# ENERGY STATEMENT

124 Theobalds Road TEO646

Prepared for: Theobald Investment Ltd June 2024

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# TWINJEARTH

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We listen and respond to our customers. We are open and flexible to their needs and concerns, breaking down complex concepts into simple solutions that work both on paper and in practice. Our consultants take a holistic view of each proposal, focusing on responsible and technical strategies that are pragmatic and inspiring.

# TABLE OF CONTENTS

### GLOSSARY

- 1 EXECUTIVE SUMMARY
- 2 INTRODUCTION
- 3 PLANNING POLICY
- 4 ENERGY STRATEGY
- 5 MINIMISING THE RISK OF OVERHEATING
- 6 PART L COMPLIANCE
- APPENDIX A PROPOSED SPECIFICATIONS
- APPENDIX B DISTRICT HEATING NETWORK
- APPENDIX C RENEWABLE TECHNOLOGY FEASIBILITY
- APPENDIX D INDICATIVE HEAT PUMP SPECIFICATION
- APPENDIX E INDICATIVE PV PANEL SPECIFICATION AND LAYOUT
- APPENDIX F NON-DOMESTIC BRUKL REPORTS

# ----- TJ-E

5
7
11
13
17
27
29
30
39
40
43
44

45

# GLOSSARY

CO <sub>2</sub>	Carbon dioxide emissions - released as a result of burning fossil fuels
ASHP	Air Source Heat Pump - Electrically powered heating and cooling system that transfers heat from the outside air to the inside, and vice versa when in co
VRF	Variable Refrigerant Flow - Electrically powered heating and cooling system that uses refrigerant as the heating/cooling medium
PV	Photovoltaic Panel - Device that converts the sun's energy into useful electrical energy
kWp	Kilowatt Peak - The peak (maximum) power that can be generated by a system
SAP10	Standard Assessment Procedure - Methodology used to assess the carbon emissions of dwellings, and also sets the carbon emission intensity of grid sup
СНР	Combined Heat and Power - System that generates electricity and heat, usually via the combustion of natural gas in an engine.
DSY	Design Summer Year - Standard weather tape produced by CIBSE. Includes weather tape representing different summers (DSY1 - Moderately warm s Long, less intense warm spell)
CIBSE	Chartered Institute of Building Services Engineers
COP	Coefficient of Performance - Energy efficiency of a heating system at 100% output
SCOP	Seasonal Coefficient of Performance - Average energy efficiency of a heating system over a year, accounting for part load operation
EER	Energy Efficiency Ratio – Energy efficiency of a cooling system at 100% output
SEER	Seasonal Energy Efficiency Ratio - Average energy efficiency of a cooling system over a year, accounting for part load operation
TM52	Methodology for assessing the overheating risk in non-domestic buildings
TM54	Methodology for evaluating operational energy use at the design stage
TM59	Methodology for assessing the overheating risk in domestic buildings
HIU	Heat Interface Unit - Device that connects individual dwellings to a communal heating system
Green lease	A lease that includes clauses whereby the owner and occupier undertake specific responsibilities/obligations with regards to sustainable operation of a b
BRUKL	Building Regulation Part L calculation - The BRUKL document summarises the performance of the building against the Part L regulations
NCM	National Calculation Methodology - Government methodology for assessing the carbon emissions of non-domestic buildings
Sensible gain	Heat that causes a change in temperature of the surroundings
Latent gain	Heat that results from an increase in the amount of moisture in the air
BSRIA	Building Services Research and Information Association
PFC	Power Factor Correction - Power Factor Correction equipment is a technology which when installed allows the consumer to reduce their electricit consumption.
LTHW	Low Temperature Hot Water - Water circulated for space and hot water heating at less than 90°C

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summer, DSY2 - Short, intense warm spell, DSY3 -

building

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# EXECUTIVE SUMMARY

"All cities must face up to the reality of climate change and the need to limit their future contribution to this major global problem" (The London Plan - March 2021).

This report summaries the proposed Energy Strategy for the redevelopment of 124 Theobalds Road ('the Site') within the London Borough of Camden.

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# **1 EXECUTIVE SUMMARY**



This report summarises the proposed Energy Strategy for the redevelopment of 124 Theobalds Road ('the Site') within the London Borough of Camden.

This energy statement has been prepared by Twin&Earth on behalf of Theobald Investment Ltd ('the Applicant') in support of a full planning application for the refurbishment and extension of the existing commercial building at 124 Theobalds Road, London, WC1X 8RX ("the Site").

The proposed development comprises of the refurbishment and extension of the existing building to provide additional commercial, business and service use (Class E) including external alterations, introduction of a rooftop terrace, new hard and soft landscaping, provision of cycle parking, provision of publicly accessible café space, and other associated works.

### 1.1 The Site

124 Theobalds Road ('The Site') is located in the London Borough of Camden (LBC) and covers an area of 0.24 hectares.

The current building was completed in 1955 and comprises a basement, ground and eight upper floors with a total floorspace of approximately 11,937 sqm.

The Site fronts Theobalds Road to the south and is bounded by Boswell Street to the west and New North Street to the east.

### 1.2 Proposed Development

The proposals comprise the refurbishment of the existing building to provide an additional 598 sqm of commercial, business and service use (Class E) floorspace. This will be achieved by a high-quality front extension and by infilling the existing atrium at levels 6-8.

External alterations are proposed to the facades. Cycle parking provision will be provided at lower ground floor level. A landscaped forecourt and rear yard, a sunken courtyard and a communal roof top terrace will also be provided.



Figure 1. Proposed Development CGI. Source: ORMS

### 1.3 Energy Strategy

The Energy Strategy has been developed in accordance with the GLA's 'Be Lean', 'Be Clean', 'Be Green' and 'Be Seen' energy hierarchy and has been assessed against Part L of the Building Regulations 2021, which was introduced in June 2022.



Figure 2. The London Plan Energy Hierarchy

Although this is a minor refurbishment and therefore there is no requirement to comply with the London Plan carbon reduction targets, every effort has been made to improve the energy performance of the building in line with London Plan carbon targets and to follow the energy hierarchy.

The carbon reduction for the extension and refurbishment parts have been shown separately as there are different baselines. For the extension the baseline is a Part L2A 2021 compliant development. The baseline is therefore the Target Emission Rate (TER) from the final proposed building specification. For the refurbished areas, baseline CO2 emissions have been generated assuming the notional specification for existing buildings, shown in Appendix 3 of the GLA guidance (June 2022). This provides a consistent baseline across all refurbishments.

### 1.3.1 Be Lean

The following measures are proposed in order for the Proposed Development to use less energy and manage demand during operation:

- Provision of openable windows providing natural ventilation enabling a mixed mode strategy within the office areas.
- Replacement of the majority of the existing windows with high performance glazing
- For the new build extension, high levels of insulation will be incorporated, going beyond Part L 2021 targets and notional building specifications, in order to reduce the demand for space conditioning.
- Low energy lighting will be provided throughout.
- Perimeter / daylit zones will be fitted with daylight control to automatically vary lighting levels depending on the amount of daylight.
- Office and landlord areas will be fitted with lighting occupancy control that switches off lighting when the areas are not occupied.
- Hot water secondary circulation will be limited to high usage areas (basement showers) to limit pumping power and circulation heat losses.

### 1.3.2 Be Clean

According to the London and Camden heat network maps, there are no existing or planned heat networks on the vicinity of the development where the development could connect.

Space provision has been identified within the basement level to provide future plant that will allow the development to be connected to a future district heating network. This includes space allowance for heat exchangers, isolation vales and safeguarded pipe routes to the site boundary. Notional layouts of each of the plant rooms have been provided in Appendix B.

### 1.3.3 Be Green

The following measures are proposed in order to maximise the opportunities for renewable energy production, storage and use on site:

- Air source heat pumps will provide space heating and cooling to office areas as well as the shared amenity, administrative and flexible spaces throughout the ground and basement levels and top storey pavilion.
- Air source heat pumps will provide domestic hot water (DHW) to the basement changing areas with electric top up for the showers. Point of use electric water heaters will be used through the office areas to limit unnecessary heat losses and increased cooling associated with a hot water distribution system.

Renewable on-site generation will be provided by highly efficient PV panels on the roof providing an estimated yield of ~11.5MWh per annum.

### 1.3.4 Summary of Results

Based on the above, the proposed development is predicted to achieve on-site carbon savings of at 21% over the appropriate baseline. The site wide carbon emissions and savings for the proposed development are summarised in the table below:

Site Wide	Carbon Dioxide Emissions (Tonnes CO2 per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	120.5		
Be Lean	100.9	19.6	16%
Be Clean	100.9	0.0	O%
Be Green	95.3	5.6	5%
Total Savings	-	25.2	21%

### Table 1. Site Wide Carbon Emissions and Savings





Figure 3. Site Wide Carbon Savings throughout the energy hierarchy (Part L 2021)



### Non-domestic PartL 2021 Carbon Emissions

Based on the above, the development is predicted to achieve on-site carbon savings of 21% when compared to an equivalent building constructed to modern building standards in line with the GLA's Energy Assessment Guidance (June 2022).

When compared to the existing building, the emissions of the building following the refurbishment works will be significantly reduced.

The following diagram demonstrates the performance of the development against the existing building (prior to the refurbishment works). The modelling shows a total 75.5% carbon emissions reduction against the existing building.



Non-domestic PartL 2021 Carbon Emissions

### 1.3.5 Minimising the Risk of Overheating

The cooling hierarchy has been applied during the development of the building proposal. The strategy of the building is active cooling but openable windows have been provided to allow the opportunity to integrate a mixed-mode strategy.

Although active cooling systems are required to futureproof the building and mitigate the risk of overheating when accounting for climate change, the development has maximised passive measures to reduce the cooling demand.

### 1.3.6 Part L Compliance

The development is a minor refurbishment and extension of the existing office building, and will be designed to meet and exceed, where possible, all the minimum standards as described and defined within the relevant section of Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings, 2021 edition incorporating 2023 amendments.

As the proposed building does not fall under the new building definition as per the requirements set out in section 10.7 of ADL2021, the extension is required to meet the guidance in paragraphs 10.8 to 10.11. Compliance with the guidance has been demonstrated.

Figure 4. Site Wide Carbon Savings - Proposed development performance against the existing building

Site Non Domestic Emissions — Carbon Savings – – Baseline (Existing building)

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# INTRODUCTION

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

This section introduces the 124 Theobalds Road development.

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# 2 INTRODUCTION



This section introduces the 124 Theobalds Road development.

### 2.1 Introduction

This energy statement has been prepared by Twin&Earth on behalf of Theobald Investment Ltd ('the Applicant') in support of a full planning application for the refurbishment and extension of the existing commercial building at 124 Theobalds Road, London, WC1X 8RX ("the Site").

The proposed development comprises of the refurbishment and extension of the existing building to provide additional commercial, business and service use (Class E) including external alterations, introduction of a rooftop terrace, new hard and soft landscaping, provision of cycle parking, provision of publicly accessible café space, and other associated works.

### 2.2 The Site

124 Theobalds Road ('The Site') is located in the London Borough of Camden (LBC) and covers an area of 0.24 hectares.

The current building was completed in 1955 and comprises a basement, ground and eight upper floors with a total floorspace of approximately 11,937 sqm.

The Site fronts Theobalds Road to the south and is bounded by Boswell Street to the west and New North Street to the east.

The Site is not a statutory listed building, nor does it fall within a conservation area. However, Bloomsbury conservation area is in proximity and surrounds the Site to the north, east and west. Kingsway conservation area is also situated to the south of the Site.

### 2.3 The Proposed Development

The proposals comprise the refurbishment of the existing building to provide an additional 598 sqm of commercial, business and service use (Class E) floorspace. This will be achieved by a high-quality front extension and by infilling the existing atrium at levels 6-8.

External alterations are proposed to the facades. Cycle parking provision will be provided at lower ground floor level. A landscaped forecourt and rear yard, a sunken courtyard and a communal roof top terrace will also be provided.



Figure 5. Proposed Development CGI. Source: ORMS



Figure 6. The site. Source: ORMS



# PLANNING POLICY

"The planning system should support the transition to a low carbon future in a changing climate. It should help to shape places in ways that contribute to radical reductions in greenhouse gas emissions and support renewable and low carbon energy" (NPPF, 2023)

This section summarises the relevant national and local planning policy and applicable regulations to the development, which form the basis of the proposed energy and carbon reduction strategy.

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# 3 PLANNING POLICY

This section summarises the relevant national and local planning policy and applicable regulations to the development, which form the basis of the proposed energy and carbon reduction strategy.

### 3.1 APPLICABLE POLICIES

### 3.1.1 Adopted Planning Policy Framework

Key legislation and policies are briefly set out in this chapter. The following adopted documents are relevant:

- The London Plan (2021)
- London Borough of Camden Local Plan (2017)

Other relevant documents which will form a material consideration in the determination of the planning application include the following:

- National Planning Policy Framework (NPPF)
- National Planning Practice Guidance (NPPG)

There are also a number of additional Supplementary Planning Guidance (SPG) and Supplementary Planning Documents (SPD) which provide guidance on standards for development proposals including:

- GLA Energy Assessment Guidance (2022)
- GLA 'Be Seen' Energy Monitoring Guidance (September 2021)

### 3.1.1 Draft Planning Policy

The Draft New Camden Local Plan (January 2024) has been subject to consultation. The draft new Camden Local Plan sets out our vision for future development in Camden for the next 15 years and includes the planning policies and site allocations to help achieve this. It identifies how many new homes and jobs are needed to support Camden's population, and where and how they should be provided. The Local Plan also has an important role in shaping how Camden's places look and feel, promoting inclusion, reducing inequality, enhancing the environment, tackling climate change and securing sustainable neighbourhoods.

The Plan underwent consultation between 17<sup>th</sup> January 2024 and 13<sup>th</sup> March 2024.

### 3.2 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The NPPF stipulates that the purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

The National Planning Policy Framework (NPPF) was first published on 27 March 2012 and revised most recently in December 2023 as a key part of Government reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. The revised NPPF emphasises the delivery of new homes, and for the design community to put design quality at the heart of the system. The Government have also published a series of National Planning Practice Guidance covering different topics to support the framework.

### 3.3 THE LONDON PLAN 2021

The London Plan (March 2021) is the overall strategic plan for London which sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years.

The plan brings together the geographic and locational (although not site specific) aspects of the Mayor's other strategies including those dealing with: Transport, Economic Development, Housing, Culture, Social issues and Environment including climate change (adaptation and mitigation), air quality, noise and waste.

The following sets out a summary of the key energy and carbon reduction policies from the London Plan applicable to the Site.

### 3.3.1 Policy SI2 Minimising Greenhouse Gas Emissions

The policy requires major developments to be zero-carbon with the strategy being developed following the Be Lean, Be Clean, Be Green, Be Seen energy hierarchy. Where zero carbon targets cannot be met, a minimum on-site reduction of at least 35 per cent below a Building Regulations compliant development must be achieved with the remaining carbon emissions being offset via either a cash in lieu contribution to the relevant borough's carbon offset fund, and/or off-site, provided that an alternative proposal is identified and delivery is certain.

The policy also proposes that non-residential developments aim to achieve 15 per cent reduction through energy efficiency measures.

### 3.3.2 Policy SI3 Energy Infrastructure

Energy and infrastructure requirements should be carefully considered for large-scale masterplans. Developments should identify requirements for energy centres, energy storage and upgrades to existing infrastructure and review opportunities to support existing and future district heating networks.

Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system, with systems selected in accordance with the GLA's heating hierarchy and should be designed to allow for the cost-effective future connection to district heating networks (if not currently available). Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE CP1 Heat Networks: Code of Practice for the UK or equivalent.

### 3.3.3 Policy SI4 Managing Heat Risk

Policy SI4 states that developments should be designed to limit their contribution to the heat island effect and encourages spaces to be designed to avoid overheating, including by following the cooling hierarchy set out in the policy.

Guidance on how to prepare an energy assessment to accompany strategic planning applications referred to the Mayor is set out in the document 'Energy Assessment Guidance' (June 2022).

### 3.4 LONDON BOROUGH OF CAMDEN

### 3.4.1 LBC's Local Plan (2017)

The specific policies that have been considered when developing the energy strategy for the development are listed below.

The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation. We will:

- a. promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
- b. require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met;
- c. ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
- d. support and encourage sensitive energy efficiency improvements to existing buildings;
- e. require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
- f. expect all developments to optimise resource efficiency.

For decentralised energy networks, we will promote decentralised energy by:

- a. working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
- b. protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and
- c. requiring 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.

To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.

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

- a. the protection of existing green spaces and promoting new appropriate green infrastructure;
- b. not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems;
- c. incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and

d. 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 sgm 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:

- a. ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
- b. encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
- c. 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
- d. 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.

### 3.4.2 **LBC's Planning Guidance -** Energy efficiency and adaptation (2021)

The Camden Planning Guidance (CPG) has been produced to establish more detailed guidance on the application of policies within the Local Plan and any neighbourhood plans that may come into effect.

The specific policies that have been considered when developing the energy strategy for the development are listed below.

### Energy Hierarchy - key messages

- All development in Camden is expected to reduce carbon dioxide emissions by following the energy hierarchy in accordance with Local Plan policy CC1.
- Energy strategies are to be designed following the steps set out in the energy hierarchy.

### Making buildings more energy efficient - key messages

- Natural 'passive' measures should be prioritised overactive measures to reduce energy.
- Major residential development to achieve 10%, and non-residential development to achieve 15% site energy efficient measures (Be lean stage).

### Decentralised energy – key messages

All new major developments in Camden are expected to assess the feasibility of decentralised energy network growth (paragraph 8.25 Local Plan).

- There are a variety of renewable energy technologies that can be installed to supplement a development's energy needs.
- Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies.

reduction (beyond part L Building regulations), in accordance with the new London Plan, through on-

### Energy statements - key messages

- Energy statements are required for all developments involving 5 or more dwellings and/or more than 500sqm of any (gross internal) floorspace.
- Energy statements should demonstrate how a development has been designed following the steps in the energy hierarchy.
- The energy reductions should accord with those set out in the Chapter below 'Energy reduction'.

### Energy reduction – key messages

- All development in Camden is expected to reduce carbon dioxide emissions through the application of the energy hierarchy.
- All new build major development to demonstrate compliance with London Plan targets for carbon dioxide emissions.
- Deep refurbishments (i.e. refurbishments assessed under Building Regulations Part L2B/L2B) should also meet the London Plan carbon reduction targets for new buildings.
- All new build residential development (of 1 9 dwellings) must meet 19% carbon dioxide reduction; and
- Developments of five or more dwellings and/or more than 500sqm of any gross internal floorspace to achieve 20% reduction in carbon dioxide emissions from on-site renewable energy generation

### Energy efficiency in existing buildings - key messages

- All developments should demonstrate how sustainable design principles have been considered and incorporated.
- Sensitive improvements can be made to historic buildings to reduce carbon dioxide emissions.
- Warm homes and buildings are key to good health and wellbeing. As a guide, at least 10% of the project cost should be spent on environmental improvements.
- The 20% carbon reduction target (using on-site renewable energy technologies) applies for developments of five or more dwellings and/or more than 500 sqm of any gross internal floorspace (see Chapters 2 and 4).

### Sustainable design and construction – key messages

- All developments involving 5 or more residential units or 500 sqm or more of any additional floorspace should address sustainable design and construction measures (proposed in design and implementation) in a Sustainability Statement (Local Plan policy CC2).
- Active cooling (air conditioning) will only be permitted where its need is demonstrated and the steps in the cooling hierarchy are followed (Local Plan policy CC2).
- Development is expected to reduce overheating risk through following the steps in the cooling hierarchy. All new development should submit a statement demonstrating how the cooling hierarchy has been followed (Local Plan policy CC2).
- All developments should seek opportunities to make a positive contribution to green space provision or greening.

# ENERGY STRATEGY

### "The purpose of an energy assessment is to demonstrate that the proposed climate change mitigation measures comply with London Plan energy policies, including the energy hierarchy. It also ensures energy remains an integral part of the development's design and evolution" (Energy Assessment Guidance, June 2022).

This section summarises how the development has been designed to meet energy and carbon reduction policies, based on the guidance contained in Energy Assessment Guidance (June 2022).

# 4 ENERGY STRATEGY

This section summarises how the development has been designed to meet energy and carbon reduction policies, based on the guidance contained in Energy Assessment Guidance (June 2022).

### 4.1 Introduction

This section summarises the considerations made, and technologies proposed to reduce the energy consumption of the building and to minimise carbon emissions associated with the development's operational energy.

The strategy has been developed following the 'Be Lean', 'Be Clean', 'Be Green' and 'Be Seen' energy hierarchy as stated in Policy SI2 in the London Plan (March 2021) which ensures that sustainability is integrated within the building design rather than achieved via "add-on" features and systems.



Figure 7. The London Plan energy hierarchy

The carbon reduction for the extension and refurbishment parts have been shown separately as there are different baselines. For the extension the baseline is a Part L2A 2021 compliant development. The baseline is therefore the Target Emission Rate (TER) from the final proposed building specification. For the refurbished areas, baseline  $CO_2$  emissions have been generated assuming the notional specification for existing buildings, shown in Appendix 3 of the GLA guidance (June 2022). This provides a consistent baseline across all refurbishments.

### 4.2 Energy Modelling Tools

Performance evaluation has been undertaken by a certified CIBSE Low Carbon Energy Assessor using government approved Dynamic Simulation Modelling software IES virtual Environment 2023.4.1 which can assess compliance against Part L 2021 and the National Calculation Methodology (NCM).



Figure 8. IES VE Model - South



Figure 9. IES VE Model - North

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### 4.3 Use Less Energy (Be Lean)

### 4.3.1 Building Envelope & Glazing Performance

The passive design strategy has been developed to incorporate high thermal performance building fabric and balance the requirements for daylight with overheating and heat loss considerations.

High thermal performance fabric is proposed for the new build areas and new windows which significantly improves upon the requirements of Part L of the Building Regulations 2021, as shown in the following table:

Building Element	Part L 2021 Limiting Parameters	Building Fabric - Extension
External walls	0.26 W/m <sup>2</sup> K	0.18 W/m <sup>2</sup> K
Roof	0.18 W/m <sup>2</sup> K	0.12 W/m <sup>2</sup> K
Windows (u-value)	1.6 W/m <sup>2</sup> K	1.40 W/m <sup>2</sup> K
Windows (g-value)	-	O.35
Windows (Light transmittance)	-	60%

Table 2. Proposed thermal performance of new build areas

To compare the existing building with the proposed refurbishment, Appendix 3 of the Energy Assessment Guidance (June 2022) has been used to establish a consistent baseline. The table below details the specifications used.

Building Element	Appendix 3 Specification - Non- Domestic	Building Fabric - Existing (retained elements)
External walls	0.55 W/m²K	0.45 (1990s curtain wall)- 1.60 (stone facade) W/m <sup>2</sup> K
Basement wall	0.55 W/m <sup>2</sup> K	1.70 W/m2.K
Roof (flat roof)	0.18 W/m <sup>2</sup> K	2.80 W/m <sup>2</sup> K
Floor	0.25 W/m <sup>2</sup> K	0.25 W/m <sup>2</sup> K
Windows (u-value)	1.40 W/m <sup>2</sup> K	2.80 W/m <sup>2</sup> K
Windows (g-value)	0.40	0.40
Air tightness	25 m³/m².h @ 50Pa	25 m³/m².h @ 50Pa

Table 3 Appendix 3 thermal performance and existing building performance

### 4.3.2 Proposed Heating, Cooling & DHW Services

Priority has been given to minimising the cooling demands, as detailed in section 5, which covers minimising the risk of overheating.

The building is energised and designed as an electrical-only driven building. There are no fossil fuel appliances in the building. Primary plant has been selected with specific emphasis on carbon footprint, both operational and whole life.

It is proposed that heating and cooling will be provided via air source heat pumps (AHSP) located at roof level. Domestic hot water for the changing areas will come from a high efficiency heat pump with electric boiler to top up. Domestic hot water for the office areas will be provided by point of use generators to limit unnecessary heat losses associated with a secondary circulation hot water loop.

### 4.3.3 Ventilation

The offices have been designed with operable windows and centralised ventilation with high efficiency thermal heat recovery of ≥80%. The centralised systems will in addition to offices, provide ventilation to other areas including basement, ground and first floor common area, reception and atrium.

Ventilation	AHUs
Duct air leakage standard	A
AHU air leakage standard	L2
AHU SFP (W/I/s)	2.5
AHU Heat recovery (HR%)	80
Terminal unit (FCU) SFP	0.25

Table 4 Mechanical ventilation inputs

### 4.3.4 Lighting

All lighting will comprise high efficiency LED lamps and luminaires to maximise the efficacy of the light fittings. The efficacy targets and expected level of lighting control (daylight/occupancy control) proposed for the development have been summarised in the table below:

Ѕрасе Туре	Minimum lighting efficacy	Daylight control (perimeter zones)	Occupancy control
Office	110	Yes	Presence detection
Reception and atrium	110	Yes	Presence detection
FOH communal areas & BOH offices	115	Yes	Presence detection
Gym/fitness studio	120	Yes	Manual
Plant Rooms	120	No	Manual
Circulation, toilets, changing facilities, cycle storage, store rooms	120	No	Presence detection
Display lighting	80	N/A	N/A

Table 5. Proposed lighting efficacies and lighting control

### 4.3.5 Metering and controls

Metering systems will be installed to link all meters within the building to the central BMS system. The system will meter:

- MID Electric meters to enable revenue recovery for all sub-metered tenants.
- Electric meters to provide energy monitoring for the Landlord.
- Electric meters on PV panels to provide PV energy monitoring for the Landlord.
- Heat meters on CHW and LPHW systems.
- Water meters on mains water systems. •
- Water meters on irrigation and rainwater harvesting systems.

A data network will be installed to directly link all metering equipment on a ModBus (RS485) network to the central BMS system. The system will encompass:

- A backbone ModBus Cabling network using Belden 3105A cable.
- Ethernet cabling using Cat 6
- All MID meters will be connected directly to ModBus backbones.
- Pulse-count interfaces will be installed to directly connect pulse-count water and heat meters.

### 4.3.6 Summary Results

The carbon emissions performance of the development was tested using dynamic energy modelling, with Government-compliant software for assessing Part L (IES VE). Carbon emissions have been calculated with the GLA's Carbon Emissions Reporting Spreadsheet.

Based on the above strategy, the following 'Be Lean' results can be achieved:

OFFICE - REFURBISHED	Carbon Dioxide Emissions (Tonnes CO2 per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	117.5		
Be Lean	97.3	20.3	17%

Table 6. Non-Domestic Carbon Emissions for the refurbished spaces -Be Lean

OFFICE - EXTENSION	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	3.0		
Be Lean	3.7	-0.7	-24%

Table 7. Non-Domestic Carbon Emissions for extension spaces - Be Lean

SITE-WIDE	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	120.5		
Be Lean	100.9	19.6	16%

Table 8. Non-Domestic Carbon Emissions Site-Wide - Be Lean

### 4.4 Energy Efficient Supply (Be Clean)

The space heating and domestic hot water system has been selected in accordance with the hierarchy of the London Plan, which should prioritise connection to local existing or planned heat networks.

### Heating Hierarchy:

a) connect to local existing or planned heat networks

b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)

c) use low-emission combined heat and power (only where there is a case for it to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)

d) use ultra-low nitrogen oxides (NOx) gas boilers

Table 9. The Heating Hierarchy, GLA Energy Assessment Guidance (June 2022)

### 4.4.1Connect to existing or planned heat networks

According to the Camden heat network map, there is an existing heat network located in close proximity to the proposed development, the Bloomsbury Heat & Power network. This network provides electricity and heat to a number of college buildings and is unlikely to have additional capacity for new developments to be connected. It is understood that this heat network is served by a gas fired CHP plant, which at the time of installation resulted in fewer carbon emissions compared to an electric system. However, as the national grid undergoes decarbonisation, it would prove more carbon intensive to connect to the centralised network as opposed to utilising electric heat pumps.

According to the London heat network map, the existing Citigen heat network is the closest in proximity to the proposed building, situated approximately 1km away, including proposed extensions planned for 2027. Due to the significant distance between the site and the heat work it would be deemed unfeasible to make a connection.

According to the London Heat map, there is also a proposed heat network running along Euston Road, with the nearest connection point approximately 1km away. Due to the significant distance between the site and the heat work it would be deemed unfeasible to make a connection.

### 4.4.2 Enable future connection

Space provision has been identified within the basement level to provide future plant that will allow the development to be connected to a future district heating network. This includes space allowance for heat exchangers, isolation vales and safeguarded pipe routes to the site boundary. Notional layouts of each of the plant rooms have been provided in Appendix B.



Figure 10. London heat network map



Figure 11. Camden heat network map

### 4.4.3 Summary Results

### The following tables therefore show no change in the carbon emissions as a result of the 'Be Clean' Stage.

OFFICE - REFURBISHED	Carbon Dioxide Emissions (Tonnes CO2 per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	117.5		
Be Lean	97.3	20.3	17%
Be Clean	97.3	0.0	O%

Table 10. Non-Domestic Carbon Emissions for the refurbished spaces - Be Clean

OFFICE - EXTENSION	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	3.0		
Be Lean	3.7	-0.7	-24%
Be Clean	3.7	0.0	0%

Table 11. Non-Domestic Carbon Emissions for extension spaces - Be Clean

SITE-WIDE	Carbon Dioxide Emissions (Tonnes CO2 per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	120.5		
Be Lean	100.9	19.6	16%
Be Clean	100.9	0	0%

Table 12. Non-Domestic Carbon Emissions Site-Wide - Be Clean

### 4.5 Renewable Energy (Be Green)

A feasibility study has been undertaken to evaluate the viability of incorporating low and zero carbon technologies within the development.

The suitability of each technology for the development has been evaluated based on the technical viability, considering spatial requirements, suitability for the development's demand profile and potential for carbon emissions savings.

Appendix C provides details of each technology and the appropriateness to the development. The following table summarises the feasibility of each technology.

Technology	Feasibility	Recommended?	Proposed?
Photovoltaic panels (PV)	The proposed development has unshaded flat roofs which are suitable for the installation of roof mounted PV panels. Although limited area is available due to the extensive requirements for plant space.	Yes	Yes
Solar hot water (SHW)	SHW collectors would compete with PV panels for the available roof space. PV panels are anticipated to result in higher carbon emissions savings and are deemed more suitable for the development therefore SHW collectors are not recommended.	No	No
Heat Pumps	Air Source Heat Pumps (ASHP) can provide low carbon solution for the provision of space heating, domestic hot water and cooling. Owing to their high efficiency, ASHPs are feasible and proposed for heating, cooling and DHW production within the development.	Yes	Yes
Wind Turbines	Due to the site constraints and urban location, wind turbines would need to be roof mounted. Roof mounted turbines are likely to cause building vibrations that are undesirable for domestic use.	No	No
Biomass Heating	The development cannot accommodate the storage required for biomass. In addition, biomass produces high levels of particulates and NOx, potentially causing issues with local air quality.	No	No

Table 13. Low and zero carbon energy - technical feasibility summary table

### 4.5.1Heat Pumps

It is proposed that heating and cooling will be provided via air source heat pumps (AHSP) located at roof level. The basement shower facility is supplied with domestic hot water from a hot water generation plant room, driven by ASHPs located in the plant area adjacent to the cycle storage.

### 4.5.2 Photovoltaics

The potential locations for photovoltaic panels were assessed based on available roof area, orientation, shading and visual impacts (visual and structural).

An array providing an approximate annual yield of 11.5 MWh will be connected to the development. This will be mounted at roof level. This is equivalent to approximately 44 PV panels (1.046 W X 1.812) with a total area of 83m2 arranged as follows:

- Panels will be installed horizontal.
- Separation between panels will be sufficient to allow access for maintenance purposes as well as to avoid overshadowing.

Please see Appendix E for proposed panel layout and indicative specification.

4.5.3 Summary Results

Based on the above strategy, the following 'Be Green results can be achieved:

OFFICE - REFURBISHED	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	117.5		
Be Lean	97.3	20.3	17%
Be Clean	97.3	0.0	0%
Be Green	91.8	5.5	5%

Table 14. Non-Domestic Carbon Emissions and Reduction for refurbished spaces - Be Green

OFFICE - EXTENSION	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	3.0		
Be Lean	3.7	-0.7	-24%
Be Clean	3.7	0.0	0%
Be Green	3.5	O.1	5%

Table 15. Non-Domestic Carbon Emissions and Reduction for extension spaces - Be Green

SITE-WIDE	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	Regulated Carbon Dioxide Savings (Tonnes CO <sub>2</sub> per annum)	Percentage Carbon Dioxide Savings (%)
Baseline	120.5		
Be Lean	100.9	19.6	16%
Be Clean	100.9	0	0%
Be Green	95.3	5.6	5%

Table 16. Non-Domestic Carbon Emissions Site-Wide - Be Green

### 4.6 Monitor, Verify and Respond (Be Seen)

4.6.1Sub metering / Building Energy Management

The sub-metering strategy is to be developed further during the detailed design stages; however, the development will incorporate energy meters in line with the GLA's Energy Monitoring Guidance (September 2021) to enable performance in use to be monitored and optimised.

Metering systems will be installed to link all meters within the building to the central BMS system. The system will meter:

- MID Electric meters to enable revenue recovery for all sub-metered tenants.
- Electric meters to provide energy monitoring for the Landlord.
- Electric meters on PV panels to provide PV energy monitoring for the Landlord.
- Heat meters on CHW and LPHW systems.
- Water meters on mains water systems.
- Water meters on irrigation and rainwater harvesting systems.

A data network will be installed to directly link all metering equipment on a ModBus (RS485) network to the central BMS system. The system will encompass:

- A backbone ModBus Cabling network using Belden 3105A cable.
- Ethernet cabling using Cat 6
- All MID meters will be connected directly to ModBus backbones.
- Pulse-count interfaces will be installed to directly connect pulse-count water and heat meters.

### 4.6.2 Demand Side Response

The potential for configurable gateways, allowing for automated Demand Side Response (DSR) will be reviewed during the detailed design stage through dialogue with DSR aggregators and to ensure that any DSR approaches are suitable for the building uses.

### 4.6.3 Electricity Capacity

Early conversations have been held with the DNO by Lehding Services Design, including the electrical utility application based on an initial load assessment.

	Electrical
Estimate peak demand	935kW
Available capacity	Installed capacity 2,400kW. Apportionment to building will be agreed at a later stage.
Flexibility potential	Will be developed in Stage 3 with occupancy modelling.

Table 17. Summary of site wide peak demand, capacity and flexibility potential

### 4.6.4 Flexibility Potential

Opportunities to reduce the peak heating and electricity demand of the development have been considered and the following has been concluded:

Flexibility achieved through	Yes/No	Details
Electrical energy storage (kWh) capacity	No	Due to exist generated b
Heat energy storage (kWh) capacity	Yes	Buffer vesse recommenda
Renewable energy generation (load matching)	No	The site co energy gen insufficient t
Gateway to enable automated demand response	No	The provisio
Smart systems integration	Yes	It is proposed developed v allow tenant
Other initiative	No	Additional in

Table 18. Summary of interventions for achieving flexibility

### ΤÆ

ting site constraints, it is expected that all energy by on-site PV will be used by the development.

els will be provided as per heat pump manufacturer lations. Estimated total capacity 50 kWh.

ponstraints limit the amount of on-site renewable neration (provided by PVs) to a level which is to justify a load match.

on of a gateway will be investigated in the future.

sed that a landlord smart building system will be which will enable secure energy meter reading and t integration.

nitiatives will be explored during later design stages.

### 4.7 Summary of Carbon Emissions and Savings

The following tables summarise the carbon emissions and reduction performance for the Whole Site.

4.7.1Non-Domestic Carbon Emissions and Savings - Part L 2021

The following tables demonstrate the performance of the development against the appropriate baseline for the development as described within GLA's Energy Assessment Guidance (June 2022).

SITE WIDE DEVELOPMENT	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	
	Regulated	Unregulated
Baseline	120.5	66.7
After energy demand reduction (Be Lean)	100.9	66.7
After heat network connection (Be Clean)	100.9	66.7
After renewable energy (Be Green)	95.3	66.7

Table 19. Non-Domestic Carbon Dioxide Emissions after each stage of the Energy Hierarchy

	Regulated Carbon Dioxide Savings	
	(Tonnes CO <sub>2</sub> per annum)	(%)
Be Lean: Savings from energy demand reduction	19.6	16%
Be Clean: Savings from heat network	0.0	0%
Be Green: Savings from renewable energy	5.6	5%
Cumulative on-site savings	25.2	21%

Table 20. Non-Domestic Regulated Carbon Dioxide Savings from each stage of the Energy Hierarchy



Site Non Domestic Emissions Carbon Savings - - Baseline: Notional specification/Appendix 3

Figure 12. Site Wide Carbon Savings throughout the energy hierarchy (Part L 2021)

The modelling shows a total 21% carbon emissions reduction against the GLA's Baseline (A Part L 2021 compliant development for new construction and the GLA's Baseline for existing areas) after demand reduction (Be Lean), energy efficient supply (Be Clean) and incorporation of renewable technologies (Be Green).

### 4.8 Comparison against existing building

As mentioned at the previous section the development is predicted to achieve on-site carbon savings of 21% when compared to an equivalent building constructed to modern building standards in line with the GLA's Energy Assessment Guidance (June 2022). This assumes that the building is upgraded to include the use of ASHPs, low specific fan power ventilation systems, demand control ventilation, high heat recovery efficiency, high efficiency lighting and highly insulated building fabric and high-performance glazing.

When compared to the existing building, the emissions of the building following the refurbishment works will be significantly reduced. For comparison, the existing building comprises the following inefficient and carbon intensive services which will be replaced by modern systems.

- Gas boiler serving a combination of fan coil units, radiators and DHW
- Air-cooled chiller serving fan coil units
- Mechanical ventilation with no heat recovery
- Low efficient fluorescent lighting throughout with manual switching (no occupancy or daylight • sensing)
- Simplified BMS with limited metering and smart capabilities •
- Low efficiency double glazed windows •

The following tables and diagram demonstrate the performance of the development against the existing building (prior to the refurbishment works).

SITE WIDE DEVELOPMENT	Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum)	
	Regulated	Unregulated
Existing development (pre-refurb)	389	66.7
Proposed development	95.3	66.7

Table 21. Non-Domestic Carbon Dioxide Emissions for the existing and proposed development

	Regulated Carbon Dioxide Savings				
SITE WIDE DEVELOPMENT	(Tonnes CO <sub>2</sub> per annum)	(%)			
Total savings from refurbishment	293.7	75.5%			

Table 22. Non-Domestic Regulated Carbon Dioxide Savings from the refurbishment

The modelling shows a total 75.5% carbon emissions reduction against the existing building.



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Figure 13. Site Wide Carbon Savings - Proposed development performance against the existing building

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issions		

# MINIMISING THE **RISK OF OVERHEATING**

"Development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems" (London Plan, March 2021).

This section summarises how the development has been designed to minimise the need for cooling.

# $\rightarrow$

# 5 MINIMISING THE RISK OF **OVERHEATING**



This section summarises how the development has been designed to minimise the need for cooling.

### 5.1 APPROACH TO MINIMISING COOLING ENERGY

The development has been designed around passive measures and limiting internal heat gains to minimise the need for cooling. The approach to the design has followed the cooling hierarchy as set out in Policy SI 4 of the London Plan (March 2021). The following sets out the measures adopted against each stage of the hierarchy.

- 1. Reduce the amount of heat entering the building through high albedo materials, additional openings, and the provision of green infrastructure on the roof.
  - a. New glazing has been designed to balance daylighting requirements and overheating risk.
  - b. High performance low q-value (0.35) windows and glazed doors will be installed for any proposed glazing to minimise thermal losses.
  - c. Urban greening is being provided.
- 2. Minimising internal heat generation through energy efficient design
  - a. All areas will benefit from energy efficient lighting and controls to minimise the internal gains and consequently the cooling loads.
  - b. The heating distribution system will be designed to limit losses in line with the recommendations set out in the CIBSE Heat Networks: Code of Practice for the UK.
- 3. Manage heat within the building through exposed internal thermal mass and high ceilings.
  - a. All occupied areas will have a floor to ceiling height of between 2.5 and 2.975m.
  - b. Existing external walls benefit from a construction with a medium to high thermal mass.
- 4. Provide passive ventilation.
  - a. Openable panels are proposed for office areas, providing potential for natural ventilation during the day.
- 5. Provide mechanical ventilation.
  - a. All supply/extract mechanical ventilation systems will be fitted with a summer bypass on the heat recovery system for summer mode operation.

- 6. Provide active cooling systems
  - heat pumps will be installed to provide active cooling.

### 5.2 COOLING DEMAND

The cooling demand of the development has been calculated using energy modelling software and compared to the notional building's cooling demands.

The table below shows the cooling demand of the actual and notional building as taken from the Building Regulation Part L (BRUKL) output report.

	Area weighted average non- domestic cooling demand (MJ/m <sup>2</sup> )	Area weighted total non-domestic cooling demand (MJ/year)
Actual	23.40	275,699
Notional	84.47	995,065

Table 23. Cooling demand

The above demonstrates that the proposed development's approach to minimising cooling energy demand has resulted in a significant reduction over the notional building, achieving a reduction of 72%.

a. Active cooling is proposed throughout the development. It is proposed that centralised air source

# PARTL COMPLIANCE

conservation of fuel and power in dwellings and buildings other than dwellings.

This section summarises how the development will be designed to meet the requirements set out in approved documents Part L Volume 2.

# +

# Approved documents L of the Building Regulations relate to the

# 6 PART L COMPLIANCE



This section summarises how the development will be designed to meet the requirements set out in approved documents Part L Volume 2.

The development is a minor refurbishment and extension of the existing office building, and will be designed to meet and exceed, where possible, all the minimum standards for existing buildings as described and defined within the relevant section of Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings, 2021 edition incorporating 2023 amendments.

In respect to the proposed extension and in accordance with section 10.7 of the Approved Document L, the new proposed extension does not fall under the new building definition as it does not meet both of the requirements regarding its total useful floor area:

a. Greater than 100m<sup>2</sup>

- b. Greater than 25% of the total useful floor area of the existing building
- In that case the proposed extension is required to meet the guidance in paragraphs 10.8 to 10.11.
- The new extension has been designed to meet all the requirement of the guidance.

Note that compliance with Part L will need to be reconfirmed during detailed design stage and following completion of the construction stage.

HM Government	
The Building Regulatio	ons 2010
Conservation of	
fuel and power	
APPROVED DOCUMENT	
Volume 2: Buildings otl Requirement L1: Conservation of f Requirement L2: On-site generatio Regulations: 6, 22, 23, 24, 25, 25A, 2 28, 40, 40A, 43, 44 and 44ZA	ner than dwellings uel and power on of electricity 58, 26, 26C, 27, 27C,
2021 edition incorporat	ing 2023 amendments -

Figure 14. Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings, 2021 edition incorporating 2023 amendments

# APPENDIX A - PROPOSED SPECIFICATIONS

### METHODOLOGY

Performance evaluation has been undertaken using compliant software in accordance with Approved Document L of the Building Regulations 2021 and the National Calculation Methodology (NCM) for assessing the energy performance of buildings required. Modelling has been carried out as follows:

• Non-Domestic: Tested by a certified CIBSE Energy Assessor using government approved Dynamic Simulation Modelling Software IES virtual Environment which can assess compliance against Part L 2021 and the National Calculation Methodology (NCM).

### Notes:

• The Developed Design of the building has not yet been undertaken, therefore reasonable assumptions about the performance of the building envelope and building services have been made based on consultation with the design team.

### BUILDING FABRIC INPUTS

			New / Existing element	Non- domestic areas	Build-Ups (outside to inside)	Notes/Sources
	External wall (Existing Portland stone facade): U-value	W/m²K	Existing	1.6	75mm Portland stone, 20mm cavity, 100mm blockwork, 12.5mm plasterboard	U-value - NCM based on age of construction Build up - T&E assumption
	External wall (1990s curtain wall): U-value	W/m²K	Existing	O.45	2mm aluminium cladding, 25 cavity, 25mm insulation, 13mm plaster	U-value & build up - NCM based on age of construction
	External wall (New extension facade): U-value	W/m <sup>2</sup> K	New	O.18	50mm Portland stone, 150mm precast concrete, 200mm insulation,12.5mmm plasterboard	Target U-value and provisional façade build up as provided by ORMS
	Basement wall (Existing): U-value	W/m <sup>2</sup> K	Existing	1.7	150mm concrete, 13mm plaster	U-value and build up assumed: Based on NCM Database: Solid concrete wall, uninsulated U=1.7
	Internal Wall (existing): U-value	W/m²K	Existing	-	2 layers 12.5mm plasterboard, 70mm aluminium stud filled with acoustic batt insulation, 2 layers 12.5mm plasterboard Internal	Build-up - Typical build up assumed
U-value Opaque Elements	Internal Wall (new): U-value	W/m²K	New	-	2 layers 12.5mm plasterboard, 70mm aluminium stud filled with acoustic batt insulation, 2 layers 12.5mm plasterboard Internal	Build-up - Typical build up assumed
	Intermediate Floor/Ceiling (existing): U-value	W/m²K	Existing	-	130mm concrete, 10mm void, 25mm RAF tiles	Build-up - As provided by ORMS
	Intermediate Floor/Ceiling (new): U-value	W/m²K	New	-	130mm concrete, 10mm void, 25mm RAF tiles	Build-up - As provided by ORMS
	Existing Roof: U-value (Applies to all existing terraces)	W/m²K	Existing	2.8	25mn stone chippings, 19mm asphalt, 150mm concrete, 13mm plaster dense	U-value and build up assumed: Based on NCM Database: Flat roof, concrete deck, uninsulated U=2.8
	New Pavilion Roof: U-value	W/m²K	New	0.12	100mm roof finish, 200mm insulation, 130mm comflor slab, 533mm UB steel	Build-up - ORMS Stage 2 Report U-value as confirmed by ORMS
	New Blue Roof: U-value	W/m²K	New	0.12	100mm terrace finish, 100mm blue roof layers, 200mm insulation, 150mm concrete slab	Build-up - ORMS Stage 2 Report U-value as confirmed by ORMS

		Existing Ground/Basement Floor: U-value	W/m²K	Existing	0.25	750mm clay underfloor, 25mm brick slips, 100mm concrete slab, insulation, 50mm screed	U-value and build Database: Solid g
		New Ground/Basement floor: U- value	W/m²K	New	N/A	N/A	N/A
		Opaque door: U-value	W/m²K	New	1.2	_	U-value as confirr
		Bronze door: U-value	W/m <sup>2</sup> K	New	1.2	50mm bronze	U-value as confirm
		Window and Glazed Doors: U- value (including frame)	W/m²K		2.8		Based on NCM
	Existing Windows & Glazing Doors	Window: Frame factor	%		From elevations		-
		Window and Glazed Doors - Glass solar transmission (g-value)	%	Existing	0.76	Existing Aluminium framed Double glazed windows	Based on NCM
		Window and Glazed Doors - Glass solar transmission (g-value)	%		O.8		Based on NCM
		Window: U-value (including frame)	W/m <sup>2</sup> K		1.4		U-value, g-value a
	New Windows	Window: Frame factor	%	N	From elevations		-
	& Glazing Doors	Window & GD - Glass solar transmission (g-value)	%	New	O.35	New Double-glazed windows	U-value, g-value a
		Window & GD - Light solar transmission (LT)	%		60		U-value, g-value a
	Thermal Mass	Thermal mass	-	N/A	Thermal mass based on build ups		

	ТЪЕ
l up assumed: Based on NCM ground floor, uninsulated	
med by ORMS	
med by ORMS	
and LT as confirmed by ORMS	
and LT as confirmed by ORMS	
and LT as confirmed by ORMS	

Thermal Bridging	Thermal bridging allowance (y- value)	W/m²K	N/A	25% of u-value (default)	
Air Permeability	Existing Air leakage value	m <sup>3</sup> /m <sup>2</sup> .hr @ 50Pa	Existing	25	Based on Non-Do England & Wales

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omestic EPC Conventions for Issue 8

### **BUILDING SERVICES INPUTS**

Heating, Cooling & Ventila LEVEL	tion (HVAC) - SYSTEM	HVAC-1	HVAC-2	HVAC-3	HVAC-4	HVAC-5	HVAC-6	HVAC-7	HVAC-8	HVAC-9	HVAC-10	HVAC-11
System description	Description	FCUs fed from ASHPs & ventilation AHUs	FCUs fed from ASHPs & ventilation AHUs	FCUs fed from ASHPs & ventilation AHUs	FCUs fed from ASHPs & extract	FCUs fed from ASHPs & ventilation AHUs	DX cooling split system	FCUs fed from ASHPs & ventilation AHUs	FCUs fed from ASHPs & ventilation AHUs	ventilation	None	None
Applies to	Room types	Office areas	Front of house communal areas and BOH offices (Basement flexible spaces, basement co- working lounges, basement building manager office, Ground floor post room, Ninth floor amenity space)	Reception and atrium	Toilets	Basement changing rooms	Telecommunications Room (Comms room)	Circulation areas	Gym	Plant	Cycle store	Stairs
UK NCM type	Туре											
Heating System		Heat pump	Heat pump	Heat pump	Heat pump	Heat pump	Heat pump	Heat pump	Heat pump	Heat pump	Heat pump	Heat pump
- Heat Fuel Type	Elec/gas	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec
- Heat generator seasonal efficiency	SCOP	2.94	2.94	2.94	2.94	2.94	N/A	2.94	2.94	N/A	N/A	N/A
- Does it Qualify for ECA?	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cooling System												
- Cooling system type (assumed system in model)	Description											
- Chiller fuel type	Description	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec	Elec

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- Seasonal EER	SEER	5.51	5.51	5.51	5.51	5.51	6.5	5.51	5.51	N/A	N/A	N/A
- Nominal EER	EER	3.56	3.56	3.56	3.56	3.56	3.91	3.56	3.56	N/A	N/A	N/A
- Does it Qualify for ECA?	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
System adjustment												
- Ductwork Leakage Classification	Class	A	A	A	A	A	N/A	A	А	A	N/A	N/A
- AHU Leakage Classification	Class	L2	L2	L2	L2	L2	N/A	L2	L2	L2	N/A	N/A
- Specific Fan Power (AHUs)	W/I/s	2.5	2.5	2.5	2.5	2.5	N/A	2.5	2.5	2.5	N/A	N/A
- Pump type	Description	Variable speed	Variable speed	Variable speed	Variable speed	Variable speed	N/A	Variable speed	Variable speed	Variable speed	N/A	N/A
Metering Provision												
- Does the system have provision for metering?	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
- Does the system warn of "out of range" values	Yes/No	No	No	No	No	No	No	No	No	No	N/A	N/A
Ventilation & pumping												
- Cooling/vent mechanism	Air con / nat vent	Air conditioned	Air conditioned	Air conditioned	Air conditioned	Air conditioned	Air conditioned	Air conditioned	Air conditioned	Air conditione d	Air conditioned	Air conditioned
- Air supply mechanism	Description	Centralised balanced	Centralised balanced	Centralised balanced	Zonal extract system with remote fan	Centralised balanced						
- Heat recovery	% efficiency or n/a	80%	80%	80%	N/A	80%	N/A	80%	80%	80%	N/A	N/A
System Controls												
- Central Time Control?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
- Optimum start/stop control?	No	No	No	No	No	No	No	No	No	No	N/A	N/A
- Local Time Control?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
- Local Temperature Control?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A

- Weather Compensation Control?	No	No	No	No	No	No	No	No	No	No	N/A	N/A
Ventilation - ZONAL LEVE	L	VENT-1	VENT-2	VENT-3								
System description	Description	Toilet extract	FCUs	Cleaners' cupboard extract								
Applies to	Room types	Toilets	All areas with FCUs	Cleaners' cupboards								
Specific Fan Power (Terminal units)	W/I/s	0.5	0.25	0.5								
Fan location	Description	Remote from room	N/A	Remote from room								
Air change rate (if applicable)	АСН	10	N/A	6								
Demand Control Ventilation (DCV)	Description / type	No	No	No								
Domestic DHW		DHW-1	DHW-2									
System description	Description	POU	ASHP & electric top up for showers									
Applies to	-	All areas above basement	Changing/showe r facilities in basement									
Heating fuel	Elec/gas	Elec	Elec									
Heat generator seasonal efficiency	%	100%	324%									
Is a CHP system installed? (see below for details)	Yes/No	No	No									
DHW delivery efficiency	%	95%	300%									
Is the system a storage system?	Yes/No	Yes	Yes									
Storage system size	litres	20No x 30L	1600									
Storage system losses	kWh/(l.day)	0.9	2.74									
Does the system have secondary circulation?	Yes/No	No	Yes									
Secondary circulation total flow & return pipe length & losses	m / W/m	n/a	100 / 8									
DHW pump power / time switch?	W / Time switch?	n/a	100 / Yes									

124 Theobalds Road | Energy Statement
Lighting		LT-1	LT-2	LT-3	LT-4	LT-5	LT-6	LT-7	LT-8	LT-9	LT-10	LT-11
Applies to	_	Office areas	Front of house communal areas and BOH offices (Basement flexible spaces, Basement Co- working lounges, Basement Building Manager Office, Ground floor post room, Ninth floor amenity space)	Reception and atrium	Toilets	Basement changing rooms	Telecommunication s Room (Comms room)	Circulation areas	Gym	Plant	Cycle store	Stairs
Lamp Type	type	LED	LED	LED	LED	LED	LED	LED	LED	LED	LED	LED
Illuminance	lux	500	400	300	200	200	400	200	400	400	150	200
Averaged lighting power density across the building OR	Luminaire Lumens/circuitW	110	115	110	120	120	120	120	120	120	120	120
Installed lighting Power Density	W/m2	9.1	6.9	5.5	3.3	3.3	6.7	3.3	6.7	6.7	2.5	3.3
PIR controls?	Description	Yes	Yes	Yes	Yes	Yes	No (plant)	Yes	No (safety)	No (plant)	Yes	Yes
PIR - Parasitic Power	W/m <sup>2</sup>	O.1	O.1	O.1	O.1	O.1	О	O.1	O.1	0	O.1	O.1
PIR - Time switching?	Yes/No	Yes	Yes	Yes	Yes	Yes	No (plant)	Yes	Yes	No (plant)	Yes	Yes
Automatic Daylighting Control?	Yes/No	Yes	Yes	Yes	No	No	No	No	Yes	No	No	No
Control Type (Switching/Dimming)	Switching/Dimming	Dimming	Dimming	Dimming	on/off	on/off	Switched	on/off	Dimming	Switched	on/off	on/off
Sensor Type (Standalone/Addressable )	Standalone/Addressabl e	Addressabl e	Addressable	Addressabl e	Addressabl e	Addressabl e	n/a	Addressabl e	Addressabl e	n/a	Addressabl e	Addressabl e
Daylight - Parasitic Power	W/m <sup>2</sup>	O.1	O.1	O.1	0	0	0	0	O.1	0	0	0
Display lighting uses efficient lamps?	Im	80	80	80	n/a	n/a	n/a	n/a	80	n/a	n/a	n/a
Building Management		BM-1										
Electric Power Factor of the building	Power Factor Control	0.95-0.98										
Lighting systems have provision for metering?	Yes/No	Yes										
Lighting systems metering warns of 'out of range' values?	Yes/No	Yes (via BMS)										
Does the system have provision for metering?	Yes/No	Yes										
Does the metering warn "out of range" values?	Yes/No	Yes (via BMS)										

124 Theobalds Road | Energy Statement

						1 the
LZC DETAILS - PV		LZC-1				
Number of Panels	No.	44				
Area (m2)	m2	83				
PV module efficiency (%)	%	22 (datasheet)				
Inclination (°)	0	0				
Azimuth - from north (°)	0	25				
Reference irradiance for NOCT	W/m2	221				
Nominal cell temperature (NOCT)	°C	25				
Temperature coefficient for module efficiency	1/K	-0.27%/deg C				
- Electrical conversion efficiency (%)	%	95				
Shading factor (0-1, with 1=unshaded)	O-1	1				

# APPENDIX B - DISTRICT HEATING NETWORK





# APPENDIX C – RENEWABLE TECHNOLOGY FEASIBILITY

#### PHOTOVOLTAICS

Photovoltaics (PV) are a method of generating electrical power by converting sunlight into direct current electricity using semiconducting materials. Uses of this technology have been explored for more than 50 years and nowadays it is a well-established and reliable technology which has seen prices dramatically reduce over the last decade thanks to economies of scale and the introduction of Feed-in-Tariff's in the UK (which was closed to new applicants in March 2019). This has resulted in typical financial payback of 8-9 years with returns on investment over 20 years typically in the order of 8-12%.



Figure 15. Image of PV panel

#### Types of PV Panels

There are three basic types of PV technologies: Monocrystalline, Polycrystalline (or multi-crystalline) and Amorphous.

- Monocrystalline cells. These are cut from a single crystal of silicon. In appearance, it has a smooth texture and the thickness of the slice can be easily seen. These PV cells have efficiencies of 13-17% and are the most efficient of the three types of silicon PV cell. However, they require more time and energy to produce than polycrystalline silicon PV cells, and are therefore more expensive.
- Polycrystalline (or Multi-crystalline). Polycrystalline silicon is produced from a molten and highly pure molten silicon by using a casting process. The silicon is heated to a high temperature and cooled under controlled conditions in a mould. It sets as an irregular poly- or multi-crystalline form. The square silicon block is then cut into 0.3mm slices. The typical blue appearance is due to the application of an antireflective layer. The thickness of this layer determines the colour - blue has the best optical qualities. It reflects the least and absorbs the lightest. More chemical processes and fixing of the conducting grid and electrical contacts complete the process. Mass-produced polycrystalline PV cell modules have an efficiency of 11-15%.
- Amorphous silicon. These are made from non-crystalline silicon, similar to the material found in pocket calculators etc. The layer of semi-conductor material is only 0.5-2.0um thick, where 1um is 0.001mm. This means that considerably less raw material is necessary in their production compared with crystalline silicon PV production. The film of amorphous silicon is deposited as a gas on a surface such as glass. Further chemical processes and the fixing of a conducting grid and electrical contacts follow.

These PV cells have an efficiency of between 6-8%. Multi-junction amorphous thin film PV cells are also available which are sensitive to different wavelengths of the light spectrum. These have slightly higher efficiencies.

The favourable efficiency-to-cost ratio of polycrystalline silicon makes them the most commonly used form of PV. The amount of silicon waste produced during manufacture is also less compared to monocrystalline panels.

#### Applicability to Development

Installation of solar technologies (PV and/or solar hot water) requires unshaded flat or south-facing areas. The potential to install PV at roof level has been reviewed based on availability of roof, access to the panels and overshadowing, and the roofs area provides an opportunity for the installation of a PV array. For the above reasons, PV is deemed a viable renewable energy solution for the development.

#### SOLAR HOT WATER

Solar water heating is a widely used technology within a number of hot and sunny countries and has also been proven a viable technology within the UK climate.

Heat is trapped by collectors usually located on the roof which in turn is used to preheat water, which is typically stored in a dual coil cylinder. In order to ensure adequate hot water (particularly during the winter months), and to prevent legionella, the hot water tank usually incorporates a second heating coil which is heated via a gas boiler or electric immersion heater.



Figure 16. Image of an evacuated tubes solar thermal panel

Types of Solar Water Heating Collectors

There are two main types of solar water heating collectors: evacuated tubes and flat plate. Evacuated tube solar thermal systems are one of the most popular solar thermal systems available and are the most efficient with an efficiency of up to 70%. Their efficiency is achieved because of the way in which the evacuated tube systems are constructed, meaning they have excellent insulation and are virtually unaffected by air temperatures. The collector itself is made up of rows of insulated glass tubes which contain a vacuum with copper pipes at their core. Water is heated in the collector and is then sent through the pipes to the water tank.

The cylindrical shape of evacuated tubes means that they are able to collect sunlight throughout the day and at all times in the year. Evacuated tube collectors are also easier to install as they are light, compact, easy to maintain - the tubes can be replaced individually if one becomes faulty - and reliable but are also the most expensive type of collectors. The system is efficient and durable with the vacuum inside the collector tubes having been proven to last for over twenty years. The reflective coating on the inside of the tube will also not degrade unless the vacuum is lost.

Flat plate solar thermal systems comprise a dark-coloured flat plate absorber with an insulated cover, a heat transfer liquid containing antifreeze to transfer heat from the absorber to the hot water tank, and an insulated backing. The flat plate feature of the solar panel increases the surface area for heat absorption. The heat transfer liquid is circulated through copper or silicon tubes contained within the flat surface plate.

In an area of the UK that produces an average level of solar energy, the amount of energy a flat plate solar collector generates equates to around one square foot panel generating one gallon (4.5 litres) of one day's hot water.

This design of solar panel is, overall, slightly less compact and less efficient when compared with an evacuated tube system, however this is reflected in a lower overall price. Solar thermal can typically provide up to 50% of total hot water demand (depending on the size of the system) and can have a life expectancy of over 25 years.

#### Applicability to Development

As with PV panels, installation of solar collectors requires unshaded surfaces which receive direct sunlight. SHW collectors would compete with PV panels for the available roof space. PV panels are anticipated to result in higher carbon emissions savings and are deemed more suitable for the development, therefore SHW collectors are not recommended. Therefore, Solar Hot Water is not recommended.

#### **HEAT PUMPS**

A heat pump is a device that is able to transfer heat from one fluid (e.g. external air) which is at a lower temperature to another fluid (e.g. internal air) at a higher temperature. This is typically achieved through use of a refrigerant that is pumped around a closed circuit of pipework using a pump (compressor). Heat pumps can be considered low or zero carbon when the heat is taken from a renewable source such as ground heat or external air. The efficiency of a heat pump is termed 'coefficient of performance' or COP and is the ratio of electrical (input) energy to drive the pump to the heat or output energy of the system. A typical air source heat pump has a COP of ~2.5 which means that for every unit of electrical energy used by the pump, the system will produce 2.5 units of heat energy (of which 1.5 units comes from the air, and the other 1 unit comes from the pumping energy). The figure below shows the main components and refrigeration cycle within a heat pump



Figure 17. Heat Pump components and refrigeration cycle

#### Types of Heat Pumps

Heat Pumps are categorised as follows depending on the source of heat:

- A Ground Source Heat Pump (GSHP) uses buried coils to extract the heat from the ground into a fluid boreholes can be 'open loop' and directly circulate water from the aquifer as the working fluid.
- A Water Source Heat Pump (WSHP) produces heat in a similar way to ground source systems. Pipes building (e.g. radiators, underfloor heating or fan coil units).

An Air Source Heat Pump (ASHP) takes heat directly from the external air and boosts it to a higher temperature using a heat pump. As with the above systems, the pump (compressor) needs electricity to operate. As with most Heat Pumps, ASHPs are available in different sizes and configurations. One form of ASHP is called Variable Refrigerant Flow / Volume (VRF/VRV) which can deliver both heating and cooling within a building, but also recover heat from one area and transfer the heat to another area through a refrigeration circuit. This can therefore maximise the carbon emissions savings, when installed in buildings that may have concurrent heating and cooling demand such as in offices.

#### Applicability to Development

Heat pumps provide a low carbon form of heating and cooling with zero local emissions, helping to minimise the impact of the building on local air quality. Therefore, heat pumps are suitable for the development.

that contains a mixture of water and antifreeze. The fluid is then passed through a heat exchanger into the heat pump. The ground stays at a fairly constant temperature under the surface, so the heat pump can be used throughout the year - even in the middle of winter. Coils can be laid down horizontally, which requires larger surface areas, vertically into 100-150m deep boreholes or can be integrated into the building piles - also called thermal piles. When there is an aquifer in close proximity to the site,

are submerged in a river, stream or lake, where temperatures can remain at a relatively constant level of between 7 and 12°C. Fluid in the pipes absorbs the heat from the open water source. This fluid in turn is passed through a heat pump which transfers the heat energy to a distribution system within the

#### WIND TURBINES

Wind turbines use the energy of the wind to generate electricity. On-shore and off-shore wind farms are one of the most widely used technologies for large scale generation of renewable energy with a total installed capacity in the UK of over 28 gigawatts with a 60%/40% on-shore/off-shore split (as of 2014). Whilst large scale turbines (1MW+) are a financially viable technology for producing clean energy, their visual impact together with the extensive area requirements make them unsuitable for use in most city/town centre locations.

With sizes typically between 0.3 and 10kW, 'Microwind' or 'Small-wind' turbines, are an alternative which can be considered for on-site use as roof-mounted devices. According to the Energy Saving Trust, forty percent of all the wind energy in Europe blows over the UK, making it an ideal country for domestic turbines. Whilst this statement applies to some areas, ground roughness due to the built landscape can create turbulence which quite often makes the use of roof mounted turbines unfeasible. Also, it is recommended that annual wind speeds average at least 6m/s to provide significant carbon emissions savings.



Figure 18. Image of a wind turbine

Applicability to Development

Large scale wind turbines can present nuisances such as noise and flicker effect which are not considered acceptable for an urban development of this nature and are likely to face significant objection through the planning process.

With regards to roof-mounted wind turbines, recent studies demonstrate that they underperform in urban environments as a result of turbulent air flows, and therefore they are not deemed suitable for a building in this location. Therefore, Wind Turbines are not a suitable option for this development.

#### **BIOMASS HEATING**

Biomass heating systems for domestic or commercial use typically burn wood pellets, chips or logs to provide warmth to a single room, or multiple rooms when the heat is delivered through a central heating system. Biomass can also be produced from non-woody fuel sources such as sugar, starch or oils, although most commercially available systems in the UK work with wood-based fuel usually in the shape of wood chips or pellets. Wood, in the form of logs, can also be used in some systems, but needs to be manually fed and therefore are not viable for most commercial buildings.

Wood chips are typically the cheapest form of biomass (depending on the source of supply) but require larger storage space than pellets as they typically have a lower calorific value per unit volume of fuel as a result of their irregular shape and higher moisture content. On the other hand, pellets require more energy to manufacture and quality can significantly vary, therefore sourcing needs careful consideration. In both cases,

in addition to the storage requirements of biomass fuels, long-term local reliable supply can be an issue. With limited availability in the UK, it is important to set up supply agreements when installing a biomass boiler to avoid price escalation, lack of supply or sourcing of the fuel from abroad. New sustainability criteria regarding biomass has been introduced for the Renewable Heat Incentive (RHI), which will make sure biomass meets the Government's carbon and environmental objectives, ensuring that support delivers value for money. This will affect domestic and non-domestic RHI participants, producers and traders of biomass fuels.

Biomass boilers are available in a wide range of sizes and fuel storage / feed configurations. As well as heatonly boilers, a limited number of manufacturers also produce biomass combined heat and power systems that can run on biomass fuel, although they are relatively expensive and are only available in a limited range of sizes (outputs).



Figure 19. Image of wood pellets

Applicability to Development

Use of biomass heating requires a large area for the supply of pellets which must be within easy reach for the pellets/chips to be blown. The development does not have any available area, making the use of this technology unfeasible. In addition, the burning of biomass produces high particulate and NOx emissions which can reduce local air quality, particularly in urban settings. Therefore, Biomass Heating is not considered suitable for this development.

# \_\_\_\_\_ TJ-E

# APPENDIX D - INDICATIVE HEAT PUMP SPECIFICATION





**Technical Selection** 

Page 3/8

### EAHV-M1800YCL(-N)

Air Source Reversible Heat Pump / Chiller

#### Seasonal Efficiencies - SEER User Defined

Prated,c	kW	180
Fluid Outlet Temp	°C	7
SEER*	kW/kW	5.51
EER at 35°C/180kW	kW/kW	3.16
EER at 30°C/135kW	kW/kW	4.27
EER at 25°C/90kW	kW/kW	5.50
EER at 20°C/45kW	kW/kW	7.61



\*SEER given as an indication based on the guidance found in Part L of the building regulations with a fixed flow rate 8.6l/s.

#### SEER = (0.03\*EER@35°C)+(0.33\*EER@30°C)+(0.41\*EER@25°C)+(0.23\*EER@20°C)

Seasonal Efficiencies - SCOP User Defined

Prated,h	kW	141.5
Fluid Outlet Temp	°C	50
SCOP**	kW/kW	2.94
COP at -5°C/141.5kW	kW/kW	2.3
COP at 0°C/135kW	kW/kW	2.67
COP at 7°C/90kW	kW/kW	3.09

4.00				3.7
3.00		1012	3.09	
2.50	-	2.6/		
2.00	2.3			
1.50				
1.00				
0.50				
0.00				
	COP at -	COP at	COP at	COP at

\*\*SCOP given as an indication based on simplified ambient temperatures and weighting from EN18525 with a fixed flow rate of 8.6l/s.

SCOP = (0.05\*COP@-5°C)+(0.4\*COP@0°C)+(0.45\*COP@7°C)+(0.1\*COP@15°C)

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# APPENDIX E - INDICATIVE PV PANEL SPECIFICATION AND LAYOUT



#### MAXEON 3 POWER: 410-420 W | EFFICIENCY: Up to 22.2%

Electrical Data				<b>Operating Condition And Mechanical Data</b>			
	SPR-MAX3-420-	SPR-MAX3-415-	SPR-MAX3-410-	Temperature	-40°C to +85°C		
	BLK	BLK	BLK	Impact Resistance	25 mm diameter hail a	t 23 m/s	
Nominal Power (Pnom) *	420 W	415 W	410 W	Solar Cells	112 Monocrystalline M	axeon Gen 3	
Power Tolerance	+5/0%	+5/0%	+5/0%	Tempored Glass	Ligh transmission tem	need seti reflection	
Panel Efficiency	22.2%	21.9%	21,6%	Tempereu diass	High-transmission term	pered anonenective	
Rated Voltage (Vmpp)	71.3 V	70.8 V	70.4 V	Junction Box	IP-68, Staubli (MC4), 3 t	oypass diodes	
Rated Current (Impp)	5.89 A	5.86 A	5.82 A	Weight	21,2 kg	1. A 5 10 10 10 10 10 10 10 10 10 10 10 10 10	
Open-Circuit Voltage (Voc)	81.5 V	81.4 V	81.4 V	Max. Load €	Wind: 2400 Pa, 244 kg/ Snow: 5400 Pa, 550 kg/	m² front & back	
Short-Circuit Current (lsc)	6.33 A	6.32 A	6.31 A	Erama	Class 1 black apodized	(highest AAMA ration)	
Max. System Voltage		1000 V IEC		FIBOR	class i black anouzeu	(ng) esc where racing/	
Maximum Series Fuse		20 A					
Power Temp Coef.		-0.27%/°C					
Voltage Temp Coef.		-0.236%/*C					
Current Temp Coef.		0.058% / °C		- 1046 mm	) — <b>&gt;</b>		
Warranties,	Certifications a	nd Complian	ce			FRAME PROFILE	
Standard Tests <sup>3</sup>	IEC 61215, IEC 61	730		(A)		15	
Quality Management Certs	ISO 9001:2015, IS	O 14001:2015			)il	0.00	
Ammonia Test	IEC 62716					i baba	
Desert Test	IEC 60068-2-68, N	AIL-STD-B10G				(11)	
Salt Spray Test	IEC 61701 (maxin	num severity)			1812 mm	A. Cable Length:	
PID Test	1000 V: IEC 62804	4				1000 mm +/-10 mm	
Available Listings	TUV					B. LONG SIDE: 32 mm	
IFLI Declare Label	First solar panel l transparency and	abeled for ingredi d LBC-compliance	ient	111	1	SHURT SIDE: 24 mm	
Cradle to Cradle Certified <sup>™</sup> Bronze	First solar panel I water stewardsh renewable energ social fairness. <sup>5</sup>	ine certified for m ip, material reutili y & carbon manaj	aterial health, zation, gement, and		40 mm		
Green Building Certification Contribution	Panels can contri LEED and BREEA	bute additional po M certifications.	oints toward		7		
EHS Compliance	RoHS, OHSAS 180 REACH SVHC-163	001:2007, Recycle 3	Scheme,				





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Please read the safety and installation instructions. Visit www.sunpower.maxeon.com/int/PVInstallGuidelEC, Paper version can be requested through chsupport.ROW@maxeon.com

# APPENDIX F - NON-DOMESTIC BRUKL REPORTS

## BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

#### **Project name**

## Post-Refurb (Baseline)\_Refurbishment

### As designed

Date: Fri May 17 16:10:52 2024

#### Administrative information

#### **Building Details**

Address: 124 Theobalds Road, London, WC1X 8RX

#### **Certifier details**

Name: Matt Cotton Telephone number: 02037139538 Address: 15-19 Bloomsbury Way, London, WC1A 2TH **Certification tool** 

Calculation engine: Apache Calculation engine version: 7.0.25 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.25 BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 896.99

#### The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum	5.21		
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum	10.5		
Target primary energy rate (TPER), kWh <sub>PE</sub> /m²annum	57.42		
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	114.57		
Do the building's emission and primary energy rates exceed the targets?	BER > TER	BPER > TPER	

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

Fabric element	Ua-Limit	Ua-Calc	<b>U</b> i-Calc	First surface with maximum value
Walls*	0.26	0.55	0.55	B1000014:Surf[0]
Floors	0.18	0.25	0.25	0000004:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.18	0.18	04000001:Surf[10]
Windows** and roof windows	1.6	1.4	1.4	000000C:Surf[0]
Rooflights***	2.2	2.1	2.1	B1000030:Surf[1]
Personnel doors^	1.6	1.88	5.87	000000C:Surf[6]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	1.4	1.4	0000008:Surf[2]
U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]			U i-Calc = Ca	Iculated maximum individual element U-values [W/(m²K)]

 $U_{a-Calc} = Calculated area-weighted average U-values [W/(m^2K)]$ 

U<sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]

\* 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. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	25

#### **Building services**

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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

#### 1-01\_FCU-ASHP-AHUs (Office areas)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR e	efficiency	
This system	2.5	5	0	2.6	0.8		
Standard value	2.5*	N/A	N/A	2^	N/A		
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 2-07\_FCU-ASHP-AHU (Circulation)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency		
This system	2.5	5	0	2.6	0.8		
Standard value	2.5*	N/A	N/A	2^	N/A		
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 3-04\_FCU-ASHP-Extract (Toilets)

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.									

### 4-02 FCU-ASHP-AHUs (FOH communal, basement flex, lounge, cellular office, post room, 9th floor amenity)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency					
This system	2.5	5	0	2.6	0.8	}				
Standard value	2.5*	N/A	N/A	2^	N//	4				
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO										
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.										

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 5-03\_FCU-ASHP-AHUs (Reception and atrium)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency				
This system	2.5	5	0	2.6	0.8				
Standard value	2.5*	N/A	N/A	2^	N/A				
Automatic moni	toring & targeting w	ith alarms for out-of	-range values for thi	s HVAC syster	n	NO			
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.									

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 6- 05\_FCU-ASHP-AHU (Basement changing rooms)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HF	R efficiency			
This system	2.5	5	0	2.6	0.8	3			
Standard value	2.5*	N/A	N/A	2^	N//	A			
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.									

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 7-06\_DX (Comms room)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HF	R efficiency				
This system	2.5	5	0	-	-					
Standard value	2.5*	5	N/A	N/A N/		A				
Automatic moni	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.										

#### 8-08\_FCU-ASHP-AHU (Gym)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency				
This system	2.5	5	0	2.6	0.8				
Standard value	value 2.5* N/A N/A 2^ N/A								
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO									
* Standard shown is f	or all types >12 kW output,	except absorption and gas	s engine heat pumps.						
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.									

#### 1-00a\_DHW 01-POU (REFURB)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.03
Standard value	1	N/A

#### 2- 00b\_DHW 02-ASHP + elec top up (REFURB)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1.43	0.002
Standard value	2*	N/A
* Standard shown is for all	types except absorption and gas engine heat pumps.	

#### Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
А	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
Е	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
Н	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: L	imiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name											
ID of system type	Α	В	С	D	Е	F	G	Н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_Core A WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
00_XXX_Core A WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core A WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core A WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core A WC-06	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core B WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Core B WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Post room	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Reception	-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Reception (Perimeter - North	h)-	-	-	-	-	-	-	0.4	-	-	N/A
00 XXX Reception (Perimeter - Sout	h)	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX B Office (Perimeter)	-	-	-	_	-	-	_	0.4	-	-	N/A
01 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
01 XXX C Office (Perimeter)	_	-	-	_	_	-	_	0.4	-	_	N/A
01 XXX Core A Circulation	_	-	-	_	_	-	_	0.4	-	_	N/A
01 XXX Core A WC (Acc)-01	_	-	-	_	_	-	_	0.4	-	_	N/A
01 XXX Core A WC Lobby	_	_		_	_	_	_	0.4	-	_	N/A
01 XXX Core A WC-02								0.4		_	N/Δ
01 XXX Core A WC-02		_	-		_			0.4	-		N/A
01 XXX Core B Circulation								0.4			
	-	-	-	-	-	-	-	0.4	-	-	IN/A

Zone name											
ID of system type	Α	В	С	D	E	F	G	Н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
01_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
01_XXX_Core B WC-01	-	-	-	-	-	-	-	0.4	-	-	N/A
01_XXX_Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
01_XXX_Core B WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
01_XXX_Core B WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
01_XXX_Core B WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
01_XXX_Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_A Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_B Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core A WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
02_XXX_Core B WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_A Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_B Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A

Zone name											
ID of system type	Α	В	С	D	E	F	G	Н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
03_XXX_C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core A WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
03_XXX_Core B WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_A Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_B Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core A WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B WC-03	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B WC-04	-	-	-	-	-	-	-	0.4	-	-	N/A
04_XXX_Core B WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
05_XXX_A Elevator lobby	-	-	-	-	-	-	-	0.4	-	-	N/A

ID of system type         A         B         C         D         E         F         G         H         I         Pre-treency           Standard value         0.3         1.1         0.5         2.3         2         0.5         0.4         1         Zone         Standard           05_XXX_A Office (Perimeter)         -         -         -         -         -         -         0.4         -         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.4         -         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.4         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.4         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.4         -         N/A           05_XXX_C Office (Perimeter)         -         -         -         -         0.4         -         N/A           05_XXX_C Office (Perimeter)         -         -         -         -         0.4         -         N/A <t< th=""></t<>
Standard value         0.3         1.1         0.5         2.3         2         0.5         0.4         1         Zone         Standard           05_XXX_A Office (Perimeter)         -         -         -         -         -         -         0.4         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.4         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.4         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.4         -         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         -         0.4         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.4         -         N/A           05_XXX_C Office         -         -         -         -         -         0.4         -         N/A           05_XXX_C Office (Perimeter)         -         -         -         -         0.4         -         N/A           05_XXX_C Off
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       N/A         05_XXX_C Office       -       -       -       -       0.4       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       0.4       -       N/A         05_XXX_C Office (Perimeter)       -       -       - <t< th=""></t<>
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-03       -
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.4       -       N/A
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC 02       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.4       -       N/A
05_XXX_B Elevator lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-05
05_XXX_B Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Ore A Circulation       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Ore A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_C Ore A WC Lobby       -       -       -       -       0.4       -       -       N/A         05_XXX_C Ore A WC-02       -       -       -       -       0.4       -       N/A         05_XXX_C Ore A WC-03       -       -       -       -       0.4       -       N/A         05_XXX_C Ore A WC-04       -       -       -       -       -       0.4       -       N/A
05_XXX_B Office (Perimeter)       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.4       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC Clobby       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.4       -       N/A
05_XXX_C Office       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC 02
05_XXX_C Office (Perimeter)       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -
05_XXX_Core A Circulation       -       -       -       -       -       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC 02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.4       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.4       -       N/A
05_XXX_Core A WC (Acc)-01       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC Co2       -       -       -       -       -       0.4       -       N/A <tr< td=""></tr<>
05_XXX_Core A WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4 <td< td=""></td<>
05_XXX_Core A WC-02       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC 02       -       -       -       -       -       0.4       -
05_XXX_Core A WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       -
05_XXX_Core A WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.4       -       N/A
05_XXX_Core A WC-05       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -
05_XXX_Core B Circulation       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       -       -       N/A         06_XXX_A BOH Circulation       -       -       -
05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       -       0.4       -       -       N/A
05_XXX_Core B WC Lobby       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       -       0.4       -       -       N/A
05_XXX_Core B WC-02       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       -       0.4       -       -       N/A
05_XXX_Core B WC-03       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       0.4       -       -       N/A
05_XXX_Core B WC-04       -       -       -       -       -       -       0.4       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       0.4       -       -       N/A
05_XXX_Core B WC-05       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       -       0.4       -       -       N/A         06_XXX_A BOH Circulation       -       -       -       -       -       0.4       -       -       N/A
06_XXX_A BOH Circulation 0.4 N/A
UD_XXX_COTE A CITCULATION  -  -  -  -  -  -  -  0.4  -  -  N/A
06_XXX_Core A WC (Acc)-01 0.4 N/A
06_XXX_Core A WC Lobby 0.4 N/A
06_XXX_Core A WC-02 0.4 N/A
06 XXX Core A WC-03 0.4 N/A
06 XXX Core A WC-05 0.4 N/A
06_XXX_Core B Circulation 0.4 N/A
06_XXX_Core B WC (Acc)-01 0.4 N/A
06 XXX Core B WC Lobby 0.4 N/A
06 XXX Core B WC-02 0.4 N/A
06 XXX Core B WC-03 0.4 N/A
06 XXX Core B WC-05 0.4 N/A
06 XXX Office 0.4 N/A
06 XXX Office (Perimeter) 0.4 N/A
06 XXX Office (Perimeter) 0.4 N/A
06 XXX Office (Perimeter) 0.4 N/A
06 XXX Office (Perimeter) 0.4 N/A
06 XXX Office (Perimeter) 0.4 N/A
06 XXX Office (Perimeter) 0.4 N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core A WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core A WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
07_XXX_Core B WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
07 XXX Office	-	-	-	-	-	-	-	0.4	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core A WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core A WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core A WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core A WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core B WC (Acc)-01	-	-	-	-	-	-	-	0.4	-	-	N/A
08_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
08_XXX_Core B WC-02	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Core B WC-05	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Office	-	-	-	-	-	-	-	0.4	-	-	N/A
08_XXX_Office	-	-	-	-	-	-	-	0.4	-	-	N/A
08_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
08 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.4	-	-	N/A
09 XXX C Office	-	-	-	-	-	-	-	0.4	-	-	N/A
09 XXX Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
09 XXX Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
09 XXX Core B WC 01	-	-	-	-	-	-	-	0.4	-	-	N/A
09 XXX Core B WC 02	-	-	-	-	-	-	-	0.4	-	-	N/A
B1 XXX Building manager office	-	-	-	-	-	-	-	0.4	-	-	N/A
B1 XXX Changing facilities 01	-	-	-	-	-	-	-	0.4	-	-	N/A
B1 XXX Changing facilities 02	-	-	-	-	-	-	-	0.4	-	-	N/A
B1 XXX Changing rooms (AWC)	-	-	-	-	-	-	-	0.4	-	-	N/A
B1 XXX Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
B1 XXX Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
	I		1	1		I			1		

Zone name		SFP [W/(I/s)]									
ID of system type	Α	В	С	D	Е	F	G	Н	I	пке	mciency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
B1_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core A Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B Circulation	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 01	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 01	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 02 (Ass)	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 03	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 04	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 05	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 06	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 07	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC 09 (Ass)	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Core B WC lobby	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Co-working lounge	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Drying room	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Fitness studio	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Flexible space 01	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Flexible space 02	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Flexible working space	-	-	-	-	-	-	-	0.4	-	-	N/A
B1_XXX_Gym	-	-	-	-	-	-	-	0.4	-	-	N/A

General lighting and display lighting	General luminaire	Displa	Display light source		
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]		
Standard value	95	80	0.3		
00_XXX_A Office (Perimeter)	60	-	-		
00_XXX_A Office (Perimeter)	60	-	-		
00_XXX_A Office (Perimeter)	60	-	-		
00_XXX_A Office (Perimeter)	60	-	-		
00_XXX_B Office (Perimeter)	60	-	-		
00_XXX_B Office (Perimeter)	60	-	-		
00_XXX_B Office (Perimeter)	60	-	-		
00_XXX_B Office (Perimeter)	60	-	-		
00_XXX_Core A Circulation	60	-	-		
00_XXX_Core A Cleaners Cupboard	60	-	-		
00_XXX_Core A WC (Acc)-01	60	-	-		
00_XXX_Core A WC Lobby	60	-	-		
00_XXX_Core A WC-02	60	-	-		
00_XXX_Core A WC-03	60	-	-		
00_XXX_Core A WC-04	60	-	-		
00_XXX_Core A WC-05	60	-	-		
00_XXX_Core A WC-06	60	-	-		
00_XXX_Core B Circulation	60	-	-		

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
00_XXX_Core B Cleaners Cupboard	60	-	-
00_XXX_Core B WC (Acc)-01	60	-	-
00_XXX_Core B WC Lobby	60	-	-
00_XXX_Core B WC-02	60	-	-
00_XXX_Core B WC-03	60	-	-
00_XXX_Entrance lobby	60	-	-
00_XXX_FF Stair A	60	-	-
00_XXX_FF Stair B	60	-	-
00_XXX_Post room	60	-	-
00_XXX_Reception	60	15	9
00_XXX_Reception (Perimeter - North)	60	15	9
00_XXX_Reception (Perimeter - South)	60	15	9
01_XXX_A Office (Perimeter)	60	-	-
01_XXX_A Office (Perimeter)	60	-	-
01 XXX A Office (Perimeter)	60	-	-
01 XXX A Office (Perimeter)	60	-	-
01 XXX B Office (Perimeter)	60	-	-
01 XXX B Office (Perimeter)	60	-	-
01 XXX B Office (Perimeter)	60	-	-
01 XXX B Office (Perimeter)	60	-	-
01 XXX C Office	60	-	-
01 XXX C Office	60	-	-
01 XXX C Office	60	-	-
01 XXX C Office (Perimeter)	60	-	-
01 XXX Core A Circulation	60	-	-
01 XXX Core A Cleaners cupboard	60	-	-
01 XXX Core A WC (Acc)-01	60	-	-
01 XXX Core A WC Lobby	60	-	-
01 XXX Core A WC-02	60	-	-
01_XXX_Core A WC-03	60	-	-
01 XXX Core B Circulation	60	-	-
01 XXX Core B WC Lobby	60	-	-
01 XXX Core B WC-01	60	-	-
01_XXX_Core B WC-02	60	-	-
01_XXX_Core B WC-03	60	-	-
01_XXX_Core B WC-04	60	-	-
	60		
	60		
	60	-	-
	60	_	
	60	_	
02_XXX_A Office (Derimeter)	60	-	-
	60	-	-
	UΟ	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
02_XXX_A Office (Perimeter)	60	-	-
02_XXX_A Office (Perimeter)	60	-	-
02_XXX_B Elevator lobby	60	-	-
02_XXX_B Office (Perimeter)	60	-	-
02_XXX_B Office (Perimeter)	60	-	-
02_XXX_B Office (Perimeter)	60	-	-
02_XXX_B Office (Perimeter)	60	-	-
02_XXX_C Office	60	-	-
02_XXX_C Office (Perimeter)	60	-	-
02_XXX_Core A Circulation	60	-	-
02_XXX_Core A Cleaners cupboard	60	-	-
02_XXX_Core A WC (Acc)-01	60	-	-
02_XXX_Core A WC Lobby	60	-	-
02_XXX_Core A WC-02	60	-	-
02_XXX_Core A WC-03	60	-	-
02_XXX_Core A WC-04	60	-	-
02 XXX Core A WC-05	60	-	-
02 XXX Core B Circulation	60	-	-
02 XXX Core B Cleaners cupboard	60	-	-
02 XXX Core B WC (Acc)-01	60	-	-
02 XXX Core B WC Lobby	60	-	-
02_XXX_Core B WC-02	60	-	-
02_XXX_Core B WC-03	60	-	-
02_XXX_Core B WC-04	60	-	-
02_XXX_Core B WC-05	60	-	-
02_XXX_FF Stair A	60	-	-
02_XXX_FF Stair B	60	-	-
03_XXX_A Elevator lobby	60	-	-
03_XXX_A Office (Perimeter)	60	-	-
03_XXX_A Office (Perimeter)	60	-	-
03_XXX_A Office (Perimeter)	60	-	-
03_XXX_A Office (Perimeter)	60	-	-
03_XXX_B Elevator lobby	60	-	-
03_XXX_B Office (Perimeter)	60	-	-
03_XXX_B Office (Perimeter)	60	-	-
03_XXX_B Office (Perimeter)	60	-	-
03 XXX B Office (Perimeter)	60	-	-
03 XXX C Office	60	-	-
03_XXX_C Office (Perimeter)	60	-	-
03 XXX Core A Circulation	60	-	-
03 XXX Core A Cleaners cubboard	60	-	-
03 XXX Core A WC (Acc)-01	60	-	-
03 XXX Core A WC Lobby	60	-	-
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General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
03_XXX_Core A WC-02	60	-	-
03_XXX_Core A WC-03	60	-	-
03_XXX_Core A WC-04	60	-	-
03_XXX_Core A WC-05	60	-	-
03_XXX_Core B Circulation	60	-	-
03_XXX_Core B Cleaners cupboard	60	-	-
03_XXX_Core B WC (Acc)-01	60	-	-
03_XXX_Core B WC Lobby	60	-	-
03_XXX_Core B WC-02	60	-	-
03_XXX_Core B WC-03	60	-	-
03_XXX_Core B WC-04	60	-	-
03_XXX_Core B WC-05	60	-	-
03_XXX_FF Stair A	60	-	-
03_XXX_FF Stair B	60	-	-
04_XXX_A Elevator lobby	60	-	-
04 XXX A Office (Perimeter)	60	-	-
04 XXX A Office (Perimeter)	60	-	-
04 XXX A Office (Perimeter)	60	-	-
04 XXX A Office (Perimeter)	60	-	-
04 XXX B Elevator lobby	60	-	-
04 XXX B Office (Perimeter)	60	-	-
04 XXX B Office (Perimeter)	60	-	-
04 XXX B Office (Perimeter)	60	-	-
04_XXX_B Office (Perimeter)	60	-	-
04_XXX_C Office	60	-	-
04_XXX_C Office (Perimeter)	60	-	-
04_XXX_Core A Circulation	60	-	-
04 XXX Core A Cleaners cupboard	60	-	-
04 XXX Core A WC (Acc)-01	60	-	-
04 XXX Core A WC Lobby	60	-	-
04 XXX Core A WC-02	60	-	-
04 XXX Core A WC-03	60	-	-
04 XXX Core A WC-04	60	-	-
04 XXX Core A WC-05	60	-	-
04 XXX Core B Circulation	60	-	-
04 XXX Core B Cleaners cupboard	60	-	-
04 XXX Core B WC (Acc)-01	60	-	-
04 XXX Core B WC Lobby	60	-	-
04 XXX Core B WC-02	60	-	-
04 XXX Core B WC-03	60	-	-
04 XXX Core B WC-04	60	-	-
04_XXX_Core B WC-05	60	-	-
04 XXX FE Stair A	60	-	
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General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
04_XXX_FF Stair B	60	-	-
05_XXX_A Elevator lobby	60	-	-
05_XXX_A Office (Perimeter)	60	-	-
05_XXX_A Office (Perimeter)	60	-	-
05_XXX_A Office (Perimeter)	60	-	-
05_XXX_A Office (Perimeter)	60	-	-
05_XXX_B Elevator lobby	60	-	-
05_XXX_B Office (Perimeter)	60	-	-
05_XXX_B Office (Perimeter)	60	-	-
05_XXX_C Office	60	-	-
05_XXX_C Office (Perimeter)	60	-	-
05_XXX_Core A Circulation	60	-	-
05_XXX_Core A Cleaners cupboard	60	-	-
05_XXX_Core A WC (Acc)-01	60	-	-
05_XXX_Core A WC Lobby	60	-	-
05 XXX Core A WC-02	60	-	-
05 XXX Core A WC-03	60	-	-
05 XXX Core A WC-04	60	-	-
05 XXX Core A WC-05	60	-	-
05 XXX Core B Circulation	60	-	-
05 XXX Core B Cleaners cupboard	60	-	-
05 XXX Core B WC (Acc)-01	60	-	-
05 XXX Core B WC Lobby	60	-	-
05 XXX Core B WC-02	60	-	-
05 XXX Core B WC-03	60	-	-
05 XXX Core B WC-04	60	-	-
05 XXX Core B WC-05	60	-	-
05 XXX FF Stair A	60	-	-
05 XXX FF Stair B	60	-	-
06 XXX A BOH Circulation	60	-	-
06 XXX Core A Circulation	60	-	-
06 XXX Core A Cleaners cupboard	60	-	-
06 XXX Core A PB 01	60	-	-
06 XXX Core A PB 02	60	-	-
06_XXX_Core A PB 02	60	-	-
06_XXX_Core A WC (Acc)-01	60	-	-
	60		_
	60	_	
06_XXX_Core A WC-03	60		
06_XXX_Core A WC-05	60		
06_XXX_Core B Circulation	60	_	
06_XXX_Core B Cleaners support	60	_	
	60	-	-
	00	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
06_XXX_Core B WC (Acc)-01	60	-	-
06_XXX_Core B WC Lobby	60	-	-
06_XXX_Core B WC-02	60	-	-
06_XXX_Core B WC-03	60	-	-
06_XXX_Core B WC-05	60	-	-
06_XXX_FF Stair A	60	-	-
06_XXX_FF Stair B	60	-	-
06_XXX_Office	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06_XXX_Office (Perimeter)	60	-	-
06 XXX Office (Perimeter)	60	-	-
07 XXX Core A Circulation	60	-	-
07 XXX Core A Cleaners cupboard	60	-	-
07_XXX_Core A PB 02	60	-	-
07_XXX_Core A PB 02	60	-	-
07_XXX_Core A WC (Acc)-01	60	-	-
07_XXX_Core A WC Lobby	60	-	-
07_XXX_Core A WC-02	60	-	-
07_XXX_Core A WC-05	60	-	-
07_XXX_Core B Circulation	60	-	-
07_XXX_Core B Cleaners cupboard	60	-	-
07_XXX_Core B WC (Acc)-01	60	-	-
07_XXX_Core B WC Lobby	60	-	-
07_XXX_Core B WC-02	60	-	-
07_XXX_Core B WC-05	60	-	-
07_XXX_FF Stair A	60	-	-
07_XXX_FF Stair B	60	-	-
07_XXX_Office	60	-	-
07_XXX_Office (Perimeter)	60	-	-
07_XXX_Office (Perimeter)	60	-	-
07_XXX_Office (Perimeter)	60	-	-
07_XXX_Office (Perimeter)	60	-	-
08_XXX_Core A Circulation	60	-	-
08_XXX_Core A Cleaners cupboard	60	-	-
08_XXX_Core A PB 02	60	-	-
08_XXX_Core A PB 02	60	-	-
08_XXX_Core A WC (Acc)-01	60	-	-

Instruct         Efficacy [Im/W]         Efficacy [Im/W]         Power density [W/m]           08         XXX_Core A WC Loby         60         -         -           08         XXX_Core A WC Co2         60         -         -           08         XXX_Core A WC Co2         60         -         -           08         XXX_Core B WC Co2         60         -         -           08         XXX_Core B Circulation         60         -         -           08         XXX_Core B WC Aco; O1         60         -         -           08         XXX_Core B WC Co2         60         -         -           08         XXX_Core B WC Co5         60         -         -           08         XXX_Core B WC Co5         60         -         -           08         XXX_Office         60         -         -           08         XXX_Office         60         -         -           08         XXX_Office Perimeter)         60         -         -           09         XXX_Core B WC 01         60         -         -           09         XXX_Core B WC 02         60         -         -           09         XXX_F FSt	General lighting and display lighting	General luminaire	Displa	y light source
Standard value         95         80         0.3           06         XXX Core A WC-02         60         -         -           08_XXX_Core A WC-02         60         -         -           08_XXX_Core B Cicaulation         60         -         -           08_XXX_Core B Cicaulation         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC-02         60         -         -           08_XXX_Core B WC-05         60         -         -           08_XXX_Core B WC-06         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Core B VC01         60         -         -           09_XXX_Core B WC01         60         -         -           09_XXX_Core B WC02         60         -         -           09_XXX_Core B WC01         60         - <th>Zone name</th> <th>Efficacy [Im/W]</th> <th>Efficacy [lm/W]</th> <th>Power density [W/m<sup>2</sup>]</th>	Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
06         XXX Core A WC-02         60         -         -           08         XXX Core A WC-02         60         -         -           08         XXX Core B Circulation         60         -         -           08         XXX Core B Circulation         60         -         -           08         XXX Core B WC (Aco)-01         60         -         -           08         XXX Core B WC (Aco)-01         60         -         -           08         XXX Core B WC (Aco)-01         60         -         -           08         XXX Core B WC (Aco)-02         60         -         -           08         XXX Core B WC (Aco)-05         60         -         -           08         XXX Core B WC (Aco)-05         60         -         -           08         XXX Office         60         -         -         -           08         XXX Office         60         -         -         -         -           08         XXX Office         60         -         -         -         -           09         XXX Core A Circulation         60         -         -         -         -           09	Standard value	95	80	0.3
08         XXX_Core A WC-02         60         -         -           08         XXX_Core B WC-05         60         -         -           08         XXX_Core B Cleaners cupboard         60         -         -           08         XXX_Core B WC (Acc)-01         60         -         -           08         XXX_Core B WC (Acc)         60         -         -           08         XXX_Core B WC (Acc)         60         -         -           08         XXX_Core B WC (Acc)         60         -         -           08         XXX_Office (Perimeter)         60         -         -           09         XXX_Core A Circulation         60         -         -           09         XXX_Core A Circulation         60         -         -           09         XXX_Core B WC 01         60         -         -	08_XXX_Core A WC Lobby	60	-	-
08_XXX_Core A WC-05         60         -         -           08_XXX_Core B Circulation         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC Lobby         60         -         -           08_XXX_Core B WC Lobby         60         -         -           08_XXX_Core B WC-02         60         -         -           08_XXX_Core B WC-05         60         -         -           08_XXX_Core B WC-05         60         -         -           08_XXX_Core B WC-05         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 01         60         - <td>08_XXX_Core A WC-02</td> <td>60</td> <td>-</td> <td>-</td>	08_XXX_Core A WC-02	60	-	-
08_XXX_Core B Circulation         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC (Acc)         60         -         -           08_XXX_FF Stair A         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Coffice (Perimeter)         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Ef Stair A         60 <t< td=""><td>08_XXX_Core A WC-05</td><td>60</td><td>-</td><td>-</td></t<>	08_XXX_Core A WC-05	60	-	-
08_XXX_Core B Cleaners cupboard         60         -         -           08_XXX_Core B WC (Acc)-01         60         -         -           08_XXX_Core B WC-02         60         -         -           08_XXX_Core B WC-02         60         -         -           08_XXX_FF Stair A         60         -         -           08_XXX_FF Stair A         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B Groulation         60 <td< td=""><td>08_XXX_Core B Circulation</td><td>60</td><td>-</td><td>-</td></td<>	08_XXX_Core B Circulation	60	-	-
08       XXX_Core B WC (Acc)-01       60       -       -         08       XXX_Core B WC Lobby       60       -       -         08_XXX_Core B WC-02       60       -       -         08_XXX_Core B WC-05       60       -       -         08_XXX_FF Stair A       60       -       -         08_XXX_Office       60       -       -         08_XXX_Office       60       -       -         08_XXX_Office       60       -       -         08_XXX_Office (Perimeter)       60       -       -         09_XXX_Core A Circulation       60       -       -         09_XXX_Core B WC 01       60       -       -         09_XXX_Core B WC 02       60       -       -         09_XXX_Core B WC 02       60       -       -         09_XXX_FF Stair B       60       -       -         09_XXX_FF Stair B       60       -       -         09_XXX_Core B WC 02       60       -       -         09_XXX_FF Stair B       60       -       -         11_XXX_Bike store       60       -       -         11_XXX_Core B VC 02       60       -       - <td>08_XXX_Core B Cleaners cupboard</td> <td>60</td> <td>-</td> <td>-</td>	08_XXX_Core B Cleaners cupboard	60	-	-
08_XXX_Core B WC Lobby         60         -         -           08_XXX_Core B WC-02         60         -         -           08_XXX_Core B WC-05         60         -         -           08_XXX_FF Stair A         60         -         -           08_XXX_FF Stair B         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Core A Circulation         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_StFF Stair B         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair B         60         -         -           11_XXX_AHU         60         -         -	08_XXX_Core B WC (Acc)-01	60	-	-
08_XXX_Core B WC-02       60       -       -         08_XXX_FF Stair A       60       -       -         08_XXX_FF Stair B       60       -       -         08_XXX_Office       60       -       -         08_XXX_Office       60       -       -         08_XXX_Office (Perimeter)       60       -       -         08_XXX_Office (Perimeter)       60       -       -         09_XXX_Core A Circulation       60       -       -         09_XXX_Core B Circulation       60       -       -         09_XXX_Core B WC 01       60       -       -         09_XXX_Core B WC 02       60       -       -         11_XXX_Lore B WC 02       60       -       -         11_XXX_Dianging facilities 01       60       -       -	08_XXX_Core B WC Lobby	60	-	-
08_XXX_Core B WC-05         60         -         -           08_XXX_FF Stair A         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Coffice (Perimeter)         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_FF Stair B         60         -         -           11_XXX_AHU         60         -         -           12_XXX_Building manager office         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Circulation         60         - <td>08_XXX_Core B WC-02</td> <td>60</td> <td>-</td> <td>-</td>	08_XXX_Core B WC-02	60	-	-
08_XXX_FF Stair A         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Coffice         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_FF Stair B         60         -         -           11_XXX_KIP         60         -         -           11_XXX_K         60         -         -           11_XXX_K         60         -         -           11_XXX_K         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing roms (AWC) </td <td>08_XXX_Core B WC-05</td> <td>60</td> <td>-</td> <td>-</td>	08_XXX_Core B WC-05	60	-	-
08_XXX_FF Stair B         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_Core B WC 02         60         -         -           11_XXX_Bike store         60         -         -           12_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Chanaging facilities 01         60	08_XXX_FF Stair A	60	-	-
08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_COTFICe         60         -         -           09_XXX_COR A Circulation         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           11_XXX_Bike store         60         -         -           12_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing fac	08_XXX_FF Stair B	60	-	-
08_XXX_Office         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Coffice (Perimeter)         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_AHU         60         -         -           11_XXX_AHU         60         -         -           12_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Circulation	08_XXX_Office	60	-	-
08_XXX_Office (Perimeter)         60         -         -           08_XXX_Office (Perimeter)         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           109_XXX_Building manager office         60         -         -           11_XXX_Building manager office         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing rooms (AWC)         60         -         -           11_XXX_Coreang Circulation         60         -         -           11_XXX_Coreang Circulation         60         -         -           11_XXX_Coreang Circulation         60         -         -	08_XXX_Office	60	-	-
08_XXX_Office         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_K_FF Stair B         60         -         -           109_XXX_FF Stair B         60         -         -           11_XXX_AHU         60         -         -           12_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           12_XXX_Changing facilities 01         60         -         -           15_XXX_Coreal X	08_XXX_Office (Perimeter)	60	-	-
09_XXX_C Office         60         -         -           09_XXX_Core A Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_FF Stair B         60         -         -           109_XXX_FF Stair B         60         -         -           109_XXX_FF Stair B         60         -         -           11_XXX_Bike store         60         -         -           12_XX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Core A Circulatio	08_XXX_Office (Perimeter)	60	-	-
09_XXX_Core A Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           109_XXX_AHU         60         -         -           11_XXX_Bike store         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Changing facilities 02         60         -         -           11_XXX_Changing facilities 01         60         -         -           11_XXX_Core A	09 XXX C Office	60	-	-
DXXX_Core B Circulation         60         -         -           09_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           09_XXX_FF Stair B         60         -         -           109_XXX_AHU         60         -         -           B1_XXX_Bike store         60         -         -           B1_XXX_Changing facilities 01         60         -         -           B1_XXX_Changing facilities 01         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing rooms (AWC)         60         -         -           B1_XXX_Corela Circulation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core B Circulation         60         -         -           B1_XXX_Core B Circulation </td <td>09 XXX Core A Circulation</td> <td>60</td> <td>-</td> <td>-</td>	09 XXX Core A Circulation	60	-	-
Og_XXX_Core B WC 01         60         -         -           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           B1_XXX_AHU         60         -         -           B1_XXX_Bike store         60         -         -           B1_XXX_Changing facilities 01         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing rooms (AWC)         60         -         -           B1_XXX_Corelution         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Stairs         60         -         -           B1_XXX_Core B Circulation	09 XXX Core B Circulation	60	-	-
D         D         D           09_XXX_Core B WC 02         60         -         -           09_XXX_FF Stair A         60         -         -           09_XXX_FF Stair B         60         -         -           B1_XXX_AHU         60         -         -           B1_XXX_Bilding manager office         60         -         -           B1_XXX_Changing facilities 01         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing rooms (AWC)         60         -         -           B1_XXX_Corelation         60         -         -           B1_XXX_Corelation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Stairs         60         -         -           B1_XXX_Core B Circulation         60         -         -           B1_XXX_Core B Circulation         60         -         -           B1_XXX_Core B Circulation         60         -         -           B1_XXX_Core B Stairs         60	09 XXX Core B WC 01	60	-	-
Dystring         Display         <	09 XXX Core B WC 02	60	-	-
Og_XXX_FF Stair B         60         -         -           B1_XXX_AHU         60         -         -           B1_XXX_Bike store         60         -         -           B1_XXX_Building manager office         60         -         -           B1_XXX_Changing facilities 01         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing rooms (AWC)         60         -         -           B1_XXX_Coreanging rooms (AWC)         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core A Circulation         60         -         -           B1_XXX_Core B Circulation         60         -         -	09 XXX FF Stair A	60	-	-
B1_XXX_AHU         60         -         -           B1_XXX_Bike store         60         -         -           B1_XXX_Building manager office         60         -         -           B1_XXX_Changing facilities 01         60         -         -           B1_XXX_Changing facilities 02         60         -         -           B1_XXX_Changing rooms (AWC)         60         -         -           B1_XXX_Circulation         60         -         -           B1_XXX_Core a Circulation         60         -         -           B1_XXX_Core A Stairs         60         -         -           B1_XXX_Core B Circulation         60         -         -           B1_XXX_Core B Stairs         60         -         -           B1_XXX_C	09_XXX_FF Stair B	60	-	-
B1_XXX_Bike store       60       -       -         B1_XXX_Building manager office       60       -       -         B1_XXX_Changing facilities 01       60       -       -         B1_XXX_Changing facilities 02       60       -       -         B1_XXX_Changing facilities 02       60       -       -         B1_XXX_Changing rooms (AWC)       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Corelation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_C	B1_XXX_AHU	60	-	-
B1_XXX_Building manager office       60       -       -         B1_XXX_Changing facilities 01       60       -       -         B1_XXX_Changing facilities 02       60       -       -         B1_XXX_Changing rooms (AWC)       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Corelation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (As	B1_XXX_Bike store	60	-	-
B1_XXX_Changing facilities 01       60       -       -         B1_XXX_Changing facilities 02       60       -       -         B1_XXX_Changing rooms (AWC)       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Comms room       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass) <t< td=""><td>B1_XXX_Building manager office</td><td>60</td><td>-</td><td>-</td></t<>	B1_XXX_Building manager office	60	-	-
B1_XXX_Changing facilities 02       60       -       -         B1_XXX_Changing rooms (AWC)       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Corculation       60       -       -         B1_XXX_Corel Circulation       60       -       -         B1_XXX_Core A Stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       6	B1_XXX_Changing facilities 01	60	-	-
B1_XXX_Changing rooms (AWC)       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Corculation       60       -       -         B1_XXX_Corms room       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03	B1_XXX_Changing facilities 02	60	-	-
B1_XXX_Circulation       60       -       -         B1_XXX_Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass) <td< td=""><td>B1_XXX_Changing rooms (AWC)</td><td>60</td><td>-</td><td>-</td></td<>	B1_XXX_Changing rooms (AWC)	60	-	-
B1_XXX_Circulation       60       -       -         B1_XXX_Comms room       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03       60       -       -	B1_XXX_Circulation	60	-	-
B1_XXX_Comms room       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1 XXX Core B WC 03       60       -       -	B1_XXX_Circulation	60	-	-
B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03       60       -       -	B1_XXX_Comms room	60	-	-
B1_XXX_Core A Circulation       60       -       -         B1_XXX_Core A stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B Cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03       60       -       -	B1_XXX_Core A Circulation	60	-	-
B1_XXX_Core A stairs       60       -       -         B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03       60       -       -	B1_XXX_Core A Circulation	60	-	-
B1_XXX_Core B Circulation       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -	B1_XXX_Core A stairs	60	-	-
B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -	B1_XXX_Core B Circulation	60	-	-
B1_XXX_Core B cleaners cupboard       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -	B1_XXX_Core B cleaners cupboard	60	-	-
B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1 XXX_Core B WC 03       60       -       -	B1 XXX Core B cleaners cupboard	60	-	-
B1_XXX_Core B Stairs       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03       60       -       -	B1 XXX Core B Stairs	60	-	-
B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 01       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 02 (Ass)       60       -       -         B1_XXX_Core B WC 03       60       -       -	B1 XXX Core B Stairs	60	-	-
B1_XXX_Core B WC 01     60     -       B1_XXX_Core B WC 02 (Ass)     60     -       B1_XXX_Core B WC 03     60     -	B1 XXX Core B WC 01	60	-	-
B1_XXX_Core B WC 02 (Ass)         60         -         -           B1 XXX_Core B WC 03         60         -         -	B1 XXX Core B WC 01	60	-	-
B1 XXX Core B WC 03 60	B1 XXX Core B WC 02 (Ass)	60	-	-
	B1_XXX_Core B WC 03	60	-	-

General lighting and display lighting	General luminaire	re Display light source	
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
B1_XXX_Core B WC 04	60	-	-
B1_XXX_Core B WC 05	60	-	-
B1_XXX_Core B WC 06	60	-	-
B1_XXX_Core B WC 07	60	-	-
B1_XXX_Core B WC 09 (Ass)	60	-	-
B1_XXX_Core B WC lobby	60	-	-
B1_XXX_Core B WC lobby	60	-	-
B1_XXX_Co-working lounge	60	-	-
B1_XXX_Cylinder room	60	-	-
B1_XXX_Domestic boosting tanks	60	-	-
B1_XXX_Drying room	60	-	-
B1_XXX_Fitness studio	60	-	-
B1_XXX_Flexible space 01	60	-	-
B1_XXX_Flexible space 02	60	-	-
B1_XXX_Flexible working space	60	-	-
B1_XXX_Gym	60	-	-
B1_XXX_Mains water tank	60	-	-
B1_XXX_PB	60	-	-
B1_XXX_Plant	60	-	-
B1_XXX_Plant	60	-	-
B1_XXX_Plant	60	-	-
B1_XXX_Sprinkler tank	60	-	-
B1_XXX_Sprinkler tank room	60	-	-
B1_XXX_Storage	60	-	-
B1_XXX_UKPN	60	-	-
B1_XXX_UKPN	60	-	-

# The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00_XXX_A Office (Perimeter)	NO (-21.6%)	NO
00_XXX_A Office (Perimeter)	NO (-13.3%)	NO
00_XXX_A Office (Perimeter)	NO (-42.1%)	NO
00_XXX_A Office (Perimeter)	NO (-47.2%)	NO
00_XXX_B Office (Perimeter)	NO (-57.1%)	NO
00_XXX_B Office (Perimeter)	NO (-66.7%)	NO
00_XXX_B Office (Perimeter)	NO (-47.5%)	NO
00_XXX_B Office (Perimeter)	NO (-50.9%)	NO
00_XXX_Core A Circulation	N/A	N/A
00_XXX_Core A WC (Acc)-01	N/A	N/A
00_XXX_Core A WC Lobby	NO (-99%)	NO
00_XXX_Core A WC-02	NO (-98.7%)	NO
00_XXX_Core A WC-03	NO (-99.4%)	NO
00_XXX_Core A WC-04	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00_XXX_Core A WC-05	N/A	N/A
00_XXX_Core A WC-06	NO (-99.4%)	NO
00_XXX_Core B Circulation	NO (-100%)	NO
00_XXX_Core B WC (Acc)-01	NO (-100%)	NO
00_XXX_Core B WC Lobby	NO (-99.9%)	NO
00_XXX_Core B WC-02	N/A	N/A
00_XXX_Core B WC-03	NO (-99%)	NO
00_XXX_Post room	N/A	N/A
00_XXX_Reception	NO (-85.5%)	NO
00_XXX_Reception (Perimeter - North)	NO (-32.1%)	NO
00_XXX_Reception (Perimeter - South)	NO (-34.3%)	NO
01_XXX_A Office (Perimeter)	NO (-55.1%)	NO
01_XXX_A Office (Perimeter)	NO (-71.8%)	NO
01_XXX_A Office (Perimeter)	NO (-45.6%)	NO
01_XXX_A Office (Perimeter)	NO (-43.3%)	NO
01_XXX_B Office (Perimeter)	NO (-64.3%)	NO
01_XXX_B Office (Perimeter)	NO (-63.9%)	NO
01_XXX_B Office (Perimeter)	NO (-75.1%)	NO
01_XXX_B Office (Perimeter)	NO (-60.9%)	NO
01_XXX_C Office	NO (-99.7%)	NO
01_XXX_C Office	NO (-99.7%)	NO
01_XXX_C Office	NO (-69.8%)	NO
01_XXX_C Office (Perimeter)	NO (-52.2%)	NO
01_XXX_Core A Circulation	N/A	N/A
01_XXX_Core A WC (Acc)-01	N/A	N/A
01_XXX_Core A WC Lobby	NO (-100%)	NO
01_XXX_Core A WC-02	N/A	N/A
01_XXX_Core A WC-03	NO (-100%)	NO
01_XXX_Core B Circulation	N/A	N/A
01_XXX_Core B WC Lobby	NO (-100%)	NO
01_XXX_Core B WC-01	N/A	N/A
01_XXX_Core B WC-02	N/A	N/A
01_XXX_Core B WC-03	N/A	N/A
01_XXX_Core B WC-04	N/A	N/A
01_XXX_Core B WC-05	N/A	N/A
01_XXX_Elevator lobby	NO (-95.7%)	NO
02_XXX_A Elevator lobby	NO (-94.5%)	NO
02_XXX_A Office (Perimeter)	NO (-22.8%)	NO
02_XXX_A Office (Perimeter)	NO (-59.6%)	NO
02_XXX_A Office (Perimeter)	NO (-20.3%)	NO
02_XXX_A Office (Perimeter)	NO (-33.7%)	NO
02_XXX_B Elevator lobby	NO (-94.4%)	NO
02_XXX_B Office (Perimeter)	NO (-50.9%)	NO
02_XXX_B Office (Perimeter)	NO (-63%)	NO
02_XXX_B Office (Perimeter)	NO (-39.1%)	NO
02_XXX_B Office (Perimeter)	NO (-44.9%)	NO
02_XXX_C Office	NO (-99.5%)	NO
02_XXX_C Office (Perimeter)	NO (-45.6%)	NO
02_XXX_Core A Circulation	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
02_XXX_Core A WC (Acc)-01	N/A	N/A
02_XXX_Core A WC Lobby	N/A	N/A
02_XXX_Core A WC-02	N/A	N/A
02_XXX_Core A WC-03	N/A	N/A
02_XXX_Core A WC-04	N/A	N/A
02_XXX_Core A WC-05	N/A	N/A
02_XXX_Core B Circulation	N/A	N/A
02_XXX_Core B WC (Acc)-01	N/A	N/A
02_XXX_Core B WC Lobby	N/A	N/A
02_XXX_Core B WC-02	N/A	N/A
02_XXX_Core B WC-03	N/A	N/A
02_XXX_Core B WC-04	N/A	N/A
02_XXX_Core B WC-05	N/A	N/A
03_XXX_A Elevator lobby	NO (-95%)	NO
03_XXX_A Office (Perimeter)	NO (-70.7%)	NO
03_XXX_A Office (Perimeter)	NO (-57.3%)	NO
03_XXX_A Office (Perimeter)	NO (-55.2%)	NO
03_XXX_A Office (Perimeter)	NO (-46%)	NO
03_XXX_B Elevator lobby	NO (-94.9%)	NO
03_XXX_B Office (Perimeter)	NO (-71.5%)	NO
03 XXX B Office (Perimeter)	NO (-67.9%)	NO
03 XXX B Office (Perimeter)	NO (-53.6%)	NO
03 XXX B Office (Perimeter)	NO (-64.1%)	NO
03 XXX C Office	NO (-99.6%)	NO
03 XXX C Office (Perimeter)	NO (-49.7%)	NO
03 XXX Core A Circulation	N/A	N/A
03 XXX Core A WC (Acc)-01	N/A	N/A
03 XXX Core A WC Lobby	N/A	N/A
03 XXX Core A WC-02	N/A	N/A
03 XXX Core A WC-03	N/A	N/A
03 XXX Core A WC-04	N/A	N/A
03 XXX Core A WC-05	N/A	N/A
03 XXX Core B Circulation	N/A	N/A
03 XXX Core B WC (Acc)-01	N/A	N/A
03 XXX Core B WC Lobby	N/A	N/A
03 XXX Core B WC-02	N/A	N/A
03 XXX Core B WC-03	N/A	N/A
03 XXX Core B WC-04	N/A	N/A
03 XXX Core B WC-05	N/A	N/A
04 XXX A Flevator lobby	NO (-94 9%)	NO
04 XXX A Office (Perimeter)	NO (-70.3%)	NO
04 XXX A Office (Perimeter)	NO (-58%)	NO
04 XXX A Office (Perimeter)	NO (-56%)	NO
04 XXX A Office (Perimeter)	NO (-45.9%)	NO
04 XXX B Flevator lobby	NO (-95%)	NO
04 XXX B Office (Perimeter)	NO (-63.2%)	NO
04_XXX_B_Office (Perimeter)	NO (-70.1%)	NO
04_XXX_B_Office (Perimeter)	NO (-51 7%)	NO
04_XXX_B_Office (Perimeter)	NO (-68 5%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
04_XXX_C Office	NO (-99.8%)	NO
04_XXX_C Office (Perimeter)	NO (-48.2%)	NO
04_XXX_Core A Circulation	NO (-99.9%)	NO
04_XXX_Core A WC (Acc)-01	N/A	N/A
04_XXX_Core A WC Lobby	N/A	N/A
04_XXX_Core A WC-02	N/A	N/A
04_XXX_Core A WC-03	N/A	N/A
04_XXX_Core A WC-04	N/A	N/A
04_XXX_Core A WC-05	NO (-99.9%)	NO
04_XXX_Core B Circulation	N/A	N/A
04_XXX_Core B WC (Acc)-01	N/A	N/A
04_XXX_Core B WC Lobby	N/A	N/A
04_XXX_Core B WC-02	N/A	N/A
04_XXX_Core B WC-03	N/A	N/A
04_XXX_Core B WC-04	N/A	N/A
04_XXX_Core B WC-05	N/A	N/A
05_XXX_A Elevator lobby	NO (-94.7%)	NO
05_XXX_A Office (Perimeter)	NO (-54.6%)	NO
05_XXX_A Office (Perimeter)	NO (-50.6%)	NO
05_XXX_A Office (Perimeter)	NO (-73.3%)	NO
05_XXX_A Office (Perimeter)	NO (-56.8%)	NO
05_XXX_B Elevator lobby	NO (-94.7%)	NO
05_XXX_B Office (Perimeter)	NO (-63.6%)	NO
05_XXX_B Office (Perimeter)	NO (-67.6%)	NO
05_XXX_C Office	NO (-99.8%)	NO
05_XXX_C Office (Perimeter)	NO (-41.7%)	NO
05_XXX_Core A Circulation	N/A	N/A
05_XXX_Core A WC (Acc)-01	N/A	N/A
05_XXX_Core A WC Lobby	N/A	N/A
05_XXX_Core A WC-02	N/A	N/A
05_XXX_Core A WC-03	N/A	N/A
05_XXX_Core A WC-04	N/A	N/A
05_XXX_Core A WC-05	NO (-99.9%)	NO
05_XXX_Core B Circulation	NO (-100%)	NO
05_XXX_Core B WC (Acc)-01	N/A	N/A
05_XXX_Core B WC Lobby	N/A	N/A
05_XXX_Core B WC-02	N/A	N/A
05_XXX_Core B WC-03	N/A	N/A
05_XXX_Core B WC-04	N/A	N/A
05_XXX_Core B WC-05	N/A	N/A
06_XXX_A BOH Circulation	NO (-62.9%)	NO
06_XXX_Core A Circulation	YES (+31%)	NO
06_XXX_Core A WC (Acc)-01	N/A	N/A
06_XXX_Core A WC Lobby	N/A	N/A
06_XXX_Core A WC-02	N/A	N/A
06_XXX_Core A WC-03	N/A	N/A
06_XXX_Core A WC-05	NO (-99.9%)	NO
06_XXX_Core B Circulation	YES (+6.8%)	NO
06_XXX_Core B WC (Acc)-01	NO (-100%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
06_XXX_Core B WC Lobby	N/A	N/A
06_XXX_Core B WC-02	N/A	N/A
06_XXX_Core B WC-03	N/A	N/A
06_XXX_Core B WC-05	N/A	N/A
06_XXX_Office	NO (-95.4%)	NO
06_XXX_Office (Perimeter)	NO (-64.7%)	NO
06_XXX_Office (Perimeter)	NO (-55.4%)	NO
06_XXX_Office (Perimeter)	NO (-71.5%)	NO
06_XXX_Office (Perimeter)	NO (-61.3%)	NO
06_XXX_Office (Perimeter)	NO (-46.4%)	NO
06_XXX_Office (Perimeter)	NO (-58.2%)	NO
06_XXX_Office (Perimeter)	NO (-48.4%)	NO
06_XXX_Office (Perimeter)	NO (-56.2%)	NO
06_XXX_Office (Perimeter)	NO (-68%)	NO
07_XXX_Core A Circulation	NO (-34.8%)	NO
07_XXX_Core A WC (Acc)-01	N/A	N/A
07_XXX_Core A WC Lobby	N/A	N/A
07_XXX_Core A WC-02	N/A	N/A
07_XXX_Core A WC-05	N/A	N/A
07_XXX_Core B Circulation	NO (-21.2%)	NO
07_XXX_Core B WC (Acc)-01	N/A	N/A
07_XXX_Core B WC Lobby	N/A	N/A
07_XXX_Core B WC-02	N/A	N/A
07_XXX_Core B WC-05	N/A	N/A
07_XXX_Office	NO (-92.8%)	NO
07_XXX_Office (Perimeter)	NO (-38.6%)	NO
07_XXX_Office (Perimeter)	NO (-49.1%)	NO
07_XXX_Office (Perimeter)	NO (-46.6%)	NO
07_XXX_Office (Perimeter)	NO (-62.1%)	NO
08_XXX_Core A Circulation	NO (-34.7%)	NO
08_XXX_Core A WC (Acc)-01	N/A	N/A
08_XXX_Core A WC Lobby	N/A	N/A
08_XXX_Core A WC-02	N/A	N/A
08_XXX_Core A WC-05	N/A	N/A
08_XXX_Core B Circulation	NO (-18.6%)	NO
08_XXX_Core B WC (Acc)-01	N/A	N/A
08_XXX_Core B WC Lobby	N/A	N/A
08_XXX_Core B WC-02	N/A	N/A
08_XXX_Core B WC-05	N/A	N/A
08_XXX_Office	NO (-94.4%)	NO
08_XXX_Office	NO (-86.3%)	NO
08_XXX_Office (Perimeter)	NO (-46.1%)	NO
08_XXX_Office (Perimeter)	NO (-37.6%)	NO
09_XXX_C Office	NO (-32.4%)	NO
09_XXX_Core A Circulation	N/A	N/A
09_XXX_Core B Circulation	N/A	N/A
09_XXX_Core B WC 01	N/A	N/A
09_XXX_Core B WC 02	N/A	N/A
B1_XXX_Building manager office	NO (-100%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B1_XXX_Changing facilities 01	NO (-100%)	NO
B1_XXX_Changing facilities 02	NO (-100%)	NO
B1_XXX_Changing rooms (AWC)	N/A	N/A
B1_XXX_Circulation	NO (-100%)	NO
B1_XXX_Circulation	NO (-100%)	NO
B1_XXX_Comms room	NO (-99.5%)	NO
B1_XXX_Core A Circulation	N/A	N/A
B1_XXX_Core A Circulation	N/A	N/A
B1_XXX_Core B Circulation	N/A	N/A
B1_XXX_Core B WC 01	N/A	N/A
B1_XXX_Core B WC 01	NO (-99.5%)	NO
B1_XXX_Core B WC 02 (Ass)	NO (-100%)	NO
B1_XXX_Core B WC 03	NO (-100%)	NO
B1_XXX_Core B WC 04	NO (-100%)	NO
B1_XXX_Core B WC 05	NO (-99.6%)	NO
B1_XXX_Core B WC 06	NO (-99.9%)	NO
B1_XXX_Core B WC 07	N/A	N/A
B1_XXX_Core B WC 09 (Ass)	NO (-100%)	NO
B1_XXX_Core B WC lobby	NO (-100%)	NO
B1_XXX_Core B WC lobby	NO (-99.8%)	NO
B1_XXX_Co-working lounge	NO (-68.9%)	NO
B1_XXX_Drying room	NO (-100%)	NO
B1_XXX_Fitness studio	N/A	N/A
B1_XXX_Flexible space 01	NO (-4.9%)	NO
B1_XXX_Flexible space 02	NO (-71.7%)	NO
B1_XXX_Flexible working space	NO (-79.1%)	NO
B1_XXX_Gym	YES (+8.8%)	NO

## Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

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

#### **Building Global Parameters**

	Actual	Notional	% Ai
Floor area [m <sup>2</sup> ]	11191.2	11191.2	
External area [m <sup>2</sup> ]	9868.2	9868.2	
Weather	LON	LON	100
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	
Average conductance [W/K]	5541.53	3944.44	
Average U-value [W/m <sup>2</sup> K]	0.56	0.4	
Alpha value* [%]	25.25	10	

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

### **Building Use**

#### % Area Building Type

Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways
Offices and Workshop Businesses
General Industrial and Special Industrial Groups Storage or Distribution
Hotels
Residential Institutions: Hospitals and Care Homes
Residential Institutions: Residential Schools
Residential Institutions: Universities and Colleges
Secure Residential Institutions
Residential Spaces
Non-residential Institutions: Community/Day Centre
Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education
Non-residential Institutions: Primary Health Care Building
Non-residential Institutions: Crown and County Courts
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	6.01	1.11
Cooling	4.93	4.99
Auxiliary	19.27	9.63
Lighting	35.08	14.75
Hot water	10.46	8.38
Equipment*	41.83	41.83
TOTAL**	75.76	38.87

\* 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
Displaced electricity	0	0

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	112.47	94.29
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	114.57	57.42
Total emissions [kg/m <sup>2</sup> ]	10.5	5.21

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] ASHP, [H	FT] Electric	city, [CFT] I	Electricity				
	Actual	56.6	72.7	6.8	5.8	20.8	2.31	3.51	2.5	5
	Notional	12.7	96.7	1.3	5.8	10.3	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] I	Electricity				
	Actual	55.6	55.4	6.7	4.4	18.2	2.31	3.51	2.5	5
	Notional	10.1	88.6	1	5.3	8.4	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] I	Electricity	-		-	
	Actual	24.5	84.3	2.9	6.7	20.2	2.31	3.51	2.5	5
	Notional	2.5	67	0.2	4	8.1	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	103.4	13.7	12.4	1.1	36.1	2.31	3.51	2.5	5
	Notional	23.9	39.6	2.4	2.4	27.9	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] I	Electricity	-		-	_
	Actual	172.3	2.5	20.7	0.2	19.9	2.31	3.51	2.5	5
	Notional	44.2	15.1	4.4	0.9	8.8	2.78	4.63		
[ST	] Split or m	ulti-split sy	stem, [HS]	ASHP, [HF1	[] Electricit	y, [CFT] Ele	ctricity		-	_
	Actual	0	1118.8	0	87.5	0	2.33	3.55	2.5	5
	Notional	0	1480.3	0	88.8	0	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] I	Electricity				
	Actual	46.5	51.2	5.6	4	17.8	2.31	3.51	2.5	5
	Notional	10	83.8	1	5	7.7	2.78	4.63		
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	11	24.5	1.3	1.9	71.8	2.31	3.51	2.5	5
	Notional	0.1	42.1	0	2.5	22.1	2.78	4.63		
[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] Cool dem [MJ/m2] Heat con [kWh/m2] Cool con [kWh/m2] Aux con [kWh/m2] Heat SSEFF Cool SSEER Heat gen SSEFF Cool gen SSEER ST HS	<ul> <li>Heating energy demand</li> <li>Cooling energy demand</li> <li>Heating energy consumption</li> <li>Cooling energy consumption</li> <li>Auxiliary energy consumption</li> <li>Heating system seasonal efficiency (for notional building, value depends on activity glazing class)</li> <li>Cooling generator seasonal efficiency ratio</li> <li>Heating generator seasonal efficiency ratio</li> <li>System type</li> <li>Heat source</li> </ul>
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

## **BRUKL** Output Document

HM Government

Compliance with England Building Regulations Part L 2021

#### **Project name**

## Post-Refurb (Be Lean)\_Refurb

## As designed

Date: Fri May 17 14:53:00 2024

#### Administrative information

#### **Building Details**

Address: 124 Theobalds Road, London, WC1X 8RX

#### **Certifier details**

Name: Matt Cotton Telephone number: 02037139538 Address: 15-19 Bloomsbury Way, London, WC1A 2TH **Certification tool** 

Calculation engine: Apache Calculation engine version: 7.0.25 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.25 BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 896.99

#### The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO2 emission rate (TER), kgCO2/m2annum5.21			
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum	8.69		
Target primary energy rate (TPER), kWh <sub>PE</sub> /m²annum	57.42		
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	92.75		
Do the building's emission and primary energy rates exceed the targets? BER > TER BPER > T			

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

Fabric element	Ua-Limit	Ua-Calc	Ui-Calc	First surface with maximum value
Walls*	0.26	1.44	1.7	B100001D:Surf[2]
Floors	0.18	0.25	0.25	0000004:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	2.41	2.8	04000001:Surf[10]
Windows** and roof windows	1.6	1.5	2.8	01000018:Surf[0]
Rooflights***	2.2	2.1	2.1	B1000030:Surf[1]
Personnel doors^	1.6	1.88	5.87	000000C:Surf[6]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	1.4	1.4	0000008:Surf[2]
U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]				alculated maximum individual element U-values [W/(m <sup>2</sup> K)]

 $U_{a-Calc} = Calculated area-weighted average U-values [W/(m^2K)]$ 

\* 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. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	25

#### **Building services**

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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

#### 1-01\_FCU-ASHP-AHUs (Office areas)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency		
This system	2.64	5.51	0	2.5	0.8		
Standard value	2.5*	N/A	N/A	2^	N/A		
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 2-07\_FCU-ASHP-AHU (Circulation)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency		
This system	2.64	5.51	0	2.5	0.8		
Standard value	2.5*	N/A	N/A	2^	N/A		
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 3-04\_FCU-ASHP-Extract (Toilets)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency			
This system	2.64	5.51	0	2.5	-			
Standard value	2.5*	N/A	N/A	1.5^	N/A			
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.								

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 4-02\_FCU-ASHP-AHUs (FOH communal, basement flex, lounge, cellular office, post room, 9th floor amenity)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HF	R efficiency	
This system	2.64	5.51	0	2.5	0.8		
Standard value	2.5*	N/A	N/A	2^	N//	N/A	
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 5-03 FCU-ASHP-AHUs (Reception and atrium)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR	efficiency	
This system	2.64	5.51	0	2.5	0.8		
Standard value	2.5*	N/A	N/A	2^	N/A	N/A	
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 6-05\_FCU-ASHP-AHU (Basement changing rooms)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HF	R efficiency	
This system	2.64	5.51	0	2.5	0.8	3	
Standard value	2.5*	N/A	N/A	2^	N/.	N/A	
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 7-06\_DX (Comms room)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR	R efficiency	
This system	2.64	6.5	0	-	-		
Standard value	2.5*	5	N/A	N/A	N//	N/A	
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.							

#### 8-08\_FCU-ASHP-AHU (Gym)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR	HR efficiency			
This system	2.64	5.51	0	2.5	0.8				
Standard value	2.5*	N/A	N/A	2^	N/A				
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.									
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.									

#### 1-00a\_DHW 01-POU (REFURB)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.03
Standard value	1	N/A

#### 2- 00b\_DHW 02-ASHP + elec top up (REFURB)

	Water heating efficiency	ating efficiency Storage loss factor [kWh/litre per day]				
This building	1.64	0.002				
Standard value	2*	N/A				
* Standard shown is for all types except absorption and gas engine heat pumps.						

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents				
А	Local supply or extract ventilation units				
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 balanced supply and extract ventilation system				
Е	Local balanced supply and extract ventilation units				
F	Other local ventilation units				
G	Fan assisted terminal variable air volume units				
Н	Fan coil units				
I	Kitchen extract with the fan remote from the zone and a grease filter				
NB: L	NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.				

Zone name		SFP [W/(I/s)]									
ID of system type		В	С	D	Е	F	G	Н	I	нк епісіепсу	
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX A Office (Perimeter)		-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-06	-	_	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core B WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core B WC Lobby	-	-	_	_	_	_	_	0.3	-	_	N/A
00_XXX_Core B WC-02	_	_	_	_	_	_	_	0.0	_	_	N/A
00_XXX_Core B WC-03	_	_		_	_	_	_	0.3		_	N/A
00_XXX_Bost room	_	_		_	_	_	_	0.3		_	N/A
00 XXX Reception	_	_		_	_	_	_	0.3		_	N/A
00_XXX_Reception	- h\	_		_	_	_	_	0.3		_	N/A
00_XXX_Reception (Perimeter - North	h)	_		_	_	_	_	0.3		_	N/A
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	_	
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	_	
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC (Acc)-01		-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
ID of system type A B C D E F G H I Standard value 0.3 11 0.5 23 2 0.5 0.5 0.4 1 Zero S											
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Standard value 0.2 11 05 22 2 05 05 04 1 Zono S											
$\frac{1}{1}$ Statuaru value $10.3$ $1.1$ $10.3$ $2.3$ $2$ $10.3$ $0.3$ $0.4$ $1$ <b>2016</b> $3$	tandard										
01_XXX_Core B WC Lobby 0.3 N	/A										
01_XXX_Core B WC-01 0.3 N	/A										
01_XXX_Core B WC-02 0.3 N	/A										
01_XXX_Core B WC-03 0.3 N	/A										
01_XXX_Core B WC-04 0.3 N	/A										
01_XXX_Core B WC-05 0.3 N	/A										
01_XXX_Elevator lobby 0.3 N	/A										
02_XXX_A Elevator lobby 0.3 N	/A										
02_XXX_A Office (Perimeter) 0.3 N	/A										
02_XXX_A Office (Perimeter) 0.3 N	/A										
02_XXX_A Office (Perimeter) 0.3 N	/A										
02_XXX_A Office (Perimeter) 0.3 N	/A										
02_XXX_B Elevator lobby 0.3 N	/A										
02_XXX_B Office (Perimeter) 0.3 N	/A										
02_XXX_B Office (Perimeter) 0.3 N	/A										
02_XXX_B Office (Perimeter) 0.3 N	/A										
02_XXX_B Office (Perimeter) 0.3 N	/A										
02_XXX_C Office 0.3 N	/A										
02_XXX_C Office (Perimeter) 0.3 N	/A										
02_XXX_Core A Circulation 0.3 N	/A										
02_XXX_Core A WC (Acc)-01 0.3 N	/A										
02_XXX_Core A WC Lobby 0.3 N	/A										
02_XXX_Core A WC-02 0.3 N	/A										
02_XXX_Core A WC-03 0.3 N	/A										
02_XXX_Core A WC-04 0.3 N	/A										
02_XXX_Core A WC-05 0.3 N	/A										
02_XXX_Core B Circulation 0.3 N	/A										
02_XXX_Core B WC (Acc)-01 0.3 N	/A										
02_XXX_Core B WC Lobby 0.3 N	/A										
02_XXX_Core B WC-02 0.3 N	/A										
02_XXX_Core B WC-03 0.3 N	/A										
02_XXX_Core B WC-04 0.3 N	/A										
02_XXX_Core B WC-05 0.3 N	/A										
03_XXX_A Elevator lobby 0.3 N	/A										
03_XXX_A Office (Perimeter) 0.3 N	/A										
03_XXX_A Office (Perimeter) 0.3 N	/A										
03_XXX_A Office (Perimeter) 0.3 N	/A										
03_XXX_A Office (Perimeter) 0.3 N	/A										
03_XXX_B Elevator lobby 0.3 N	/A										
03_XXX_B Office (Perimeter) 0.3 N	/A										
03_XXX_B Office (Perimeter) 0.3 N	/A										
03_XXX_B Office (Perimeter) 0.3 N	/A										
03_XXX_B Office (Perimeter) 0.3 N	/A										

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
03_XXX_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
03 XXX Core B WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
03 XXX Core B WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
03 XXX Core B WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Elevator lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Elevator lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC (Acc)-01	-	-	-	_	_	-	_	0.3	-	-	N/A
04 XXX Core B WC Lobby	-	-	-	_	_	-	_	0.3	-	-	N/A
04 XXX Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC-03	_	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC-04	-	_	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC-05	-	_	-	-	-	-	-	0.3	-	-	N/A
05 XXX A Flevator lobby	_	_	-	_	-	-	_	0.3	-	-	N/A
								0.0			11/7

ID of system type         A         B         C         D         E         F         G         H         I         Intermeter           Standard value         0.3         1.1         0.5         2.3         2         0.5         0.4         1         Zone         Standard           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_B Diffice (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_C Office         -         -         -         -         0.3         -         N/A           05_XXX_C Core A WC (Acc)-01         -         -         -
Standard value         0.3         1.1         0.5         2.3         2         0.5         0.4         1         Zone         Standard           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_C Office         -         -         -         -         0.3         -         N/A           05_XXX_C Coffice (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_C Coffice (Perimeter)         -         -         -         -         0.3         -
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Ore A WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_C Ore A WC O2       -       -       -       -       0.3       -
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Corfice (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Core A Circulation       -       -       -       -       0.3       -       N/A         05_XXX_C Core A WC Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_C Core A WC O2       -
05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Co
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -
05_XXX_B Elevator lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -
05_XXX_B Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Ore A Circulation       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       - </td
05_XXX_B Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B
05_XXX_C Office       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Co2       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC 05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       <
05_XXX_C Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02
05_XXX_Core A Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       0.3       -       N/A
05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC 02       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03<
05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03       -       -
05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -
05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       N/A         05_
05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-05       -       -       -       -
05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC-03         -         -         -         -         -         -         -         0.3         -         -         N/A           05_XXX_Core B WC-04         -         -         -         -         -         0.3         -         -         N/A           05_XXX_Core B WC-04         -         -         -         -         -         0.3         -         -         N/A           05_XXX_Core B WC-05         -         -         -         -         -         0.3         -         -         N/A
05_XXX_Core B WC-04         -         -         -         -         -         0.3         -         N/A           05_XXX_Core B WC-05         -         -         -         -         -         0.3         -         -         N/A
05_XXX_Core B WC-05 0.3 N/A
06_XXX_A BOH Circulation 0.3 N/A
06_XXX_Core A Circulation 0.3 N/A
06_XXX_Core A WC (Acc)-01 0.3 N/A
06_XXX_Core A WC Lobby 0.3 N/A
06_XXX_Core A WC-02 0.3 N/A
06 XXX Core A WC-03 0.3 N/A
06 XXX Core A WC-05 0.3 N/A
06_XXX_Core B Circulation 0.3 N/A
06_XXX_Core B WC (Acc)-01 0.3 N/A
06 XXX Core B WC Lobby 0.3 N/A
06 XXX Core B WC-02 0.3 N/A
06 XXX Core B WC-03 0.3 N/A
06 XXX Core B WC-05 0.3 N/A
06 XXX Office 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	Н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
07_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
07 XXX Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
07 XXX Core B WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
07 XXX Office	-	-	-	-	-	-	-	0.3	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	_	-	-	0.3	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
08 XXX Core A Circulation	-	-	-	_	-	-	_	0.3	-	_	N/A
08 XXX Core A WC (Acc)-01	_	_	_	_	_	_	_	0.0	-	_	N/A
08 XXX Core A WC Lobby	_	_		_	_		_	0.3	-	_	N/A
08 XXX Core A WC-02	_			_	_		_	0.3		_	N/A
08_XXX_Core A WC-05	_	_		_	_		_	0.3	-	_	N/A
08 XXX Core B Circulation	_			_	_		_	0.3		_	N/A
08 XXX Core B WC (Acc)-01	_			_	_		_	0.3		_	N/A
08 XXX Core B WC Lobby	-	-		-	-	-	-	0.3		_	
08 XXX Core B WC-02	-	-		-	-	-	-	0.3		_	
08_XXX_Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	
	-	-	-	-	-	-	-	0.3	-	-	
	-	-	-	-	-	-	-	0.3	-	-	
08_XXX_Office (Derimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
08_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
	-	-	-	-	-	-	-	0.3	-	-	N/A
09_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
09_XXX_Core B WC 01	-	-	-	-	-	-	-	0.3	-	-	N/A
09_XXX_Core B WC 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Building manager office	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Changing facilities 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Changing facilities 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Changing rooms (AWC)	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A

Zone name	SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	н	1	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
B1_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 02 (Ass)	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 04	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 05	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 06	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 07	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 09 (Ass)	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Co-working lounge	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Drying room	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Fitness studio	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Flexible space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Flexible space 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Flexible working space	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Gym	-	-	-	-	-	-	-	0.3	-	-	N/A

General lighting and display lighting	General luminaire	Display light source		
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]	
Standard value	95	80	0.3	
00_XXX_A Office (Perimeter)	110	-	-	
00_XXX_A Office (Perimeter)	110	-	-	
00_XXX_A Office (Perimeter)	110	-	-	
00_XXX_A Office (Perimeter)	110	-	-	
00_XXX_B Office (Perimeter)	110	-	-	
00_XXX_B Office (Perimeter)	110	-	-	
00_XXX_B Office (Perimeter)	110	-	-	
00_XXX_B Office (Perimeter)	110	-	-	
00_XXX_Core A Circulation	120	-	-	
00_XXX_Core A Cleaners Cupboard	120	-	-	
00_XXX_Core A WC (Acc)-01	120	-	-	
00_XXX_Core A WC Lobby	120	-	-	
00_XXX_Core A WC-02	120	-	-	
00_XXX_Core A WC-03	120	-	-	
00_XXX_Core A WC-04	120	-	-	
00_XXX_Core A WC-05	120	-	-	
00_XXX_Core A WC-06	120	-	-	
00_XXX_Core B Circulation	120	-	-	

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
00_XXX_Core B Cleaners Cupboard	120	-	-
00_XXX_Core B WC (Acc)-01	120	-	-
00_XXX_Core B WC Lobby	120	-	-
00_XXX_Core B WC-02	120	-	-
00_XXX_Core B WC-03	120	-	-
00_XXX_Entrance lobby	120	-	-
00_XXX_FF Stair A	120	-	-
00_XXX_FF Stair B	120	-	-
00_XXX_Post room	115	-	-
00_XXX_Reception	110	80	1.35
00_XXX_Reception (Perimeter - North)	110	80	1.35
00_XXX_Reception (Perimeter - South)	110	80	1.35
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_C Office	110	-	-
01_XXX_C Office	110	-	-
01_XXX_C Office	110	-	-
01_XXX_C Office (Perimeter)	110	-	-
01_XXX_Core A Circulation	120	-	-
01_XXX_Core A Cleaners cupboard	120	-	-
01_XXX_Core A WC (Acc)-01	120	-	-
01_XXX_Core A WC Lobby	120	-	-
01_XXX_Core A WC-02	120	-	-
01_XXX_Core A WC-03	120	-	-
01_XXX_Core B Circulation	120	-	-
01_XXX_Core B WC Lobby	120	-	-
01_XXX_Core B WC-01	120	-	-
01_XXX_Core B WC-02	120	-	-
01_XXX_Core B WC-03	120	-	-
01_XXX_Core B WC-04	120	-	-
01_XXX_Core B WC-05	120	-	-
01_XXX_Elevator lobby	120	-	-
01_XXX_FF Stair A	120	-	-
01_XXX_FF Stair B	120	-	-
02_XXX_A Elevator lobby	120	-	-
02_XXX_A Office (Perimeter)	110	-	-
02_XXX_A Office (Perimeter)	110	-	-

Zone name         Efficacy [Im/W]         Efficacy [Im/W]         Power density [W/m³]           Standard value         95         80         0.3           02_XXX_A Office (Perimeter)         110         -         -           02_XXX_B Office (Perimeter)         110         -         -           02_XXX_C Ore A Cleaners cupboard         120         -         -           02_XXX_Core A WC (Acc)-01         120         -         -           02_XXX_Core A WC (Acc)-01         120         -         -           02_XXX_Core A WC -02         120         -         -           02_XXX_Core A WC -05         120         -         -           02_XXX_Core A WC -05         120
Standard value         95         80         0.3           02_XXX_A Office (Perimeter)         110         -         -           02_XXX_B Office (Perimeter)         110         -         -           02_XXX_B Elevator lobby         120         -         -           02_XXX_B Office (Perimeter)         110         -         -           02_XXX_C Office         110         -         -           02_XXX_C Office (Perimeter)         110         -         -           02_XXX_C Office (Perimeter)         110         -         -           02_XXX_C Office (Perimeter)         110         -         -           02_XXX_C Ore A WC Acc)-01         120         -         -           02_XXX_C Ore A WC Lobby         120         -         -           02_XXX_C Ore A WC-02         120         -         -           02_XXX_C Ore A WC-03         120         -         -           02_XXX_C Ore A WC-05         120         -         - <tr< th=""></tr<>
02_XXX_A Office (Perimeter)       110       -       -         02_XXX_A Office (Perimeter)       110       -       -         02_XXX_B Elevator lobby       120       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_A Office (Perimeter)       110       -       -         02_XXX_B Elevator lobby       120       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Ore A Circulation       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -
02_XXX_B Elevator lobby       120       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       120       -       -         02_XXX_C OF A Cleaners cupboard       120       -       -         02_XXX_C Ore A WC (Acc)-01       120       -       -         02_XXX_C Ore A WC Clobby       120       -       -         02_XXX_C Ore A WC-02       120       -       -         02_XXX_C Ore A WC-03       120       -       -         02_XXX_C Ore B WC-04       120       -       -         02_XXX_C Ore B Cleaners cupboard       120       -       -         02_XXX_C Ore B WC (Acc)-01       120       -       -<
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Acc)-01       120       -       -         02_XXX_Core A WC Co3       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC Acc)-01       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC Co2       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC 03       120       -       -         02_XXX_Core B WC-03
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC -03       120       -       -
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC -02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC 02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC
02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC
02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC -02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-
02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC Cole       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC -02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05
02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120
02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC -02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
Deliver         Deliver <t< td=""></t<>
02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -
02_XXX_Core B WC-04         120         -         -           02_XXX_Core B WC-05         120         -         -
02 XXX Core B WC-05 120
02_XXX_FF Stair A 120
02_XXX_FF Stair B 120
03_XXX_A Elevator lobby 120
03_XXX_A Office (Perimeter) 110
03_XXX_B Elevator lobby 120
03_XXX_B Office (Perimeter) 110
03_XXX_C Office 110
03_XXX_C Office (Perimeter) 110
03_XXX_Core A Circulation 120
03_XXX_Core A Cleaners cupboard 120
03_XXX_Core A WC (Acc)-01 120
03_XXX_Core A WC Lobby 120

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
03_XXX_Core A WC-02	120	-	-
03_XXX_Core A WC-03	120	-	-
03_XXX_Core A WC-04	120	-	-
03_XXX_Core A WC-05	120	-	-
03_XXX_Core B Circulation	120	-	-
03_XXX_Core B Cleaners cupboard	120	-	-
03_XXX_Core B WC (Acc)-01	120	-	-
03_XXX_Core B WC Lobby	120	-	-
03_XXX_Core B WC-02	120	-	-
03_XXX_Core B WC-03	120	-	-
03_XXX_Core B WC-04	120	-	-
03_XXX_Core B WC-05	120	-	-
03_XXX_FF Stair A	120	-	-
03_XXX_FF Stair B	120	-	-
04_XXX_A Elevator lobby	120	-	-
04_XXX_A Office (Perimeter)	110	-	-
04_XXX_A Office (Perimeter)	110	-	-
04_XXX_A Office (Perimeter)	110	-	-
04_XXX_A Office (Perimeter)	110	-	-
04_XXX_B Elevator lobby	120	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_C Office	110	-	-
04_XXX_C Office (Perimeter)	110	-	-
04_XXX_Core A Circulation	120	-	-
04_XXX_Core A Cleaners cupboard	120	-	-
04_XXX_Core A WC (Acc)-01	120	-	-
04_XXX_Core A WC Lobby	120	-	-
04_XXX_Core A WC-02	120	-	-
04_XXX_Core A WC-03	120	-	-
04_XXX_Core A WC-04	120	-	-
04 XXX Core A WC-05	120	-	-
04 XXX Core B Circulation	120	-	-
04 XXX Core B Cleaners cupboard	120	-	-
04 XXX Core B WC (Acc)-01	120	-	-
04_XXX_Core B WC Lobby	120	-	-
04 XXX Core B WC-02	120	-	-
04 XXX Core B WC-03	120	-	-
04 XXX Core B WC-04	120	-	-
04 XXX Core B WC-05	120	-	-
04 XXX FF Stair A	120	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
04_XXX_FF Stair B	120	-	-
05_XXX_A Elevator lobby	120	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_B Elevator lobby	120	-	-
05_XXX_B Office (Perimeter)	110	-	-
05_XXX_B Office (Perimeter)	110	-	-
05_XXX_C Office	110	-	-
05_XXX_C Office (Perimeter)	110	-	-
05_XXX_Core A Circulation	120	-	-
05_XXX_Core A Cleaners cupboard	120	-	-
05_XXX_Core A WC (Acc)-01	120	-	-
05_XXX_Core A WC Lobby	120	-	-
05_XXX_Core A WC-02	120	-	-
05 XXX Core A WC-03	120	-	-
05 XXX Core A WC-04	120	-	-
05 XXX Core A WC-05	120	-	-
05 XXX Core B Circulation	120	-	-
05 XXX Core B Cleaners cupboard	120	-	-
05 XXX Core B WC (Acc)-01	120	-	-
05 XXX Core B WC Lobby	120	-	-
05 XXX Core B WC-02	120	-	-
05 XXX Core B WC-03	120	-	-
05 XXX Core B WC-04	120	-	-
05 XXX Core B WC-05	120	-	-
05 XXX FF Stair A	120	-	-
05 XXX FF Stair B	120	-	-
06 XXX A BOH Circulation	120	-	-
06 XXX Core A Circulation	120	-	-
06 XXX Core A Cleaners cupboard	120	-	-
06 XXX Core A PB 01	120	-	-
06 XXX Core A PB 02	120	-	-
06_XXX_Core A PB 02	120	-	-
06_XXX_Core A WC (Acc)-01	120	-	-
06_XXX_Core A WC Lobby	120	-	-
06_XXX_Core A WC-02	120	_	
06_XXX_Core A WC-03	120		
06_XXX_Core A WC-05	120		
06_XXX_Core B Circulation	120		
06_XXX_Core B Cleaners support	120		
	120	-	-
	120	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
06_XXX_Core B WC (Acc)-01	120	-	-
06_XXX_Core B WC Lobby	120	-	-
06_XXX_Core B WC-02	120	-	-
06_XXX_Core B WC-03	120	-	-
06_XXX_Core B WC-05	120	-	-
06_XXX_FF Stair A	120	-	-
06_XXX_FF Stair B	120	-	-
06_XXX_Office	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
07_XXX_Core A Circulation	120	-	-
07_XXX_Core A Cleaners cupboard	120	-	-
07_XXX_Core A PB 02	120	-	-
07_XXX_Core A PB 02	120	-	-
07_XXX_Core A WC (Acc)-01	120	-	-
07_XXX_Core A WC Lobby	120	-	-
07_XXX_Core A WC-02	120	-	-
07_XXX_Core A WC-05	120	-	-
07_XXX_Core B Circulation	120	-	-
07_XXX_Core B Cleaners cupboard	120	-	-
07_XXX_Core B WC (Acc)-01	120	-	-
07_XXX_Core B WC Lobby	120	-	-
07_XXX_Core B WC-02	120	-	-
07_XXX_Core B WC-05	120	-	-
07_XXX_FF Stair A	120	-	-
07_XXX_FF Stair B	120	-	-
07_XXX_Office	110	-	-
07_XXX_Office (Perimeter)	110	-	-
07_XXX_Office (Perimeter)	110	-	-
07_XXX_Office (Perimeter)	110	-	-
07_XXX_Office (Perimeter)	110	-	-
08_XXX_Core A Circulation	120	-	-
08_XXX_Core A Cleaners cupboard	120	-	-
08_XXX_Core A PB 02	120	-	-
08_XXX_Core A PB 02	120	-	-
08_XXX_Core A WC (Acc)-01	120		-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
08_XXX_Core A WC Lobby	120	-	-
08_XXX_Core A WC-02	120	-	-
08_XXX_Core A WC-05	120	-	-
08_XXX_Core B Circulation	120	-	-
08_XXX_Core B Cleaners cupboard	120	-	-
08_XXX_Core B WC (Acc)-01	120	-	-
08_XXX_Core B WC Lobby	120	-	-
08_XXX_Core B WC-02	120	-	-
08_XXX_Core B WC-05	120	-	-
08_XXX_FF Stair A	120	-	-
08_XXX_FF Stair B	120	-	-
08_XXX_Office	110	-	-
08_XXX_Office	110	-	-
08_XXX_Office (Perimeter)	110	-	-
08_XXX_Office (Perimeter)	110	-	-
09_XXX_C Office	110	-	-
09_XXX_Core A Circulation	120	-	-
09_XXX_Core B Circulation	120	-	-
09_XXX_Core B WC 01	120	-	-
09_XXX_Core B WC 02	120	-	-
09_XXX_FF Stair A	120	-	-
09_XXX_FF Stair B	120	-	-
B1_XXX_AHU	120	-	-
B1_XXX_Bike store	120	-	-
B1_XXX_Building manager office	115	-	-
B1_XXX_Changing facilities 01	120	-	-
B1_XXX_Changing facilities 02	120	-	-
B1_XXX_Changing rooms (AWC)	120	-	-
B1_XXX_Circulation	120	-	-
B1_XXX_Circulation	120	-	-
B1_XXX_Comms room	120	-	-
B1_XXX_Core A Circulation	120	-	-
B1_XXX_Core A Circulation	120	-	-
B1_XXX_Core A stairs	120	-	-
B1_XXX_Core B Circulation	120	-	-
B1_XXX_Core B cleaners cupboard	120	-	-
B1_XXX_Core B cleaners cupboard	120	-	-
B1_XXX_Core B Stairs	120	-	-
B1_XXX_Core B Stairs	120	-	-
B1_XXX_Core B WC 01	120	-	-
B1_XXX_Core B WC 01	120	-	-
B1_XXX_Core B WC 02 (Ass)	120	-	-
B1_XXX_Core B WC 03	120	-	-

General lighting and display lighting	General luminaire	e Display light source	
Zone name	Efficacy [Im/W]	Efficacy [Im/W] Power density [W/	
Standard value	95	80	0.3
B1_XXX_Core B WC 04	120	-	-
B1_XXX_Core B WC 05	120	-	-
B1_XXX_Core B WC 06	120	-	-
B1_XXX_Core B WC 07	120	-	-
B1_XXX_Core B WC 09 (Ass)	120	-	-
B1_XXX_Core B WC lobby	120	-	-
B1_XXX_Core B WC lobby	120	-	-
B1_XXX_Co-working lounge	110	-	-
B1_XXX_Cylinder room	120	-	-
B1_XXX_Domestic boosting tanks	120	-	-
B1_XXX_Drying room	120	-	-
B1_XXX_Fitness studio	120	-	-
B1_XXX_Flexible space 01	110	-	-
B1_XXX_Flexible space 02	110	-	-
B1_XXX_Flexible working space	110	-	-
B1_XXX_Gym	120	-	-
B1_XXX_Mains water tank	120	-	-
B1_XXX_PB	120	-	-
B1_XXX_Plant	120	-	-
B1_XXX_Plant	120	-	-
B1_XXX_Plant	120	-	-
B1_XXX_Sprinkler tank	120	-	-
B1_XXX_Sprinkler tank room	120	-	-
B1_XXX_Storage	120	-	-
B1_XXX_UKPN	120	-	-
B1_XXX_UKPN	120	-	-

# The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00_XXX_A Office (Perimeter)	NO (-32.6%)	NO
00_XXX_A Office (Perimeter)	NO (-25.4%)	NO
00_XXX_A Office (Perimeter)	NO (-50.4%)	NO
00_XXX_A Office (Perimeter)	NO (-54.8%)	NO
00_XXX_B Office (Perimeter)	NO (-63.2%)	NO
00_XXX_B Office (Perimeter)	NO (-71.4%)	NO
00_XXX_B Office (Perimeter)	NO (-54.8%)	NO
00_XXX_B Office (Perimeter)	NO (-57.7%)	NO
00_XXX_Core A Circulation	N/A	N/A
00_XXX_Core A WC (Acc)-01	N/A	N/A
00_XXX_Core A WC Lobby	NO (-99.2%)	NO
00_XXX_Core A WC-02	NO (-98.9%)	NO
00_XXX_Core A WC-03	NO (-99.5%)	NO
00_XXX_Core A WC-04	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00_XXX_Core A WC-05	N/A	N/A
00_XXX_Core A WC-06	NO (-99.5%)	NO
00_XXX_Core B Circulation	NO (-100%)	NO
00_XXX_Core B WC (Acc)-01	NO (-100%)	NO
00_XXX_Core B WC Lobby	NO (-99.9%)	NO
00_XXX_Core B WC-02	N/A	N/A
00_XXX_Core B WC-03	NO (-99.2%)	NO
00_XXX_Post room	N/A	N/A
00_XXX_Reception	NO (-87.6%)	NO
00_XXX_Reception (Perimeter - North)	NO (-41.4%)	NO
00_XXX_Reception (Perimeter - South)	NO (-43.6%)	NO
01_XXX_A Office (Perimeter)	NO (-61.5%)	NO
01_XXX_A Office (Perimeter)	NO (-75.8%)	NO
01 XXX A Office (Perimeter)	NO (-53.2%)	NO
01 XXX A Office (Perimeter)	NO (-51.2%)	NO
01 XXX B Office (Perimeter)	NO (-69.4%)	NO
01 XXX B Office (Perimeter)	NO (-68,9%)	NO
01 XXX B Office (Perimeter)	NO (-78.6%)	NO
01 XXX B Office (Perimeter)	NO (-66.3%)	NO
01 XXX C Office	NO (-99.7%)	NO
01_XXX_C_Office	NO (-99.8%)	NO
01_XXX_C_Office	NO (-74.3%)	NO
01_XXX_C_Office (Perimeter)	NO (-58.8%)	NO
01_XXX_Core A Circulation	N/A	N/A
	Ν/Δ	N/A
	NO (-100%)	
	N(A	
01_XXX_CORE A WC-02	NO (-100%)	
01_XXX_Core B Circulation	NO (-10078)	
	NO (-100%)	
	NG (-10078)	
01_XXX_Core B WC-01		N/A
		N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
	NO (-96.1%)	NO
	NO (-92.2%)	NO
	NO (-33.6%)	NO
02_XXX_A Office (Perimeter)	NO (-63.9%)	NO
	NO (-31.2%)	NO
02_XXX_A Office (Perimeter)	NO (-43%)	NO
02_XXX_B Elevator lobby	NO (-92.2%)	NO
02_XXX_B Office (Perimeter)	NO (-57.6%)	NO
02_XXX_B Office (Perimeter)	NO (-68%)	NO
02_XXX_B Office (Perimeter)	NO (-45.6%)	NO
02_XXX_B Office (Perimeter)	NO (-52.6%)	NO
02_XXX_C Office	NO (-99.4%)	NO
02_XXX_C Office (Perimeter)	NO (-19%)	NO
02_XXX_Core A Circulation	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
02_XXX_Core A WC (Acc)-01	N/A	N/A
02_XXX_Core A WC Lobby	N/A	N/A
02_XXX_Core A WC-02	N/A	N/A
02_XXX_Core A WC-03	N/A	N/A
02_XXX_Core A WC-04	N/A	N/A
02_XXX_Core A WC-05	N/A	N/A
02_XXX_Core B Circulation	N/A	N/A
02_XXX_Core B WC (Acc)-01	N/A	N/A
02_XXX_Core B WC Lobby	N/A	N/A
02_XXX_Core B WC-02	N/A	N/A
02_XXX_Core B WC-03	N/A	N/A
02_XXX_Core B WC-04	N/A	N/A
02_XXX_Core B WC-05	N/A	N/A
03_XXX_A Elevator lobby	NO (-92.2%)	NO
03_XXX_A Office (Perimeter)	NO (-73.2%)	NO
03_XXX_A Office (Perimeter)	NO (-63.2%)	NO
03_XXX_A Office (Perimeter)	NO (-61.4%)	NO
03_XXX_A Office (Perimeter)	NO (-53.4%)	NO
03_XXX_B Elevator lobby	NO (-92.1%)	NO
03_XXX_B Office (Perimeter)	NO (-75.2%)	NO
03_XXX_B Office (Perimeter)	NO (-72.4%)	NO
03_XXX_B Office (Perimeter)	NO (-57.4%)	NO
03_XXX_B Office (Perimeter)	NO (-68.9%)	NO
03_XXX_C Office	NO (-99.5%)	NO
03_XXX_C Office (Perimeter)	NO (-21.7%)	NO
03_XXX_Core A Circulation	N/A	N/A
03_XXX_Core A WC (Acc)-01	N/A	N/A
03_XXX_Core A WC Lobby	N/A	N/A
03_XXX_Core A WC-02	N/A	N/A
03_XXX_Core A WC-03	N/A	N/A
03_XXX_Core A WC-04	N/A	N/A
03_XXX_Core A WC-05	N/A	N/A
03_XXX_Core B Circulation	N/A	N/A
03_XXX_Core B WC (Acc)-01	N/A	N/A
03_XXX_Core B WC Lobby	N/A	N/A
03_XXX_Core B WC-02	N/A	N/A
03_XXX_Core B WC-03	N/A	N/A
03_XXX_Core B WC-04	N/A	N/A
03_XXX_Core B WC-05	N/A	N/A
04_XXX_A Elevator lobby	NO (-92%)	NO
04_XXX_A Office (Perimeter)	NO (-72.8%)	NO
04_XXX_A Office (Perimeter)	NO (-63.9%)	NO
04_XXX_A Office (Perimeter)	NO (-62.2%)	NO
04_XXX_A Office (Perimeter)	NO (-53.3%)	NO
04_XXX_B Elevator lobby	NO (-91.9%)	NO
04_XXX_B Office (Perimeter)	NO (-68.2%)	NO
04_XXX_B Office (Perimeter)	NO (-73.9%)	NO
04_XXX_B Office (Perimeter)	NO (-55.7%)	NO
04_XXX_B Office (Perimeter)	NO (-72.9%)	NO
· · · · · · · · · · · · · · · · · · ·		•

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
04_XXX_C Office	NO (-99.7%)	NO
04_XXX_C Office (Perimeter)	NO (-19%)	NO
04_XXX_Core A Circulation	NO (-99.9%)	NO
04_XXX_Core A WC (Acc)-01	N/A	N/A
04_XXX_Core A WC Lobby	N/A	N/A
04_XXX_Core A WC-02	N/A	N/A
04_XXX_Core A WC-03	N/A	N/A
04_XXX_Core A WC-04	N/A	N/A
04_XXX_Core A WC-05	NO (-99.9%)	NO
04_XXX_Core B Circulation	N/A	N/A
04_XXX_Core B WC (Acc)-01	N/A	N/A
04_XXX_Core B WC Lobby	N/A	N/A
04_XXX_Core B WC-02	N/A	N/A
04_XXX_Core B WC-03	N/A	N/A
04_XXX_Core B WC-04	N/A	N/A
04_XXX_Core B WC-05	N/A	N/A
05_XXX_A Elevator lobby	NO (-91.7%)	NO
05_XXX_A Office (Perimeter)	NO (-61%)	NO
05_XXX_A Office (Perimeter)	NO (-57.4%)	NO
05_XXX_A Office (Perimeter)	NO (-75.1%)	NO
05_XXX_A Office (Perimeter)	NO (-62.8%)	NO
05_XXX_B Elevator lobby	NO (-91.6%)	NO
05_XXX_B Office (Perimeter)	NO (-67.8%)	NO
05_XXX_B Office (Perimeter)	NO (-72%)	NO
05_XXX_C Office	NO (-99.7%)	NO
05_XXX_C Office (Perimeter)	NO (-9.8%)	NO
05_XXX_Core A Circulation	N/A	N/A
05_XXX_Core A WC (Acc)-01	N/A	N/A
05_XXX_Core A WC Lobby	N/A	N/A
05_XXX_Core A WC-02	N/A	N/A
05_XXX_Core A WC-03	N/A	N/A
05_XXX_Core A WC-04	N/A	N/A
05_XXX_Core A WC-05	NO (-99.9%)	NO
05_XXX_Core B Circulation	NO (-100%)	NO
05_XXX_Core B WC (Acc)-01	N/A	N/A
05_XXX_Core B WC Lobby	N/A	N/A
05_XXX_Core B WC-02	N/A	N/A
05_XXX_Core B WC-03	N/A	N/A
05_XXX_Core B WC-04	N/A	N/A
05_XXX_Core B WC-05	N/A	N/A
06_XXX_A BOH Circulation	NO (-68.1%)	NO
06_XXX_Core A Circulation	YES (+12.7%)	NO
06_XXX_Core A WC (Acc)-01	N/A	N/A
06_XXX_Core A WC Lobby	N/A	N/A
06_XXX_Core A WC-02	N/A	N/A
06_XXX_Core A WC-03	N/A	N/A
06_XXX_Core A WC-05	NO (-99.9%)	NO
06_XXX_Core B Circulation	NO (-8%)	NO
06_XXX_Core B WC (Acc)-01	NO (-100%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
06_XXX_Core B WC Lobby	N/A	N/A
06_XXX_Core B WC-02	N/A	N/A
06_XXX_Core B WC-03	N/A	N/A
06_XXX_Core B WC-05	N/A	N/A
06_XXX_Office	NO (-95%)	NO
06_XXX_Office (Perimeter)	NO (-69.6%)	NO
06_XXX_Office (Perimeter)	NO (-57.1%)	NO
06_XXX_Office (Perimeter)	NO (-75.5%)	NO
06_XXX_Office (Perimeter)	NO (-55.1%)	NO
06_XXX_Office (Perimeter)	NO (-4.6%)	NO
06_XXX_Office (Perimeter)	NO (-64.1%)	NO
06_XXX_Office (Perimeter)	NO (-7.2%)	NO
06_XXX_Office (Perimeter)	NO (-62.3%)	NO
06_XXX_Office (Perimeter)	NO (-72.5%)	NO
07_XXX_Core A Circulation	NO (-43.9%)	NO
07_XXX_Core A WC (Acc)-01	N/A	N/A
07_XXX_Core A WC Lobby	N/A	N/A
07_XXX_Core A WC-02	N/A	N/A
07_XXX_Core A WC-05	N/A	N/A
07_XXX_Core B Circulation	NO (-32.1%)	NO
07_XXX_Core B WC (Acc)-01	N/A	N/A
07_XXX_Core B WC Lobby	N/A	N/A
07_XXX_Core B WC-02	N/A	N/A
07_XXX_Core B WC-05	N/A	N/A
07_XXX_Office	NO (-90.9%)	NO
07_XXX_Office (Perimeter)	NO (-46.9%)	NO
07_XXX_Office (Perimeter)	NO (-8.7%)	NO
07_XXX_Office (Perimeter)	NO (-53.6%)	NO
07_XXX_Office (Perimeter)	NO (-61%)	NO
08_XXX_Core A Circulation	NO (-43.8%)	NO
08_XXX_Core A WC (Acc)-01	N/A	N/A
08_XXX_Core A WC Lobby	N/A	N/A
08_XXX_Core A WC-02	N/A	N/A
08_XXX_Core A WC-05	N/A	N/A
08_XXX_Core B Circulation	NO (-29.9%)	NO
08_XXX_Core B WC (Acc)-01	N/A	N/A
08_XXX_Core B WC Lobby	N/A	N/A
08_XXX_Core B WC-02	N/A	N/A
08_XXX_Core B WC-05	N/A	N/A
08_XXX_Office	NO (-93.5%)	NO
08_XXX_Office	NO (-75.4%)	NO
08_XXX_Office (Perimeter)	NO (-53.3%)	NO
08_XXX_Office (Perimeter)	NO (-46%)	NO
09_XXX_C Office	NO (-41.8%)	NO
09_XXX_Core A Circulation	N/A	N/A
09_XXX_Core B Circulation	N/A	N/A
09_XXX_Core B WC 01	N/A	N/A
09_XXX_Core B WC 02	N/A	N/A
B1_XXX_Building manager office	NO (-100%)	NO
1	1	1

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B1_XXX_Changing facilities 01	NO (-100%)	NO
B1_XXX_Changing facilities 02	NO (-100%)	NO
B1_XXX_Changing rooms (AWC)	N/A	N/A
B1_XXX_Circulation	NO (-100%)	NO
B1_XXX_Circulation	NO (-100%)	NO
B1_XXX_Comms room	NO (-99.6%)	NO
B1_XXX_Core A Circulation	N/A	N/A
B1_XXX_Core A Circulation	N/A	N/A
B1_XXX_Core B Circulation	N/A	N/A
B1_XXX_Core B WC 01	N/A	N/A
B1_XXX_Core B WC 01	NO (-99.6%)	NO
B1_XXX_Core B WC 02 (Ass)	NO (-100%)	NO
B1_XXX_Core B WC 03	NO (-100%)	NO
B1_XXX_Core B WC 04	NO (-100%)	NO
B1_XXX_Core B WC 05	NO (-99.6%)	NO
B1_XXX_Core B WC 06	NO (-99.9%)	NO
B1_XXX_Core B WC 07	N/A	N/A
B1_XXX_Core B WC 09 (Ass)	NO (-100%)	NO
B1_XXX_Core B WC lobby	NO (-100%)	NO
B1_XXX_Core B WC lobby	NO (-99.8%)	NO
B1_XXX_Co-working lounge	NO (-73.2%)	NO
B1_XXX_Drying room	NO (-100%)	NO
B1_XXX_Fitness studio	N/A	N/A
B1_XXX_Flexible space 01	NO (-18.1%)	NO
B1_XXX_Flexible space 02	NO (-71.7%)	NO
B1_XXX_Flexible working space	NO (-82%)	NO
B1_XXX_Gym	NO (-6.5%)	NO

# Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

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

# **Building Global Parameters**

	Actual	Notional	% Ai
Floor area [m <sup>2</sup> ]	11191.2	11191.2	
External area [m <sup>2</sup> ]	9868.2	9868.2	
Weather	LON	LON	100
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	
Average conductance [W/K]	13878.9	3944.44	
Average U-value [W/m <sup>2</sup> K]	1.41	0.4	
Alpha value* [%]	24.93	10	

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

# **Building Use**

### % Area Building Type

Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways
Offices and Workshop Businesses
General Industrial and Special Industrial Groups Storage or Distribution
Residential Institutions: Hospitals and Care Homes Residential Institutions: Residential Schools Residential Institutions: Universities and Colleges Secure Residential Institutions
Residential Spaces Non-residential Institutions: Community/Day Centre Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education
Non-residential Institutions: Primary Health Care Building Non-residential Institutions: Crown and County Courts 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 Litility Plack

# Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	21.53	1.11
Cooling	1.5	4.99
Auxiliary	16.8	9.63
Lighting	12.88	14.75
Hot water	9.46	8.38
Equipment*	41.83	41.83
TOTAL**	62.17	38.87

\* 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
Displaced electricity	0	0

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	209.37	94.29
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	92.75	57.42
Total emissions [kg/m <sup>2</sup> ]	8.69	5.21

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	S] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	224	24.5	25.6	1.7	17.9	2.43	3.9	2.64	5.51
	Notional	12.7	96.7	1.3	5.8	10.3	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	142.3	18.4	16.3	1.3	15.5	2.43	3.9	2.64	5.51
	Notional	10.1	88.6	1	5.3	8.4	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity	-		-	_
	Actual	60.6	28.6	6.9	2	15.7	2.43	3.9	2.64	5.51
	Notional	2.5	67	0.2	4	8.1	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	S] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	223	2.7	25.5	0.2	34	2.43	3.9	2.64	5.51
	Notional	23.9	39.6	2.4	2.4	27.9	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity	-		-	-
	Actual	623.6	0.7	71.3	0.1	23.6	2.43	3.9	2.64	5.51
	Notional	44.2	15.1	4.4	0.9	8.8	2.78	4.63		
[ST	] Split or m	ulti-split sy	stem, [HS]	ASHP, [HF1	] Electricity	y, [CFT] Ele	ctricity		-	-
	Actual	249.4	336.2	28.2	20.2	0	2.46	4.62	2.64	6.5
	Notional	0	1480.3	0	88.8	0	2.78	4.63		
[ST	] Fan coil s	ystems, [HS	6] ASHP, [H	FT] Electric	city, [CFT] E	lectricity			-	-
	Actual	140	21	16	1.5	16.2	2.43	3.9	2.64	5.51
	Notional	10	83.8	1	5	7.7	2.78	4.63		
[ST	[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
	Actual	33.7	11.8	3.9	0.8	64	2.43	3.9	2.64	5.51
	Notional	0.1	42.1	0	2.5	22.1	2.78	4.63		
[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] Cool dem [MJ/m2] Heat con [kWh/m2] Cool con [kWh/m2] Aux con [kWh/m2] Heat SSEFF Cool SSEER Heat gen SSEFF Cool gen SSEER ST HS HET	<ul> <li>Heating energy demand</li> <li>Cooling energy demand</li> <li>Heating energy consumption</li> <li>Cooling energy consumption</li> <li>Auxiliary energy consumption</li> <li>Heating system seasonal efficiency (for notional building, value depends on activity glazing class)</li> <li>Cooling system seasonal energy efficiency ratio</li> <li>Heating generator seasonal efficiency</li> <li>Cooling generator seasonal energy efficiency ratio</li> <li>System type</li> <li>Heat source</li> <li>Heating fuel type</li> </ul>
HS HFT	= Heat source = Heating fuel type
CFT	= Cooling fuel type

# **BRUKL Output Document**

HM Government

Compliance with England Building Regulations Part L 2021

## **Project name**

# Post-Refurb (Be Green)\_Refurb

# As designed

Date: Fri May 17 14:26:07 2024

## Administrative information

#### **Building Details**

Address: 124 Theobalds Road, London, WC1X 8RX

### **Certifier details**

Name: Matt Cotton Telephone number: 02037139538 Address: 15-19 Bloomsbury Way, London, WC1A 2TH Certification tool

Calculation engine: Apache Calculation engine version: 7.0.25 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.25 BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 896.99

# The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum	5.21		
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum	8.2		
Target primary energy rate (TPER), kWh <sub>PE</sub> /m²annum	57.42		
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	87.57		
Do the building's emission and primary energy rates exceed the targets? BER > TER BPER >			

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

Fabric element	Ua-Limit	Ua-Calc	<b>U</b> i-Calc	First surface with maximum value
Walls*	0.26	1.44	1.7	B100001D:Surf[2]
Floors	0.18	0.25	0.25	0000004:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	2.41	2.8	04000001:Surf[10]
Windows** and roof windows	1.6	1.5	2.8	01000018:Surf[0]
Rooflights***	2.2	2.1	2.1	B1000030:Surf[1]
Personnel doors^	1.6	1.88	5.87	000000C:Surf[6]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	1.4	1.4	0000008:Surf[2]
U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]			U i-Calc = Ca	lculated maximum individual element U-values [W/(m <sup>2</sup> K)]

 $U_{a\text{-Limit}} = \text{Limiting area-weighted average U-values } [W/(m^2K)] \\ U_{a\text{-Calc}} = \text{Calculated area-weighted average U-values } [W/(m^2K)]$ 

\* 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. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	25

### **Building services**

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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

#### 1-01\_FCU-ASHP-AHUs (Office areas)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency	
This system	2.94	5.51	0	2.5	0.8	
Standard value	2.5*	N/A	N/A	2^	N/A	
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.						

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 2-07\_FCU-ASHP-AHU (Circulation)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR effic	iency
This system	2.94	5.51	0	2.5	0.8	
Standard value	2.5*	N/A	N/A	2^	N/A	
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.						

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 3-04\_FCU-ASHP-Extract (Toilets)

	Heating efficiency	<b>Cooling efficiency</b>	Radiant efficiency	SFP [W/(I/s)]	HR efficiency	
This system	2.94	5.51	0	2.5	-	
Standard value	2.5*	N/A	N/A	1.5^	N/A	
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.						

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

### 4-02\_FCU-ASHP-AHUs (FOH communal, basement flex, lounge, cellular office, post room, 9th floor amenity)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HF	R efficiency	
This system	2.94	5.51	0	2.5	0.8	}	
Standard value	2.5*	N/A	N/A	2^	N//	N/A	
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 5-03 FCU-ASHP-AHUs (Reception and atrium)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency	
This system	2.94	5.51	0	2.5	0.8	
Standard value	2.5*	N/A	N/A	2^	N/A	
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.						

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

### 6- 05\_FCU-ASHP-AHU (Basement changing rooms)

	Heating efficiency Cooling efficiency Radiant efficiency SFP [W/(I/s)] HR efficiency											
This system         2.94         5.51         0         2.5         0.8												
Standard value 2.5* N/A N/A 2^ N/A												
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.												

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

## 7-06\_DX (Comms room)

Heating efficiency Cooling efficiency Radiant efficiency SFP [W/(I/s)] HR efficience											
This system         2.94         6.5         0         -         -											
Standard value 2.5* 5 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 all types >12 kW output, except absorption and gas engine heat pumps.											

## 8-08\_FCU-ASHP-AHU (Gym)

Heating efficiency         Cooling efficiency         Radiant efficiency         SFP [W/(I/s)]         HR efficiency												
This system	tem 2.94 5.51 0 2.5 0.8											
Standard value	2.5*	2^	N/A									
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.												
^ Limiting SFP may b	e increased by the amount	s specified in the Approved	l Documents if the installati	on includes particula	ar com	nponents.						

## 1-00a\_DHW 01-POU (REFURB)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.03
Standard value	1	N/A

### 2- 00b\_DHW 02-ASHP + elec top up (REFURB)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1.71	0.002
Standard value	2*	N/A
* Standard shown is for all	types except absorption and gas engine heat pumps.	

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
А	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
Е	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
н	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: L	imiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name		SFP [W/(I/s)]									
ID of system type	Α	В	С	D	Е	F	G	Н	I	нк е	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
00_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core A WC-06	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core B WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
00 XXX Core B WC Lobby	_	-	-	_	-	-	_	0.3	-	_	N/A
00 XXX Core B WC-02	_	_	_	_	_	_	_	0.0	-	_	N/A
00_XXX_Core B WC-02	_			_	_		_	0.3		_	N/A
00_XXX_Bost room	_			_	_		_	0.3		_	N/A
00 XXX Reception	_	_		_	_		_	0.3	-	_	N/A
00 XXX Reception (Perimeter - North	<u>ل</u>	_		_	_		_	0.3			N/A
00_XXX_Reception (Perimeter - North	h)						_	0.3		_	
01_XXX_A Office (Perimeter)	117	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
	-	-	-	-	-	-	-	0.3	-	-	IN/A
01_XXX_A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
01_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A

ID of system type A B C D E F G H I Standard value 0.3 11 0.5 23 2 0.5 0.5 0.4 1 Zono St	
Standard value 0.2 11 05 22 2 05 05 04 1 Zono S	
$\frac{1}{1}$ Statuaru value $10.3$ $1.1$ $10.3$ $2.3$ $2$ $10.3$ $0.3$ $0.4$ $1$ <b>2016</b> $3$	tandard
01_XXX_Core B WC Lobby 0.3 N	/A
01_XXX_Core B WC-01 0.3 N	/A
01_XXX_Core B WC-02 0.3 N	/A
01_XXX_Core B WC-03 0.3 N	/A
01_XXX_Core B WC-04 0.3 N	/A
01_XXX_Core B WC-05 0.3 N	/A
01_XXX_Elevator lobby 0.3 N	/A
02_XXX_A Elevator lobby 0.3 N	/A
02_XXX_A Office (Perimeter) 0.3 N	/A
02_XXX_A Office (Perimeter) 0.3 N	/A
02_XXX_A Office (Perimeter) 0.3 N	/A
02_XXX_A Office (Perimeter) 0.3 N	/A
02_XXX_B Elevator lobby 0.3 N	/A
02_XXX_B Office (Perimeter) 0.3 N	/A
02_XXX_B Office (Perimeter) 0.3 N	/A
02_XXX_B Office (Perimeter) 0.3 N	/A
02_XXX_B Office (Perimeter) 0.3 N	/A
02_XXX_C Office 0.3 N	/A
02_XXX_C Office (Perimeter) 0.3 N	/A
02_XXX_Core A Circulation 0.3 N	/A
02_XXX_Core A WC (Acc)-01 0.3 N	/A
02_XXX_Core A WC Lobby 0.3 N	/A
02_XXX_Core A WC-02 0.3 N	/A
02_XXX_Core A WC-03 0.3 N	/A
02_XXX_Core A WC-04 0.3 N	/A
02_XXX_Core A WC-05 0.3 N	/A
02_XXX_Core B Circulation 0.3 N	/A
02_XXX_Core B WC (Acc)-01 0.3 N	/A
02_XXX_Core B WC Lobby 0.3 N	/A
02_XXX_Core B WC-02 0.3 N	/A
02_XXX_Core B WC-03 0.3 N	/A
02_XXX_Core B WC-04 0.3 N	/A
02_XXX_Core B WC-05 0.3 N	/A
03_XXX_A Elevator lobby 0.3 N	/A
03_XXX_A Office (Perimeter) 0.3 N	/A
03_XXX_A Office (Perimeter) 0.3 N	/A
03_XXX_A Office (Perimeter) 0.3 N	/A
03_XXX_A Office (Perimeter) 0.3 N	/A
03_XXX_B Elevator lobby 0.3 N	/A
03_XXX_B Office (Perimeter) 0.3 N	/A
03_XXX_B Office (Perimeter) 0.3 N	/A
03_XXX_B Office (Perimeter) 0.3 N	/A
03_XXX_B Office (Perimeter) 0.3 N	/A

Zone name		SFP [W/(I/s)]									
ID of system type	Α	В	С	D	Е	F	G	Н	I	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
03_XXX_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
03_XXX_Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
03 XXX Core B WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
03 XXX Core B WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
03 XXX Core B WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Elevator lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX A Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Elevator lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX B Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-03	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-04	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC (Acc)-01	-	-	-	_	_	-	_	0.3	-	-	N/A
04 XXX Core B WC Lobby	-	-	-	_	_	-	_	0.3	-	-	N/A
04 XXX Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC-03	_	-	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC-04	-	_	-	-	-	-	-	0.3	-	-	N/A
04 XXX Core B WC-05	-	_	-	-	-	-	-	0.3	-	-	N/A
05 XXX A Flevator lobby	_	_	-	_	-	-	_	0.3	-	-	N/A
								0.0			11/7

ID of system type         A         B         C         D         E         F         G         H         I         Intermeter           Standard value         0.3         1.1         0.5         2.3         2         0.5         0.4         1         Zone         Standard           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_B Diffice (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_C Office         -         -         -         -         0.3         -         N/A           05_XXX_C Core A WC (Acc)-01         -         -         -
Standard value         0.3         1.1         0.5         2.3         2         0.5         0.4         1         Zone         Standard           05_XXX_A Office (Perimeter)         -         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_A Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_B Office (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_C Office         -         -         -         -         0.3         -         N/A           05_XXX_C Coffice (Perimeter)         -         -         -         -         0.3         -         N/A           05_XXX_C Coffice (Perimeter)         -         -         -         -         0.3         -
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Ore A WC (Acc)-01       -       -       -       -       0.3       -<
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Core A Circulation       -       -       -       -       0.3       -       N/A         05_XXX_C Core A WC Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_C Core A WC Co2       -
05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_A Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Co
05_XXX_A Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Elevator lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -
05_XXX_B Elevator lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -
05_XXX_B Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_B Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_C Ore A Circulation       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       - </td
05_XXX_B Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B
05_XXX_C Office       -       -       -       -       -       0.3       -       -       N/A         05_XXX_C Office (Perimeter)       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Co2       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC 05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       <
05_XXX_C Office (Perimeter)       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-03       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-04       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02
05_XXX_Core A Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       0.3       -       N/A
05_XXX_Core A WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC 02       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03<
05_XXX_Core A WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       N/A         05_XXX_Core A WC-05       -       -       -       -       0.3       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03       -
05_XXX_Core A WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-04       -       -       -       -       0.3       -       N/A
05_XXX_Core A WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       N/A         05_
05_XXX_Core A WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       N/A         05_XXX_Core B WC-05       -       -       -       -
05_XXX_Core A WC-05       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B Circulation       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B Circulation       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC (Acc)-01       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC Lobby       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-02       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC-02       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC-03       -       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-04       -       -       -       -       -       0.3       -       -       N/A         05_XXX_Core B WC-05       -       -       -       -       -       0.3       -       -       N/A
05_XXX_Core B WC-04         -         -         -         -         -         0.3         -         N/A           05_XXX_Core B WC-05         -         -         -         -         -         0.3         -         -         N/A
05_XXX_Core B WC-05 0.3 N/A
06_XXX_A BOH Circulation 0.3 N/A
06_XXX_Core A Circulation 0.3 N/A
06_XXX_Core A WC (Acc)-01 0.3 N/A
06_XXX_Core A WC Lobby 0.3 N/A
06_XXX_Core A WC-02 0.3 N/A
06 XXX Core A WC-03 0.3 N/A
06 XXX Core A WC-05 0.3 N/A
06_XXX_Core B Circulation 0.3 N/A
06_XXX_Core B WC (Acc)-01 0.3 N/A
06 XXX Core B WC Lobby 0.3 N/A
06 XXX Core B WC-02 0.3 N/A
06 XXX Core B WC-03 0.3 N/A
06 XXX Core B WC-05 0.3 N/A
06 XXX Office 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A
06 XXX Office (Perimeter) 0.3 N/A

Zone name		SFP [W/(I/s)]										
ID of system type	Α	В	С	D	Е	F	G	Н	I	нке	fficiency	
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
06_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core A WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core A WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core A WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core A WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core B WC (Acc)-01	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_XXX_Core B WC Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A	
07 XXX Core B WC-02	-	-	-	-	-	-	-	0.3	-	-	N/A	
07 XXX Core B WC-05	-	-	-	-	-	-	-	0.3	-	-	N/A	
07 XXX Office	-	-	-	-	-	-	-	0.3	-	-	N/A	
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
07 XXX Office (Perimeter)	-	-	-	-	_	-	-	0.3	-	-	N/A	
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
07 XXX Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
08 XXX Core A Circulation	-	-	-	_	-	-	_	0.3	-	_	N/A	
08 XXX Core A WC (Acc)-01	_	_	_	_	_	_	_	0.0	-	_	N/A	
08 XXX Core A WC Lobby	_	_		_	_		_	0.3	-	_	N/A	
08 XXX Core A WC-02	_			_	_		_	0.3		_	N/A	
08_XXX_Core A WC-05	_	_		_	_		_	0.3	-	_	N/A	
08 XXX Core B Circulation	_			_	_		_	0.3		_	N/A	
08 XXX Core B WC (Acc)-01	_			_	_		_	0.3		_	N/A	
08 XXX Core B WC Lobby	-	-		-	-	-	-	0.3		_		
08 XXX Core B WC-02	-	-		-	-	-	-	0.3		_		
08_XXX_Core B WC-02	-	-	-	-	-	-	-	0.3	-	-		
	-	-	-	-	-	-	-	0.3	-	-		
	-	-	-	-	-	-	-	0.3	-	-		
08_XXX_Office (Derimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A	
08_XXX_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	IN/A	
	-	-	-	-	-	-	-	0.3	-	-	N/A	
	-	-	-	-	-	-	-	0.3	-	-	N/A	
	-	-	-	-	-	-	-	0.3	-	-	N/A	
09_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A	
09_XXX_Core B WC 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
09_XXX_Core B WC 02	-	-	-	-	-	-	-	0.3	-	-	N/A	
B1_XXX_Building manager office	-	-	-	-	-	-	-	0.3	-	-	N/A	
B1_XXX_Changing facilities 01	-	-	-	-	-	-	-	0.3	-	-	N/A	
B1_XXX_Changing facilities 02	-	-	-	-	-	-	-	0.3	-	-	N/A	
B1_XXX_Changing rooms (AWC)	-	-	-	-	-	-	-	0.3	-	-	N/A	
B1_XXX_Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A	
B1_XXX_Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A	

Zone name											
ID of system type	Α	В	С	D	Е	F	G	н	1	нке	fficiency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
B1_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core A Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B Circulation	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 02 (Ass)	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 04	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 05	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 06	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 07	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC 09 (Ass)	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Core B WC lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Co-working lounge	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Drying room	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Fitness studio	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Flexible space 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Flexible space 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Flexible working space	-	-	-	-	-	-	-	0.3	-	-	N/A
B1_XXX_Gym	-	-	-	-	-	-	-	0.3	-	-	N/A

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
00_XXX_A Office (Perimeter)	110	-	-
00_XXX_A Office (Perimeter)	110	-	-
00_XXX_A Office (Perimeter)	110	-	-
00_XXX_A Office (Perimeter)	110	-	-
00_XXX_B Office (Perimeter)	110	-	-
00_XXX_B Office (Perimeter)	110	-	-
00_XXX_B Office (Perimeter)	110	-	-
00_XXX_B Office (Perimeter)	110	-	-
00_XXX_Core A Circulation	120	-	-
00_XXX_Core A Cleaners Cupboard	120	-	-
00_XXX_Core A WC (Acc)-01	120	-	-
00_XXX_Core A WC Lobby	120	-	-
00_XXX_Core A WC-02	120	-	-
00_XXX_Core A WC-03	120	-	-
00_XXX_Core A WC-04	120	-	-
00_XXX_Core A WC-05	120	-	-
00_XXX_Core A WC-06	120	-	-
00_XXX_Core B Circulation	120	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
00_XXX_Core B Cleaners Cupboard	120	-	-
00_XXX_Core B WC (Acc)-01	120	-	-
00_XXX_Core B WC Lobby	120	-	-
00_XXX_Core B WC-02	120	-	-
00_XXX_Core B WC-03	120	-	-
00_XXX_Entrance lobby	120	-	-
00_XXX_FF Stair A	120	-	-
00_XXX_FF Stair B	120	-	-
00_XXX_Post room	115	-	-
00_XXX_Reception	110	80	1.35
00_XXX_Reception (Perimeter - North)	110	80	1.35
00_XXX_Reception (Perimeter - South)	110	80	1.35
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_A Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_B Office (Perimeter)	110	-	-
01_XXX_C Office	110	-	-
01_XXX_C Office	110	-	-
01_XXX_C Office	110	-	-
01_XXX_C Office (Perimeter)	110	-	-
01_XXX_Core A Circulation	120	-	-
01_XXX_Core A Cleaners cupboard	120	-	-
01_XXX_Core A WC (Acc)-01	120	-	-
01_XXX_Core A WC Lobby	120	-	-
01_XXX_Core A WC-02	120	-	-
01_XXX_Core A WC-03	120	-	-
01_XXX_Core B Circulation	120	-	-
01_XXX_Core B WC Lobby	120	-	-
01_XXX_Core B WC-01	120	-	-
01_XXX_Core B WC-02	120	-	-
01_XXX_Core B WC-03	120	-	-
01_XXX_Core B WC-04	120	-	-
01_XXX_Core B WC-05	120	-	-
01_XXX_Elevator lobby	120	-	-
01_XXX_FF Stair A	120	-	-
01_XXX_FF Stair B	120	-	-
02_XXX_A Elevator lobby	120	-	-
02_XXX_A Office (Perimeter)	110	-	-
02_XXX_A Office (Perimeter)	110	-	-

Zone name         Efficacy [Im/W]         Efficacy [Im/W]         Power density [W/m³]           Standard value         95         80         0.3           02_XXX_A Office (Perimeter)         110         -         -           02_XXX_B Office (Perimeter)         110         -         -           02_XXX_B Elevator lobby         120         -         -           02_XXX_B Office (Perimeter)         110         -         -           02_XXX_C Office         110         -         -           02_XXX_C Office (Perimeter)         110         -         -           02_XXX_C Office (Perimeter)         110         -         -           02_XXX_C Office (Perimeter)         120         -         -           02_XXX_C Office (Perimeter)         120         -         -           02_XXX_C Ore A WC (Acc)-01         120         -         -           02_XXX_C Ore A WC O2         120         -         -           02_XXX_C Ore A WC-03         120         -
Standard value         95         80         0.3           02_XXX_A Office (Perimeter)         110         -         -           02_XXX_A Office (Perimeter)         110         -         -           02_XXX_B Elevator lobby         120         -         -           02_XXX_B Office (Perimeter)         110         -         -           02_XXX_C Office (Perimeter)         110         -         -           02_XXX_C Core A Cleaners cupboard         120         -         -           02_XXX_Core A WC (Acc)-01         120         -         -           02_XXX_Core A WC (Acc)-01         120         -         -           02_XXX_Core A WC (Acc)-01         120         -         -           02_XXX_Core A WC -03         120         -         -           02_XXX_Core A WC-05         120         -         -           02_XXX_Core B Circulation         120         -         -<
02_XXX_A Office (Perimeter)       110       -       -         02_XXX_A Office (Perimeter)       110       -       -         02_XXX_B Elevator lobby       120       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Core A Core Logloard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Co2       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Circulation       120       -       -
02_XXX_A Office (Perimeter)       110       -       -         02_XXX_B Elevator lobby       120       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       120       -       -         02_XXX_C Office (Perimeter)       120       -       -         02_XXX_C Core A Cleaners cupboard       120       -       -         02_XXX_C Core A WC (Acc)-01       120       -       -         02_XXX_C Core A WC -02       120       -       -         02_XXX_C Core A WC-03       120       -       -         02_XXX_C Core A WC-05       120       -       -         02_XXX_C Core B Cleaners cupboard       120       -
02_XXX_B Elevator lobby       120       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Acc)-01       120       -       -         02_XXX_Core A WC Co2       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -         0
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_C Ore A Circulation       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       - <td< td=""></td<>
02_XXX_B Office (Perimeter)       110       -       -         02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC -02       120       -       -         02_X
02_XXX_C Office       110       -       -         02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC O2       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B WC-04       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC 02       120       -       -         02_XXX_Core B WC-03
02_XXX_C Office (Perimeter)       110       -       -         02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-0
02_XXX_Core A Circulation       120       -       -         02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC -02       120       -       -         02_XXX_Core B WC -03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       1
02_XXX_Core A Cleaners cupboard       120       -       -         02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core A WC (Acc)-01       120       -       -         02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC -02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core A WC Lobby       120       -       -         02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core A WC-02       120       -       -         02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core A WC-03       120       -       -         02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core A WC-04       120       -       -         02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core A WC-05       120       -       -         02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core B Circulation       120       -       -         02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core B Cleaners cupboard       120       -       -         02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core B WC (Acc)-01       120       -       -         02_XXX_Core B WC Lobby       120       -       -         02_XXX_Core B WC-02       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-03       120       -       -         02_XXX_Core B WC-04       120       -       -
02_XXX_Core B WC Lobby     120     -     -       02_XXX_Core B WC-02     120     -     -       02_XXX_Core B WC-03     120     -     -       02_XXX_Core B WC-04     120     -     -
02_XXX_Core B WC-02     120     -     -       02_XXX_Core B WC-03     120     -     -       02_XXX_Core B WC-04     120     -     -
02_XXX_Core B WC-03         120         -         -           02_XXX_Core B WC-04         120         -         -
02 XXX Core B WC-04 120
02_XXX_Core B WC-05 120
02_XXX_FF Stair A 120
02_XXX_FF Stair B 120
03_XXX_A Elevator lobby 120
03_XXX_A Office (Perimeter) 110
03_XXX_B Elevator lobby 120
03_XXX_B Office (Perimeter) 110
03_XXX_C Office 110
03_XXX_C Office (Perimeter) 110
03_XXX_Core A Circulation 120
03_XXX_Core A Cleaners cupboard 120
03_XXX_Core A WC (Acc)-01 120
03_XXX_Core A WC Lobby 120

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
03_XXX_Core A WC-02	120	-	-
03_XXX_Core A WC-03	120	-	-
03_XXX_Core A WC-04	120	-	-
03_XXX_Core A WC-05	120	-	-
03_XXX_Core B Circulation	120	-	-
03_XXX_Core B Cleaners cupboard	120	-	-
03_XXX_Core B WC (Acc)-01	120	-	-
03_XXX_Core B WC Lobby	120	-	-
03_XXX_Core B WC-02	120	-	-
03_XXX_Core B WC-03	120	-	-
03_XXX_Core B WC-04	120	-	-
03_XXX_Core B WC-05	120	-	-
03_XXX_FF Stair A	120	-	-
03_XXX_FF Stair B	120	-	-
04_XXX_A Elevator lobby	120	-	-
04_XXX_A Office (Perimeter)	110	-	-
04_XXX_A Office (Perimeter)	110	-	-
04_XXX_A Office (Perimeter)	110	-	-
04 XXX A Office (Perimeter)	110	-	-
04_XXX_B Elevator lobby	120	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_B Office (Perimeter)	110	-	-
04_XXX_C Office	110	-	-
04_XXX_C Office (Perimeter)	110	-	-
04_XXX_Core A Circulation	120	-	-
04_XXX_Core A Cleaners cupboard	120	-	-
04_XXX_Core A WC (Acc)-01	120	-	-
04_XXX_Core A WC Lobby	120	-	-
04_XXX_Core A WC-02	120	-	-
04_XXX_Core A WC-03	120	-	-
04_XXX_Core A WC-04	120	-	-
04_XXX_Core A WC-05	120	-	-
04_XXX_Core B Circulation	120	-	-
04_XXX_Core B Cleaners cupboard	120	-	-
04_XXX_Core B WC (Acc)-01	120	-	-
04_XXX_Core B WC Lobby	120	-	-
04_XXX_Core B WC-02	120	-	-
04_XXX_Core B WC-03	120	-	-
04_XXX_Core B WC-04	120	-	-
04_XXX_Core B WC-05	120	-	-
04_XXX_FF Stair A	120	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
04_XXX_FF Stair B	120	-	-
05_XXX_A Elevator lobby	120	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_A Office (Perimeter)	110	-	-
05_XXX_B Elevator lobby	120	-	-
05_XXX_B Office (Perimeter)	110	-	-
05_XXX_B Office (Perimeter)	110	-	-
05_XXX_C Office	110	-	-
05_XXX_C Office (Perimeter)	110	-	-
05_XXX_Core A Circulation	120	-	-
05_XXX_Core A Cleaners cupboard	120	-	-
05_XXX_Core A WC (Acc)-01	120	-	-
05_XXX_Core A WC Lobby	120	-	-
05_XXX_Core A WC-02	120	-	-
05 XXX Core A WC-03	120	-	-
05 XXX Core A WC-04	120	-	-
05 XXX Core A WC-05	120	-	-
05 XXX Core B Circulation	120	-	-
05 XXX Core B Cleaners cupboard	120	-	-
05 XXX Core B WC (Acc)-01	120	-	-
05 XXX Core B WC Lobby	120	-	-
05 XXX Core B WC-02	120	-	-
05 XXX Core B WC-03	120	-	-
05 XXX Core B WC-04	120	-	-
05 XXX Core B WC-05	120	-	-
05 XXX FF Stair A	120	-	-
05 XXX FF Stair B	120	-	-
06 XXX A BOH Circulation	120	-	-
06 XXX Core A Circulation	120	-	-
06 XXX Core A Cleaners cupboard	120	-	-
06 XXX Core A PB 01	120	-	-
06 XXX Core A PB 02	120	-	-
06_XXX_Core A PB 02	120	-	-
06_XXX_Core A WC (Acc)-01	120	-	-
06_XXX_Core A WC Lobby	120	-	-
06_XXX_Core A WC-02	120		
06_XXX_Core A WC-03	120		
06_XXX_Core A WC-05	120		
06_XXX_Core B Circulation	120	_	
06_XXX_Core B Cleaners support	120	_	
	120	-	-
	120	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
06_XXX_Core B WC (Acc)-01	120	-	-
06_XXX_Core B WC Lobby	120	-	-
06_XXX_Core B WC-02	120	-	-
06_XXX_Core B WC-03	120	-	-
06_XXX_Core B WC-05	120	-	-
06_XXX_FF Stair A	120	-	-
06_XXX_FF Stair B	120	-	-
06_XXX_Office	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
06_XXX_Office (Perimeter)	110	-	-
07_XXX_Core A Circulation	120	-	-
07_XXX_Core A Cleaners cupboard	120	-	-
07_XXX_Core A PB 02	120	-	-
07_XXX_Core A PB 02	120	-	-
07_XXX_Core A WC (Acc)-01	120	-	-
07_XXX_Core A WC Lobby	120	-	-
07_XXX_Core A WC-02	120	-	-
07_XXX_Core A WC-05	120	-	-
07_XXX_Core B Circulation	120	-	-
07_XXX_Core B Cleaners cupboard	120	-	-
07_XXX_Core B WC (Acc)-01	120	-	-
07_XXX_Core B WC Lobby	120	-	-
07_XXX_Core B WC-02	120	-	-
07_XXX_Core B WC-05	120	-	-
07_XXX_FF Stair A	120	-	-
07_XXX_FF Stair B	120	-	-
07_XXX_Office	110	-	-
07_XXX_Office (Perimeter)	110	-	-
07_XXX_Office (Perimeter)	110	-	-
07_XXX_Office (Perimeter)	110	-	-
07_XXX_Office (Perimeter)	110	-	-
08_XXX_Core A Circulation	120	-	-
08_XXX_Core A Cleaners cupboard	120	-	-
08_XXX_Core A PB 02	120	-	-
08_XXX_Core A PB 02	120	-	-
08_XXX_Core A WC (Acc)-01	120		-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
08_XXX_Core A WC Lobby	120	-	-
08_XXX_Core A WC-02	120	-	-
08_XXX_Core A WC-05	120	-	-
08_XXX_Core B Circulation	120	-	-
08_XXX_Core B Cleaners cupboard	120	-	-
08_XXX_Core B WC (Acc)-01	120	-	-
08_XXX_Core B WC Lobby	120	-	-
08_XXX_Core B WC-02	120	-	-
08_XXX_Core B WC-05	120	-	-
08_XXX_FF Stair A	120	-	-
08_XXX_FF Stair B	120	-	-
08_XXX_Office	110	-	-
08_XXX_Office	110	-	-
08_XXX_Office (Perimeter)	110	-	-
08_XXX_Office (Perimeter)	110	-	-
09_XXX_C Office	110	-	-
09_XXX_Core A Circulation	120	-	-
09_XXX_Core B Circulation	120	-	-
09_XXX_Core B WC 01	120	-	-
09_XXX_Core B WC 02	120	-	-
09_XXX_FF Stair A	120	-	-
09_XXX_FF Stair B	120	-	-
B1_XXX_AHU	120	-	-
B1_XXX_Bike store	120	-	-
B1_XXX_Building manager office	115	-	-
B1_XXX_Changing facilities 01	120	-	-
B1_XXX_Changing facilities 02	120	-	-
B1_XXX_Changing rooms (AWC)	120	-	-
B1_XXX_Circulation	120	-	-
B1_XXX_Circulation	120	-	-
B1_XXX_Comms room	120	-	-
B1_XXX_Core A Circulation	120	-	-
B1_XXX_Core A Circulation	120	-	-
B1_XXX_Core A stairs	120	-	-
B1_XXX_Core B Circulation	120	-	-
B1_XXX_Core B cleaners cupboard	120	-	-
B1_XXX_Core B cleaners cupboard	120	-	-
B1_XXX_Core B Stairs	120	-	-
B1_XXX_Core B Stairs	120	-	-
B1_XXX_Core B WC 01	120	-	-
B1_XXX_Core B WC 01	120	-	-
B1_XXX_Core B WC 02 (Ass)	120	-	-
B1_XXX_Core B WC 03	120	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
B1_XXX_Core B WC 04	120	-	-
B1_XXX_Core B WC 05	120	-	-
B1_XXX_Core B WC 06	120	-	-
B1_XXX_Core B WC 07	120	-	-
B1_XXX_Core B WC 09 (Ass)	120	-	-
B1_XXX_Core B WC lobby	120	-	-
B1_XXX_Core B WC lobby	120	-	-
B1_XXX_Co-working lounge	110	-	-
B1_XXX_Cylinder room	120	-	-
B1_XXX_Domestic boosting tanks	120	-	-
B1_XXX_Drying room	120	-	-
B1_XXX_Fitness studio	120	-	-
B1_XXX_Flexible space 01	110	-	-
B1_XXX_Flexible space 02	110	-	-
B1_XXX_Flexible working space	110	-	-
B1_XXX_Gym	120	-	-
B1_XXX_Mains water tank	120	-	-
B1_XXX_PB	120	-	-
B1_XXX_Plant	120	-	-
B1_XXX_Plant	120	-	-
B1_XXX_Plant	120	-	-
B1_XXX_Sprinkler tank	120	-	-
B1_XXX_Sprinkler tank room	120	-	-
B1_XXX_Storage	120	-	-
B1_XXX_UKPN	120	-	-
B1_XXX_UKPN	120	-	-

# The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00_XXX_A Office (Perimeter)	NO (-32.6%)	NO
00_XXX_A Office (Perimeter)	NO (-25.4%)	NO
00_XXX_A Office (Perimeter)	NO (-50.4%)	NO
00_XXX_A Office (Perimeter)	NO (-54.8%)	NO
00_XXX_B Office (Perimeter)	NO (-63.2%)	NO
00_XXX_B Office (Perimeter)	NO (-71.4%)	NO
00_XXX_B Office (Perimeter)	NO (-54.8%)	NO
00_XXX_B Office (Perimeter)	NO (-57.7%)	NO
00_XXX_Core A Circulation	N/A	N/A
00_XXX_Core A WC (Acc)-01	N/A	N/A
00_XXX_Core A WC Lobby	NO (-99.2%)	NO
00_XXX_Core A WC-02	NO (-98.9%)	NO
00_XXX_Core A WC-03	NO (-99.5%)	NO
00_XXX_Core A WC-04	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00_XXX_Core A WC-05	N/A	N/A
00_XXX_Core A WC-06	NO (-99.5%)	NO
00_XXX_Core B Circulation	NO (-100%)	NO
00_XXX_Core B WC (Acc)-01	NO (-100%)	NO
00_XXX_Core B WC Lobby	NO (-99.9%)	NO
00_XXX_Core B WC-02	N/A	N/A
00_XXX_Core B WC-03	NO (-99.2%)	NO
00_XXX_Post room	N/A	N/A
00_XXX_Reception	NO (-87.6%)	NO
00_XXX_Reception (Perimeter - North)	NO (-41.4%)	NO
00_XXX_Reception (Perimeter - South)	NO (-43.6%)	NO
01_XXX_A Office (Perimeter)	NO (-61.5%)	NO
01_XXX_A Office (Perimeter)	NO (-75.8%)	NO
01 XXX A Office (Perimeter)	NO (-53.2%)	NO
01 XXX A Office (Perimeter)	NO (-51.2%)	NO
01 XXX B Office (Perimeter)	NO (-69.4%)	NO
01 XXX B Office (Perimeter)	NO (-68,9%)	NO
01 XXX B Office (Perimeter)	NO (-78.6%)	NO
01 XXX B Office (Perimeter)	NO (-66.3%)	NO
01 XXX C Office	NO (-99.7%)	NO
01_XXX_C_Office	NO (-99.8%)	NO
01_XXX_C_Office	NO (-74.3%)	NO
01_XXX_C_Office (Perimeter)	NO (-58.8%)	NO
01_XXX_Core A Circulation	N/A	N/A
	Ν/Δ	N/A
	NO (-100%)	
	N(A	
01_XXX_CORE A WC-02	NO (-100%)	
01_XXX_Core B Circulation	NO (-10078)	
	N/A	
	NG (-10078)	
		N/A
		N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
	NO (-96.1%)	NO
	NO (-92.2%)	NO
	NO (-33.6%)	NO
02_XXX_A Office (Perimeter)	NO (-63.9%)	NO
	NO (-31.2%)	NO
02_XXX_A Office (Perimeter)	NO (-43%)	NO
02_XXX_B Elevator lobby	NO (-92.2%)	NO
02_XXX_B Office (Perimeter)	NO (-57.6%)	NO
02_XXX_B Office (Perimeter)	NO (-68%)	NO
02_XXX_B Office (Perimeter)	NO (-45.6%)	NO
02_XXX_B Office (Perimeter)	NO (-52.6%)	NO
02_XXX_C Office	NO (-99.4%)	NO
02_XXX_C Office (Perimeter)	NO (-19%)	NO
02_XXX_Core A Circulation	N/A	N/A
Zone	Solar gain limit exceeded? (%)	Internal blinds used?
---------------------------------------	--------------------------------	-----------------------
02_XXX_Core A WC (Acc)-01	N/A	N/A
02_XXX_Core A WC Lobby	N/A	N/A
02_XXX_Core A WC-02	N/A	N/A
02_XXX_Core A WC-03	N/A	N/A
02_XXX_Core A WC-04	N/A	N/A
02_XXX_Core A WC-05	N/A	N/A
02_XXX_Core B Circulation	N/A	N/A
02_XXX_Core B WC (Acc)-01	N/A	N/A
02_XXX_Core B WC Lobby	N/A	N/A
02_XXX_Core B WC-02	N/A	N/A
02_XXX_Core B WC-03	N/A	N/A
02_XXX_Core B WC-04	N/A	N/A
02_XXX_Core B WC-05	N/A	N/A
03_XXX_A Elevator lobby	NO (-92.2%)	NO
03_XXX_A Office (Perimeter)	NO (-73.2%)	NO
03_XXX_A Office (Perimeter)	NO (-63.2%)	NO
03_XXX_A Office (Perimeter)	NO (-61.4%)	NO
03_XXX_A Office (Perimeter)	NO (-53.4%)	NO
03_XXX_B Elevator lobby	NO (-92.1%)	NO
03_XXX_B Office (Perimeter)	NO (-75.2%)	NO
03_XXX_B Office (Perimeter)	NO (-72.4%)	NO
03_XXX_B Office (Perimeter)	NO (-57.4%)	NO
03_XXX_B Office (Perimeter)	NO (-68.9%)	NO
03_XXX_C Office	NO (-99.5%)	NO
03_XXX_C Office (Perimeter)	NO (-21.7%)	NO
03_XXX_Core A Circulation	N/A	N/A
03_XXX_Core A WC (Acc)-01	N/A	N/A
03_XXX_Core A WC Lobby	N/A	N/A
03_XXX_Core A WC-02	N/A	N/A
03_XXX_Core A WC-03	N/A	N/A
03_XXX_Core A WC-04	N/A	N/A
03_XXX_Core A WC-05	N/A	N/A
03_XXX_Core B Circulation	N/A	N/A
03_XXX_Core B WC (Acc)-01	N/A	N/A
03_XXX_Core B WC Lobby	N/A	N/A
03_XXX_Core B WC-02	N/A	N/A
03_XXX_Core B WC-03	N/A	N/A
03_XXX_Core B WC-04	N/A	N/A
03_XXX_Core B WC-05	N/A	N/A
04_XXX_A Elevator lobby	NO (-92%)	NO
04_XXX_A Office (Perimeter)	NO (-72.8%)	NO
04_XXX_A Office (Perimeter)	NO (-63.9%)	NO
04_XXX_A Office (Perimeter)	NO (-62.2%)	NO
04_XXX_A Office (Perimeter)	NO (-53.3%)	NO
04_XXX_B Elevator lobby	NO (-91.9%)	NO
04_XXX_B Office (Perimeter)	NO (-68.2%)	NO
04_XXX_B Office (Perimeter)	NO (-73.9%)	NO
04_XXX_B Office (Perimeter)	NO (-55.7%)	NO
04_XXX_B Office (Perimeter)	NO (-72.9%)	NO
· · · · · · · · · · · · · · · · · · ·		•

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
04_XXX_C Office	NO (-99.7%)	NO
04_XXX_C Office (Perimeter)	NO (-19%)	NO
04_XXX_Core A Circulation	NO (-99.9%)	NO
04_XXX_Core A WC (Acc)-01	N/A	N/A
04_XXX_Core A WC Lobby	N/A	N/A
04_XXX_Core A WC-02	N/A	N/A
04_XXX_Core A WC-03	N/A	N/A
04_XXX_Core A WC-04	N/A	N/A
04_XXX_Core A WC-05	NO (-99.9%)	NO
04_XXX_Core B Circulation	N/A	N/A
04_XXX_Core B WC (Acc)-01	N/A	N/A
04_XXX_Core B WC Lobby	N/A	N/A
04_XXX_Core B WC-02	N/A	N/A
04_XXX_Core B WC-03	N/A	N/A
04_XXX_Core B WC-04	N/A	N/A
04_XXX_Core B WC-05	N/A	N/A
05_XXX_A Elevator lobby	NO (-91.7%)	NO
05_XXX_A Office (Perimeter)	NO (-61%)	NO
05_XXX_A Office (Perimeter)	NO (-57.4%)	NO
05_XXX_A Office (Perimeter)	NO (-75.1%)	NO
05_XXX_A Office (Perimeter)	NO (-62.8%)	NO
05_XXX_B Elevator lobby	NO (-91.6%)	NO
05_XXX_B Office (Perimeter)	NO (-67.8%)	NO
05_XXX_B Office (Perimeter)	NO (-72%)	NO
05_XXX_C Office	NO (-99.7%)	NO
05_XXX_C Office (Perimeter)	NO (-9.8%)	NO
05_XXX_Core A Circulation	N/A	N/A
05_XXX_Core A WC (Acc)-01	N/A	N/A
05_XXX_Core A WC Lobby	N/A	N/A
05_XXX_Core A WC-02	N/A	N/A
05_XXX_Core A WC-03	N/A	N/A
05_XXX_Core A WC-04	N/A	N/A
05_XXX_Core A WC-05	NO (-99.9%)	NO
05_XXX_Core B Circulation	NO (-100%)	NO
05_XXX_Core B WC (Acc)-01	N/A	N/A
05_XXX_Core B WC Lobby	N/A	N/A
05_XXX_Core B WC-02	N/A	N/A
05_XXX_Core B WC-03	N/A	N/A
05_XXX_Core B WC-04	N/A	N/A
05_XXX_Core B WC-05	N/A	N/A
06_XXX_A BOH Circulation	NO (-68.1%)	NO
06_XXX_Core A Circulation	YES (+12.7%)	NO
06_XXX_Core A WC (Acc)-01	N/A	N/A
06_XXX_Core A WC Lobby	N/A	N/A
06_XXX_Core A WC-02	N/A	N/A
06_XXX_Core A WC-03	N/A	N/A
06_XXX_Core A WC-05	NO (-99.9%)	NO
06_XXX_Core B Circulation	NO (-8%)	NO
06_XXX_Core B WC (Acc)-01	NO (-100%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
06_XXX_Core B WC Lobby	N/A	N/A
06_XXX_Core B WC-02	N/A	N/A
06_XXX_Core B WC-03	N/A	N/A
06_XXX_Core B WC-05	N/A	N/A
06_XXX_Office	NO (-95%)	NO
06_XXX_Office (Perimeter)	NO (-69.6%)	NO
06_XXX_Office (Perimeter)	NO (-57.1%)	NO
06_XXX_Office (Perimeter)	NO (-75.5%)	NO
06_XXX_Office (Perimeter)	NO (-55.1%)	NO
06_XXX_Office (Perimeter)	NO (-4.6%)	NO
06_XXX_Office (Perimeter)	NO (-64.1%)	NO
06_XXX_Office (Perimeter)	NO (-7.2%)	NO
06_XXX_Office (Perimeter)	NO (-62.3%)	NO
06_XXX_Office (Perimeter)	NO (-72.5%)	NO
07_XXX_Core A Circulation	NO (-43.9%)	NO
07_XXX_Core A WC (Acc)-01	N/A	N/A
07_XXX_Core A WC Lobby	N/A	N/A
07_XXX_Core A WC-02	N/A	N/A
07_XXX_Core A WC-05	N/A	N/A
07_XXX_Core B Circulation	NO (-32.1%)	NO
07_XXX_Core B WC (Acc)-01	N/A	N/A
07_XXX_Core B WC Lobby	N/A	N/A
07_XXX_Core B WC-02	N/A	N/A
07_XXX_Core B WC-05	N/A	N/A
07_XXX_Office	NO (-90.9%)	NO
07_XXX_Office (Perimeter)	NO (-46.9%)	NO
07_XXX_Office (Perimeter)	NO (-8.7%)	NO
07_XXX_Office (Perimeter)	NO (-53.6%)	NO
07_XXX_Office (Perimeter)	NO (-61%)	NO
08_XXX_Core A Circulation	NO (-43.8%)	NO
08_XXX_Core A WC (Acc)-01	N/A	N/A
08_XXX_Core A WC Lobby	N/A	N/A
08_XXX_Core A WC-02	N/A	N/A
08_XXX_Core A WC-05	N/A	N/A
08_XXX_Core B Circulation	NO (-29.9%)	NO
08_XXX_Core B WC (Acc)-01	N/A	N/A
08_XXX_Core B WC Lobby	N/A	N/A
08_XXX_Core B WC-02	N/A	N/A
08_XXX_Core B WC-05	N/A	N/A
08_XXX_Office	NO (-93.5%)	NO
08_XXX_Office	NO (-75.4%)	NO
08_XXX_Office (Perimeter)	NO (-53.3%)	NO
08_XXX_Office (Perimeter)	NO (-46%)	NO
09_XXX_C Office	NO (-41.8%)	NO
09_XXX_Core A Circulation	N/A	N/A
09_XXX_Core B Circulation	N/A	N/A
09_XXX_Core B WC 01	N/A	N/A
09_XXX_Core B WC 02	N/A	N/A
B1_XXX_Building manager office	NO (-100%)	NO
1	1	1

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B1_XXX_Changing facilities 01	NO (-100%)	NO
B1_XXX_Changing facilities 02	NO (-100%)	NO
B1_XXX_Changing rooms (AWC)	N/A	N/A
B1_XXX_Circulation	NO (-100%)	NO
B1_XXX_Circulation	NO (-100%)	NO
B1_XXX_Comms room	NO (-99.6%)	NO
B1_XXX_Core A Circulation	N/A	N/A
B1_XXX_Core A Circulation	N/A	N/A
B1_XXX_Core B Circulation	N/A	N/A
B1_XXX_Core B WC 01	N/A	N/A
B1_XXX_Core B WC 01	NO (-99.6%)	NO
B1_XXX_Core B WC 02 (Ass)	NO (-100%)	NO
B1_XXX_Core B WC 03	NO (-100%)	NO
B1_XXX_Core B WC 04	NO (-100%)	NO
B1_XXX_Core B WC 05	NO (-99.6%)	NO
B1_XXX_Core B WC 06	NO (-99.9%)	NO
B1_XXX_Core B WC 07	N/A	N/A
B1_XXX_Core B WC 09 (Ass)	NO (-100%)	NO
B1_XXX_Core B WC lobby	NO (-100%)	NO
B1_XXX_Core B WC lobby	NO (-99.8%)	NO
B1_XXX_Co-working lounge	NO (-73.2%)	NO
B1_XXX_Drying room	NO (-100%)	NO
B1_XXX_Fitness studio	N/A	N/A
B1_XXX_Flexible space 01	NO (-18.1%)	NO
B1_XXX_Flexible space 02	NO (-71.7%)	NO
B1_XXX_Flexible working space	NO (-82%)	NO
B1_XXX_Gym	NO (-6.5%)	NO

# Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

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

## **Building Global Parameters**

	Actual	Notional	% Ai
Floor area [m <sup>2</sup> ]	11191.2	11191.2	
External area [m <sup>2</sup> ]	9868.2	9868.2	
Weather	LON	LON	100
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	
Average conductance [W/K]	13878.9	3944.44	
Average U-value [W/m <sup>2</sup> K]	1.41	0.4	
Alpha value* [%]	24.93	10	

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

## **Building Use**

#### % Area Building Type

Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways
Offices and Workshop Businesses
General Industrial and Special Industrial Groups Storage or Distribution
Residential Institutions: Hospitals and Care Homes Residential Institutions: Residential Schools Residential Institutions: Universities and Colleges Secure Residential Institutions
Residential Spaces Non-residential Institutions: Community/Day Centre Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education
Non-residential Institutions: Primary Health Care Building Non-residential Institutions: Crown and County Courts 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 Litility Plack

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	19.33	1.11
Cooling	1.5	4.99
Auxiliary	16.8	9.63
Lighting	12.88	14.75
Hot water	9.19	8.38
Equipment*	41.83	41.83
TOTAL**	59.7	38.87

\* 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	0.97	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0.97	0

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	209.37	94.29
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	87.57	57.42
Total emissions [kg/m <sup>2</sup> ]	8.2	5.21

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, [H	S] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	224	24.5	23	1.7	17.9	2.7	3.9	2.94	5.51
	Notional	12.7	96.7	1.3	5.8	10.3	2.78	4.63		
[ST	] Fan coil s	ystems, [H	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity	-		-	_
	Actual	142.3	18.4	14.6	1.3	15.5	2.7	3.9	2.94	5.51
	Notional	10.1	88.6	1	5.3	8.4	2.78	4.63		
[ST	] Fan coil s	ystems, [H	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity	-		-	
	Actual	60.6	28.6	6.2	2	15.7	2.7	3.9	2.94	5.51
	Notional	2.5	67	0.2	4	8.1	2.78	4.63		
[ST	] Fan coil s	ystems, [H	S] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	223	2.7	22.9	0.2	34	2.7	3.9	2.94	5.51
	Notional	23.9	39.6	2.4	2.4	27.9	2.78	4.63		
[ST	] Fan coil s	ystems, [H	6] ASHP, [H	FT] Electric	city, [CFT] E	Electricity	-		-	_
	Actual	623.6	0.7	64.1	0.1	23.6	2.7	3.9	2.94	5.51
	Notional	44.2	15.1	4.4	0.9	8.8	2.78	4.63		
[ST	] Split or m	ulti-split sy	stem, [HS]	ASHP, [HF1	] Electricit	y, [CFT] Ele	ctricity			
	Actual	249.4	336.2	25.3	20.2	0	2.74	4.62	2.94	6.5
	Notional	0	1480.3	0	88.8	0	2.78	4.63		
[ST	] Fan coil s	ystems, [H	S] ASHP, [H	FT] Electric	city, [CFT] E	Electricity				
	Actual	140	21	14.4	1.5	16.2	2.7	3.9	2.94	5.51
	Notional	10	83.8	1	5	7.7	2.78	4.63		
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	33.7	11.8	3.5	0.8	64	2.7	3.9	2.94	5.51
	Notional	0.1	42.1	0	2.5	22.1	2.78	4.63		
[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] Cool dem [MJ/m2] Heat con [kWh/m2] Cool con [kWh/m2] Aux con [kWh/m2] Heat SSEFF Cool SSEER Heat gen SSEFF Cool gen SSEER ST HS HET	<ul> <li>Heating energy demand</li> <li>Cooling energy demand</li> <li>Heating energy consumption</li> <li>Cooling energy consumption</li> <li>Auxiliary energy consumption</li> <li>Heating system seasonal efficiency (for notional building, value depends on activity glazing class)</li> <li>Cooling system seasonal energy efficiency ratio</li> <li>Heating generator seasonal efficiency</li> <li>Cooling generator seasonal energy efficiency ratio</li> <li>System type</li> <li>Heat source</li> <li>Heating fuel type</li> </ul>
HS HFT	= Heat source = Heating fuel type
CFT	= Cooling fuel type

# **BRUKL Output Document**

HM Government

Compliance with England Building Regulations Part L 2021

### **Project name**

# Post-Refurb (Be Lean)\_Extension

# As designed

Date: Fri May 17 14:58:22 2024

### Administrative information

#### **Building Details**

Address: 124 Theobalds Road, London, WC1X 8RX

### **Certifier details**

Name: Matt Cotton Telephone number: 02037139538 Address: 15-19 Bloomsbury Way, London, WC1A 2TH **Certification tool** 

Calculation engine: Apache Calculation engine version: 7.0.25 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.25 BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 73.6

## The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum	5.03	
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum	6.22	
Target primary energy rate (TPER), kWh <sub>PE</sub> /m²annum	55.09	
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	67.39	
Do the building's emission and primary energy rates exceed the targets?	BER > TER	BPER > TPER

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

Fabric element	Ua-Limit	Ua-Calc	Ui-Calc	First surface with maximum value
Walls*	0.26	0.18	0.18	01000010:Surf[1]
Floors	0.18	0.25	0.25	01000010:Surf[2]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.12	0.12	06000019:Surf[21]
Windows** and roof windows	1.6	1.4	1.4	01000010:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building
Ua-Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]			U i-Calc = Ca	lculated maximum individual element U-values [W/(m <sup>2</sup> K)]

 $U_{a\text{-Limit}} = \text{Limiting area-weighted average U-values } [W/(m^2K)] \\ U_{a\text{-Calc}} = \text{Calculated area-weighted average U-values } [W/(m^2K)]$ 

\* 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. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	25

#### **Building services**

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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	

#### 1-01\_FCU-ASHP-AHUs (Office areas)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR	efficiency	
This system	2.64	5.51	0	2.5	0.8		
Standard value	2.5*	N/A	N/A	2^	N/A	N/A	
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.							

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 1-00a\_DHW 01-POU (EXTENSION)

	Water heating efficiency	Storage loss factor [kWh/litre per day]				
This building	1	0.03				
Standard value	1	N/A				

#### Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
Е	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
Н	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: L	imiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name		SFP [W/(I/s)]						UD officianov				
ID of system type	Α	В	С	D	E	F	G	н	I	пке	HR efficiency	
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
01_EXT_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A	
01_EXT_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A	
02_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
03_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
04_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
05_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
06_EXT_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
07_EXT_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	
08_EXT_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A	

General lighting and display lighting	General luminaire	Displa	y light source	
Zone name	Efficacy [Im/W]	Efficacy [Im/W]	Power density [W/m <sup>2</sup> ]	
Standard value	95	80	0.3	
01_EXT_C Office	110	-	-	

General lighting and display lighting	General luminaire	re Display light source		
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]	
Standard value	95	80	0.3	
01_EXT_C Office	110	-	-	
02_EXT_C Office (Perimeter)	110	-	-	
03_EXT_C Office (Perimeter)	110	-	-	
04_EXT_C Office (Perimeter)	110	-	-	
05_EXT_C Office (Perimeter)	110	-	-	
06_EXT_Office (Perimeter)	110	-	-	
07_EXT_Office (Perimeter)	110	-	-	
08_EXT_Office (Perimeter)	110	-	-	

# The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
01_EXT_C Office	NO (-81.3%)	NO
01_EXT_C Office	NO (-76.5%)	NO
02_EXT_C Office (Perimeter)	NO (-83.8%)	NO
03_EXT_C Office (Perimeter)	NO (-36.9%)	NO
04_EXT_C Office (Perimeter)	NO (-34.8%)	NO
05_EXT_C Office (Perimeter)	NO (-44.8%)	NO
06_EXT_Office (Perimeter)	NO (-27.1%)	NO
07_EXT_Office (Perimeter)	NO (-43.2%)	NO
08_EXT_Office (Perimeter)	NO (-43.6%)	NO

## Regulation 25A: Consideration of high efficiency 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?	YES			
Are any such measures included in the proposed design?	YES			

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

## **Building Global Parameters**

	Actual	Notional	% Ai
Floor area [m <sup>2</sup> ]	588.8	588.8	
External area [m <sup>2</sup> ]	554.8	554.8	
Weather	LON	LON	100
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	
Average conductance [W/K]	310.12	305.83	
Average U-value [W/m <sup>2</sup> K]	0.56	0.55	
Alpha value* [%]	25	10	

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

## **Building Use**

#### % Area Building Type

Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways
Offices and Workshop Businesses
General Industrial and Special Industrial Groups Storage or Distribution
Hotels
Residential Institutions: Hospitals and Care Homes
Residential Institutions: Residential Schools
Residential Institutions: Universities and Colleges
Secure Residential Institutions
Residential Spaces
Non-residential Institutions: Community/Day Centre
Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education
Non-residential Institutions: Primary Health Care Building
Non-residential Institutions: Crown and County Courts
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	6.92	1.76
Cooling	3.92	5.69
Auxiliary	19.28	12.3
Lighting	11.99	14.95
Hot water	3.45	2.74
Equipment*	42.19	42.19
TOTAL**	45.55	37.43

\* 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
Displaced electricity	0	0

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	115.5	112.43
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	67.39	55.09
Total emissions [kg/m <sup>2</sup> ]	6.22	5.03

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	[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
	Actual	60.5	55	6.9	3.9	19.3	2.43	3.9	2.64	5.51
	Notional	17.6	94.8	1.8	5.7	12.3	2.78	4.63		
[ST	[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] Cool dem [MJ/m2] Heat con [kWh/m2] Cool con [kWh/m2]	<ul> <li>Heating energy demand</li> <li>Cooling energy demand</li> <li>Heating energy consumption</li> <li>Cooling energy consumption</li> </ul>
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
COOI 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

# **BRUKL Output Document**

HM Government

Compliance with England Building Regulations Part L 2021

### **Project name**

# Post-Refurb (Be Green)\_Extension

# As designed

Date: Fri May 17 13:42:37 2024

## Administrative information

#### **Building Details**

Address: 124 Theobalds Road, London, WC1X 8RX

### **Certifier details**

Name: Matt Cotton Telephone number: 02037139538 Address: 15-19 Bloomsbury Way, London, WC1A 2TH **Certification tool** 

Calculation engine: Apache Calculation engine version: 7.0.25 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.25 BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 73.6

## The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum	5.03		
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum	5.99		
Target primary energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> annum 55.09		
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	64.94		
Do the building's emission and primary energy rates exceed the targets?	BER > TER	BPER > TPER	

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

Fabric element	Ua-Limit	Ua-Calc	Ui-Calc	First surface with maximum value
Walls*	0.26	0.18	0.18	01000010:Surf[1]
Floors	0.18	0.25	0.25	01000010:Surf[2]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.12	0.12	06000019:Surf[21]
Windows** and roof windows	1.6	1.4	1.4	01000010:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building
Ua-Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]			U i-Calc = Ca	alculated maximum individual element U-values [W/(m²K)]

 $U_{a\text{-Limit}} = \text{Limiting area-weighted average U-values } [W/(m^2K)] \\ U_{a\text{-Calc}} = \text{Calculated area-weighted average U-values } [W/(m^2K)]$ 

\* 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.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	25

#### **Building services**

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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	

#### 1-01\_FCU-ASHP-AHUs (Office areas)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(I/s)]	HR efficiency	
This system	2.94	5.51	0	2.5	0.8	
Standard value	2.5*	N/A	N/A	2^	N/A	
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.						

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

#### 1-00a\_DHW 01-POU (EXTENSION)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.03
Standard value	1	N/A

#### Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents				
A	Local supply or extract ventilation units				
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 balanced supply and extract ventilation system				
Е	Local balanced supply and extract ventilation units				
F	Other local ventilation units				
G	Fan assisted terminal variable air volume units				
Н	Fan coil units				
I	Kitchen extract with the fan remote from the zone and a grease filter				
NB: L	NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.				

Zone name		SFP [W/(I/s)]					UD officionay				
ID of system type	Α	В	С	D	E	F	G	н	I	пке	inciency
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
01_EXT_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
01_EXT_C Office	-	-	-	-	-	-	-	0.3	-	-	N/A
02_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
03_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
04_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
05_EXT_C Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
06_EXT_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
07_EXT_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
08_EXT_Office (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [Im/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
01_EXT_C Office	110	-	-

General lighting and display lighting	General luminaire	Displa	y light source
Zone name	Efficacy [Im/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
01_EXT_C Office	110	-	-
02_EXT_C Office (Perimeter)	110	-	-
03_EXT_C Office (Perimeter)	110	-	-
04_EXT_C Office (Perimeter)	110	-	-
05_EXT_C Office (Perimeter)	110	-	-
06_EXT_Office (Perimeter)	110	-	-
07_EXT_Office (Perimeter)	110	-	-
08_EXT_Office (Perimeter)	110	-	-

# The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
01_EXT_C Office	NO (-81.3%)	NO
01_EXT_C Office	NO (-76.5%)	NO
02_EXT_C Office (Perimeter)	NO (-83.8%)	NO
03_EXT_C Office (Perimeter)	NO (-36.9%)	NO
04_EXT_C Office (Perimeter)	NO (-34.8%)	NO
05_EXT_C Office (Perimeter)	NO (-44.8%)	NO
06_EXT_Office (Perimeter)	NO (-27.1%)	NO
07_EXT_Office (Perimeter)	NO (-43.2%)	NO
08_EXT_Office (Perimeter)	NO (-43.6%)	NO

## Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

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

## **Building Global Parameters**

	Actual	Notional	% Ai
Floor area [m <sup>2</sup> ]	588.8	588.8	
External area [m <sup>2</sup> ]	554.8	554.8	
Weather	LON	LON	100
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3	
Average conductance [W/K]	310.12	305.83	
Average U-value [W/m <sup>2</sup> K]	0.56	0.55	
Alpha value* [%]	25	10	

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

## **Building Use**

#### % Area Building Type

Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways
Offices and Workshop Businesses
General Industrial and Special Industrial Groups Storage or Distribution Hotels
Residential Institutions: Hospitals and Care Homes Residential Institutions: Residential Schools
Residential Institutions: Universities and Colleges Secure Residential Institutions Residential Spaces
Non-residential Institutions: Community/Day Centre Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education
Non-residential Institutions: Primary Health Care Building Non-residential Institutions: Crown and County Courts 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	6.21	1.76
Cooling	3.92	5.69
Auxiliary	19.28	12.3
Lighting	11.99	14.95
Hot water	3.45	2.74
Equipment*	42.19	42.19
TOTAL**	44.84	37.43

\* 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	0.94	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0.94	0

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	115.5	112.43
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	64.94	55.09
Total emissions [kg/m <sup>2</sup> ]	5.99	5.03

HVAC Systems Performance											
System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity											
	Actual	60.5	55	6.2	3.9	19.3	2.7	3.9	2.94	5.51	
	Notional	17.6	94.8	1.8	5.7	12.3	2.78	4.63			
[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 dom [M I/m2]	- Heating energy demand
neat 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

= Cooling fuel type

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