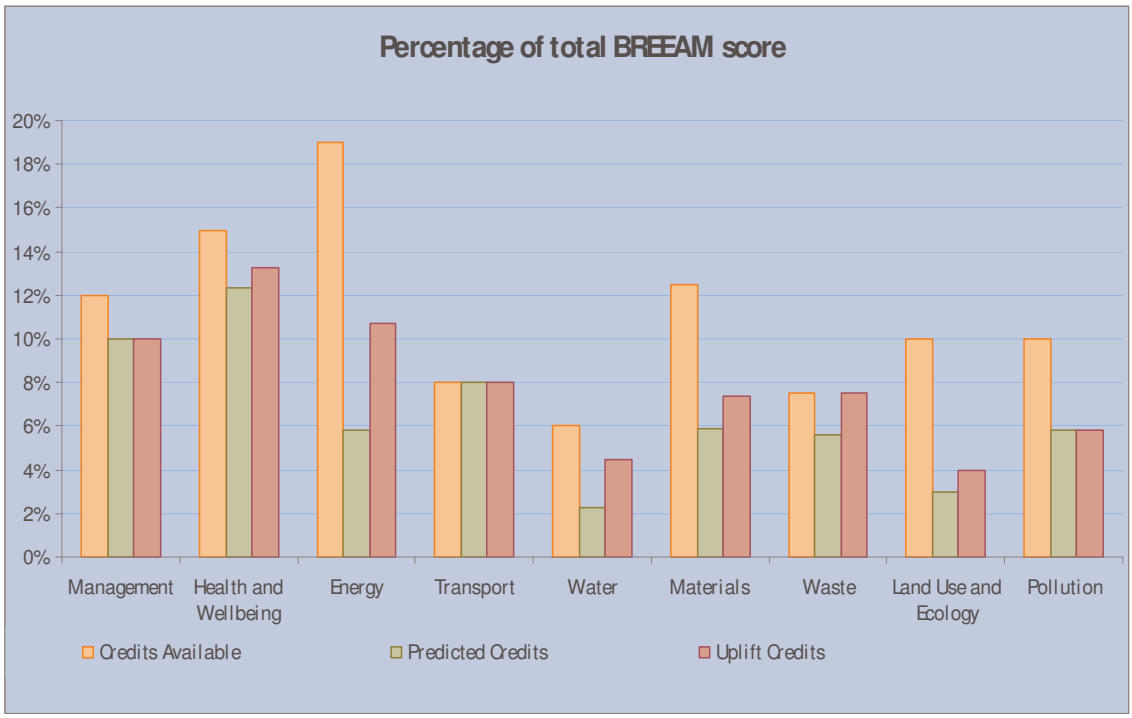
The proposed minimum scores that will be achieved for the building in each credit category are represented in table 0.1 below

Table 0.1

Category	Weighting	Available Credits	Available %age	Predicted credits	Predicted % age	Uplift credits	Uplift %age
Management	1.00	12	12.0%	10	10.0%	10	10.0%
Health and Wellbeing	0.88	17	15.0%	15	13.2%	14	12.3%
Energy	0.83	23	19.0%	9	7.5%	13	10.7%
Transport	0.89	9	8.0%	9	8.0%	9	8.0%
Water	0.75	8	6.0%	3	2.3%	6	4.5%
Materials	0.74	17	12.5%	8	5.9%	10	6.6%
Waste	0.94	8	7.5%	6	5.6%	8	7.5%
Land Use and Ecology	1.00	10	10.0%	3	3.0%	4	3.0%
Pollution	0.83	12	10.0%	7	5.8%	7	5.8%
Innovation	-	10	10	0	0.00%	0	0.00%
Totals		**126**	**100.0%**	**67**	**61.30%**	**81**	**71.13%**

* Predicted credits are assumed achievable according to information supplied at the time of the pre-assessment. This information therefore is for guidance only.
Weighted figures are only approximate and calculations should be made using an approved calculation method.

Fig 0.1 Graphic presentation of credits



Part 1 – Introduction and context

1.1 Document structure

This first part of this document sets the context and objectives for this document and also gives a brief description of the development.

The second section briefly reviews the criteria for evidence and the process that must be followed to achieve BREEAM Multi Residential 2008 very good.

Section three reviews the overall scoring for the Goodenough College development.

Section four offers conclusions and a summary review of those credits required to score 'Very Good' over and above the predicted score of Good.

1.2 Project Description

William Goodenough House is being used by Goodenough College as halls of residence. The proposal for this development is to erect an additional two floors at roof level to the Heathcote Street building and central internal block, together with the alteration of the roof of the East Wing (on Mecklenburgh Street). This work anticipates a further additional 61 units to the existing building.

The main extension is an erection of two new storeys at roof level onto an existing block: the extension is proposed to be a lightweight structure with a slate clad mansard roof with dormer windows to Heathcote Street (to match the appearance of the adjoining roof).

The development will add a further 1555m^2 of internal gross floor area which is to be assessed under BREEAM scheme.

Sustainia have therefore set out a number of baseline credits named as 'predicted credits' (that are achievable at little or no cost) to achieve a 'very good' rating. Alternative credits are identified and named 'uplift credits'. Uplift credits raise the current predicted score to 'excellent', or offer the developer a replacement to targeted credits within the 'predicted' section, in the event of those credits originally thought feasible actually not being attainable.

Sustainia will require written confirmation of which credits are being pursued so that the most cost-effective path is chosen in pursuing the required target during Design Stage.

1.3 Context

Based on the information received, it is anticipated that a number of credits could be easily achieved, and that these credits would enable a rating of 'very good' to be awarded. In most cases the credits applicable for this development represent best practice, so for this reason credits identified should be realistically attainable. However, to achieve 'very good' which has been aspired by the client, may bring significant financial or logistical implications due to the mandatory BREEAM requirements.

This document addresses these issues by achieving the following objectives. Though the objectives are inter-linked, they are presented below in separate chapters for clarity.

Objective 1

Give an overview of the requirements of BREEAM Multi Residential 2008

Objective 2

Develop an understanding of the credits which are required to achieve a 'good' rating.

Objective 3

To provide a set of uplift credits for any event of identified credits not being achieved, so that the minimum score of 'very good' is realised.

Part 2 – BREEAM 2008 – Overview

2.1 BREEAM Multi Residential 2008

BREEAM Mutli Residential 2006 was superseded by BREEAM Multi Residential 2008 in May 2008.

