



# **HOLBORN LINKS PROJECT 1**

Energy Statement WBS-ZZ-XX-RP-M-00010 P04

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# Quality Assurance – Approval Status

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

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# **1. EXECUTIVE SUMMARY**

This report outlines the energy strategy for Holborn Links Project 1 located in the London Borough of Camden. The development looks to provide upgraded office spaces through internal alternation works, a small extension to Vernon House at the existing 5th floor, together with new plant equipment, cycle parking spaces and other associated works. At ground floor, the development looks to provide an improved office entrance experience from the street to the office demises of Vernon - Sicilian House & 21 Southampton Row, as well as reposition the existing retail units to current market requirements, while retaining the existing frontages.

The office and retail refurbishment areas have been assessed utilising the SBEM methodology utilising SAP10 emission factors. The pre-refurbishment "baseline" performance values are the GLA recommendations for the notional building.

Following the Energy Hierarchy, the CO<sub>2</sub> emissions of the refurbished building are reduced by ~31% in comparison to the baseline (i.e., pre-refurbishment performance values relate the GLA) emissions using SAP10 fuel factors.

The energy efficiency and generation initiatives proposed to deliver above performances are summarised below:

- Improved thermal efficiency through upgrades to the roof and external glazing.
- Provision of heat recovery on the air handling plant.
- Use of highly efficient LED lighting and light fittings throughout the building.
- Provision of efficient heat pumps for heating, and the majority of hot water and cooling systems.
- On site generation of green electricity via the use of efficient Photovoltaic (PV) panels.

The results of the analysis are contained within the following figures and tables:







### Table 1: Carbon dioxide emissions - office and retail pre- and post-refurbishment

	Carbon dioxide emissions				
	(tonnes [CO <sub>2</sub> ]/annum)				
Regulated Unregulated Total					
Baseline (pre-refurb)	167.4	70.9	238.3		
LEAN (postrefurb)	238.3	70.9	309.2		
CLEAN (post refurb)	238.3	70.9	309.2		
GREEN (post refurb)	114.9	70.9	185.8		

### Table 2: Carbon dioxide savings - office and retail pre- and post-refurbishment

		Carbon dioxide savings					
	(tonnes [CO	2]/annum)	(%)				
	Regulated	Total	Regulated	Total <i>(inc.</i> Unregulated)			
Lean savings	-70.9	-70.9	-42%	-30%			
Clean savings	0.0	0.0	0%	0%			
Green savings	123.4	123.4	74%	52%			
Total savings	52.5	52.5	31%	22%			



# 2. INTRODUCTION

This report outlines the energy strategy for Holborn Links Project 1 located in the London Borough of Camden.

The focus of the design approach has been to limit building energy consumption and CO<sub>2</sub> emissions through optimising the performance of the proposed building envelope, together with energy efficiency measures. This philosophy follows the Mayor of London's "Energy Hierarchy" which identifies building design and resultant energy use to be considered in the following order of priority:

1. Use less energy

"Be Lean"

2. Supply energy efficiently

"Be Clean"

3. Use renewable energy

"Be Green"

 Monitoring Energy Performance "Be Seen"







### 2.1 Description of Development

The development looks to provide upgraded office spaces through internal alternation works, a small extension to Vernon House at the existing 5th floor, together with new plant equipment, cycle parking spaces and other associated works. At ground floor, the development looks to provide an improved office entrance experience from the street to the office demises of Vernon - Sicilian House & 21 Southampton Row, as well as reposition the existing retail units to current market requirements, while retaining the existing frontages.

### 2.2 Area Schedule

The building comprises of the following:

- Basement plant space, locker rooms, WCs, showers, and cycle storage.
- Ground floor main entrance/reception, kitchen space, flexi workspace, management office and WCs
- First to sixth floor (21 SP) office accommodation with associated lift/stair cores and WCs
- First to fifth floor (V & S) office accommodation with associated lift/stair cores and WCs
- Retail areas are located in the Basement and on the ground floor.

# 2.3 Policy and Legislation

The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system and it provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities. Planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development. The following regulations and policies have been considered when developing the energy strategy for this scheme.

# 2.3.1 Building Regulations Approved Document L2B – Non-Dwellings

To meet the requirements of the Energy Performance of Buildings, the UK Government introduced Approved Document L2B which provide benchmark regarding refurbishment.

An updated version of Part L (2021) was released in December 2021 with a 12-month transition period coming into force in June 2022. The new regulations will apply to any proposals which have not submitted a planning application by this date and subsequently have not started building work before the end of the transition period in June 2023.

At the time of writing the Approved Software is not yet available for calculating carbon emission rates for buildings against Part L 2021.



# 2.3.2 The New London Plan (March 2021)

The Policies have been produced in a way that allows London to implement this ambitious London Plan as soon as possible. There is no requirement for the policies to be repeated at the local level. However, in some instances a local approach is required within the context of the overall policy. The new London Plan clearly sets out where this is the case.

- Policy SI2 Minimising greenhouse gas emissions
  - Major development should be net zero-carbon.
  - This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the energy hierarchy.
  - A minimum on-site reduction of at least 35% beyond Building Regulations is required for major development.
  - Non-residential development should achieve 15% through energy efficiency measures. Where it
    is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any
    shortfall should be provided, in agreement with the borough, either:
    - 1) through a cash in lieu contribution to the borough's carbon offset fund, or
    - 2) off-site provided that an alternative proposal is identified, and delivery is certain.
  - If the zero-carbon target cannot be met on site, then the annual remaining carbon emissions figure is multiplied by the assumed lifetime of the development's services (e.g., 30 years) to give the cumulative shortfall. The cumulative shortfall is multiplied by the CO2 offset price to determine the required cash-in-lieu contribution. It is expected to use the recommended carbon offset price of £95 per tonne of CO2. This equates to tonne of CO2 multiplied by £2,850.

As staged in the London Plan, refurbishment that requires planning permission will be subject to London Plan policy. It also states development involving major refurbishment should also aim to meet SI2 policy

- Policy SI 4 Managing heat risk
  - Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials, and the incorporation of green infrastructure.
  - Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
    - 1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
    - 2) minimise internal heat generation through energy efficient design
    - 3) manage the heat within the building through exposed internal thermal mass and high ceilings



- 4) provide passive ventilation
- 5) provide mechanical ventilation
- 6) provide active cooling systems.

# 2.3.3 GLA Energy Assessment Guide (April 2020)

The energy assessment must clearly identify the carbon footprint of the development after each stage of the energy hierarchy. Regulated emissions must be provided and, separately, those emissions associated with uses not covered by Building Regulations i.e., unregulated energy uses. The figures for the domestic elements of development should be presented separately from the non-domestic elements as domestic buildings have a different policy target to non-domestic.

If the carbon savings are not achieved on site, the annual remaining carbon emissions figure is multiplied by the assumed lifetime of the development's services (e.g., 30 years) to give the cumulative shortfall. The cumulative shortfall is multiplied by the carbon dioxide offset price to determine the required cash-inlieu contribution.

The Mayor's Housing Standard's Viability Assessment assumed a carbon offset price of £95 per tonne of carbon dioxide for a period of 30 years. Boroughs may use this price or set their own by undertaking a locally specific viability assessment. Where the borough applies a carbon dioxide offset price of £95 per tonne, it is not considered necessary to carry out a further viability assessment of the policy approach. The GLA will regularly review the recommended carbon offset price.

# 2.3.4 Camden Borough Council Local Plan

The Camden Local Plan 2017 includes 2 key policies that relate to energy performance

### Policy CC1 Climate change mitigation

The council requires developments to minimise the effects of climate change and encourages all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

Policy CC1 promotes zero carbon development and requires all developments to reduce carbon dioxide emissions through following the steps in the energy hierarchy it also requires all major developments to demonstrate how London Plan targets for carbon dioxide emissions have been met and encourages sensitive energy efficiency improvements to existing buildings. Policy CC1 also requires all major developments to assess the feasibility of connecting to an existing decentralised energy network, or where this is not possible establishing a new network.

### Policy CC2 Adapting to climate change

The Council will require development to be resilient to climate change. All development should adopt appropriate climate change adaptation measures such as:

- the protection of existing green spaces and promoting new appropriate green infrastructure;
- not increasing, and wherever possible reducing, surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems;



- incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
- measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.
- Any development involving 5 or more residential units or 500 sqm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.

#### Sustainable design and construction measures

The Council will promote and measure sustainable design and construction by:

- ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
- encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
- encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve "excellent" in BREEAM domestic refurbishment; and
- h. expecting non-domestic developments of 500 sqm of floorspace or above to achieve "excellent" in BREEAM assessments and encouraging zero carbon in new development from 2019.



# 3. REDUCING ENERGY DEMAND (BE LEAN)

In line with the London Plan and the Camden Local Plan energy efficiency measures are proposed to minimise the energy used by the proposed development and consequently reduce carbon emissions.

The Simplified Building Energy Model (SBEM) is the Government's recommended methodology for energy rating enabling calculation of the energy demand and the CO<sub>2</sub> emissions associated with non-domestic buildings. The performance of the proposed development was assessed by comparing the building emissions rate (BER) against the baseline emissions rate (TER). In addition, unregulated energy consumption is also calculated as explained under SBEM calculation methodology.

Noting that the GLA has decided that from January 2019 and until central Government updates Part L with the latest carbon emission factors, planning applicants are encouraged to use the SAP 10 emission factors for referable applications when estimating CO<sub>2</sub> emission performance against London Plan policies, therefore, the following fuel factors were used for calculations.

#### SAP10 Emission Factors:

- 0.210 kgCO<sub>2</sub>/kWh Gas mains fuel factor
- 0.233 kgCO<sub>2</sub>/kWh Grid electricity fuel factor



## 3.1 Baseline Pre-Refurbishment Performance Value

As required by GLA Guide, the baseline energy model utilises the following performance values.

Element	Unit	Specification	
External Wall	W/m²K	0.55 (GLA guide notional figure)	
Roof	W/m²K	0.18 (GLA guide notional figure)	
Floor	W/m²K	0.25 (GLA guide notional figure)	
Clozing	W/m²K	1.8 (GLA guide notional figure)	
Glazing	g-value	0.40 (GLA guide notional figure)	
Air permeability	(m³/h m² @ 50 Pa)	25 (the original construction date ~1910)	
Thermal Bridging	W/m²K	default	
Heating	%	84% gross efficiency gas boiler	
Hot Water	%	84% gross efficiency gas boiler	
Cooling	SEER	2.60 (GLA guide recommendation)	
Central ventilation SFP	W/I/s	2.20 (GLA guide recommendation)	
Terminal Unit SFP	W/I/s	0.50 (GLA guide recommendation)	
Heat Recovery	%	0.70 (GLA guide notional figure)	
Lighting	lm/Watt	51 (GLA guide recommendation)	

 Table 3:
 Fabric Thermal Performance – Existing Building (GLA recommendations)

In the next section the performance of the fabric and services at post refurbishment are discussed.



# 3.2 Fabric Performance

The development is receiving upgrades to the roof and partial upgrades to glazing. For energy modelling of existing elements u-values from SAP guidance have been used based on a pre-1929 building.

Element	Unit	Specification
External Wall	W/m²K	2.1 (as per original construction spec)
Roof	W/m²K	0.18
Floor	W/m²K	1.2 (as per original construction spec)
Potoinod Clazing	W/m²K	5.75 (as per original construction spec)
Retained Glazing	g-value	0.7 (as per original construction spec)
New Claring	W/m²K	1.8
New Glazing	g-value	0.4
Air permeability	(m <sup>3</sup> /h m <sup>2</sup> @ 50 Pa)	25 (the original construction date ~1910)
Thermal Bridging	W/m²K	default

Table 4: Fabric Thermal Performance - Post Refurbishment



# 3.3 Building Services

Below is the list of building services performance values assumed to represent the services strategy.

	Comfort		Ventilation W/l/s			
Area	Space heating via	Cooling via	AHU	MVHR	extract fan	supply fan
Office spaces	VRF/FCU	VRF/FCU	1.9 W/l/s HR 75%	-	-	0.3
Reception	VRF/FCU	VRF/FCU	1.9 W/l/s HR 75%	-	-	0.3
Flexi space	VRF/FCU	VRF/FCU	1.9 W/l/s HR 75%	-	-	0.3
Kitchen	VRF/FCU	VRF/FCU	1.9 W/l/s HR 75%	-	-	0.3
Retail Areas	VRF/FCU	VRF/FCU	1.9 W/l/s HR 75%	-	-	0.3
Lockers	Electric Heater	-	1.9 W/l/s HR 75%	-	-	-
Changing room	Electric Heater	-	1.9 W/l/s HR 75%	-	-	-
Shower	Electric Heater	-	1.9 W/l/s HR 75%	-	-	-
Circulation areas with external walls	Electric Heater	-	-	-	-	-
WC 1 <sup>st-</sup> 6 <sup>th</sup> floor	Electric Heater	-	-	-	0.5	-
Internal Circulation areas	-	-	-	-	-	-
WC Ground floor	-	-	-	-	0.5	-
WC Basement	-	-	1.9 W/l/s HR 75%	-	-	-
Plantroom	-	-	1.9 W/l/s HR 75%	-	-	-
Cycle Store	-	-	1.9 W/l/s HR 75%	-	-	-

## Table 5: Services Strategy



Table 6:	Heating a	and Cooling	Plant Efficiency

System	Heating Plant Efficiency (SCoP)	Cooling Plant Efficiency (SEER)	DHW Plant Efficiency
VRF/FCU	3.8	3.5	3.8
Panel Heaters	1	-	-

### Table 7: Hot Water Strategy

Area		System	Internal cylinder storage size (litre)	efficiency	Secondary Circulation
	Oh en sin s	VRF (80%)		3.8	
Basement	Rooms/WCs	Direct Electric (20%)	1000 L	1.0	30 m loop
All other areas	WCs	Electric PoU Heaters	-	1.0	-

Abbreviations:

ASHP: air source heat pump	AHU: air handling unit	VRF: Variable Refrigerant Flow
HR: heat recovery	sfp: specific fan power	FCU: Fan Coil Unit
POU: point of use electric	SCoP: seasonal coefficient of performance	
DHW: domestic not water	SEER: Seasonal Energy Efficiency Ratio	

\* Retail spaces are shell only. Services are assumed in line with the proposed services and efficiencies for the rest of the building.



# 3.4 Cooling Requirement

The design complies with London Plan Policy SI 4 Managing Heat Risk, as set out below:

### Figure 3: Policy SI 4 - Cooling Hierarchy

#### Policy SI 4 Managing heat risk

- A Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
- B Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
  - reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
  - 2) minimise internal heat generation through energy efficient design
  - manage the heat within the building through exposed internal thermal mass and high ceilings
  - 4) provide passive ventilation
  - 5) provide mechanical ventilation
  - 6) provide active cooling systems.

## 3.4.1 Minimise Internal Heat Generation by Energy Efficient Design

Heat emissions from lighting have been minimised through utilisation of energy efficient LED lighting. The internal gains are also minimised through the choice of energy efficient equipment and services systems in combination with good insulation in the distribution pipework system.

### 3.4.2 Reduce the Amount of Heat Entering a Building in Summer

The amount of heat entering the building will be reduced by:

- Upgrading glazing with improved g-values to reduce solar gain. This will be achieved by introducing secondary glazing to the building frontage on floors 1-6 and replacement glazing to the rear of the ground floor areas.
- The building roof will also be replaced with a more thermally efficient construction (u=0.18).



# 3.4.3 Managing Heat within the Building by Exposed Internal Thermal Mass and High Ceilings

Exposed thermal mass acts as a heat sink levelling the peaks and troughs of the internal temperature during the day. In the energy model of this study, a conservative low thermal mass was used for the simulation.

### 3.4.4 Passive Ventilation and Mechanical Ventilation

To improve the energy efficiency, mechanical ventilation heat recovery is provided to meet industry standards and expectations.

### 3.4.5 Active Cooling Systems

To provide thermal comfort for building users active cooling systems are proposed for the development. The results of the energy simulation demonstrate that the measures detailed in this energy strategy offer reduced energy consumption for cooling over the notional building (see Table 9).

### Table 8: Cooling Demand

-			
Design	Area weighted average non- domestic cooling demand (MJ/m2)	Total area weighted non- domestic cooling demand (MJ/year)	
Actual	48	395083.2	
Notional	69.1	568755.2	



# 3.5 Lighting

Energy efficient LED lighting has become an essential feature of building design in recent years. Changes to standards such as Part L Building Regulations, have pushed the standards for efficiency in lighting installations and promoted the use of lighting controls systems. The following lamp / Luminaire efficacies are proposed.

Table 9:	Lighting	Efficacy

Area	Efficacy (luminaire Lumens/circuit Watt)	Occupancy sensing	Daylight Control
Office	120	auto on/off	dimm
Reception	100	manual on/off	dimm
Cycle storage	100	auto on/off	-
Changing room	100	auto on/off	-
Shower	100	auto on/off	-
WC	100	auto on/off	-
Lift lobby / Corridor / Stair	100	auto on/off	-
Plantroom	110	manual on/off	-
Display Lighting	80	manual on/off	-
Retail Areas	90	Auto on/off	-

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Lighting systems have provision for metering?	✓
Lighting systems metering warns of 'out-of-range' values?	✓



# 4. DELIVERING ENERGY EFFICIENTLY (BE CLEAN)

# 4.1 Potential District Heating (Cooling) Network Connection

We have researched the area surrounding the Site to establish the availability of heating networks and CHP sites from which the Site could benefit. The closest existing district heating route is ~1200m from the development. The space heating is currently based on ASHP strategy and there will be no allowance for future connectivity to future district heating network when route is expanded to the Site.

As stated within the latest GLA Energy Assessment Guide publication in October 2018, grid electricity has significantly decarbonised since the last update of Part L in April 2014 and in July 2018 the Government published updated carbon emission factors (SAP 10) demonstrating this. Knowing that the GLA has decided that from January 2019 and until Government updates Part L with the latest carbon emission factors, planning applicants are encouraged to use the SAP 10 emission factors for referable applications when estimating CO<sub>2</sub> emission performance against London Plan policies. Based on above, the use of district heating has not been considered for the development.



#### Figure 4: Proximity to Available DH Network - London Heat Map



# 4.2 Combined Heat and Power (CHP)

The economic justification for Combined Heat and Power (CHP) is largely dependent on the size of the development and the heat demand.

As stated within the latest GLA Energy Assessment Guide publication in October 2018, grid electricity has significantly decarbonised since the last update of Part L in April 2014 and in July 2018 the Government published updated carbon emission factors (SAP 10) demonstrating this. The impact of these new emission factors is significant in that technologies generating on-site electricity, such as gas-engine CHP, will not achieve the carbon savings they have provided in the past.

Knowing that the GLA has decided that from January 2019 and until Government updates Part L with the latest carbon emission factors, planning applicants are encouraged to use the SAP 10 emission factors for referable applications when estimating  $CO_2$  emission performance against London Plan policies. Based on above, the use of CHP has not been considered for this development.



# 5. RENEWABLE ENERGY (BE GREEN)

The following sections evaluate feasibility of renewable energy technologies which can be considered in the Be Green step of the energy hierarchy.

## 5.1 Wind Power

Wind power is conversion of wind energy into more useful forms. Common contemporary wind power is generated in the form of electricity by converting the rotation of turbine blades into electrical current by means of an electrical generator. Wind energy is renewable, widely distributed, clean, and reduces toxic atmospheric and greenhouse gas emissions if used to replace fossil-fuel-derived electricity. Horizontal or vertical axis wind turbines could be used to assist in the power requirements for a building. Not as a single solution, but part of renewable energy strategy, a turbine could be integrated into a building profile.

#### Figure 5: Wind Turbine



It is essential that turbines should be sited away from obstructions, with a clear exposure or fetch for the prevailing wind. However, the noise generated by wind turbines (typically 60 to 65 dBA) is not favourable for sites which include terraced areas and outside amenity spaces. Aside from this issue, the fact that the development is in a dense urban location, it is not ideal for wind turbines as there is a lot of interference with wind flows causing turbulence which decreases the efficiency of wind turbines and yields insufficient wind velocities to make them viable.

Following review, the negative impact that wind turbines would have on this building and surrounding building occupants, this option is found to not be feasible for the development.



# 5.2 Ground Source Cooling

A closed loop ground source cooling system circulates a fluid, usually water, through the buried loop field pipes. In a closed loop system, there is no direct interaction between the fluid and the earth; only heat transfer across the pipe. Horizontal closed loops require a high site footprint to net internal ratio which is not available at the development and for this reason vertical loops would be required.

The cooling available from the vertical loops required is a function of the ground formation thermal conductivity, deep earth temperature, and depends on the balance between the amount of heat rejected to and absorbed from the ground during the year. As a guide, the surrounding soil temperature is the average annual temperature for the region. For London, this is approximately 14°C.

A vertical closed loop field is composed of pipes that run vertically in the ground. A hole is bored in the ground, typically, 50 to 150m deep. Pipe pairs are installed in the hole and are joined with a U-shaped cross connector at the bottom of the hole. The borehole is commonly filled with a bentonite grout surrounding the pipe to provide a good thermal connection to the surrounding soil or rock. Vertical loop fields are typically used when there is a limited square footage of land available. Bore holes are spaced 5–6 m apart and are generally 15m deep per kW<sub>th</sub> of capacity. Typically, high capital costs are associated with vertical ground source cooling systems due to the complications associated with the drilling of deep boreholes.



### Figure 6: Ground Source Cooling



Based on the site location, existing floors and absence of sufficient external areas it is anticipated this technology would face practical and technical difficulties in respect to drilling bore holes or laying trenchbased pipe loops. The possible presence of existing sewage and telecom networks, water and gas pipes in dense urban areas also presents additional challenges. Therefore, this technology is not recommended for the development.

# 5.3 Air Source Heat Pump

Air Source Heat Pumps (ASHP) work exactly like Ground Source Heat Pumps (GSHP). The system absorbs heat from the outside air, which can be used to generate heat for space heating via radiators, underfloor heating systems, or warm air convectors, and domestic hot water. The heat pump extracts heat from the outside air in the same way that a fridge extracts heat from within the occupied space. It can extract heat from outside air even when the temperature is as low as -15°C.

