

## Project name

**No 18 Park Square East - Be  
Green Existing**

As designed

Date: Fri May 15 08:25:49 2020

## Administrative information

## Building Details

Address: 18 Park Square East, London,

## Owner Details

Name:

Telephone number:

Address: , ,

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.12

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.12

BRUKL compliance check version: v5.6.a.1

## Certifier details

Name: Cundall

Telephone number: +442074381600

Address: One Carter Lane, London, EC4V 5ER

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

The building does not comply with England Building Regulations Part L 2013

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	16.3
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	16.3
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	19.3
Are emissions from the building less than or equal to the target?	<b>BER &gt; TER</b>
Are as built details the same as used in the BER calculations?	Separate submission

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

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

## 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	<b>1.01</b>	1.7	BP000002:Surf[0]
Floor	0.25	<b>0.58</b>	0.58	BP000002:Surf[20]
Roof	0.25	<b>0.28</b>	0.28	BP000002:Surf[21]
Windows***, roof windows, and rooflights	2.2	<b>2.97</b>	2.97	BP000002:Surf[11]
Personnel doors	2.2	<b>3</b>	3	BP000002:Surf[18]
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	<b>20</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	YES
Whole building electric power factor achieved by power factor correction	>0.95

### 1- Be Green VRF FCUs - AHU (Reception, Atrium and Meeting Rms)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3	4.5	0	1.6	0.75
<b>Standard value</b>	2.5*	3.2	N/A	1.6^	0.65
<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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

### 2- Be Green VRF CAM-V system - AHU (Open Plan Offices)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3	4.5	0	0	0.75
<b>Standard value</b>	2.5*	3.2	N/A	N/A	0.65
<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"

### Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	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
E	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
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]										HR efficiency	
	A	B	C	D	E	F	G	H	I	Zone	Standard	
<b>ID of system type</b>												
<b>Standard value</b>	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
F1 - Atirum	-	-	-	-	-	-	-	0.3	-	-	N/A	
F2 - Atirum	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF - Atirum	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF - Atirum	-	-	-	-	-	-	-	0.3	-	-	N/A	
F1 - Toilets	-	-	-	1.6	-	-	-	-	-	-	N/A	
F1 - Staircase	-	-	-	1.6	-	-	-	-	-	-	N/A	
F1 - Staircase	-	-	-	1.6	-	-	-	-	-	-	N/A	
F1 - Atirum	-	-	-	-	-	-	-	0.3	-	-	N/A	
F2 - Atirum	-	-	-	-	-	-	-	0.3	-	-	N/A	

Zone name	SFP [W/(l/s)]									HR efficiency		
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
F2 - Toilets	-	-	-	1.6	-	-	-	-	-	-	-	N/A
F2 - Staircase	-	-	-	1.6	-	-	-	-	-	-	-	N/A
F1 - Open Plan Office	-	-	-	1.6	-	-	-	-	-	-	-	N/A
F1 - Open Plan Office Per	-	-	-	1.6	-	-	-	-	-	-	-	N/A
F2 - Open Plan Office	-	-	-	1.6	-	-	-	-	-	-	-	N/A
F2 - Open Plan Office Per	-	-	-	1.6	-	-	-	-	-	-	-	N/A
F1 - Circulation	-	-	-	1.6	-	-	-	-	-	-	-	N/A
GF - Open Plan Office Per	-	-	-	1.6	-	-	-	-	-	-	-	N/A
GF - Toilets	-	-	-	1.6	-	-	-	-	-	-	-	N/A
GF - Post Room	-	-	-	1.6	-	-	-	-	-	-	-	N/A
GF - Open Plan Office	-	-	-	1.6	-	-	-	-	-	-	-	N/A
GF - Open Plan Office	-	-	-	1.6	-	-	-	-	-	-	-	N/A
GF - Reception Per	-	-	-	-	-	-	-	0.3	-	-	-	N/A
F1 - Board Room Per	-	-	-	-	-	-	-	0.3	-	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
B - Plant Room Future Connection		80	-	-	197
F1 - Atirum		-	80	-	6
F2 - Atirum		-	80	-	6
B - Utility Room		80	-	-	55
GF - Atirum		-	80	-	197
GF - Atirum		-	80	-	42
F1 - Toilets		-	80	-	122
F1 - Staircase		-	80	-	56
F1 - Staircase		-	80	-	55
F1 - Atirum		-	80	-	144
F2 - Atirum		-	80	-	141
F2 - Toilets		-	80	-	120
F2 - Staircase		-	80	-	55
F1 - Open Plan Office		120	-	-	1198
F1 - Open Plan Office Per		120	-	-	1503
F2 - Open Plan Office		120	-	-	1197
F2 - Open Plan Office Per		120	-	-	1501
F1 - Bin Store		80	-	-	20
F1 - Circulation		-	80	-	31
GF - Open Plan Office Per		120	-	-	1324
GF - Cycle Store		80	-	-	38
GF - Toilets		-	80	-	160
GF - Post Room		120	-	-	58
GF - Open Plan Office		120	-	-	527
GF - Open Plan Office		120	-	-	497

