

## Project name

**Niahkam Hounslow 2013 Green- 820m2  
PV**

As designed

Date: Wed Jul 01 10:22:22 2015

## Administrative information

## Building Details

Address: Address 1, London, Postcode

## Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

## 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

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO<sub>2</sub> emission rate for the building should not exceed the target

1.1	CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	15.5
1.2	Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	15.5
1.3	Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	10
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	U <sub>a</sub> -Limit	U <sub>a</sub> -Calc	U <sub>i</sub> -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.51	00000026:Surf[4]
Floor	0.25	0.17	0.63	0100000B:Surf[11]
Roof	0.25	0.18	0.18	00000035:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.85	1.91	00000044:Surf[1]
Personnel doors	2.2	-	-	No Personnel doors in building
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 <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]				
* 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
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	5

## 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.

<b>Whole building lighting automatic monitoring &amp; targeting with alarms for out-of-range values</b>	NO
<b>Whole building electric power factor achieved by power factor correction</b>	>0.95

### 1- LTHW + MVHR

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	0.98	-	0.2	1.7	0.7
<b>Standard value</b>	0.91	N/A	N/A	1.5	0.5
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES

### 2- LTHW + Nat Vent

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	0.98	-	0.2	0	-
<b>Standard value</b>	0.91*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES
* 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- Air System KITCHEN/ DINING

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	0.98	-	0.2	1.5	-
<b>Standard value</b>	0.91	N/A	N/A	1.5	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES

### 4- DX System

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	4	3.2	-	0	0.7
<b>Standard value</b>	2.5*	3.2	N/A	N/A	0.5
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES
* 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.					

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
<b>Standard value</b>	60	60	22	
00 6TH FORM SEMINAR	94	-	-	103
00 6TH FORM SEMINAR	119	-	-	52
00 6TH FORM SEMINAR	111	-	-	52
00 ART	71	-	-	493
00 ART	71	-	-	489
00 ART CORRIDOR	-	97	-	443
00 ART STORE	39	-	-	35
00 CHAIR STORE	43	-	-	27
00 CHANGING	-	96	-	302

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
		60	60	22	
00 CHANGING		-	96	-	303
00 CLEANERS		-	258	-	12
00 CLEANERS		-	258	-	18
00 CLEANERS		-	258	-	7
00 CLEANERS		-	258	-	8
00 COAT		46	-	-	23
00 COAT		46	-	-	23
00 COAT		46	-	-	23
00 COAT		46	-	-	23
00 DIS WC		-	205	-	28
00 DIS WC		-	201	-	29
00 ENTRANCE		-	102	-	274
00 EXAM STORE		59	-	-	14
00 EXAM STORE		63	-	-	13
00 FAITH SPACE		59	-	-	3885
00 FOOD		70	-	-	620
00 FOOD STORE		56	-	-	29
00 GEN OFFICE		134	-	-	53
00 GEN OFFICE		126	-	-	58
00 GEN OFFICE		84	-	-	207
00 GEN STORE		38	-	-	49
00 GEN TEACHING CR		73	-	-	333
00 GEN TEACHING CR		73	-	-	334
00 GEN TEACHING CR		73	-	-	336
00 GEN TEACHING CR		73	-	-	330
00 HUMANITIES		73	-	-	332
00 HUMANITIES		73	-	-	337
00 HYGIENE		-	136	-	67
00 INFANT 01		73	-	-	352
00 INFANT 02		73	-	-	356
00 INFANT 03		73	-	-	354
00 INFANT 04		73	-	-	360
00 INFANT 05		73	-	-	361
00 INFANT 06		73	-	-	353
00 INFANT 07		73	-	-	357
00 INFANT 08		73	-	-	351
00 INFANT CORRIDOR		-	95	-	328
00 INFANT STORE		40	-	-	34
00 INTERVIEW		99	-	-	88
00 INTERVIEW		108	-	-	81
00 KILIN		56	-	-	17
00 KITCHEN		-	59	-	3359
00 LRC		63	-	-	1155

