BREEAM

BUILDING RESEARCH ESTABLISHMENT
ENVIRONMENTAL ASSESSMENT METHOD

BREEAM 98 for Offices
Version 1.1

An environmental assessment for office designs

CERTIFICATION REPORT

Building :	**MSP Building, Scottish Parliament**
Developer :	**Scottish Parliamentary Corporate Body**
Date :	**23rd March 2001**
Ref. No :	**1152/107a**
Assessor:	**Michelle Wangusi / Sarah Jane Stewart**

ECD Energy and Environment
Tel : 020 7405 3121
Fax : 020 7405 1670
E-mail : ecde@ecde.co.uk

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QUALITY REVIEW	
Report Prepared by:	Michelle [signature]
Report Reviewed by:	[signature]
Date Reviewed:	23rd March 2001

GENERAL DETAILS

Building:	MSP Building, Scottish Parliament
Developer:	Scottish Parliamentary Corporate Body
Architect:	EMBT/RMJM Ltd
Building Services:	RMJM Scotland Ltd
Contractor:	Bovis Lend Lease
Status:	Certification Report
Assessor:	Michelle Wangusi / Sarah Jane Stewart
Ref.:	1152/107a
Date:	23rd March 2001

This assessment has been based on drawings and information collected at a meeting on the 11th August 2000 at the offices of RMJM and on information subsequently received. The following people attended the meeting:

Iain Harper	RMJM Scotland Ltd (Building Services)
John Kinsley	EMBT/RMJM Ltd (Architects)
Sarah Jane Stewart	ECD Energy and Environment (BREEAM Assessor)

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ASSESSMENT SUMMARY

INTRODUCTION

The MSP Building for the Scottish Parliament has been assessed using BREEAM 98 for Offices Version 1.1, the Building Research Establishment Environmental Assessment Method for New and Existing Office Designs. Details of the method are set out in the 'BREEAM 98 for Offices' [1] publication.

This report describes the performance of the building at certification.

BREEAM for Offices seeks to minimise the adverse effects of new buildings on the environment at global and local scales, whilst promoting healthy indoor conditions for the occupants. The environmental implications of a new building are assessed at the design stage, and compared with good practice by independent assessors.

An overall rating of the building's performance is given using the terms Pass, Good, Very Good or Excellent. This is determined from the total number of BREEAM criteria met and their respective environmental weighting (see section 2 below for a more detailed description). The building's rating is displayed on a certificate which can be displayed in the building or used for marketing purposes.

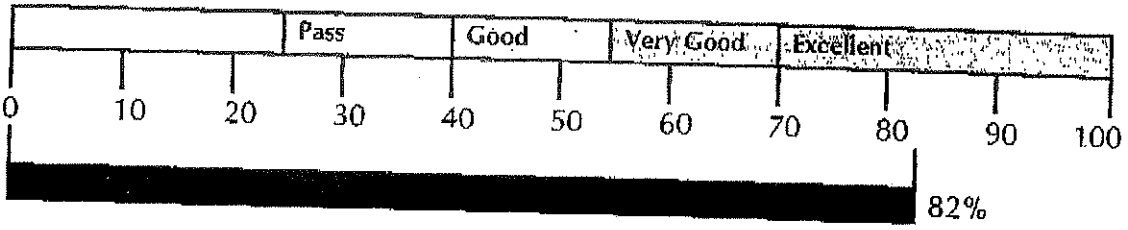
The building's rating is shown on page 5 and a summary of the credits obtained is provided on page 6. An explanation of the rating system for BREEAM 98 is included in Appendix A.

1. Background information and a summary of the BREEAM criteria is set out in the published BRE report BREEAM 98 for Offices which is available from CRC Publications Tel: 020 7505 6622.

PERFORMANCE OF MSP BUILDING

BREEAM Rating

Based on the number of environmental credits achieved under each section and their relative importance

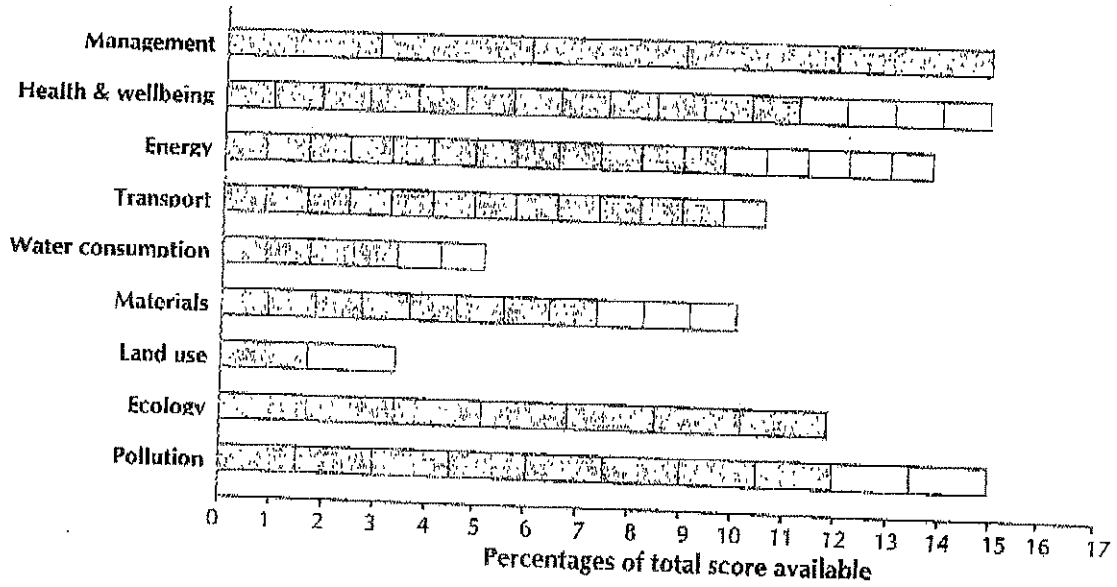


EXCELLENT

Environmental Performance Index

This scale provides a comparative measure of a buildings performance between buildings assessed at different stages. It is based on the percentage of core credits achieved, multiplied by the Environmental Weighting Factor

Performance by Category



An explanation of the rating system for BREEAM 98 is included in Appendix A.

