

Avonmouth House, London Borough of Southwark  
Energy Strategy

25<sup>th</sup> October 2021

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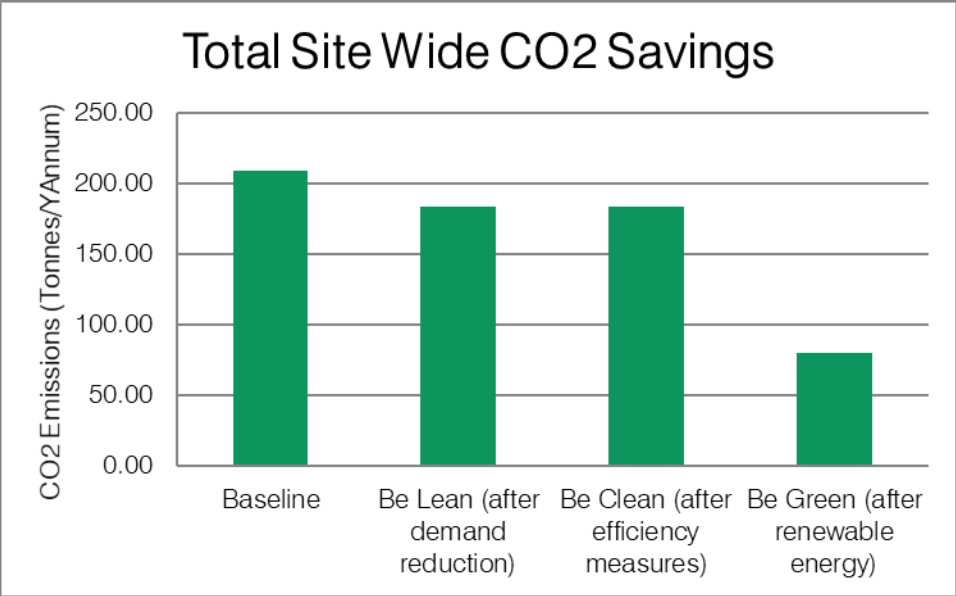
Executive Summary

This energy strategy has been prepared for the proposed development of Avonmouth House. The proposed development consists of the demolition of existing building and structures and erection of a part 2, part 7, part 14, part 16 storey plus basement mixed-use development comprising 1733sqm (GIA) of space for Class E employment use and/or community health hub and/or Class F1(a) education use and 233 purpose-built student residential rooms with associated amenity space and public realm works, car and cycle parking, and ancillary infrastructure.

This report demonstrates how the proposed development addresses local planning policies relating to energy.

Following the energy hierarchy, passive design measures, energy efficient equipment have been proposed, resulting in achieved a 60.1% saving for the development as a whole. The heating and cooling hierarchies have also been followed. An offset payment is proposed to achieve zero carbon overall.

The design team have made all reasonable endeavours to achieve the maximum carbon savings. The fabric performs significantly better than building regulations minimum standards, highly efficient systems are specified, including an ASHP for providing low carbon heating and hot water and the PV system utilises all available roof space.



## 1 Introduction

This energy strategy has been prepared for the proposed development at Avonmouth House in order to meet the sustainability requirements of the London Plan and the London Borough of Southwark

The site is situated in London Borough of Southwark. The proposed development consists of the demolition of existing building and structures and erection of a part 2, part 7, part 14, part 16 storey plus basement mixed-use development comprising 1733sqm (GIA) of space for Class E employment use and/or community health hub and/or Class F1(a) education use and 233 purpose-built student residential rooms with associated amenity space and public realm works, car and cycle parking, and ancillary infrastructure. The site area is shown in Figure 1-1 below.

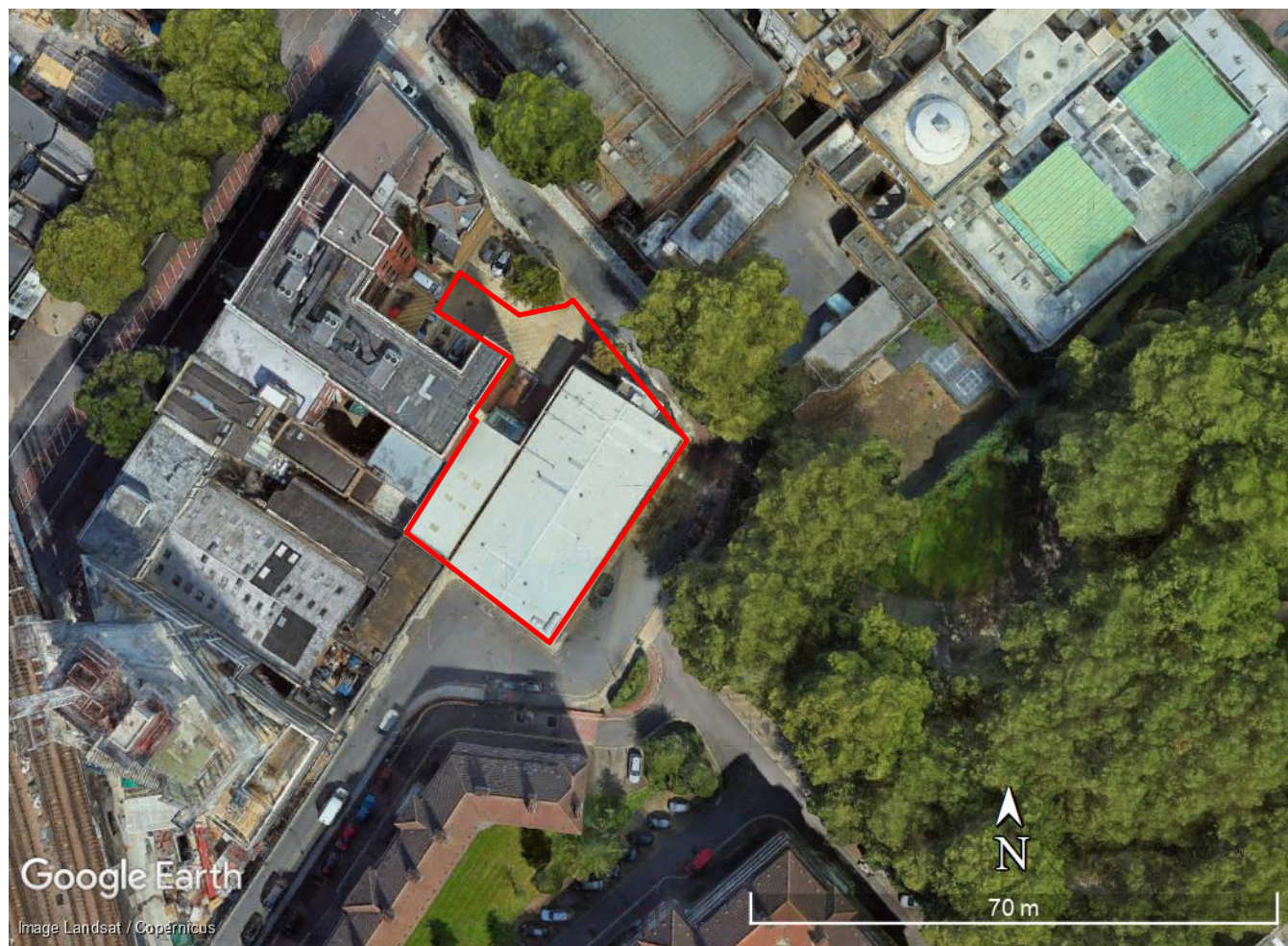


Figure 1-1 – Avonmouth House Site location

### 1.1 Assessment approach

This report summarises the work undertaken to support the development of an energy strategy for the new development, following the energy hierarchy 'Be Lean, Be Clean, Be Green, Be Seen'.

Energy calculations have been carried out using IES VE Apache tool to produce separate BRUKLS for the employment and student sections of the development. These are used to assess the impact on energy demand and CO<sub>2</sub> emissions of improvements through the hierarchy and demonstrate

the most appropriate solution for the development to meet the relevant planning requirements. The SAP 10 carbon factors have been used to calculate the carbon emissions for the development.

## 2 Policy

### 2.1 Southwark Core Strategy 2011

#### Strategic Policy 13 – High environmental standards

*Our approach is:*

Development will help us live and work in a way that respects the limits of the planet's natural resources, reduces pollution and damage to the environment and helps us adapt to climate change.

*We will do this by:*

1. Requiring development to meet the highest possible environmental standards, including targets based on the Code for Sustainable Homes and BREEAM.
2. Requiring all new development to be designed and built to minimise greenhouse gas emissions across its lifetime. This will be achieved by applying the energy hierarchy:
  - Designing all developments so that they require as little energy as possible to build and use.
  - Expecting all major developments to set up and/or connect to local energy generation networks where possible. We will develop local energy networks across Southwark.
  - Requiring developments to use low and zero carbon sources of energy.
3. Enabling existing buildings to become more energy efficient and make use of low and zero carbon sources of energy.

### 2.2 New Southwark Plan

The following policy from the draft New Southwark Plan have been identified as having relevance to the developments energy strategy.

#### P69 Energy

*Energy Hierarchy*

Development must minimise carbon emissions on site in accordance with the following energy hierarchy:

1. Be lean (energy efficient design and construction); then
2. Be clean (low carbon energy supply); then
3. Be green (on site renewable energy generation and storage).

*Targets for major development*

Major development must reduce carbon dioxide emissions on site by:

1. 100% on 2013 Building Regulations Part L standards for residential development; and

2. A minimum of 40% on 2013 Buildings Regulations Part L and zero carbon (100%) for non-residential developments.
3. Any shortfall against carbon emissions reduction requirements must be secured off site through, planning obligations or as a financial contribution.

#### *Decentralised energy*

Major development must be designed to incorporate decentralised energy in accordance with the following hierarchy:

1. Connect to an existing decentralised energy network; then
2. Be future-proofed to connect to a planned decentralised energy network; or
3. Implement a site-wide low carbon communal heating system; and
4. Explore and evaluate the potential to oversize the communal heating system for connection and supply to adjacent sites and, where feasible be implemented.

## 2.3 The London Plan

### Policy SI 2 Minimising greenhouse gas emissions

- A. Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
  1. be lean: use less energy and manage demand during operation
  2. be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
  3. be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
  4. be seen: monitor, verify and report on energy performance.
- B. Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
- C. A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
  - a. through a cash in lieu contribution to the borough's carbon offset fund, or
  - b. off-site provided that an alternative proposal is identified, and delivery is certain.
- D. Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.
- E. Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.