BREEAM Multi Residential 2008 has been developed using the Building Research Establishment's (BRE) Bespoke System, which has already achieved success in reducing the environmental impact of many development projects.

BREEAM Multi Residential 2008 builds upon previous BREEAM systems in a number of ways, for example:

- Introduces minimum mandatory standards for each level
- Introduces a mandatory Post Construction Review (PCR)

Innovation credits have also been included for going beyond best practice and up to 10% additional scoring can be achieved in this way in the following credits:

• Man 2 - Considerate Constructors	A score of 36 points
• Hea 1 – Daylighting	Higher daylight factors
• Ene 1 - Reduction of CO_2 emissions	CO_2 index <0
• Ene 5 - Low or Zero Carbon Technologies	20% renewable generation
• Wat 2 - Water Meter	Water sub-metering
• Mat 1 - Materials Specification	Achieving higher scores
• Mat 5 - Responsible Sourcing of Materials	95% of materials comply
• Wst 1 - Construction Site Waste Management	95% of waste diverted

At all times it must be remembered that BREEAM is an evidence-based methodology, and the credits cannot be awarded if the evidence is not provided in the format set out within the BREEAM guidance.

2.2 Categories, Scoring & Weighting

BREEAM (Building Research Establishment Environmental Assessment Method) was devised by the BRE to provide an established method of benchmarking the performance of developments so that the environmental impact of buildings can easily be understood and compared. BREEAM is based upon nine credit categories which can be briefly defined as follows:

Management (M) - An assessment of the clients' commitment to management of the environmental impact of the project during construction or operation.

Health and Wellbeing (HW) - An assessment of the risks posed to occupant health and comfort in the design or operation of the building.

Energy (E) – This assessment primarily measures the energy efficiency of the project and measures taken to minimise energy use (i.e. CO_2 production).

Transport (T) - An analysis is made of the location of the project so that the environmental impact due to the production of CO_2 and other pollutants from commuter transport may be assessed.

Water Consumption (W) - This part of the assessment measures the level of water economy and awareness within the building/organisation.

Materials (Mat) – This is primarily an assessment of the embodied environmental impact of the project due to material specification.

Waste (W) – This covers site waste management and measures to facilitate the collection of recyclable waste.

Land Use and Ecology (LE) - A building project may interfere with or displace ecology on a local level. An assessment of the degree to which a project detracts from or improves the local environment is provided.

Pollution (P) – This is an assessment of measures taken to limit the main pollutants (other than CO_2) that inflict damage upon the atmosphere, land or local watercourses.

Within these nine credit categories are a varying number of individual credit criteria (over 70 in total) which can be scored as outlined in Table 2.1 below.

An environmental weighting is applied to each credit scored and this varies from category to category as in Table 2.1 below. 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 the BRE to establish the relative importance of each environmental issue.

The total achieved scores from each category are multiplied by the weighting factor to give the final score for that category. In Table 2.1 below the categories which have the highest weighting factors have been highlighted.

Table 2.1 – BREEAM Categories and Weightings

Category	Available Credits	Credit Weighting	Points per credit
Management	12	12.00%	1.00%
Health and Wellbeing	17	15.00%	0.88%
Energy and CO_2 Emissions	23	19.00%	0.83%
Transport	9	8.00%	0.89%
Water	8	6.00%	0.75%
Materials	17	12.50%	0.74%
Waste	8	7.50%	0.94%
Ecology	10	10.00%	1.00%
Pollution	12	10.00%	0.83%
Innovation	10	10.00%	1.00%
Totals	116	110%	

*Weighting figures are only approximate and calculations should be made using an approved calculator

Achieving credits in the highlighted categories will gain the development a higher score for achieving fewer credits.

2.3 BRE Calculator inputs

The exact number of credits available, and therefore the value of a single credit in each category, varies from development to development. This is because the BRE has provided a calculator which changes the credits that are available depending on the answers to the inputs shown in Figure 2.1 above.

Sustainia has limited data available at this stage and therefore has made the assumptions as documented in Table 2.2 below.

It is important at this stage that the design team examines our assumptions and gives feedback to ensure that the appropriate credits are used for this assessment.

Figure 2.2 – BREEAM Building profile form from the BRE calculator

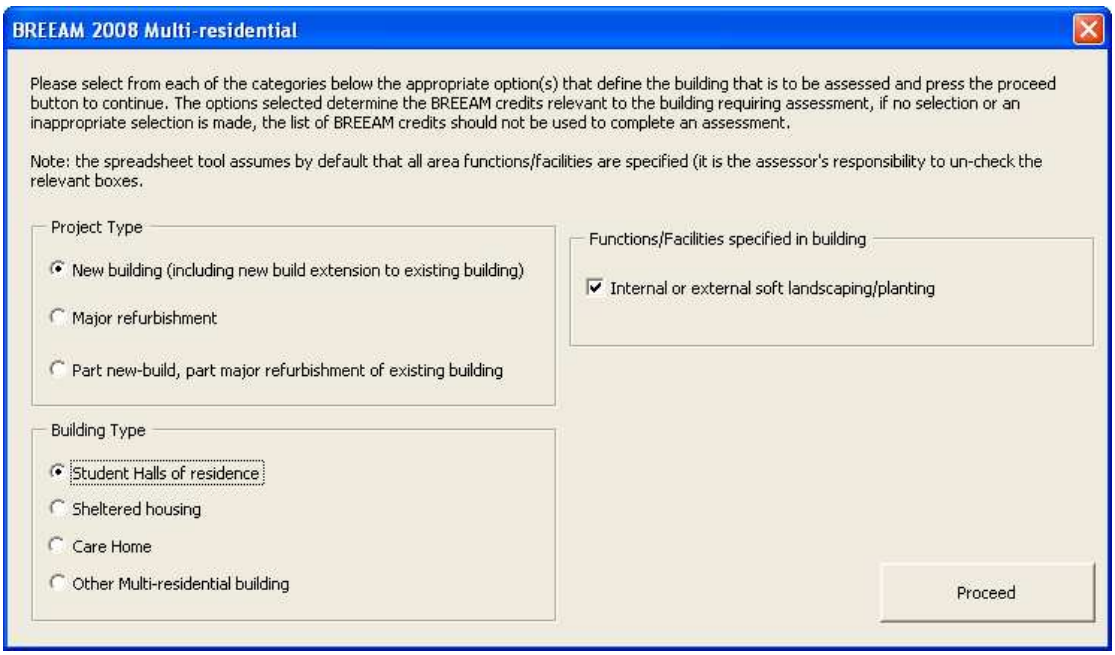


Table 2.2 – Assumptions made by Sustainia.