OVERALL SUMMARY OF CREDITS

CATEGORY AND CREDITS		Core/ Design	Credits Available	Credits Achieved
Management	Adequate commissioning period	D	1	1
	Design team member monitoring commissioning	D	1	1
	Specialist commissioning agent appointed	D	1	1
	Contractual clause for contractor responsibility	D	1	1
	Re-commissioning guide for complex services	D	1	1
Health and well being	Legionnaires' disease 1 (airborne External)	C	1	1
	Legionnaires' disease 2 (domestic water services)	C	1	1
	Ventilation (10% external facade openable)	C	1	1
	Humidification	C	1	1
	Air quality (location of air intakes/outlets)	C	1	1
	Fresh air provision (Outside air to CIBSE/trickle vents)	C	1	1
	Daylighting	C	1	1
	Glare control (internal/external blinds fitted)	C	1	0
	Lighting (high frequency ballasts)	C	1	0
	Lighting levels (BCO specification)	C	1	1
	Lighting controls	C	1	0
	View to outside (with max. 7m to windows)	C	1	1
	Local temperature control	C	1	1
	Legionnaires' Disease 3 (cooling towers)	C	1	1
	Thermal comfort	D	1	1
	Indoor noise	D	1	0
Energy	Total net CO_2 emissions	C	15	10
	Sub-metering of energy use	C	1	1
	Check-metering (single tenant or multi tenant)	C	1	1
Transport	Transport CO_2 emissions	C	10	9
	Cyclist facilities (cycle storage, showers, changing)	C	1	1
	Access to public transport networks (commuting)	C	1	1
	Access to public transport networks (business travel)	C	1	1
Water consumption	Water consumption 4.5-<5.5m³ per person/yr	C	1	1
	Water consumption 1.5-<4.5m³ per person/yr	C	1	1
	Water consumption <1.5m³ per person/yr	C	1	0
	Water Metering	C	1	1
	Water Leak detection	C	1	0
	Proximity detection water shut off in toilet areas	C	1	1
Materials	Asbestos	C	1	1
	Storage of Recyclable Materials	C	1	1
	At least 80% of upper floor slab achieve A rating	D	1	0
	At least 80% of external wall achieve A rating	D	1	1
	At least 80% of roof achieve A rating	D	1	1
	At least 80% of windows achieve A rating	D	1	1
	Solid Timber	D	1	1
	Composite timber panel products	D	1	1
	Reuse of more than 50% of existing façade	D	1	1
	Reuse of more than 80% of major structure	D	1	0
	Re-use of demolition materials.	D	1	0
Land use	Re-use of site	D	1	1
	Contaminated land	D	1	1
Ecology	Minimising ecological damage	D	1	0
	Ecological impact	D	4	1
	Ecological enhancement	D	1	4
	Protection of existing ecology	D	1	1
Pollution	Ozone depletion, refrigerants	C	1	1
	Ozone depletion, refrigerant leak detection	C	1	1
	Ozone depletion, refrigerant recovery	C	1	1
	Ozone depletion, halons	C	1	1
	Acid rain - NO_x emissions 200 or less mg/kWh	C	1	1
	Acid rain - NO_x emissions 99 or less kWh	C	1	1
	Acid rain - NO_x emissions 69 or less mg/kWh	C	1	1
	Acid rain - NO_x emissions 39 or less mg/kWh	C	1	1
	Protection of natural watercourses	C	1	0
	Ozone depletion, insulants	D	1	0
				1

GENERAL BUILDING DETAILS

MSP Building

Building Details

The MSP building for the Scottish Parliament comprises mainly offices for the MSP's and their secretarial staff with kitchen, dining and fitness and changing facilities. This building is entirely new build.

Construction

The building comprises a concrete frame consisting of a combination of insitu and precast, post and beam elements in conjunction with a pre-cast vaulted concrete ceiling structure. Ground floors and upper floors are suspended concrete, with internal walls constructed of timber, glass and in-built timber storage units.

External walls are typically a combination of granite, slate, stainless steel and precast concrete cladding panels. The eastern façade is composed of lightweight construction whereas the western façade is of a heavyweight pre-cast concrete design. The external walls are designed to have a U-Value of 0.25W/m²K.

The roof is pitched, constructed in timber and clad in stainless steel. The roof is insulated and is designed to have a U-Value of 0.25W/m²K.

Glazing and shading

All windows in the building are low emissivity coated, argon-filled, double-glazed oak-framed units. Decorative oak external shading elements are provided on the western façade to deflect any direct sunlight. The housing directly opposite the site will cut out the majority of low angle sun from the west. Fixed external oak louvres are provided to the eastern elevation.

Heating

Heating is provided by 3 gas fired boilers located in the plant room on the ground floor of the building. 2 boilers are condensing whereas one boiler is a high efficiency boiler. The boilers operate in series with modulating control, full weather compensation, optimum start control and a full building management system. The sequencing of the boilers is such that at part load the condensing boilers will operate before the high efficiency boiler. Heat is distributed to office spaces via a low pressure hot water perimeter trench heating system. Heating to non office areas such as W.C.'s are provided by radiators. Although the building operates under a building management system , all offices are provided with local controls for the heating system in the form of two port motorised valves linked to thermostatic controllers. Window sensors are directly linked to the building management system to ensure that the heating in office spaces does not operate when the windows are open.

Lighting

Lighting to office spaces is provided by compact fluorescent luminaires, supplemented by individual task lighting.

Lighting controls have PIR absence detection, timeswitching, daylight sensing and incorporate local control of lighting via switching provided to all office areas.

Ventilation

Ventilation is provided by openable windows and trickle ventilation. Mechanical ventilation is only supplied to internal rooms. The fitness suite, and the computer server room are provided with local cooling units using a refrigerant with an ozone depletion potential of zero.

Cooling

Offices will not be air conditioned.

Domestic Hot Water

Domestic hot water will be provided by solar panels with a gas fired water heater acting as a back up.