The advantage of ASHP over GSHP is that the unit and installation require less space and are less complicated to install and operate. Using efficient heat pump systems substantially reduces running costs and carbon emissions. This can be up to as much as 75%. These systems are also suitable for installation in new and existing buildings. Other advantages of an air source heat pump are listed below:

- There no fuel deliveries needed
- It can provide both space heating and domestic hot water
- It requires minimal maintenance
- It can be on installed at both ground level and the roof level.



#### Figure 7: Air Source Heat Pump



### 5.4 Biomass

An efficient biomass heating strategy requires both efficient biomass boilers and a large central plant room containing the biomass boilers with gas back up boilers.

One of the issues with biomass boilers is the supply of the fuel. Currently, within the UK there is abundance in the supply of wood chip batches which can be used for fuel within Biomass, however, this type of fuel leads to greater inefficiencies compared to other types of biomass fuel such as wood pellets that are currently limited in supply, although suppliers within the UK are increasing. Wood pellets are more controllable in terms of their moisture content and heat calorific value whereas the heat calorific value of the wood chips batches may vary as the moisture content varies within natural resources and subsequently it can cause issues for the heat demand, maintenance and servicing of boilers. In addition to this issue, the management of fuel deliveries, traffic routes, and highway design is problematic for developments in urban locations.

Biomass has factors that mitigate against the use of boilers. These include transport carbon emissions, boiler and fuel storage space, boiler maintenance, fuel delivery frequency in urban or suburban areas, fuel source availability and reliability and high NOx emission compared to natural gas. In respect to these matters and more importantly inadequacy of available on-site space for the biomass fuel storage, this technology is not assessed any further.



### Figure 8: Biomass Boilers

Moreover, biomass installations are not acceptable in central London because biomass fired boilers will generate high levels of particulate matter (PM10) and NOx emissions which are both detrimental to air quality. Therefore, this technology is not recommended for the developments.



# 5.5 Photovoltaics

Solar energy is the energy force that sustains life on the earth for all plants, animals, and people. The earth receives this radiant energy from the sun in the form of electromagnetic waves, which the sun continually emits into space. The earth is essentially a huge solar energy collector receiving large quantities of this energy which manifests itself in various forms, such as direct sunlight used through photosynthesis by plants, heated air masses causing wind, and evaporation of the oceans resulting as rain which can form rivers.

Figure 9: Solar Panels



As the proposed development includes an area of suitable roof space, PV is deemed a viable option for inclusion.

An initial feasibility study was undertaken to identify the roof areas suitable for the installation of PV for both buildings at this stage it is anticipated that approximately 80m<sup>2</sup> of PV panels can be accommodated which equates to ~16kWp and are predicted to generate at least ~10,400kWh of electricity per annum.



# 6. MONITOR, VERIFY, REPORT ON PERFORMANCE (BE SEEN)

As stated in the London Plan "to truly achieve net zero-carbon buildings, we need to have a better understanding of their actual operational energy performance and work towards bridging the 'performance gap' between design theory and actual energy use".

Draft London Plan Policy SI 2 sets out the 'be seen' requirement for all major development proposals to monitor and report on their actual operational energy performance.

The 'be seen' policy will hopefully enable the developers / local authorities to understand the performance gap and identify road maps for an efficient transition for compliance with London's net zero-carbon target. Guidance has been published to explain how to comply with this policy as well as a reporting spreadsheet which planning applicants will be expected to use.

Referring to the London Plan the applicant is required to provide accurate and verified estimates of each of the planning stage performance indicators through the planning stage using the 'be seen' excel spreadsheet platform.

The "Be Seen" excel file has been produced and submitted alongside this report.



# 7. CONCLUSIONS

The development has been assessed using approved software to demonstrate the potential energy usage and CO<sub>2</sub> emissions.

The strategic design approach follows energy hierarchy as required by the Camden Local and London Plans, outlined below:

1) Use less energy

"Be Lean"

2) Supply energy efficiently

"Be Clean"

3) Use renewable energy

"Be Green"

4) Monitoring Energy Performance

"Be Seen"

Following the Energy Hierarchy, the predicted  $CO_2$  emissions for the building are reduced by ~31% in comparison to pre-refurbishment baseline emissions using SAP10 fuel factors.

As stated in the London Plan, refurbishments that require planning permission will be subject to London Plan policy. Developments involving major refurbishment should also aim to meet Policy SI 2, minimising greenhouse gas emissions and achieving zero carbon target.

The following carbon reduction measures are proposed.

- Improved thermal efficiency through upgrades to the roof and external glazing.
- Provision of heat recovery on the air handling plant.
- Use of highly efficient LED lighting and light fittings throughout the building.
- Provision of efficient heat pumps for heating, and the majority of hot water and cooling systems.
- On site generation of green electricity via the use of efficient Photovoltaic (PV) panels.



# **APPENDICES**

Appendices HOLBORN LINKS PROJECT 1 Project Number: BSD14049 Holborn Links\7 Energy Overheating\9 Reports\1 Pre Planning\Energy Statement\P03



A. SBEM: GLA NOTIONAL (BASELINE)

# **BRUKL Output Document**

Compliance with England Building Regulations Part L 2013

### **Project name**

# **GLA NOTIONAL**

Date: Thu Jul 07 16:18:32 2022

## Administrative information

### **Building Details**

Address: Holborn Links - Project 01, ,

### **Certification tool**

Calculation engine: Apache Calculation engine version: 7.0.14 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.14 BRUKL compliance check version: v5.6.b.0

### Certifier details Name: Telephone number: Phone Address: Street Address, City, Postcode

### 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	24.9
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	24.9
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	34.5
Are emissions from the building less than or equal to the target?	BER > TER
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	<b>U</b> a-Limit	Ua-Calc	<b>U</b> i-Calc	Surface where the maximum value occurs*
Wall**	0.35	0.55	0.55	SP00000D:Surf[4]
Floor	0.25	0.25	0.25	SP00000D:Surf[6]
Roof	0.25	0.18	0.18	SP00000D:Surf[7]
Windows***, roof windows, and rooflights	2.2	1.89	5.56	GF00000A:Surf[21]
Personnel doors	2.2	2.2	2.2	SP00000D:Surf[8]
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
Ua-Limit = Limiting area-weighted average U-values [W	//(m²K)]			

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

 $U_{i\text{-}Calc} = Calculated maximum individual element U-values [W/(m^2K)]$ 

\* 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	>0.95	

#### **1- ELEC PANEL HEATERS ONLY**

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.84	-	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 efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

#### 2- VRF HEATING/COOLING (FCUs) & AHU(HR) (fan coil)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency				
This system	0.84	2.5	0	2.2	0.7				
Standard value	0.91*	3.2	N/A	1.6^	0.5				
Automotic menitoria e 4 constitue with classes for out of reasons up to for this UNAC customs NO									

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.

^ 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.

### 3- ELEC PANEL HEATERS & AHU

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency				
This system	0.84	-	0	-	0.7				
Standard value	dard value 0.91* 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 efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

#### 1- DHW DIRECT ELEC

	Water heating efficiency	Storage loss factor [kWh/litre per day]					
This building	0.84	0.005					
Standard value 0.9* N/A							
* Standard shown is for as boilars $>30 $ kW output. For boilars $<=30 $ kW output, limiting afficiency 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
A	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	HR efficiency		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard	
GF00 - Retail Unit 04	-	-	-	-	-	-	-	0.5	-	-	N/A	

Zone name											
ID of system type	Α	В	С	D	E	F	G	Н	I	HR efficiency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
GF00 - Retail Unit 05	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Retail Unit 06	-	-	-	-	-	-	-	0.5	-	-	N/A
F01 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Office Space 01	-	-	-	-	-	-	-	0.5	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Office Space 01	-	-	-	-	-	-	-	0.5	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - Office Space 01	-	-	-	-	-	-	-	0.5	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
F05 - Office Space 01	-	-	-	-	-	-	-	0.5	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Retail Unit 02	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Retail Unit 03	-	-	-	-	-	-	-	0.5	-	-	N/A
F01 - Office Space 01	-	-	-	-	-	-	-	0.5	-	-	N/A
F06 - Office Space 01	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Retail Unit 03	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Flex space	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Estate Management Office	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Kitchen	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Flex space	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Reception/Lobby	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Retail Unit 02	-	-	-	-	-	-	-	0.5	-	-	N/A
GF00 - Retail Unit 01	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Locker Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A

Zone name											
ID of system type		В	С	D	Е	F	G	Н	I	нке	fficiency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
BF-01 - Acc. WC/Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	2.2	-	-	-	-	-	-	N/A
BF-01 - Fitness and Wellbeing	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.5	-	-	N/A
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.5	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - Office Space 03	-	-	-	-	-	-	-	0.5	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - Office Space 02	_	-	_	-	-	-	_	0.5	-	-	N/A
F01 - WC	-	-	0.5	-	_	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	_	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	_	-	-	-	-	-	N/A
F02 - Office Space 02	_	-	-	-	_	-	_	0.5	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Office Space	_	-	_	-	-	-	_	0.5	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Office Space	_	-	-	-	-	-	-	0.5	-	_	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	_	N/A
F03 - WC	_	_	0.5	-	_	_	_	-	_	_	N/A
F04 - WC	_	_	0.5		_		_	-			N/A
F04 - WC			0.5					-			N/A
F04 - Office Space			0.0					0.5		_	
	_		0.5	-	-	-	_	0.0	-		
F04 - WC	_		0.5	-	-	-	_		-		
	-	-	0.0	-	-	-	-	-	-	-	
FU4 - Office Space	-	-	-	-	-	-	-	0.5	-	-	IN/A
Zone name	SFP [W/(I/s)]			ficionav							
---------------------	---------------	-----	-----	----------	-----	-----	-----	-----	---	------	----------
ID of system type	Α	В	С	D	Е	F	G	Н	I	пке	mciency
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.5	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
BF-01 - Locker Room	-	-	-	2.2	-	-	-	-	-	-	N/A
GF00 - Flex Space	-	-	-	-	-	-	-	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	
GF00 - Circulation/Lift Lobby	-	51	-	154
GF00 - Retail Unit 04	-	51	51	2447
GF00 - Retail Unit 05	-	51	51	3186
GF00 - Retail Unit 06	-	51	51	2095
F01 - Acc. WC	-	51	-	58
F01 - Cupboard	51	-	-	3
F01 - Cupboard	51	-	-	3
F01 - Cupboard	51	-	-	4
F01 - Cupboard	51	-	-	4
F01 - Lift Lobby	-	51	-	55
F01 - Lift Lobby 02	-	51	-	82
F01 - Plant	51	-	-	43
F01 - Stairwell	-	51	-	61
F01 - WC	-	51	-	42
F01 - WC	-	51	-	42
F01 - Lift Lobby 03	-	51	-	80
F02 - Acc. WC	-	51	-	58
F02 - Cupboard	51	-	-	3
F02 - Cupboard	51	-	-	3
F02 - Cupboard	51	-	-	4
F02 - Cupboard	51	-	-	4
F02 - Lift Lobby	-	51	-	55
F02 - Lift Lobby 02	-	51	-	81
F02 - Office Space 01	51	-	-	4237
F02 - Plant	51	-	-	43
F02 - Stairwell	-	51	-	61
F02 - WC	-	51	-	42
F02 - WC	-	51	-	42
F02 - Lift Lobby 03	-	51	-	79

Zone name         Luminaire         Lamp         Display lamp         General lighting [W]           F03 - Acc. WC         -         51         -         58           F03 - Cupboard         51         -         -         3           F03 - Cupboard         51         -         -         3           F03 - Cupboard         51         -         -         4           F03 - Cupboard         51         -         -         4           F03 - Cupboard         51         -         4         -           F03 - Cupboard         51         -         4         -           F03 - Cupboard         51         -         4         -           F03 - Dirit Cubby F03         -         51         -         4231           F03 - Stairwell         -         51         -         42           F03 - MC         -         51<	General lighting and display lighting	Lumino	ous effic	]	
Standard value         60         60         22           F03 - Cupboard         51         -         58           F03 - Cupboard         51         -         3           F03 - Cupboard         51         -         4           F03 - Cupboard         51         -         42311           F03 - Stainwell         -         51         -         43           F03 - Stainwell         -         51         -         42           F03 - WC         -         51         -         42           F03 - WC         -         51         -         3           F04 - Cupboard         51         -         4         4           F04 - Cupboard         51         -         4         4           F04 - Cupboard         51         -         4         4           F04 - Cupboard         51 <th>Zone name</th> <th>Luminaire</th> <th>Lamp</th> <th>Display lamp</th> <th>General lighting [W]</th>	Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
F03 - Acc. WC       -       51       -       58         F03 - Cupboard       51       -       3         F03 - Cupboard       51       -       4         F03 - Lift Lobby       -       51       -         F03 - Stainwell       -       51       -       42         F03 - Stainwell       -       51       -       58         F04 - Cupboard       51       -       1       58         F04 - Cupboard       51       -       4       -         F04 - Cupboard	Standard value	60	60	22	
F03 - Cupboard       51       -       3         F03 - Cupboard       51       -       4         F03 - Cupboard       51       -       4         F03 - Cupboard       51       -       4         F03 - Lift Lobby F03       -       51       -       81         F03 - Lift Lobby F03       -       51       -       42         F03 - Lift Lobby F03       -       51       -       43         F03 - Staiwell       -       51       -       43         F03 - Staiwell       -       51       -       42         F03 - WC       -       51       -       42         F04 - Cupboard       51       -       58       59         F04 - Cupboard       51       -       4       51       -       4         F04 - Cupboard       51       -       51       -       4       51       -       4         F04 - Cupboard       51       -       51       -<	F03 - Acc. WC	-	51	-	58
F03 - Cupboard       51       -       3         F03 - Cupboard       51       -       4         F03 - Litt Lobby       -       51       -       4         F03 - Litt Lobby       -       51       -       81         F03 - Cupboard       51       -       81       -       43         F03 - Plant       51       -       43       -       61         F03 - Stairwell       -       51       -       42       -         F03 - Stairwell       -       51       -       42       -       -       -       42       -       -       -       -       42       -	F03 - Cupboard	51	-	-	3
F03 - Cupboard       51       -       4         F03 - Lift Lobby       -       51       -       4         F03 - Lift Lobby       -       51       -       81         F03 - Lift Lobby       -       51       -       81         F03 - Stairwell       -       51       -       4231         F03 - Stairwell       -       51       -       43         F03 - Stairwell       -       51       -       42         F03 - WC       -       51       -       42         F04 - Cupboard       51       -       58       -         F04 - Cupboard       51       -       4       -         F04 - Cupboard       51       -       4       -         F04 - Cupboard       51       -       43       -         F04 - Lift Lobby F04       -<	F03 - Cupboard	51	-	-	3
F03 - Cupboard       51       -       4         F03 - Lift Lobby F03       -       51       -       55         F03 - Lift Lobby F03       -       51       -       81         F03 - Uift Lobby F03       51       -       43         F03 - Wife Space 01       51       -       43         F03 - WC       -       51       -       42         F04 - Cupboard       51       -       3       56         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       4237       55         F04 - Lift Lobby F04       -       51       -       4237         F04 - Lift Lobby F04       -       51       -       4237         F04 - Stainwell       -       51       -       4237         F04 - WC       -	F03 - Cupboard	51	-	-	4
F03 - Lift Lobby F03       -       61       -       81         F03 - Office Space 01       51       -       4231         F03 - Plant       51       -       43         F03 - NC       -       51       -       43         F03 - NC       -       51       -       42         F03 - WC       -       51       -       42         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       4       -         F04 - Lift Lobby F04       -       51       -       81         F04 - Uffice Space 01       51       -       43       -         F04 - Uffice Space 01       51       -       4237       -         F04 - WC       -       51       -       42       -         F04 - WC       <	F03 - Cupboard	51	-	-	4
F03 - Lift Lobby F03       -       51       -       81         F03 - Office Space 01       51       -       -       4231         F03 - Stainwell       51       -       61       61         F03 - Stainwell       -       51       -       42         F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - Lift Lobby 03       -       51       -       42         F03 - Lift Lobby 03       -       51       -       42         F04 - Acc, WC       -       51       -       3         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       4       4         F04 - Cupboard       51       -       4       4         F04 - Lift Lobby F04       -       51       -       43         F04 - Plant       51       -       43       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42	F03 - Lift Lobby	-	51	-	55
F03 - Office Space 01       51       -       4231         F03 - Plant       51       -       43         F03 - Stainwell       -       51       -       61         F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - Lift Lobby 03       -       51       -       79         F04 - Cupboard       51       -       58       58         F04 - Cupboard       51       -       3       55         F04 - Cupboard       51       -       4       4         F04 - Lift Lobby F04       -       51       -       4237         F04 - Stainwell       -       51       -       43         F04 - Stainwell       -       51       -       43         F04 - WC       -       51       -       42         F04 - WC       -	F03 - Lift Lobby F03	-	51	-	81
F03 - Plant       51       -       43         F03 - Stainvell       -       51       -       61         F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - Lift Lobby 03       -       51       -       79         F04 - Acc. WC       -       51       -       73         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       4       -         F04 - Uift Lobby F04       -       51       -       4237         F04 - Vifte Space 01       51       -       -       43         F04 - Stainvell       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       3         F05 - Cupboard	F03 - Office Space 01	51	-	-	4231
F03 - Stainwell       -       51       -       61         F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - Lift Lobby 03       -       51       -       79         F04 - Acc, WC       -       51       -       58         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Upboard       51       -       -       4         F04 - Cupboard       51       -       4       -         F04 - Uft Lobby F04       -       51       -       42377         F04 - Plant       51       -       -       43         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       3         F05 - Cupboard	F03 - Plant	51	-	-	43
F03 - WC       -       51       -       42         F03 - WC       -       51       -       42         F03 - WC       -       51       -       79         F04 - Cupboard       51       -       58       58         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Lift Lobby       F04       -       51       -       41         F04 - Lift Lobby F04       -       51       -       4237         F04 - Lift Lobby F04       -       51       -       4237         F04 - WC       -       51       -       43         F04 - Stairwell       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       3         F05 - Cupboard       51       -       -       3	F03 - Stairwell	-	51	-	61
F03 - WC       -       51       -       42         F03 - Lift Lobby 03       -       51       -       79         F04 - Acc. WC       -       51       -       58         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Lift Lobby       -       51       -       81         F04 - Diftice Space 01       51       -       -       433         F04 - Stairwell       -       51       -       433         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       79         F05 - Acc. WC       -       51       -       79         F05 - Cupboard       51       -       -       3         F05 - C	F03 - WC	-	51	-	42
F03 - Lift Lobby 03       -       51       -       79         F04 - Acc. WC       -       51       -       58         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Lift Lobby       -       51       -       4         F04 - Lift Lobby F04       -       51       -       4237         F04 - Plant       51       -       -       433         F04 - Stairwell       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       79         F05 - Cupboard       51       -       58       56         F05 - Cupboard       51       -       3       55         F05 - Cupboard       51       -       4         F05 - Cupboard<	F03 - WC	-	51	-	42
F04 - Acc. WC       -       51       -       58         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Lift Lobby       -       51       -       81         F04 - Lift Lobby F04       -       51       -       433         F04 - Office Space 01       51       -       -       433         F04 - Stairwell       -       51       -       61         F04 - WC       -       51       -       61         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       79         F05 - Cupboard       51       -       79       56         F05 - Cupboard       51       -       3       55         F05 - Cupboard       51       -       4       55         F05 - Cupboard       51       -       4       55         F0	F03 - Lift Lobby 03	-	51	-	79
F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Lift Lobby       -       51       -       -       4         F04 - Lift Lobby F04       -       51       -       4237         F04 - Office Space 01       61       -       -       43         F04 - Stairwell       -       51       -       43         F04 - WC       -       51       -       42         F04 - WC       -       51       -       3         F05 - Cupboard       51       -       58       55         F05 - Cupboard       51       -       4         F05 - Uit Loby F05 <td>F04 - Acc. WC</td> <td>-</td> <td>51</td> <td>-</td> <td>58</td>	F04 - Acc. WC	-	51	-	58
F04 - Cupboard       51       -       -       3         F04 - Cupboard       51       -       -       4         F04 - Cupboard       51       -       -       4         F04 - Lift Lobby       -       51       -       -       4         F04 - Lift Lobby F04       -       51       -       55       55         F04 - Lift Lobby F04       -       51       -       81       51       -       4237         F04 - Plant       51       -       -       43       61       -       43         F04 - Stairwell       -       51       -       42       -       42         F04 - WC       -       51       -       42       -       42         F04 - WC       -       51       -       42       -       -       42         F04 - WC       -       51       -       58       -       79       -       58       -       79       -       58       -       58       -       58       -       51       -       3       -       55       -       55       -       55       -       55       -       51       - <td< td=""><td>F04 - Cupboard</td><td>51</td><td>-</td><td>-</td><td>3</td></td<>	F04 - Cupboard	51	-	-	3
F04 - Cupboard       51       -       4         F04 - Cupboard       51       -       4         F04 - Cupboard       51       -       55         F04 - Lift Lobby       -       51       -       55         F04 - Lift Lobby F04       -       51       -       81         F04 - Office Space 01       51       -       4237       -       43         F04 - Stairwell       -       51       -       43       -       42         F04 - Stairwell       -       51       -       42       -       -       42         F04 - WC       -       51       -       42       -       -       42       -       -       42         F04 - WC       -       51       -       42       -       -       42       -       -       42       -       -       51       -       42       -       -       51       -       55       -       55       -       55       -       55       -       55       -       55       -       55       -       55       -       55       -       55       -       55       -       55       -       5	F04 - Cupboard	51	-	-	3
F04 - Cupboard       51       -       4         F04 - Lift Lobby       -       51       -       55         F04 - Lift Lobby F04       -       51       -       81         F04 - Office Space 01       51       -       4237       4237         F04 - Plant       51       -       43       4237         F04 - Stairwell       -       51       -       43         F04 - Stairwell       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - Uift Lobby 03       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Cupboard       51       -       79       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       51       -       43	F04 - Cupboard	51	-	-	4
F04 - Lift Lobby       -       51       -       55         F04 - Lift Lobby F04       -       51       -       81         F04 - Office Space 01       51       -       -       4237         F04 - Plant       51       -       -       43         F04 - Stairwell       -       51       -       61         F04 - WC       -       51       -       61         F04 - WC       -       51       -       42         F04 - WC       -       51       -       58         F05 - Lift Lobby 03       -       51       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       4         F05 - Lift Lobby F05       -       51       -       43         F05 - NC	F04 - Cupboard	51	-	-	4
F04 - Lift Lobby F04       -       51       -       81         F04 - Office Space 01       51       -       -       4237         F04 - Plant       51       -       -       43         F04 - Stainwell       -       51       -       61         F04 - Stainwell       -       51       -       61         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - Uft Lobby 03       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Cupboard       51       -       58       58         F05 - Cupboard       51       -       3       70         F05 - Cupboard       51       -       4       4         F05 - Cupboard       51       -       4       4         F05 - Lift Lobby       -       51       -       4         F05 - Lift Lobby F05       -       51       -       43         F05 - NC       -       51       -       42 <t< td=""><td>F04 - Lift Lobby</td><td>-</td><td>51</td><td>-</td><td>55</td></t<>	F04 - Lift Lobby	-	51	-	55
F04 - Office Space 01       51       -       -       4237         F04 - Plant       51       -       -       43         F04 - Stainwell       -       51       -       61         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - Lift Lobby 03       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Acc. WC       -       51       -       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       4       -         F05 - Lift Lobby F05       -       51       -       43	F04 - Lift Lobby F04	-	51	-	81
F04 - Plant       51       -       43         F04 - Stairwell       -       51       -       61         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - Lift Lobby 03       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Acc. WC       -       51       -       79         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       4       -         F05 - Lift Lobby       -       51       -       81         F05 - Plant       51       -       43       -         F05 - WC       -       51       -       42         F05 - WC       -	F04 - Office Space 01	51	-	-	4237
F04 - Stainwell       -       51       -       61         F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - Lift Lobby 03       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Acc. WC       -       51       -       79         F05 - Cupboard       51       -       3       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       4         F05 - Lift Lobby F05       -       51       -       43         F05 - Plant       51       -       51       -       42         F05 - WC       -       51       -       42       -         F05 - Lift Lobby 03       -       51       - <t< td=""><td>F04 - Plant</td><td>51</td><td>-</td><td>-</td><td>43</td></t<>	F04 - Plant	51	-	-	43
F04 - WC       -       51       -       42         F04 - WC       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Acc. WC       -       51       -       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       81         F05 - Lift Lobby F05       -       51       -       43         F05 - Stairwell       -       51       -       42         F05 - WC       -       51       -       47         F06 -	F04 - Stairwell	-	51	-	61
F04 - WC       -       51       -       42         F04 - Lift Lobby 03       -       51       -       79         F05 - Acc. WC       -       51       -       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       81         F05 - Plant       51       -       43       -       43         F05 - WC       -       51       -       42       -         F05 - WC       -       51       -       42       -         F05 - Lift Lobby 03       -       51       -       70       -         F06 - Plant       51       - <t< td=""><td>F04 - WC</td><td>-</td><td>51</td><td>-</td><td>42</td></t<>	F04 - WC	-	51	-	42
F04 - Lift Lobby 03       -       51       -       79         F05 - Acc. WC       -       51       -       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       81         F05 - Plant       51       -       81       -         F05 - Stairwell       -       51       -       42         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       47         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       70         F06 - WC       -       51       -       44         F06	F04 - WC	-	51	-	42
F05 - Acc. WC       -       51       -       58         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       81         F05 - Lift Lobby F05       -       51       -       81         F05 - Plant       51       -       43       -         F05 - Stairwell       -       51       -       42         F05 - WC       -       51       -       42         F05 - WC       -       51       -       47         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       47         F06 - WC       -       51       -       42         F06 - WC	F04 - Lift Lobby 03	-	51	-	79
F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       55         F05 - Lift Lobby F05       -       51       -       81         F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       47         F06 - Plant       51       -       47       70         F06 - Stairwell       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC <td>F05 - Acc. WC</td> <td>-</td> <td>51</td> <td>-</td> <td>58</td>	F05 - Acc. WC	-	51	-	58
F05 - Cupboard       51       -       -       3         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       55         F05 - Lift Lobby F05       -       51       -       81         F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       47         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC	F05 - Cupboard	51	-	-	3
F05 - Cupboard       51       -       -       4         F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       -       4         F05 - Lift Lobby       -       51       -       55       55         F05 - Lift Lobby F05       -       51       -       81       51         F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       79         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - Cupboard	51	-	-	3
F05 - Cupboard       51       -       -       4         F05 - Lift Lobby       -       51       -       55         F05 - Lift Lobby F05       -       51       -       81         F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       42         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - Uff Lobby 03       -       51       -       42         F06 - Plant       51       -       -       47         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - Cupboard	51	-	-	4
F05 - Lift Lobby       -       51       -       55         F05 - Lift Lobby F05       -       51       -       81         F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       61         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       47         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - Cupboard	51	-	-	4
F05 - Lift Lobby F05       -       51       -       81         F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       47         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       44	F05 - Lift Lobby	-	51	-	55
F05 - Plant       51       -       -       43         F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       79         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       70         F06 - WC       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - Lift Lobby F05	-	51	-	81
F05 - Stairwell       -       51       -       61         F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       79         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       70         F06 - WC       -       51       -       42         F06 - Office Space       51       -       30	F05 - Plant	51	-	-	43
F05 - WC       -       51       -       42         F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       79         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       70         F06 - WC       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - Stairwell	-	51	-	61
F05 - WC       -       51       -       42         F05 - Lift Lobby 03       -       51       -       79         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       70         F06 - WC       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - WC	-	51	-	42
F05 - Lift Lobby 03       -       51       -       79         F06 - Plant       51       -       -       47         F06 - Stairwell       -       51       -       70         F06 - WC       -       51       -       42         F06 - WC       -       51       -       44         F06 - Office Space       51       -       30	F05 - WC	-	51	-	42
F06 - Plant     51     -     -     47       F06 - Stairwell     -     51     -     70       F06 - WC     -     51     -     42       F06 - WC     -     51     -     44       F06 - Office Space     51     -     30	F05 - Lift Lobby 03	-	51	-	79
F06 - Stairwell     -     51     -     70       F06 - WC     -     51     -     42       F06 - WC     -     51     -     44       F06 - Office Space     51     -     30	F06 - Plant	51	-	-	47
F06 - WC     -     51     -     42       F06 - WC     -     51     -     44       F06 - Office Space     51     -     30	F06 - Stairwell	-	51	-	70
F06 - WC         -         51         -         44           F06 - Office Space         51         -         30	F06 - WC	-	51	-	42
F06 - Office Space 51 30	F06 - WC	-	51	-	44
	F06 - Office Space	51	-	-	30