Calculator Assumptions		
Question	**Assumption**	**Agreed by Client**
Air conditioning	**No**	**Yes**
Lifts	**No**	**Yes**
Vehicle delivery and manoeuvring areas	**No**	**Yes**
Internal or external soft landscaping	**Yes**	**Yes**

The amount of credits available changes depending on the answers made in the Building profile form in the BRE Calculator. This affects the value of credits available in each category but does not affect the percentage weighting for each category.

2.4 Mandatory Credits

Within BREEAM 2008, minimum standards have been set for a number of categories as shown in the table below. These mandatory credits must be gained for a development to achieve the relevant BREEAM Level. The most challenging of these targets are those set in the *Energy* and *Water* credit categories.

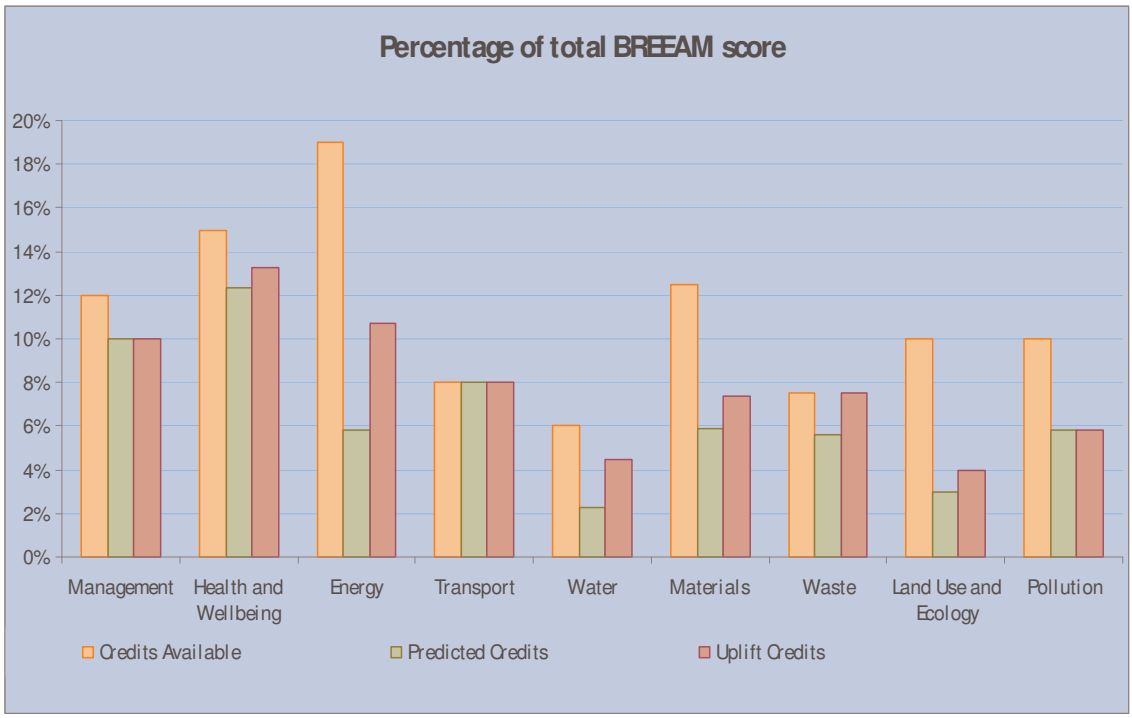
The mandatory elements for 'very good' will give 7 credits while the mandatory elements for 'excellent' will give 17 credits, with the remainder of the credits in each case being made up from Tradable Credits. These credits must then be multiplied by the appropriate weighting factor to show what score is achieved.

Table 2.3 – Mandatory credit levels

Mandatory Ratings			
Credit Description	**Good**	**Very Good**	**Excellent**
Man 1 – Commissioning	1	1	1
Man 2 – Considerate Constructors	-	-	1
Man 4 – Building User Guide	-	-	1
Hea 4 – High frequency lighting	1	1	1
Hea 12 – Microbial contamination	1	1	1
Ene 1 – Reduction of CO2 emissions	-	-	6
Ene 2 – Sub-metering of substantial energy uses	-	1	1
Ene 5 – Low or zero carbon technologies	-	-	1
Wat 1 – Water consumption	1	1	1
Wat 2 – Water meter	1	1	1
Wst 3 – Storage of recyclable waste	-	-	1
LE 4 – Mitigating ecological impact	-	1	1

Available credits as percentages on the Goodenough College development illustrated in graph 2.4 below.

Figure 2.4



Part 3 – Achieving 'very good'

The following section sets out the proposed minimum scores that will be achieved for the building in each credit category. This is represented in table 3.1 below. These universal credits are then summarised with a brief description of what is needed to achieve them.

Table 3.1: Achievable minimum credit score by category for the building

Category	Weighting	Available Credits	Available %age	Predicted credits	Predicted % age	Uplift credits	Uplift %age
Management	1.00	12	12.0%	10	10.0%	10	10.0%
Health and Wellbeing	0.88	17	15.0%	15	13.2%	14	12.3%
Energy	0.83	23	19.0%	9	7.5%	13	10.7%
Transport	0.89	9	8.0%	9	8.0%	9	8.0%
Water	0.75	8	6.0%	3	2.3%	6	4.5%
Materials	0.74	17	12.5%	8	5.9%	10	6.6%
Waste	0.94	8	7.5%	6	5.6%	8	7.5%
Land Use and Ecology	1.00	10	10.0%	3	3.0%	4	3.0%
Pollution	0.83	12	10.0%	7	5.8%	7	5.8%
Innovation	-	10	10	0	0.00%	0	0.00%
Totals		**126**	**100.0%**	**67**	**61.30%** **Very Good**	**81**	**71.13%** **Excellent**

Weighting figures are only approximate and calculations should be made using an approved calculator.
*Predicted credits are set for draft purposes only; the client will be required to approve the credits for a design stage submission.
*Uplift credits may be used as a replacement for ensuring the score remains at least at 'very good' if in any event predicted credits are not achievable.

The total minimum score achievable by the Goodenough College development, based on the information provided, is 58.70% which gives a rating of 'very good'.

