

Energy Statement

1-19 Torrington Place London WC1E 7HB



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ABOUT 4SEE

4see provides services across the UK and Europe from its headquarters in Northamptonshire and across the MENA region from our offices in Abu Dhabi. Our consultants are highly experienced and qualified professionals, trainers, engineers, surveyors and environmental management specialists, focussed clearly on our clients' success.

4see has been specifically designed and developed to provide a new kind of high quality, multidisciplinary consultancy. Our standards are the highest in the industry, requiring all consultants and trainers to have a minimum level of qualifications far higher than the industry norm, in addition to extensive experience in their relevant discipline or sector. These high standards allow us to support clients with complex or demanding portfolios of work throughout the UK and internationally, while always guaranteeing the highest level of professional input.



INTRODUCTION

4see have been commissioned by University College London (UCL) to prepare an energy statement relating to the energy performance of 1-19 Torrington Place W1CE 7HB. The report has been requested by Camden Council in relation to planning consent certificate 2012/4608/P, Bloomsbury Ward, dated 03/09/2012.

Proposal

Change of use from offices (Class B1a) to dual use as offices (Class B1a) and educational use (Class D1) for a temporary period of 10 years (excluding retail and other commercial units on Tottenham Court Road frontage). The application is for the change of use and refurbishment and does not include new development or additional floor space.

Proposal background

1-19 Torrington Place has been occupied by UCL since the early 1990s. Temporary planning permission for Class D1 use of part basement, ground floor and second to fifth floors of the building expired October 2013. Prior to UCL, the building was a headquarters office for Philips. UCL needs a 'swing space' for the implementation of Bloomsbury Masterplan which is an ambitious programme of renovation and redevelopment of its Bloomsbury campus, with expected investment around £500 million over the next 10-15 years. The Bloomsbury Masterplan has not yet been finalised and agreed by the Council but 1-19 Torrington Place is needed to accommodate future academic and administrative moves associated with it.

The Masterplan is based on flexible and achievable strategies and a range of 60 projects. It seeks to capitalise on a continued involvement of University people in the allocation and arrangement of space in the future and promotes a significant overall improvement in the estate. This includes the consolidation and co-location of linked departments and faculties within close proximity, to respond to the needs of academics and students, and years of ad hoc additions and changes across the Bloomsbury Campus. This will require a series of independent and sequential moves to enable existing buildings to be refurbished and departments to be temporarily or permanently relocated.

The use of 1-19 Torrington Place with flexibility of switching between Class B1 and Class D1 uses is expected to play an important role in the implementation of the Bloomsbury Masterplan strategy by enabling a number of planned temporary and permanent moves possible.

Prior to commencement of the development, an Energy Statement describing and illustrating the potential carbon reduction measures and efficient energy supply and generation systems for the site, in comparison to existing situation, shall be submitted to and approved in writing by the Local Planning Authority. The measures shall include but not be restricted to:

- a insulation;
- b floor by floor energy metre to monitor energy use;
- c energy efficient lighting;
- d systems to control ventilation, heating, cooling, lighting and speed of motors driving pumps and fans;
- e natural ventilation; and
- f replacement of ageing gas boilers and air handling units with more efficient ones.



IMPROVEMENTS UNDERTAKEN

UCL is required to demonstrate how the buildings carbon emissions have been reduced since taking control of the building. UCL has undertaken a number of energy saving improvements since taking ownership of the building. Improvements include:

- 1 Replacement of inefficient lighting with efficient LED/T5 lighting
- 2 Installing lighting control PIR (occupancy and daylight sensors)
- 3 Replacement of roof top chiller with new energy efficient chiller
- 4 Replacement of existing boilers with high energy efficient boilers
- 5 Installation of intelligent building management system
- 6 Installation of voltage optimisation equipment
- 7 Installation of building and floor-by floor energy meter, to monitor energy use and assess the impact of energy efficiency improvements
- 8 Insulating all plant rooms
- 9 Installing inverter control to AHUs
- 10 Cooling plant upgrade to Free Cooling

The aim of the report is to demonstrate how the above energy saving projects have reduced the buildings carbon emissions.



METHODOLOGY

4see undertook an EPC inspection at 1-19 Torrington Place in order to provide a baseline EPC rating and Building Emission Rate (BER). The information to calculate the buildings BER was collected from a site visit undertaken by Lee Pegler. In addition to the site information, we have also taken into account how the building was fitted out prior to any improvement works being undertaken. Once the baseline BER had been calculated 4see re-calculated the BER with the above energy saving projects included.

As a number of the above energy saving projects are not relevant or included in the EPC assessment, we have also used industry guidelines to calculate the additional carbon reduction from the remaining energy saving projects. (Improvements 1-5 are relevant to the EPC calculation and improvements 6-10 are not relevant to the EPC calculation).

The EPC calculation is an industry recognised method of determining the buildings carbon emissions. The calculation takes into account the equipment within the building, but does not take into account how the building is used. We have undertaken all the EPC calculations in the present version of SBEM v5.2.d.2. It must be noted that when UCL first occupied 1-19 Torrington Place an earlier version of SBEM was available and as such the ratings that we state will not be the same as when first occupied. In order to ensure that the buildings pre and post improvements BERs are comparable we have used the same version of SBEM.



FINDINGS

Assumed energy use prior to improvement works being undertaken based on SBEM v5.2.D.2 calculation

BER = 143.8kgCO₂/m² per annum (see appendix A)

(Electricity = 110.8kgCO₂/m² - Gas = 33kgCO₂/m²)

Improvements based on EPC methodology:

- 1 Replacement of inefficient lighting with efficient LED/T5 lighting. BER = 137.5kgCO₂/m² (5% CO₂ reduction)
- Installing lighting control PIR (occupancy and daylight sensors). BER = 132.3kgCO₂/m² (4% CO₂ reduction)
- 3 Replacement of roof top chiller with new energy efficient chiller (EER 2.740). BER = 130.1kgCO₂/m² (2% CO₂ reduction)
- 4 Replacement of existing boilers with high energy efficient boilers (SEER 88%). BER = 124.9kgCO₂/m² (4% CO₂ reduction)
- 5 Installation of intelligent building management system. BER = 123.2kgCO₂/m² (1% CO₂ reduction)

BER = 123.2kgCO₂/m² per annum 16% reduction of CO₂ (see Appendix B)

(Electricity = 91.2kg/CO₂/m² - Gas = 32kgCO₂/m²)

Additional improvements based on industry standards*:

- 6 Installation of voltage optimisation equipment *5% electricity savings. BER = 118.6kgCO₂/m² (4% CO₂ reduction)
- 7 Installation of building and floor-by floor energy meter to monitor energy use and assess the impact of energy efficiency improvements. *5% electricity savings and 5% gas savings. BER = 113kgCO₂/m² (5% CO₂ reduction)
- 8 Insulating of all plant rooms *1% gas saving. $BER = 112.7 \text{kgCO}_2/\text{m}^2$ (0.5% CO_2 reduction)
- Installing inverter control to the AHU's *5% electricity savings and 15% gas savings.
 BER = 104.9kgCO₂/m² (7% CO₂ reduction)
- 10 Upgrading cooling plant to include "free cooling" 5% electricity savings. BER = 100.4kgCO₂/m² (4% CO₂ reduction)

BER = 100.4kgCO₂/m² per annum Overall 30% reduction in CO₂ emissions

(Electricity = 75.1kgCO₂/m² Gas = 25.3kgCO₂/m²)



CONCLUSION

Camden Planning Policy states that the energy hierarchy (be lean, be clean, be green) within LP 5.2 applies to all developments, and all developments are required to make the fullest contribution to reducing CO_2 emissions.

From the original site visit undertaken by Lee Pegler and the additional information made available, we have calculated that 1-19 Torrington Place has achieved energy savings of the following:

Total CO₂ savings = 43.4kgCO₂/m².annum

(Total CO₂ savings (electricity) = 35.7kgCO₂/m². annum)

(Total CO₂ savings (Gas) = 7.7kgCO₂/m². annum)

The significant energy improvements from the proposals outlined above have equated to a 30% reduction in CO₂ emissions.

We consider that the improvements outlined above ensure that the energy efficiency of the building will significantly improve and the measures undertaken are reasonable, practical and cannot be improved upon further.

Justification of improvements

1 & 2 – (Lighting and PIRs) T5 & LED lighting are the most efficient lighting available to date and along with the installation of occupancy and daylight sensors this will ensure that the highly efficient lights are also controlled efficiently.

3 – (Replacement chillier) The roof top chillier has been replaced with a chillier which achieves an EER of 2.740. (Non-domestic building service compliance guide 2013 states that for packaged chillers the EER for new and existing buildings should achieve a minimum of 2.60).

4 & 5 – (Replacement boiler and BMS) The boiler has been replaced with a boiler that achieves an overall SEER of 0.85. When you add the control credits for the new BMS this improves the boilers overall SEER to 0.9 (Non-domestic building service compliance guide 2013 states SEER for new and existing buildings a boiler should achieve a minimum of 0.84).

6-10 – All the improvements listed from 6-10 are industry standard improvements. These improvements are a one of a kind improvement and as such cannot be improved upon with the latest technologies available.

CPG3 states "All buildings, whether being updated or refurbished, are expected to reduce their carbon emissions by making improvements to the existing building. Work involving a change of use or an extension to an existing property is included. As a guide, at least 10% of the Project cost should be spent on the improvements." We can confirm that the carbon reduction refurbishment of 1-19 Torrington Place has achieved the minimum spend of 10% of the project cost.



APPENDIX A

Pre works BRUKL report



BRUKL Output Document

HM Government

As built

Compliance with England Building Regulations Part L 2013

Project name

1-19 Torrington Place

Date: Mon Aug 10 13:40:45 2015

Administrative information

Building Details

Address: 1-19 Torrington Place, LONDON, WC1E 7HB

Certification tool

Calculation engine: SBEM Calculation engine version: v5.2.d.2 Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v4.2.0 BRUKL compliance check version: v5.2.d.2

Owner Details Name: Telephone number: Address: , ,

Certifier details Name: Lee Pegler Telephone number: 01327 810620 Address: Henge Barn Pury Hill Business Park Alderton Road, Towcester, NN12 7LS

Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target

The building does not comply with England Building Regulations Part L 2013 CO_2 emission rate from the notional building, kg CO_2/m^2 .annum19.8Target CO_2 emission rate (TER), kg CO_2/m^2 .annum19.8Building CO_2 emission rate (BER), kg CO_2/m^2 .annum143.8Are emissions from the building less than or equal to the target?BER > TERAre as built details the same as used in the BER calculations?Separate submission

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

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	Ua-Limit	Ua-Calc	Ui-Calc	Surface where the maximum value occurs*			
Wall**	0.35	2.4	3.5	0002a Basment 2 - Z01 Circulation_P_6			
Floor	0.25	0.83	1	0002a Basment 2 - Z01 Circulation_F_4			
Roof	0.25	2.8	2.8	00a Ground - Z05b Cupboard_R_5			
Windows***, roof windows, and rooflights	2.2	6.29	6.31	001a Basment - Z01c Circulation_G_7			
Personnel doors	2.2	3	3	01 First - Z01a Circulation_D_12			
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"			
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"			
Line = Limiting area-weighted average Livelues [M/(m ² K)]							

 $U_{a-Calic}$ = Calculated area-weighted average U-values [W/(m⁻K)] $U_{a-Calic}$ = Calculated area-weighted average U-values [W/(m²K)]

 $-U_{\text{FCalls}}$ = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building				
m³/(h.m²) at 50 Pa	10	25				

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values					
Whole building electric power factor achieved by power factor correction	<0.9				

1- H5 rads

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency			
This system	0.7	-	-	-	-			
Standard value	0.91*	N/A	N/A	N/A	N/A	Ą		
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.								

2- H4 elec heater

	Heating efficiency	Cooling efficiency	Radiant efficiency	HR efficiency				
This system	1	-	-	-	-			
Standard value	N/A	N/A	N/A	N/A	N/A			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								

3- H3 split system

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]		efficiency		
This system	2	3.13	-	-	-			
Standard value	2.5*	N/A	N/A	N/A	N//	4		
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.								

4- H2 CAV

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency			
This system	0.7	2.5	-	3	-			
Standard value	0.91*	N/A	N/A	1.6^	N/A			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.								

^ Allowed SFP may be increased by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

5- H1 vestatempt

	Heating efficiency	gefficiency Cooling efficiency Radiant efficiency SFP [W/(I/s)] HR		R efficiency						
This system	0.75	2.5	-	3	0.6	85				
Standard value	0.91*	N/A	N/A	1.6^	0.5					
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO										

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

^ Allowed SFP may be increased by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

1- D2 500L gas

	Water heating efficiency	Storage loss factor [kWh/litre per day]					
This building	0.89	0.012					
Standard value	0.9*	N/A					
* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.							