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
		60	60	22	
00 LRC CORRIDOR		-	96	-	269
00 LRC CORRIDOR		-	95	-	164
00 MAIN HALL		61	-	-	1992
00 MAINT		112	-	-	73
00 MEETING		71	-	-	269
00 OFFICE		124	-	-	58
00 OFFICE		97	-	-	109
00 PE STORE		34	-	-	106
00 PE STORE		33	-	-	126
00 PRIMARY DINING		-	105	-	1484
00 PRIMARY PRINCIPLE		90	-	-	160
00 PRINCIPLE		112	-	-	85
00 PRINCIPLE		88	-	-	158
00 RECEPTION CLOAKS		30	-	-	97
00 RECEPTION CR 01		72	-	-	374
00 RECEPTION CR 02		71	-	-	380
00 RECEPTION CR 03		71	-	-	388
00 RECEPTION CR 04		72	-	-	373
00 RECEPTION CR WC		-	120	-	92
00 RECEPTION CR WC		-	121	-	89
00 REPROGRAPHICS		107	-	-	58
00 REPROGRAPHICS		105	-	-	61
00 SCIENCE/ DT		70	-	-	652
00 SECONDARY DINING		-	105	-	1343
00 SEN CORRIDOR		-	96	-	372
00 SEN GROUP		92	-	-	98
00 SEN GROUP		92	-	-	98
00 SEN RESOURCE		82	-	-	142
00 SEN THERAPY		82	-	-	142
00 SERVERY		-	78	-	555
00 SICK BAY		-	130	-	73
00 SICK BAY		-	142	-	59
00 SLT		118	-	-	49
00 SLT		124	-	-	43
00 SLT		118	-	-	46
00 SPORTS		-	102	-	5548
00 SPORTS ADMIN		113	-	-	72
00 SPORTS CORRIDOR		-	91	-	430
00 STAFF CHANGING		-	174	-	43
00 STAFF CHANGING		-	166	-	46
00 STAIRS		-	83	-	176
00 STAIRS		-	97	-	82
00 STAIRS		-	81	-	210

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
00 STAIRS		-	89	-	115
00 STAIRS		-	94	-	94
00 STAIRS		-	93	-	104
00 STORE		-	145	-	26
00 STORE		-	146	-	25
00 SWITCH ROOM		40	-	-	34
00 VIS WC		-	205	-	27
00 WC		-	121	-	103
00 WC		-	136	-	70
00 WC		-	258	-	21
00 WC		-	122	-	101
00 WC		-	136	-	70
00 WC		-	104	-	179
00 WC		-	136	-	70
00 WC		-	110	-	149
00 WC		-	136	-	70
00 WC		-	258	-	22
00 WHEELCHAIR STORE		45	-	-	24
01 STAFF CORRIDOR		-	80	-	152
01 STAFF CORRIDOR		-	82	-	397
01 WC		-	210	-	26
01 WC		-	122	-	86
01 WC		-	124	-	83
01 AV		43	-	-	29
01 CLEANERS		-	258	-	16
01 CLEANERS		-	258	-	13
01 CLEANERS		-	256	-	20
01 CLEANERS		-	258	-	14
01 DIC WC		-	200	-	29
01 ENGLISH 01		73	-	-	340
01 ENGLISH 02		73	-	-	334
01 ENGLISH 03		73	-	-	339
01 ENGLISH 04		73	-	-	339
01 GEN OFFICE		102	-	-	96
01 GENERAL STORE		56	-	-	17
01 HUMANITIES		73	-	-	330
01 HUMANITIES		73	-	-	333
01 HUMANITIES CORRIDOR		-	80	-	318
01 IT		73	-	-	385
01 IT		75	-	-	274
01 IT CORRIDOR		-	93	-	495
01 IT OFFICE		100	-	-	102
01 JUNIOR 01		73	-	-	345