3.1 Management

To achieve 'very good', a mandatory credit must be achieved under Management 1 - Commissioning.

Management 1 – Commissioning (2/2 Credits)

All building services commissioning will be carried out in accordance with best practice and seasonal commissioning will also be carried out during the first year of occupation. All commissioning will be carried out in accordance with the relevant CIBSE and BSRIA guidance.

The achievement of at least 1 credit under this topic is required to meet the minimum BREEAM rating of Very Good.

Management 2 – Considerate Constructors (2/2 Credits)

The site will be registered with the Considerate Constructors Scheme, and will achieve a minimum score of 32 to qualify for two credits under BREEAM. The site contractor will have to commit to these scores to attain the credits in either case by means of a completed form A1 supplied at the time of submission or specified within the Tender document as contractor responsibility.

Management 3 – Construction Site Impacts (3/4 Credits)

Up to four credits available, the first credit can be achieved by adopting 2 items from the list below; the second credit for 4 items from the list and a third credit for selecting 6 items from the list below. The design team must ensure that the contractor understands his/her obligation in recording the information accurately. The list is as follows:

- 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

The final fourth credit is awarded when it can be demonstrated that construction timber intended for site use is 100% legally and responsibly sourced. This credit may be attained in addition to the

other credits.

Uplift credits recommended for Man 3: Targeting 4/4 credits

By producing the evidence for all required categories listed above the fourth credit may be awarded.

This will score 1.00 extra percentage points if pursued for the design stage assessment.

Management 4 – Building User Guide (1/1 Credit)

A bespoke building user guide will be produced that covers non-technical information on areas such as operation and environmental performance of the building. The guide will include specific information on building services, energy performance, water use, recycling and waste, transport facilities and emergency services.

Management 6 – Consultation (1/2 Credits)

Points for 'Consultation' can be achieved by involving the relevant stakeholders through the RIBA stage B of the build. This should include the opportunity for local community and future building users to have their input during the design process, and their suggestions should be implemented. The second credit can be achieved when it can be illustrated that the consultation was undertaken using an independent method, for example: by a third party in a format such as DQI, DQM or Office Works.

Uplift credit recommended for Man 6: Targeting 2/2 credits

By producing the evidence for the independent consultation taking place by the above method the second credit may be awarded.

This will score 1.00 percentage points.

Management 8 – Security (1/1 Credit)

A member of the design team will be required to seek the advice of the local police representative "Architectural Liaison Officer" (ALO) or "Crime Prevention Design Advisor" (CPDA) on designing out the opportunity for crime from the new proposed building. In order to gain this credit the design team will be required to implement the suggestions made by the ALO.

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Table 3.2: Management credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted Score
Man1	Commissioning	2.00	2.00	2.00%
Man2	Considerate Constructors	2.00	2.00	2.00%
Man3	Construction Site Impacts	4.00	3.00	3.00%
Man4	Building user guide	1.00	1.00	1.00%
Man6	Consultation	2.00	1.00	1.00%
Man8	Security	1.00	1.00	1.00%
Totals		**12.00**	**10**	**8.00%**

3.2 Health and Wellbeing

To achieve 'very good', a mandatory 1 credit must be achieved under:

Health and Wellbeing 4 – High frequency lighting

Health and Wellbeing 12 – Microbial contamination

Health and Wellbeing 1 – Daylighting (1/1 Credit)

The BREEAM requirement states that at least 80% of all areas should be adequately day lit to achieve this credit. Communal kitchens must have a daylight factor of 2% and study-bedrooms a daylight factor of 1.5%. 80% of the working plane in each kitchen, lounge room, dining room and study-bedroom must receive direct light from the sky. This must be confirmed through daylighting analysis and calculations carried out at the Design Stage.

Health and Wellbeing 2 – View Out (1/1 Credit)

All living rooms/ bed-sits or study bedrooms which lay within 5m of a wall must have 20% of total wall space designated as window which can be used as a view out. All other building areas are within 7m of a window or permanent opening. If these criteria are met than this credit may be awarded.

Health and Wellbeing 3 – Glare Control (1/1 Credit)

This credit can be awarded if occupant controlled shading (internal or external) is fitted on all windows and glazed doors on study bedrooms, offices, IT suites and meeting rooms.

Health and Wellbeing 4 – High frequency lighting (1/1 Credit)

All fluorescent and compact fluorescent lamps will be fitted with high frequency ballasts, reducing visible flicker and buzzing noises. The achievement of this credit is required to meet the minimum standards for a BREEAM rating of Very Good.

Health and Wellbeing 5 – Internal and External Lighting Levels (1/1 Credit)

For this credit all internal and external lighting are required to meet illuminance/ lux levels specified in '*Part two CIBSE Code for Lighting 2002 and 2004 Addendum'.*

Lighting Guide 7 sections 3.3, 4.6, 4.7, 4.8 and 4.9 apply where computer screens are operated. Lighting guide section 9 applies for residential communal areas and section 6 for outdoor environments.

Health and Wellbeing 7 – Potential for Natural Ventilation (1/1 Credit)

Where the ventilation strategy delivers fresh air to occupied spaces and is compliant with either:

- Openable windows of sizes equal to 5% of the gross floor area in each room, if the room depth is between 7m and 15m then the openable size is shared so that effective cross ventilation occurs.
- Or the design demonstrates by calculation that there is adequate cross flow of air by calculation tools recommended in CIBSE AM10.

Health and Wellbeing 8 – Indoor Air Quality (1/1 Credits)

To achieve this credit, on naturally ventilated systems the building's air intake vents and windows must be designed to be over 10m from sources of external pollution, such as car parks, waiting bays, main access roads and other building exhausts. If the design team opt for a mechanical ventilation system then the distances from external pollution must be 20m.

Health and Wellbeing 9 – Volatile Organic Compounds (1/1 Credits)

All internal fittings and finishes must be compliant with minimal emissions of VOC's and other substances, materials used must comply with kite marked European standards (BS EN) numbers in line with those recommended best practice levels.

By demonstrating that those finishes used were specified as listed (table 1 of the Heath and Wellbeing section of the Multi Residential manual pages 27-30 of 55) then this credit can be awarded.

This will score 0.88 percentage points.