2- D1 500L gas

	Water heating efficiency	Storage loss factor [kWh/litre per day]					
This building	0.89	0.012					
Standard value	0.9*	N/A					
* Standard shown is for use boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73							

Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
А	Local supply or extract ventilation units serving a single area
В	Zonal supply system where the fan is remote from the zone
С	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
Е	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
Н	Fan coil units

Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(I/s)]										
ID of system type	Α	в	С	D	Е	F	G	Н	I	нке	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
0002a Basment 2 - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z08c Office (Staff Roon	1)-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z08b Office (staff room)	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z03a WC	1.5	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z08a Office (Staff room) -	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z08a Office (staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z08b Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z08 Office (Staff room)	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z03b WC	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z08 Office (Staff room) 1	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
00b Ground - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]							UD officiency			
ID of system type	Α	В	С	D	E	F	G	Н	I	ПКе	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
001a Basment - Z01c Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z03b WC	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z03a WC	-	-	-	-	-	-	-	-	-	-	N/A
00c Ground - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z08b Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z03b WC	-	-	-	-	_	-	-	-	-	-	N/A
04 Fourth - Z03a WC	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z08a Office (Staff room)	1 -	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z08a Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z01a Circulation	-	_	-	-	_	-	-	_	-	-	N/A
06a Sixth - Z01b Circulation	-	_	-	-	_	-	-	_	-	-	N/A
06a Sixth - Z01a Circulation	-	_	-	_	_	-	_	_	-	-	N/A
06a Sixth - Z08 Office (Staff Room)	_	_	_	_	_	_	_	_	-	_	N/A
06b Sixth - Z01 Circulation	-	_	-	-	_	-	-	_	-	-	N/A
07 Seventh - Z01a Circulation	_	_	-	-	_	_	-	_	-	_	N/A
08 Fighth - Z01a Circulation	_	_	_	_	_	_	_	_	-	_	N/A
08 Eighth - Z08 Office (Staff room)	_	_	-	-	-	-	-	_	-	-	N/A
09 Ninth - Z08b Office (Staff room)	_	_	_	_	_	_	_	_	-	_	N/A
09 Ninth - Z01a Circulation	_	_	-	_	_	-	-	_	-	_	N/A
09 Ninth - Z03 WC	_	_	_	_	_	_	_	_	_	_	N/A
09 Ninth - Z08a Office (Staff Room)	_	_	-	_	_	_	_	_	-	_	N/A
10a Tenth - Z01b Circulation	_	_	-	-	_	-	-	_	-	_	N/A
10a Tenth - Z01a Circulation	-	_	-	-	_	-	-	_	-	-	N/A
10a Tenth - Z03 WC	_	_	_	_	_	_	_	_	-	_	N/A
00a Ground - Z03b WC	_	_	-	_	_	_	_	_	-	_	N/A
00a Ground - 712 Reception	_	_	-	_	_	_	_	_	-	_	N/A
00a Ground - Z01a Circulation	_	_	_	_	_	_	_	_	_	_	N/A
00a Ground - Z01c Circulation	_	_	_	_	_	_	_	_	_	_	N/A
0002a Basment 2 - 706 24 Server	_	_	_	_	_	_	_	_	_	_	N/A
01 First - 706 24 Server	_	_	_	_	_	_	_	_	_	_	N/A
02 Second - 706 24 Server	_	_	_	_	_	_	_	_	_	_	N/A
001a Basment - 702 Office	_	_	_		_			_		_	N/A
001a Basment - Z02 Office	_				_						
04 Fourth - 706 24 Server											N/A
07 Soventh Z06 24h Server	-	-	-	-	-	-	-	-	-	-	N/A
09 Eighth 706 24h Server	-		-	-	-	-	-		-	-	
001a Resmont 700a Teaching	-	-	-	-	-	-	-	-	-	-	
001a Basment - Z090 Feaching	-	-	-	-	-	-	-	-	-	-	
001a Dasment - Z HD Comp Lab	-	-	-	-	-	-	-	-	-	-	
UUTA Basment - 2096 Teaching	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	E	F	G	Н	I	пке	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
001a Basment - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z11a Comp Lab	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z09c Teaching	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z11 Comp Lab	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02i Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02h Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02g Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z07 Teaching	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02g Office	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z10 Lab	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z09 Teaching	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z09c Teaching	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	E	F	G	Н	I	ПКе	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
04 Fourth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02g Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02h Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z10c Lab	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z10b Lab	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z10a Lab	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
06a Sixth - Z02 Office	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z08 Office (Staff room)	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z02a Office	-	_	-	-	_	-	_	-	-	_	N/A
08 Eighth - Z02b Office	-	-	-	-	_	-	-	-	-	_	N/A
09 Ninth - Z12 Reception	-	-	-	-	-	-	-	-	-	_	N/A
09 Ninth - Z02a Office	-	_	-	-	_	-	_	-	_	_	N/A
09 Ninth - Z02b Office	-	_	-	-	_	-	-	-	-	_	N/A
10a Tenth - Z08b Office (Staff Room)	_	_	_	_	_	_	_	-	_	-	N/A
10a Tenth - Z02a Office	_	_	-	_	_	-	_	-	_	-	N/A
10a Tenth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z08a Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
0002h Basment 2 - Z04 Plant	-	_	-	-	_	-	_	-	_	-	N/A
0002i Basement 2 - Z04 Plant	-	-	-	-	-	-	-	-	-	_	N/A
0002a Basment 2 - Z04a Plant	-	-	-	-	-	-	_	-	-	_	N/A
0002a Basment 2 - Z05 Cupboard	_	_	-	_	_	_	_	-	_	_	N/A
0002a Basment 2 - Z04b Plant	_	_	-	-	_	-	-	-	_	_	N/A
0002a Basment 2 - Z03 WC	-	_	-	_	-	-	_	-	_	_	N/A
0002c Basment 2 - Z01 Circulation	-	_	-	_	_	-	_	-	_	-	N/A
0002b Basment 2 - Z01 Circulation	-	_	-	-	_	-	_	-	_	_	N/A
0002b Basment 2 - Z04 Plant	_	_	-	_	_	-	_	-	_	_	N/A
0002b Basment 2 - Z05 Cupboard	_	_	_	_	_	_	_	-	_	_	N/A
0002e Carpark Fire Exit - Z01 Circula	tien	_	-	-	_	-	_	-	_	_	N/A
0002f Basment 2 - 705 Cupboard	-	_	-	-	_	-	_	-	_	_	N/A
0002g Basement 2 - Cupboard	_	_	_	_	_	_	_	_	_	_	N/A
0002d Basment 2 - 704 Plant	_	_	_	_	_	_	_	_	_	_	N/A
0002d Basment 2 - 705 Curboard	_	_	_	_	_	_	_	_	_	_	N/A
001d Carpark Plant - 704a Plant	_									_	N/A
						-		_		_	IND A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	E	F	G	Н	I	ПКе	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
001d Carpark Plant - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
001c Carpark Fire exit - Z01 Circulation	n	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05c Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05d Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05e Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04b Plant	_	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04a Plant	_	_	-	_	-	_	_	_	-	-	N/A
02 Second - Z05 Cupboard	_	_	-	_	_	_	_	-	-	_	N/A
03 Third - Z05b Cupboard	_	_	-	_	_	_	_	-	_	-	N/A
03 Third - Z04a Plant	_	-	-	-	-	-	-	-	-	_	N/A
03 Third - Z05a Cupboard	_	_	-	_	_	-	_	_	-	_	N/A
001a Basment - 705f Cupboard	_	-	_	_	_	_	_	-	-	_	N/A
001a Basment - Z04g Plant	_	-	_	-	-	_	-	_	-	_	N/A
001a Basment - Z05g Cupboard	_	_	_	_	_	_	_	_	_	_	N/A
001a Basment - Z04h Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04i Plant	_	-	-	_	_	-	-	-	-	-	N/A
001a Basment - Z05e Cupbaord	_	_	_	_	_	_	_	_	-	_	N/A
001a Basment - Z05d Cupboard	_	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04f Plant	_	-	-	-	-	-	-	-	-	_	N/A
001a Basment - 704a Plant	_	_	_	_	_	_	_	_	_	_	N/A
001a Basment - Z05c Cupboard	_	_	_	_	_	_	_	_	_	_	N/A
001a Basment - 704e Plant	_	_	_	_	_	_	_	_	_	_	N/A
001a Basment - Z05b Cupboard	_	_	_	_	_	_	_	_	_	_	N/A
001a Basment - 70/h Plant	_	_				_		_	_	_	
001a Basmont Z04d Plant	_	-	-	-	-	-	-	-	-	-	
001a Basment Z04c Plant	-	-	-	-	-	-	-	-	-	-	
001a Basment - Z04c Flant	-	-	-	-	-	-	-	-	-	-	
001a Basment - 205a Cupboard	-	-	-	-	-	-	-	-	-	-	
04 Fourth 704o Plant	-	-	-	-	-	-	-	-	-	-	
04 Fourth - 204c Plant	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - 204b Plant	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - 205a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
05 Fitth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A

Zone name		SFP [W/(I/s)]								UD officiency	
ID of system type	Α	в	С	D	E	F	G	н	1	ПКе	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
06a Sixth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
06c Sixth - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
06d Sixth - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
10b Tenth - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
11b Eleventh - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z05c Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	Lumino	ous effic	acy [lm/W]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
0002a Basment 2 - Z01 Circulation	-	20	-	142
00a Ground - Z02f Office	11	-	-	2728
00a Ground - Z04b Plant	5	-	-	73
00a Ground - Z01b Circulation	-	30	-	842
00a Ground - Z05b Cupboard	6	-	-	58
00a Ground - Z02c Office	12	-	-	790
00a Ground - Z05a Cupboard	6	-	-	70
00a Ground - Z08c Office (Staff Room)	13	-	-	589
00a Ground - Z04c Plant	7	-	-	433
00a Ground - Z08b Office (staff room)	5	-	-	379
00a Ground - Z03a WC	-	24	-	495
00a Ground - Z08a Office (Staff room)	11	-	-	828
00a Ground - Z04a Plant	5	-	-	99
01 First - Z01a Circulation	-	28	-	2161
01 First - Z01b Circulation	-	12	-	100
01 First - Z08a Office (staff Room)	11	-	-	386
01 First - Z08b Office (Staff Room)	7	-	-	281