ASSESSMENT ISSUES

1. MANAGEMENT ISSUES

1.1 Commissioning Period

One credit will be awarded where evidence can be provided showing adequate time and budget allowances for commissioning are made on project programmes and in cost plans prior to occupation of the building.

Suitable evidence would include a programme of works indicating a clear period of no less than 2 weeks for commissioning.

RMJM Scotland Ltd enclosed a copy of the Strategic Programme for The Scottish Parliament Building dated 19 July 2000 with their letter of 8 December 2000. This confirms that commissioning of the MSP Building is planned into the programme for the period from beginning September 2001 through to mid December 2001 (approx. 3½ months). This satisfies the criteria for this credit.

This credit has been achieved.

1.2 Design Team Responsibilities

One credit will be awarded where evidence can be provided that a design team member or members are expressly appointed to monitor commissioning on behalf of the client.

Suitable evidence would include

EITHER a letter of appointment of a design team member for responsibility for commissioning of services

OR specific reference to an individual(s) in the contract documents.

RMJM confirmed this in their letter of 8 December 2000 and enclosed a copy of the relevant sections of their contract conditions. Briefly their appointment as building services engineers on this project is based on full ACE conditions. In addition, their 'brief' requires the appointment of a full time resident engineer whose duties will include monitoring, witnessing, testing and commissioning of all building services plant.

This credit has been achieved.

1.3 Commissioning Agent

One credit will be awarded where evidence can be provided that a specialist commissioning agent is appointed by either the client or contractor for complex systems including air conditioning, mechanical ventilation, displacement ventilation, passive ventilation systems, BMS, etc.

Where a building excludes any systems deemed to be complex this credit will be achieved by default.

Suitable evidence is defined as:

EITHER a letter of appointment of a commissioning manager

OR suitable reference to a commissioning manager within the contract documents.

RMJM confirmed in their letter of 8 December 2000 that the appointment of a commissioning manager is not programmed until April/May 2001. However a letter from the management contractor, Bovis Lend Lease, dated 4 December 2000 was enclosed confirming their intention to appoint a commissioning manager to undertake the commissioning of complex systems on the project.

This credit has been achieved.

1.4 Contractor Responsibilities

One credit will be awarded where evidence can be provided that ensures responsibilities for pre-commissioning, commissioning, quality monitoring are passed onto the appropriate contractors and all trades on site. In line with the recommendations as set out in BSRIA/CIBSE guidance.

Suitable evidence would include a copy of the relevant contract documentation which provides details of the contractors responsibilities.

A copy of specification clause Y51 (Testing and Commissioning Mechanical Services) was enclosed with RMJM's letter of 8 December 2000. This confirms that the above criteria are met with specific reference being made to the relevant BSRIA Application Guides and CIBSE Commissioning Codes in the specification.

This credit has been achieved.

1.5 Re-Commissioning Guide

One credit will be awarded where there is provision of a simple re-commissioning guide covering the key building services systems (heating, cooling, lighting, ventilation, humidification, etc.). This may be within a building manual or Health & Safety File.

Suitable evidence at the Design & Procurement stage would be a commitment to provide this together with a detailed outline of the contents would be sufficient to demonstrate this.

RMJM confirmed in their letter of 8 December 2000 that a Re-Commissioning Guide will be produced for the Scottish Parliament Building.

This credit has been achieved.

2. HEALTH & WELLBEING ISSUES

2.1 Legionnaires' Disease (Airborne External)

There is one credit available where cooling tower locations are designed to allow ease of access to filters/drip trays etc. for cleaning/replacement, or no cooling towers. Cooling towers provide one of the major areas for microbial contamination and, therefore, present a substantial health concern.

BREEAM gives one credit for specifying one of the following:

- no air conditioning;
- air conditioning without wet cooling towers;
- air conditioning with wet cooling towers designed to the specification described in CIBSE TM13 and HSG70.

The design team confirmed at the design assessment meeting that there are no wet cooling towers associated with the building.

This credit has been achieved.

2.2 Legionnaires' Disease (Domestic Water Services)

The majority of outbreaks of legionnaires' disease are associated with the domestic hot water systems of non-domestic buildings. The Chartered Institute of Building Services Engineers (CIBSE), have recommended design procedures for minimising the risk of legionnaires' disease in their Technical Memorandum TM13. A credit is given for designs which comply with TM13.

The CIBSE TM13 checklist issued during the design team meeting has been completed (dated 11 August 2000), confirming that the guidelines have been implemented in the design of domestic hot water systems.

This credit has been achieved.

2.3 Ventilation

One credit will be awarded where at least 10% of external facades to office areas are openable and on at least two opposite sides. This should have an even distribution across the office area so as to promote adequate cross ventilation.

The design team confirmed, at the design team meeting, that at least 10% of all external facades to office areas have openable windows. Examination of the plans confirmed that the distribution of openable windows had an even distribution across the office floor therefore the criteria for this credit has been met.

This credit has been achieved.

2.4 Humidification

One credit will be awarded where steam humidification is installed OR where no humidification is present.

The design team confirmed at the design assessment meeting that no humidification would be provided for the building.

This credit has been achieved.

2.5 Air Quality

One credit will be awarded where location of air intakes/outlets serving occupied areas avoid major sources of external pollution.

Air conditioned and mixed-mode buildings:
Where location of air intakes/outlets
- are over 10m apart to minimise recirculation
- AND are over 20m from sources of major external pollution including other extracts, roads, vehicle manoeuvring areas, industrial extract etc.

Naturally-ventilated buildings
Where location of openable windows/ventilators
- are over 10m from sources of major external pollution including other extracts, roads, vehicle manoeuvring areas, industrial extract etc.

The design team confirmed at the design assessment meeting that all of the openable windows of the building were located at least 20 metres away from roads and other forms of external pollution.

This credit has been achieved.

2.6 Outside Air Provision

One credit will be awarded where either:

- Outside air is provided in accordance with CIBSE recommended ventilation rates in a/c mech. vent systems. This is currently 8 litres per person in instances where smoking is not permitted (16 litres per person - light smoking; 32 litres per person - heavy smoking)
- OR Trickle vents are provided on the majority of windows in naturally ventilated buildings

The design team confirmed at the design assessment meeting that trickle vents had been specified on all windows.