- F. Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

### Policy SI 3 Energy infrastructure

- A. Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.
- B. Energy masterplans should be developed for large-scale development locations (such as those outlined in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify:
  1. major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
  2. heat loads from existing buildings that can be connected to future phases of a heat network
  3. major heat supply plant including opportunities to utilise heat from energy from waste plants
  4. secondary heat sources, including both environmental and waste heat
  5. opportunities for low and ambient temperature heat networks
  6. possible land for energy centres and/or energy storage
  7. possible heating and cooling network routes
  8. opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
  9. infrastructure and land requirements for electricity and gas supplies
  10. implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector
  11. opportunities to maximise renewable electricity generation and incorporate demand-side response measures.
- C. Development Plans should:
  1. identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure
  2. identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and inter-connecting existing networks as well as establishing new networks.
- D. Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:
  1. the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

- 2. connect to local existing or planned heat networks
  - 3. use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
  - 4. use low-emission combined heat and power (CHP) (only where there is a case for CHP 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)
  - 5. use ultra-low NOx gas boilers
  - 6. CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality
  - 7. where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.
- E. Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE/ADE Code of Practice CP1 or equivalent.

Policy SI 4 Managing heat risk

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

3 Energy Strategy

An energy strategy has been developed following the energy hierarchy ‘Be Lean, Be Clean, Be Green’, ‘Be Seen’. Energy calculations using Building Regulations approved and accredited software have been undertaken at each stage to calculate the savings associated with the measures incorporated.

The energy consumption and carbon emission figures within this report have been calculated using IES VE Apache tool to produce separate BRUKLS for employment use and/or community health hub and/or education use and student sections of the development.

For the purposes of energy modelling, the Class E employment use and/or community health hub and/or Class F1(a) education use section has been treated as office space.

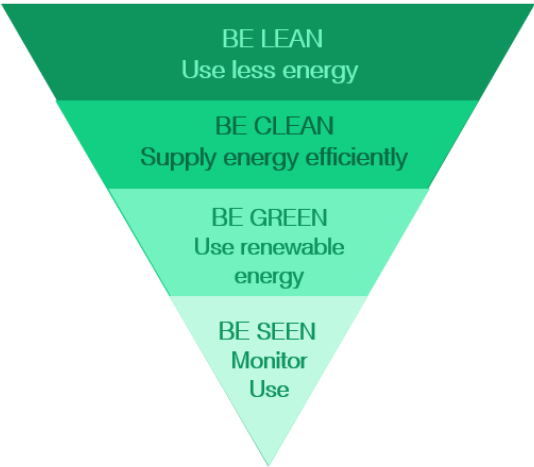


Figure 3-01 The Energy Hierarchy

3.1 Energy Targets

In line with the London Plan and the New Southwark plan, there is a target of zero carbon for the development, with at least a 40% reduction over Part L 2013. Table 3-01 and 3-02 detail the energy and carbon breakdown of the Part L target emission rate. The SAP 10 Carbon Factors have been used for all calculations for the development.

| Use Type   | Gas (kWh/yr)  |           |         | Gas CO2 (kg/yr) | Electricity (kWh/yr) |    |         |              |          |         | Electricity CO2 (kg/yr) |
|------------|---------------|-----------|---------|-----------------|----------------------|----|---------|--------------|----------|---------|-------------------------|
|            | Space Heating | Hot Water | Total   |                 | Space Heating        | HW | Cooling | Pumps & Fans | Lighting | Total   |                         |
| Student    | 172,428       | 687,269   | 859,697 | 180,536         | 0                    | 0  | 0       | 31,409       | 94,228   | 122,497 | 28,542                  |
| Employment | 8,038         | 4,639     | 12,677  | 2,662           | 0                    | 0  | 10,516  | 3,048        | 33,894   | 46,272  | 10,781                  |
| Total      | 180,466       | 691,907   | 872,374 | 183,198         | 0                    | 0  | 10,516  | 34,457       | 128,122  | 168,768 | 39,323                  |

Table 3-01 Target regulated energy demand and carbon emissions per energy source

| Use Type   | Total Energy (kWh/yr) | Total CO2 (kg/yr) |
|------------|-----------------------|-------------------|
| Student    | 982,193               | 209,078           |
| Employment | 58,948                | 13,443            |
| Total      | 1,041,142             | 222,521           |

Table 3-02 Total target regulated energy demand and carbon emissions

3.2 Be Lean

As part of the Be Lean approach, passive design measures have been considered throughout the pre-planning stage to reduce initial energy demand.

Solar Gain Control and Daylight

Solar gains are a passive form of heating from the sun's radiation and are beneficial to a building during winter months as they provide an effective source of heat and reduce internal heating requirements. However, during summer months they must be controlled in order to mitigate the risk of overheating. They can be controlled through glazing and shading design in order to allow low level winter sun to enter the building and to limit access to high level summer sun.

The glazing strategy design has carefully considered orientation and window size in order to maximise daylight while controlling excessive solar gains. Glazing will incorporate low emissivity coatings to limit overheating without compromising light transmittance.

Overheating

The building follows the steps in the cooling hierarchy to minimise overheating. A separate dynamic overheating assessment has been conducted, please refer to the overheating report for further details.

Building Fabric

Designing an efficient thermal envelope will greatly reduce the need for space heating and cooling as heat transmittance through the thermal elements is reduced. Low air permeability rates will also reduce heating and cooling energy demand by reducing the volume of air that can penetrate the building. As part of a ‘fabric first’ approach, the building fabric has been carefully considered and specified to meet or exceed current Building Regulations minimum requirements, as detailed in Table 3-03 below.

| Fabric Component                                  | Proposed Student Specification | Proposed Employment Specification |
|---------------------------------------------------|--------------------------------|-----------------------------------|
| External Walls                                    | 0.15 W/m²K                     | 0.15 W/m²K                        |
| Basement walls                                    | 0.15 W/m²K                     | 0.15 W/m²K                        |
| Internal Partition between heated/unheated spaces | 0.30 W/m²K                     | 0.30 W/m²K                        |
| Roof                                              | 0.13 W/m²K                     | 0.15 W/m²K                        |
| Ground Floor                                      | 0.15 W/m²K                     | 0.15 W/m²K                        |
| Exposed Floor                                     | 0.13 W/m²K                     | 0.15 W/m²K                        |
| Windows (including glazed doors)                  | 1.2 W/m²K, G-value 0.40        | 1.5 W/m²K, G-value 0.40           |
| External Doors                                    | 1.5 W/m²K                      | 1.5 W/m²K                         |
| Air Tightness                                     | 3 m³/m²/h                      | 3 m³/m²/h                         |

Table 3-03 Proposed Be Lean passive design measures

Building Services

A communal gas boiler has been assumed for Be Lean calculations only, in line with the guidance in the London plan, and does not reflect the energy strategy of the development. Systems have been specified to maximise efficiency therefore reducing energy used to deliver services. The services for the Employment space are assumed at this point, as the end use if not known. Table 3-04 shows the proposed services strategy and energy efficiency measures for the development.

| Services Component | Proposed Student Specification                         | Assumed Employment Specification                       |
|--------------------|--------------------------------------------------------|--------------------------------------------------------|
| Space Heating      | Communal Gas boiler, 95% efficient assumed for Be Lean | Communal Gas boiler, 95% efficient assumed for Be Lean |
| Domestic Hot Water | Communal Gas boiler, 95% efficient assumed for Be Lean | Communal Gas boiler, 95% efficient assumed for Be Lean |
| Cooling            | -                                                      | VRF, SEER 5.6                                          |
| Ventilation        | MVHR 85% efficient, SFP 0.95 W/l/s                     | MVHR 85% efficient, SFP 0.95 W/l/s                     |

|                         |                                                                                                                                                  |                                                                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Demand control based on occupant density                                                                                                         |                                                                                                                                            |
| Lighting & Controls     | LED lighting, 100lm/W, occupancy sensors in circulation spaces, daylight dimming and occupancy sensors in living areas, Display lighting 60 lm/W | LED lighting, 100lm/W, daylight dimming on ground and 1 <sup>st</sup> floor spaces, occupancy sensors throughout, Display lighting 60 lm/W |
| Metering                | Metering with warnings for out of range values for HVAC & lighting                                                                               | Metering with warnings for out of range values for HVAC & lighting                                                                         |
| Power Factor Correction | 0.95                                                                                                                                             | 0.95                                                                                                                                       |

Table 3-04 Proposed energy efficient design measures

Energy Use

The breakdown of carbon and energy use has been identified for the site. Table 3-05 and 3-06 show the breakdown of carbon and energy use once the strategies proposed at the be lean stage are incorporated.

| Use Type   | Gas (kWh/yr)  |           |         | Gas CO2 (kg/yr) | Electricity (kWh/yr) |    |         |              |          |         | Electricity CO2 (kg/yr) |
|------------|---------------|-----------|---------|-----------------|----------------------|----|---------|--------------|----------|---------|-------------------------|
|            | Space Heating | Hot Water | Total   |                 | Space Heating        | HW | Cooling | Pumps & Fans | Lighting | Total   |                         |
| Student    | 70,438        | 693,019   | 763,456 | 160,326         | 0                    | 0  | 0       | 56,063       | 46,216   | 99,721  | 23,235                  |
| Employment | 3,031         | 4,672     | 7,703   | 1,618           | 0                    | 0  | 8,725   | 5,191        | 17,885   | 31,006  | 7,224                   |
| Total      | 73,469        | 697,691   | 771,159 | 161,943         | 0                    | 0  | 8,725   | 61,254       | 64,100   | 130,727 | 30,459                  |

Table 3-05 Be Lean regulated energy demand and carbon emissions per energy source

| Use Type   | Total Energy (kWh/yr) | Total CO2 (kg/yr) |
|------------|-----------------------|-------------------|
| Student    | 863,177               | 183,561           |
| Employment | 38,709                | 8,842             |
| Total      | 901,886               | 192,403           |

Table 3-06 Be Lean target regulated energy demand and carbon emissions

Carbon Savings

Table 3-07 and Figure 3-02 demonstrates the percentage improvement over the notional baseline levels for the be lean stage. Overall, the development demonstrates a 13.5% reduction in CO2 emissions over the gas boiler baseline scenario. This does not meet the London plan target of 15%, however all reasonable measures have been taken to maximise be lean savings.

The student section of the development achieves a 12.2% saving at the be lean stage. Although this does not achieve the target of 15% for non-residential, this is greater than the London plan target for residential development, and the nature of the building is for residential purposes.

The development does not meet the 15% target at the be lean stage, due to the high energy use attributed to domestic hot water (DHW) for student developments within the NCM methodology. Within the baseline scenario, DHW represents 68.8% of the overall buildings CO2 emissions.

This means that measures such as efficient fabric and lighting, which drastically reduce the energy demand for heating and lighting, have relatively little impact on the overall be lean savings, as DHW is so dominate. The development has employed an extremely efficient fabric, MVHR and efficient lighting and controls to halve the baseline emissions for heating and lighting at the be lean stage.