General lighting and display lighting	Lumino	ous effic	]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
F05 - Office Space 01	51	-	-	4084
BF-01 - Plant Room	51	-	-	53
BF-01 - Acc. WC	-	51	-	81
BF-01 - Lift Lobby	-	51	-	76
BF-01 - Cupboard	51	-	-	13
F05 - Office Space	51	-	-	455
BF-01 - Store	51	-	-	18
BF-01 - Store	51	-	-	20
BF-01 - Retail Unit 02	-	51	51	2817
BF-01 - Plant Room	51	-	-	106
BF-01 - Lift Lobby	-	51	-	64
BF-01 - New Water Tank Room	51	-	-	204
BF-01 - Retail Unit 03	-	51	51	3384
BF-01 - Circulation	-	51	-	70
F01 - Office Space 01	51	-	-	3922
F06 - Lift Lobby	-	51	-	46
F06 - Office Space 01	51	-	-	2967
GE00 - Circulation	-	51	-	145
GF00 - Retail Unit 03	_	51	51	585
GE00 - Elex space	51	-	-	566
GE00 - Estate Management Office	51	-	_	399
GF00 - Acc. WC	-	51	_	74
GF00 - WC	_	51		44
GE00 - WC	_	51	_	58
GE00 - Stairwell	_	51	-	36
GE00 - Circulation	_	51	_	43
GE00 - Stairwell	_	51	_	57
GF00 - Kitchen	_	51	_	396
GE00 - Elev space	51	-		871
GEO0 - Reception/Lobby	-	51	51	513
GF00 - Retail Unit 02	_	51	51	571
GF00 - Retail Unit 02	_	51	51	569
BE-01 - Stainvell		51	-	503
BE-01 - Cleaners Cupboard	51	-	_	16
BE-01 - Circulation	51	-		140
PE 01 - Evicting Detail	-	51	-	691
DF-01 - Existing Retail	-	51	51	679
DF-01 - Existing Retail	-	51	51	070
BF-01 - Existing Retail	-	51	51	650
BF-UI - Plant	51	-	-	451
BF-01 - Shower Room	-	51	-	30
BF-01 - Circulation	-	51	-	69
BF-01 - Locker Room	-	51	-	100
BF-01 - WC	-	51	-	57

Zone nameLuminerLuminerBipslay LampGeneral lighting [W]Standard value606022BF-01 - Shower Room-51-25BF-01 - Shower Room-51-27BF-01 - Shower Room-51-22BF-01 - Shower Room-51-24BF-01 - Shower Room-51-24BF-01 - Shower Room-51-22BF-01 - Shower Room-51-28BF-01 - Shower Room-51-28BF-01 - Shower Room-51-36BF-01 - Shower Room-51-36BF-01 - Shower Room51-36-BF-01 - Shower Room51-36-BF-01 - Shower Room5136BF-01 - Shower Room5136BF-01 - Shower Room5136BF-01 - Shower Room-51-36BF-01 - Shower Room-51-36BF-01 - Shower Room-5	General lighting and display lighting	Lumino	ous effic	]	
Standard value         60         62         22           BF-01 - Shower Room         -         51         -         25           BF-01 - Shower Room         -         51         -         27           BF-01 - Shower Room         -         51         -         27           BF-01 - Shower Room         -         51         -         22           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         51         -         36         -           BF-01 - Shower Room         51         -         36         -           BF-01 - Shower Room <td< th=""><th>Zone name</th><th>Luminaire</th><th>Lamp</th><th>Display lamp</th><th>General lighting [W]</th></td<>	Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
BF-01 - Shower Room         -         51         -         25           BF-01 - Acc. WC/Shower Room         -         51         -         37           BF-01 - Shower Room         -         51         -         27           BF-01 - Shower Room         -         51         -         25           BF-01 - Shower Room         -         51         -         29           BF-01 - Shower Room         -         51         -         22           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         45           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         28           BF-01 - Dath         -         51         -         31           BF-01 - Plant Room         51         -         206           BF-01 - Retail Mont 04	Standard value	60	60	22	
BF-01 - Acc. WC/Shower Room         -         51         -         27           BF-01 - Shower Room         -         51         -         25           BF-01 - Shower Room         -         51         -         22           BF-01 - Shower Room         -         51         -         28           BF-01 - Stairwell         -         51         -         28           BF-01 - Plant         89         -         -         36           BF-01 - Plant Room         51         -         206         22           BF-01 - Store         51         -         280         22           BF-01 - Plant Room         51         -         280         22           BF-01 - Retail Unit 04         -         51         51         31           BF-01 - Ret	BF-01 - Shower Room	-	51	-	25
BF-01 - Shower Room       -       51       -       27         BF-01 - Shower Room       -       51       -       25         BF-01 - Shower Room       -       51       -       29         BF-01 - Shower Room       -       51       -       29         BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       24         BF-01 - Shower Room       -       51       -       28         BF-01 - Shower Room       -       51       -       36         BF-01 - Shower Room       51       -       36       51         BF-01 - Plant       89       -       -       36         BF-01 - Store       51       -       206       51         BF-01 - Plant Room       51       -       170       52         BF-01 - Store       51	BF-01 - Acc. WC/Shower Room	-	51	-	37
BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       28         BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       24         BF-01 - Shower Room       -       51       -       24         BF-01 - Shower Room       -       51       -       62         BF-01 - Shower Room       51       -       -       36         BF-01 - Shower Room       51       -       206       51         BF-01 - Plant Room       51       -       210       280         BF-01 - Plant Room       51       -       51       51       310         BF-01 - Retail Unit 04       -       51       51       310       51       51 </td <td>BF-01 - Shower Room</td> <td>-</td> <td>51</td> <td>-</td> <td>27</td>	BF-01 - Shower Room	-	51	-	27
BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       29         BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       22         BF-01 - Shower Room       -       51       -       24         BF-01 - Shower Room       -       51       -       28         BF-01 - Shower Room       -       51       -       45         BF-01 - Shower Room       51       -       36       36         BF-01 - Plant       89       -       -       31       36         BF-01 - Shower Room       51       -       206       31       31         BF-01 - Shower Room       51       -       10       31       31         BF-01 - Shower Room       -       51       51       31       31         BF-01 - Shower Room       -       51       51	BF-01 - Shower Room	-	51	-	25
BF-01 - Shower Room         -         51         -         29           BF-01 - Shower Room         -         51         -         26           BF-01 - Shower Room         -         51         -         24           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         45           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         45           BF-01 - Shower Room         51         -         45         51           BF-01 - Lift Loby         -         51         -         45           BF-01 - Plant Room         51         -         206         51           BF-01 - Store         51         -         170         51           BF-01 - Store         51         -         170         51           BF-01 - Retail Wellbeing         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC	BF-01 - Shower Room	-	51	-	22
BF-01 - Shower Room         -         51         -         26           BF-01 - Shower Room         -         51         -         22           BF-01 - Shower Room         -         51         -         24           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         62           BF-01 - Shower Room         51         -         45         51           BF-01 - Shower Room         51         -         62         28           BF-01 - Lift Lobby         -         51         -         36           BF-01 - Plant Room         51         -         206         31           BF-01 - Store         51         -         10         206           BF-01 - Nto         51         -         10         20           BF-01 - Ntore         51         51         10         20           BF-01 - Nto         -         51         51         30           BF-01 - Nto         -         51         51         20           BF-01 - Retail Unit 04	BF-01 - Shower Room	-	51	-	29
BF-01 - Shower Room         -         51         -         22           BF-01 - Shower Room         -         51         -         24           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         28           BF-01 - Shower Room         -         51         -         45           BF-01 - Stainwell         89         -         -         36           BF-01 - Plant         89         -         -         65           BF-01 - Bike Store         51         -         -         206           BF-01 - Fitness and Wellbeing         -         51         -         280           BF-01 - Plant Room         51         -         -         52           BF-01 - Plant Room         51         -         -         52           BF-01 - NC         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - WC	BF-01 - Shower Room	-	51	-	26
BF-01 - Shower Room         -         51         -         24           BF-01 - Shower Room         -         51         -         28           BF-01 - Stairvell         -         51         -         62           BF-01 - Lift Lobby         -         51         -         62           BF-01 - Lift Lobby         -         36         51         -         65           BF-01 - Plant Room         51         -         -         65         51           BF-01 - Plant Room         51         -         -         206         51           BF-01 - Store         51         -         -         206         51         -         206           BF-01 - Fitness and Wellbeing         -         51         -         206         51         -         206           BF-01 - Nata Room         51         -         -         170         51         51         306         52           BF-01 - Retail Unit 04         -         51         51         306         51         51         51         51         51         51         51         51         51         51         51         51         51         51         51         51	BF-01 - Shower Room	-	51	-	22
BF-01 - Shower Room         -         51         -         28           BF-01 - Stainvell         -         51         -         62           BF-01 - Lift Lobby         -         51         -         45           BF-01 - Plant Room         51         -         36         55           BF-01 - Plant Room         51         -         65         55           BF-01 - Store         51         -         206         51           BF-01 - Bike Store         51         -         280         31           BF-01 - Plant Room         51         -         280         31           BF-01 - VC         51         -         280         31           BF-01 - Netasi and Wellbeing         -         51         -         52           BF-01 - NCC         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - Circulation         -         51         -         52           F01 - Office Space 02 <td>BF-01 - Shower Room</td> <td>-</td> <td>51</td> <td>-</td> <td>24</td>	BF-01 - Shower Room	-	51	-	24
BF-01 - Stainvell         -         51         -         62           BF-01 - Lift Lobby         -         51         -         45           BF-01 - Plant         89         -         -         36           BF-01 - Plant Room         51         -         -         65           BF-01 - Store         51         -         -         206           BF-01 - Store         51         -         -         206           BF-01 - Store         51         -         -         206           BF-01 - Plant Room         51         -         -         280           BF-01 - NC         -         51         -         280           BF-01 - Retail Unit 04         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         2045           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - Circulation         -         51         -         5792           F01 - Circulation         -         51         -         5792           F01 - WC         -	BF-01 - Shower Room	-	51	-	28
BF-01 - Lift Lobby         -         51         -         45           BF-01 - Plant         89         -         -         36           BF-01 - Plant Room         51         -         -         65           BF-01 - Store         51         -         -         31           BF-01 - Store         51         -         -         206           BF-01 - Bike Store         51         -         -         280           BF-01 - Plant Room         51         -         -         170           BF-01 - Plant Room         51         -         -         170           BF-01 - NC         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         51         2045           F01 - WC         -         51         -         43           F01 - Circulation         -         51         -         5792           F01 - WC         -         51         -         52         51           F01 - WC         -	BF-01 - Stairwell	-	51	-	62
BF-01 - Plant         89         -         -         36           BF-01 - Plant Room         51         -         -         65           BF-01 - Store         51         -         -         31           BF-01 - Store         51         -         -         280           BF-01 - Fitness and Wellbeing         -         51         -         280           BF-01 - Plant Room         51         -         -         170           BF-01 - Netail Unit 04         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         51         2045           F01 - WC         -         51         -         43           F01 - Circulation         -         51         -         43           F01 - WC         -         51         -         29           F01 - WC         -         51         -         29           F01 - WC         -         51         -         43           F01 - WC         -         51	BF-01 - Lift Lobby	-	51	-	45
BF-01 - Plant Room         51         -         -         65           BF-01 - Store         51         -         -         31           BF-01 - Bike Store         51         -         -         206           BF-01 - Fitness and Wellbeing         -         51         -         280           BF-01 - Plant Room         51         -         52         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           BF-01 - Retail Unit 04         -         51         51         2045           BF-01 - Retail Unit 04         -         51         51         2045           BF-01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - Circulation         -         51         -         38           F01 - Office Space 03         51         -         75         51           F01 - WC         -         51         -         75           F01 - WC         -         51         -         74           F01 - WC <td>BF-01 - Plant</td> <td>89</td> <td>-</td> <td>-</td> <td>36</td>	BF-01 - Plant	89	-	-	36
BF-01 - Store         51         -         31           BF-01 - Bike Store         51         -         206           BF-01 - Fitness and Wellbeing         -         51         -         280           BF-01 - Plant Room         51         -         -         170           BF-01 - WC         -         51         -         52           BF-01 - Retail Unit 04         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - WC         -         51         -         38           F01 - Office Space 03         51         -         29         51           F01 - WC         -         51         -         29           F01 - WC         -         51         -         52           F01 - WC         -         51         -         43           F01 - WC         -         51         -         43<	BF-01 - Plant Room	51	-	-	65
BF-01 - Bike Store         51         -         -         206           BF-01 - Fitness and Wellbeing         -         51         -         280           BF-01 - Plant Room         51         -         -         170           BF-01 - WC         -         51         -         52           BF-01 - Retail Unit 04         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - WC         -         51         -         38           F01 - Circulation         -         51         -         38           F01 - Circulation         -         51         -         29           F01 - WC         -         51         -         52           F01 - WC         -         51         -         43           F01 - WC         -         51         -         43           F01 - WC         -         51 <td>BF-01 - Store</td> <td>51</td> <td>-</td> <td>-</td> <td>31</td>	BF-01 - Store	51	-	-	31
BF-01 - Fitness and Wellbeing       -       51       -       280         BF-01 - Plant Room       51       -       -       170         BF-01 - WC       -       51       -       52         BF-01 - Retail Unit 04       -       51       51       310         BF-01 - Retail Unit 04       -       51       51       306         BF-01 - Retail Unit 04       -       51       51       2045         F01 - Retail Unit 04       -       51       51       2045         F01 - WC       -       51       -       74         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       38         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       1724         F01 - WC       -       51       -       43         F01 - WC       -       51       -       43         F01 - WC       -       51       -       43	BF-01 - Bike Store	51	-	-	206
BF-01 - Plant Room         51         -         -         170           BF-01 - WC         -         51         -         52           BF-01 - Retail Unit 04         -         51         51         310           BF-01 - Retail Unit 04         -         51         51         306           BF-01 - Retail Unit 04         -         51         51         2045           F01 - Retail Unit 04         -         51         51         2045           F01 - WC         -         51         -         74           F01 - WC         -         51         -         38           F01 - Circulation         -         51         -         38           F01 - Office Space 03         51         -         -         5792           F01 - Circulation         -         51         -         29           F01 - WC         -         51         -         29           F01 - WC         -         51         -         52           F01 - WC         -         51         -         43           F01 - WC         -         51         -         43           F01 - Office Space 02         51         -	BF-01 - Fitness and Wellbeing	-	51	-	280
BF-01 - WC       -       51       -       52         BF-01 - Retail Unit 04       -       51       51       310         BF-01 - Retail Unit 04       -       51       51       306         BF-01 - Retail Unit 04       -       51       51       2045         F01 - Retail Unit 04       -       51       51       2045         F01 - WC       -       51       -       74         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       38         F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       43         F01 - Office Space 02       51       -       43         F01 - WC       -       51       -       47         F02 - WC       -       51       -       43         F01 - Circulation       -       51       -       43      F	BF-01 - Plant Room	51	-	-	170
BF-01 - Retail Unit 04       -       51       51       310         BF-01 - Retail Unit 04       -       51       51       306         BF-01 - Retail Unit 04       -       51       51       2045         F01 - Retail Unit 04       -       51       -       74         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       38         F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       724         F01 - Office Space 02       51       -       43         F01 - Circulation       -       51       -       47         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       1656	BF-01 - WC	-	51	-	52
BF-01 - Retail Unit 04       -       51       51       306         BF-01 - Retail Unit 04       -       51       51       2045         F01 - WC       -       51       -       74         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       38         F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       75         F01 - WC       -       51       -       72         F01 - Office Space 02       51       -       1724         F01 - Office Space 02       51       -       43         F01 - Circulation       -       51       -       43         F02 - WC       -       51       -       43         F02 - WC       -       51       -       1656         F02 - Office Space 02       51       -       1656         F02 - Office Spa	BF-01 - Retail Unit 04	-	51	51	310
BF-01 - Retail Unit 04       -       51       51       2045         F01 - WC       -       51       -       74         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       43         F01 - Office Space 03       51       -       5792       5792         F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       -       1724         F01 - Office Space 02       51       -       43         F01 - Office Space 02       51       -       43         F01 - Circulation       -       51       -       43         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       1656         F02 - WC       -       51       -       42         F02 - Office	BF-01 - Retail Unit 04	-	51	51	306
F01 - WC       -       51       -       74         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       38         F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       43         F01 - Office Space 02       51       -       43         F01 - Office Space 02       51       -       43         F01 - WC       -       51       -       43         F01 - Office Space 02       -       51       -       43         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       1656         F02 - WC       -       51       -       42         F02 - Office Space 02       51       -	BF-01 - Retail Unit 04	-	51	51	2045
F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       38         F01 - Office Space 03       51       -       -       5792         F01 - Office Space 03       51       -       -       5792         F01 - Office Space 03       -       51       -       29         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       1724         F01 - WC       -       51       -       43         F01 - Office Space 02       51       -       43         F01 - Circulation       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       1656         F02 - Office Space 02       51       -       42         F02 - Office Space 02       51       -       46         F02 - Office Space       51       -       46         F02 - Office Space       51	F01 - WC	-	51	-	74
F01 - Circulation       -       51       -       38         F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       72         F01 - Office Space 02       51       -       52       51         F01 - Office Space 02       51       -       1724         F01 - Office Space 02       51       -       43         F01 - Circulation       -       51       -       43         F01 - Circulation       -       51       -       43         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       1656         F02 - Office Space 02       51       -       42         F02 - Office Space 02       51       -       46         F02 - Office Space       51       -       46         F02 - Office Space       51       -       5826         F02 - Office Space       51       - <td>F01 - WC</td> <td>-</td> <td>51</td> <td>-</td> <td>43</td>	F01 - WC	-	51	-	43
F01 - Office Space 03       51       -       -       5792         F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       -       1724         F01 - WC       -       51       -       43         F01 - WC       -       51       -       47         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       43         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       43         F02 - Office Space 02       51       -       43         F02 - Office Space 02       51       -       42         F02 - WC       -       51       -       42         F02 - Office Space       51       -       46         F02 - Office Space       51       -       5826         F02 - Office Space       51       -       5	F01 - Circulation	-	51	-	38
F01 - Circulation       -       51       -       29         F01 - WC       -       51       -       75         F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       -       1724         F01 - WC       -       51       -       43         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       47         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       43         F02 - Office Space 02       51       -       38         F02 - Office Space 02       51       -       42         F02 - Office Space 02       51       -       42         F02 - Office Space       -       51       -       46         F02 - Office Space       51       -       5826       51         F02 - Office Space       51       -       5826       51       -       5826         F02 - Circulation       -       51       -       29       51	F01 - Office Space 03	51	-	-	5792
F01 - WC       -       51       -       75         F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       -       1724         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       43         F02 - WC       -       51       -       47         F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       43         F02 - WC       -       51       -       43         F02 - Office Space 02       51       -       43         F02 - Office Space 02       51       -       1656         F02 - WC       -       51       -       42         F02 - Office Space 02       51       -       42         F02 - Office Space       51       -       46         F02 - Office Space       51       -       5826         F02 - Office Space       51       -       29	F01 - Circulation	-	51	-	29
F01 - WC       -       51       -       52         F01 - Office Space 02       51       -       -       1724         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       47         F02 - WC       -       51       -       74         F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       43         F02 - Office Space 02       -       51       -       43         F02 - Office Space 02       51       -       38         F02 - Office Space 02       51       -       1656         F02 - WC       -       51       -       42         F02 - Office Space 02       51       -       46         F02 - Office Space       51       -       5826         F02 - Office Space       51       -       5826         F02 - Circulation       -       51       -       29	F01 - WC	-	51	-	75
F01 - Office Space 02       51       -       -       1724         F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       47         F02 - WC       -       51       -       47         F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       43         F02 - Office Space 02       -       51       -       43         F02 - Office Space 02       51       -       38       -         F02 - Office Space 02       51       -       -       1656         F02 - Office Space 02       51       -       42       -         F02 - Office Space 02       51       -       46       -         F02 - Office Space       51       -       51       -       46         F02 - Office Space       51       -       -       5826       -       51       -       29	F01 - WC	-	51	-	52
F01 - WC       -       51       -       43         F01 - Circulation       -       51       -       47         F02 - WC       -       51       -       74         F02 - WC       -       51       -       43         F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       43         F02 - Office Space 02       51       -       38         F02 - Office Space 02       51       -       1656         F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826       51         F02 - Office Space       51       -       5826       51       -       29	F01 - Office Space 02	51	-	-	1724
F01 - Circulation       -       51       -       47         F02 - WC       -       51       -       74         F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       43         F02 - Office Space 02       51       -       38         F02 - Office Space 02       51       -       1656         F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826       51         F02 - Office Space       51       -       5826       51       -       29	F01 - WC	-	51	-	43
F02 - WC       -       51       -       74         F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       38         F02 - Office Space 02       51       -       -       1656         F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826         F02 - Office Space       51       -       5826         F02 - Circulation       -       51       -       29	F01 - Circulation	-	51	-	47
F02 - WC       -       51       -       43         F02 - Circulation       -       51       -       38         F02 - Office Space 02       51       -       -       1656         F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826         F02 - Circulation       -       51       -       29	F02 - WC	-	51	-	74
F02 - Circulation       -       51       -       38         F02 - Office Space 02       51       -       -       1656         F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826         F02 - Circulation       -       51       -       29	F02 - WC	-	51	-	43
F02 - Office Space 02       51       -       -       1656         F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826         F02 - Circulation       -       51       -       29	F02 - Circulation	-	51	-	38
F02 - WC       -       51       -       42         F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       5826         F02 - Circulation       -       51       -       29	F02 - Office Space 02	51	-	-	1656
F02 - Circulation       -       51       -       46         F02 - Office Space       51       -       -       5826         F02 - Circulation       -       51       -       29	F02 - WC	-	51	-	42
F02 - Office Space         51         -         5826           F02 - Circulation         -         51         -         29	F02 - Circulation	-	51	-	46
F02 - Circulation - 51 - 29	F02 - Office Space	51	-	-	5826
	F02 - Circulation	-	51	-	29
F02 - WC - 51 - 74	F02 - WC	-	51	-	74
F02 - WC - 51 - 26	F02 - WC	-	51	-	26
F02 - WC - 51 - 51	F02 - WC	-	51	-	51