This credit has been achieved.

2.7 Daylighting

One credit will be awarded where at least 80% of net lettable office area is adequately daylit.

Credit is given if the following criteria are met in at least 80% of the office area:

- the average daylight factor exceeds 2%
- the sky must be visible from desk height from at least 80 % of each room
- the room depth criterion must satisfy: $d/w + d/h < 2/(1-R_B)$,

where d = room depth
w = width
h = window head height
R_B = average reflectance of surfaces in the back half of the room

Daylight calculations have been provided for a single room type in the MSP building. These show that the average daylight factor for room type 1A, MSP/Staff Room, is 2.9%.

Iain Harper (for RMJM Scotland Ltd) has confirmed in his letter of 5 March 2001 that the building does not satisfy all three criteria for this credit due to the height of the adjacent buildings and the proportions of the rooms.

This credit has not been achieved.

2.8 Glare Control

One credit will be awarded where occupant controllable internal or external blinds are fitted to all windows to prevent glare.

The installation of internal blinds has not been included in the design. The design team have stated in their letter dated 8 December 2000 that 'it is felt that the building design, its orientation and the proximity of a neighbouring 6 storey hotel, alleviate the requirement for blinds on the west elevation. On the east side... it is felt that glare from the sun is highly unlikely, accordingly blinds are not specified.' This credit is awarded where blinds are fitted to all windows, therefore it is not achieved.

This credit has not been achieved.

2.9 Lighting, High Frequency Ballasts

One credit will be awarded where high frequency ballasts are installed in all general office luminaires.

The design team confirmed at the design assessment meeting that high frequency ballasts have been specified in all office areas.

This credit has been achieved.

2.10 Lighting Levels

One credit will be awarded where lighting meets BCO Specification for Offices recommendations in terms of lighting levels. BCO specification for lighting states that the "Design for maintained illuminance level of 350-400 lux (open plan) with a uniform ratio of 0.8 over the defined task area in general offices areas". In addition light fittings should be designed and installed with Category 2 reflectors with design for inter-changeability with Category 1 and 3 louvres, without modification, being required.

The design team confirmed at the design assessment meeting that the illuminance level in office areas would be between 450 and 500 Lux. This does not meet the BREEAM criteria for this credit.

This credit has not been achieved.

2.11 Lighting Controls

One credit will be awarded where control of lighting in office areas relates to circulation space, daylighting and is zoned to provide separate control for groups of no more than 4 work areas.

The building services engineer confirmed at the design assessment meeting that a PIR lighting control system would be installed incorporating daylight sensing, time switching and absence detection. In addition manual switching would be provided for banks of 4 workstations to allow occupants to have local control of their environment.

This credit has been achieved.

2.12 View to Outside

One credit will be awarded where all workstations to have view out with a maximum distance of 7m to the nearest window.

The design team provided a plan of the building at the design assessment meeting confirming that all workstations were located at a maximum distance of 7m from the nearest window.

This credit has been achieved.

2.13 Local Temperature Control

One credit will be awarded where local control is available for temperature in office areas to cope with different load requirements. This requires that the system is designed to allow for independent thermal control in all separate office areas including floors within the building and zoning should allow separate control of each perimeter area and the central zone.

The design team confirmed at the design assessment meeting that local temperature control would be provided using motorised two port valves linked to wall mounted temperature controllers. The heating zones would be limited to a maximum of four persons per controller.

This credit has been achieved.

2.14 Legionnaires' Disease (Airborne External)

One credit will be awarded where cooling towers/systems designed in accordance with HSG70 & TM13 or no cooling towers. If the building involves no air-conditioning or if the air conditioning system employs air cooled condensers, then credit is automatically given.

The design team confirmed at the design assessment meeting that there are no wet cooling towers associated with the building.

This credit has been achieved.

2.15 Thermal Comfort

There is one credit for minimising the risks of discomfort due to overheating of the building. The credit is awarded where it can be shown that assessments of thermal comfort levels have been made at an early design stage as well as at detailed design. The thermal assessment should be consistent with the CIBSE Guide, Volume A.

The design team confirmed at the design assessment meeting that the design was assessed at an early stage in the design process using the CFD thermal analysis software TAS. It was also assessed towards the end of the design process in March 2000. The results of the March thermal comfort analysis predicted that the temperature in the building would exceed 25°C for only 2.6% of the time over an entire year.

This credit has been achieved.

2.16 Indoor Noise

One credit will be awarded where design achieves ambient noise levels below:
- 40dB LAeqT in small offices
- 45dB LAeqT in large offices.

A copy of noise calculations for the MSP Building and Queensberry House were enclosed with RMJM's letter of 8 December 2000. These were carried out by Sandy Brown Associates. In summary they say that the building services are designed to meet the criteria but that traffic noise intrusion is likely to push the predicted noise levels in some offices above the criteria, when the windows are open. As the building is naturally ventilated and therefore dependent on windows being opened for ventilation purposes this credit cannot be awarded, based on current conditions.

This credit has not been achieved.

3. ENERGY ISSUES

3.1 Carbon Dioxide Emissions

Credits will be awarded for predicted carbon dioxide emissions from the building, as follows:

CO_2 emissions	Number of credits
CO_2 emissions between 160 - 140 Kg/m^2/yr	1
CO_2 emissions between 139 - 120 Kg/m^2/yr	2
CO_2 emissions between 119 - 100 Kg/m^2/yr	3
CO_2 emissions between 99 - 90 Kg/m^2/yr	4
CO_2 emissions between 89 - 80 Kg/m^2/yr	5
CO_2 emissions between 79 - 70 Kg/m^2/yr	6
CO_2 emissions between 69 - 60 Kg/m^2/yr	7
CO_2 emissions between 59 - 50 Kg/m^2/yr	8
CO_2 emissions between 49 - 40 Kg/m^2/yr	9
CO_2 emissions between 39 - 30 Kg/m^2/yr	10
CO_2 emissions between 29 - 20 Kg/m^2/yr	11
CO_2 emissions between 19 - 10 Kg/m^2/yr	12
CO_2 emissions between 9 - 5 Kg/m^2/yr	13
CO_2 emissions between 4 - 0 Kg/m^2/yr	14
CO_2 emissions of 0 Kg/m^2/yr	15

The annual energy consumption for this office has been predicted using the "ESICHECK" program. The following energy usage assumes standard occupancy patterns.