Zone name Luminaire Lamp Display lamp General lighting [W] 01 Standard value 60 60 22 01 First - Z03 WC - 27 - 666 02 Second - Z01 Circulation - 27 - 2091 02 Second - Z03 WC - 26 - 666 03 Third - Z03 WC - 22 - 184 03 Third - Z06 24 Server 12 - 102 2001 03 Third - Z014 Circulation - 28 - 244 00b Ground - Z01 Circulation - 28 - 144 001a Basment - Z015 Circulation - 22 - 175 01a Basment - Z03b WC - 22 - 185 01a Basment - Z03b WC - 27 - 166 01a Basment - Z03b WC - 27 - 188 026 Ground - Z01 Circulation - 27 -	General lighting and display lighting	Lumino	ous effic		
Standard value 60 60 22 01 First - 203 WC - 27 - 666 02 Second - 201 Circulation - 27 - 2091 02 Second - 203 WC - 26 - 696 02 Second - 208 WC - 22 - 184 03 Third - 206 A Server 12 - 102 03 Third - 208 Office (Staff room) 1 7 - 308 03 Third - 208 Office (Staff room) - 28 - 244 00b Ground - 201 Circulation - 23 . 144 001a Basment - 201b Circulation - 28 - 244 001a Basment - 201b Circulation - 29 . 1185 001a Basment - 201b Circulation - 29 . 1186 001a Basment - 201b Circulation - 27 . 168 002 Ground - 201 Circulation - 19 . 117 04 Fourth - 203 WC - 23	Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
01 First - Z03 WC - 27 - 666 02 Second - Z01 Circulation - 26 - 2691 02 Second - Z08 Office (Staff room) 13 - - 471 03 Third - Z04 Office (Staff room) 13 - - 471 03 Third - Z06 Affice (Staff room) 12 - 102 306 03 Third - Z06 Affice (Staff room) 7 - 306 307 03 Third - Z06 Office (Staff room) 7 - 308 333 03 Third - Z06 Office (Staff room) - 27 - 308 03 Third - Z01b Circulation - 28 - 244 00b Ground - 201 Circulation - 23 - 144 001a Basment - Z01a Circulation - 23 - 185 001a Basment - Z03 WC - 27 - 168 00c Ground - Z01 Circulation - 27 - 168 00c Ground - Z01 Circulation - 27 - 126 04 Fourth - Z08 Office (Staff Room) 7 - - 226	Standard value	60	60	22	
02 Second - Z01 Circulation - 27 - 2091 02 Second - Z03 WC - 26 - 696 03 Third - Z08 Office (Staff room) 13 - - 471 03 Third - Z08 Office (Staff room) 12 - 184 03 Third - Z06 24 Server 12 - 102 03 Third - Z01a Circulation - 27 - 2001 03 Third - Z01a Circulation - 28 - 244 00b Ground - Z01 Circulation - 23 - 144 00b assment - Z01b Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 185 001a Basment - Z01b Circulation - 29 - 185 001a Basment - Z03a WC - 27 - 168 005 Ground - 201 Circulation - 19 - 147 04 Fourth - Z03 WC - 23 - 226 04 Fourth - Z08 Office (Staff Room) 7 - 226 26 04 Fourth - Z08a Office (Staff Room)	01 First - Z03 WC	-	27	-	666
02 Second - Z03 WC - 26 - 696 02 Second - Z08 Office (Staff room) 13 - - 471 03 Third - Z03 WC - 22 - 184 03 Third - Z06 24 Server 12 - 102 03 Third - Z08 Office (Staff room) 1 7 - 308 03 Third - Z08 Office (Staff room) 1 7 - 308 03 Third - Z08 Office (Staff room) 1 7 - 308 001a Basment - Z01 Circulation - 23 - 144 001a Basment - Z01b Circulation - 22 - 175 001a Basment - Z01b Circulation - 20 - 1185 001a Basment - Z03 WC - 27 - 168 00c Ground - Z01 Circulation - 19 147 04 Fourth - Z03 WC - 27 - 2196 04 Fourth - Z03 WC - 23 - 323 04 Fourth - Z08 Office (Staff Room) 7 - 226 24 04 Fourth - Z08 Office (Staff Room) 1	02 Second - Z01 Circulation	-	27	-	2091
02 Second - Z08 Office (Staff room) 13 - 471 03 Third - Z03b WC - 22 - 184 03 Third - Z06 24 Server 12 - 102 03 Third - Z04 Circulation - 27 - 2001 03 Third - Z04 Circulation - 28 - 244 00b Ground - Z01 Circulation - 31 - 353 001a Basment - Z01b Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01b Circulation - 20 - 175 001a Basment - Z03b WC - 27 - 168 005 Ground - 201 Circulation - 19 - 147 04 Fourth - Z01a Circulation - 27 - 168 006 Ground - 201 Circulation - 27 - 2198 04 Fourth - Z03a WC - 26 696 696 04 Fourth - Z08a Office (Staff Room)	02 Second - Z03 WC	-	26	-	696
03 Third - Z03b WC - 22 - 184 03 Third - Z06 24 Server 12 - - 102 03 Third - Z06 Office (Staff room) - 27 - 2001 03 Third - Z08 Office (Staff room) 1 7 - 308 03 Third - Z01b Circulation - 28 - 244 00b Ground - Z01 Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z03b WC - 22 - 175 001a Basment - Z03a WC - 27 - 168 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z03a WC - 27 - 196 04 Fourth - Z03b Office (Staff Room) 7 - 226 244 05 Fifth - Z08a Office (Staff Room) 7 - 2196 245 04 Fourth - Z03a WC - 26 - 696 245 04 Fourth - Z03a Office (Staff Room) 17 - 308 305 325 <td>02 Second - Z08 Office (Staff room)</td> <td>13</td> <td>-</td> <td>-</td> <td>471</td>	02 Second - Z08 Office (Staff room)	13	-	-	471
03 Third - Z06 24 Server 12 - - 102 03 Third - Z01a Circulation - 27 - 2001 03 Third - Z08 Office (Staff room) 1 7 - - 308 03 Third - Z01b Circulation - 28 - 244 00b Ground - Z01 Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01a Circulation - 29 - 175 001a Basment - Z01a Circulation - 20 - 168 001a Basment - Z01a Circulation - 27 - 168 00c Ground - Z01 Circulation - 27 - 168 00c Ground - Z01 Circulation - 27 - 2196 04 Fourth - Z08 Office (Staff Room) 7 - - 226 04 Fourth - Z03 WC - 26 - 696 04 Fourth - Z08 Office (Staff Room) 12 - - 448 05 Fifth - Z08 Office (Staff Room) 12 - - 448	03 Third - Z03b WC	-	22	-	184
03 Third - Z01a Circulation - 27 - 2001 03 Third - Z08 Office (Staff room) 1 7 - - 308 03 Third - Z01b Circulation - 28 - 244 00b Ground - Z01 Circulation - 28 - 244 001a Basment - Z01c Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01a Circulation - 29 - 175 001a Basment - Z01a Circulation - 30 - 816 001a Basment - Z01a Circulation - 30 - 816 00ta Basment - Z01a Circulation - 19 - 147 04 Fourth - Z01 Circulation - 27 - 168 00c Ground - Z01 Circulation - 27 - 2196 04 Fourth - Z03 WC - 26 - 226 04 Fourth - Z08a Office (Staff Room) 12 - 448 05 Fifth - Z08a Office (Staff Room) 12 - 448 05 Fifth	03 Third - Z06 24 Server	12	-	-	102
03 Third - Z08 Office (Staff room) 1 7 - - 308 03 Third - Z01b Circulation - 28 - 244 00b Ground - Z01 Circulation - 31 - 353 001a Basment - Z01b Circulation - 23 - 144 001a Basment - Z01b Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01a Circulation - 22 - 175 001a Basment - Z01a Circulation - 19 - 147 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z08b Office (Staff Room) 7 - 226 226 04 Fourth - Z08b Office (Staff Room) 7 - 226 24 04 Fourth - Z08b Office (Staff Room) 12 - 448 233 05 Fifth - Z08a Office (Staff Room) 12 - 448 244 05 Fifth - Z01a Circulation - 26 - 279 05 Fifth - Z01a Circulation - 33 - <td>03 Third - Z01a Circulation</td> <td>-</td> <td>27</td> <td>-</td> <td>2001</td>	03 Third - Z01a Circulation	-	27	-	2001
03 Third - Z01b Circulation - 28 - 244 00b Ground - Z01 Circulation - 31 - 353 001a Basment - Z01b Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01a Circulation - 29 - 175 001a Basment - Z01a Circulation - 30 - 816 001a Basment - Z01a Circulation - 27 - 168 00ta Ground - Z01 Circulation - 19 - 147 04 Fourth - Z03 WC - 27 - 2186 04 Fourth - Z03b Office (Staff Room) 7 - - 226 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z08a Office (Staff Room) 12 - 244 245 06 Sixth - Z01a Circulation - 28 - 1702 06a Sixth - Z01a Circulation - 32 - 113	03 Third - Z08 Office (Staff room) 1	7	-	-	308
00b Ground - Z01 Circulation - 31 - 353 001a Basment - Z01c Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z03b WC - 22 - 175 001a Basment - Z03a WC - 27 - 168 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z01b Circulation - 27 - 2196 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z080 Office (Staff Room) 7 - 266 696 04 Fourth - Z08a Office (Staff Room) 12 - 448 05 Fifth - Z01a Circulation - 32 - 279 05 Fifth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation	03 Third - Z01b Circulation	-	28	-	244
001a Basment - Z01c Circulation - 23 - 144 001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z01a Circulation - 22 - 175 001a Basment - Z01a Circulation - 27 - 168 00ta Basment - Z01a Circulation - 27 - 168 00c Ground - Z01 Circulation - 27 - 2196 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z01 Circulation - 27 - 226 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z08a Office (Staff Room) 12 - 448 279 06 Sixth - Z01a Circulation - 28 - 1702 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 23 - 113	00b Ground - Z01 Circulation	-	31	-	353
001a Basment - Z01b Circulation - 29 - 1185 001a Basment - Z03b WC - 22 - 175 001a Basment - Z01a Circulation - 30 - 816 001a Basment - Z03a WC - 27 - 188 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 - 05 Fifth - Z01a Circulation - 28 - 1702 - 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01 Circulation - 33 -	001a Basment - Z01c Circulation	-	23	-	144
001a Basment - Z03b WC - 22 - 175 001a Basment - Z01a Circulation - 30 - 816 001a Basment - Z03a WC - 27 - 168 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z01 Circulation - 27 - 226 04 Fourth - Z08b Office (Staff Room) 7 - - 226 04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 33 - 418 06a Sixth - Z01b Circulation - 33 - 418 06a Sixth - Z01b Circulation - 33 - 418 06a Sixth - Z01a Circulation - 31 - 497	001a Basment - Z01b Circulation	-	29	-	1185
001a Basment - Z01a Circulation - 30 - 816 001a Basment - Z03a WC - 27 - 168 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z03b Office (Staff Room) 7 - - 226 04 Fourth - Z03a WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z03a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01a Circulation - 26 - 279 05 Fifth - Z01a Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eig	001a Basment - Z03b WC	-	22	-	175
001a Basment - Z03a WC - 27 - 168 00c Ground - Z01 Circulation - 19 - 147 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z08b Office (Staff Room) 7 - - 226 04 Fourth - Z03a WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z03a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z04a Office (Staff Room) 12 - - 448 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01a Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 <t< td=""><td>001a Basment - Z01a Circulation</td><td>-</td><td>30</td><td>-</td><td>816</td></t<>	001a Basment - Z01a Circulation	-	30	-	816
Ooc Ground - Z01 Circulation - 19 - 147 04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z08b Office (Staff Room) 7 - - 226 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z03a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01a Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 <tr< td=""><td>001a Basment - Z03a WC</td><td>-</td><td>27</td><td>-</td><td>168</td></tr<>	001a Basment - Z03a WC	-	27	-	168
04 Fourth - Z01 Circulation - 27 - 2196 04 Fourth - Z08b Office (Staff Room) 7 - - 226 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01a Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 <tr< td=""><td>00c Ground - Z01 Circulation</td><td>-</td><td>19</td><td>-</td><td>147</td></tr<>	00c Ground - Z01 Circulation	-	19	-	147
04 Fourth - Z08b Office (Staff Room) 7 - - 226 04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01b Circulation - 28 - 1702 06a Sixth - Z01a Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 31 - 497 08b Sixth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 0	04 Fourth - Z01 Circulation	-	27	-	2196
04 Fourth - Z03b WC - 23 - 323 04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Firith - Z08a Office (Staff Room) 12 - - 448 05 Firith - Z01a Circulation - 26 - 279 05 Firith - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Sixth - Z01 Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 08 Eighth - Z08 Office (Staff room) 10 - 358 - 355	04 Fourth - Z08b Office (Staff Room)	7	-	-	226
04 Fourth - Z03a WC - 26 - 696 04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 23 - 113 06a Sixth - Z01 Circulation - 31 - 497 06b Sixth - Z01 a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 497 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08 Office (Staff room) 8 - - 355 09 Ninth - Z08 Office (Staff Room) 13 - 422 <t< td=""><td>04 Fourth - Z03b WC</td><td>-</td><td>23</td><td>-</td><td>323</td></t<>	04 Fourth - Z03b WC	-	23	-	323
04 Fourth - Z08a Office (Staff room) 1 7 - - 308 05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01 a Circulation - 33 - 418 06a Sixth - Z01 a Circulation - 31 - 497 06b Sixth - Z01 a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08 Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 28 - 770 <	04 Fourth - Z03a WC	_	26	-	696
05 Fifth - Z08a Office (Staff Room) 12 - - 448 05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01 a Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - 454 10a Tenth - Z01a Circulation - 32 - 218 10a T	04 Fourth - Z08a Office (Staff room) 1	7	-	-	308
05 Fifth - Z01b Circulation - 26 - 279 05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z08 Office (Staff Room) 15 - - 754 06b Sixth - Z01 Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z080 Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tent	05 Fifth - Z08a Office (Staff Room)	12	-	-	448
05 Fifth - Z01a Circulation - 28 - 1702 06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z08 Office (Staff Room) 15 - - 754 06b Sixth - Z01 Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08 Office (Staff room) 8 - - 355 09 Ninth - Z08 Office (Staff room) 8 - - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08 Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 <	05 Fifth - Z01b Circulation	-	26	-	279
06a Sixth - Z01b Circulation - 32 - 219 06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z08 Office (Staff Room) 15 - - 754 06b Sixth - Z01 Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08 Office (Staff room) 8 - - 355 09 Ninth - Z08 Office (Staff room) 8 - - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z03 WC - 32 - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z01a Circulation - 33 - 411 10a	05 Fifth - Z01a Circulation	-	28	-	1702
06a Sixth - Z01a Circulation - 33 - 418 06a Sixth - Z08 Office (Staff Room) 15 - - 754 06b Sixth - Z01 Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08 Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z08 Office (Staff room) 8 - - 422 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z03 WC - 32 - 218 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z01a Circulation - 33 - 411 10a T	06a Sixth - Z01b Circulation	-	32	-	219
06a Sixth - Z08 Office (Staff Room) 15 - - 754 06b Sixth - Z01 Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z01a Circulation - 28 - 770 09 Ninth - Z03 WC - 28 - 214 09 Ninth - Z03 WC - 32 - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	06a Sixth - Z01a Circulation	-	33	-	418
06b Sixth - Z01 Circulation - 23 - 113 07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z01a Circulation - 28 - 770 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z01b Circulation - 32 - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	06a Sixth - Z08 Office (Staff Room)	15	-	-	754
07 Seventh - Z01a Circulation - 31 - 497 08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z01a Circulation - 28 - 770 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	06b Sixth - Z01 Circulation	-	23	-	113
08 Eighth - Z01a Circulation - 31 - 491 08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z01a Circulation - 18 - 192	07 Seventh - Z01a Circulation	-	31	-	497
08 Eighth - Z08 Office (Staff room) 10 - - 358 09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	08 Eighth - Z01a Circulation	_	31	-	491
09 Ninth - Z08b Office (Staff room) 8 - - 355 09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	08 Eighth - Z08 Office (Staff room)	10	-	-	358
09 Ninth - Z01a Circulation - 32 - 422 09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	09 Ninth - Z08b Office (Staff room)	8	-	_	355
09 Ninth - Z03 WC - 28 - 770 09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	09 Ninth - Z01a Circulation	-	32	_	422
09 Ninth - Z08a Office (Staff Room) 13 - - 454 10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	09 Ninth - Z03 WC	-	28	-	770
10a Tenth - Z01b Circulation - 32 - 218 10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	09 Ninth - Z08a Office (Staff Room)	13	-	-	454
10a Tenth - Z01a Circulation - 33 - 411 10a Tenth - Z03 WC - 18 - 192	10a Tenth - Z01b Circulation	-	32	-	218
10a Tenth - Z03 WC - 18 - 192	10a Tenth - Z01a Circulation	_	33	_	411
	10a Tenth - Z03 WC	_	18	-	192
00a Ground - Z03b WC - 15 - 447	00a Ground - Z03b WC	-	15	-	447
00a Ground - Z12 Reception - 8 50 2308	00a Ground - Z12 Reception	_	8	50	2308
00a Ground - Z01a Circulation - 24 - 691	00a Ground - Z01a Circulation	-	24	-	691
00a Ground - Z01c Circulation - 28 - 553	00a Ground - Z01c Circulation	_	28	-	553
0002a Basment 2 - Z06 24 Server 16 793	0002a Basment 2 - Z06 24 Server	16	-	-	793