Feedback received from completed student schemes has also generally indicated that the NCM methodology massively overestimates the DHW demand of student schemes, so it is highly unlikely to be as high as indicated in the building regulation calculations. Water efficient appliances will also be installed within the scheme to reduce water use for showering and washing, which will reduce hot water demand for the development, however there is no way to account for this within the energy calculations.

The only available measure to reduce carbon emissions from DHW at the be lean stage is Waste Water Heat Recovery (WWHR). WWHR can help to reduce energy demand and therefore carbon emissions. For multi-tenanted buildings, particularly student accommodation, some issues have been identified with maintenance. The efficiency of the system will drop over time due to scum, dirt etc., that goes down the drain. Significant maintenance programs will be required to stop this. The technology is not widely used due to low overall savings compared to installation costs. Feasibility studies general indicate that the energy savings from WWHR are not as significant as energy modelling demonstrates. This means the real world cost savings in terms of energy reduction is quite low when compared to the cost of installation and maintenance of WWHR technology, and that the payback period for the technology can be longer then the design life of the development and the installed technology. There are also some concerns about the increased risk of legionella, due to the fact that some water will remain in the pipes once pre-warmed, at a temperature of 20-30 degrees, which is a breeding temperature for legionella. Although this risk is not thought to be extremely high, it is still a cause for concern. This is again particularly relevant in buildings like these where occupancy can be more sporadic. For these reasons the use of WWHR has been discounted

|          | Student                                   |                                         |          | Employment                                |                                         |          | Site Wide                                 |                                         |          |
|----------|-------------------------------------------|-----------------------------------------|----------|-------------------------------------------|-----------------------------------------|----------|-------------------------------------------|-----------------------------------------|----------|
|          | CO <sub>2</sub> Emissions (tonnes /annum) | CO <sub>2</sub> Savings (tonnes /annum) | % Saving | CO <sub>2</sub> Emissions (tonnes /annum) | CO <sub>2</sub> Savings (tonnes /annum) | % Saving | CO <sub>2</sub> Emissions (tonnes /annum) | CO <sub>2</sub> Savings (tonnes /annum) | % Saving |
| Baseline | 209.08                                    |                                         |          | 13.44                                     |                                         |          | 222.52                                    |                                         |          |
| Be Lean  | 183.56                                    | 25.52                                   | 12.2%    | 8.84                                      | 4.60                                    | 34.2%    | 192.40                                    | 30.12                                   | 13.5%    |

Table 3-07 Be Lean improvements over building regulations gas boiler baseline

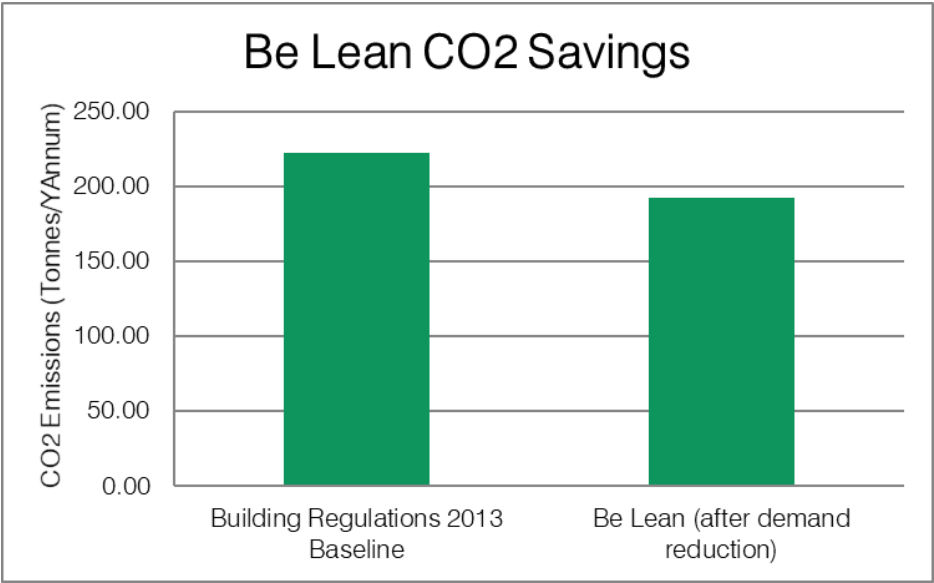


Figure 3-02 Be Lean improvement over the building regulations gas boiler baseline

3.3 Be Clean

As part of the Be Clean approach, the use of energy efficient equipment, heat networks and community heating have been considered.

The development is located near elephant and castle roundabout. The london heat map does not demonstrate that any existing or proposed networks run close to the site.

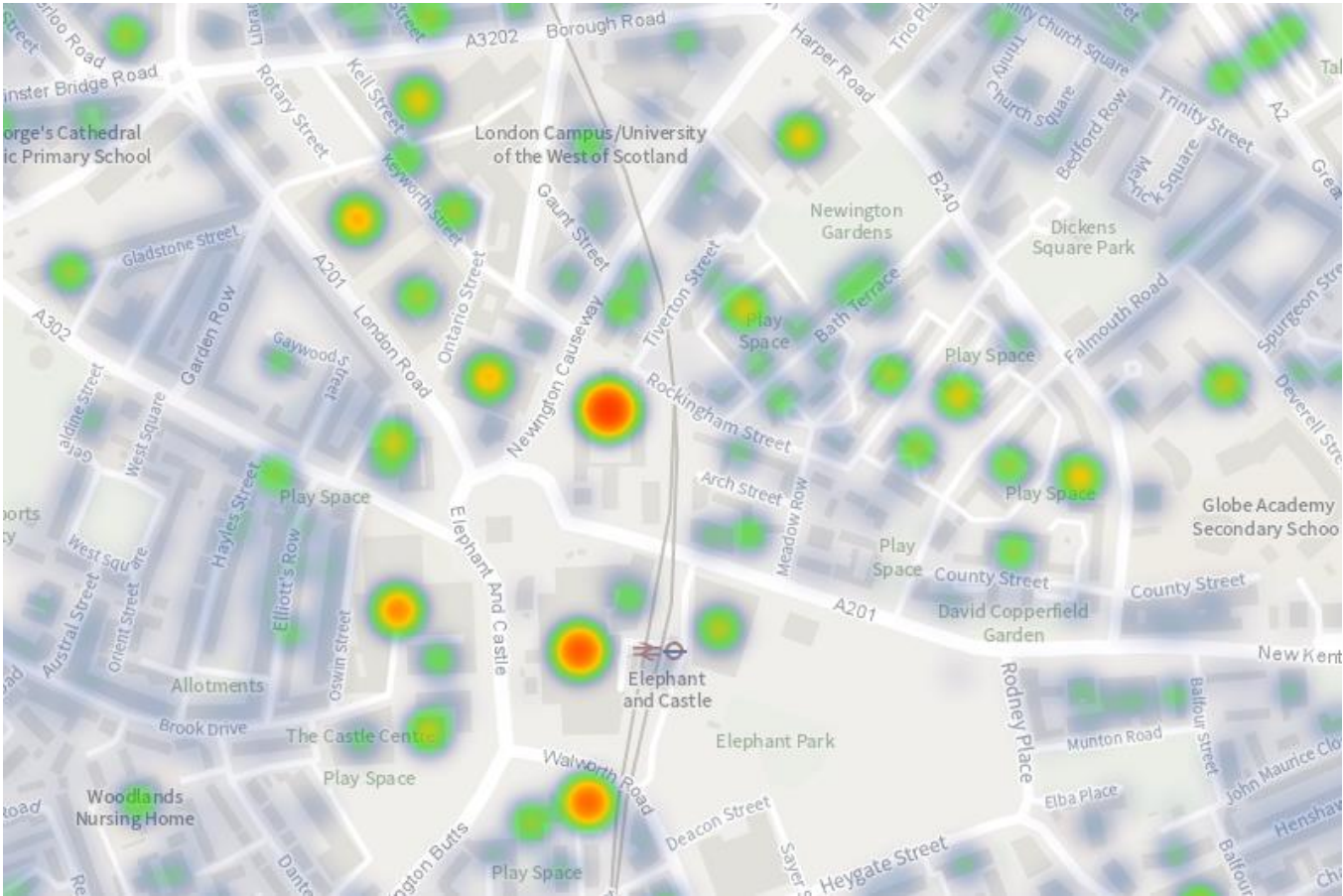


Figure 3-03 London Heat Map for Avonmouth House and surrounding area

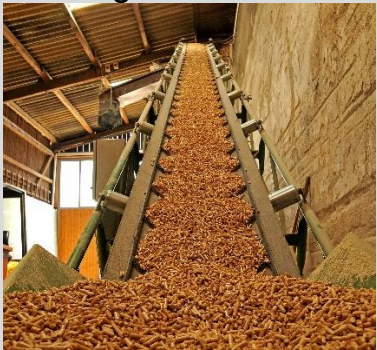
E.ON, the operator of the heat network at nearby Elephant Park, were also contacted regarding the feasibility of connection to their heat network. They confirm that the site is too far away from any current proposed route for the network, and that it would not be feasible to connect to.

Efficient systems for energy delivery have also been investigated. At the scale of this development, Combined Heat and Power (CHP) systems are not viable. CHP requires a high base energy demand load in order to operate efficiently. It is usually more suited to hotel or hospital schemes which have a high hot water demand, or very large residential schemes incorporating hundreds of units. With the continued decarbonisation fo the grid over the buildings lifespan, in the long term, CHP is also not viewed as the ideal technology for reducing carbon emissions.

The development will incorporate a community heating system, with a communal heating system for the student section. This will futureproof the development for connection to any heat networks that become available in the future.