General lighting and display lighting	Lumino	ous effic	]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
F06 - Circulation	-	51	-	31
F06 - Lift Lobby 02	-	51	-	73
F06 - Office Space	51	-	-	1295
F06 - WC	-	51	-	44
F06 - Circulation	-	51	-	58
F03 - WC	-	51	-	74
F03 - WC	-	51	-	43
F03 - Circulation	-	51	-	38
F03 - Office Space	51	-	-	1649
F03 - WC	-	51	-	42
F03 - Circulation	-	51	-	46
F03 - Office Space	51	-	-	5888
F03 - Circulation	-	51	-	29
F03 - WC	-	51	-	74
F03 - WC	-	51	_	51
F04 - WC	_	51	_	74
F04 - WC		51	_	43
F04 - Circulation	_	51		38
	- 51	51	-	5000
F04 - Office Space	51	-	-	2000
	-	51	-	29
	-	51	-	74
	-	51	-	54
F04 - Office Space	51	-	-	1656
	-	51	-	42
F04 - Circulation	-	51	-	46
F05 - Circulation	-	51	-	38
F05 - Office Space	51	-	-	4051
F05 - WC	-	51	-	86
F05 - Office Space	51	-	-	89
F05 - Circulation	-	51	-	46
F06 - Lift Lobby 03	-	51	-	82
F05 - WC	-	51	-	87
F05 - Circulation	-	51	-	35
F05 - WC	-	51	-	66
F05 - Office Space	51	-	-	1606
F05 - WC	-	51	-	42
F05 - Circulation	-	51	-	46
GF00 - Stairwell	-	51	-	53
BF-01 - Plant	51	-	-	69
BF-01 - Locker Room	-	51	-	101
GF00 - Post Room	51	-	-	16
GF00 - Flex Space	51	-	-	1379
GF00 - Lift Lobby	-	51	-	54
	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	
GF00 - Circulation	-	51	-	194

# 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?
GF00 - Retail Unit 04	YES (+7.4%)	NO
GF00 - Retail Unit 05	YES (+18.1%)	NO
GF00 - Retail Unit 06	NO (-42.9%)	NO
F02 - Office Space 01	NO (-58.4%)	NO
F03 - Office Space 01	NO (-55.5%)	NO
F04 - Office Space 01	NO (-57.6%)	NO
F06 - Office Space	N/A	N/A
F05 - Office Space 01	NO (-63.8%)	NO
F05 - Office Space	NO (-57.6%)	NO
BF-01 - Retail Unit 02	NO (-56.3%)	NO
BF-01 - Retail Unit 03	NO (-69.5%)	NO
F01 - Office Space 01	NO (-59.4%)	NO
F06 - Office Space 01	NO (-80.1%)	NO
GF00 - Retail Unit 03	YES (+39.1%)	NO
GF00 - Flex space	N/A	N/A
GF00 - Estate Management Office	NO (-54.5%)	NO
GF00 - Kitchen	NO (-47.4%)	NO
GF00 - Flex space	NO (-3.9%)	NO
GF00 - Reception/Lobby	NO (-38.8%)	NO
GF00 - Retail Unit 02	YES (+27.1%)	NO
GF00 - Retail Unit 01	NO (-21.8%)	NO
BF-01 - Existing Retail	N/A	N/A
BF-01 - Existing Retail	N/A	N/A
BF-01 - Existing Retail	N/A	N/A
BF-01 - Fitness and Wellbeing	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
F01 - Office Space 03	NO (-66.6%)	NO
F01 - Office Space 02	NO (-59.9%)	NO
F02 - Office Space 02	NO (-60.9%)	NO
F02 - Office Space	NO (-61.2%)	NO
F06 - Office Space	NO (-81.8%)	NO
F03 - Office Space	NO (-60.3%)	NO
F03 - Office Space	NO (-60.7%)	NO
F04 - Office Space	NO (-60%)	NO
F04 - Office Space	NO (-66.2%)	NO
F05 - Office Space	YES (+23.5%)	NO
F05 - Office Space	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
F05 - Office Space	NO (-81.5%)	NO
GF00 - Flex Space	NO (-3%)	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?	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 [m <sup>2</sup> ]	8230.9	8230.9	13
External area [m <sup>2</sup> ]	7926	7926	
Weather	LON	LON	87
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	-
Average conductance [W/K]	5030.65	4160.42	-
Average U-value [W/m <sup>2</sup> K]	0.63	0.52	-
Alpha value* [%]	10.09	10	-

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

## **Building Use**

### % Area Building Type

13	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
87	B1 Offices and Workshop businesses
	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	24.44	6.5
Cooling	8.3	7.86
Auxiliary	19.38	11.38
Lighting	22.27	20.66
Hot water	18.38	15.43
Equipment*	36.99	36.99
TOTAL**	92.77	61.84

\* 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> ]	121.21	127.43
Primary energy* [kWh/m <sup>2</sup> ]	201.75	146.2
Total emissions [kg/m <sup>2</sup> ]	34.5	24.9

\* 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	] Fan coil s	ystems, [HS	6] LTHW bo	iler, [HFT] I	Natural Gas	s, [CFT] Elec	ctricity			
	Actual	62.2	69.1	23.5	10.2	23	0.73	1.88	0.84	2.5
	Notional	17.8	131.7	5.7	9.7	13.7	0.86	3.79		
[ST	] Central he	eating using	y water: rad	iators, [HS]	LTHW boi	ler, [HFT] N	atural Gas,	[CFT] Elect	tricity	
	Actual	267.4	0	99.1	0	11.2	0.75	0	0.84	0
	Notional	74.5	0	24	0	3.5	0.86	0		
[ST	] Central he	eating using	y water: rad	iators, [HS]	LTHW boil	ler, [HFT] N	atural Gas,	[CFT] Elect	tricity	
	Actual	139.6	0	51.7	0	3.3	0.75	0	0.84	0
	Notional	60.4	0	19.5	0	2.3	0.86	0		
[ST	] No Heatin	g or Coolin	g							
	Actual	0	0	0	0	0	0	0	0	0
	Notional	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	<b>U</b> і-Тур	Ui-Min	Surface where the minimum value occurs*	
Wall	0.23	0.55	SP00000D:Surf[4]	
Floor	0.2	0.25	SP00000D:Surf[6]	
Roof	0.15	0.18	SP00000D:Surf[7]	
Windows, roof windows, and rooflights	1.5	1.61	F0000037:Surf[16]	
Personnel doors	1.5	2.2	SP00000D:Surf[8]	
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
m³/(h.m²) at 50 Pa	5	25



## B. SBEM: BE GREEN

## **BRUKL Output Document**

Compliance with England Building Regulations Part L 2013

## **Project name**

## **BE GREEN**

Date: Fri Jul 08 11:42:47 2022

## Administrative information

### **Building Details**

Address: Holborn Links - Project 01, ,

### **Certification tool**

Calculation engine: Apache Calculation engine version: 7.0.14 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.14 BRUKL compliance check version: v5.6.b.0

### Certifier details Name: Telephone number: Phone Address: Street Address, City, Postcode

## 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	24.5
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	24.5
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	31.1
Are emissions from the building less than or equal to the target?	BER > TER
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	Ua-Limit	Ua-Calc	<b>U</b> i-Calc	Surface where the maximum value occurs*
Wall**	0.35	2.11	2.11	SP00000D:Surf[4]
Floor	0.25	1.2	1.2	SP00000D:Surf[6]
Roof	0.25	0.43	2.34	SF00004A:Surf[4]
Windows***, roof windows, and rooflights	2.2	3.97	5.75	SP00000D:Surf[0]
Personnel doors	2.2	2.2	2.2	SP00000D:Surf[8]
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
Ua-Limit = Limiting area-weighted average U-values [W	//(m²K)]			

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

 $U_{i-Calc}$  = 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
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	>0.95	

#### 1- ELEC PANEL HEATERS ONLY

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HF	IR efficiency	
This system	1	-	0	-	-		
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							

### 2- VRF HEATING/COOLING (FCUs) & AHU(HR) (fan coil)

	Heating efficiency	<b>Cooling efficiency</b>	Radiant efficiency	SFP [W/(I/s)]	HR efficiency			
This system	3.8	3.5	0	1.9	0.75			
Standard value	2.5*	3.2	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 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.

#### 3- ELEC PANEL HEATERS & AHU

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency			
This system	1	-	0	0	0.75			
Standard value         N/A         N/A         N/A         0.5								
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO								

#### 1- DHW DIRECT ELEC

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.005
Standard value	1	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
1	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(I/s)]								HP officiency		
ID of system type	Α	В	С	D	Е	F	G	Н	I	HR efficiency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
GF00 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Retail Unit 05	-	-	-	-	-	-	-	0.3	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	Н	I	HR enciency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
GF00 - Retail Unit 06	-	-	-	-	-	-	-	0.3	-	-	N/A
F01 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Retail Unit 02	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Retail Unit 03	-	-	-	-	-	-	-	0.3	-	-	N/A
F01 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
F06 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Retail Unit 03	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Flex space	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Estate Management Office	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Kitchen	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Flex space	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Reception/Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Retail Unit 02	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Retail Unit 01	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Locker Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Acc. WC/Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	Н	I	пк епісіенсу	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A
BF-01 - Fitness and Wellbeing	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - Office Space 03	-	-	-	-	-	-	-	0.3	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F01 - Office Space 02	-	-	-	-	-	-	-	0.3	-	-	N/A
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Office Space 02	-	-	-	-	-	-	-	0.3	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F06 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F04 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A

Zone name		SFP [W/(I/s)]									
ID of system type	Α	В	С	D	E	F	G	н	I	HR efficiency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
BF-01 - Locker Room	-	-	-	1.9	-	-	-	-	-	-	N/A
GF00 - Flex Space	-	-	-	-	-	-	-	0.3	-	-	N/A

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
GF00 - Circulation/Lift Lobby	-	100	-	79
GF00 - Retail Unit 04	-	90	80	1387
GF00 - Retail Unit 05	-	90	80	1805
GF00 - Retail Unit 06	-	90	80	1187
F01 - Acc. WC	-	100	-	30
F01 - Cupboard	100	-	-	2
F01 - Cupboard	100	-	-	1
F01 - Cupboard	100	-	-	2
F01 - Cupboard	100	-	-	2
F01 - Lift Lobby	-	100	-	28
F01 - Lift Lobby 02	-	100	-	42
F01 - Plant	110	-	-	20
F01 - Stairwell	-	100	-	31
F01 - WC	-	100	-	21
F01 - WC	-	100	-	22
F01 - Lift Lobby 03	-	100	-	41
F02 - Acc. WC	-	100	-	30
F02 - Cupboard	100	-	-	2
F02 - Cupboard	100	-	-	1
F02 - Cupboard	100	-	-	2
F02 - Cupboard	100	-	-	2
F02 - Lift Lobby	-	100	-	28
F02 - Lift Lobby 02	-	100	-	42
F02 - Office Space 01	120	-	-	1801
F02 - Plant	110	-	-	20
F02 - Stairwell	-	100	-	31
F02 - WC	-	100	-	21
F02 - WC	-	100	-	21
F02 - Lift Lobby 03	-	100	-	41
F03 - Acc. WC	-	100	-	30

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
F03 - Cupboard	100	-	-	2
F03 - Cupboard	100	-	-	1
F03 - Cupboard	100	-	-	2
F03 - Cupboard	100	-	-	2
F03 - Lift Lobby	-	100	-	28
F03 - Lift Lobby F03	-	100	-	42
F03 - Office Space 01	120	-	-	1798
F03 - Plant	110	-	-	20
F03 - Stairwell	-	100	-	31
F03 - WC	-	100	-	21
F03 - WC	-	100	-	21
F03 - Lift Lobby 03	-	100	-	41
F04 - Acc. WC	-	100	-	30
F04 - Cupboard	100	-	-	2
F04 - Cupboard	100	-	-	1
F04 - Cupboard	100	-	-	2
F04 - Cupboard	100	-	-	2
F04 - Lift Lobby	-	100	-	28
F04 - Lift Lobby F04	-	100	-	42
F04 - Office Space 01	120	-	-	1801
F04 - Plant	110	-	-	20
F04 - Stairwell	-	100	-	31
F04 - WC	-	100	-	21
F04 - WC	-	100	-	21
F04 - Lift Lobby 03	-	100	-	41
F05 - Acc. WC	-	100	-	30
F05 - Cupboard	100	-	-	2
F05 - Cupboard	100	-	-	1
F05 - Cupboard	100	-	-	2
F05 - Cupboard	100	-	-	2
F05 - Lift Lobby	-	100	-	28
F05 - Lift Lobby F05	-	100	-	42
F05 - Plant	110	-	-	20
F05 - Stairwell	-	100	-	31
F05 - WC	-	100	-	21
F05 - WC	-	100	-	21
F05 - Lift Lobby 03	-	100	_	41
F06 - Plant	110	-	-	22
F06 - Stairwell	-	100	-	36
F06 - WC	-	100	-	22
F06 - WC	-	100	-	22
F06 - Office Space	120	-	-	13
F05 - Office Space 01	120	-	-	1736
	120		l .	1750

Zone name         Luminaire         Lamp         Display lamp         General lighting [W]           BF-01 - Plant Room         110         -         -         25           BF-01 - Acc. WC         -         100         -         41           BF-01 - Acc. WC         -         100         -         41           BF-01 - Lift Lobby         -         100         -         39           BF-01 - Cupboard         100         -         -         7           F05 - Office Space         120         -         -         194           BF-01 - Store         100         -         -         9           BF-01 - Store         100         -         -         9           BF-01 - Store         100         -         -         10           BF-01 - Store         100         -         -         49           BF-01 - Store         100         -         33         -           BF-01 - Netail Unit 02         -         90         80         1596           BF-01 - Lift Lobby         -         100         -         33           BF-01 - New Water Tank Room         110         -         -         95           BF-0
Standard value         60         60         22           BF-01 - Plant Room         110         -         -         25           BF-01 - Acc. WC         -         100         -         41           BF-01 - Lift Lobby         -         100         -         39           BF-01 - Cupboard         100         -         -         7           F05 - Office Space         120         -         -         194           BF-01 - Store         100         -         -         9           BF-01 - Store         100         -         -         9           BF-01 - Retail Unit 02         -         90         80         1596           BF-01 - Retail Unit 02         -         90         80         1596           BF-01 - Lift Lobby         -         100         -         33           BF-01 - New Water Tank Room         110         -         -         95           BF-01 - New Water Tank Room         110         -         90         80         1918           BF-01 - Circulation         -         100         -         36           F01 - Office Space 01         120         -         1667           F06 - Office
BF-01 - Plant Room       110       -       -       25         BF-01 - Acc. WC       -       100       -       41         BF-01 - Lift Lobby       -       100       -       39         BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       9         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - View Water Tank Room       110       -       -       95         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Office Space 01       120       -       1261       32         F06 - Office Space 01       120       -       1261       32         F06 - Office Space 01       20       -       1261       32
BF-01 - Acc. WC       -       100       -       41         BF-01 - Lift Lobby       -       100       -       39         BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       9         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Office Space 01       120       -       1261       -         F06 - Office Space 01       120       -       1261       -         GF00 - Circulation       -       100       -       74         GF00
BF-01 - Lift Lobby       -       100       -       39         BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit
BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       288       332         GF00 - E
F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         G
BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       288       332         GF00 - Flex space       100       -       -       170         GF00 - Estate Management Office       120       -       170       170
BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Circulation       -       90       80       332         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
GF00 - Flex space         100         -         -         288           GF00 - Estate Management Office         120         -         -         170
GF00 - Estate Management Office 120 170
GFUU - ACC. WC  -   100  -   38
GF00 - WC - 100 - 23
GF00 - WC - 100 - 30
GF00 - Stairwell - 100 - 18
GF00 - Circulation - 100 - 22
GF00 - Stairwell - 100 - 29
GF00 - Kitchen - 100 - 202
GF00 - Flex space 100 444
GF00 - Reception/Lobby - 110 80 238
GF00 - Retail Unit 02 - 90 80 324
GF00 - Retail Unit 01 - 90 80 322
BF-01 - Stairwell - 100 - 30
BF-01 - Cleaners Cupboard 100 8
BF-01 - Circulation - 100 - 72
BF-01 - Existing Retail - 90 80 386
BF-01 - Existing Retail - 90 80 384
BF-01 - Existing Retail - 90 80 368
BF-01 - Plant 110 209
BF-01 - Shower Room - 100 - 15
BF-01 - Circulation - 100 - 35
BF-01 - Locker Room - 100 - 51
BF-01 - WC - 100 - 29
BF-01 - Shower Room - 100 - 13