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
GF - Reception Per		-	120	30	149
F1 - Board Room Per		120	-	-	301

### 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?
F1 - Atirum	N/A	N/A
F2 - Atirum	N/A	N/A
GF - Atirum	N/A	N/A
GF - Atirum	N/A	N/A
F1 - Toilets	NO (-87.7%)	NO
F1 - Staircase	NO (-56.7%)	NO
F1 - Staircase	NO (-76.2%)	NO
F1 - Atirum	N/A	N/A
F2 - Atirum	N/A	N/A
F2 - Toilets	NO (-84.6%)	NO
F2 - Staircase	NO (-59.2%)	NO
F1 - Open Plan Office	NO (-54.6%)	NO
F1 - Open Plan Office Per	NO (-47%)	NO
F2 - Open Plan Office	NO (-61.2%)	NO
F2 - Open Plan Office Per	NO (-52.5%)	NO
F1 - Circulation	N/A	N/A
GF - Open Plan Office Per	NO (-48.3%)	NO
GF - Toilets	N/A	N/A
GF - Post Room	N/A	N/A
GF - Open Plan Office	NO (-78%)	NO
GF - Open Plan Office	NO (-63.2%)	NO
GF - Reception Per	NO (-26.2%)	NO
F1 - Board Room Per	YES (+30.2%)	NO

### 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?	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 <sup>2</sup> ]	2180	2180
External area [m <sup>2</sup> ]	2077.4	2077.4
Weather	LON	LON
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	20	3
Average conductance [W/K]	2181.55	1148.22
Average U-value [W/m <sup>2</sup> K]	1.05	0.55
Alpha value* [%]	10.01	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
<b>100</b>	<b>B1 Offices and Workshop businesses</b>
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: 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	18.62	3.49
Cooling	2.15	6.15
Auxiliary	7.34	3.71
Lighting	9.28	18.02
Hot water	0.71	0.8
Equipment*	38.03	38.03
<b>TOTAL**</b>	<b>38.1</b>	<b>32.18</b>

\* Energy used by equipment does not count towards the total for consumption or 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	0	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> ]	227.35	116.08
Primary energy* [kWh/m <sup>2</sup> ]	171.9	109.17
Total emissions [kg/m <sup>2</sup> ]	19.3	16.3

\* 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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
<b>[ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity</b>									
<b>Actual</b>	205.4	23.4	19	1.8	13.5	3	3.58	3	4.5
<b>Notional</b>	14.2	70.7	1.5	5.2	11.2	2.56	3.79	----	----
<b>[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity</b>									
<b>Actual</b>	211.7	28.3	19.6	2.3	6.1	3	3.36	3	4.5
<b>Notional</b>	37.6	91.4	4.1	6.7	2.1	2.56	3.79	----	----
<b>[ST] No Heating or Cooling</b>									
<b>Actual</b>	0	0	0	0	0	0	0	0	0
<b>Notional</b>	0	0	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 Building Control Body is advised to give particular attention to items whose specifications 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	0.3	F100000E:Surf[6]
Floor	0.2	0.58	BP000002:Surf[20]
Roof	0.15	0.28	BP000002:Surf[21]
Windows, roof windows, and rooflights	1.5	2.97	BP000002:Surf[11]
Personnel doors	1.5	3	BP000002:Surf[18]
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	20