Gas	*70.43 kWh/m^2*
Electricity	*44.58 kWh/m^2*

This converts to the following CO_2 emissions:

Gas	*13.38 kg/m^2/year (conversion factor 0.19)*
Electricity	*20.95 kg/m^2/year (conversion factor 0.47)*
Total	***34.33 kg/m^2/year***

10 credits have been achieved.

3.2 Submetering of Energy Use

One credit will be awarded where sub metering is available for substantive energy uses within the building covering lighting and each of the following where present:

- Computer Room
- Catering Facilities
- Humidification Plant
- Cooling Plant
- Fans

The design team confirmed at the design assessment meeting that energy use for heating, domestic hot water and lighting intake will be sub-metered. RMJM have additionally confirmed in their letter dated 8 December 2000 that cooling and air handling plant will be sub-metered and that there are no computer rooms or humidification plant installed. A copy of the relevant control panel schedules was enclosed.

This credit has been achieved.

3.3 Check Metering of Energy Use

One credit will be awarded where check-metering of electricity supply to tenancy areas (in multi-occupant buildings only) has been specified or where the building is occupied by a single tenant and is likely to remain so within the next five years.

All of the Scottish Parliament buildings have the same tenant therefore this credit is automatically achieved.

This credit has been achieved.

4. TRANSPORT ISSUES

4.1 Transport

Ten credits are available depending on the predicted net CO_2 emissions arising from transport to and from the building. The number of credits is calculated using a spreadsheet-based calculation method, which predicts the potential number of car journeys created by the office development and therefore the potential CO_2 emissions.

The calculation predicts the percentages of occupants travelling to and from the office in the following categories: bus, train, tube/metro, cycling, walking, individual cars and car sharing/pools.

CO_2 emissions	Number of Credits
CO_2 emissions less than 4500 kg/person/year	1
CO_2 emissions less than 4000 kg/person/year	2
CO_2 emissions less than 3500 kg/person/year	3
CO_2 emissions less than 3000 kg/person/year	4
CO_2 emissions less than 2500 kg/person/year	5
CO_2 emissions less than 2000 kg/person/year	6
CO_2 emissions less than 1700 kg/person/year	7
CO_2 emissions less than 1300 kg/person/year	8
CO_2 emissions less than 1000 kg/person/year	9
CO_2 emissions less than 750 kg/person/year	10

The proposed building is situated in the city centre of Edinburgh within 200m walk of Waverly train station (the main train station in Edinburgh) and bus transport nodes. Based on 'close proximity to major transport nodes', a net office floor area of 2826m² and 65 car parking spaces (including 4 disabled), the CO_2 emissions have been calculated using the BREEAM spreadsheet. The predicted emissions are 755 kg per person per year which falls just above the 750 kg/person/year level and achieves 9 of the 10 credits available.

9 credits have been achieved.

4.2 Cyclists Facilities

There is one credit for the provision of adequate cyclist's facilities.

The BREEAM credit is available for designing-in secure points to allow a minimum 10% of staff to lock bicycles adjacent to the building, sheltered from rain and snow. The design should allow one wheel and the frame to be secured together. In addition, at least two of the following features should be provided:

- changing facilities for cyclists;
- space for drying wet clothes;
- showers for cyclists.

The building has a net office floor area of 2826 m² therefore the expected office population based on 1 person per 10m² is 282 people.

Iain Harper (for RMJM Scotland Ltd) confirmed in his letter of 5 March 2001 that 50 cycle spaces are provided in the MSP building, together with separate male and female locker rooms with five showers in each. There are an additional 40 cycle spaces located in the vicinity of the main entrance to the Parliament buildings, (thus giving a total of 90 cycle spaces available to the staff of the buildings). He confirmed that the spaces are not dedicated to any of the buildings, but will be allocated on the basis of first come first served.

He provided approximate occupancy figures for the three buildings on the site:

MSP Building 250-350approx.
Queensberry House 75 approx.
Assembly Building 400 approx.

Thus the total occupancy for the site should be in the range of 725 to 825 people. BREEAM would therefore require a minimum of 72 to 82 cycle spaces for the site. The provision of 50 internal spaces plus 40 external spaces satisfies the requirements for the site as a whole.

This credit has been achieved.

4.3 Access to Public Transport Networks (Commuting)

One credit will be awarded where good access to public transport networks within 500m and with a 15 min. service frequency to local urban centre.

The design team confirmed at the design assessment meeting that the development is located in the city centre of Edinburgh within 200m of a major train station and bus transport nodes, thus meeting the above criteria.

This credit has been achieved.

4.4 Access to Public Transport Networks (Business Travel)

One credit will be awarded where good access to public transport networks within 500m and with a 30 min. service frequency to major transport node.

The design team confirmed at the design assessment meeting that the development is located in the city centre of Edinburgh within 200m walk of a major train station and bus transport nodes, thus meeting the above criteria.

This credit has been achieved.

5. WATER CONSUMPTION ISSUES

5.1 Water Consumption

Credits will be awarded for water conservation measures as follows:

	Number of credits
Predicted water consumption between 4.5 and 5.5m³ per person per year.	1
Predicted water consumption between 1.5 and 4.5m³ per person per year.	2
Predicted water consumption is less than 1.5m³ per person per year.	3

The design team completed and returned the water consumption checklist with their letter dated 11th August 2000. The following were confirmed:

- *WCs with 6.0 litre flushes (95%)*
- *Vacuum toilets in basement with 1 litre flushes (5%)*
- *Urinals with Infra Red proximity control*
- *Wash hand basins with flow regulators and automatic shut off*
- *Showers with flow rate of <9 and >6 litres per minute*
- *Well water collection to supply 100% of water used for flushing W.C.'s*

Using the above data, the estimated water consumption for the MSP Building was calculated using the BREEAM assessment software to be 2.89 m³ per person per year. This achieves two credits.