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
		60	60	22	
01 JUNIOR 01		73	-	-	342
01 JUNIOR 02		73	-	-	338
01 JUNIOR 02		73	-	-	341
01 JUNIOR 03		73	-	-	342
01 JUNIOR 03		73	-	-	334
01 JUNIOR 04		72	-	-	372
01 JUNIOR 04		73	-	-	347
01 JUNIOR 05		73	-	-	347
01 JUNIOR 05		73	-	-	343
01 JUNIOR 06		73	-	-	349
01 JUNIOR 06		73	-	-	342
01 JUNIOR 07		73	-	-	351
01 JUNIOR 07		73	-	-	341
01 JUNIOR 08		73	-	-	349
01 JUNIOR 08		73	-	-	342
01 JUNIOR CORRIDOR		-	108	-	121
01 JUNIOR CORRIDOR		-	98	-	349
01 JUNIOR CORRIDOR		-	95	-	232
01 JUNIOR SLT		102	-	-	69
01 JUNIOR SLT		99	-	-	71
01 JUNIOR SLT		100	-	-	70
01 JUNIOR STORE		81	-	-	10
01 JUNIOR STORE		57	-	-	17
01 JUNIOR WC		-	114	-	144
01 JUNIOR WC		-	105	-	179
01 JUNIOR WC		-	109	-	169
01 JUNIOR WC		-	108	-	161
01 MATHS 01		73	-	-	338
01 MATHS 02		73	-	-	337
01 MATHS 03		73	-	-	334
01 MATHS 04		73	-	-	337
01 MATHS CORRIDOR		-	94	-	348
01 MFL 01		73	-	-	342
01 MFL 02		73	-	-	334
01 MFL 03		73	-	-	336
01 MFL 04		73	-	-	334
01 MUSIC		72	-	-	417
01 MUSIC CORRIDOR		-	90	-	413
01 MUSIC PRAC		133	-	-	37
01 MUSIC PRAC		132	-	-	37
01 MUSIC PRAC		133	-	-	36
01 MUSIC PRAC		93	-	-	94
01 MUSIC PRAC		131	-	-	37

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	<b>Standard value</b>	60	60	22	
01 MUSIC PRAC		132	-	-	37
01 MUSIC PRAC		101	-	-	67
01 MUSIC PRAC		132	-	-	37
01 MUSIC STORE		40	-	-	35
01 REPROGRAPHICS		142	-	-	50
01 SEMINAR		78	-	-	208
01 SEN GROUP		72	-	-	258
01 SEN RESOURCE		81	-	-	151
01 SERVER HUB		52	-	-	66
01 SERVER ROOM		39	-	-	126
01 SLT		122	-	-	60
01 SLT		120	-	-	66
01 SLT		125	-	-	58
01 SLT		118	-	-	65
01 SLT		128	-	-	55
01 STAFF SOCIAL		62	-	-	626
01 STAFF WORKROOM		62	-	-	403
01 STAIRS		-	94	-	100
01 STAIRS		-	81	-	210
01 STAIRS		-	97	-	82
01 STAIRS		-	83	-	176
01 STAIRS		-	94	-	94
01 STAIRS		-	84	-	115
01 STORE		66	-	-	13
01 WC		-	113	-	132
01 WC		-	108	-	151
02 CHEMICAL STORE		49	-	-	19
02 DIS WC		-	162	-	46
02 IT		73	-	-	368
02 SCIENCE CORRIDOR		-	91	-	477
02 SCIENCE CORRIDOR		-	80	-	176
02 SCIENCE LAB 01		65	-	-	1575
02 SCIENCE LAB 02		65	-	-	1596
02 SCIENCE LAB 03		65	-	-	1667
02 SCIENCE LAB 04		65	-	-	1616
02 SCIENCE LAB 05		65	-	-	1669
02 SCIENCE LAB 06		65	-	-	1520
02 SCIENCE LAB 07		65	-	-	1704
02 SCIENCE PREP		74	-	-	323
02 SCIENCE STUDIO		72	-	-	429
02 SLT		115	-	-	52
02 SOCIAL SPACE		62	-	-	751
02 STAIRS		-	88	-	121

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
02 STAIRS		-	84	-	159
02 WC		-	119	-	94
02 WC		-	119	-	94