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
BF-01 - Acc. WC/Shower Room	-	100	-	19
BF-01 - Shower Room	-	100	-	14
BF-01 - Shower Room	-	100	-	13
BF-01 - Shower Room	-	100	-	11
BF-01 - Shower Room	-	100	-	15
BF-01 - Shower Room	-	100	-	14
BF-01 - Shower Room	-	100	-	11
BF-01 - Shower Room	-	100	-	12
BF-01 - Shower Room	-	100	-	14
BF-01 - Stairwell	-	100	-	32
BF-01 - Lift Lobby	-	100	-	23
BF-01 - Plant	89	-	-	36
BF-01 - Plant Room	110	-	-	30
BF-01 - Store	100	-	-	16
BF-01 - Bike Store	100	-	-	105
BF-01 - Fitness and Wellbeing	-	100	-	143
BF-01 - Plant Room	110	-	-	79
BF-01 - WC	-	100	-	27
BF-01 - Retail Unit 04	-	90	80	176
BF-01 - Retail Unit 04	-	90	80	173
BF-01 - Retail Unit 04	-	90	80	1159
F01 - WC	-	100	-	38
F01 - WC	-	100	-	22
F01 - Circulation	-	100	-	20
F01 - Office Space 03	120	-	-	2461
F01 - Circulation	-	100	-	15
F01 - WC	-	100	-	38
F01 - WC	-	100	-	26
F01 - Office Space 02	120	-	-	733
F01 - WC	-	100	-	22
F01 - Circulation	-	100	-	24
F02 - WC	-	100	-	38
F02 - WC	-	100	-	22
F02 - Circulation	-	100	-	19
F02 - Office Space 02	120	-	-	704
F02 - WC	-	100	-	22
F02 - Circulation	-	100	-	24
F02 - Office Space	120	-	-	2476
F02 - Circulation	-	100	-	15
F02 - WC	-	100	-	38
F02 - WC	-	100	-	13
F02 - WC	-	100	-	26
F06 - Circulation	-	100	-	16

General lighting and display lighting	Lumino	ous effic	]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
F06 - Lift Lobby 02	-	100	-	37
F06 - Office Space	120	-	-	550
F06 - WC	-	100	-	23
F06 - Circulation	-	100	-	30
F03 - WC	-	100	-	38
F03 - WC	-	100	-	22
F03 - Circulation	-	100	-	19
F03 - Office Space	120	-	-	701
F03 - WC	-	100	-	21
F03 - Circulation	-	100	-	24
F03 - Office Space	120	-	-	2502
F03 - Circulation	-	100	-	15
F03 - WC	-	100	-	38
F03 - WC	-	100	-	26
F04 - WC	-	100	-	38
F04 - WC	-	100	-	22
F04 - Circulation	-	100	-	19
F04 - Office Space	120	-	-	2502
F04 - Circulation	-	100	-	15
F04 - WC	-	100	-	38
F04 - WC	-	100	-	27
F04 - Office Space	120	-	-	704
F04 - WC	-	100	-	22
F04 - Circulation	-	100	-	24
F05 - Circulation	-	100	-	19
F05 - Office Space	120	-	-	1722
F05 - WC	-	100	-	44
F05 - Office Space	120	-	-	38
F05 - Circulation	-	100	-	24
F06 - Lift Lobby 03	-	100	-	42
F05 - WC	-	100	-	44
F05 - Circulation	-	100	-	18
F05 - WC	-	100	-	34
F05 - Office Space	120	-	-	683
F05 - WC	-	100	-	22
F05 - Circulation	-	100	-	24
GF00 - Stairwell	-	100	-	27
BF-01 - Plant	110	-	-	32
BF-01 - Locker Room	-	100	-	52
GF00 - Post Room	100	-	-	8
GF00 - Flex Space	100	-	-	703
GF00 - Lift Lobby	-	100	-	27
GF00 - Circulation	-	100	-	99
	1			

# 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?
GF00 - Retail Unit 04	YES (+92.9%)	NO
GF00 - Retail Unit 05	YES (+111.5%)	NO
GF00 - Retail Unit 06	YES (+4.5%)	NO
F02 - Office Space 01	NO (-18.8%)	NO
F03 - Office Space 01	NO (-12.1%)	NO
F04 - Office Space 01	NO (-17%)	NO
F06 - Office Space	N/A	N/A
F05 - Office Space 01	NO (-27.9%)	NO
F05 - Office Space	NO (-57.6%)	NO
BF-01 - Retail Unit 02	YES (+4.8%)	NO
BF-01 - Retail Unit 03	NO (-27.2%)	NO
F01 - Office Space 01	NO (-25.4%)	NO
F06 - Office Space 01	NO (-60.3%)	NO
GF00 - Retail Unit 03	YES (+129.9%)	NO
GF00 - Flex space	N/A	N/A
GF00 - Estate Management Office	NO (-28.3%)	NO
GF00 - Kitchen	NO (-16.7%)	NO
GF00 - Flex space	YES (+108.4%)	NO
GF00 - Reception/Lobby	YES (+32.6%)	NO
GF00 - Retail Unit 02	YES (+109.1%)	NO
GF00 - Retail Unit 01	YES (+79.3%)	NO
BF-01 - Existing Retail	N/A	N/A
BF-01 - Existing Retail	N/A	N/A
BF-01 - Existing Retail	N/A	N/A
BF-01 - Fitness and Wellbeing	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
F01 - Office Space 03	NO (-38.1%)	NO
F01 - Office Space 02	NO (-7.7%)	NO
F02 - Office Space 02	NO (-9.5%)	NO
F02 - Office Space	NO (-29.6%)	NO
F06 - Office Space	NO (-62.9%)	NO
F03 - Office Space	NO (-8.9%)	NO
F03 - Office Space	NO (-29.1%)	NO
F04 - Office Space	NO (-27.9%)	NO
F04 - Office Space	NO (-21.6%)	NO
F05 - Office Space	YES (+69.9%)	NO
F05 - Office Space	N/A	N/A
F05 - Office Space	NO (-56.8%)	NO
GF00 - Flex Space	YES (+69.9%)	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?		
Is evidence of such assessment available as a separate submission?		
Are any such measures included in the proposed design?		

## **Technical Data Sheet (Actual vs. Notional Building)**

## **Building Global Parameters**

	Actual	Notional	%
Area [m <sup>2</sup> ]	8230.9	8230.9	13
External area [m <sup>2</sup> ]	7926	7926	
Weather	LON	LON	87
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	
Average conductance [W/K]	15276.5	4160.45	
Average U-value [W/m <sup>2</sup> K]	1.93	0.52	
Alpha value* [%]	10.06	10	

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

## **Building Use**

### % Area Building Type

13	A1/A2 Retail/Financial and Professional services			
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways			
87	B1 Offices and Workshop businesses			
	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	26.08	3.36
Cooling	3.1	7.83
Auxiliary	16.66	11.38
Lighting	11.38	20.66
Hot water	5.82	8.5
Equipment*	36.99	36.99
TOTAL**	63.04	51.73

\* 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	1.59	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> ]	281.94	126.8
Primary energy* [kWh/m <sup>2</sup> ]	188.69	146.97
Total emissions [kg/m <sup>2</sup> ]	31.1	24.5

\* 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	] Fan coil s	ystems, [HS	6] Heat pum	np (electric)	: air source	e, [HFT] Ele	ctricity, [CF	T] Electrici	ty	
	Actual	248.3	48	18.1	3.8	19.7	3.8	3.5	3.8	3.5
	Notional	17.6	131.2	1.9	9.6	13.7	2.56	3.79		
[ST	] Central he	eating using	g water: rad	iators, [HS]	Direct or s	torage elec	tric heater,	[HFT] Elec	tricity, [CF1	] Electricity
	Actual	892.8	0	248	0	9.9	1	0	1	0
	Notional	69.7	0	22.5	0	3.5	0.86	0		
[ST	] Central he	eating using	g water: rad	iators, [HS]	Direct or s	torage elec	tric heater,	[HFT] Elec	tricity, [CF1	] Electricity
	Actual	381.9	0	106.1	0	3.3	1	0	1	0
	Notional	59.5	0	19.2	0	2.3	0.86	0		
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	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	<b>U</b> і-Тур	Ui-Min	Surface where the minimum value occurs*	
Wall	0.23	2.11	SP00000D:Surf[4]	
Floor	0.2	1.2	SP00000D:Surf[6]	
Roof	0.15	0.18	SP00000D:Surf[7]	
Windows, roof windows, and rooflights	1.5	1.61	F0000037:Surf[16]	
Personnel doors	1.5	2.2	SP00000D:Surf[8]	
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	
Ui-Typ = Typical individual element U-values [W/(m²K)] Ui-Min = Minimum in			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
m³/(h.m²) at 50 Pa	5	25



## C. SBEM: BE LEAN

As designed

Compliance with England Building Regulations Part L 2013

## **Project name**

## **BE LEAN**

Date: Fri Jul 08 10:37:34 2022

## Administrative information

### **Building Details**

Address: Holborn Links - Project 01, ,

### **Certification tool**

Calculation engine: Apache Calculation engine version: 7.0.14 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.14 BRUKL compliance check version: v5.6.b.0

### Certifier details Name: Telephone number: Phone Address: Street Address, City, Postcode

## 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	25.3
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	25.3
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	40.8
Are emissions from the building less than or equal to the target?	BER > TER
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	Ua-Limit	Ua-Calc	<b>U</b> i-Calc	Surface where the maximum value occurs*
Wall**	0.35	2.11	2.11	SP00000D:Surf[4]
Floor	0.25	1.2	1.2	SP00000D:Surf[6]
Roof	0.25	0.43	2.34	SF00004A:Surf[4]
Windows***, roof windows, and rooflights	2.2	3.97	5.75	SP00000D:Surf[0]
Personnel doors	2.2	2.2	2.2	SP00000D:Surf[8]
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
Ua-Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]				

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

 $U_{i-Calc}$  = 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
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	YES
Whole building electric power factor achieved by power factor correction	>0.95

#### 1- ELEC PANEL HEATERS ONLY

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HF	R efficiency				
This system	1	-	0	-	-					
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										

### 2- VRF HEATING/COOLING (FCUs) & AHU(HR) (fan coil)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency					
This system	0.96	3.5	0	2	0.75					
Standard value	0.91*	3.2	3.2 N/A 1.6^							
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.										

^ 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.

#### 3- ELEC PANEL HEATERS & AHU

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency					
This system	1	-	0	0	0.75					
Standard value	N/A	N/A	N/A	N/A	0.5					
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO										

#### 1- DHW DIRECT ELEC

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.005
Standard value	1	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
1	Zonal extract system where the fan is remote from the zone with grease filter

Zone name				UD officionov							
ID of system type	Α	В	С	D	Е	F	G	Н	I	HR efficiency	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
GF00 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A
GF00 - Retail Unit 05	-	-	-	-	-	-	-	0.3	-	-	N/A

Zone name	SFP [W/(I/s)]											
ID of system type	Α	В	С	D	E	F	G	Н	I			
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard	
GF00 - Retail Unit 06	-	-	-	-	-	-	-	0.3	-	-	N/A	
F01 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F05 - Acc. WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F06 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F05 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Retail Unit 02	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Retail Unit 03	-	-	-	-	-	-	-	0.3	-	-	N/A	
F01 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
F06 - Office Space 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Retail Unit 03	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Flex space	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Estate Management Office	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Kitchen	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Flex space	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Reception/Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Retail Unit 02	-	-	-	-	-	-	-	0.3	-	-	N/A	
GF00 - Retail Unit 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Existing Retail	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Locker Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Acc. WC/Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	

Zone name	SFP [W/(I/s)]											
ID of system type	Α	В	С	D	Е	F	G	Н	I	HR efficiency		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Shower Room	-	-	-	1.9	-	-	-	-	-	-	N/A	
BF-01 - Fitness and Wellbeing	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A	
BF-01 - Retail Unit 04	-	-	-	-	-	-	-	0.3	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F01 - Office Space 03	-	-	-	-	-	-	-	0.3	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F01 - Office Space 02	-	-	-	-	-	-	-	0.3	-	-	N/A	
F01 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - Office Space 02	-	-	-	-	-	-	-	0.3	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F02 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F06 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F06 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F03 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
F04 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A	
F04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	

Zone name	SFP [W/(I/s)]					UD officiancy					
ID of system type	Α	В	С	D	Е	F	G	Н	I		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
F05 - Office Space	-	-	-	-	-	-	-	0.3	-	-	N/A
F05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A
BF-01 - Locker Room	-	-	-	1.9	-	-	-	-	-	-	N/A
GF00 - Flex Space	-	-	-	-	-	-	-	0.3	-	-	N/A

General lighting and display lighting	Lumino	ous effic	]	
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
GF00 - Circulation/Lift Lobby	-	100	-	79
GF00 - Retail Unit 04	-	90	80	1387
GF00 - Retail Unit 05	-	90	80	1805
GF00 - Retail Unit 06	-	90	80	1187
F01 - Acc. WC	-	100	-	30
F01 - Cupboard	100	-	-	2
F01 - Cupboard	100	-	-	1
F01 - Cupboard	100	-	-	2
F01 - Cupboard	100	-	-	2
F01 - Lift Lobby	-	100	-	28
F01 - Lift Lobby 02	-	100	-	42
F01 - Plant	110	-	-	20
F01 - Stairwell	-	100	-	31
F01 - WC	-	100	-	21
F01 - WC	-	100	-	22
F01 - Lift Lobby 03	-	100	-	41
F02 - Acc. WC	-	100	-	30
F02 - Cupboard	100	-	-	2
F02 - Cupboard	100	-	-	1
F02 - Cupboard	100	-	-	2
F02 - Cupboard	100	-	-	2
F02 - Lift Lobby	-	100	-	28
F02 - Lift Lobby 02	-	100	-	42
F02 - Office Space 01	120	-	-	1801
F02 - Plant	110	-	-	20
F02 - Stairwell	-	100	-	31
F02 - WC	-	100	-	21
F02 - WC	-	100	-	21
F02 - Lift Lobby 03	-	100	-	41
F03 - Acc. WC	-	100	-	30

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
F03 - Cupboard	100	-	-	2
F03 - Cupboard	100	-	-	1
F03 - Cupboard	100	-	-	2
F03 - Cupboard	100	-	-	2
F03 - Lift Lobby	-	100	-	28
F03 - Lift Lobby F03	-	100	-	42
F03 - Office Space 01	120	-	-	1798
F03 - Plant	110	-	-	20
F03 - Stairwell	-	100	-	31
F03 - WC	-	100	-	21
F03 - WC	-	100	-	21
F03 - Lift Lobby 03	-	100	-	41
F04 - Acc. WC	-	100	-	30
F04 - Cupboard	100	-	-	2
F04 - Cupboard	100	-	-	1
F04 - Cupboard	100	-	-	2
F04 - Cupboard	100	-	-	2
F04 - Lift Lobby	-	100	-	28
F04 - Lift Lobby F04	-	100	-	42
F04 - Office Space 01	120	-	-	1801
F04 - Plant	110	-	-	20
F04 - Stairwell	-	100	-	31
F04 - WC	-	100	-	21
F04 - WC	-	100	-	21
F04 - Lift Lobby 03	-	100	-	41
F05 - Acc. WC	-	100	-	30
F05 - Cupboard	100	-	-	2
F05 - Cupboard	100	-	-	1
F05 - Cupboard	100	-	-	2
F05 - Cupboard	100	-	-	2
F05 - Lift Lobby	-	100	-	28
F05 - Lift Lobby F05	-	100	-	42
F05 - Plant	110	-	-	20
F05 - Stairwell	-	100	-	31
F05 - WC	-	100	-	21
F05 - WC	-	100	-	21
F05 - Lift Lobby 03	-	100	-	41
F06 - Plant	110	-	-	22
F06 - Stairwell	-	100	-	36
F06 - WC	-	100	-	22
F06 - WC	-	100	-	22
F06 - Office Space	120	-	-	13
F05 - Office Space 01	120	-	-	1736
I -	1	1	1	I

Zone name         Luminaire         Lamp         Display lamp         General lighting [W]           BF-01 - Plant Room         110         -         -         25           BF-01 - Acc. WC         -         100         -         41           BF-01 - Acc. WC         -         100         -         41           BF-01 - Lift Lobby         -         100         -         39           BF-01 - Cupboard         100         -         -         7           F05 - Office Space         120         -         -         194           BF-01 - Store         100         -         -         9           BF-01 - Store         100         -         -         10           BF-01 - Store         100         -         -         10           BF-01 - Store         100         -         -         49           BF-01 - Retail Unit 02         -         90         80         1596           BF-01 - New Water Tank Room         110         -         -         95           BF-01 - Circulation         -         100         -         36           F01 - Office Space 01         120         -         -         1667
Standard value         60         60         22           BF-01 - Plant Room         110         -         -         25           BF-01 - Acc. WC         -         100         -         41           BF-01 - Lift Lobby         -         100         -         39           BF-01 - Cupboard         100         -         -         7           F05 - Office Space         120         -         -         194           BF-01 - Store         100         -         -         9           BF-01 - Store         100         -         -         90           BF-01 - Retail Unit 02         -         90         80         1596           BF-01 - Plant Room         110         -         -         49           BF-01 - Lift Lobby         -         100         -         33           BF-01 - New Water Tank Room         110         -         -         95           BF-01 - New Water Tank Room         110         -         -         95           BF-01 - Circulation         -         100         -         36           F01 - Office Space 01         120         -         -         1667           F06 - Office Space 01<
BF-01 - Plant Room       110       -       -       25         BF-01 - Acc. WC       -       100       -       41         BF-01 - Lift Lobby       -       100       -       39         BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       9         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Office Space 01       120       -       1261       33         F06 - Office Space 01       120       -       1261       33         F06 - Office Space 01       120       -       1261       332 <td< th=""></td<>
BF-01 - Acc. WC       -       100       -       41         BF-01 - Lift Lobby       -       100       -       39         BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Office Space 01       120       -       1261       332         F06 - Office Space 01       120       -       1261       332         F06 - Office Space 01       20       -       1261       332
BF-01 - Lift Lobby       -       100       -       39         BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 0
BF-01 - Cupboard       100       -       -       7         F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Fle
F05 - Office Space       120       -       -       194         BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Flex space       100       -       -       170         GF00 -
BF-01 - Store       100       -       -       9         BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Flex space       100       -       -       170         GE00 - Acc WC       -       100       -       38
BF-01 - Store       100       -       -       10         BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Setate Management Office       120       -       -       170
BF-01 - Retail Unit 02       -       90       80       1596         BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GE00 - Acc. WC       -       -       38       -       -
BF-01 - Plant Room       110       -       -       49         BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GE00 - Acc. WC       -       -       100       -       -
BF-01 - Lift Lobby       -       100       -       33         BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GE00 - Acc, WC       -       100       -       38
BF-01 - New Water Tank Room       110       -       -       95         BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Circulation       -       90       80       332         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
BF-01 - Retail Unit 03       -       90       80       1918         BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Acc. WC       -       100       -       38
BF-01 - Circulation       -       100       -       36         F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
F01 - Office Space 01       120       -       -       1667         F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170
F06 - Lift Lobby       -       100       -       23         F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Acc. WC       -       100       -       -       38
F06 - Office Space 01       120       -       -       1261         GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Acc. WC       -       100       -       -       38
GF00 - Circulation       -       100       -       74         GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Acc. WC       -       -       288
GF00 - Retail Unit 03       -       90       80       332         GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Acc. WC       -       100       -       -       38
GF00 - Flex space       100       -       -       288         GF00 - Estate Management Office       120       -       -       170         GF00 - Acc. WC       -       100       -       -       38
GF00 - Estate Management Office 120 170
GE00 - Acc WC
GF00 - WC - 100 - 23
GF00 - WC - 100 - 30
GF00 - Stairwell - 100 - 18
GF00 - Circulation - 100 - 22
GF00 - Stairwell - 100 - 29
GF00 - Kitchen - 100 - 202
GF00 - Flex space 100 444
GF00 - Reception/Lobby - 110 80 238
GF00 - Retail Unit 02 - 90 80 324
GF00 - Retail Unit 01 - 90 80 322
BF-01 - Stairwell - 100 - 30
BF-01 - Cleaners Cupboard 100 8
BF-01 - Circulation - 100 - 72
BF-01 - Existing Retail - 90 80 386
BF-01 - Existing Retail - 90 80 384
BF-01 - Existing Retail - 90 80 368
BF-01 - Plant 110 209
BF-01 - Shower Room - 100 - 15
BF-01 - Circulation - 100 - 35
BF-01 - Locker Room - 100 - 51
BF-01 - WC - 100 - 29
BF-01 - Shower Room - 100 - 13

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
BF-01 - Acc. WC/Shower Room	-	100	-	19
BF-01 - Shower Room	-	100	-	14
BF-01 - Shower Room	-	100	-	13
BF-01 - Shower Room	-	100	-	11
BF-01 - Shower Room	-	100	-	15
BF-01 - Shower Room	-	100	-	14
BF-01 - Shower Room	-	100	-	11
BF-01 - Shower Room	-	100	-	12
BF-01 - Shower Room	-	100	-	14
BF-01 - Stairwell	-	100	-	32
BF-01 - Lift Lobby	-	100	-	23
BF-01 - Plant	89	-	-	36
BF-01 - Plant Room	110	-	-	30
BF-01 - Store	100	-	-	16
BF-01 - Bike Store	100	-	-	105
BF-01 - Fitness and Wellbeing	-	100	-	143
BF-01 - Plant Room	110	-	-	79
BF-01 - WC	-	100	-	27
BF-01 - Retail Unit 04	-	90	80	176
BF-01 - Retail Unit 04	-	90	80	173
BF-01 - Retail Unit 04	-	90	80	1159
F01 - WC	-	100	-	38
F01 - WC	-	100	-	22
F01 - Circulation	-	100	-	20
F01 - Office Space 03	120	-	-	2461
F01 - Circulation	-	100	-	15
F01 - WC	-	100	-	38
F01 - WC	-	100	-	26
F01 - Office Space 02	120	-	-	733
F01 - WC	-	100	-	22
F01 - Circulation	-	100	-	24
F02 - WC	-	100	-	38
F02 - WC	-	100	-	22
F02 - Circulation	-	100	-	19
F02 - Office Space 02	120	-	-	704
F02 - WC	-	100	-	22
F02 - Circulation	-	100	-	24
F02 - Office Space	120	-	-	2476
F02 - Circulation	-	100	-	15
F02 - WC	-	100	-	38
F02 - WC	-	100	-	13
F02 - WC	-	100	-	26
F06 - Circulation	-	100	-	16

General lighting and display lighting	Lumino	ous effic		
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
F06 - Lift Lobby 02	-	100	-	37
F06 - Office Space	120	-	-	550
F06 - WC	-	100	-	23
F06 - Circulation	-	100	-	30
F03 - WC	-	100	-	38
F03 - WC	-	100	-	22
F03 - Circulation	-	100	-	19
F03 - Office Space	120	-	-	701
F03 - WC	-	100	-	21
F03 - Circulation	-	100	-	24
F03 - Office Space	120	-	-	2502
F03 - Circulation	-	100	-	15
F03 - WC	-	100	-	38
F03 - WC	-	100	-	26
F04 - WC	-	100	-	38
F04 - WC	-	100	-	22
F04 - Circulation	-	100	-	19
F04 - Office Space	120	-	-	2502
F04 - Circulation	-	100	-	15
F04 - WC	-	100	-	38
F04 - WC	-	100	-	27
F04 - Office Space	120	-	-	704
F04 - WC	-	100	-	22
F04 - Circulation	-	100	-	24
F05 - Circulation	-	100	-	19
F05 - Office Space	120	-	-	1722
F05 - WC	-	100	-	44
F05 - Office Space	120	-	-	38
F05 - Circulation	-	100	-	24
F06 - Lift Lobby 03	-	100	-	42
F05 - WC	-	100	-	44
F05 - Circulation	-	100	-	18
F05 - WC	-	100	-	34
F05 - Office Space	120	-	-	683
F05 - WC	-	100	-	22
F05 - Circulation	-	100	-	24
GF00 - Stairwell	-	100	-	27
BF-01 - Plant	110	-	-	32
BF-01 - Locker Room	-	100	-	52
GF00 - Post Room	100	-	-	8
GF00 - Flex Space	100	-	-	703
GF00 - Lift Lobby	-	100	-	27
GF00 - Circulation	-	100	-	99
	1		1	1

# 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?
GF00 - Retail Unit 04	YES (+92.9%)	NO
GF00 - Retail Unit 05	YES (+111.5%)	NO
GF00 - Retail Unit 06	YES (+4.5%)	NO
F02 - Office Space 01	NO (-18.8%)	NO
F03 - Office Space 01	NO (-12.1%)	NO
F04 - Office Space 01	NO (-17%)	NO
F06 - Office Space	N/A	N/A
F05 - Office Space 01	NO (-27.9%)	NO
F05 - Office Space	NO (-57.6%)	NO
BF-01 - Retail Unit 02	YES (+4.8%)	NO
BF-01 - Retail Unit 03	NO (-27.2%)	NO
F01 - Office Space 01	NO (-25.4%)	NO
F06 - Office Space 01	NO (-60.3%)	NO
GF00 - Retail Unit 03	YES (+129.9%)	NO
GF00 - Flex space	N/A	N/A
GF00 - Estate Management Office	NO (-28.3%)	NO
GF00 - Kitchen	NO (-16.7%)	NO
GF00 - Flex space	YES (+108.4%)	NO
GF00 - Reception/Lobby	YES (+32.6%)	NO
GF00 - Retail Unit 02	YES (+109.1%)	NO
GF00 - Retail Unit 01	YES (+79.3%)	NO
BF-01 - Existing Retail	N/A	N/A
BF-01 - Existing Retail	N/A	N/A
BF-01 - Existing Retail	N/A	N/A
BF-01 - Fitness and Wellbeing	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
BF-01 - Retail Unit 04	N/A	N/A
F01 - Office Space 03	NO (-38.1%)	NO
F01 - Office Space 02	NO (-7.7%)	NO
F02 - Office Space 02	NO (-9.5%)	NO
F02 - Office Space	NO (-29.6%)	NO
F06 - Office Space	NO (-62.9%)	NO
F03 - Office Space	NO (-8.9%)	NO
F03 - Office Space	NO (-29.1%)	NO
F04 - Office Space	NO (-27.9%)	NO
F04 - Office Space	NO (-21.6%)	NO
F05 - Office Space	YES (+69.9%)	NO
F05 - Office Space	N/A	N/A
F05 - Office Space	NO (-56.8%)	NO
GF00 - Flex Space	YES (+69.9%)	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?		
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> ]	8230.9	8230.9	13
External area [m <sup>2</sup> ]	7926	7926	
Weather	LON	LON	87
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	_
Average conductance [W/K]	15276.5	4160.45	_
Average U-value [W/m <sup>2</sup> K]	1.93	0.52	_
Alpha value* [%]	10.06	10	_

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

## **Building Use**

## % Area Building Type

13	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
87	B1 Offices and Workshop businesses
	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	78.21	6.42
Cooling	4.28	7.83
Auxiliary	17	11.38
Lighting	11.38	20.66
Hot water	15.98	15.43
Equipment*	36.99	36.99
TOTAL**	126.85	61.73

\* 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> ]	281.94	126.8
Primary energy* [kWh/m <sup>2</sup> ]	236.95	145.51
Total emissions [kg/m <sup>2</sup> ]	40.8	25.3

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

H	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	] Fan coil s	ystems, [HS	6] LTHW bo	iler, [HFT] I	Natural Gas	s, [CFT] Elec	ctricity			
	Actual	248.3	48	82.2	5.3	20.1	0.84	2.54	0.96	3.5
	Notional	17.6	131.2	5.7	9.6	13.7	0.86	3.79		
[ST] Central heating using water: radiators, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	892.8	0	248	0	9.9	1	0	1	0
	Notional	69.7	0	22.5	0	3.5	0.86	0		
[ST	] Central he	eating using	g water: rad	iators, [HS]	Direct or s	torage elec	tric heater,	[HFT] Elec	tricity, [CF1	] Electricit
	Actual	381.9	0	106.1	0	3.3	1	0	1	0
	Notional	59.5	0	19.2	0	2.3	0.86	0		
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	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	<b>U</b> і-Тур	Ui-Min	Surface where the minimum value occurs*
Wall	0.23	2.11	SP00000D:Surf[4]
Floor	0.2	1.2	SP00000D:Surf[6]
Roof	0.15	0.18	SP00000D:Surf[7]
Windows, roof windows, and rooflights	1.5	1.61	F0000037:Surf[16]
Personnel doors	1.5	2.2	SP00000D:Surf[8]
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
m³/(h.m²) at 50 Pa	5	25



D. GLA SAP10 Excel Spreadsheet

# **GLA Carbon Emission Reporting Spreadsheet**

## **BACKGROUND AND PURPOSE**

The GLA has decided that from January 2019 and until central Government updates Part L with the latest carbon emission factors, planning applicants are encouraged to use the SAP 10.0 emission factors for **referable applications** when estimating CO<sub>2</sub> emission performance against London Plan policies. This is a new approach being taken by the GLA to reflect the decarbonisation of the electricity grid, which is not currently taken into account by Part L of Building Regulations. This approach will remain in place until Government adopts new Building Regulations with updated emission factors.

This GLA Carbon Emission Reporting Spreadsheet facilitates the use of the SAP 10.0 emission factors and ensures a consistent and transparent process for updating Part L 2013 CO<sub>2</sub> emission performance. In particular, the approach has been developed to ensure that SAP 10.0 results can still be validated against supporting Part L 2013 BRUKL and SAP outputs.

From January 2019 all GLA referable applications (including refurbishments) are expected to use this spreadsheet to report the anticipated carbon performance of a development. This includes planning applicants who are continuing to use SAP 2012 emission factors; although doing so will need to be supported by sufficient justification in line with the Energy Assessment Guidance. Applicants are required to submit this spreadsheet to the GLA alongside the energy assessment. It should be used for both domestic and non-domestic uses. The GLA will not accept the use of alternative methodologies or tools. This is to ensure consistency and to minimise the need for clarifications during the determination period.

Planning applicants should use Part L 2013 BRUKL and SAP outputs to fill in this spreadsheet which serves as a the final step in reporting the carbon emission performance of the proposed energy strategy. It is solely for the purpose of reporting to the GLA and does not replace Part L calculations submitted for Building Regulations approval.

The spreadsheet has been developed to fit as wide a range of policy compliant approaches for referable schemes as possible. Any planning applicants with a policy compliant approach that the spreadsheet does not serve should contact the GLA at: **environment@london.gov.uk**. Applicants must not amend or alter the spreadsheet to suit non-policy compliant strategies. Any unauthorised amendment to the spreadsheet will invalidate the CO<sub>2</sub> emission calculations.

Applicants should note that we will update the spreadsheet from time to time to ensure it remains fit for purpose. Applicants are expected to use the latest version at the time of the planning submission.

Any feedback on this spreadsheet should be sent to: environment@london.gov.uk.

## METHODOLOGY

Applicants are required to complete all light blue input cells in the applicable tabs ('Carbon Factors', 'Baseline', 'Be Lean', 'Be Clean', 'Be Green' and 'GLA Summary Tables').

## Input Data

- For all applications, the input data required includes:
- Bespoke Carbon Factors (if applicable)
- Type of units modelled
- Area of units modelled (m<sup>2</sup>)
- Number of units modelled
- Total area represented by model (m<sup>2</sup>)
- Regulated energy consumption by end use (kWh p.a. for residential and kWh/m<sup>2</sup> p.a. for non-residential)
- Regulated energy consumption by fuel type (kWh/m<sup>2</sup> p.a. for non-residential)
- TER, DER and BER figures (kgCO<sub>2</sub>/m<sup>2</sup> p.a.)
- TFEE and DFEE figures for residential (kWh//m<sup>2</sup> p.a.)
- Unregulated figures (tCO<sub>2</sub> p.a.) [In the 'GLA Summary tables' tab only]
- Actual and notional building cooling demand (MJ/m<sup>2</sup>) [In the 'GLA Summary tables' tab only]
- Distribution loss factor (if applicable) [In the 'Development information' tab, Table 4]

Applicants should update the highlighted cells with the type, area and number of modelled units. The consumption figures (kWh p.a. for domestic and kWh/m<sup>2</sup> p.a. for non-domestic) from the Part L modelling output reports should be reported and used to estimate the  $CO_2$  emissions for each stage of the Energy Hierarchy. The TER, DER and BER figures from the Part L 2013 modelling output sheets should also be reported for cross-reference purposes. The applicant should ensure that the manually calculated TER, DER and BER figures are equal to the figures reported within the output sheets. TFEE and DFEE information should also be provided as well as unregulated uses consumption figures and cooling demand performance.

The total carbon emissions figures in the 'GLA Summary tables' tab are now calculated based on the area input for 'Total area represented by

model  $(m^2)'$ . This input requirement has been added to ensure that the carbon emission figures align with the development area schedule (included within the DAS) rather than the number of representative models.

### Required Part L Outputs for the GLA spreadsheet

### Domestic Part L Outputs:

For the domestic conversion applicants are required to use the outputs from the SAP TER and DER worksheets. To assist in the conversion process the required SAP worksheet rows have been referenced in each input cell. For Space Heating and Hot Water applicants will be required to manually convert the SAP energy requirements to energy consumption by fuel type, the appropriate SAP rows for this calculation have also been listed. **Note.** The SAP worksheet rows are based on a communal heating system, which is an expectation for GLA referrable schemes. Applicants proposing individual systems must first seek confirmation from the GLA as to whether the approach will be acceptable.

### Non-domestic Part L Outputs:

The required Part L outputs from non-domestic modelling will be energy consumption by **fuel type** (e.g. grid electricity, natural gas). The energy consumption by end use (e.g. heating, hot water, cooling etc.) included in the BRUKL documents are no longer used to estimate the  $CO_2$  emission performance with SAP 10.0 emission factors in this spreadsheet. This decision has been taken as the consumption figures provided in the BRUKL may include a mixture of fuel types, for instance heating may include energy consumption from gas boilers and electrically driven heat pumps. The required data can be found in:

• SBEM software: the required data is included in the output file ending "\*sim.csv"

• Government approved software (such as IES and TAS): the required data is included in the output file ending in "\*BRUKL.inp"

The above output files should be appended to the energy assessment document.

Regarding the non-domestic uses, the applicant can determine whether each individual unit will be modelled independently and apportioned to the entire scheme or whether a single model will be generated for the entire development. The applicant should, however, include the results from all BRUKL outputs generated for the proposed development under the "NON-DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS" sections. Applicants are generally encouraged to model each individual typology independently.

**Note:** GLA are aware that the Part L outputs for grid supplied electricity consumption does not account for power factor correction. Where power factor correction is present applicants may be required to amend the electricity consumption by the appropriate adjustment factor. The power factor correction is found in Table 1 of the Government's Approved Document L2A (ADL2A). Applicants should note in the appropriate cells where power factor correction has been applied.

### **Carbon Factors**

The carbon factors for SAP 2012 and SAP 10.0 scenarios have been provided in the 'Development Information' tab. The table has been prepopulated with grid electricity and gas factors. Additional space has been included for alternative fuel factors that are included in Table 12 of the SAP 2012 and SAP 10.0 methodology documents. For applications with non-domestic buildings connecting to external heat networks a bespoke carbon factor needs to be introduced, the applicant should provide the full calculation behind the introduced bespoke carbon factor.

## Validation Check

A validation check is required for each model entered to ensure that the conversion is robust. Applicants must ensure that the calculated TER/DER/BER in this spreadsheet matches the actual values from the Part L 2013 BRUKL and SAP worksheets.

TABLE 1. DEVELOPMENT INFORMATION		NOTES
Date of Application		Please provide the date the application was submitted to the Local Planning Authority.
Local Planning Authority		Please indicate the Local Planning Authority determining the application.
Confirmed carbon offset		Please confirm the agreed carbon offset price for the Local Planning Authority. Evidence of communication on the
price		price is expected to be included in the energy assessment. If no value is entered then the GLA's recommend price of
(£/tonne of carbon		£95 per tonne of carbon dioxide will be used.
dioxide)		

TABLE 2. CARBON (CO <sub>2</sub> ) FACTORS			NOTES
Fuel type	Fuel Carbon Fa	ictor (kgCO <sub>2</sub> /kWh)	
	SAP 2012	SAP 10.0	
Natural Gas	0.216	0.210	SAP 2012 and SAP 10.0 carbon emission factors (Table 12).
Grid Electricity	0.519	0.233	
Enter Carbon Factor 1			These factors should be used where alternative fuel is used to grid gas and electricity. Carbon emission factors used
Enter Carbon Factor 2			here must be taken from Table 12 within the SAP 2012 and SAP 10.0 documents.
Enter Carbon Factor 3			Fuel type should be updated and referenced in Column A when additional carbon factor values have been added.
Enter Carbon Factor 4			
Bespoke DH Factor			This should only be used for non-domestic buildings that are connecting to District Heating (DH) networks. The network carbon factor should be calculated in line with Part L requirements and separate factors should be provided using SAP 2012 and SAP 10.0 fuel factors. Assumptions and workings should be shown below in Table 4.

TABLE 3. BESPOKE DH CARBON FACTOR CALCULATION METHODOLOGY

Please provide below details of the calculation methodology followed to establish the bespoke carbon factor, if applicable.

TABLE 4. DISTRIBUTION	LOSSES		COMMENTS	
Primary network (buried pipe)	Total pipe length (m)			

	Average heat loss rate (W/m)	
Secondary network (buried pipe)	Total pipe length (m)	
	Average heat loss rate (W/m)	
Total losses (MWh/year)		
Total heat supplied (MWh	/year)	
Distribution Loss Factor (E	DLF)	
Calculation included in en	ergy statement (yes/no)	

The applicar	nt should compl	ete all the light bl	lue cells incl	luding informa	tion on the model	led units, the are	ea per unit, the nu	mber of units, the	baseline energy	consumption fi	gures, the TER a	nd the TFEE.			SAP 2012 CO <sub>2</sub> F	ERFORMANCE					SA	AP 10.0 CO <sub>2</sub> P	PERFORMANCE				
DOMEST		Y CONSUMP	TION AN		ALYSIS	ų																					DEMAND
				VALIDAT	TION CHECK		REGULATED EN		PTION PER UNIT	(kWh p.a.) - TE	R WORKSHEET			REGU	ILATED CO2 EMISSIC	NS PER UNIT (kgCO₂ p	o.a.)				REGUL	LATED CO <sub>2</sub> EN	MISSIONS PER UN	ΙΙΤ			Fabric Energy Efficiency
Unit identif (e.g. plot number, dwelling ty etc.)	ier Model tota floor area (m²)	l Number of re units	Total area epresented by model (m²)	Calculated TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	TER Worksheet TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	Space Heating	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot Water	Lighting	Auxiliary	Cooling	Space Heating	Domestic Hot Wa	ater Lighting	Auxiliary	Cooling	2012 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Space Heatin	g Domestic Hot V	Vater Lightin	ing	Auxiliary	Cooling	SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Calculated TER SAP 10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )	(FEE) Target Fabric Energy Efficiency (TFEE) (kWh/m²)
	TER Worksheet (Row 4)	:			TER Worksheet (Row 273)	TER Worksheet (Row 211)		TER Worksheet (Row 219)		TER Worksheet (Row 232)	TER Worksheet (Row 231)	N / A															
Sum	0	0	0	0.0	_	0	N/A	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0.0	0.00
NON-DO			SUMPTIC	ON AND CO	D₂ ANALYSIS	и ;																					
Building U	Model Area	- a Number of re	Total area epresented	VALIDAT Calculated	TION CHECK BRUKL	REGUL	ATED ENERGY CO	DNSUMPTION BY Domestic Hot	END USE (kWh/r Fuel type	m² p.a.) TER - SO	OURCE: BRUKL	OUTPUT Cooling	REGULATED ENE	RGY CONSUMPTIO	N BY FUEL TYPE (k)	/h/m² p.a.) TER - SOUI	RCE: BRUKL.INP o	r *SIM.CSV FILE 2012 CO <sub>2</sub>	REGUL Natural Gas	ATED ENERGY CON	SUMPTION BY FU	JEL TYPE (kW ed Grid	Wh/m² p.a.) - TER B	RUKL	REGULATED SAP10.0 CO <sub>2</sub>	CO <sub>2</sub> EMISSIONS BRUKL	
	8230.9	units	by model (m²)	TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	(kWh/m <sup>2</sup> p.a.)	Space Heating	Water (kWh/m² p.a.)	Domestic Hot Water	(kWh/m² p.a.)	(kWh/m² p.a.)	(kWh/m² p.a.)	0.216 kgCO <sub>2</sub> /kWh	0.519 kgCO <sub>2</sub> /kW	Vh 0.519 kgCO <sub>2</sub> /k	Vh		(kgCO <sub>2</sub> p.a.)	0.210 kgCO <sub>2</sub> /kl	Vh 0.233 kgCO <sub>2</sub> //	Wh 0.233 kgCC	city O₂/kWh			emissions (kgCO <sub>2</sub> p.a.)	TER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 20.3	
Onice	8230.9	1	8230.9	34.0	34.5	24.44	Natural Gas	18.38	Natural Gas	22.27	19.38	8.3	43	49	19			204,172	43	49	19				167,413	20.3	
Sum	8,231	1	8,231	34.5	-	201,163	N/A	151,284	N/A	183,302	159,515	68,316	352,447	400,855	158,015	N/A	N/A	284,172	352,447	400,855	158,01	15	N/A	N/A	167,413	20.3	
SITE-WIDE E	ENERGY CONSU	IMPTION AND CO	02 ANALYSIS	S		1																					
Use		Total Area (m²)		Calculated TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	-	Space Heating		REGULATEI Domestic Hot Water			Auxiliary	Cooling						CO <sub>2</sub> EMISSIONS 2012 CO <sub>2</sub> emissions							REGULATED PER SAP 10.0 CO <sub>2</sub> emissions	CO <sub>2</sub> EMISSIONS R UNIT Calculated TER SAP 10.0	
Sum		8,231		34.5	-	201,163	HIA	(kWh p.a.)	HIA	(kwn p.a.) 183,302	(kwn p.a.) 159,515	(KWN p.a.) 68,316						(kgCO <sub>2</sub> p.a.) 284,172							(kgCO₂ p.a.) 167,413	(kgCO <sub>2</sub> / m <sup>2</sup> )	
						·																					

DOMESTIC	ENFRGY	CONSU			AI YSIS				
Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m²)	Number of units	Total area represented by model (m²)	Calculated DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	DER Worksheet DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	Space Heating	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)	Fuel type Domestic Hot Water
					DER Sheet (Row 384)	DER Sheet [(Row 307a) ÷ (Row 367a x	Select fuel type	DER Sheet [Row 310b ÷ (Row 367b x 0.01)]	Select fuel type
	0 ESTIC ENI				- 	0	N/A	0	N/A
				VALIDATI	ON CHECK		REGUL		SUMPTION BY END
Building Use	Model Area (m²)	Number of units	represented by model	Calculated	BRUKL	Space Heating (kWh/m <sup>2</sup> p.a.)	Fuel type	Domestic Hot	Fuel type
Office			(m²)	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	(	Space Heating	Water (kWh/m² p.a.)	Domestic Hot Water
	8230.9	1	(m²) 8230.9	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	78.21	Space Heating	Water (kWh/m² p.a.) 15.98	Domestic Hot Water
	8230.9	1	(m²) 8230.9	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	78.21	Space Heating Natural Gas	Water (kWh/m² p.a.) 15.98	Domestic Hot Water
Sum	8230.9	1	(m²) 8230.9	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	643.739	Space Heating Natural Gas	Water (kWh/m² p.a.) 15.98	Domestic Hot Water
Sum SITE-WIDE	8230.9 8,231 8,231	1 1 CONSUN	(m²) 8230.9 8,231 8,231	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8 40.8 ND CO2 AN	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	78.21	Space Heating Natural Gas	Water (kWh/m² p.a.) 15.98	Domestic Hot Water         Natural Gas
Sum SITE-WIDE	8230.9 8,231 ENERGY	1 1 CONSUN	(m²) 8230.9 8,231 8,231 /IPTION A	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8 40.8 A0.8 ND CO2 AN Calculated BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> ) 40.8	78.21 78.21 643,739 643,739	Space Heating Natural Gas	Water (kWh/m² p.a.) 15.98 131,530	Domestic Hot         Natural Gas         Natural Gas         NIA         REGULATED

energy deman	d of the 'be lean' s	scenario.					:	SAP 2012 CO <sub>2</sub> PER	FORMANCE				SAP	10.0 CO <sub>2</sub> PERFORMANCE				F
PER UNIT (kWh	p.a.) - 'BE LEAN'	SAP DER WORK	SHEET				REGULATE	D CO2 EMISSIONS	S PER UNIT (kgCO₂ p.a.)				REGULA	TED CO <sub>2</sub> EMISSIONS PER UNIT				Fabric Effi
Secondary Heating system	Fuel type Space Heating	Lighting	Auxiliary	Cooling		Space Heating CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Domestic Hot Water CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Lighting CO <sub>2</sub> emissions ( (kgCO <sub>2</sub> p.a.)	Auxiliary Cooli CO <sub>2</sub> emissions CO <sub>2</sub> emis (kgCO <sub>2</sub> p.a.) (kgCO <sub>2</sub>	ng 2012 CO <sub>2</sub> emissions ssions (kgCO <sub>2</sub> p.a.) p.a.)	Space Heating CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Domestic Hot Water CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Lighting CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Auxiliary Cooling CO <sub>2</sub> emissions CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) (kgCO <sub>2</sub> p.a.)	Unregulated (kgCO <sub>2</sub> p.a.)	SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Calculated DER SAP 10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )	(F Dwellin En Effic (D (kW
DER Sheet [Row 309]	Select fuel type	DER Sheet Row 332	DER Sheet (Row 313 + 331)	DER Sheet Row 315	-													
0	N/A	0	0	0	N/A	0	0	0	0 0	0	0	0	0	0 0	0	0	0.0	
								/b/m² n a \ 'BE I EA					REGULA					
		Lighting (kWh/m² p.a.)	Auxiliary (kWh/m² p.a.)	Cooling (kWh/m² p.a.)	Natural Gas	Grid Electricity	Equipment			2012 CO <sub>2</sub> emissions	Natural Gas	Grid Electricity	Equipment			SAP 10.0 CO <sub>2</sub>	BRUKL	-
		11.38	17	4.28	0.216 kgCO₂/kWh 94	0.519 kgCO₂/kWh 39	0.519 kgCO₂/kWh	-		(kgCO₂ p.a.) 335,577	0.210 kgCO₂/kWh 94	0.233 kgCO₂/kWh 39	0.233 kgCO₂/kWh 19			emissions (kgCO <sub>2</sub> p.a.) 238.282	BER SAP 10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 	
N/A	N/A	93,668	139,925	35,228	775,268	323,930	158,015	N/A	N/A N/A	A <u>335,577</u>	775,268	323,930	158,015			238,282	28.9	
D ENERGY COI										REGULATED CO₂ EMISSIONS						REGULATED	CO <sub>2</sub> EMISSIONS	
Secondary Heating System (kWh p.a.)	MA	Lighting (kWh p.a.)	Auxiliary (kWh p.a.)	Cooling (kWh p.a.)						2012 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)						SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Calculated BER SAP 10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )	
0		93,668	139,925	35,228						335,577						238,282	28.9	

energy demand of the 'be lean'	scenario.						SAP 2012 CO <sub>2</sub> PE	ERFORMANCE					SAP	10.0 CO <sub>2</sub> PERFOR	MANCE				F
											1								
ER UNIT (kWh p.a.) - 'BE LEAN'	SAP DER WORK	SHEET				REGULATE	ED CO <sub>2</sub> EMISSIOI	NS PER UNIT (kgC	CO <sub>2</sub> p.a.)				REGULAT	ED CO <sub>2</sub> EMISSION	NS PER UNIT				Fabric Effi (I
Secondary Fuel type Heating Space Heating system	Lighting	Auxiliary	Cooling		Space Heating CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Domestic Hot Water CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Lighting CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Auxiliary s CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Cooling CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	2012 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Space Heating CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Domestic Hot Water CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Lighting CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Auxiliary CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Cooling CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Unregulated (kgCO <sub>2</sub> p.a.)	SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	Calculated DER SAP 10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )	Dwellin Er Effi (D (kV
DER Sheet Select fuel type [Row 309]	DER Sheet Row 332	DER Sheet (Row 313 + 331)	DER Sheet Row 315																
0 N/A	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C
USE (kWh/m² p.a.) 'BE LEAN' BI	ER - SOURCE: BR	UKL OUTPUT		REGULATED ENE	RGY CONSUMPTION	BY FUEL TYPE (kW	/h/m² p.a.) 'BE LI	EAN' BER - SOUR	RCE: BRUKL.INF	or *SIM.CSV FILE			REGULAT	ED CO₂ EMISSIO	NS PER UNIT				
	Lighting (kWh/m² p.a.)	Auxiliary (kWh/m² p.a.)	Cooling (kWh/m² p.a.)	Natural Gas	Grid Electricity	Equipment				2012 CO <sub>2</sub> emissions	Natural Gas	Grid Electricity	Equipment				SAP 10.0 CO <sub>2</sub> emissions	BRUKL BER SAP 10.0	
	11.38	17	4.28	0.216 kgCO <sub>2</sub> /kWh 94	0.519 kgCO₂/kWh 39	0.519 kgCO₂/kWh 19	-			335,577	0.210 kgCO <sub>2</sub> /kWh 94	0.233 kgCO₂/kWh 39	0.233 kgCO₂/kWh 19				(kgCO <sub>2</sub> p.a.) 238,282	(kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9	
N/A N/A	93,668	139,925	35,228	775,268	323,930	158,015	N/A	N/A	N/A	335,577	775,268	323,930	158,015				238,282	28.9	
										REGULATED CO.									
ENERGY CONSUMPTION										EMISSIONS							REGULATED	CO <sub>2</sub> EMISSIONS	



The applicant should o	complete all the light	blue cells inc	luding informa	ation on the 'be cl	ean' energy cons	umption figures an	nd the 'be clean' DE	ER.												SAP 2012 CO <sub>2</sub> PERF	ORMANCE						
DOMESTIC ENE	ERGY CONSUM		ND CO2 AN	IALYSIS																							
			VALIDAT	ION CHECK				REGULAT		UMPTION PER UN	IT (kWh p.a.) - 'BE	CLEAN' SAP DER	WORKSHEET						REGULAT	ED CO <sub>2</sub> EMISSIONS P	'ER UNIT (kgCO₂ p.a.)						REG
Unit identifier (e.g. plot Mode	el total Number of r	Total area	Calculated	DER Worksheet	Space Heating	Fuel type	Domestic Hot Water	Fuel type	Space and	Fuel type CHP	Total Electricity	Secondary	Fuel type	Lighting	Auxiliary	Cooling	Space Heating	Domestic Hot Water	Space Heating and	Electricity generated	Lighting	Auxiliary	Cooling	2012 $CO_2$ emissions	Space Heating	Domestic Hot Water	Space Heating and
dwelling type (n etc.)	m²) units	by model (m²)	$(kgCO_2 / m^2)$	$(kgCO_2 / m^2)$	(near oource r)	Space heating	(Heat Source 1)	) Water	Water from CHP		CHP (-)	rieating system	Heating							by offi				(κgCO <sub>2</sub> μ.a.)			
									if applicable	if applicable	if applicable								if applicable	if applicable							if applicable
				DER Sheet (Row 384)	DER Sheet [Row 307b ÷	Select fuel type	DER Sheet [Row 310b ÷	Select fuel type	DER Sheet [(Row 307a +	Select fuel type	DER Sheet [(Row 307a +	DER Sheet [Row 309]	Select fuel type	DER Sheet Row 332	DER Sheet (Row 313 + 331)	DER Sheet Row 315											
					(Row 367b x 0.01)]		(Row 367b x 0.01)]		310a) ÷ (Row 362 x 0.01)]		310a) × (Row 361 ÷ 362)]																
Sum	0 0	0	0.0	-	0	N/A	0	N/A	0	N/A	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON-DOMESTIC		NSUMPTI			S																						
		-	VALIDAT Calculated	ION CHECK BRUKL	Space Heating	Fuel type	Domestic Hot	REGULATED ENI Fuel type	ERGY CONSUMPTIC	ON BY END USE (k	Wh/m² p.a.) 'BE C Electricity	LEAN' BER - SOUR	CE: BRUKL OUT	PUT Lighting	Auxiliary	Cooling	REGU Natural Gas	LATED ENERGY CONS	SUMPTION BY FUE Bespoke DH Factor	L TYPE (kWh/m <sup>2</sup> p.a.) Electricity generated	'BE CLEAN' BER - SO Equipment	URCE: BRUKL.INF	P or *SIM.CSV	FILE 2012 CO <sub>2</sub> emissions	Natural Gas	Grid Electricity	REGUI Bespoke DH Factor
Building Use Mode	el Area Number of r	Total area represented	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	(kWh/m² p.a.)	Space Heating	Water (kWh/m² p.a.)	Domestic Hot Water			generated by CHP			(kWh/m² p.a.)	(kWh/m² p.a.)	(kWh/m² p.a.)			·	by CHP (-)				(kgCO₂ p.a.)			
(1)	n-) units	(m²)	,								(-)									if applicable							
Office 823	30.9 1	8230.9	40.8	40.8	78.2	Natural Gas	16.0	Natural Gas			if applicable 0	-		11.38	17	4.28	0.216 kgCO <sub>2</sub> /kWh 94.19	0.519 kgCO <sub>2</sub> /kWh 39.3553	0.000 kgCO₂/kWh 0	0.519 kgCO₂/kWh 0	0.519 kgCO₂/kWh 19			335,577	0.210 kgCO₂/kWh 94	0.233 kgCO₂/kWh 39	0.000 kgCO₂/kWh
									l																		
									NIA	NIA		NIA	NIA									NIA	NIA				
									V	v		V.	, v									N.	v				
Sum 8,2	231 1	8,231	40.8	-	643,739	N/A	131,530	N/A			0			93,668	139,925	35,228	775,268	323,930	0	0	158,015			335,577	775,268	323,930	0
SITE-WIDE ENE		IPTION AN	ND CO2 AN	IALYSIS																							
										REGULATED ENE	RGY CONSUMPTI	ION												REGULATED CO <sub>2</sub> EMISSIONS			
Use	Total Area (m²)	)	Calculated BER 2012	-					Space and		Electricity	-															
			(kgCO <sub>2</sub> / m <sup>2</sup> )		Space Heating (kWh p.a.)		Domestic Hot Water	.0	Domestic Hot Water from CHP	.0.	generated by CHP	Secondary Heating System	.0	Lighting (kWh p.a.)	Auxiliary (kWh p.a.)	Cooling (kWh p.a.)								2012 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)			
					,	HIL	(kWh p.a.)	HIP.	(kWh p.a.)	HIP.	(kWh p.a.) <i>if applicable</i>	(kWh p.a.)	HIL		, F)	,								( ) <u>2</u> [·····)			
Sum	8,231		40.8	-	643,739		131,530		0		0	0		93,668	139,925	35,228								335,577			

SAP 10.0 CO <sub>2</sub>	PERFORMANCE				
EGULATED CO <sub>2</sub> EMISS	IONS PER UNIT (kgCC	0₂ p.a.)			
d Electricity generated	Lighting	Auxiliary	Cooling	SAP 10.0 CO <sub>2</sub>	Calculated
by CHP				emissions (kgCO <sub>2</sub> p.a.)	$\frac{\text{DER SAP 10.0}}{(\text{kgCO}_2 / \text{m}^2)}$
					,
if applicable					
0	0	0	0	0	0.0
0	0	0	0	0	0.0
0 ULATED CO₂ EMISSION	0 IS PER UNIT	0	0	0	0.0
0 ULATED CO₂ EMISSION r Electricity generated	0 IS PER UNIT Equipment	0	0	<i>0</i> SAP 10.0 CO <sub>2</sub>	0.0 BRUKL
0 ULATED CO₂ EMISSION r Electricity generated by CHP (-)	0 IS PER UNIT Equipment	0	0	<i>0</i> SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )
0 ULATED CO₂ EMISSION r Electricity generated by CHP (-) if applicable	0 IS PER UNIT Equipment	0	0	<i>0</i> SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )
0 ULATED CO₂ EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO₂/kWh	0 S PER UNIT Equipment 0.233 kgCO₂/kWh	0	0	<i>0</i> SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> )
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO₂/kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION or Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION or Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION or Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19	0	0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19		0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19		0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19		0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19		0	0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO2 EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO2/kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9
0 ULATED CO2 EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO2/kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9
0 ULATED CO2 EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO2/kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19 158,015			0 SAP 10.0 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.) 238,282 238,282 238,282	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9
0 ULATED CO2 EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO2/kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19			0         SAP 10.0 CO2         emissions         (kgCO2 p.a.)         238,282         238,282         REGULATED         PEF	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19 158,015			0         SAP 10.0 CO2 emissions (kgCO2 p.a.)         238,282         238,282         REGULATED PER         REGULATED PER	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (.) if applicable 0.233 kgCO <sub>2</sub> /kWh 0	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19 158,015			0         SAP 10.0 CO2         emissions         (kgCO2 p.a.)         238,282         238,282         REGULATED         PEF         SAP 10.0 CO2         emissions	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9 28.9 28.9 28.9
0 ULATED CO <sub>2</sub> EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO <sub>2</sub> /kWh 0	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19 158,015			0         SAP 10.0 CO2         emissions         (kgCO2 p.a.)         238,282         REGULATED         PEF         SAP 10.0 CO2         emissions         (kgCO2 p.a.)	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9 28.9 28.9
0 ULATED CO2 EMISSION r Electricity generated by CHP (-) if applicable 0.233 kgCO2/kWh	0 S PER UNIT Equipment 0.233 kgCO <sub>2</sub> /kWh 19 158,015			0         SAP 10.0 CO2         emissions         (kgCO2 p.a.)         238,282         REGULATED         PEF         SAP 10.0 CO2         emissions         (kgCO2 p.a.)	0.0 BRUKL BER SAP10.0 (kgCO <sub>2</sub> / m <sup>2</sup> ) 28.9 28.9 28.9 28.9 28.9

The applicant sh	•												
DOMESTIC	ENERGY	CONSUMP	TION AND	CO2 ANALY	SIS								
				VALIDATI	ON CHECK							REGULATED ENERGY	
Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m²)	Number of units	Total area represented by model (m²)	Calculated DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	DER Worksheet DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	Space Heating (Heat Source 1)	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)	Fuel type Domestic Hot Water	Space Heating (Heat source 2)	Fuel type Space Heating	Domestic Hot Water (Heat source 2)	l Do
					DER Sheet (Row 384)	DER Sheet [Row 307b ÷ (Row 367b x 0.01)]	Select fuel type	DER Sheet [Row 310b ÷ (Row 367b x 0.01)]	Select fuel type	if applicable DER Sheet [Row 307c ÷ (Row 367c x 0.01)]	Select fuel type	if applicable DER Sheet [Row 310c ÷ (Row 367c x 0.01)]	Sele
Sum	0	0	0	0.0	-	0	N/A	0	N/A	0	N/A	0	
NON-DOME	STIC ENE	RGY CONS	SUMPTION		IALYSIS	1					REGU	ATED ENERGY CONS	
Use	Area per unit (m²)	Number of units	Total area represented	Calculated BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	BRUKL BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	Space Heating (kWh/m² p.a.)	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot				
Office			by model (m²)		(02)			(kWh/m² p.a.)	water				
	8230.9	1	by model (m²) 8230.9	31.1	31.1	26.08	Grid Electricity	(kWh/m² p.a.)	Grid Electricity	WA	WA	w	
Sum	8230.9	1	by model (m²) 8230.9 8233.9	31.1	31.1	26.08	Grid Electricity	(kWh/m² p.a.) 5.82 47,904	Vater	WA	ъ	W	
Sum	8230.9 8,231 ENERGY (	1 1 CONSUMP	by model (m²) 8230.9 8231 8,231	31.1 31.1 31.1	31.1	26.08	Grid Electricity	(kWh/m² p.a.) 5.82	Water Grid Electricity	WA	м		
Sum SITE-WIDE E	8230.9 8,231 ENERGY (	1 1 CONSUMP	by model (m²) 8230.9 8231 8,231 TION AND	31.1 31.1 31.1 CO2 ANALYS Calculated BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	31.1 - SIS	26.08	Grid Electricity	(kWh/m² p.a.) 5.82 47,904	Water         Grid Electricity         N/A	Space Heating	<b>W</b> A	WA Domestic Hot Water	
Sum SITE-WIDE E	8230.9 8,231 ENERGY (	1 1 CONSUMP Total Area (m	by model (m²) 8230.9 8231 8,231 TION AND	31.1 31.1 31.1 CO2 ANALYS Calculated BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	31.1 - SIS	26.08 214,662	Srid Electricity	(kWh/m² p.a.) 5.82 47,904	Water Grid Electricity	W <sup>A</sup> Space Heating (Heat source 2) (kWh p.a.)	κ	W <sup>A</sup>	

green' DER.																		SAP 2012 CO <sub>2</sub> PEF	FORMANCE								SAP 10.0	CO <sub>2</sub> PERFORMANCE				
				REGULATED ENERG	GY CONSUMPTION PE	ER UNIT (kWh p.a.)	) - 'BE GREEN' SAP DE	R WORKSHEET									RE	EGULATED CO <sub>2</sub> EMISSIONS	∋ PER UNIT (kgCO₂ p.a.)								REGULATED	CO <sub>2</sub> EMISSIONS PER UN	IIT			
Domestic Hot Water	Fuel type Domestic Hot Water	Space Heating t source 2)	g (Heat Fuel type 2) Space Heating	Domestic Hot Wate g (Heat source 2)	er Fuel type Domestic Hot Water	Space and Domestic Hot	Fuel type CHP	Total Electricity generated by	Secondary Heating system	Fuel type Secondary	Electricity generated by	Lighting	Auxiliary	Cooling	Space Heating Domestic Hot Wate	er Space Heating and DHW from CHP	Electricity generated by CHP	Electricity generated by renewable	Lighting A	uxiliary Cooli	ling	2012 CO <sub>2</sub> emissions (kgCO <sub>2</sub> p.a.)	s Space Heating	Domestic Hot Water	Space Heating and DHW from CHP	Electricity generated by CHP	Electricity generated by renewable	Lighting	Auxiliary	Cooling	S	SAP 10.0 CO <sub>2</sub> Calculated emissions DER SAP 10.0
(Heat Source 1)	water				water	water from CHP	F	СпР (-)		Heating	renewable (-)																					(kgCO <sub>2</sub> p.a.) (kgCO <sub>2</sub> / m <sup>2</sup> )
DER Sheet [Row 310b ÷	Select fuel type	if applicable e DER Shee [Row 307c	ble et Select fuel typ ; ÷	if applicable De DER Sheet [Row 310c ÷ (Row 367c × 0.01)]	Select fuel type	if applicable DER Sheet [(Row 307a +	if applicable Select fuel type	if applicable DER Sheet [(Row 307a + 310a) × (Row 361	DER Sheet Row 309	Select fuel type	if applicable DER Sheet Row 333	DER Sheet Row 332	DER Sheet (Row 313 + 331)	DER Sheet Row 315		if applicable	if applicable	if applicable							if applicable	if applicable	if applicable				-	
(KOW 367D X 0.01)]		(KOW 307C X 0		(KOW 507C X 0.01)	1	(Row 362 x 0.01)	)]	÷ 362)]																							-	
0	N/A	0	N/A	0	N⁄A	0	N/A	0	0	N/A	0	0	0	0	0 0	0	0	0	0	0 0	NA	0	0	0	0	0	0	0	0	0	NA	<i>0</i> 0.0
Domestic Hot Water	Fuel type Domestic Hot		REC	GULATED ENERGY CON	ISUMPTION BY END U	JSE (kWh/m² p.a.) '	'BE GREEN' BER - SO	URCE: BRUKL OUT Electricity generated by			Electricity	Lighting (kWb/m² n a )	Auxiliary (kWb/m² n a )	Cooling (kWb/m² n a )	Natural Gas Grid Electricity	REGULATED ENE Bespoke DH Factor	ERGY CONSUMPTION B Electricity generated by CHP	SY FUEL TYPE (kWh/m² p.a Electricity generated Electricity renewable	.) 'BE GREEN' BER - SOURC nter Carbon Factor Enter C 1	E: BRUKL.INP or *SIM.CSV arbon Factor Enter Carbo	V FILE on Factor Equipm	ent 2012 CO <sub>2</sub> emissions	s Natural Gas	Grid Electricity	Bespoke DH Factor	REGULATED CO <sub>2</sub> E Electricity generated	MISSIONS PER UNIT Electricity generated	Enter Carbon Factor	Enter Carbon Factor	Enter Carbon Factor	Equipment	SAP 10.0 $CO_2$ BRUKL emissions BFR SAP 10.0
(kWh/m <sup>2</sup> p.a.)	Water							CHP (-)			renewable technology (-)						(-) if applicable	technology (-) if applicable	·	- 0		(kg00 <sub>2</sub> p.a.)				(-) if applicable	technology (-) if applicable	·	-			(kgCO <sub>2</sub> / m <sup>2</sup> )
5.82	Grid Electricity	_					-	if applicable 0			if applicable	11.38	16.66	3.1	0.216 kgCO <sub>2</sub> /kWh 0.519 kgCO <sub>2</sub> /kWh 0 60	0.000 kgCO₂/kWh 0	0.519 kgCO₂/kWh 0	0.519 kgCO₂/kWh 0	0.000 kgCO₂/kWh 0.000 0	kgCO₂/kWh 0.000 kgC 0 0	CO₂/kWh 0.519 kgCC 19	D <sub>2</sub> /kWh 255,832	0.210 kgCO₂/kWh	0.233 kgCO₂/kWh 60	0.000 kgCO₂/kWh	0.233 kgCO₂/kWh	0.233 kgCO₂/kWh	0.000 kgCO₂/kWh	0.000 kgCO₂/kWh	0.000 kgCO₂/kWh	0.233 kgCO <sub>2</sub> /kWh 19	114,853 14.0
		AI	Alt	AL	Ali	Alt	118		Ali	411																						
		<i>L</i> P.	<i>L</i> a.	<i>L</i> 2.	Ln.	<i>L</i> n.	49.		<i>L</i> 4.	<i>L</i> n.																						
47,904	N/A							0			0	93,668	137,127	25,516	0 492,932	0	0	0	0	0 0	158,01	15 <u>255,832</u>	0	492,932	0	0	0	0	0	0	158,015	114,853 14.0
					REGULATED	D ENERGY CONSU	JMPTION															REGULATED CO <sub>2</sub> EMISSIONS										REGULATED CO <sub>2</sub> EMISSIONS
Domestic Hot Water		Space Heati (Heat source	ting e 2)	Domestic Hot Wate (Heat source 2)	er	Space and Domestic Hot	P	Electricity generated by CHP	Secondary Heating system		Electricity generated by renewable	Lighting	Auxiliary									2012 CO <sub>2</sub> emissions	s								S	SAP 10.0 CO <sub>2</sub> Calculated emissions BER SAP 10.0
(kWh p.a.)	HIA	(kWh p.a	a.) <sub>t</sub> up	(kWh p.a.)	NA	(kWh p.a.)	the	(kWh p.a.) <i>if applicable</i>	(kWh p.a.)	HIA	(kWh p.a.) <i>if applicable</i>	(אזאוו h.a.)	(rwii p.a.)	(איזיוו p.a.)																	HIP	(kgCO <sub>2</sub> / m <sup>2</sup> )
47,904		0		0		0		0	0		0	93,668	137,127	25,516								255,832										114,853 14.0

# SAP 2012 Performance

## Domestic

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for domestic buildings

	Carbon Dioxide Emission (Tonnes CO <sub>2</sub>	ns for domestic buildings 2 per annum)
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	0.0	
After energy demand reduction (be lean)	0.0	
After heat network connection (be clean)	0.0	
After renewable energy (be green)	0.0	

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for domestic buildings

	Regulated domestic c	arbon dioxide savings
	(Tonnes CO <sub>2</sub> per annum)	(%)
Be lean: savings from energy demand reduction	0.0	0%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.0	0%
Cumulative on site savings	0.0	0%
Annual savings from off- set payment	0.0	-
	(Tonne	es CO <sub>2</sub> )
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	0	

\*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

Baseline: the Build Complia After ene reductior

After hea connectio 

After rene (be greer

## SAP 10.0 Performance

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for domestic buildings

	Carbon Dioxide Emissior (Tonnes CO <sub>2</sub>	ns for domestic buildings 2 per annum)
	Regulated	Unregulated
aseline: Part L 2013 of e Building Regulations ompliant Development	0.0	
ter energy demand duction (be lean)	0.0	
ter heat network nnection (be clean)	0.0	
ter renewable energy e green)	0.0	

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for domestic buildings

	Regulated domestic carbon dioxide savings		
	(Tonnes CO <sub>2</sub> per annum)	(%)	
Be lean: Savings from energy demand reduction	0.0	0%	
Be clean: Savings from heat network	0.0	0.0 0%	
Be green: Savings from renewable energy	0.0	0%	
Cumulative on site savings	0.0	0%	
Annual savings from off- set payment	0.0	-	
	(Tonne	es CO <sub>2</sub> )	
Cumulative savings for off-set payment	0	-	
Cash in-lieu contribution (£)	0		

\*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

## Non-domestic

Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-domestic buildings

	Carbon Dioxide Emissions for non-domestic buildings (Tonnes CO <sub>2</sub> per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	284.2	158.0
After energy demand reduction (be lean)	335.6	158.0
After heat network connection (be clean)	335.6	158.0
After renewable energy (be green)	255.8	158.0

Table 4: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-domestic buildings

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO <sub>2</sub> per annum)	(%)
Be lean: savings from energy demand reduction	-51.4	-18%
Be clean: savings from heat network	0.0 0%	
Be green: savings from renewable energy	79.7	28%
Total Cumulative Savings	28.3	10%
Annual savings from off- set payment	255.8	-
	(Tonne	es CO <sub>2</sub> )
Cumulative savings for off-set payment	7,675	-
Cash in-lieu contribution (£)	729,121	

\*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

Baseline the Build Complia After en reduction

After hea connecti 

After rene (be greer

Table 4: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-domestic buildings

(£)\*

Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-domestic buildings

	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub>	for non-domestic buildings 2 per annum)
	Regulated	Unregulated
e: Part L 2013 of ding Regulations ant Development	167.4	70.9
ergy demand on (be lean)	238.3	70.9
at network tion (be clean)	238.3	70.9
newable energy en)	114.9	70.9

	Regulated non-domestic carbon dioxide savings		
	(Tonnes CO <sub>2</sub> per annum)	(%)	
Be lean: savings from energy demand reduction	-70.9	-42%	
Be clean: savings from heat network	0.0	0.0 0%	
Be green: savings from renewable energy	123.4	74%	
Total Cumulative Savings	52.6	31%	
Annual savings from off- set payment	114.9	-	
	(Tonne	es CO <sub>2</sub> )	
Cumulative savings for off-set payment	3,446	-	
Cash in-lieu contribution (£)*	327,332		

\*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

	Total regulated emissions (Tonnes CO <sub>2</sub> / year)	CO <sub>2</sub> savings (Tonnes CO <sub>2</sub> / year)	Percentage savings (%)
2013 baseline	284.2		
ean	335.6	-51.4	-18%
clean	335.6	0.0	0%
green	255.8	79.7	28%
otal Savings	-	28.3	10%
	-	CO <sub>2</sub> savings off-set (Tonnes CO <sub>2</sub> )	-
-set	-	7,675.0	-

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	Target Fabric Energy Efficiency (kWh/m²)	Dwelling Fabric Energy Efficiency (kWh/m²)	Improvement (%)
Development total	0.00	0.00	

	Area weighted non-domestic cooling demand (MJ/m <sup>2</sup> )	Total area weighted non-domestic cooling demand (MJ/year)
Actual	43	307321
Notional	56.6	404520.2









Issue	1.2
Date	23/04/2020
Author	Greater London Authority

Undata Logation	Undete Leastion	Description of changes made to GLA Carbon Emission Reporting
Version 1.2		Spreadsneet
		References to SAP 10 have been updated to SAP 10.0 throughout the reporting spreadsheet to confirm the specific emission factors used in the sheet.
Version 1.2	Development Information	Replaces 'Carbon factor tab' and includes additional inputs for development information on Local Planning Authority for the application, agreed carbon offset price and distribution loss factor.
	Baseline, be lean, be	Domestic
Update Location       L         Version 1.2       II         I       II	clean & be green tabs	Secondary heating system has been added. Please note that this feature may only be used in exceptional circumstances, for example innovative modular construction methods, and with approval from GLA
		Tore consistency are summations for energy construction and carbon emissions by
		model (m <sup>2</sup> )'. The calculation for estimating total emissions remains was already based on 'total area represented by model (m <sup>2</sup> )' in Version 1.1 so remains unchanged.
		Additional rows added to allow for a greater number of representative Part L models.
	Be Clean/Be Green tab	Formula updated so that data input is not required for heat sources that are not used.
Version 1.1         be used in exceptional circumstances, for example innovative modular construction methods, and with approval rom GLA.           Version regime and energy use on Rows 58 & 94 are now based on 'total area representel model (m?): The calculation for estimating total emissions remains was all based on 'total area represented by model (m?)' in Version 1.1 so remains unchanged.           Additional rows added to allow for a greater number of representative Par models.           Be Clean/Be Green tab         SAP row reference changed from 380 to 333.           GLA Summary Tables         Tables now report figures to one decimal place.           The zero carbon offset fund is now calculated based on the GLA recomm price of £95 per tonne of carbon dixide unless the borough price is adder Development Information' tab.           Version 1.1         Introduction / Version Control           Carbon factors tab         Additional explanatory wording has been included in the 'Background and and 'Methodology' sections to further assist applicants with the reporting price is calculation of energy assessment graphs, which are automatically generate the results tables.           Version 1.1         Introduction / Version Control         Additional explanatory wording has been included in the 'Background and and 'Methodology' sections to further assist applicants with the reporting price is calculation is now based on 'energy consumption by fuel ty instead of the consumption figures. This data is available in the output file in '''''''''''''''''''''''''''''''''''	Be Green tab	SAP row reference changed from 380 to 333.
	Tables now report figures to one decimal place.	
		The zero carbon offset fund is now calculated based on the GLA recommended price of £95 per tonne of carbon dioxide unless the borough price is added into the 'Development Information' tab.
		Non-domestic tables have now been updated to include for the new London Plan zero carbon requirement.
	Carbon factors tab	Inclusion of energy assessment graphs, which are automatically generated from the results tables.
		Previous version updates
Version 1.1	Introduction / Version Control	Additional explanatory wording has been included in the 'Background and Purpose' and 'Methodology' sections to further assist applicants with the reporting process.
		A version control tab has been added to list all changes made to the spreadsheet under separate versions.
	Baseline, be lean, be clean & be green tabs	<b>Domestic</b> SAP worksheet row reference numbers have been included in the input tabs.
		Non-domestic calculation is now based on 'energy consumption by fuel type' instead of the consumption figures in the BRUKL tab to enable the accurate calculation of the TER/BER figures. This data is available in the output file ending in "*BRUKL.inp" for government approved software and output file ending "*sim.csv" for SBEM. Where these files are used they should be appended to the Energy Statement.
		Total calculation is now based on the 'total area represented by model (m <sup>2</sup> )' rather than the 'number of units'. This is to ensure that the total model area aligns with the development area schedule.
		Rows with void formulas have now been fixed.
		Formula for CHP/Renewable contribution now fixed in SAP 10 calculation.
		Extra input rows have been added to account for larger schemes. Columns used to calculate the carbon emissions using SAP 10 carbon factors have been unhidden to allow for greater transparency in the calculation methodology.
		Validation check moved to be more prominent.
		Validation check moved to be more prominent. Additional heat source has been added into the calculation.
		Validation check moved to be more prominent. Additional heat source has been added into the calculation. Reporting of electricity generated by CHP or renewable technologies has been changed; this should now be inputted as a negative value (-).
	Be Green tab	Validation check moved to be more prominent. Additional heat source has been added into the calculation. Reporting of electricity generated by CHP or renewable technologies has been changed; this should now be inputted as a negative value (-). Additional heat source has been added into the calculation in the 'be green' tabs to account for multiple heating systems, if present.
	Be Green tab	Validation check moved to be more prominent. Additional heat source has been added into the calculation. Reporting of electricity generated by CHP or renewable technologies has been changed; this should now be inputted as a negative value (-). Additional heat source has been added into the calculation in the 'be green' tabs to account for multiple heating systems, if present. The carbon emission factor table has been updated and clarification has been provided on how they should be used.



E. "BE SEEN" GLA EXCEL SPREADSHEET

## MAYOR OF LONDON

## 'BE SEEN' REPORTING SPREADSHEET

## **INSTRUCTIONS**

The 'be seen' webform should be completed by planning applicants, developers and building owners to submit energy performance data at each reporting stage (planning stage, as-built stage and in-use stage) in order to fulfil the requirements of the Mayor's 'be seen' policy set out in London Plan 2021 Policy SI 2.

Before completing and submitting this spreadsheet to the GLA, applicants should read the 'Be seen' energy monitoring guidance [https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance-and-spgs/be-seen-energy-monitoring-guidance] and ensure that they have fully understood the process necessary to comply with the policy.

Please note that at each reporting stage the form cannot be saved midway and so users will need to have all the relevant information to hand for the stage they are reporting against in order to submit the webform. The 'be seen' spreadsheet has been developed to enable development teams to capture all data offline before this is submitted via the webform.

By ticking the below box, the person submitting this webform confirms that they are fully authorised by the legal owner to submit data for this development
Yes

## 1. Planning stage

The applicant is required to provide accurate and verified estimates of each of the planning stage performance indicators through the planning stage 'be seen' webform, during the planning application determination period. All the required information can be viewed in the 'be seen' spreadsheet. Select the "All\_Inputs" tab, click current reporting stage and select 'planning' from the dropdown list. Applicants should submit the 'be seen' spreadsheet along with any other relevant material as part of the webform submission.

## 2. As-built stage Final process to be confirmed

Once the as-built design has been completed and prior to the building being handed over (if applicable), the developer is required to provide an accurate and verified update of the estimated performance indicators submitted at planning stage by selecting the "As-built" reporting stage of the "All\_Inputs" tab. This will include a number of additional indicators and a greater level of detail compared to the planning stage, along with some additional contextual information. Reporting from this point on will be for individual Reportable Units (RUs). The 'be seen' spreadsheet should be submitted to the GLA (EnergyMonitoringLPG@london.gov.uk) along with any other relevant material (e.g. DEC certificates etc.) or uploaded to the 'be seen' portal, when this is made available. This section will be updated accordingly.

### 3. In-use stage Final process to be confirmed

During the in-use stage, the owner is required to monitor and report accurate and verified annual energy performance data for each qualifying RU via the 'be seen' spreadsheet for at least five years once the defects liability period (DLP) is complete. Owners are required to select the "Operational Year xxx" reporting stage of the "All\_Inputs" tab, depending on the in-use reporting year, and complete the necessary information. The 'be seen' spreadsheet should be submitted to the GLA (EnergyMonitoringLPG@london.gov.uk) along with any other relevant material (e.g. DEC certificates etc.) or uploaded to the 'be seen' portal, when this is made available. This section will be updated accordingly.

## **OTHER INSTRUCTIONS**

## Please enable macros when using this spreadsheet.

Macros are used to show/hide sections of the spreadsheet, depending on the stage in the 'be seen' process and the type of development. If you are unable to use macros, please hide/show rows manually.

### User Input Cells

+

<- Free input (some cells are restricted in terms of the format, e.g. numbers)

<- Drop down selection (these may take up to ~30 seconds to run)

### **Background Cells**

- <- Result of an internal calculation
- <- Hide/show button (click away from the cell and back again to activate).</p>
- <- Required data

## **QUERIES / FEEDBACK**

Any queries of feedback on this spreadsheet should be submitted to:

EnergyMonitoringLPG@london.gov.uk

## **MAYOR OF LONDON**

	100%	
URRENT REPORTING STAGE	>>	Planning
ITEXTUAL DATA	Progress: 100%	
RGANISATION & CONTACT DETAILS		
ORGANISATION DETAILS Organisation Name		Waterman Building Services Ltd
Organisation Address		Pickfords Wharf, Clink Street, London. SE1 9DG
CONTACT DETAILS		
Contact Name Fmail		Mohamad Kiani Mo Kiani@watermangroup.com
Additional Email(s)		
Telephone No. Mobile No.		0207 928 7888
OVERALL DEVELOPMENT DETAILS		DD-11222621
		Vernon & Sicilian House and 21
Name of Whole Development		Southampton Row
DEVELOPMENT LOCATION		
Development Address		22
Address Line 2		Vernon House & Sicilian House
Address Line 3		
Address Line 4		Camden
Postcode		WC1A 2QS
Ordnance Survey Reference		
Development UPRN (if available) Geo-Location Coordinates		TQ 30446 81612
Latitude (to 6 decimal places)		51.518
Longitude (to 6 decimal places, +ve or -ve)		-0.121
DEVELOPMENT TOTAL AREA BREAKDOWN		
Residential		
Total Residential Floor Area	GIA m2	0
Flats	number	
House	number	
Non-Residential Floor Area Breakdown		
Landlord Circulation (in Residential Blocks)	GIA m2	
General office (A2, B1, B8, D1 planning classes)	GIA m2	6,857
High street agency (A2 planning classes) General retail (A1, SG planning classes)	GIA m2 GIA m2	1.043
Large non-food shop (A1 planning classes)	GIA m2	
Small food store	GIA m2	
Restaurant (A3, A5 planning classes)	GIA m2 GIA m2	
Bar, pub or licensed club (A4 planning classes)	GIA m2	
Hotel (C1 planning classes)	GIA m2	
Entertainment halls (D2 planning classes)	GIA m2	
Swimming pool centre	GIA m2	
Fitness and health centre	GIA m2 GIA m2	
Covered car park	GIA m2	
Public buildings with light usage (D1, SG planning clas	ss GIA m2	
Schools and seasonal public buildings (D1, D2 plannin University campus	gGIA m2 GIA m2	
Clinic (D1 planning classes)	GIA m2	
Hospital (clinical and research)	GIA m2	
General accommodation (C1, C2, C2A planning classes)	GIA 1112	
Emergency services (SG planning classes)	GIA m2	
Laboratory or operating theatre	GIA m2	
Terminal (B8 planning classes)	GIA m2	
Workshop (B1, B2 planning classes)	GIA m2	
Storage Facility (B8 planning classes)	GIA m2	
Overall Development Summarv		
Total Development Floor Area		
Residential	GIA m2	0
Total	GIA m2	7,900
Total Non-Residential Uses		

+ SUPPLEMENTARY FILES AND UPCOMING REPORTING STAGES				
SUPPLEMENTARY FILES				
Site Plan				
Does the development have a site plan?		No	*	
Best Practice Documents				
Does the development have a predicted DEC?		No	*	
Is there a base building energy rating (in line with DFP)?		No	*	
ANTICIPATED DATES FOR UPCOMING REPORTING STAGES				
As-Built Stage		25 Apr 2024 *	*	
Operational Year 1 End		25 Apr 2025 *	*	
DEVELOPMENT PERFORMANCE AND EMISSIONS	Progress: 100%			
+ DEVELOPMENT PERFORMANCE				
DEVELOPMENT OVERALL PREDICTED PERFORMANCE				
Predicted Performance Calculation Details				
Fuel Carbon Intensity Source (aligned with planning energy	y stateme	SAP 10.0	*	
Residential Elements of the development				
Predicted Annual Energy Use		Fill in all applicable fuels below		
Annual Electricity Use k	Wh/yr	• 0	*	
Annual Gas Use k	Wh/yr	0	*	
Annual Oil Use (if applicable) k	Wh/yr	ĸ	*	
Annual Biomass Use (if applicable) k	Wh/yr	×	*	
Annual District Htg Use (if applicable) k	Wh/yr	k	*	
Annual District Clg Use (if applicable) k	Wh/yr	k	*	
Elec Generation, Gross (if applicable) k	Wh/yr	k	*	
Solar Thermal Generation (if applicable) k	Wh/yr	×	*	
Predicted Annual Carbon Emissions to	CO2/yr	0 *	*	
Non-Residential Elements of the development (Part L Calcu	ulation)			
Predicted Annual Energy Use		Fill in all applicable fuels below		
Annual Electricity Use k	Wh/yr	518,547 *	*	
Annual Gas Use k	Wh/yr	0 *	*	
Annual Oil Use (if applicable) k	Wh/yr	ĸ	*	
Annual Biomass Use (if applicable) k	Wh/yr	ĸ	*	
Annual District Htg Use (if applicable) k	Wh/yr	ж.	*	
Annual District Clg Use (if applicable) k	Wh/yr		*	
Elec Generation, Gross (if applicable) k	Wh/yr	X	*	
Solar Thermal Generation (if applicable) k	Wh/yr		*	
Predicted Annual Carbon Emissions to	CO2/yr	115 *	*	
Non-Residential Elements of the development (TM54 Calco	ulation)			
Predicted Annual Energy Use		Fill in all applicable fuels below		
Annual Electricity Use k	Wh/yr	304,461 *	*	
Annual Gas Use k	Wh/yr	0	*	
Annual Oil Use (if applicable) k	Wh/yr	*	*	
Annual Biomass Use (if applicable) k	Wh/yr	×	*	
Annual District Htg Use (if applicable) k	Wh/yr	*	*	
Annual District Clg Use (if applicable) k	Wh/yr	*	*	
Elec Generation, Gross (if applicable) k	Wh/yr	×	*	
Solar Thermal Generation (if applicable) k	Wh/yr	×	*	
Predicted Annual Carbon Emissions to	CO2/yr	71 *	*	

CARBON OFFSETTING		
Predicted Carbon Shortfall (aligned with planning energy stCO2	94	*
Total Committed Carbon Offset £	268,612	*
		-

END



## F. CO2 Reduction Breakdown

Office Floors

### Part L2013

Total regulated emissions (Tonnes CO <sub>2</sub> / year)	CO <sub>2</sub> savings (Tonnes CO <sub>2</sub> / year)	Percentage savings (%)
218.7		
246.0	-27.4	-13%
246.0	0.0	0%
209.9	36.1	17%
-	8.7	4%
	Total regulated emissions (Tonnes CO2 / year)         218.7         246.0         246.0         209.9         -	Total regulated emissions (Tonnes CO2 / year)CO2 savings (Tonnes CO2 / year)218.7246.0246.0-27.4246.00.0209.936.1-8.7

## SAP10

	Total regulated emissions (Tonnes CO <sub>2</sub> / year)	CO <sub>2</sub> savings (Tonnes CO <sub>2</sub> / year)	Percentage savings (%)
Part L 2013 baseline	135.1		
Be lean	184.0	-48.9	-36%
Be clean	184.0	0.0	0%
Be green	94.2	89.8	66%
Total Savings	-	40.8	30%

# UK and Ireland Office Locations