2 credits have been achieved.

5.2 Water Metering

One credit will be awarded where a water meter is installed to all supplies to the building.

The design team confirmed that all mains supplies of water to the building would be separately metered. A copy of the water supply schematic, drawing number X(53)PSD 0001 (rev.T1), has been provided confirming their location in the Plantroom.

This credit has been achieved.

5.3 Water Leak Detection

One credit will be awarded where a leak detection system is installed covering all mains supplies. The leak detection credit is aimed at stopping damage and water wastage caused by leaks when the building is not occupied, e.g. at weekends, overnight, or when parts of the building are not let. The water leak detection systems would need to detect a significant change in water flow rates and shut off the mains supply automatically.

Iain Harper (for RMJM Scotland Ltd) has confirmed in his letter of 5 March 2001 that 'the only areas deemed necessary for the installation of leak detection systems are IT rooms. We are therefore unable to satisfy the criteria required to achieve this credit.'

This credit has not been achieved.

5.4 Proximity Detection Water Shut Off

One credit will be awarded where a proximity detection shut off is provided to water supply in toilet areas. The proximity detector is required to shut off, taps W.C.'s and showers when no-one is in the toilet block in order to meet the criteria for this credit.

The design team confirmed at the design assessment meeting, that absence detection linked to mains water supply of all wash hand basins and showers had been specified. The water supply will automatically shut off when no presence in the toilet block is detected.

Iain Harper (for RMJM Scotland Ltd) has provided a copy of the relevant specification clause with his letter of 5 March 2001. Clause S10:1040 Cold Water: Control Requirements, specifies PIR sensor controls on a) wash basin taps for general toilet areas, b) urinal water supply and c) group shower areas. The water for the W.C.s is not provided by mains water (being supplied by well water / grey water), and no such system has been specified for W.C.'s.

The purpose of this credit is to prevent loss through minor leaks (e.g. dripping taps, unnecessary urinal flushing, etc.). The system being provided is satisfactory to meet this purpose.

This credit has been achieved.

6. MATERIALS ISSUES

6.1 Asbestos

One credit will be awarded where there is no asbestos in structure, services, lifts etc.

The design team confirmed at the design assessment meeting that no asbestos has been specified within the building.

This credit has been achieved.

6.2 Storage of Recyclable Materials

One credit will be awarded where presence of dedicated storage space for materials either within building or on site skips with good access for collections ($2m^2$ per $1000m^2$ up to $10m^2$ max.)

Iain Harper (for RMJM Scotland Ltd) has confirmed in his letter of 5 March 2001 that there are currently no plans to provide a dedicated room within the MSP Building for recyclable refuse. However there is an area on site for the sole purpose of recyclable refuse. This is located in a 'back of house' area within the basement and measures approximately $30m^2$. An excerpt from the upper basement drawing indicating its location was enclosed, as was a statement from the Scottish Parliament Facilities Management team demonstrating their commitment to recycling. This confirms that the FM office is responsible for the implementation of the waste and recycling programmes within the parliament's interim accommodation. It also indicates that a variety of receptacles for collecting recyclable waste have been provided for use within office and vending areas.

As the site operates as an integrated unit under the one FM office, the criteria for this credit are satisfied.

This credit has been achieved.

6.3 Materials Selection (Upper Floor Slab)

Credits will be awarded for major building elements that are evaluated against the specifications set out in the 'Green Guide to Materials Specification' as follows:

One credit will be awarded where at least 80% by area of upper floor slab specifications achieve an 'A' overall rating.

The upper floor slab will be composed of precast and insitu concrete. Precast and insitu concrete flooring systems both achieve a 'B' rating according to the 'Green Guide to Materials Specification' and as such do not meet the criteria for this credit.

This credit has not been achieved.

6.4 Materials Selection (External Wall)

One credit will be awarded where at least 80% by area of external wall specifications achieve an 'A' overall rating.

The external walls are a combination of stainless steel, granite, slate and pre-cast concrete cladding panels. All of these materials obtain an 'A' rating in the BRE 'Green Guide to Specification and meet the criteria for this credit.

This credit has been achieved.

6.5 Materials Selection (Roof)

One credit will be awarded where at least 80% by area of roof specifications achieve an 'A' overall rating.

The roof will consist of an insulated pitched construction clad in steel. The closest match in the BRE 'Green Guide to specification' is Mill finish stainless steel profiled clad, PU insulation, which achieves an 'A' rating.

This credit has been achieved.

6.6 Materials Selection (Windows)

One credit will be awarded where at least 80% by area of window specifications achieve an 'A' overall rating.

The frames of the windows will be constructed of oak timber, which achieve an 'A' rating according to the 'Green Guide to Materials Specification'.

This credit has been achieved.

6.7 Solid Timber

There is one credit available for avoiding the use of solid timber originating from unknown and unsustainable sources.

BREEAM gives one credit for specifying EITHER solid timber which is entirely from well managed, sustainable sources OR suitable re-used timber. Softwood timbers and temperate hardwoods are considered to be from sustainable sources. In the case of tropical hardwoods, the design team needs to provide the following information to demonstrate that the timber comes from a well managed, sustainable source:

- the species and country of origin;
- the name of the concession or plantation within the country of origin which supplied the timber;
- a copy of the forestry policy being pursued for the plantation or concession;
- shipping documents confirming that the timber supplier in the UK has indeed obtained their timber from the concession.

The architect stated at the design assessment meeting that all timber used in the building would be oak. Oak is a temperate hardwood and for the purposes of the BREEAM assessment is considered to originate from a sustainable well managed source. A copy of the joinery specification was enclosed with the letter of 8 December 2000.