**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?
00 6TH FORM SEMINAR	N/A	N/A
00 6TH FORM SEMINAR	N/A	N/A
00 6TH FORM SEMINAR	N/A	N/A
00 ART	NO (-48.3%)	NO
00 ART	NO (-60%)	NO
00 FAITH SPACE	YES (+432.2%)	NO
00 FOOD	NO (-78%)	NO
00 GEN OFFICE	N/A	N/A
00 GEN OFFICE	N/A	N/A
00 GEN OFFICE	NO (-63%)	NO
00 GEN TEACHING CR	NO (-56.9%)	NO
00 GEN TEACHING CR	NO (-48.6%)	NO
00 GEN TEACHING CR	NO (-52.2%)	NO
00 GEN TEACHING CR	NO (-45.5%)	NO
00 HUMANITIES	NO (-61.2%)	NO
00 HUMANITIES	NO (-50.9%)	NO
00 INFANT 01	NO (-59.4%)	NO
00 INFANT 02	NO (-53.8%)	NO
00 INFANT 03	NO (-52.9%)	NO
00 INFANT 04	NO (-76.2%)	NO
00 INFANT 05	NO (-78%)	NO
00 INFANT 06	NO (-71.1%)	NO
00 INFANT 07	NO (-73.3%)	NO
00 INFANT 08	NO (-76%)	NO
00 INTERVIEW	N/A	N/A
00 INTERVIEW	N/A	N/A
00 LRC	N/A	N/A
00 MAIN HALL	YES (+44.9%)	NO
00 MAINT	N/A	N/A
00 MEETING	NO (-64.7%)	NO
00 OFFICE	N/A	N/A
00 OFFICE	NO (-52.2%)	NO
00 PRIMARY DINING	NO (-15.2%)	NO
00 PRIMARY PRINCIPLE	NO (-53.2%)	NO
00 PRINCIPLE	N/A	N/A
00 PRINCIPLE	NO (-73.9%)	NO
00 RECEPTION CR 01	NO (-46.4%)	NO



Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00 RECEPTION CR 02	NO (-47.8%)	NO
00 RECEPTION CR 03	NO (-73.8%)	NO
00 RECEPTION CR 04	NO (-39.9%)	NO
00 REPROGRAPHICS	NO (-56.4%)	NO
00 REPROGRAPHICS	N/A	N/A
00 SCIENCE/ DT	NO (-56.1%)	NO
00 SECONDARY DINING	NO (-4.2%)	NO
00 SEN GROUP	N/A	N/A
00 SEN GROUP	N/A	N/A
00 SEN RESOURCE	NO (-59.8%)	NO
00 SEN THERAPY	NO (-58.1%)	NO
00 SLT	N/A	N/A
00 SLT	N/A	N/A
00 SLT	N/A	N/A
00 SPORTS	NO (-12.1%)	NO
00 SPORTS ADMIN	N/A	N/A
01 ENGLISH 01	NO (-59.8%)	NO
01 ENGLISH 02	NO (-59.7%)	NO
01 ENGLISH 03	NO (-61.3%)	NO
01 ENGLISH 04	NO (-61.2%)	NO
01 GEN OFFICE	NO (-26.3%)	NO
01 HUMANITIES	NO (-36%)	NO
01 HUMANITIES	NO (-45.6%)	NO
01 IT	N/A	N/A
01 IT	NO (-67.1%)	NO
01 IT OFFICE	N/A	N/A
01 JUNIOR 01	NO (-46.8%)	NO
01 JUNIOR 01	NO (-53.9%)	NO
01 JUNIOR 02	NO (-44.6%)	NO
01 JUNIOR 02	NO (-51.4%)	NO
01 JUNIOR 03	NO (-51.4%)	NO
01 JUNIOR 03	NO (-43.8%)	NO
01 JUNIOR 04	NO (-73.7%)	NO
01 JUNIOR 04	NO (-75.9%)	NO
01 JUNIOR 05	NO (-76.2%)	NO
01 JUNIOR 05	NO (-57.6%)	NO
01 JUNIOR 06	NO (-58.1%)	NO
01 JUNIOR 06	NO (-68.5%)	NO
01 JUNIOR 07	NO (-58.9%)	NO
01 JUNIOR 07	NO (-69.5%)	NO
01 JUNIOR 08	NO (-60.5%)	NO
01 JUNIOR 08	NO (-72.8%)	NO
01 JUNIOR SLT	NO (-46%)	NO
01 JUNIOR SLT	NO (-39%)	NO
01 JUNIOR SLT	NO (-63%)	NO
01 MATHS 01	NO (-50.1%)	NO
01 MATHS 02	NO (-47.6%)	NO
01 MATHS 03	NO (-46.5%)	NO
01 MATHS 04	NO (-46.8%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
01 MFL 01	NO (-83.9%)	NO
01 MFL 02	NO (-73.8%)	NO
01 MFL 03	NO (-66%)	NO
01 MFL 04	NO (-67.3%)	NO
01 MUSIC	NO (-77.1%)	NO
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 MUSIC PRAC	N/A	N/A
01 REPROGRAPHICS	N/A	N/A
01 SEMINAR	NO (-54.9%)	NO
01 SEN GROUP	N/A	N/A
01 SEN RESOURCE	N/A	N/A
01 SERVER HUB	N/A	N/A
01 SERVER ROOM	N/A	N/A
01 SLT	N/A	N/A
01 SLT	N/A	N/A
01 SLT	N/A	N/A
01 SLT	N/A	N/A
01 SLT	N/A	N/A
01 STAFF SOCIAL	NO (-56%)	NO
01 STAFF WORKROOM	NO (-34.6%)	NO
02 IT	NO (-76.1%)	NO
02 SCIENCE LAB 01	NO (-50.2%)	NO
02 SCIENCE LAB 02	NO (-46.5%)	NO
02 SCIENCE LAB 03	NO (-74.5%)	NO
02 SCIENCE LAB 04	NO (-70.7%)	NO
02 SCIENCE LAB 05	NO (-68%)	NO
02 SCIENCE LAB 06	NO (-74.3%)	NO
02 SCIENCE LAB 07	NO (-53.6%)	NO
02 SCIENCE PREP	N/A	N/A
02 SCIENCE STUDIO	N/A	N/A
02 SLT	N/A	N/A
02 SOCIAL SPACE	NO (-59.9%)	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