General lighting and display lighting	neral lighting and display lighting Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
01 First - Z06 24 Server	12	-	-	106
02 Second - Z06 24 Server	12	-	-	102
001a Basment - Z02 Office	20	-	-	3576
001a Basment - Z06 24 Server	16	-	-	248
04 Fourth - Z06 24 Server	12	-	-	102
07 Seventh - Z06 24h Server	9	-	-	82
08 Eighth - Z06 24h Server	12	-	-	102
001a Basment - Z09c Teaching	17	-	-	386
001a Basment - Z11b Comp Lab	17	-	-	404
001a Basment - Z09b Teaching	21	-	-	1273
001a Basment - Z09a Teaching	19	-	-	631
001a Basment - Z11a Comp Lab	18	-	-	583
00a Ground - Z02b Office	11	-	-	1199
00a Ground - Z09b Teaching	12	-	-	722
00a Ground - Z02d Office	10	-	-	2209
00a Ground - Z09a Teaching	13	-	-	1788
00a Ground - Z02e Office	8	-	-	735
00a Ground - Z02a Office	11	-	-	9266
01 First - Z09c Teaching	17	-	-	905
01 First - Z02e Office	16	-	-	2774
01 First - Z02d Office	16	-	-	6525
01 First - Z11 Comp Lab	18	-	-	2342
01 First - Z02c Office	15	-	-	1729
01 First - Z09b Teaching	16	-	-	1824
01 First - Z02i Office	15	-	-	813
01 First - Z09a Teaching	14	-	-	533
01 First - Z02b Office	12	-	-	454
01 First - Z02a Office	13	-	-	7435
01 First - Z02f Office	14	-	-	645
01 First - Z02h Office	15	-	-	725
01 First - Z02g Office	12	-	-	2011
02 Second - Z02c Office	15	-	-	627
02 Second - Z02d Office	13	-	-	1925
02 Second - Z02e Office	14	-	-	5839
02 Second - Z02f Office	14	-	-	1098
02 Second - Z02a Office	14	-	-	6064
02 Second - Z07 Teaching	16	-	-	1786
02 Second - Z02b Office	13	-	-	1969
02 Second - Z02g Office	16	-	-	1067
03 Third - Z02e Office	12	-	-	410
03 Third - Z02d Office	13	-	-	1471
03 Third - Z10 Lab	12	-	-	1513
03 Third - Z09 Teaching	15	-	-	1577

General lighting and display lighting	Lumine	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
03 Third - Z02c Office	13	-	-	3582
03 Third - Z02b Office	17	-	-	1425
03 Third - Z02a Office	14	-	-	7483
03 Third - Z02f Office	13	-	-	2645
04 Fourth - Z09b Teaching	17	-	-	1158
04 Fourth - Z02a Office	14	-	-	5612
04 Fourth - Z09c Teaching	16	-	-	828
04 Fourth - Z02c Office	15	-	-	5693
04 Fourth - Z09a Teaching	14	-	-	433
04 Fourth - Z02d Office	13	-	-	2200
04 Fourth - Z02b Office	15	-	-	2394
05 Fifth - Z02e Office	17	-	-	7536
05 Fifth - Z09b Teaching	17	-	-	885
05 Fifth - Z02f Office	13	-	-	818
05 Fifth - Z02g Office	12	-	-	429
05 Fifth - Z02b Office	14	-	-	1079
05 Fifth - Z02h Office	10	-	-	567
05 Fifth - Z02a Office	14	-	-	1703
05 Fifth - Z09a Teaching	10	-	-	221
05 Fifth - Z10c Lab	10	-	-	997
05 Fifth - Z02d Office	13	-	-	1296
05 Fifth - Z10b Lab	15	-	-	2233
05 Fifth - Z10a Lab	14	-	-	2884
05 Fifth - Z02c Office	13	-	-	850
06a Sixth - Z02 Office	17	-	-	7624
07 Seventh - Z08 Office (Staff room)	13	-	-	460
07 Seventh - Z02a Office	18	-	-	6877
07 Seventh - Z02b Office	15	-	-	1189
08 Eighth - Z02a Office	17	-	-	7244
08 Eighth - Z02b Office	14	-	-	591
09 Ninth - Z12 Reception	-	25	50	317
09 Ninth - Z02a Office	17	-	-	7187
09 Ninth - Z02b Office	11	-	-	706
10a Tenth - Z08b Office (Staff Room)	11	-	-	297
10a Tenth - Z02a Office	17	-	-	4798
10a Tenth - Z02b Office	12	-	-	999
10a Tenth - Z08a Office (Staff Room)	13	-	-	431
0002h Basment 2 - Z04 Plant	7	-	-	90
0002i Basement 2 - Z04 Plant	13	-	-	55
0002a Basment 2 - Z04a Plant	16	-	-	2352
0002a Basment 2 - Z05 Cupboard	14	-	-	134
0002a Basment 2 - Z04b Plant	6	-	-	116
0002a Basment 2 - Z03 WC	-	16	-	181

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
0002c Basment 2 - Z01 Circulation	-	19	-	134
0002b Basment 2 - Z01 Circulation	-	15	-	353
0002b Basment 2 - Z04 Plant	11	-	-	169
0002b Basment 2 - Z05 Cupboard	14	-	-	272
0002e Carpark Fire Exit - Z01 Circulation	-	23	-	157
0002f Basment 2 - Z05 Cupboard	15	-	-	159
0002g Basement 2 - Cupboard	16	-	-	220
0002d Basment 2 - Z04 Plant	12	-	-	262
0002d Basment 2 - Z05 Cupboard	13	-	-	216
001d Carpark Plant - Z04a Plant	7	-	-	151
001d Carpark Plant - Z04b Plant	17	-	-	859
001c Carpark Fire exit - Z01 Circulation	-	25	-	143
01 First - Z04b Plant	6	-	-	59
01 First - Z05c Cupboard	6	-	-	28
01 First - Z04a Plant	6	-	_	95
01 First - Z05b Cupboard	6	_	_	32
01 First - Z05d Cupboard	6	_	_	42
01 First - 705a Cupboard	7	_		42
01 First - 2056 Cupboard	6	_		10
01 First - Z00e Cupboard	ß	_	_	122
01 First - 2040 Flam	0	-	-	270
01 First - 2040 Fiant	0	-	-	100
02 Second - Z040 Plant	0	-	-	257
02 Second - 204c Plant	9	-	-	50
02 Second - 204p Plant	0	-	-	09
02 Second - 204a Plant	6	-	-	124
02 Second - 205 Cupboard	10	-	-	38
U3 Third - 205b Cupboard	8	-	-	37
03 Third - Z04a Plant	6	-	-	124
03 Third - Z05a Cupboard	10	-	-	38
001a Basment - Z05f Cupboard	17	-	-	208
001a Basment - Z04g Plant	6	-	-	256
001a Basment - Z05g Cupboard	9	-	-	34
001a Basment - Z04h Plant	18	-	-	365
001a Basment - Z04i Plant	6	-	-	59
001a Basment - Z05e Cupbaord	7	-	-	55
001a Basment - Z05d Cupboard	7	-	-	46
001a Basment - Z04f Plant	6	-	-	201
001a Basment - Z04a Plant	16	-	-	537
001a Basment - Z05c Cupboard	17	-	-	369
001a Basment - Z04e Plant	6	-	-	98
001a Basment - Z05b Cupboard	8	-	-	53
001a Basment - Z04b Plant	8	-	-	123
001a Basment - Z04d Plant	12	-	-	442

General lighting and display lighting	Lumino	ous effic	acy [lm/W]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
001a Basment - Z04c Plant	8	-	-	227
001a Basment - Z05a Cupboard	14	-	-	149
001b Basment - Z05a Cupboard	17	-	-	105
04 Fourth - Z04c Plant	9	-	-	357
04 Fourth - Z04b Plant	6	-	-	59
04 Fourth - Z04d Plant	6	-	-	122
04 Fourth - Z05a Cupboard	10	-	-	38
04 Fourth - Z04a Plant	6	-	-	124
05 Fifth - Z05 Cupboard	10	-	-	38
05 Fifth - Z04d Plant	6	-	-	122
06a Sixth - Z05 Cupboard	12	-	-	53
06c Sixth - Z04 Plant	16	-	-	728
06d Sixth - Z04 Plant	11	-	-	264
07 Seventh - Z05 Cupboard	6	-	-	17
07 Seventh - Z04a Plant	6	-	-	124
08 Eighth - Z05b Cupboard	13	-	-	79
08 Eighth - Z05a Cupboard	6	-	-	11
08 Eighth - Z04a Plant	6	-	-	124
09 Ninth - Z04a Plant	6	-	-	112
09 Ninth - Z04c Plant	9	-	-	357
09 Ninth - Z05 Cupboard	9	-	-	33
10b Tenth - Z04 Plant	11	-	-	103
10a Tenth - Z04b Plant	6	-	-	74
10a Tenth - Z04a Plant	6	-	-	111
10a Tenth - Z04c Plant	9	-	-	327
10a Tenth - Z05 Cupboard	8	-	-	27
11b Eleventh - Z04 Plant	15	-	-	159
11a Eleventh - Z04b Plant	15	-	-	1929
11a Eleventh - Z05c Cupboard	16	-	-	184
11a Eleventh - Z05a Cupboard	6	-	-	11
11a Eleventh - Z01a Circulation	-	23	-	124
11a Eleventh - Z05b Cupboard	11	-	-	33

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00a Ground - Z02f Office	YES (+58.3%)	NO
00a Ground - Z02c Office	NO (-64.3%)	NO
00a Ground - Z08c Office (Staff Room)	N/A	N/A
00a Ground - Z08b Office (staff room)	N/A	N/A
00a Ground - Z08a Office (Staff room)	NO (-46.8%)	NO
01 First - Z08a Office (staff Room)	N/A	N/A
01 First - Z08b Office (Staff Room)	YES (+70.1%)	NO
02 Second - Z08 Office (Staff room)	YES (+49.7%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
03 Third - Z08 Office (Staff room) 1	N/A	N/A
04 Fourth - Z08b Office (Staff Room)	N/A	N/A
04 Fourth - Z08a Office (Staff room) 1	N/A	N/A
05 Fifth - Z08a Office (Staff Room)	YES (+49.7%)	NO
06a Sixth - Z08 Office (Staff Room)	NO (-70.6%)	NO
08 Eighth - Z08 Office (Staff room)	YES (+19.4%)	NO
09 Ninth - Z08b Office (Staff room)	YES (+40.7%)	NO
09 Ninth - Z08a Office (Staff Room)	NO (-54.5%)	NO
00a Ground - Z12 Reception	YES (+347%)	NO
001a Basment - Z02 Office	YES (+32.6%)	NO
001a Basment - Z09c Teaching	N/A	N/A
001a Basment - Z11b Comp Lab	N/A	N/A
001a Basment - Z09b Teaching	N/A	N/A
001a Basment - Z09a Teaching	N/A	N/A
001a Basment - Z11a Comp Lab	N/A	N/A
00a Ground - Z02b Office	NO (-51.4%)	NO
00a Ground - Z09b Teaching	NO (-64.3%)	NO
00a Ground - Z02d Office	N/A	N/A
00a Ground - Z09a Teaching	N/A	N/A
00a Ground - Z02e Office	N/A	N/A
00a Ground - Z02a Office	YES (+258.5%)	NO
01 First - 709c Teaching	YES (+57.3%)	NO
01 First - 702e Office	YES (+60.1%)	NO
01 First - 202d Office	VES (+11.7%)	NO
01 First - Z11 Comp Lab	YES (+118.1%)	NO
01 First - 702c Office	YES (+118.8%)	NO
01 First - Z09b Teaching	VES (+68.9%)	NO
01 First - Z020 Feaching	N/A	N/A
01 First - 202i Onice	NO (12.6%)	
01 First - Z02b Office	NO (-16.1%)	NO
01 First - 2020 Office	VES (+65.6%)	NO
01 First - 2024 Office	NO (26.6%)	NO
01 First - 202h Office	NO (-30.0%)	NO
01 First - 2020 Office	YES (156 0%)	NO
02 Second 702 Office	TES (T50.9%)	NO
02 Second - 202c Office	NU (-30.0%)	NO
	YES (+58.5%)	NO
	YES (+74.7%)	NO
	NU (-13.9%)	NU
02 Second - 202a Office	YES (+61.5%)	NO
02 Second - 207 Teaching	YES (+63.1%)	NU
02 Second - 202b Office	YES (+52.6%)	NO
02 Second - 202g Office	NO (-24.6%)	NO
03 Third - Z02e Office	NO (-42.5%)	NO
03 Third - Z02d Office	YES (+60.3%)	NO
03 I hird - Z10 Lab	YES (+59.9%)	NO
03 Third - Z09 Teaching	YES (+33.3%)	NO
03 Third - Z02c Office	YES (+120.6%)	NO
03 Third - Z02b Office	NO (-13.9%)	NO
03 Third - Z02a Office	YES (+63.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
03 Third - Z02f Office	YES (+56.9%)	NO
04 Fourth - Z09b Teaching	NO (-3.3%)	NO
04 Fourth - Z02a Office	YES (+102.8%)	NO
04 Fourth - Z09c Teaching	NO (-13.9%)	NO
04 Fourth - Z02c Office	YES (+74.7%)	NO
04 Fourth - Z09a Teaching	YES (+32.7%)	NO
04 Fourth - Z02d Office	YES (+60.1%)	NO
04 Fourth - Z02b Office	YES (+56.9%)	NO
05 Fifth - Z02e Office	YES (+71%)	NO
05 Fifth - Z09b Teaching	YES (+56.5%)	NO
05 Fifth - Z02f Office	YES (+65.4%)	NO
05 Fifth - Z02g Office	YES (+27.6%)	NO
05 Fifth - Z02b Office	YES (+112.6%)	NO
05 Fifth - Z02h Office	YES (+60.1%)	NO
05 Fifth - Z02a Office	YES (+13.3%)	NO
05 Fifth - Z09a Teaching	YES (+115.3%)	NO
05 Fifth - Z10c Lab	YES (+65.2%)	NO
05 Fifth - Z02d Office	NO (-25.2%)	NO
05 Fifth - Z10b Lab	YES (+105.9%)	NO
05 Fifth - Z10a Lab	NO (-13.9%)	NO
05 Fifth - Z02c Office	YES (+103.2%)	NO
06a Sixth - Z02 Office	YES (+70.5%)	NO
07 Seventh - Z08 Office (Staff room)	YES (+49.7%)	NO
07 Seventh - Z02a Office	YES (+71%)	NO
07 Seventh - Z02b Office	NO (-32.4%)	NO
08 Eighth - Z02a Office	YES (+71.2%)	NO
08 Eighth - Z02b Office	NO (-43%)	NO
09 Ninth - Z12 Reception	YES (+65.7%)	NO
09 Ninth - Z02a Office	YES (+71.2%)	NO
09 Ninth - Z02b Office	NO (-34.3%)	NO
10a Tenth - Z08b Office (Staff Room)	NO (-88.9%)	NO
10a Tenth - Z02a Office	YES (+72.9%)	NO
10a Tenth - Z02b Office	NO (-39%)	NO
10a Tenth - Z08a Office (Staff Room)	N/A	N/A

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

Separate submission

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

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	12348.8	12348.8
External area [m ²]	20805.7	20805.7
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	25	3
Average conductance [W/K]	55365.6	9074.22
Average U-value [W/m ² K]	2.66	0.44
Alpha value* [%]	2.09	12.3

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	152.66	11.43
Cooling	23.59	7.64
Auxiliary	131.45	8.76
Lighting	52.55	16.53
Hot water	10.66	2.7
Equipment*	61.77	61.77
TOTAL**	370.91	47.06

* Energy used by equipment does not court towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	651.23	215.49
Primary energy* [kWh/m ²]	841.57	115.91
Total emissions [kg/m ²]	143.8	19.8

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

ŀ	HVAC Systems Performance									
Sys	stem Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central he	ating using	g water: rad	iators, [HS]] LTHW boil	ler, [HFT] N	atural Gas,	[CFT] Natu	ral Gas	
	Actual	622.2	53.8	276.6	0	2.9	0.63	0	0.7	0
	Notional	78.7	61.2	26.7	0	1.2	0.82	0		
[\$1] Other loca	al room hea	ter - unfanr	ned, [HS] Ro	oom heater	, [HFT] Elec	ctricity, [CF	T] Natural G	Gas	
	Actual	127.3	135.1	44.2	0	0	0.8	0	1	0
	Notional	22.5	84.8	7.6	0	0	0.82	0		
[\$1	[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
	Actual	371	438.1	55.3	68.6	0	1.86	1.78	2	2.5
	Notional	17.7	835.5	2	64.5	0	2.43	3.6		
[\$1] Constant	volume sys	tem (fixed i	fresh air raf	te), [HS] LTI	HW boiler,	[HFT] Natur	al Gas, [CF	T] Electricit	ty
	Actual	298.6	34.3	120	13.1	212.1	0.69	0.73	0.7	2
	Notional	2.1	92.9	0.7	7.2	13.7	0.82	3.6		
[\$1	[ST] Water loop heat pump, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
	Actual	393.1	165.4	146.2	42.3	255.7	0.75	1.09	0.75	2
	Notional	23.4	138.2	8	10.7	16.5	0.82	3.6		
[\$1	[ST] No Heating or Cooling									
	Actual	778.7	162	0	0	0	0	0	0	0
	Notional	94	304.2	0	0	0	0	0		

Key to terms

Heat dem [MJ/m2] = Heating energy demand Cool dem [MJ/m2] = Cooling energy demand Heat con [kWh/m2] = Heating energy consumption Cool con [kWh/m2] = Cooling energy consumption Aux con [kWh/m2] = Auxiliary energy consumption Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) Cool SSEER = Cooling system seasonal energy efficiency ratio Heat gen SSEFF = Heating generator seasonal efficiency Cool gen SSEER = Cooling generator seasonal energy efficiency ratio ST = System type HS = Heat source HFT = Heating fuel type CFT = Cooling fuel type

Key Features

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

Building fabric

Element	U і-тур	Ui-Min	Surface where the minimum value occurs*
Wall	0.23	1.7	00a Ground - Z02f Office_W_6
Floor	0.2	0.27	0002a Basment 2 - Z06 24 Server_S_3
Roof	0.15	2.8	00a Ground - Z05b Cupboard_R_5
Windows, roof windows, and rooflights	1.5	6.29	00a Ground - Z02f Office_G_7
Personnel doors	1.5	3	01 First - Z01a Circulation_D_12
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
UFTyp = Typical individual element U-values [W/(m ² K)] UFMin =		U _{FMin} = Minimum individual element U-values [W/(m ² K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	25

APPENDIX B

Post works BRUKL report



BRUKL Output Document

Compliance with England Building Regulations Part L 2013

Project name

1-19 Torrington Place

Date: Wed Aug 12 11:30:56 2015

Administrative information

Building Details

Address: 1-19 Torrington Place, LONDON, WC1E 7HB

Certification tool

Calculation engine: SBEM Calculation engine version: v5.2.d.2 Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v4.2.0

BRUKL compliance check version: v5.2.d.2

Owner Details Name: Telephone number: Address: , ,

Certifier details Name: Lee Pegler Telephone number: 01327 810620 Address: Henge Barn Pury Hill Business Park Alderton Road, Towcester, NN12 7LS

Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target

The building does not comply with England Building Regulations Part L 2013 CO_2 emission rate from the notional building, kg CO_2/m^2 .annum19.8Target CO_2 emission rate (TER), kg CO_2/m^2 .annum19.8Building CO_2 emission rate (BER), kg CO_2/m^2 .annum123.2Are emissions from the building less than or equal to the target?BER > TERAre as built details the same as used in the BER calculations?Separate submission

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

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building	fabric
----------	--------

Element	Ua-Limit	Ua-Calc	Ui-Cale	Surface where the maximum value occurs*		
Wall**	0.35	2.41	3.5	0002a Basment 2 - Z01 Circulation_P_6		
Floor	0.25	0.83	1	0002a Basment 2 - Z01 Circulation_F_4		
Roof	0.25	2.8	2.8	00a Ground - Z05b Cupboard_R_5		
Windows***, roof windows, and rooflights	2.2	6.29	6.31	001a Basment - Z01c Circulation_G_7		
Personnel doors	2.2	3	3	01 First - Z01a Circulation_D_12		
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"		
High usage entrance doors	3.5	_	-	"No external high usage entrance doors"		
LL = Limiting area weighted average LL values DM//m2//31						

 $U_{a-Limit}$ = Limiting area-weighted average U-values [W/(m²K)] U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]

 U_{ECalc} = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
m³/(h.m²) at 50 Pa	10	25

As designed

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values					
Whole building electric power factor achieved by power factor correction	<0.9				

1- H5 rads

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	SFP [W/(I/s)] HR efficien			
This system	0.9	-	-	-	-			
Standard value	0.91*	N/A	N/A	N/A	N//	٩		
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								
* Standard shown is for gas single boiler systems <= 2 MW output. For single boiler systems > 2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.								

2- H4 elec heater

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency			
This system	1	-	-	-	-			
Standard value	N/A	N/A	N/A	N/A	N/A			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								

3- H3 split system

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)] H		efficiency			
This system	2	3.13	-	-	-				
Standard value	2.5*	N/A	N/A	N/A	N//	4			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO									
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.									

4- H2 CAV

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency			
This system	0.9	2.74	-	3	-			
Standard value	0.91*	N/A	N/A	1.6^	N/A			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.								

^ Allowed SFP may be increased by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

5- H1 vestatempt

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency					
This system	0.9	2.74	-	3	0.65					
Standard value	0.91*	N/A	N/A	1.6^	0.5					
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO										

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

^ Allowed SFP may be increased by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

1- D2 500L gas

	Water heating efficiency	Storage loss factor [kWh/litre per day]					
This building	0.89	0.012					
Standard value	0.9*	N/A					
* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.							

2- D1 500L gas

	Water heating efficiency	Storage loss factor [kWh/litre per day]					
This building	0.89	0.012					
Standard value	0.9*	N/A					
* Standard shown is for use boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73							

Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
А	Local supply or extract ventilation units serving a single area
В	Zonal supply system where the fan is remote from the zone
С	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
Е	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
Н	Fan coil units

Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(I/s)]										
ID of system type	Α	в	С	D	Е	F	G	Н	I	нке	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
0002a Basment 2 - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z08c Office (Staff Roon	1)-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z08b Office (staff room)	- 1	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z03a WC	1.5	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z08a Office (Staff room) -	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z08a Office (staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z08b Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z08 Office (Staff room)	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z03b WC	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z03a WC	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z08 Office (Staff room) 1	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	E	F	G	Н	I	нке	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
00b Ground - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z01c Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z03b WC	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z03a WC	-	-	-	-	-	-	-	-	-	-	N/A
00c Ground - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z08b Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z03b WC	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z03a WC	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z08a Office (Staff room)	1 -	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z08a Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
06a Sixth - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
06a Sixth - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
06a Sixth - Z08 Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
06b Sixth - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z08 Office (Staff room)	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z08b Office (Staff room)	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z08a Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z01b Circulation	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z03b WC	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z12 Reception	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z01c Circulation	-	-	-	-	-	-	-	-	-	-	N/A
0002a Basment 2 - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z02 Office	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z06 24 Server	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z06 24h Server	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z06 24h Server	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z09c Teaching	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z11b Comp Lab	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	E	F	G	Н	I	пке	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
001a Basment - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z11a Comp Lab	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
00a Ground - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z09c Teaching	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z11 Comp Lab	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02i Office	-	-	-	-	-	_	-	_	_	-	N/A
01 First - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02f Office	_	-	-	-	-	_	-	-	-	_	N/A
01 First - Z02h Office	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z02g Office	_	-	-	-	_	_	-	_	_	-	N/A
02 Second - Z02c Office	_	-	-	-	_	_	_	_	_	-	N/A
02 Second - Z02d Office	_	_	-	-	-	_	_	-	-	-	N/A
02 Second - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z07 Teaching	_	_	_	-	_	_	_	_	_	_	N/A
02 Second - 702b Office	_	_	_	_	_	_	_	_	_	_	N/A
02 Second - Z02g Office	_	-	-	_	_	_	_	_	_	_	N/A
03 Third - Z02e Office	_	-	-	-	-	_	_	_	_	-	N/A
03 Third - Z02d Office	_	-	-	_	_	_	_	_	_	_	N/A
03 Third - 710 Lab	_	-	-	_	_	_	_	_	_	_	N/A
03 Third - 709 Teaching	_	_	_	_	_	_	_	_	_	_	N/A
03 Third - 702c Office	_	_	_	_	_	_	_	_	_	_	N/A
03 Third - 702b Office	_	_	_	_	_	_	_	_	_	_	N/A
03 Third - 2029 Office	_							_			
03 Third - Z02t Office								_		_	N/A
04 Fourth Z09b Toaching	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - 702a Office											Ν/Δ
04 Fourth - Z02a Onice	-							-	-	-	N/A
04 Fourth 702c Office	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	
04 Fourth - 209a Teaching	-	-	-	-	-	-	-	-	-	-	N/A

ID of system typeABCDEFGHIIRStandard value0.31.10.51.91.60.51.10.51ZoneStandard04 Fourth - 2020 OfficeN/A05 Fifth - 2020 Office<	Zone name	SFP [W/(I/s)]										
Standard value0.91.10.91.01.00.10.01.00.0Standard04 Fourth - 2020 Griftine11 <td< th=""><th>ID of system type</th><th>Α</th><th>В</th><th>С</th><th>D</th><th>E</th><th>F</th><th>G</th><th>Н</th><th>I</th><th>ПКе</th><th>miclency</th></td<>	ID of system type	Α	В	С	D	E	F	G	Н	I	ПКе	miclency
04 Fourth - Z02d Office11 <t< th=""><th>Standard value</th><th>0.3</th><th>1.1</th><th>0.5</th><th>1.9</th><th>1.6</th><th>0.5</th><th>1.1</th><th>0.5</th><th>1</th><th>Zone</th><th>Standard</th></t<>	Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
04 Fourth - Z02b OfficeN/A05 Fifth - Z02e OfficeN/A05 Fifth - Z02b Office	04 Fourth - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02e OfficeN/A05 Fifth - Z09b TeachingN/A05 Fifth - Z02b OfficeN/A05 Fifth - Z02b Office<	04 Fourth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z09b TeachingN/A05 Fifth - Z02p OfficeN/A05 Fifth - Z02b OfficeN/A05 Fifth - Z02a OfficeN/A05 Fifth - Z09a TeachingN/A05 Fifth - Z02a OfficeN/A05 Fifth - Z02a OfficeN/AN/A05 Fifth - Z02a OfficeN/A05 Fifth - Z02a OfficeN/A05 Fifth - Z02a OfficeN/A </td <td>05 Fifth - Z02e Office</td> <td>-</td> <td>N/A</td>	05 Fifth - Z02e Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02t Office - - - - - - - - N/A 05 Fifth - Z02g Office - - - - - - - - N/A 05 Fifth - Z02b Office - - - - - - - - - N/A 05 Fifth - Z02b Office - - - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - N/A 05 Fifth - Z02a Office - - - -	05 Fifth - Z09b Teaching	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02g Office - - - - - - - - - N/A 05 Fifth - Z02b Office - - - - - - - N/A 05 Fifth - Z02b Office - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - - - N/A 05 Fifth - Z02a Office - - - - - - N/A 05 Fifth - Z02a Office - - - - - N/A 05 Fifth - Z02a Office - -	05 Fifth - Z02f Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02b Office N/A 05 Fifth - Z02h Office N/A 05 Fifth - Z02a Office N/A 05 Fifth - Z02a Office N/A 05 Fifth - Z09a Teaching N/A 05 Fifth - Z09a Teaching N/A 05 Fifth - Z02d Office N/A 05 Fifth - Z02d Office N/A 05 Fifth - Z10a Lab N/A 05 Fifth - Z02c Office N/A 05 Fifth - Z02c Office N/A	05 Fifth - Z02g Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02h Office N/A 05 Fifth - Z02a Office N/A 05 Fifth - Z09a Teaching N/A 05 Fifth - Z09a Teaching N/A 05 Fifth - Z09a Teaching N/A 05 Fifth - Z10c Lab N/A 05 Fifth - Z02d Office N/A N/A 05 Fifth - Z10b Lab N/A 05 Fifth - Z10a Lab N/A 05 Fifth - Z02c Office N/A 05 Fifth - Z02c Office N/A 06a Sixth - Z02 Office N/A	05 Fifth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02a Office - - - - - - - - N/A 05 Fifth - Z09a Teaching - - - - - - - N/A 05 Fifth - Z09a Teaching - - - - - - - N/A 05 Fifth - Z02d Office - - - - - - N/A 05 Fifth - Z02d Office - - - - - - - N/A 05 Fifth - Z02d Office - - - - - - - N/A 05 Fifth - Z10a Lab - - - - - - - N/A 05 Fifth - Z02o Office - - - - - - N/A 05 Fifth - Z02o Office - - - - - - N/A 06a Sixth - Z02o Office Staff room) - - - - - N/A 07 Seventh - Z02a Office - - - -	05 Fifth - Z02h Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z09a Teaching - - - - - - - - N/A 05 Fifth - Z10c Lab - - - - - - - - N/A 05 Fifth - Z02d Office - - - - - - - N/A 05 Fifth - Z10b Lab - - - - - - - N/A 05 Fifth - Z10b Lab - - - - - - - - N/A 05 Fifth - Z10a Lab - - - - - - - - N/A 05 Fifth - Z02c Office - - - - - - - N/A 05 Sifth - Z02c Office - - - - - - N/A 06a Sixth - Z02 Office Sift - Z08 - - - - N/A 07 Seventh - Z08 Office (Staff room) - - - - - N/A 07 Seventh - Z02b Office - -	05 Fifth - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z10c Lab - - - - - - - - N/A 05 Fifth - Z02d Office - - - - - - - N/A 05 Fifth - Z10b Lab - - - - - - - N/A 05 Fifth - Z10a Lab - - - - - - - N/A 05 Fifth - Z02c Office - - - - - - - N/A 05 Fifth - Z02c Office - - - - - - - N/A 05 Fifth - Z02c Office - - - - - - N/A 06a Sixth - Z02 Office - - - - - - N/A 07 Seventh - Z08 Office (Staff room) - - - - - - N/A 07 Seventh - Z02a Office - - - - - - N/A 08 Eighth - Z02a Office - - - - -<	05 Fifth - Z09a Teaching	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02d Office N/A 05 Fifth - Z10b Lab N/A 05 Fifth - Z10a Lab N/A 05 Fifth - Z02c Office N/A 05 Fifth - Z02c Office N/A 05 Fifth - Z02c Office N/A 06a Sixth - Z02 Office N/A 07 Seventh - Z08 Office (Staff room) N/A 07 Seventh - Z02a Office N/A 07 Seventh - Z02b Office N/A 08 Eighth - Z02b Office - - - - - N/A 08 Eighth - Z02b Office - -	05 Fifth - Z10c Lab	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z10b Lab - - - - - - - - - N/A 05 Fifth - Z10a Lab - - - - - - - N/A 05 Fifth - Z02c Office - - - - - - - N/A 06a Sixth - Z02 Office - - - - - - - N/A 07 Seventh - Z08 Office (Staff room) - - - - - - - N/A 07 Seventh - Z02a Office - - - - - - - - N/A 07 Seventh - Z02b Office - - - - - - - - N/A 07 Seventh - Z02b Office - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - N/A - N/A <t< td=""><td>05 Fifth - Z02d Office</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>N/A</td></t<>	05 Fifth - Z02d Office	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z10a Lab - - - - - - - - N/A 05 Fifth - Z02c Office - - - - - - N/A 06a Sixth - Z02 Office - - - - - - - N/A 06a Sixth - Z02 Office - - - - - - N/A 07 Seventh - Z08 Office (Staff room) - - - - - - N/A 07 Seventh - Z02a Office - - - - - - - N/A 07 Seventh - Z02a Office - - - - - - - N/A 07 Seventh - Z02b Office - - - - - - N/A 07 Seventh - Z02b Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A 08 Eighth - Z02b Office - - - -	05 Fifth - Z10b Lab	-	-	-	-	-	-	-	-	-	-	N/A
05 Fifth - Z02c Office - - - - - - N/A 06a Sixth - Z02 Office - - - - - - - N/A 07 Seventh - Z08 Office (Staff room) - - - - - - - N/A 07 Seventh - Z02a Office - - - - - - N/A 07 Seventh - Z02a Office - - - - - - N/A 07 Seventh - Z02a Office - - - - - - N/A 07 Seventh - Z02b Office - - - - - - - N/A 08 Eighth - Z02a Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A	05 Fifth - Z10a Lab	-	-	-	-	-	-	-	-	-	-	N/A
06a Sixth - Z02 Office - - - - - - - N/A 07 Seventh - Z08 Office (Staff room) - - - - - - - N/A 07 Seventh - Z02a Office - - - - - - - N/A 07 Seventh - Z02a Office - - - - - - N/A 07 Seventh - Z02b Office - - - - - - N/A 08 Eighth - Z02a Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A	05 Fifth - Z02c Office	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z08 Office (Staff room) - - - - - - - N/A 07 Seventh - Z02a Office - - - - - - - N/A 07 Seventh - Z02b Office - - - - - - - N/A 07 Seventh - Z02b Office - - - - - - N/A 08 Eighth - Z02b Office - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A	06a Sixth - Z02 Office	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z02a Office - - - - - - - N/A 07 Seventh - Z02b Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - N/A	07 Seventh - Z08 Office (Staff room)	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z02b Office - - - - - - - N/A 08 Eighth - Z02a Office - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A	07 Seventh - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z02a Office - - - - - - - - N/A 08 Eighth - Z02b Office - - - - - - - N/A	07 Seventh - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z02b Office N/A	08 Eighth - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
	08 Eighth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z12 Reception N/A	09 Ninth - Z12 Reception	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z02a Office N/A	09 Ninth - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z02b Office N/A	09 Ninth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z08b Office (Staff Room) N/A	10a Tenth - Z08b Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z02a Office N/A	10a Tenth - Z02a Office	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z02b Office N/A	10a Tenth - Z02b Office	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z08a Office (Staff Room) N/A	10a Tenth - Z08a Office (Staff Room)	-	-	-	-	-	-	-	-	-	-	N/A
0002h Basment 2 - Z04 Plant N/A	0002h Basment 2 - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
0002i Basement 2 - Z04 Plant N/A	0002i Basement 2 - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
0002a Basment 2 - Z04a Plant N/A	0002a Basment 2 - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
0002a Basment 2 - Z05 Cupboard N/A	0002a Basment 2 - Z05 Cupboard	_	-	-	_	_	-	_	-	_	-	N/A
0002a Basment 2 - Z04b Plant N/A	0002a Basment 2 - Z04b Plant	_	-	-	_	_	_	_	-	_	-	N/A
0002a Basment 2 - Z03 WC N/A	0002a Basment 2 - Z03 WC	-	-	-	-	-	-	-	-	-	-	N/A
0002c Basment 2 - Z01 Circulation N/A	0002c Basment 2 - Z01 Circulation	-	-	-	-	-	-	-	-	-	-	N/A
0002b Basment 2 - Z01 Circulation N/A	0002b Basment 2 - Z01 Circulation	_	-	-	-	-	-	-	-	-	_	N/A
0002b Basment 2 - Z04 Plant N/A	0002b Basment 2 - Z04 Plant	_	-	-	-	-	-	-	-	_	-	N/A
0002b Basment 2 - Z05 Cupboard N/A	0002b Basment 2 - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
0002e Carpark Fire Exit - Z01 Circulation N/A	0002e Carpark Fire Exit - Z01 Circula	tien	-	-	-	-	-	-	-	-	-	N/A
0002f Basment 2 - Z05 Cupboard N/A	0002f Basment 2 - Z05 Cupboard	-	_	-	_	-	-	-	_	-	-	N/A
0002g Basement 2 - Cupboard N/A	0002g Basement 2 - Cupboard	-	_	-	_	_	-	-	_	-	-	N/A
0002d Basment 2 - Z04 Plant N/A	0002d Basment 2 - Z04 Plant	-	_	-	_	_	_	-	_	-	_	N/A
0002d Basment 2 - Z05 Cupboard N/A	0002d Basment 2 - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	Н	I	пке	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
001d Carpark Plant - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
001d Carpark Plant - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
001c Carpark Fire exit - Z01 Circulatio	ph	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05c Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05d Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z05e Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
01 First - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
02 Second - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
03 Third - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05f Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04g Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05g Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04h Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04i Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05e Cupbaord	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05d Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04f Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05c Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04e Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05b Cupboard	-	-	-	-	-	-	-	-	-	_	N/A
001a Basment - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
001a Basment - Z05a Cupboard	-	-	-	-	-	-	-	-	-	_	N/A
001b Basment - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
04 Fourth - Z04a Plant	_	_	_	-	_	-	_	_	_	-	N/A
05 Fifth - Z05 Cupboard	_	-	-	-	-	-	-	-	-	-	N/A
		I	1		1		1	1	1	1	-

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	E	F	G	н	I	ПКе	miclency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
05 Fifth - Z04d Plant	-	-	-	-	-	-	-	-	-	-	N/A
06a Sixth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
06c Sixth - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
06d Sixth - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
07 Seventh - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
08 Eighth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
09 Ninth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
10b Tenth - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z04a Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z04c Plant	-	-	-	-	-	-	-	-	-	-	N/A
10a Tenth - Z05 Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
11b Eleventh - Z04 Plant	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z04b Plant	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z05c Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z05a Cupboard	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z01a Circulation	-	-	-	-	-	-	-	-	-	-	N/A
11a Eleventh - Z05b Cupboard	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	Lumino	ous effic]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
0002a Basment 2 - Z01 Circulation	-	30	-	95
00a Ground - Z02f Office	11	-	-	2728
00a Ground - Z04b Plant	5	-	-	73
00a Ground - Z01b Circulation	-	30	-	842
00a Ground - Z05b Cupboard	6	-	-	58
00a Ground - Z02c Office	12	-	-	790
00a Ground - Z05a Cupboard	6	-	-	70
00a Ground - Z08c Office (Staff Room)	13	-	-	589
00a Ground - Z04c Plant	7	-	-	433
00a Ground - Z08b Office (staff room)	5	-	-	379
00a Ground - Z03a WC	-	24	-	495
00a Ground - Z08a Office (Staff room)	11	-	-	828
00a Ground - Z04a Plant	5	-	-	99
01 First - Z01a Circulation	-	38	-	1585
01 First - Z01b Circulation	-	17	-	73
01 First - Z08a Office (staff Room)	15	-	-	283

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
01 First - Z08b Office (Staff Room)	9	-	-	206
01 First - Z03 WC	-	36	-	488
02 Second - Z01 Circulation	-	36	-	1533
02 Second - Z03 WC	-	35	-	510
02 Second - Z08 Office (Staff room)	18	-	-	346
03 Third - Z03b WC	-	30	-	135
03 Third - Z06 24 Server	16	-	-	75
03 Third - Z03a WC	-	35	-	510
03 Third - Z01a Circulation	-	37	-	1468
03 Third - Z08 Office (Staff room) 1	9	-	-	226
03 Third - Z01b Circulation	-	38	-	179
00b Ground - Z01 Circulation	-	42	-	259
001a Basment - Z01c Circulation	-	31	-	106
001a Basment - Z01b Circulation	-	40	-	869
001a Basment - Z03b WC	-	22	-	175
001a Basment - Z01a Circulation	-	42	-	598
001a Basment - Z03a WC	-	27	-	168
00c Ground - Z01 Circulation	-	26	-	108
04 Fourth - Z01 Circulation	_	37	-	1610
04 Fourth - Z08b Office (Staff Room)	10	-	-	166
04 Fourth - Z03b WC	-	31	-	237
04 Fourth - Z03a WC	-	35	-	510
04 Fourth - Z08a Office (Staff room) 1	9	-	-	226
05 Fifth - Z08a Office (Staff Room)	16	-	-	329
05 Fifth - Z01b Circulation	-	36	-	205
05 Fifth - Z01a Circulation	-	38	-	1248
06a Sixth - Z01b Circulation	-	43	-	161
06a Sixth - Z01a Circulation	-	45	-	307
06a Sixth - Z08 Office (Staff Room)	20	-	-	553
06b Sixth - Z01 Circulation	-	32	-	83
07 Seventh - Z01a Circulation	-	43	-	364
08 Fighth - Z01a Circulation	_	43	_	360
08 Eighth - Z08 Office (Staff room)	14	-	_	262
09 Ninth - Z08b Office (Staff room)	11	-	_	260
09 Ninth - Z01a Circulation	-	44	-	310
09 Ninth - Z03 WC	-	38	-	565
09 Ninth - Z08a Office (Staff Room)	17	-	_	333
10a Tenth - Z01b Circulation	-	44	-	160
10a Tenth - Z01a Circulation	-	45	-	301
10a Tenth - 703 WC	_	24	-	141
00a Ground - 703b WC	_	15		447
00a Ground - 712 Recention	_	30	50	629
00a Ground - Z01a Circulation	_	24	-	691
	1	- T	1	001

General lighting and display lighting	Lumino	ous effic]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
00a Ground - Z01c Circulation	-	28	-	553
0002a Basment 2 - Z06 24 Server	24	-	-	529
01 First - Z06 24 Server	16	-	-	78
02 Second - Z06 24 Server	16	-	-	75
001a Basment - Z02 Office	20	-	-	3576
001a Basment - Z06 24 Server	22	-	-	182
04 Fourth - Z06 24 Server	16	-	-	75
07 Seventh - Z06 24h Server	12	-	-	60
08 Eighth - Z06 24h Server	16	-	-	75
001a Basment - Z09c Teaching	17	-	-	386
001a Basment - Z11b Comp Lab	17	-	-	404
001a Basment - Z09b Teaching	21	_	_	1273
001a Basment - Z09a Teaching	19	_	_	631
001a Basment - 711a Comp Lab	18	-	_	583
00a Ground - 702b Office	11	_	_	1199
00a Ground - Z09b Teaching	12	_		722
00a Ground - Z02d Office	10	-		2200
00a Ground Z02a Grice	10	-	-	1799
00a Ground - Z02a Office	10	-	-	725
Oba Ground - Zoze Office	0	-	-	0000
04 Ground - 202a Office		-	-	9200
01 First - 209c Teaching	23	-	-	004
01 First - 202e Office	22	-	-	2034
	22	-	-	4785
01 First - 211 Comp Lab	25	-	-	1/18
01 First - 202c Office	21	-	-	1268
01 First - Z09b Teaching	22	-	-	1337
01 First - Z02i Office	20	-	-	596
01 First - Z09a Teaching	19	-	-	391
01 First - Z02b Office	16	-	-	333
01 First - Z02a Office	18	-	-	5452
01 First - Z02f Office	19	-	-	473
01 First - Z02h Office	20	-	-	532
01 First - Z02g Office	16	-	-	1475
02 Second - Z02c Office	20	-	-	460
02 Second - Z02d Office	17	-	-	1412
02 Second - Z02e Office	19	-	-	4282
02 Second - Z02f Office	19	-	-	805
02 Second - Z02a Office	19	-	-	4447
02 Second - Z07 Teaching	22	-	-	1310
02 Second - Z02b Office	17	-	-	1444
02 Second - Z02g Office	22	-	-	783
03 Third - Z02e Office	17	-	-	301
03 Third - Z02d Office	17	-	-	1079

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
03 Third - Z10 Lab	16	-	-	1110
03 Third - Z09 Teaching	21	-	-	1156
03 Third - Z02c Office	17	-	-	2627
03 Third - Z02b Office	23	-	-	1045
03 Third - Z02a Office	19	-	-	5487
03 Third - Z02f Office	18	-	-	1940
04 Fourth - Z09b Teaching	23	-	-	849
04 Fourth - Z02a Office	19	-	-	4116
04 Fourth - Z09c Teaching	22	-	-	607
04 Fourth - Z02c Office	20	-	-	4175
04 Fourth - Z09a Teaching	19	-	-	317
04 Fourth - Z02d Office	17	-	-	1614
04 Fourth - Z02b Office	20	-	-	1756
05 Fifth - Z02e Office	24	-	-	5527
05 Fifth - Z09b Teaching	23	-	-	649
05 Fifth - Z02t Office	17	_	_	600
05 Fifth - 702g Office	17	_	_	315
05 Fifth - 702b Office	19	_		791
05 Fifth - Z02b Office	13	_		/16
	10	-		1240
05 Fifth - 202a Office	19	-	-	163
05 Fifth - 710a Lab	13	-	-	704
OS Filth - Z TOC Lab	13	-	-	050
	10	-	-	950
	20	-	-	1637
05 Fiπ - 210a Lab	19	-	-	2115
	18	-	-	624
06a Sixth - 202 Office	24	-	-	5591
07 Seventh - Z08 Office (Staff room)	17	-	-	338
07 Seventh - Z02a Office	24	-	-	5043
07 Seventh - Z02b Office	21	-	-	872
08 Eighth - Z02a Office	24	-	-	5312
08 Eighth - Z02b Office	19	-	-	434
09 Ninth - Z12 Reception	-	35	50	233
09 Ninth - Z02a Office	23	-	-	5270
09 Ninth - Z02b Office	16	-	-	517
10a Tenth - Z08b Office (Staff Room)	14	-	-	218
10a Tenth - Z02a Office	23	-	-	3519
10a Tenth - Z02b Office	16	-	-	733
10a Tenth - Z08a Office (Staff Room)	18	-	-	316
0002h Basment 2 - Z04 Plant	11	-	-	60
0002i Basement 2 - Z04 Plant	19	-	-	37
0002a Basment 2 - Z04a Plant	23	-	-	1568
0002a Basment 2 - Z05 Cupboard	21	-	-	89

General lighting and display lighting	Lumino	ous effic			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]	
Standard value	60	60	22		
0002a Basment 2 - Z04b Plant	8	-	-	77	
0002a Basment 2 - Z03 WC	-	24	-	121	
0002c Basment 2 - Z01 Circulation	-	21	-	121	
0002b Basment 2 - Z01 Circulation	-	16	-	320	
0002b Basment 2 - Z04 Plant	16	-	-	113	
0002b Basment 2 - Z05 Cupboard	22	-	-	181	
0002e Carpark Fire Exit - Z01 Circulation	-	35	-	105	
0002f Basment 2 - Z05 Cupboard	22	-	-	106	
0002g Basement 2 - Cupboard	24	-	-	147	
0002d Basment 2 - Z04 Plant	18	-	-	175	
0002d Basment 2 - Z05 Cupboard	14	-	-	196	
001d Carpark Plant - Z04a Plant	10	-	-	111	
001d Carpark Plant - Z04b Plant	23	-	-	630	
001c Carpark Fire exit - Z01 Circulation	-	35	-	105	
01 First - Z04b Plant	8	-	-	44	
01 First - Z05c Cupboard	8	-	_	20	
01 First - Z04a Plant	8	-	_	70	
01 First - Z05b Cupboard	8	-	-	24	
01 First - Z05d Cupboard	9	-	-	31	
01 First - Z05a Cupboard	10	-	_	30	
01 First - Z05e Cupboard	8	-	-	14	
01 First - Z04d Plant	8	-	_	90	
01 First - Z04c Plant	11	-	-	278	
02 Second - Z04d Plant	8	-	_	90	
02 Second - Z04c Plant	12	-	-	262	
02 Second - Z04b Plant	8	-	-	44	
02 Second - Z04a Plant	8	-	-	91	
02 Second - Z05 Cupboard	13	_	-	28	
03 Third - Z05b Cupboard	10	-	_	27	
03 Third - Z04a Plant	8	_	_	91	
03 Third - Z05a Cupboard	13	_	_	28	
001a Basment - 705f Cupboard	24	_	_	153	
001a Basment - Z04g Plant	9	-	_	188	
001a Basment - 705g Cupboard	13	-	_	25	
001a Basment - Z04h Plant	18	-	-	365	
001a Basment - Z04i Plant	8	_	_	44	
001a Basment - 705e Cupbaord	10	-	_	41	
001a Basment - Z05d Cupboard	10	-	_	34	
001a Basment - Z04f Plant	8	-	-	147	
001a Basment - 704a Plant	16	-	-	537	
001a Basment - 705c Cupboard	24	-	_	271	
001a Basment - 704e Plant	8	-		72	
001a Basment - Z05b Cupboard	11	-	-	39	
	1	1	1		