Clause A33:105 of the specification states that timber used on the project 'must be demonstrably from well- managed, regulated, sustainable sources'. The management contractor, Bovis Lend Lease, have confirmed by e-mail dated 22 January 2001 that BLL are a member of the WWF95+ group. As such they 'are required to audit chains of custody and collect data on timber use. Where procurement of FSC timber is not reasonably practicable contractors should obtain timber form a known source and attempt to gain as much assurance as possible that the forest is well-managed and provide documentation to BLL as proof.' A list of the required documentation was also given. The information provided is satisfactory to enable this credit to be awarded.

This credit has been achieved.

6.8 Composite Timber Products

There is one credit for specifying plywood which does not contain tropical hardwoods of unsustainable or unknown origin.

The credit is available for specifying EITHER timber panel products which are entirely from well managed, sustainable sources OR suitable re-used timber. The following clause gives clear guidance to a contractor concerning the supply of plywood:

" • Plywood of unknown composition is expressly prohibited.
- Plywood comprised of solid temperate hardwoods (or softwoods) may be used, such as solid Birch, or solid Douglas Fir plywood.
- Plywood containing tropical hardwood is prohibited, unless certification is provided. The certification should include the following:
  - the species and country of origin;
  - the name of the concession or plantation within the country of origin which supplied the timber;
  - a copy of the forestry policy being pursued for the plantation or concession.
  - shipping documents confirming that the timber supplier in the UK has indeed obtained their timber from that concession.

The contractor is to confirm in writing to The Project Manager the species of timber contained in the plywood, and how they have met the above specification.

The contractor's attention is drawn to the fact that plywood may contain timber from unknown or unsustainable sources."

Including such a clause in the specification for plywood would meet the criteria for this BREEAM credit.

A copy of the joinery specification has been forwarded to the assessor, enclosed with the letter of 8 December 2000.

Clause A33:105 of the specification states that timber used on the project 'must be demonstrably from well- managed, regulated, sustainable sources'. The management contractor, Bovis Lend Lease, have confirmed by e-mail dated 22 January 2001 that BLL are a member of the WWF95+ group. As such they 'are required to audit chains of custody and collect data on timber use. Where procurement of FSC timber is not reasonably practicable contractors should obtain timber form a known source and attempt to gain as much assurance as possible that the forest is well-managed and provide documentation to BLL as proof.' A list of the required documentation was also given. The information provided is satisfactory to enable this credit to be awarded.

This credit has been achieved.

6.9 Building Materials Containing Waste or Re-Used Materials (50% of Facade)

One credit will be awarded where reuse of more than 50% of existing façades by area.

The façade of the building is entirely newbuild therefore the criteria for this credit have not been met.

This credit has not been achieved.

6.10 Building Materials Containing Waste or Re-Used Materials (80% of Structure)

One credit will be awarded where reuse of more than 80% of the existing structure.

The structure of the building is entirely newbuild therefore the criteria for this credit have not been met.

This credit has not been achieved.

6.11 Re-Use of Demolition Materials

There is one credit for re-using demolition material.

BREEAM gives one credit for using one or more of the following:

- suitable uncontaminated demolition materials, wherever appropriate, in fill and hardcore and/or granular road base;
- crushed concrete aggregate complying with the quality and grading requirements of British Standard BS882 for use in concrete for foundations, over-site slabs, hardstanding, paths or site roads.

The design team confirmed at the design assessment meeting that demolition material had been used for fill and hardcore in the development.

This credit has been achieved.

7. LAND USE

7.1 Re-Use of Site

One credit will be awarded where the site has been previously built on or used for industrial purposes within the last 50 years.

The design team confirmed at the design assessment meeting that the proposed site was previously occupied by the offices belonging to the Scottish & Newcastle Brewery. These premises were subsequently demolished. The site is therefore being re-used and as such meets the criteria for this credit.

This credit has been achieved.

7.2 Contaminated Land

One credit will be awarded where land is defined as contaminated and where adequate steps have been taken to contain or clean the site prior to construction. Evidence of survey and consultants report will demonstrate targets to be achieved. The aim of this credit is to encourage the re-use and cleaning up of contaminated land, therefore, if the land is not contaminated, the credit will not be achieved.

The design team confirmed at the design assessment meeting that the site was not contaminated, therefore this credit has not been achieved.

This credit has not been achieved.

8. ECOLOGY

8.1 Minimising Ecological Damage

One credit will be awarded where land is defined as of low ecological value.

The site has been confirmed to be of low ecological value by the AWTC (Middlemarch Environmental) Ecological Assessment report. The AWTC assessor found it to consist of species-poor amenity grassland and hard surfacing.

This credit has been achieved.

8.2 Ecological Impact

Credits will be awarded for the level of ecological impact that the development has on the site, as follows. The change in ecological value is established by estimating the number of species of wildlife on the site before and after the development.

Ecological Impact	Number of Credits
Where change in ecological value of site is minor and negative.	1
Where change in ecological value of site is neutral.	2
Where change in ecological value of site is minor and positive.	3
Where change in ecological value of site is significant and positive.	4

A BREEAM ecological assessment has been carried out by David Smith of Middlemarch Environmental Ltd. This assessment covers the whole site and was conducted in November 2000. The assessors report states that 'if all enhancement recommendations ... are observed then the change in ecological value will be > +9 "species hectares" and therefore 4 credits will be awarded. The client must provide written confirmation that the recommendations will be followed prior to the credits being awarded.'

Written confirmation that the design team will carry out the proposed recommendations has been received in the form of a letter dated 20 March 2001.

Four credits have been achieved.

8.3 Ecological Enhancement

One credit will be awarded where seeking and acting on advice from the Association of Wildlife Trusts Consultancies (AWTC) or a member of Institute of Environmental Assessment (IEA) on the best ways to enhance the ecological value of the site.

A copy of Middlemarch Environmental Ltd's ecological assessment report has been forwarded to the assessor. This confirms that '1 credit will be awarded subject to the recommendations being observed. The client must provide written confirmation that the recommendations will be followed prior to the credits being awarded.'
Written confirmation that the design team will carry out the proposed recommendations has been received in the form of a letter dated 20 March 2001.

This credit has been achieved.