<b>Were alternative energy systems considered and analysed as part of the design process?</b>	<b>NO</b>
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 [m <sup>2</sup> ]	9768.6	9768.6
External area [m <sup>2</sup> ]	15020.6	15020.6
Weather	LON	LON
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	3
Average conductance [W/K]	5634.93	5229.73
Average U-value [W/m <sup>2</sup> K]	0.38	0.35
Alpha value* [%]	9.66	10

\* 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  
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  
**100 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/m<sup>2</sup>]

	Actual	Notional
Heating	17.01	14.11
Cooling	0	0
Auxiliary	8.9	8.14
Lighting	9.21	12.05
Hot water	11.16	10.36
Equipment*	17.07	17.07
<b>TOTAL**</b>	<b>46.28</b>	<b>44.67</b>

\* 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/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	10.14	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

## Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	58.17	43.8
Primary energy* [kWh/m <sup>2</sup> ]	88.58	90.31
Total emissions [kg/m <sup>2</sup> ]	10	15.5

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

## HVAC Systems Performance

System Type	Heat dem MJ/m <sup>2</sup>	Cool dem MJ/m <sup>2</sup>	Heat con kWh/m <sup>2</sup>	Cool con kWh/m <sup>2</sup>	Aux con kWh/m <sup>2</sup>	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
<b>[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity</b>									
Actual	41.4	0	12.1	0	3.2	0.95	0	0.98	0
Notional	40.9	0	13.2	0	2.8	0.86	0	----	----
<b>[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity</b>									
Actual	0	0	0	0	0	3	4	4	4
Notional	0	0	0	0	0	2.56	3.79	----	----
<b>[ST] Central heating using air distribution, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity</b>									
Actual	65.4	0	19.1	0	11.1	0.95	0	0.98	0
Notional	45.9	0	14.8	0	10.2	0.86	0	----	----
<b>[ST] Central heating using air distribution, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity</b>									
Actual	39.2	0	11.5	0	9.8	0.95	0	0.98	0
Notional	5.7	0	1.8	0	11.7	0.86	0	----	----

### Key to terms

Heat dem [MJ/m <sup>2</sup> ]	= Heating energy demand
Cool dem [MJ/m <sup>2</sup> ]	= Cooling energy demand
Heat con [kWh/m <sup>2</sup> ]	= Heating energy consumption
Cool con [kWh/m <sup>2</sup> ]	= Cooling energy consumption
Aux con [kWh/m <sup>2</sup> ]	= 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 <sub>i-Typ</sub>	U <sub>i-Min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.12	00000002:Surf[27]
Floor	0.2	0.16	00000036:Surf[0]
Roof	0.15	0.18	00000035:Surf[1]
Windows, roof windows, and rooflights	1.5	1.58	00000035:Surf[18]
Personnel doors	1.5	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
U <sub>i-Typ</sub> = Typical individual element U-values [W/(m <sup>2</sup> K)]		U <sub>i-Min</sub> = Minimum individual element U-values [W/(m <sup>2</sup> K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	5