3.4 Be Green

At the Be Green stage, renewable and low carbon technologies are investigated. Table 3-08 considers the feasibility of renewable energy technologies for the scheme.

| LZC Technologies                                                                                                                   | Description                                                                                                                                                                                                                                                                                                                                   | Noise | Visual impact | Internal Space | External Space | Capital Cost | Maintenance | Feasibility                                                                                                                                                |   |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|----------------|----------------|--------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| <div>Solar Thermal Collectors</div> <div></div>   | <p>Solar thermal collectors can be used to provide hot water using the irradiation from the sun. They can generally provide approximately 50% of the hot water demand.</p>                                                                                                                                                                    | ●     | ●             | ●              | ●              | ●            | ●           | There are areas of flat roof that can incorporate solar technologies. However, carbon savings are quite low and it is quite a high cost technology.        | ✗ |
| <div>Solar Photovoltaic Panels</div> <div></div> | <p>Solar PV panels generate electricity from the sun's energy. They should be installed within 90° of due south ideally at a 30° angle.</p> <p>The electricity can be used to supply the landlords load.</p>                                                                                                                                  | ●     | ●             | ●              | ●              | ●            | ●           | There are areas of flat roof that can incorporate solar technologies. Solar PV is ideal for making carbon savings while being a simple technology.         | ✓ |
| <div>Biomass Heating</div> <div></div>          | <p>Solid, liquid or gaseous fuels derived from plant material can provide boiler heat for space and water heating.</p> <p>A biomass boiler would supplement a standard gas heating system so some of the cost may be offset through money saved on using smaller traditional boilers. Reliability of fuel access/supply can be a problem.</p> | ●     | ●             | ●              | ●              | ●            | ●           | Biomass is not considered feasible for this development due to issues with fuel storage, access for delivery vehicles and local NO <sub>x</sub> emissions. | ✗ |

|                                                                                                                              |                                                                                                                                                                                                                                                                                    |                                                                                     |                                                                                                                                         |              |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <div>Wind Turbines</div>                    | <p>Vertical and horizontal axis wind turbines enable electricity to be generated using the energy within the wind. Not suitable for urban environments due to low wind conditions and obstructions.</p>                                                                            | <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> | <p>This development is in an urban environment and so a wind turbine will not be an effective solution.</p>                             | <div>✗</div> |
| <div>Ground Source Heat Pumps (GSHP)</div>  | <p>Utilising horizontal loops or vertical boreholes, GSHP make use of the grounds almost constant temperature to provide heating and/or cooling using a heat exchanger connected to a space/water heating delivery system. Optimum efficiency with underfloor heating systems.</p> | <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> | <p>GSHP are not a feasible technology for the site since there is a limited external space available for installation of boreholes.</p> | <div>✗</div> |
| <div>Air Source Heat Pumps (ASHP)</div>   | <p>Air Source Heat Pumps extract latent energy from the external air in a manner similar to ground source heat pumps. Optimum efficiency with underfloor heating systems.</p>                                                                                                      | <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> | <p>Air source heat pumps are feasible option for both the student and employment spaces.</p>                                            | <div>✓</div> |

Table 3-08 Feasibility of LZC technologies for the development

Renewable and low carbon systems

The feasibility study has identified ASHP as the most appropriate technology for the development. A communal ASHP is proposed for the student section, with a separate VRF heat pump for the Employment section of the development. All suitable roof space on the development has been reserved for solar PV. All suitable roof space on the top floors has been reserved for Solar PV. The estimated system for the development is outlined in Table 3-09.

| Services Component  | Proposed Student specification                                                                                                                                                   | Proposed Employment Specification |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Photovoltaic panels | 14.5 kWp<br>Orientation – South-West<br>Angle of elevation – 10°<br>Estimated Generation: 15.4 MWh/year<br>Estimated array – 58 panels, 250 Wp, 20% efficiency, panel area 1.6m² | -                                 |
| Space Heating       | Communal ASHP, SCOP 3.13                                                                                                                                                         | Heating via VRF, SCOP 4.1         |
| Domestic Hot Water  | Communal ASHP, SCOP 3.13, 90% load<br>Direct Electric Immersion, 10% load (assumed)<br>Estimated DHW storage, 6500l, storage loss 0.003 kWh/l/day                                | Instantaneous DHW                 |

Table 3-09 Proposed Be Green systems

An initial design for the centralised ASHP system has been produced by the M&E consultant. This will be developed in more details as the design progresses. The system is based of products provided by Lochinvar, and performance figures have been taken from the documentation provided by the manufacturer, shown in the appendix. The performance of systems is likely to change as the system design develops, and other manufacturers may be explored.

3.5 Energy and Carbon Savings

Energy Use

The breakdown of carbon and energy use has been identified for the site. Table 3-10 and 3-11 demonstrates the breakdown of carbon and energy use once the strategies proposed in this report are incorporated.

| Use Type   | Electricity (kWh/yr) |           |         |              |           |         |         | Electricity CO2 (kg/yr) |
|------------|----------------------|-----------|---------|--------------|-----------|---------|---------|-------------------------|
|            | Space Heating        | Hot Water | Cooling | Pumps & Fans | Lightin g | PV      | Total   |                         |
| Student    | 21,347               | 245,166   | 0       | 56,063       | 46,216    | -15,381 | 344,574 | 80,286                  |
| Employment | 703                  | 4,438     | 8,725   | 5,191        | 17,885    | 0       | 36,018  | 8,392                   |
| Total      | 22,050               | 249,603   | 8,725   | 61,254       | 64,100    | -15,381 | 380,592 | 88,678                  |

Table 3-10 Be Green regulated energy demand and carbon emissions per energy source

| Use Type   | Total Energy (kWh/yr) | Total CO2 (kg/yr) |
|------------|-----------------------|-------------------|
| Student    | 344,574               | 80,286            |
| Employment | 36,018                | 8,392             |
| Total      | 380,592               | 88,678            |

Table 3-11 Be Green target regulated energy demand and carbon emissions

Carbon Savings

Table 3-12 and Figure 3-04 demonstrate the percentage improvement over the notional baseline levels for the development for the district heating case, with renewable measures incorporated.

|          | Student                       |                             |          | Employment                    |                             |          | Site Wide                     |                             |          |
|----------|-------------------------------|-----------------------------|----------|-------------------------------|-----------------------------|----------|-------------------------------|-----------------------------|----------|
|          | CO2 Emissions (tonnes /annum) | CO2 Savings (tonnes /annum) | % Saving | CO2 Emissions (tonnes /annum) | CO2 Savings (tonnes /annum) | % Saving | CO2 Emissions (tonnes /annum) | CO2 Savings (tonnes /annum) | % Saving |
| Baseline | 209.08                        |                             |          | 13.44                         |                             |          | 222.52                        |                             |          |
| Be Lean  | 183.56                        | 25.52                       | 12.2%    | 8.84                          | 4.60                        | 34.2%    | 192.40                        | 30.12                       | 13.5%    |
| Be Clean | 183.56                        | 0.00                        | 0.0%     | 8.84                          | 0.00                        | 0.0%     | 192.40                        | 0.00                        | 0.0%     |
| Be Green | 80.29                         | 103.28                      | 49.4%    | 8.39                          | 0.45                        | 3.3%     | 88.68                         | 103.72                      | 46.6%    |
| Total    |                               | 128.79                      | 61.6%    |                               | 5.05                        | 37.6%    |                               | 133.84                      | 60.1%    |

Table 3-12 Be Green improvements over building regulations gas boiler baseline

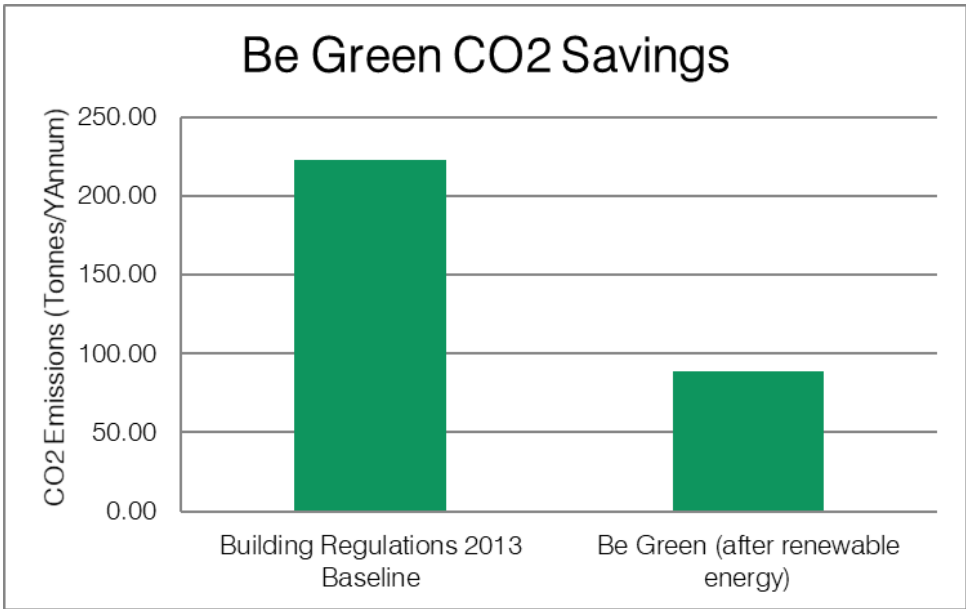


Figure 3-04 Be Green improvement over the building regulations gas boiler baseline

Carbon Offset Payment

Overall, the development has achieved a 60.1% improvement over the baseline scenario, which meets the London plan requirements of on-site carbon savings. In line with the London Plan carbon reduction requirements, there is a target of zero carbon, which can be achieved through an offset payment when there is a shortfall on site. The carbon offset payment is detailed in the Table below, estimated at a carbon price of £95/tonne.

|            | Carbon emissions (tonnes / annum) | 30 year carbon emissions | Offset payment (£95/tonne) |
|------------|-----------------------------------|--------------------------|----------------------------|
| Student    | 80.29                             |                          |                            |
| Employment | 8.39                              |                          |                            |
| Total      |                                   | 88.68                    | £ 252,732                  |

Table 3-13 Carbon offset payment for the development

### 3.6 Be Seen

All major plant will be fitted with meters to allow remote monitoring of energy used by the communal heating systems and electrical distribution boards. A contract will be put in place to monitor the readings so that they can be compared with the predicted energy performance, and this information will be reported, as detailed in the GLA's 'Be Seen' guidance.

### 3.7 Operational costs

The cost to operate the building has been considered as part of the energy strategy. As described in section 3.2, all practical measures have been taken to reduce the energy demand through energy efficiency measures. This will help to keep long term operational costs down. Within the building, the communal system will be designed to CIBSE standards to maximise efficiency and reduce waste heat.

Direct running costs for operational energy for the student units have been estimated to be an average of £208 per annum per unit, based on total electricity use and an electricity price of 15.1 p/kWh. Student occupants are not likely to pay bills directly but have the cost incorporated into rent.

## 4 Conclusion

This report outlines the energy strategy for the proposed development at Avonmouth House. The proposed development consists of the demolition of existing building and structures and erection of a part 2, part 7, part 14, part 16 storey plus basement mixed-use development comprising 1733sqm (GIA) of space for Class E employment use and/or community health hub and 233 purpose-built student residential rooms with associated amenity space and public realm works, car and cycle parking, and ancillary infrastructure.

As required by the London Plan, the development follows the energy hierarchy, incorporating passive design measures, energy efficient equipment and renewable energy.

The development employs an efficient building fabric, including well insulated walls and highly efficient glazing and efficient systems. At the be lean stage, this results in an 13.5% saving for the development as a whole. Although this does not quite meet the London Plan target of 15%, all reasonable measures have been taken to maximise be lean savings. Justification for why the 15% is not achievable has been outlined.

At the be green stage, PV Panels and an air source heat pump for heating and hot water are proposed to maximise carbon savings for the site. Overall, the development achieves a 60.1% improvement over the building regulation gas boiler baseline, which meets the London plan target for on-site carbon savings.

There is a target of zero carbon, which can be achieved through an offset payment. The carbon offset is estimated at £252,732.

The figures within this report are based on preliminary analysis only and further detailed studies will be required at the detailed design stage before specifying any of the proposed systems.

## 5 Appendix

### 5.1 BRUKL Output Documents

The BRUKL output documents for the Employment and Student sections are shown below.

## Project name

**211001 Avonmouth House Commercial Energy (be lean)**

As designed

Date: Fri Oct 01 16:40:04 2021

## Administrative information

## Building Details

Address: Address 1, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.13

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.13

BRUKL compliance check version: v5.6.b.0

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 16                  |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 16                  |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 10.6                |
| Are emissions from the building less than or equal to the target?                                  | BER ≤ TER           |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

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

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

## Building fabric

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                      | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs*  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.35                  | 0.15                 | 0.15                 | L00001A6:Surf[2]                         |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.25                  | 0.13                 | 0.13                 | L0000132:Surf[0]                         |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.25                  | 0.15                 | 0.15                 | L0000132:Surf[1]                         |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                     | 2.2                   | 1.25                 | 2                    | SP000040:Surf[3]                         |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.2                   | 1.64                 | 2.2                  | L0000160:Surf[1]                         |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                         | 1.5                   | -                    | -                    | No Vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.5                   | -                    | -                    | No High usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]                                                                                                                                                            |                       |                      |                      |                                          |
| * There might be more than one surface where the maximum U-value occurs.<br>** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>*** Display windows and similar glazing are excluded from the U-value check.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 3             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

1- VRF, MVHR (be lean)

|                                                                                                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                                                       | 0.95               | 5.6                | 0                  | 0             | 0.85          |
| Standard value                                                                                                                                                                                                                                    | 0.91*              | 2.6                | N/A                | N/A           | 0.5           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system                                                                                                                                                         |                    |                    |                    |               | YES           |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. |                    |                    |                    |               |               |

1- Instantaneous DHW (be lean)

|                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|----------------|--------------------------|-----------------------------------------|
| This building  | 0.95                     | -                                       |
| Standard value | 0.8                      | N/A                                     |

## Local mechanical ventilation, exhaust, and terminal units

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| B  | Zonal supply system where the fan is remote from the zone                                               |
| C  | Zonal extract system where the fan is remote from the zone                                              |
| D  | Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| Zone name                       | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|---------------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type               | A             | B   | C   | D   | E   | F   | G   | H   | I | Zone          | Standard |
| Standard value                  | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |               |          |
| Commercial L00 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial L01 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial L01 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial LB1 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial LB1 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

## General lighting and display lighting

| Zone name                       | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------|--------------------------|------|--------------|----------------------|
|                                 | Luminaire                | Lamp | Display lamp |                      |
| Standard value                  | 60                       | 60   | 22           |                      |
| Commercial L00 bin store        | 100                      | -    | -            | 17                   |
| Commercial L00 cycle storage    | 100                      | -    | -            | 36                   |
| Commercial L00 Employment Space | 100                      | -    | -            | 1631                 |
| Commercial L00 stairs           | -                        | 100  | -            | 49                   |
| Commercial L00 stairs           | -                        | 100  | -            | 64                   |
| Commercial L01 Employment Space | 100                      | -    | -            | 2706                 |

| General lighting and display lighting | Luminous efficacy [lm/W] |      |              |                      |
|---------------------------------------|--------------------------|------|--------------|----------------------|
| Zone name                             | Luminaire                | Lamp | Display lamp | General lighting [W] |
| Standard value                        | 60                       | 60   | 22           |                      |
| Commercial L01 Employment Space       | 100                      | -    | -            | 1064                 |
| Commercial L01 stairs                 | -                        | 100  | -            | 50                   |
| Commercial L01 stairs                 | -                        | 100  | -            | 49                   |
| Commercial LB1 Employment Space       | 100                      | -    | -            | 1524                 |
| Commercial LB1 Employment Space       | 100                      | -    | -            | 1976                 |
| Commercial LB1 hall                   | -                        | 100  | -            | 28                   |
| Commercial LB1 hall                   | -                        | 100  | -            | 21                   |
| Commercial LB1 stairs                 | -                        | 100  | -            | 49                   |
| Commercial LB1 stairs                 | -                        | 100  | -            | 50                   |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone                            | Solar gain limit exceeded? (%) | Internal blinds used? |
|---------------------------------|--------------------------------|-----------------------|
| Commercial L00 Employment Space | NO (-68.8%)                    | NO                    |
| Commercial L01 Employment Space | NO (-46.7%)                    | NO                    |
| Commercial L01 Employment Space | NO (-53.7%)                    | NO                    |
| Commercial LB1 Employment Space | NO (-70.1%)                    | NO                    |
| Commercial LB1 Employment Space | NO (-80.6%)                    | NO                    |

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

Separate submission

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

Separate submission

### EPBD (Recast): Consideration of alternative energy systems

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual | Notional |
|-------------------------------------------------------|--------|----------|
| Area [m <sup>2</sup> ]                                | 1674.6 | 1674.6   |
| External area [m <sup>2</sup> ]                       | 1461.8 | 1461.8   |
| Weather                                               | LON    | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3      | 3        |
| Average conductance [W/K]                             | 454.23 | 780.68   |
| Average U-value [W/m <sup>2</sup> K]                  | 0.31   | 0.53     |
| Alpha value* [%]                                      | 10.1   | 10       |

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

## Building Use

### % Area Building Type

|     |                                                                    |
|-----|--------------------------------------------------------------------|
|     | A1/A2 Retail/Financial and Professional services                   |
|     | A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways             |
| 100 | <b>B1 Offices and Workshop businesses</b>                          |
|     | B2 to B7 General Industrial and Special Industrial Groups          |
|     | B8 Storage or Distribution                                         |
|     | C1 Hotels                                                          |
|     | C2 Residential Institutions: Hospitals and Care Homes              |
|     | C2 Residential Institutions: Residential schools                   |
|     | C2 Residential Institutions: Universities and colleges             |
|     | C2A Secure Residential Institutions                                |
|     | Residential spaces                                                 |
|     | D1 Non-residential Institutions: Community/Day Centre              |
|     | D1 Non-residential Institutions: Libraries, Museums, and Galleries |
|     | D1 Non-residential Institutions: Education                         |
|     | D1 Non-residential Institutions: Primary Health Care Building      |
|     | D1 Non-residential Institutions: Crown and County Courts           |
|     | D2 General Assembly and Leisure, Night Clubs, and Theatres         |
|     | Others: Passenger terminals                                        |
|     | Others: Emergency services                                         |
|     | Others: Miscellaneous 24hr activities                              |
|     | Others: Car Parks 24 hrs                                           |
|     | Others: Stand alone utility block                                  |

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

|                 | Actual       | Notional     |
|-----------------|--------------|--------------|
| Heating         | 1.81         | 4.8          |
| Cooling         | 5.21         | 6.28         |
| Auxiliary       | 3.1          | 1.82         |
| Lighting        | 10.68        | 20.24        |
| Hot water       | 2.79         | 2.77         |
| Equipment*      | 37.47        | 37.47        |
| <b>TOTAL **</b> | <b>23.59</b> | <b>35.91</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 84.59  | 100.58   |
| Primary energy* [kWh/m <sup>2</sup> ]         | 62.45  | 94.06    |
| Total emissions [kg/m <sup>2</sup> ]          | 10.6   | 16       |

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

| HVAC Systems Performance                                                                 |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|------|
| System Type                                                                              | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |      |
| [ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                          | Actual            | 6.9               | 90                 | 2.1                | 6                 | 3.5           | 0.93          | 4.19             | 0.95             | 5.6  |
|                                                                                          | Notional          | 17.1              | 98.2               | 5.5                | 7.2               | 2.1           | 0.86          | 3.79             | ----             | ---- |
| [ST] No Heating or Cooling                                                               |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                          | Actual            | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                | 0    |
|                                                                                          | Notional          | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | ----             | ---- |

## Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs*  |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|------------------------------------------|
| Wall                                                                     | 0.23               | 0.15                                                               | L00001A6:Surf[2]                         |
| Floor                                                                    | 0.2                | 0.13                                                               | L0000132:Surf[0]                         |
| Roof                                                                     | 0.15               | 0.15                                                               | L0000132:Surf[1]                         |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.2                                                                | L00001A7:Surf[1]                         |
| Personnel doors                                                          | 1.5                | 1.5                                                                | L00001A6:Surf[0]                         |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | No Vehicle access doors in building      |
| High usage entrance doors                                                | 1.5                | -                                                                  | No High usage entrance doors in building |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                          |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                          |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 3             |

## Project name

**211001 Avonmouth House Commercial Energy (be Green)**

As designed

Date: Fri Oct 01 16:56:07 2021

## Administrative information

## Building Details

Address: Address 1, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.13

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.13

BRUKL compliance check version: v5.6.b.0

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 16                  |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 16                  |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 11.2                |
| Are emissions from the building less than or equal to the target?                                  | BER ≤ TER           |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

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

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

## Building fabric

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs*  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.35                  | 0.15                 | 0.15                 | L00001A6:Surf[2]                         |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.25                  | 0.13                 | 0.13                 | L0000132:Surf[0]                         |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.25                  | 0.15                 | 0.15                 | L0000132:Surf[1]                         |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.2                   | 1.25                 | 2                    | SP000040:Surf[3]                         |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.2                   | 1.64                 | 2.2                  | L0000160:Surf[1]                         |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                   | -                    | -                    | No Vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.5                   | -                    | -                    | No High usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]<br>* There might be more than one surface where the maximum U-value occurs.<br>** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>*** Display windows and similar glazing are excluded from the U-value check.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 3             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- VRF, MVHR

|                                                                                                                                                                  | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                      | 4.1                | 5.6                | 0                  | 0             | 0.85          |
| Standard value                                                                                                                                                   | 2.5*               | 2.6                | N/A                | N/A           | 0.5           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system                                                                        |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types ≤12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 1- Instantaneous DHW

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

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

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| B  | Zonal supply system where the fan is remote from the zone                                               |
| C  | Zonal extract system where the fan is remote from the zone                                              |
| D  | Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| Zone name                       | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|---------------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type               | A             | B   | C   | D   | E   | F   | G   | H   | I | Zone          | Standard |
| Standard value                  | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |               |          |
| Commercial L00 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial L01 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial L01 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial LB1 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| Commercial LB1 Employment Space | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

### General lighting and display lighting

| Zone name                       | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------|--------------------------|------|--------------|----------------------|
|                                 | Luminaire                | Lamp | Display lamp |                      |
| Standard value                  | 60                       | 60   | 22           |                      |
| Commercial L00 bin store        | 100                      | -    | -            | 17                   |
| Commercial L00 cycle storage    | 100                      | -    | -            | 36                   |
| Commercial L00 Employment Space | 100                      | -    | -            | 1631                 |
| Commercial L00 stairs           | -                        | 100  | -            | 49                   |
| Commercial L00 stairs           | -                        | 100  | -            | 64                   |
| Commercial L01 Employment Space | 100                      | -    | -            | 2706                 |

| General lighting and display lighting | Luminous efficacy [lm/W] |      |              |                      |
|---------------------------------------|--------------------------|------|--------------|----------------------|
| Zone name                             | Luminaire                | Lamp | Display lamp | General lighting [W] |
| Standard value                        | 60                       | 60   | 22           |                      |
| Commercial L01 Employment Space       | 100                      | -    | -            | 1064                 |
| Commercial L01 stairs                 | -                        | 100  | -            | 50                   |
| Commercial L01 stairs                 | -                        | 100  | -            | 49                   |
| Commercial LB1 Employment Space       | 100                      | -    | -            | 1524                 |
| Commercial LB1 Employment Space       | 100                      | -    | -            | 1976                 |
| Commercial LB1 hall                   | -                        | 100  | -            | 28                   |
| Commercial LB1 hall                   | -                        | 100  | -            | 21                   |
| Commercial LB1 stairs                 | -                        | 100  | -            | 49                   |
| Commercial LB1 stairs                 | -                        | 100  | -            | 50                   |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone                            | Solar gain limit exceeded? (%) | Internal blinds used? |
|---------------------------------|--------------------------------|-----------------------|
| Commercial L00 Employment Space | NO (-68.8%)                    | NO                    |
| Commercial L01 Employment Space | NO (-46.7%)                    | NO                    |
| Commercial L01 Employment Space | NO (-53.7%)                    | NO                    |
| Commercial LB1 Employment Space | NO (-70.1%)                    | NO                    |
| Commercial LB1 Employment Space | NO (-80.6%)                    | NO                    |

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

Separate submission

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

Separate submission

### EPBD (Recast): Consideration of alternative energy systems

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual | Notional |
|-------------------------------------------------------|--------|----------|
| Area [m <sup>2</sup> ]                                | 1674.6 | 1674.6   |
| External area [m <sup>2</sup> ]                       | 1461.8 | 1461.8   |
| Weather                                               | LON    | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3      | 3        |
| Average conductance [W/K]                             | 454.23 | 780.68   |
| Average U-value [W/m <sup>2</sup> K]                  | 0.31   | 0.53     |
| Alpha value* [%]                                      | 10.1   | 10       |

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

## Building Use

| % Area | Building Type                                                      |
|--------|--------------------------------------------------------------------|
|        | A1/A2 Retail/Financial and Professional services                   |
|        | A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways             |
| 100    | <b>B1 Offices and Workshop businesses</b>                          |
|        | B2 to B7 General Industrial and Special Industrial Groups          |
|        | B8 Storage or Distribution                                         |
|        | C1 Hotels                                                          |
|        | C2 Residential Institutions: Hospitals and Care Homes              |
|        | C2 Residential Institutions: Residential schools                   |
|        | C2 Residential Institutions: Universities and colleges             |
|        | C2A Secure Residential Institutions                                |
|        | Residential spaces                                                 |
|        | D1 Non-residential Institutions: Community/Day Centre              |
|        | D1 Non-residential Institutions: Libraries, Museums, and Galleries |
|        | D1 Non-residential Institutions: Education                         |
|        | D1 Non-residential Institutions: Primary Health Care Building      |
|        | D1 Non-residential Institutions: Crown and County Courts           |
|        | D2 General Assembly and Leisure, Night Clubs, and Theatres         |
|        | Others: Passenger terminals                                        |
|        | Others: Emergency services                                         |
|        | Others: Miscellaneous 24hr activities                              |
|        | Others: Car Parks 24 hrs                                           |
|        | Others: Stand alone utility block                                  |

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

|                 | Actual       | Notional     |
|-----------------|--------------|--------------|
| Heating         | 0.42         | 1.62         |
| Cooling         | 5.21         | 6.28         |
| Auxiliary       | 3.1          | 1.82         |
| Lighting        | 10.68        | 20.24        |
| Hot water       | 2.65         | 2.77         |
| Equipment*      | 37.47        | 37.47        |
| <b>TOTAL **</b> | <b>22.06</b> | <b>32.72</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 84.59  | 100.58   |
| Primary energy* [kWh/m <sup>2</sup> ]         | 66.04  | 92.71    |
| Total emissions [kg/m <sup>2</sup> ]          | 11.2   | 16       |

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

| HVAC Systems Performance                                                                                      |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|---------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|------|
| System Type                                                                                                   | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |      |
| [ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                               | Actual            | 6.9               | 90                 | 0.5                | 6                 | 3.5           | 4.02          | 4.19             | 4.1              | 5.6  |
|                                                                                                               | Notional          | 17.1              | 98.2               | 1.9                | 7.2               | 2.1           | 2.56          | 3.79             | ----             | ---- |
| [ST] No Heating or Cooling                                                                                    |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                               | Actual            | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                | 0    |
|                                                                                                               | Notional          | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | ----             | ---- |

## Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs*  |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|------------------------------------------|
| Wall                                                                     | 0.23               | 0.15                                                               | L00001A6:Surf[2]                         |
| Floor                                                                    | 0.2                | 0.13                                                               | L0000132:Surf[0]                         |
| Roof                                                                     | 0.15               | 0.15                                                               | L0000132:Surf[1]                         |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.2                                                                | L00001A7:Surf[1]                         |
| Personnel doors                                                          | 1.5                | 1.5                                                                | L00001A6:Surf[0]                         |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | No Vehicle access doors in building      |
| High usage entrance doors                                                | 1.5                | -                                                                  | No High usage entrance doors in building |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                          |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                          |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 3             |

## Project name

**211001 Avonmouth House Student Energy (be lean)**

As designed

Date: Fri Oct 01 16:03:53 2021

## Administrative information

## Building Details

Address: Address 1, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.13

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.13

BRUKL compliance check version: v5.6.b.0

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 34.7                |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 34.7                |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 30.1                |
| Are emissions from the building less than or equal to the target?                                  | BER ≤ TER           |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

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

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

## Building fabric

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                      | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs*  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.35                  | 0.15                 | 0.15                 | L0000061:Surf[2]                         |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.25                  | 0.15                 | 0.15                 | LB000021:Surf[0]                         |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.25                  | 0.13                 | 0.15                 | SP000026:Surf[6]                         |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                     | 2.2                   | 1.2                  | 1.2                  | L00001A8:Surf[2]                         |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.2                   | 1.5                  | 1.5                  | L0000061:Surf[0]                         |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                         | 1.5                   | -                    | -                    | No Vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.5                   | -                    | -                    | No High usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]                                                                                                                                                            |                       |                      |                      |                                          |
| * There might be more than one surface where the maximum U-value occurs.<br>** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>*** Display windows and similar glazing are excluded from the U-value check.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 3             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- Gas Boiler, No MVHR (be lean)

|                                                                                                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                                                       | 0.95               | -                  | 0.2                | 0             | -             |
| Standard value                                                                                                                                                                                                                                    | 0.91*              | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system                                                                                                                                                         |                    |                    |                    |               | YES           |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. |                    |                    |                    |               |               |

### 2- Gas Boiler, MVHR (be lean)

|                                                                                                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                                                                                                                                                                       | 0.95               | -                  | 0.2                | 0             | 0.85          |
| Standard value                                                                                                                                                                                                                                    | 0.91*              | N/A                | N/A                | N/A           | 0.5           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system                                                                                                                                                         |                    |                    |                    |               | YES           |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. |                    |                    |                    |               |               |

### 1- Gas Boiler, DHW (be lean)

|                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|----------------|--------------------------|-----------------------------------------|
| This building  | 0.95                     | -                                       |
| Standard value | 0.8                      | N/A                                     |

## Local mechanical ventilation, exhaust, and terminal units

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| B  | Zonal supply system where the fan is remote from the zone                                               |
| C  | Zonal extract system where the fan is remote from the zone                                              |
| D  | Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| Zone name    | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|--------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|              | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I | Zone          | Standard |
|              | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |               |          |
| L00 WC       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A LKD    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name         | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|-------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type | A             | B   | C   | D   | E   | F   | G   | H   | I |               |          |
| Standard value    | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L02.A.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.08 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.08 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.08 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.08 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.D.01 Studio   | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.D.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name    | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|--------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|              | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|              | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L03.A.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.04 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.04 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.05 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.05 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.06 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.06 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.07 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.07 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.08 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.08 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B LKD    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.04 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.04 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.05 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.05 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.06 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.06 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.07 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.07 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.08 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.08 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C LKD    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.04 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.04 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.05 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L03.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L04.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L05.B.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L06.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L07.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.01 studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.02 studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.03 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name         | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|-------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type | A             | B   | C   | D   | E   | F   | G   | H   | I |               |          |
| Standard value    | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L09.A.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B. LKD        | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.C.01 Studio   | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.C.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L10.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L11.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L13.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L14.B.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.B.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L00 bin store                         |                | 100                      | -    | -            | 54                   |
| L00 Circ                              |                | -                        | 100  | -            | 54                   |
| L00 Circ                              |                | -                        | 100  | -            | 53                   |
| L00 concierge                         |                | -                        | 100  | 60           | 191                  |
| L00 lift lobby                        |                | -                        | 100  | 60           | 97                   |
| L00 office                            |                | 100                      | -    | -            | 274                  |
| L00 Plant                             |                | 100                      | -    | -            | 100                  |
| L00 post                              |                | 100                      | -    | -            | 171                  |
| L00 stairs                            |                | -                        | 100  | -            | 47                   |
| L00 WC                                |                | -                        | 100  | -            | 33                   |
| L00 WC Circ                           |                | -                        | 100  | -            | 22                   |
| L01 Circ                              |                | -                        | 100  | -            | 67                   |
| L01 Stairs                            |                | -                        | 100  | -            | 37                   |
| L02 Circ                              |                | -                        | 100  | -            | 52                   |
| L02 Stairs                            |                | -                        | 100  | -            | 31                   |
| L02.A Circ                            |                | -                        | 100  | -            | 56                   |
| L02.A LKD                             |                | -                        | 100  | -            | 230                  |
| L02.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L02.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L02.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.03 Bed                          |                | -                        | 100  | -            | 25                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L02.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L02.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L02.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L02.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L02.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B Circ                            |                | -                        | 100  | -            | 72                   |
| L02.B LKD                             |                | -                        | 100  | -            | 321                  |
| L02.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C Circ                            |                | -                        | 100  | -            | 58                   |
| L02.C LKD                             |                | -                        | 100  | -            | 264                  |
| L02.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.06 WC                           |                | -                        | 100  | -            | 17                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L02.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L02.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L03 Circ                              |                | -                        | 100  | -            | 52                   |
| L03 Stairs                            |                | -                        | 100  | -            | 31                   |
| L03.A Circ                            |                | -                        | 100  | -            | 56                   |
| L03.A LKD                             |                | -                        | 100  | -            | 230                  |
| L03.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L03.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L03.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L03.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L03.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L03.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L03.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L03.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B Circ                            |                | -                        | 100  | -            | 72                   |
| L03.B LKD                             |                | -                        | 100  | -            | 321                  |
| L03.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C Circ                            |                | -                        | 100  | -            | 58                   |
| L03.C LKD                             |                | -                        | 100  | -            | 264                  |
| L03.C.01 Bed                          |                | -                        | 100  | -            | 24                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L03.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L03.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L03.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L04 Circ                              |                | -                        | 100  | -            | 52                   |
| L04 Stairs                            |                | -                        | 100  | -            | 31                   |
| L04.A Circ                            |                | -                        | 100  | -            | 56                   |
| L04.A LKD                             |                | -                        | 100  | -            | 230                  |
| L04.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L04.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L04.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L04.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L04.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L04.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L04.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L04.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L04.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L04.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L04.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L04.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L04.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B Circ                            |                | -                        | 100  | -            | 72                   |
| L04.B LKD                             |                | -                        | 100  | -            | 321                  |
| L04.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L04.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L04.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L04.B.04 WC                           |                | -                        | 100  | -            | 17                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L04.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L04.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C Circ                            |                | -                        | 100  | -            | 58                   |
| L04.C LKD                             |                | -                        | 100  | -            | 264                  |
| L04.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L04.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L04.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L05 Circ                              |                | -                        | 100  | -            | 52                   |
| L05 Stairs                            |                | -                        | 100  | -            | 31                   |
| L05.A Circ                            |                | -                        | 100  | -            | 56                   |
| L05.A LKD                             |                | -                        | 100  | -            | 230                  |
| L05.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L05.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L05.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L05.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L05.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L05.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L05.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L05.A.08 Bed                          |                | -                        | 100  | -            | 24                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L05.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B Circ                            |                | -                        | 100  | -            | 72                   |
| L05.B LKD                             |                | -                        | 100  | -            | 321                  |
| L05.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C Circ                            |                | -                        | 100  | -            | 58                   |
| L05.C LKD                             |                | -                        | 100  | -            | 264                  |
| L05.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L05.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L05.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L06 Circ                              |                | -                        | 100  | -            | 52                   |
| L06 Stairs                            |                | -                        | 100  | -            | 31                   |
| L06.A Circ                            |                | -                        | 100  | -            | 56                   |
| L06.A LKD                             |                | -                        | 100  | -            | 230                  |
| L06.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L06.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L06.A.02 WC                           |                | -                        | 100  | -            | 19                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L06.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L06.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L06.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L06.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L06.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L06.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B Circ                            |                | -                        | 100  | -            | 72                   |
| L06.B LKD                             |                | -                        | 100  | -            | 321                  |
| L06.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C Circ                            |                | -                        | 100  | -            | 58                   |
| L06.C LKD                             |                | -                        | 100  | -            | 264                  |
| L06.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.06 Bed                          |                | -                        | 100  | -            | 24                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L06.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L06.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L06.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L07 Stairs                            |                | -                        | 100  | -            | 31                   |
| L07.A Circ                            |                | -                        | 100  | -            | 47                   |
| L07.A LKD                             |                | -                        | 100  | -            | 230                  |
| L07.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L07.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L07.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L07.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L07.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L07.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L07.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L07.B Circ                            |                | -                        | 100  | -            | 61                   |
| L07.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L07.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L07.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L07.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L07.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L07.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L07.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L07.C Circ                            |                | -                        | 100  | -            | 79                   |
| L07.C.01 studio                       |                | -                        | 100  | -            | 30                   |
| L07.C.01 WC                           |                | -                        | 100  | -            | 21                   |
| L07.C.02 studio                       |                | -                        | 100  | -            | 29                   |
| L07.C.02 WC                           |                | -                        | 100  | -            | 21                   |
| L07.C.03 Studio                       |                | -                        | 100  | -            | 31                   |
| L07.C.03 WC                           |                | -                        | 100  | -            | 29                   |
| L08 Circ                              |                | -                        | 100  | -            | 52                   |
| L08 Stairs                            |                | -                        | 100  | -            | 31                   |
| L08.A Circ                            |                | -                        | 100  | -            | 47                   |
| L08.A LKD                             |                | -                        | 100  | -            | 230                  |
| L08.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L08.A.01 WC                           |                | -                        | 100  | -            | 19                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L08.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L08.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L08.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L08.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L08.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L08.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L08.B Circ                            |                | -                        | 100  | -            | 79                   |
| L08.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L08.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L08.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L08.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L08.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L08.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L08.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L08.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L09 Circ                              |                | -                        | 100  | -            | 52                   |
| L09 Stairs                            |                | -                        | 100  | -            | 31                   |
| L09.A Circ                            |                | -                        | 100  | -            | 47                   |
| L09.A LKD                             |                | -                        | 100  | -            | 230                  |
| L09.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L09.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L09.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L09.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L09.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.05 Bed                          |                | -                        | 100  | -            | 24                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L09.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L09.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L09.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L09.B Circ                            |                | -                        | 100  | -            | 79                   |
| L09.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L09.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L09.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L09.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L09.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L09.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L09.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L09.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L10 Circ                              |                | -                        | 100  | -            | 52                   |
| L10 Stairs                            |                | -                        | 100  | -            | 31                   |
| L10.A Circ                            |                | -                        | 100  | -            | 47                   |
| L10.A LKD                             |                | -                        | 100  | -            | 230                  |
| L10.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L10.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L10.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L10.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L10.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L10.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L10.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L10.B Circ                            |                | -                        | 100  | -            | 79                   |
| L10.B. LKD                            |                | -                        | 100  | -            | 283                  |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L10.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L10.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L10.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L10.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L10.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L10.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L10.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L11 Circ                              |                | -                        | 100  | -            | 52                   |
| L11 Stairs                            |                | -                        | 100  | -            | 31                   |
| L11.A Circ                            |                | -                        | 100  | -            | 47                   |
| L11.A LKD                             |                | -                        | 100  | -            | 230                  |
| L11.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L11.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L11.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L11.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L11.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L11.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L11.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L11.B Circ                            |                | -                        | 100  | -            | 79                   |