8.4 Protection of Existing Ecology

One credit will be awarded where contract specification ensures that all trees over 100mm trunk diameter, hedges, ponds, streams etc. are maintained and adequately protected from damage during construction works.

A copy of Middlemarch Environmental Ltd's ecological assessment report has been forwarded to the assessor. This confirms that 'if the lime trees are fenced outside their canopies to prevent accidental damage during construction works, 1 credit will be awarded subject to written confirmation from the client that this has taken place.'

Written confirmation that the adequate protection will be provided for the lime trees during construction has been received in the form of a letter dated 20 March 2001.

This credit has been achieved.

9. POLLUTION

9.1 Ozone Depletion, Refrigerants

One credit will be awarded where the refrigerant type has an ODP of ZERO or where there are no refrigerants present.

The design team confirmed at the design assessment meeting that office spaces would not be air-conditioned. This credit is automatically achieved.

This credit has been achieved.

9.2 Ozone Depletion, Refrigerant Leak Detection

One credit will be awarded where presence of refrigerant leak detection systems covering high risk parts of plant (condenser coil can be omitted from this) or no refrigerants.

The design team confirmed at the design assessment meeting that office spaces would not be air-conditioned. This credit is automatically achieved.

This credit has been achieved.

9.3 Ozone Depletion, Refrigerant Recovery

One credit will be awarded where provision of automatic refrigerant pump down to coil or storage tanks with isolation valves or no refrigerants.

The design team confirmed at the design assessment meeting that office spaces would not be air-conditioned. This credit is automatically achieved.

This credit has been achieved.

9.4 Ozone Depletion, Halons

One credit will be awarded where absence of Halon-based fire-fighting systems.

The design team confirmed during the design assessment meeting that no halon-based fire-fighting systems would be specified.

This credit has been achieved.

9.5 Acid Rain, NOx Emissions

Credit is given for specifying boilers which are fitted with reduced-NO_x emitting burners and which have maximum NO_x emission levels, as follows:

Emissions	Number of Credits
for emissions between 100 and 200 mg/kWh delivered heating energy.	1
for emissions between 70 and 99 mg/kWh delivered heating energy.	2
for emissions between 40 and 69 mg/kWh delivered heating energy.	3
for emissions less than 40 mg/kWh delivered heating energy.	4

The building services engineer confirmed at the design assessment meeting that a boiler with NO_x emissions of less than 60 mg/kWh would be specified. A copy of the relevant specification clause confirming this has been provided.

Three credits have been achieved.

9.6 Protection of Natural and Municipal Watercourses

One credit will be awarded where site facilities reduce potential for run off to natural watercourses and/or municipal watercourses by 50% and where on site treatment such as oil interceptors / filtration is present.)

The aim of this credit is to reduce the flash runoff levels caused by storm water and so reduce pressures on the municipal or natural systems that traditionally deal with it. Excessive water runoff can harm habitats of local water courses and cause erosion. Water runoff can also wash pollutants on the ground (such as oil from cars) into local watercourses. Surface water runoff from building roofs can be stored in on-site holding facilities (tanks, soakaways etc.) or it can be stored and reused as grey water.

A copy of the report for well water supply for ponds and W.C. flushing was provided at the design assessment meeting. There are a number of feature ponds on the site. The report does not confirm whether or not rainwater will be collected from the buildings on the site for use as a top up water supply to feature ponds.
RMJM confirmed in their letter of 8 December 2000 that there are currently no plans to collect surface run-off, in holding ponds or similar.

This credit has not been achieved.

9.7 Ozone Depletion, Insulants

One credit is given in BREEAM for the use of insulation materials which use neither CFCs nor HCFC in their manufacture.

There is one credit for specifying thermal insulants in building fabric and services made only from materials with zero Ozone Depletion Potential. A full description of all the insulation materials specified will be checked for the presence of ozone-depleting agents. If there is any doubt about the ozone depletion potential of the material, the design team must provide details from the manufacturer. The credit will only be achieved if it is shown that **none** of the insulation materials specified in the building **contain CFCs or HCFCs**.

The building services engineer confirmed at the design assessment meeting that Mineral Wool had been specified as insulation to all pipework and ductwork within the building.

The architect confirmed with his letter dated 23 August 2000 that the fabric insulation material in the walls and roof is mineral fibre / mineral wool.

This credit has been achieved.

APPENDIX A

Explanation of the BREEAM 98 rating system

THE RATING SYSTEM FOR BREEAM 98

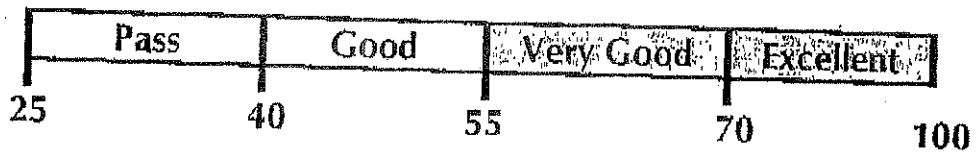
Buildings are awarded two ratings under BREEAM. The rating depends on how many environmental credits are achieved under each section and their relative environmental importance. The two ratings that are awarded are:

1. An overall BREEAM rating of Pass, Good, Very Good or Excellent, depending on the overall number of credits achieved. (A full list of the credits is given in section 4 below.)
2. An Environmental Performance Index on a scale of 1 to 10. This is derived from the number of Core credits achieved. Core credits are those issues that can either be implemented at the design stage or after the building has been built. E.g. installation of water meters. The Core credits are indicated in the full list of credits in Section 4 above.

The overall rating is derived from the percentage of credits achieved under each heading, multiplied by the Environmental Weighting Factor:

CATEGORY	Number of credits available	Weighting factor
Management	5	15
Health and wellbeing	16	15
Energy	17	25
Transport	13	
Water consumption	6	5
Materials	11	10
Land use	2	15
Ecology	7	
Pollution	10	15

The total of all these scores is the overall rating and a rating is awarded according to the following scale:



The Environmental Performance Index is based on the percentage of core credits achieved, multiplied by the Environmental Weighting Factor. The final score is derived from the following scale: