Compliance with England Building Regulations Part L 2013

Project name

The Russell School

Date: Wed Nov 26 17:22:26 2014

Administrative information

Building Details

Address: Petersham Road, Surrey, TW10 7AH

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.2

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.2

BRUKL compliance check version: v5.2.b.1

Owner Details

Name: London Borough of Richmond Telephone number: Phone Address: Street Address, City, Postcode

Certifier details

Name: Name Telephone number: Phone Address: Street Address, City, Postcode

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

1.1	CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	20.6
1.2	Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	20.6
1.3	Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	17.3
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

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

Values which do not meet standards in the 2013 Non-Domestic Building Services Compliance Guide are displayed in red.

2.a Building fabric

Element	Ua-Limit	Ua-Calc	Ui-Calc	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	00000005:Surf[0]
Floor	0.25	0.14	0.14	0000006:Surf[0]
Roof	0.25	0.12	0.18	11000008:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.28	1.4	04000001:Surf[1]
Personnel doors	2.2	2.2	2.2	050000B:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
U _{a-Limit} = Limiting area-weighted average U-values [V U _{a-Calc} = Calculated area-weighted average U-values	//(m²K)] [W/(m²K)]		Ui-Calc = C	calculated maximum individual element U-values [W/(m²K)]

Ua-Calc = Calculated area-weighted average 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	3.24		

As designed

2.b 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	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- UFH + Natural Ventilation

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency		
This system	0.94	-	0	0	-		
Standard value	0.91*	N/A	N/A	N/A	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							

* 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- UFH + Mechanical Extract (zonal with remote fan)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency			
This system	0.94	-	0	0	-			
Standard value	0.91*	N/A	N/A	N/A	N/A			
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								
* Standard shown is for any single boiler systems -2 MW output. For single boiler systems >2 MW or multi boiler systems. (overall) limiting								

* 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.

3- UFH + Mechanical Supply & Extract with HR(80%)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency		
This system	0.94	-	0	0	0.8		
Standard value	0.91*	N/A	N/A	N/A	0.5		
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO							
* Standard shown is for das single holler systems <-2 MW output. For single holler systems >2 MW or multi-holler systems. (overall) limiting							

* 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.

4- UFH + Mechanical Supply & Extract with HR(50%)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency		
This system	0.94	-	0	0	0.5		
Standard value	0.91*	N/A	N/A	N/A	0.45		
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.							

"No HWS in project, or hot water is provided by HVAC system"

1- CHECK2-CHP

	CHPQA quality index	CHP electrical efficiency
This building	0	0.24
Standard value	Not provided	N/A

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
Ι	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	TR enciency		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard	
022 ACC WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
023 ACC WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
028 ACC WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
029 ACC WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
042GirlsWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
043BoysWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
058WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
061WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
063AWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
066NurseryToilets	-	-	0.5	-	-	-	-	-	-	-	N/A	
074RWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
106AWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
109GirlsWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
110BoysWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
119AWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
071RWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
009 SWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
010AWC	-	-	0.5	-	-	-	-	-	-	-	N/A	
038VisitorsSWC	-	-	0.5	-	-	-	-	-	-	-	N/A	

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
005Corridor	-	75	-	0
006 SSpec Store	75	-	-	20
022 ACC WC	-	75	-	49
023 ACC WC	-	75	-	49
024 Store	75	-	-	27
028 ACC WC	-	75	-	49
029 ACC WC	-	75	-	49

Zone nameLuminaireLampDisplay lampGeneral lighting [W]030 Store602227036Laundny7527036Laundny-75-9030 Store75-920030 Store75-920030 Store75-020030 Store75-610030 Store75-6100430 StyWC-75-810439 EStore75-000430 EStore75-00050 ChairAppliancestore75-00050 Stariappliancestore75-00051 Breakout Space 2-75-0053 Grouproom75-00054 Grouproom75-40056 ChairAppliancestore-75-056 ChairAppliancestore-75-40057 Grouproom75-40056 ChairAppliancestore-75-057 Grouproom75-40056 ChairAppliancestore-75-057 Grouproom7541058 WC-75-40056 Grouproom-75-40066 NursenyToilets-75-40062 Clasks-75-41073 C	General lighting and display lighting Luminous efficacy [lm/W]				
Standard value 60 60 22 27 038Laundry - 75 - 27 038Laundry - 75 - 9 040Corridor - 75 - 9 040Corridor - 75 - 20 043BoysWC - 75 - 61 043BoysWC - 75 - 61 043BoysWC - 75 - 0 043BoysWC - 75 - 0 043BoysWC - 75 - 0 0 049EStore 75 - - 0 0 0 05ChairAppliancestore 75 - 0 0 0 0 0 05WC - 75 - 0 0 0 0 06WC - 75 - 40 0 0 0 06WC - 75	Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
030 Store 75 - 27 036Landry - 75 - 110 039chrs 75 - 9 040Corridor - 75 - 20 043BoysWC - 75 - 61 043BoysWC - 75 - 61 043BoysWC - 75 - 0 043PEStore 75 - - 29 049PEStore 75 - - 0 050ChairAppliancestore 75 - 0 0 051 Breakout Space 2 - 75 - 0 0567Grouproom 75 - 81 0 056WC - 75 - 81 068WC - 75 - 81 064WC - 75 - 81 064WC - 75 - 40 063AWC - 75 - <td>Standard value</td> <td>60</td> <td>60</td> <td>22</td> <td></td>	Standard value	60	60	22	
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039chrs 75 - 9 040Corridor - 75 - 20 043BrysWC - 75 - 61 043BrysWC - 75 - 61 043BrysWC - 75 - 61 049PEStore 75 - - 0 05ChairAppliancestore 75 - - 0 05ChairAppliancestore 75 - 0 0 051 Breakout Space 2 - 75 - 0 051 Breakout Space 3 - 75 - 81 058WC - 75 - 81 059Cloaks - 75 - 81 063RWC - 75 - 81 061WC - 75 - 81 062Alogs - 75 - 40 062Alogs - 75 - 29 073Cloaks -<	036Laundry	-	75	-	110
040Corridor - 75 - 20 042GirsWC - 75 - 61 043BoysWC - 75 - 61 043PEStore 75 - 29 049PEStore 75 - 0 050ChairAppliancestore 75 - 81 056WC - 75 - 81 066WC - 75 - 81 066WC - 75 - 81 064WC - 75 - 40 062Clask - 75 - 81 064WC - 75 - 41 062Clasks <td>039clnrs</td> <td>75</td> <td>-</td> <td>-</td> <td>9</td>	039clnrs	75	-	-	9
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043BoysWC - 75 - 61 049PEStore 75 - 29 049PEStore 75 - - 0 05ChairAppliancestore 75 - - 32 05OchairAppliancestore 75 - - 0 05T Breakout Space 2 - 75 - 0 05Gronyproom 76 - 81 - 05GOchairAppliancestore 75 - 81 - 05Gronyproom 75 - 81 - 05GOrouproom 75 - 81 - 06GOrouproom 75 - 81 - 062Chaks - 75 - 81 062Colaks - 75 - 67 062AWC - 75 - 40 063AWC - 75 - 41 062Cloaks - 75 - 67 067H	042GirlsWC	-	75	-	61
049PEStore 75 - - 29 049PEStore 75 - - 0 050ChairAppliancestore 75 - - 32 050ChairAppliancestore 75 - 0 0 051 Breakout Space 3 - 75 - 0 057Grouproom 75 - - 81 058WC - 75 - 40 060Grouproom 75 - 81 10 063QCaaks - 75 - 40 060Grouproom 75 - 81 10 062Cloaks - 75 - 40 062AWC - 75 - 40 063AWC - 75 - 29 073Cloaks - 75 - 29 074RWC - 75 - 414 102Classroom09 75 - 426 103Classroom10 <td>043BoysWC</td> <td>-</td> <td>75</td> <td>-</td> <td>61</td>	043BoysWC	-	75	-	61
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051 Breakout Space 2 - 75 - 0 051 Breakout Space 3 - 75 - 81 053WC - 75 - 81 058WC - 75 - 40 069Cloaks - 75 - 40 060Grouproom 75 - 81 061WC - 75 - 40 063WWC - 75 - 81 064WWC - 75 - 33 066NurseryToilets - 75 - 29 073Cloaks - 75 - 21 074RWC - 75 - 41 101Classroom07 75 - 414 102Classroom08 75 - 426 103Classroom10 75 - 291 106AWC - 75 - 291 106AWC - 75 - 12 <td>050ChairAppliancestore</td> <td>75</td> <td>-</td> <td>-</td> <td>0</td>	050ChairAppliancestore	75	-	-	0
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062Cloaks - 75 - 40 063AWC - 75 - 33 066NurseryToilets - 75 - 67 067Hygieneroom - 75 - 29 073Cloaks - 75 - 22 074RWC - 75 - 41 101Classroom07 75 - 414 102Classroom08 75 - 426 103Classroom09 75 - 427 104Classroom10 75 - 427 104Classroom10 75 - 427 104Classroom10 75 - 291 106AWC - 75 - 291 106AWC - 75 - 12 107Chrs 75 - 12 7 108Stairs - 75 - 57 109GirlsWC - 75 - 106	061WC	-	75	-	51
063AWC - 75 - 33 066NurseryToilets - 75 - 67 067Hygieneroom - 75 - 29 073Cloaks - 75 - 29 073Cloaks - 75 - 22 074RWC - 75 - 411 101Classroom07 75 - - 414 102Classroom08 75 - - 426 103Classroom09 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 12 107Chrs 75 - 12 107Chrs 107Chrs 75 - 7 106 111FoodTech 75 - 111 111 110BoysWC - 75 - 202	062Cloaks	-	75	-	40
066NurseryToilets - 75 - 67 067Hygieneroom - 75 - 29 073Cloaks - 75 - 22 074RWC - 75 - 41 101Classroom07 75 - - 414 102Classroom08 75 - - 426 103Classroom09 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 56 107Chrs 75 - 12 107 107kms 75 - - 77 108Stairs - 75 - 12 107Chrs - 75 - 111 110BoysWC - 75 - 12 111FoodTech 75 - - 289	063AWC	-	75	-	33
067Hygieneroom - 75 - 29 073Cloaks - 75 - 22 074RWC - 75 - 41 101Classroom07 75 - - 414 102Classroom08 75 - - 426 103Classroom09 75 - - 427 104Classroom10 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 291 106AWC - 75 - 12 107CInrs 75 - - 7 108Stairs - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - 202 115Library 114SENgrouproom 75 - 317 117Centralstock	066NurseryToilets	-	75	-	67
Or3Cloaks - 75 - 22 074RWC - 75 - 41 101Classroom07 75 - - 414 102Classroom08 75 - - 426 103Classroom09 75 - - 427 104Classroom10 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 56 107CInrs 75 - - 12 107CInrs 75 - - 7 108Stairs - 75 - 57 109GirlsWC - 75 - 116 111BodysWC - 75 - 289 114SENgrouproom 75 - 202 115Library 75 - 317 117Centralstock 75	067Hygieneroom	-	75	-	29
074RWC - 75 - 41 101Classroom07 75 - - 414 102Classroom08 75 - - 426 103Classroom09 75 - - 427 104Classroom10 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 56 107CInrs 75 - - 12 107CInrs 75 - - 7 108Stairs - 75 - 57 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - <td>073Cloaks</td> <td>-</td> <td>75</td> <td>-</td> <td>22</td>	073Cloaks	-	75	-	22
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102Classroom08 75 - - 426 103Classroom09 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 291 106AWC - 75 - 56 107Clnrs 75 - - 12 107Clnrs 75 - - 7 108Stairs - 75 - 7 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 202 114SENgrouproom 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - - 6 Riser 1 75 - - 6 11	101Classroom07	75	-	-	414
103Classroom09 75 - - 427 104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 56 107CInrs 75 - - 12 107CInrs 75 - - 7 108Stairs - 75 - 7 109GirlsWC - 75 - 57 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 202 114SENgrouproom 75 - - 202 115Library 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75	102Classroom08	75	-	-	426
104Classroom10 75 - - 399 105 Circulation 2 - 75 - 291 106AWC - 75 - 56 107CInrs 75 - - 12 107CInrs 75 - - 7 108Stairs 75 - - 7 109GirlsWC - 75 - 57 109GordsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	103Classroom09	75	-	-	427
105 Circulation 2 - 75 - 291 106AWC - 75 - 56 107CInrs 75 - - 12 107CInrs 75 - - 7 108Stairs - 75 - - 7 109GirlsWC - 75 - 57 109GordsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	104Classroom10	75	-	-	399
106AWC - 75 - 56 107Clnrs 75 - - 12 107Clnrs 75 - - 7 108Stairs - 75 - - 7 109GirlsWC - 75 - 57 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	105 Circulation 2	-	75	-	291
107Clnrs 75 - - 12 107Clnrs 75 - - 7 108Stairs - 75 - 57 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 9	106AWC	-	75	-	56
107Clnrs 75 - 7 108Stairs - 75 - 57 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 6 Riser 1 75 - - 6 Riser 2 75 - - 9	107Clnrs	75	-	-	12
108Stairs - 75 - 57 109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	107CInrs	75	-	-	7
109GirlsWC - 75 - 111 110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 9	108Stairs	-	75	-	57
110BoysWC - 75 - 106 111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	109GirlsWC	-	75	-	111
111FoodTech 75 - - 373 113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	110BoysWC	-	75	-	106
113Flexiblemeetingtrainingspace 75 - - 289 114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	111FoodTech	75	-	-	373
114SENgrouproom 75 - - 202 115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	113Flexiblemeetingtrainingspace	75	-	-	289
115Library 75 - - 317 117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	114SENgrouproom	75	-	-	202
117Centralstock 75 - - 31 119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	115Library	75	-	-	317
119AWC - 75 - 46 Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	117Centralstock	75	-	-	31
Riser 1 75 - - 6 Riser 2 75 - - 11 Riser 3 75 - - 9	119AWC	-	75	-	46
Riser 2 75 - - 11 Riser 3 75 - - 9	Riser 1	75	-	-	6
Riser 3 75 9	Riser 2	75	-	-	11
	Riser 3	75	-	-	9

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
Riser 4	75	-	-	12
Riser 5	75	-	-	11
Riser 6	75	-	-	10
St 1	75	-	-	6
St 2	75	-	-	6
St 3	75	-	-	6
St 4	75	-	-	6
St 5	75	-	-	6
St 6	75	-	-	6
St 7	75	-	-	6
St 8	75	-	-	6
Store 1	75	-	-	14
Store 2	75	-	-	11
Store 3	75	-	-	11
071RWC	-	75	-	41
072Cloaks	-	75	-	22
013PPAroom	75	-	-	25
009 SWC	-	75	-	37
010AWC	-	75	-	47
011Repro	75	-	-	125
012Instrumentstore	75	-	-	14
047Plantroom	75	-	-	220
048Caretakersoffice	75	-	-	207
008Practiceroom	75	-	-	97
065NurseryKitchen	-	75	-	123
005Corridor	-	75	-	129
016MIRoom	75	-	-	289
017HeadTeacher	75	-	-	281
018Visitingprofesnlsoffice	75	-	-	229
019TherapySpecialist	75	-	-	229
020MobilityEquipmentBay	75	-	-	192
035Hygieneroom	-	75	-	75
037Kitchenette	-	75	-	203
038VisitorsSWC	-	75	-	52
033Sensoryroom	75	-	-	278
034SoftPlay	75	-	-	197
068NurseryClassroom	75	-	-	297
068NurseryClassroom Dimming	75	-	-	94
068NurseryClassroom	75	-	-	290
068NurseryClassroom Dimming	75	-	-	90
070ReceptionClassroom02	75	-	-	289
070ReceptionClassroom02 Dimming	75	-	-	90
007Musicroom	75	-	-	213

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
007Musicroom Dimming	75	-	-	69
052Classroom06	75	-	-	278
052Classroom06 Dimming	75	-	-	73
053Classroom05	75	-	-	277
053Classroom05 Dimming	75	-	-	72
054Classroom04	75	-	-	277
054Classroom04 Dimming	75	-	-	72
055Classroom03 Dimming	75	-	-	157
055Classroom03	75	-	-	207
027 Classroom 02 Dimming	75	-	-	130
027 Classroom 02	75	-	-	341
032 Classroom 02	75	-	-	318
032 Classroom 02 Dimming	75	-	-	169
026 Classroom 01 Dimming	75	-	-	169
026 Classroom 01	75	-	-	318
044SmallHall Dimming	-	75	-	460
044SmallHall	-	75	-	288
045MainHall Dimming	-	75	_	798
045MainHall	-	75	_	461
031a Small Group Room	75	-	_	111
031a Small Group Room Dimming	75	-	_	71
031b Small Group Room	75	-	_	111
031b Small Group Room Dimming	75	-	-	71
025a Small Group Room	75	-	_	111
025a Small Group Room Dimming	75	-	_	71
025b Small Group Room Dimming	75	-	_	71
025b Small Group Room	75	-	_	111
002Meeting Room	75	-	_	56
002Meeting Room Dimming	75	-	_	68
	-	75	_	14
001Entrance Dimming	-	75	_	17
021 Corridor Dimming	-	75	_	23
021 Corridor	-	75	_	203
021 Corridor Dimming	-	75	_	17
116Cloaks Dimming	_	75	_	29
116Cloaks		75	_	32
112Cloaks Dimming		75	_	20
	-	75	-	29
112Cloaks	-	75	-	32
	-	10	-	22
	-	15	-	00
	-	15	-	31
	-	/5	-	28
051 Breakout Space 1 Dimming	-	75	-	16

General lighting and display lighting	Luminous efficacy [Im/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
051 Breakout Space 1	-	75	-	229
040Corridor	-	75	-	128
040Corridor Dimming	-	75	-	12
064Stairs Dimming	-	75	-	16
064Stairs	-	75	-	73
105 Circulation 1	-	75	-	45
105 Circulation 1 Dimming	-	75	-	22
003SeniorManagers	75	-	-	77
003SeniorManagers Dimming	75	-	-	68
004HeadTeacher	75	-	-	98
004 Head Teacher Dimming	75	-	-	86
014Staffroom Dimming	75	-	-	108
014Staffroom	75	-	-	276
015GeneralOffice	75	-	-	122
015GeneralOffice Dimming	75	-	-	106
046Kitchen Dimming	-	75	-	207
046Kitchen	-	75	-	543

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?
057Grouproom	N/A	N/A
060Grouproom	NO (-99.2%)	NO
101Classroom07	NO (-41.1%)	NO
102Classroom08	NO (-53%)	NO
103Classroom09	NO (-51.2%)	NO
104Classroom10	NO (-27.8%)	NO
111FoodTech	YES (+4.6%)	NO
113Flexiblemeetingtrainingspace	NO (-48.1%)	NO
114SENgrouproom	NO (-46.2%)	NO
115Library	NO (-43.7%)	NO
011Repro	N/A	N/A
048Caretakersoffice	N/A	N/A
008Practiceroom	N/A	N/A
016MIRoom	N/A	N/A
017HeadTeacher	N/A	N/A
018Visitingprofesnlsoffice	N/A	N/A
019TherapySpecialist	N/A	N/A
020MobilityEquipmentBay	NO (-88.4%)	NO
033Sensoryroom	NO (-98.8%)	NO
034SoftPlay	NO (-99.6%)	NO
068NurseryClassroom	NO (-100%)	NO
068NurseryClassroom Dimming	NO (-70%)	NO
068NurseryClassroom	NO (-100%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
068NurseryClassroom Dimming	NO (-73%)	NO
070ReceptionClassroom02	N/A	N/A
070ReceptionClassroom02 Dimming	NO (-72.9%)	NO
007Musicroom	NO (-98.3%)	NO
007Musicroom Dimming	NO (-43.9%)	NO
052Classroom06	NO (-99.6%)	NO
052Classroom06 Dimming	NO (-63%)	NO
053Classroom05	NO (-98.7%)	NO
053Classroom05 Dimming	NO (-61.8%)	NO
054Classroom04	NO (-99.6%)	NO
054Classroom04 Dimming	NO (-62.1%)	NO
055Classroom03 Dimming	NO (-65.2%)	NO
055Classroom03	NO (-85.5%)	NO
027 Classroom 02 Dimming	NO (-68.6%)	NO
027 Classroom 02	NO (-99.6%)	NO
032 Classroom 02	NO (-91%)	NO
032 Classroom 02 Dimming	NO (-51.2%)	NO
026 Classroom 01 Dimming	NO (-65.5%)	NO
026 Classroom 01	NO (-97.6%)	NO
044SmallHall Dimming	NO (-55.9%)	NO
044SmallHall	NO (-98.3%)	NO
045MainHall Dimming	NO (-68%)	NO
045MainHall	NO (-97.7%)	NO
031a Small Group Room	N/A	N/A
031a Small Group Room Dimming	NO (-60.2%)	NO
031b Small Group Room	N/A	N/A
031b Small Group Room Dimming	NO (-61.9%)	NO
025a Small Group Room	N/A	N/A
025a Small Group Room Dimming	NO (-60.3%)	NO
025b Small Group Room Dimming	NO (-61.9%)	NO
025b Small Group Room	N/A	N/A
002Meeting Room	NO (-5.5%)	NO
002Meeting Room Dimming	NO (-4.1%)	NO
003SeniorManagers	NO (-45.2%)	NO
003SeniorManagers Dimming	NO (-1.2%)	NO
004HeadTeacher	NO (-37.5%)	NO
004 Head Teacher Dimming	NO (-1.1%)	NO
014Staffroom Dimming	NO (-14.7%)	NO
014Staffroom	NO (-75.6%)	NO
015GeneralOffice	NO (-69.3%)	NO
015GeneralOffice Dimming	NO (-28.3%)	NO

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

Separate submission

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

Separate submission

EPBD (Recast): Consideration of alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	2705.6	2705.6
External area [m ²]	6488.4	6488.4
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	1607.78	0
Average U-value [W/m ² K]	0.25	0
Alpha value* [%]	10.1	10

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

Building Use

100

% Area Building Type

A1/A2 Retail/Financial and Professional services
A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
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
D1 Non-residential Inst.: Education
D1 Non-residential Inst.: Primary Health Care Building
D1 Non-residential Inst.: Crown and County Courts
D2 General Assembly and Leisure, Night Clubs and Theatres
Others: Passenger terminals
Others: Emergency services
Others: Miscellaneous 24hr activities
Others: Car Parks 24 hrs
Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	25.69	27.51
Cooling	0	0
Auxiliary	2.74	1.86
Lighting	11.55	14.45
Hot water	59.12	29.83
Equipment*	19.13	19.13
TOTAL**	82.82	73.65

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	16.28	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	58.51	85.64
Primary energy* [kWh/m ²]	97.36	118.76
Total emissions [kg/m ²]	17.3	20.6

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

HVAC Systems Performance										
System 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 heating using water: floor heating, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	68.3	0	12.5	0	1.6	0.84	0	0.94	0
	Notional	89.4	0	28.7	0	0.8	0.88	0		
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	20	0	3	0	16.6	0.84	0	0.94	0
	Notional	41.7	0	13.4	0	17.8	0.86	0		
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	54.3	0	7.8	0	5.8	0.84	0	0.94	0
	Notional	215.6	0	69.5	0	5	0.86	0		
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	8.2	0	1.5	0	6.7	0.84	0	0.94	0
	Notional	41.3	0	13.3	0	6.3	0.86	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	0.2	0000005:Surf[0]		
Floor	0.2	0.14	0000006:Surf[0]		
Roof		0.12	0000005:Surf[1]		
Windows, roof windows, and rooflights	1.5	0.9	1000000:Surf[2]		
Personnel doors		2.2	0500000B:Surf[2]		
Vehicle access & similar large doors		-	No Vehicle access doors in building		
High usage entrance doors		-	No High usage entrance doors in building		
U _{i-Typ} = Typical individual element U-values [W/(m ² K)]			U _{i-Min} = 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	3.24		