Health and Wellbeing 10 – Thermal comfort (0/1 Credit)

To ensure that the building achieves appropriate thermal comfort levels, thermal modelling will be required to demonstrate that the building design and services strategy leads to temperature levels above 28℃ for fewer than 60 hours per year. This can be demonstrated with a CIBSE AM11 full dynamic model.

On any new build a well designed ventilation strategy should ensure that this credit is achieved.

The design team have mentioned in the pre-assessment meeting that this credit will not be sought.

Health and Wellbeing 11 – Thermal zoning (1/1 Credit)

The heating strategy should allow independent adjustment of heating within those occupied spaces within the building and to match those differing demands.

The system installed should be designed to allow occupant control of each perimeter (i.e. within 7m of each external wall) and the central zone (i.e. over 7m from the external walls).

Health and Wellbeing 12 – Microbial contamination (1/1 Credit)

A mandatory credit for a **Very Good** rating, this credit denotes that water systems must be designed in compliance with HSE Approved Code of Practice (ACoP) and Guidance LA8, *"Legionnaires disease; the control of legionella bacteria in water systems"*, 2000. Or CIBSE TM13.

Health and Wellbeing 15 – Open Space (1/1 Credit)

One credit can be awarded where a suitably size outdoor amenity is provided for all building users, in a safe environment which would be undisturbed from noise such as delivery areas, car parks etc.

Health and Wellbeing 20 – Home Office (1/1 Credit)

One credit is awarded where all study locations have a suitable area for working in a home office environment, facilities should include double sockets, twin telephone sockets, a 1.8m desk, and a window with adequate ventilation.

Health and Wellbeing 21 – Sound insulation (3/4 Credit)

For the first credit, acoustic performance of the building shall be designed and tested to demonstrate that airborne and impact sound insulation and indoor ambient noise levels are less than or equal to 3db. For the second and third credits less than or equal to 5 db and four credits where the site achieves 8db.

The achievement of these requirements should be confirmed at the design stage by a compliant test body such as a UKAS technician.

Table 3.3: Health and Wellbeing credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted Score
Hea 1	Daylighting	1	1.00	0.88%
Hea 2	View Out	1	1.00	0.88%
Hea 3	Glare Control	1	1.00	0.88%
Hea 4	**High Frequency Lighting**	**1**	**1.00**	**0.88%**
Hea 5	Internal and external lighting levels	1	1.00	0.88%
Hea 7	Potential for Natural Ventilation	1	1.00	0.88%
Hea 8	Internal Air Quality	1	1.00	0.88%
Hea 9	Volatile Organic Compounds	1	1.00	0.88%
Hea 10	Thermal comfort	1	0.00	0.00%
Hea 11	Thermal Zoning	1	1.00	0.88%
Hea 12	**Microbial contamination**	**1**	**1.00**	**0.88%**
Hea 15	Outdoor Space	1	1.00	0.88%
Hea 20	Home Office	1	1.00	0.88%
Hea 21	Sound Insulation	4	3.00	2.64%
Totals		**17**	**15.00**	**13.23%**

3.3 Energy

To achieve 'very good' a mandatory one credit must be achieved under Ene 2 – Sub metering of substantial energy uses.

Energy 1 – Reduction of CO2 emissions (3/15 Credits)

Based on preliminary estimations the current design is predicted to score at least 3 credits. Both Part L 1 & L2 will apply to this rating (L1 uses comparison of BREEAM benchmarks with the CO2 emissions rate for dwelling areas, L2 calculates the CO_2 index from the EPC certificate in non dwelling areas). The 10% stated renewables target set by planning conditions should assist in achieving those 3 credits.

Uplift credit recommended for Ene 1: Targeting 6/15 credits

By implementing a further reduction of CO_2 operational emissions (at least 10% renewables as stated), reducing the building's CO_2 index EPC rating for **L1 to 26 and L2 to 40** or below, will result in a further three credits being awarded.

This will score a further 0.83 percentage points for each extra credit scored.

Energy 2 – Sub-metering of substantial energy uses (1/1 Credits)

Building services will be separately and directly sub-metered for the following services (as a minimum):

- Space heating
- Humidification plant
- Fans
- Lighting
- Small power
- Other major energy consuming items where appropriate.

The sub-meters will be required to be connected to the building management system. This credit is **mandatory** to meet the BREEAM rating of 'very good'.

Energy 4 – External Lighting (1/1 Credit)

Where there is the requirement for external lighting it must be energy efficient and controlled through a time switch or daylight sensor.

The actual lumens/circuit watt will depend on the use of the external lighting, for example building access ways and pathways will have a luminous efficacy of at least 50 lumens/circuit watt and a colour index of > 60Ra.

Energy 5 – Low / Zero Carbon Technologies (2/3 Credits)

The first credit is available where a renewable energy feasibility study has been carried out at RIBA stage C and renewable energy systems are to be installed based on the recommendations of the feasibility study.

The second credit is awarded where a LCZ technology accounts for a 10% reduction in CO_2 emissions. The third 3 credit is awarded for a 15% reduction.

Uplift credits recommended for Energy 8 credit: Targeting 3/3 credits

Three credits can be obtained if the 15% (planning consent requirements) renewable energy options are decided upon and implemented as discussed by the design team at the time of the pre-assessment meeting.

These credits are worth an extra 0.83 percentage points.

Energy 15 – Provision of energy saving White Goods (1/1 Credit)

This credit is available where white goods such as fridges, freezers, are rated A+ under the EU labelling scheme. A second credit is awarded when washing machines and dishwashers are rated A+, tumble dryers and domestic washer dryers are rated B under the scheme and when commercial scale laundry offers maximum energy efficiency.

Energy 18 – Drying Space (1/1 Credit)

For one credit each of the 61 units will require drying space, this can be either in each unit bathroom or in a communal and secure area.

The 61 single study areas will require 4m of drying space.

Table 3.4: Energy credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted Score
Ene 1	Reduction of CO2 Emissions	15	3.00	2.49%
Ene 2	**Sub-metering of Substantial Energy Uses**	**1**	**1.00**	**0.83%**
Ene 4	External Lighting	1	1.00	0.83%
Ene 5	Low or Zero Carbon technologies	3	2.00	1.66%
Ene 15	Provision of energy saving white goods	2	1.00	0.83%
Ene 18	Drying Space	1	1.00	0.83%
	Energy sub-total	**23**	**9.00**	**7.47%**

3.4 Transport

Transport 1 – Provision of public transport (3/3 Credits)

Credits here are awarded on a sliding scale based on the assessed building's accessibility to the public transport network. As the building development is within 650m from a number of regular bus services, Russell Square tube and within a 1000m King Cross overland station all credits are awarded.