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
001a Basment - Z04b Plant	11	-	-	90
001a Basment - Z04d Plant	17	-	-	324
001a Basment - Z04c Plant	11	-	-	166
001a Basment - Z05a Cupboard	19	-	-	109
001b Basment - Z05a Cupboard	24	-	-	77
04 Fourth - Z04c Plant	12	-	-	262
04 Fourth - Z04b Plant	8	-	-	44
04 Fourth - Z04d Plant	8	-	-	90
04 Fourth - Z05a Cupboard	13	-	-	28
04 Fourth - Z04a Plant	8	-	-	91
05 Fifth - Z05 Cupboard	13	-	-	28
05 Fifth - Z04d Plant	8	-	-	90
06a Sixth - Z05 Cupboard	16	-	-	39
06c Sixth - Z04 Plant	22	-	-	534
06d Sixth - Z04 Plant	16	-	-	194
07 Seventh - Z05 Cupboard	8	-	-	12
07 Seventh - Z04a Plant	8	-	-	91
08 Eighth - Z05b Cupboard	18	-	-	58
08 Eighth - Z05a Cupboard	8	-	-	8
08 Eighth - Z04a Plant	8	-	-	91
09 Ninth - Z04a Plant	8	-	-	82
09 Ninth - Z04c Plant	12	-	-	262
09 Ninth - Z05 Cupboard	12	-	-	24
10b Tenth - Z04 Plant	16	-	-	69
10a Tenth - Z04b Plant	8	-	-	54
10a Tenth - Z04a Plant	8	-	-	81
10a Tenth - Z04c Plant	13	-	-	240
10a Tenth - Z05 Cupboard	11	-	-	20
11b Eleventh - Z04 Plant	23	-	-	106
11a Eleventh - Z04b Plant	22	-	-	1286
11a Eleventh - Z05c Cupboard	24	-	-	123
11a Eleventh - Z05a Cupboard	8	-	-	7
11a Eleventh - Z01a Circulation	-	35	-	83
11a Eleventh - Z05b Cupboard	17	-	-	22

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00a Ground - Z02f Office	YES (+58.3%)	NO
00a Ground - Z02c Office	NO (-64.3%)	NO
00a Ground - Z08c Office (Staff Room)	N/A	N/A
00a Ground - Z08b Office (staff room)	N/A	N/A
00a Ground - Z08a Office (Staff room)	NO (-46.8%)	NO
01 First - Z08a Office (staff Room)	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
01 First - Z08b Office (Staff Room)	YES (+70.1%)	NO
02 Second - Z08 Office (Staff room)	YES (+49.7%)	NO
03 Third - Z08 Office (Staff room) 1	N/A	N/A
04 Fourth - Z08b Office (Staff Room)	N/A	N/A
04 Fourth - Z08a Office (Staff room) 1	N/A	N/A
05 Fifth - Z08a Office (Staff Room)	YES (+49.7%)	NO
06a Sixth - Z08 Office (Staff Room)	NO (-70.6%)	NO
08 Eighth - Z08 Office (Staff room)	YES (+19.4%)	NO
09 Ninth - Z08b Office (Staff room)	YES (+40.7%)	NO
09 Ninth - Z08a Office (Staff Room)	NO (-54.5%)	NO
00a Ground - Z12 Reception	YES (+347%)	NO
001a Basment - Z02 Office	YES (+32.6%)	NO
001a Basment - Z09c Teaching	N/A	N/A
001a Basment - Z11b Comp Lab	N/A	N/A
001a Basment - Z09b Teaching	N/A	N/A
001a Basment - Z09a Teaching	N/A	N/A
001a Basment - Z11a Comp Lab	N/A	N/A
00a Ground - Z02b Office	NO (-51.4%)	NO
00a Ground - Z09b Teaching	NO (-64.3%)	NO
00a Ground - Z02d Office	N/A	N/A
00a Ground - Z09a Teaching	N/A	N/A
00a Ground - Z02e Office	N/A	N/A
00a Ground - Z02a Office	YES (+258.5%)	NO
01 First - Z09c Teaching	YES (+57.3%)	NO
01 First - Z02e Office	YES (+60.1%)	NO
01 First - Z02d Office	YES (+11.7%)	NO
01 First - Z11 Comp Lab	YES (+118.1%)	NO
01 First - Z02c Office	YES (+118.8%)	NO
01 First - Z09b Teaching	YES (+68.9%)	NO
01 First - Z02i Office	N/A	N/A
01 First - Z09a Teaching	NO (-12.6%)	NO
01 First - Z02b Office	NO (-16.1%)	NO
01 First - Z02a Office	YES (+65.6%)	NO
01 First - Z02f Office	NO (-36.6%)	NO
01 First - Z02h Office	YES (+65.4%)	NO
01 First - Z02g Office	YES (+56.9%)	NO
02 Second - Z02c Office	NO (-36.6%)	NO
02 Second - Z02d Office	YES (+58.5%)	NO
02 Second - Z02e Office	YES (+74.7%)	NO
02 Second - Z02f Office	NO (-13.9%)	NO
02 Second - Z02a Office	YES (+61.5%)	NO
02 Second - Z07 Teaching	YES (+63.1%)	NO
02 Second - Z02b Office	YES (+52.6%)	NO
02 Second - Z02g Office	NO (-24.6%)	NO
03 Third - Z02e Office	NO (-42.5%)	NO
03 Third - Z02d Office	YES (+60.3%)	NO
03 Third - Z10 Lab	YES (+59.9%)	NO
03 Third - Z09 Teaching	YES (+33.3%)	NO
03 Third - Z02c Office	YES (+120.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
03 Third - Z02b Office	NO (-13.9%)	NO
03 Third - Z02a Office	YES (+63.3%)	NO
03 Third - Z02f Office	YES (+56.9%)	NO
04 Fourth - Z09b Teaching	NO (-3.3%)	NO
04 Fourth - Z02a Office	YES (+102.8%)	NO
04 Fourth - Z09c Teaching	NO (-13.9%)	NO
04 Fourth - Z02c Office	YES (+74.7%)	NO
04 Fourth - Z09a Teaching	YES (+32.7%)	NO
04 Fourth - Z02d Office	YES (+60.1%)	NO
04 Fourth - Z02b Office	YES (+56.9%)	NO
05 Fifth - Z02e Office	YES (+71%)	NO
05 Fifth - Z09b Teaching	YES (+56.5%)	NO
05 Fifth - Z02f Office	YES (+65.4%)	NO
05 Fifth - Z02g Office	YES (+27.6%)	NO
05 Fifth - Z02b Office	YES (+112.6%)	NO
05 Fifth - Z02h Office	YES (+60.1%)	NO
05 Fifth - Z02a Office	YES (+13.3%)	NO
05 Fifth - Z09a Teaching	YES (+115.3%)	NO
05 Fifth - Z10c Lab	YES (+65.2%)	NO
05 Fifth - Z02d Office	NO (-25.2%)	NO
05 Fifth - Z10b Lab	YES (+105.9%)	NO
05 Fifth - Z10a Lab	NO (-13.9%)	NO
05 Fifth - Z02c Office	YES (+103.2%)	NO
06a Sixth - Z02 Office	YES (+70.5%)	NO
07 Seventh - Z08 Office (Staff room)	YES (+49.7%)	NO
07 Seventh - Z02a Office	YES (+71%)	NO
07 Seventh - Z02b Office	NO (-32.4%)	NO
08 Eighth - Z02a Office	YES (+71.2%)	NO
08 Eighth - Z02b Office	NO (-43%)	NO
09 Ninth - Z12 Reception	YES (+65.7%)	NO
09 Ninth - Z02a Office	YES (+71.2%)	NO
09 Ninth - Z02b Office	NO (-34.3%)	NO
10a Tenth - Z08b Office (Staff Room)	NO (-88.9%)	NO
10a Tenth - Z02a Office	YES (+72.9%)	NO
10a Tenth - Z02b Office	NO (-39%)	NO
10a Tenth - Z08a Office (Staff Room)	N/A	N/A

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

Separate submission

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

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?		
Is evidence of such assessment available as a separate submission?	NO	
Are any such measures included in the proposed design?	NO	

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	12348.8	12348.8
External area [m ²]	20805.7	20805.7
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	25	3
Average conductance [W/K]	55365.6	9074.22
Average U-value [W/m²K]	2.66	0.44
Alpha value* [%]	2.09	12.3

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	135.81	11.43
Cooling	13.97	7.64
Auxiliary	130.2	8.76
Lighting	30.64	16.53
Hot water	10.66	2.7
Equipment*	61.77	61.77
TOTAL**	321.28	47.06

* Energy used by equipment does not court towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	668.01	215.49
Primary energy* [kWh/m ²]	720.62	115.91
Total emissions [kg/m ²]	123.2	19.8

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

ŀ	HVAC Systems Performance									
Sys	stern Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[\$1	[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Natural Gas									
	Actual	646	48.1	223.5	0	2.9	0.8	0	0.9	0
	Notional	78.7	61.2	26.7	0	1.2	0.82	0		
[\$1] Other loca	al room hea	ter - unfanr	ned, [HS] Ro	oom heater	, [HFT] Elec	ctricity, [CF	T] Natural G	Gas	
	Actual	144.5	125.3	50.2	0	0	0.8	0	1	0
	Notional	22.5	84.8	7.6	0	0	0.82	0		
[\$1	[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
	Actual	375.3	430.3	55.9	67.3	0	1.86	1.78	2	2.5
	Notional	17.7	835.5	2	64.5	0	2.43	3.6		
[\$1] Constant	volume sys	tem (fixed t	fresh air rat	te), [HS] LTI	HW boiler,	[HFT] Natur	al Gas, [CF	T] Electricit	ty
	Actual	299.9	33.9	93.8	9.5	212.1	0.89	0.99	0.9	2.74
	Notional	2.1	92.9	0.7	7.2	13.7	0.82	3.6		
[\$1	[ST] Water loop heat pump, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
	Actual	458.1	123.8	142	23.1	253.2	0.9	1.49	0.9	2.74
	Notional	23.4	138.2	8	10.7	16.5	0.82	3.6		
[\$1	[ST] No Heating or Cooling									
	Actual	782.7	159.2	0	0	0	0	0	0	0
	Notional	94	304.2	0	0	0	0	0		

Key to terms

Heat dem [MJ/m2] = Heating energy demand Cool dem [MJ/m2] = Cooling energy demand Heat con [kWh/m2] = Heating energy consumption Cool con [kWh/m2] = Cooling energy consumption Aux con [kWh/m2] = Auxiliary energy consumption Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) Cool SSEER = Cooling system seasonal energy efficiency ratio Heat gen SSEFF = Heating generator seasonal efficiency Cool gen SSEER = Cooling generator seasonal energy efficiency ratio ST = System type HS = Heat source HFT = Heating fuel type CFT

= Cooling fuel type

Key Features

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

Building fabric

Element	U і-тур	Ui-Min	Surface where the minimum value occurs*	
Wall	0.23	1.7	00a Ground - Z02f Office_W_6	
Floor	0.2	0.27	0002a Basment 2 - Z06 24 Server_S_3	
Roof	0.15	2.8	00a Ground - Z05b Cupboard_R_5	
Windows, roof windows, and rooflights	1.5	6.29	00a Ground - Z02f Office_G_7	
Personnel doors	1.5	3	01 First - Z01a Circulation_D_12	
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"	
High usage entrance doors	1.5	-	"No external high usage entrance doors"	
U _{FTyp} = Typical individual element U-values [W/(m ² K)] U _{FMin} = Minimum individual element U-values [W/(m ² K)]				
* There might be more than one surface where the minimum U-value occurs.				

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	25