Transport 2 – Proximity to key amenities (2/2 Credit)

The new development will be situated within 500m of basic amenities such as a grocery shop/ food outlet, a post box and a cash machine, so the first credit is easily achieved. The second credit denotes that the development should be within 1000m of five further amenities including leisure centres, places of worship, a pharmacy, pubs and any outside public recreation areas so this credit is achieved.

Transport 3 – Cyclist Facilities (1/1 Credits)

One credit is available where evidence provided demonstrates that covered, secure and well-lit cycle storage facilities with surveillence are provided for all building users. Provision must be anticipated for 50% of its users and 10% of staff.

Transport 4 – Pedestrian and cyclist safety (1/1 Credit)

This credit can be awarded where all external areas and internal access are designed in accordance with the relevant guidance (Guidelines and practical details – issue 2, sustrans 1997, within notes and guidance outlined in the National Cycle Network). The design should ensure best practice in order to ensure safe access for cyclists and pedestrians. In the case of this development, although there is very little on site pathway, a 3m width path shared by pedestrians and cyclists. If it can be demonstrated that the site does not have on site infrastructure and therefore fronts the public highway then this credit can be awarded by default.

Transport 6 – Car Parking (2/2 Credits)

These credits are awarded by default as there are no parking facilities at this location.

Table 3.5: Transport credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted Score
Tra1	Provision of public transport	3	3.00	2.67
Tra2	Proximity to amenities	2	2.00	1.78
Tra3	Cyclist facilities	1	1.00	0.89
Tra4	Pedestrian and cycle safety	1	1.00	0.89
Tra6	Car Parking Spaces	2	2.00	1.78
Totals		**9**	**9.00**	**8.01%**

3.5 Water

The achievement of at least 1 credit under Wat 1 and Wat 2 is required to meet the minimum BREEAM rating of 'Good' or 'very good'.

Water 1 – Water Consumption (2/5 Credits)

Water consumption in Multi Residential 2008 awards the first credit for toilet cisterns with a 4.5l dual flush or less (each unit must have instructions for use) The second credit is awarded when toilet cisterns have 3l /flush or less (plus an instruction for use on each unit). The third credit is awarded where taps have sensor shut/timer shut off or low flow lever taps with a flow rate of 6l/min at 0.3 Mpa. The fourth credit is awarded where two water saving designs are chosen from the list of 6 choices provided in the BREEAM guidance notes. A fifth and final credit is awarded when a system is specified for harvesting rainwater and recycling 50% of the total predicted rainwater / or flushing / urinals across the defined period of collection.

Uplift credits recommended for Water 1 credit: Targeting 4/5 credits

A further two credits are available for uplift depending upon the design teams choices and clients wishes.

These credits are worth an extra 0.75 percentage points each.

Water 2 – Water meter (1/1 Credit)

This credit is awarded where the building's mains water supply has a water meter with pulsed output installed on it which is capable of being connected to the Building Management System.

If there are any major water using areas then an Innovation credit is available if these are also sub-metered. Major water using areas might include showers or catering areas.

Water 3 – Major Leak Detection (0/1 Credit)

This credit can be awarded where a monitoring system is to be fitted to monitor the flow rate of the mains water supply into the building. In general an audible alarm will sound when flow rates increase above a set level for a set period of time. If a Building Management System is in place the flow monitor can be connected to it. This assists in avoiding water wastage through leaks.

Uplift credits recommended for Water 3 credit: Targeting 1/1 credits

This credit is worth an extra 0.75 percentage points if the above criterion is met.

Water 6 – Water irrigation (0/1 Credit)

One credit is available where a low water irrigation system is installed via rainwater or reclaimed water supply to serve low level planting or landscaped areas.

Uplift credits recommended for Water 6 credit: Targeting 1/1 credits

This credit is worth an extra 0.75 percentage points.

Table 3.6: Water credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted score
Wat1	Water Consumption	5	2.00	1.50
Wat2	Water meter	1	1.00	0.75
Wat3	Major leak detection	1	0.00	0.00
Wat6	Water irrigation	1	0.00	0.00
Totals		8	3.00	2.25%

3.6 Materials

Materials 1 – Materials specification major building elements (3/6 Credits)

Sustainability considerations relevant to BREEAM will be adopted across the site, namely:

- Making use of A and A+ rated materials and avoiding the use of C to E rated materials as defined by The Green Guide to Specification. (www.thegreenguide.org.uk)
- Ensuring the majority of timber and other building materials are from sustainably certified sources (e.g. PEFC, EMS, etc)

A detailed report on materials could be prepared as a discussion document. However steps should be taken to avoid the use of C to E rated materials and to use A or A+ rated materials wherever possible.

Please refer to the BREEAM Multi Residental manual under Mat1 for further guidance on the scoring system.

Uplift credits recommended for Materials 1 credit: Targeting 5/6 credits

The BREEAM tool calculator will require a score of 14 to enable the full six credits being awarded and 10 for the four credits discussed at the pre-assessment meeting.

These credits are worth an extra 0.74 percentage points each.

Materials 2 – Hard Landscaping and boundary protection (1/1 Credit)

One credit 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.

Materials 3 – Reuse of Building Façade (0/1 Credits)

This credit is not being pursued on this development.

Materials 4 – Reuse of building structure (0/1 Credits)

This credit is not being pursued on this development.

Materials 5 – Responsible sourcing of materials (1/3 Credits)

For one credit to be awarded 100% of all timber for basic building elements must be obtained from appropriately certified responsible sources. In addition, 80% of building element timber (e.g. roof

trusses, flooring systems, frames etc) should be procured from sustainably certified forests (as recognised by BREEAM 2008), notably those certified under the PEFC and SFI schemes.

Of the remaining credits the at least 80% of building elements including walls, windows, roof floor slabs and finishes will be sourced from organisations that, as a minimum, can provide evidence that an environmental management system (EMS) is in place.

A detailed report on materials could be prepared as a discussion document, however steps should be taken to maximise the use of reused and certified materials. Reused materials achieve maximum points so design incorporating demolition materials could achieve additional credits..

Uplift credits recommended for Mat 5 credit: Targeting 3/3 credits

These credits are worth an extra 0.74 percentage points each

Materials 6 – Insulation (1/2 Credits)

For the first credit, the building should make use of insulation materials for building fabric which have a low embodied impact relative to their thermal properties as set out in the Green Guide to Specification ratings. (www.thegreenguide.org.uk). For an additional credit, at least 80% of the thermal insulation products for the building are to be responsibly sourced as defined in the previous credit Mat 5.

Uplift credits recommended for Mat 6 credit: Targeting 2/2 credits

This credit is worth an extra 0.74 percentage points.

Materials 7 – Designing for robustness (1/1 Credit)

In areas where there are exposed parts of the building adequate protection will be provided for ease of maintenance and repair and therefore minimising the frequency of use of replacement materials.

Table 3.7: Materials credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted credits
Mat1	Materials Specification (major building elements)	6	3.00	2.22%
Mat2	Hard landscaping and boundary protection	1	1.00	0.74%
Mat3	Re-use of building façade	1	0.00	0.00%
Mat4	Re-use of building structure	1	0.00	0.00%
Mat5	Responsible sourcing of materials	3	1.00	0.74%
Mat6	Insulation	2	1.00	0.74%
Mat7	Designing For Robustness	1	1.00	0.74%
Mat8	Responsibility of sourcing materials: finishing elements	2	1.00	0.74%
Totals		**17**	**8.0**	**5.92%**

3.7 Waste

Waste 1 – Construction Site Waste Management (4/4 Credits)

A Site Waste Management Plan will be produced to minimise waste generation on site. The Plan will include procedures and commitments to sort, reuse and recycle construction waste on site and to adopt best practice in this regard.

The key difference between a standard SWMP for regulatory compliance and one for BREEAM compliance is that BREEAM requires that targets for waste minimisation be set using Constructing Excellence's KPI tool kit.

A pre-demolition audit will be carried out to identify what resources may be made available through demolition of existing buildings. The Demolition Protocol from ICE is one framework within which to carry out the audit of the potential for waste reduction, reuse of demolition materials, and specification of recycled content materials.

Good communication between the client and demolition contractors is important in maximising the available credits here.

Waste 2- Recycled Aggregate (1/1 Credit)

One credit is available where the amount of secondary aggregate specified has a recycled content of not less than 25% (by weight or volume) of the total high-grade aggregate uses for the building. Such aggregates can be obtained on site or obtained from a waste processing site(s) within a 30km radius of the site.

Waste 3 – Recycled Waste Storage (1/2 Credits)

A dedicated central storage space should be provided to cater for recyclable materials in each dwelling or communal kitchen area for the first credit. The size of the bin should not be less than 30 L and there should be 3 supplied for every 6 dwellings.

The second credit generated by the building during occupation. The size of the space allocated should be adequate to store the likely volume of materials to be generated. The minimum is 2m2/100m2 of building space.

Uplift credit recommended for Wst 3 (2/2 Credits)

This will score 0.94 percentage points.

Waste 5 – Composting (0/1 Credits)

A dedicated central storage space should be provided for communal / or dwelling kitchens. The waste must also have a compostable organic material container suitable for the volume of building users. (If the space for such an area is not feasible on site then a plan to have the waste material stored only temporarily whilst a removal plan for example on a weekly basis is required).

Uplift credits recommended for Waste 5 credit: Targeting 1/1 credits

This credit is worth an extra 0.74 percentage points

Table 3.8: Waste credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted credits
Wst1	Construction Site Waste Management	4	4.00	3.76%
Wst2	Recycled aggregates	1	1.00	0.94%
Wst3	Recyclable waste storage	2	1.00	0.94%
Wst5	Composting	1	0.00	0.00%
Totals		**8**	**6.00**	**5.63%**

3.8 Land Use and Ecology

The achievement of at least 1 credit under Land Use and Ecology 4 is required to meet the minimum BREEAM rating of Very Good.

Land Use and Ecology 1 – Reuse of land (1/1 Credit)

At least 75% of the new build is located on land previously developed during the last 50 years. This credit can be awarded based on the basis that the extension design usesn the existing land footprint.

Land Use and Ecology 2 – Contaminated Land (0/1 Credit)

It is not thought that the land has been defined as contaminated land and therefore this credit has not been sought on this development.

Land Use and Ecology 3 – Ecological Value of Land and Protection of Ecological Features (0/1 Credit)

The Goodenough College development team are required to either complete the BREEAM checklist A4 or employ an ecologist to carry out a site survey to achieve this credit. The information required would determine the *current ecological value of the* site and guidance on how features of ecological value may be protected during the construction phase of the works. If this credit is pursued then any site work should be carried out in accordance with guidance in the following documents:

CIRIA C502 *"Guidance on how to avoid causing environmental damage and the financial penalties that can follow"*

- CIRIA C503 *"Practical advice on how to carry out construction works without harming the environment"*
- CIRIA C567: *"Guidance to understand and implement good practice in relation to wildlife on development and construction projects"*

Land Use and Ecology 4 – Mitigating Ecological Impacts (1/2 Credits)

For the first credit being awarded there must be proof that the development of the site will result in the minimal loss of any natural habitat. This has to be carried out either by completion of the ***BREEAM spreadsheet tool*** A4 OR a qualified Ecologist must prepare a report which illustrates the same end. To achieve the second credit, evidence must show that there is no negative

change as a result of the development.

Uplift credits recommended for LE 5 (2/2)

Achieving at least one credit under this category ***in mandatory for achieving very good*** on this assessment. Both credits can be achieved by hiring an Ecologist to prepare a report

This will score 1.00 percentage point for each credit achieved.

Land Use and Ecology 5 – Enhancing site ecology (0/3 Credits)

This credit encourages actions taken to maintain and enhance the ecological value of the site as a result of development which could include landscaping (suitable vegetation and tree planting) of ecological value which could result in a positive change of ecological value of the site.

For the first credit a suitably qualified ecologist (SQE) has been appointed to provide an Ecology Report with appropriate recommendations for protection and enhancement of the site's ecology.

The report is based on a site visit/survey by the SQE prior to the commencement of initial site preparation works.

For the second credit the report must demonstrate that there is a positive increase in species of up to 6 species. A third is awarded when the increase is 6 or more.

Uplift credits recommended for LE 5 (2/3)

This will score 1.00 percentage points for each credit.

Land Use and Ecology 6 – Long term impact on biodiversity (0/2 Credits)

Local biodiversity expertise should be sought before design stage to assist in identifying species of local biodiversity importance on the site. The Ecologist involved can advise on incorporating a BAP (Biodiversity Action Plan) into this stage of the project.

The biodiversity level within the boundaries of projects must be measured prior to the commencement of site works. Incorporating proposed enhancement measures, the post completion level of biodiversity can be extrapolated and should be no less than after the project is completed.

Uplift credits recommended for LE 6 (2/2)

This will score 1.00 percentage points for each credit.

Table 3.9: Ecology credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted credits
LE1	Re-use of land	1	1.00	1.00%
LE2	Contaminated land	1	0.00	0.00%
LE3	Ecological value of site AND Protection of ecological features	1	1.00	1.00%
LE4	**Mitigating Ecological impact**	**2**	**1.00**	**1.00%**
LE5	Enhancing Site Ecology	3	0.00	0.00%
LE6	Long term impact on biodiversity	2	0.00	0.00%
Total		**10**	**3**	**3.00%**

3.9 Pollution

Pollution 1 – Refrigerant GWP Building Services (1/1 Credit)

This credit can be awarded when a copy of the specification clause is offered for evidence confirming ***any communal refrigerants*** are specified as less having a global warming potential of less than 5GWP. OR: where the absence of building services specifying any refrigerants.

Pollution 2 – Preventing refrigerant leaks (1/1 Credit)

This credit can be awarded by default if there is no comfort cooling specified or the loads of refrigerant in each system are less than 5kg.

Pollution 4 – NOx Emissions from heating source (3/3 Credits)

One credit where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O2).

Two credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤70 mg/kWh (at 0% excess O2).

Three credits where evidence provided demonstrates that the maximum dry NOx emissions from delivered space heating energy are ≤40 mg/kWh (at 0% excess O2) and emissions from delivered water heating energy are 100 mg/kWh or less (at 0% excess O2).

Pollution 5 – Minimising Flood Risk (0/4Credits)

Two credits are awarded when the flood risk for the development has been assessed and a report has been produced (FRA) which confirms that the area is in a low flood risk area. Further credits relate to the site being assessed and found to have high probability of flooding relating to any measures taken.

Pollution 6 – Minimising water course pollution (0/1 Credit)

Car parking areas or areas with water run off from buildings are to be provided with a petrol interceptors on drainage systems. A petrol / oil interceptor is a trap used to filter out hydrocarbon pollutants from rainwater runoff. It is typically used in road construction to prevent fuel contamination of streams carrying away the runoff.

SUDs may also be required in other areas not at risk from petrol contamination, but potentially at risk of other pollution (including silt) to water courses. ***If there are no external areas and no plant on the roof of the building this credit is awarded by default***.

Pollution 7 – Reduction of night time light pollution (1/1 Credit)

Reducing light pollution implies many things, such as reducing sky glow, reducing glare, reducing light trespass, and reducing clutter. The method for best reducing light pollution, therefore, depends on exactly what the problem is in any given instance and should be carried out in compliance with Institution of Lighting Engineers Guidance notes for the reduction of obtrusive light, 2005.

For example, in this case, external lights (excluding flush stud lights to aid vehicle manoeuvring) could be automatically switched off between 11pm and 7am.

Table 3.10: Pollution credits summary

Credit Code	Credit Title	Credits Available	Predicted Credits	Weighted credits
Pol1	Refrigerant GWP - Building services	1	1.00	0.83%
Pol2	Preventing refrigerant leaks	2	2.00	1.66%
Pol4	NOx emissions from heating source	3	3.00	2.49%
Pol5	Flood risk	4	0.00	0.00%
Pol6	Minimising watercourse pollution	1	0.00	0.00%
Pol7	Reduction of Night Time Light Pollution	1	1.00	0.83%
Total		**12**	**7.00**	**5.81%**

Part 4 – BREEAM 2008 – Conclusions

4.1 Summary

This document sets out the predicted pre-assessment scores for the particular credits within BREEAM Multi Residential 2008 on the Goodenough College development. The scores are based upon the information supplied at the time of the first meeting with the design team. Based upon the construction particulars of this development and the information supplied to the assessor, a **BREEAM 2008 score of 'very good' is achievable.**

Sustainia are pleased to acknowledge the aim of achieving 'very good' on this development and hope that the choices the client makes with the support of the design team are choices which benefit the future costs of running the building, those who use the building and ultimately the contribution to reducing the impact upon the environment.

4.2 To achieve Very Good

The predicted rating using standard "Predicted credits" on the BREEAM Multi Residential 2008 assessment method is " Very Good" with a score of 58.70%.

To ensure a Very Good score Sustainia recommend that the design team actually aim a few percentage points higher than the recorded score of 58.70% to ensure the benchmark of 55% score for very good allows for any credit fall out.

4.3 Uplift Credits

The additional uplift credits listed in red underneath each of the credit information sections are identified ***as technically feasible upgrades;*** however, it is not necessarily recommended that all of these credits be aimed for. It may be of more use (for example) for the client and the design team to consider the costs of credits and, where practical drop particular credits in favour of others. This may be for financial or other construction limitations.

If all of the "Predicted" and "Uplift" credits were pursued then the development would achieve a much higher percentage of 70.30**%** which translates to an **'Excellent'** rating under the BREEAM Multi Residential 2008 assessment scheme.

The proposed minimum scores that will be achieved for the building in each credit category are represented in table 4.1 below.

Table 4.1: Achievable minimum credit score by category for the building

Category	Weighting	Available Credits	Available %age	Predicted credits	Predicted % age	Uplift credits	Uplift %age
Management	1.00	12	12.0%	10	10.0%	10	10.0%
Health and Wellbeing	0.88	17	15.0%	14	12.4%	15	13.2%
Energy	0.83	23	19.0%	7	5.8%	13	10.7%
Transport	0.89	9	8.0%	9	8.0%	9	8.0%
Water	0.75	8	6.0%	3	2.3%	6	4.5%
Materials	0.74	17	12.5%	8	5.9%	10	6.6%
Waste	0.94	8	7.5%	6	5.6%	8	7.5%
Land Use and Ecology	1.00	10	10.0%	3	3.0%	4	3.0%
Pollution	0.83	12	10.0%	7	5.8%	7	5.8%
Innovation	-	10	10	0	0.00%	0	0.00%
Totals		**126**	**100.0%**	**67**	**58.70%= Very Good**	**82**	**70.30%= Excellent**

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