| L11.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L11.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L11.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.04 Bed                          |                | -                        | 100  | -            | 26                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L11.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L11.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L11.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L11.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L11.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L12 Circ                              |                | -                        | 100  | -            | 52                   |
| L12 Stairs                            |                | -                        | 100  | -            | 31                   |
| L12.A Circ                            |                | -                        | 100  | -            | 47                   |
| L12.A LKD                             |                | -                        | 100  | -            | 230                  |
| L12.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L12.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L12.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L12.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L12.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L12.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L12.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L12.B Circ                            |                | -                        | 100  | -            | 79                   |
| L12.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L12.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L12.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L12.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L12.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L12.B.07 WC                           |                | -                        | 100  | -            | 19                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L12.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L12.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L13 Circ                              |                | -                        | 100  | -            | 52                   |
| L13 Stairs                            |                | -                        | 100  | -            | 31                   |
| L13.A Circ                            |                | -                        | 100  | -            | 47                   |
| L13.A LKD                             |                | -                        | 100  | -            | 230                  |
| L13.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L13.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L13.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L13.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L13.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L13.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L13.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L13.B Circ                            |                | -                        | 100  | -            | 79                   |
| L13.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L13.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L13.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L13.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L13.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L13.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L13.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L13.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L14 Circ                              |                | -                        | 100  | -            | 50                   |
| L14 Stairs                            |                | -                        | 100  | -            | 31                   |
| L14.A Circ                            |                | -                        | 100  | -            | 61                   |
| L14.A LKD                             |                | -                        | 100  | -            | 243                  |
| L14.A.01 Bed                          |                | -                        | 100  | -            | 21                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L14.A.01 WC                           |                | -                        | 100  | -            | 20                   |
| L14.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L14.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L14.A.03 Bed                          |                | -                        | 100  | -            | 22                   |
| L14.A.03 WC                           |                | -                        | 100  | -            | 19                   |
| L14.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L14.A.04 WC                           |                | -                        | 100  | -            | 17                   |
| L14.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L14.A.05 WC                           |                | -                        | 100  | -            | 16                   |
| L14.A.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L14.A.06 WC                           |                | -                        | 100  | -            | 16                   |
| L14.B.01 Studio                       |                | -                        | 100  | -            | 29                   |
| L14.B.01 WC                           |                | -                        | 100  | -            | 22                   |
| L15 Circ                              |                | -                        | 100  | -            | 50                   |
| L15 Stairs                            |                | -                        | 100  | -            | 31                   |
| L15.A Circ                            |                | -                        | 100  | -            | 61                   |
| L15.A LKD                             |                | -                        | 100  | -            | 243                  |
| L15.A.01 Bed                          |                | -                        | 100  | -            | 21                   |
| L15.A.01 WC                           |                | -                        | 100  | -            | 20                   |
| L15.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L15.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L15.A.03 Bed                          |                | -                        | 100  | -            | 22                   |
| L15.A.03 WC                           |                | -                        | 100  | -            | 19                   |
| L15.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L15.A.04 WC                           |                | -                        | 100  | -            | 17                   |
| L15.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L15.A.05 WC                           |                | -                        | 100  | -            | 16                   |
| L15.A.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L15.A.06 WC                           |                | -                        | 100  | -            | 16                   |
| L15.B.01 Studio                       |                | -                        | 100  | -            | 29                   |
| L15.B.01 WC                           |                | -                        | 100  | -            | 22                   |
| LB1 Circ                              |                | -                        | 100  | -            | 54                   |
| LB1 stairs                            |                | -                        | 100  | -            | 47                   |
| LB2 Circ                              |                | -                        | 100  | -            | 41                   |
| LB2 Circ                              |                | -                        | 100  | -            | 44                   |
| LB2 Circ                              |                | -                        | 100  | -            | 69                   |
| LB2 cycle store                       |                | 100                      | -    | -            | 156                  |
| LB2 cycle store                       |                | 100                      | -    | -            | 60                   |
| LB2 laundry                           |                | -                        | 100  | -            | 133                  |
| LB2 plant                             |                | 100                      | -    | -            | 87                   |
| LB2 plant                             |                | 100                      | -    | -            | 911                  |
| LB2 stairs                            |                | -                        | 100  | -            | 47                   |
| LB2 store                             |                | 100                      | -    | -            | 24                   |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L00 concierge   | NO (-48.4%)                    | NO                    |
| L00 lift lobby  | NO (-27.8%)                    | NO                    |
| L00 office      | NO (-45.7%)                    | NO                    |
| L00 post        | N/A                            | N/A                   |
| L02.A.01 Bed    | NO (-83.8%)                    | NO                    |
| L02.A.02 Bed    | NO (-91.1%)                    | NO                    |
| L02.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L02.A.04 Bed    | NO (-73%)                      | NO                    |
| L02.A.05 Bed    | NO (-73%)                      | NO                    |
| L02.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L02.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L02.A.08 Bed    | NO (-57%)                      | NO                    |
| L02.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L02.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L02.B.03 Bed    | NO (-57%)                      | NO                    |
| L02.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L02.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L02.B.06 Bed    | NO (-57%)                      | NO                    |
| L02.B.07 Bed    | NO (-57%)                      | NO                    |
| L02.B.08 Bed    | NO (-57%)                      | NO                    |
| L02.C.01 Bed    | NO (-69.9%)                    | NO                    |
| L02.C.02 Bed    | NO (-70%)                      | NO                    |
| L02.C.03 Bed    | NO (-70.6%)                    | NO                    |
| L02.C.04 Bed    | NO (-71.3%)                    | NO                    |
| L02.C.05 Bed    | NO (-74.8%)                    | NO                    |
| L02.C.06 Bed    | NO (-79.2%)                    | NO                    |
| L02.D.01 Studio | NO (-94.9%)                    | NO                    |
| L03.A.01 Bed    | NO (-75%)                      | NO                    |
| L03.A.02 Bed    | NO (-87%)                      | NO                    |
| L03.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L03.A.04 Bed    | NO (-73%)                      | NO                    |
| L03.A.05 Bed    | NO (-73%)                      | NO                    |
| L03.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L03.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L03.A.08 Bed    | NO (-57%)                      | NO                    |
| L03.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L03.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L03.B.03 Bed    | NO (-57%)                      | NO                    |
| L03.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L03.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L03.B.06 Bed    | NO (-57%)                      | NO                    |
| L03.B.07 Bed    | NO (-57%)                      | NO                    |
| L03.B.08 Bed    | NO (-57%)                      | NO                    |
| L03.C.01 Bed    | NO (-68.4%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L03.C.02 Bed    | NO (-68.2%)                    | NO                    |
| L03.C.03 Bed    | NO (-68.2%)                    | NO                    |
| L03.C.04 Bed    | NO (-68.2%)                    | NO                    |
| L03.C.05 Bed    | NO (-71.1%)                    | NO                    |
| L03.C.06 Bed    | NO (-73.9%)                    | NO                    |
| L03.D.01 Studio | NO (-92%)                      | NO                    |
| L04.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L04.A.02 Bed    | NO (-84%)                      | NO                    |
| L04.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L04.A.04 Bed    | NO (-73%)                      | NO                    |
| L04.A.05 Bed    | NO (-73%)                      | NO                    |
| L04.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L04.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L04.A.08 Bed    | NO (-57%)                      | NO                    |
| L04.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L04.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L04.B.03 Bed    | NO (-57%)                      | NO                    |
| L04.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L04.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L04.B.06 Bed    | NO (-57%)                      | NO                    |
| L04.B.07 Bed    | NO (-57%)                      | NO                    |
| L04.B.08 Bed    | NO (-57%)                      | NO                    |
| L04.C.01 Bed    | NO (-68.4%)                    | NO                    |
| L04.C.02 Bed    | NO (-68.2%)                    | NO                    |
| L04.C.03 Bed    | NO (-67.8%)                    | NO                    |
| L04.C.04 Bed    | NO (-67.4%)                    | NO                    |
| L04.C.05 Bed    | NO (-67.9%)                    | NO                    |
| L04.C.06 Bed    | NO (-70.6%)                    | NO                    |
| L04.D.01 Studio | NO (-89.6%)                    | NO                    |
| L05.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L05.A.02 Bed    | NO (-84%)                      | NO                    |
| L05.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L05.A.04 Bed    | NO (-73%)                      | NO                    |
| L05.A.05 Bed    | NO (-73%)                      | NO                    |
| L05.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L05.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L05.A.08 Bed    | NO (-57%)                      | NO                    |
| L05.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L05.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L05.B.03 Bed    | NO (-57%)                      | NO                    |
| L05.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L05.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L05.B.06 Bed    | NO (-57%)                      | NO                    |
| L05.B.07 Bed    | NO (-57%)                      | NO                    |
| L05.B.08 Bed    | NO (-57%)                      | NO                    |
| L05.C.01 Bed    | NO (-68%)                      | NO                    |
| L05.C.02 Bed    | NO (-67.8%)                    | NO                    |
| L05.C.03 Bed    | NO (-67.7%)                    | NO                    |
| L05.C.04 Bed    | NO (-67.3%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L05.C.05 Bed    | NO (-67.9%)                    | NO                    |
| L05.C.06 Bed    | NO (-70.5%)                    | NO                    |
| L05.D.01 Studio | NO (-89.6%)                    | NO                    |
| L06.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L06.A.02 Bed    | NO (-84%)                      | NO                    |
| L06.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L06.A.04 Bed    | NO (-73%)                      | NO                    |
| L06.A.05 Bed    | NO (-73%)                      | NO                    |
| L06.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L06.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L06.A.08 Bed    | NO (-57%)                      | NO                    |
| L06.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L06.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L06.B.03 Bed    | NO (-56.7%)                    | NO                    |
| L06.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L06.B.05 Bed    | NO (-67.2%)                    | NO                    |
| L06.B.06 Bed    | NO (-57%)                      | NO                    |
| L06.B.07 Bed    | NO (-57%)                      | NO                    |
| L06.B.08 Bed    | NO (-57%)                      | NO                    |
| L06.C.01 Bed    | NO (-67.9%)                    | NO                    |
| L06.C.02 Bed    | NO (-67.8%)                    | NO                    |
| L06.C.03 Bed    | NO (-67.7%)                    | NO                    |
| L06.C.04 Bed    | NO (-67.2%)                    | NO                    |
| L06.C.05 Bed    | NO (-67.9%)                    | NO                    |
| L06.C.06 Bed    | NO (-70.5%)                    | NO                    |
| L06.D.01 Studio | NO (-89.6%)                    | NO                    |
| L07.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L07.A.02 Bed    | NO (-84%)                      | NO                    |
| L07.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L07.A.04 Bed    | NO (-73%)                      | NO                    |
| L07.A.05 Bed    | NO (-73%)                      | NO                    |
| L07.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L07.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L07.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L07.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L07.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L07.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L07.C.01 studio | NO (-79.2%)                    | NO                    |
| L07.C.02 studio | NO (-80.7%)                    | NO                    |
| L07.C.03 Studio | NO (-89.6%)                    | NO                    |
| L08.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L08.A.02 Bed    | NO (-84%)                      | NO                    |
| L08.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L08.A.04 Bed    | NO (-73%)                      | NO                    |
| L08.A.05 Bed    | NO (-73%)                      | NO                    |
| L08.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L08.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L08.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L08.B.02 Bed    | NO (-58.5%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L08.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L08.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L08.B.05 Bed    | NO (-64.3%)                    | NO                    |
| L08.B.06 Bed    | NO (-64.9%)                    | NO                    |
| L08.B.07 Bed    | NO (-88.7%)                    | NO                    |
| L08.C.01 Studio | NO (-89.6%)                    | NO                    |
| L09.A.01 Bed    | NO (-68%)                      | NO                    |
| L09.A.02 Bed    | NO (-84%)                      | NO                    |
| L09.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L09.A.04 Bed    | NO (-73%)                      | NO                    |
| L09.A.05 Bed    | NO (-73%)                      | NO                    |
| L09.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L09.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L09.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L09.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L09.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L09.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L09.B.05 Bed    | NO (-64.4%)                    | NO                    |
| L09.B.06 Bed    | NO (-64.9%)                    | NO                    |
| L09.B.07 Bed    | NO (-88.7%)                    | NO                    |
| L09.C.01 Studio | NO (-89.5%)                    | NO                    |
| L10.A.01 Bed    | NO (-68%)                      | NO                    |
| L10.A.02 Bed    | NO (-84%)                      | NO                    |
| L10.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L10.A.04 Bed    | NO (-73%)                      | NO                    |
| L10.A.05 Bed    | NO (-73%)                      | NO                    |
| L10.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L10.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L10.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L10.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L10.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L10.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L10.B.05 Bed    | NO (-63.8%)                    | NO                    |
| L10.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L10.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L10.C.01 Studio | NO (-89.4%)                    | NO                    |
| L11.A.01 Bed    | NO (-68%)                      | NO                    |
| L11.A.02 Bed    | NO (-84%)                      | NO                    |
| L11.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L11.A.04 Bed    | NO (-73%)                      | NO                    |
| L11.A.05 Bed    | NO (-73%)                      | NO                    |
| L11.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L11.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L11.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L11.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L11.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L11.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L11.B.05 Bed    | NO (-63.8%)                    | NO                    |
| L11.B.06 Bed    | NO (-64.4%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L11.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L11.C.01 Studio | NO (-89.4%)                    | NO                    |
| L12.A.01 Bed    | NO (-68%)                      | NO                    |
| L12.A.02 Bed    | NO (-84%)                      | NO                    |
| L12.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L12.A.04 Bed    | NO (-73%)                      | NO                    |
| L12.A.05 Bed    | NO (-73%)                      | NO                    |
| L12.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L12.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L12.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L12.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L12.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L12.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L12.B.05 Bed    | NO (-63.8%)                    | NO                    |
| L12.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L12.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L12.C.01 Studio | NO (-89.4%)                    | NO                    |
| L13.A.01 Bed    | NO (-67.8%)                    | NO                    |
| L13.A.02 Bed    | NO (-83.9%)                    | NO                    |
| L13.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L13.A.04 Bed    | NO (-73%)                      | NO                    |
| L13.A.05 Bed    | NO (-73%)                      | NO                    |
| L13.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L13.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L13.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L13.B.02 Bed    | NO (-58.4%)                    | NO                    |
| L13.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L13.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L13.B.05 Bed    | NO (-63.6%)                    | NO                    |
| L13.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L13.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L13.C.01 Studio | NO (-89.4%)                    | NO                    |
| L14.A.01 Bed    | NO (-89.4%)                    | NO                    |
| L14.A.02 Bed    | NO (-84.2%)                    | NO                    |
| L14.A.03 Bed    | NO (-84.2%)                    | NO                    |
| L14.A.04 Bed    | NO (-58.4%)                    | NO                    |
| L14.A.05 Bed    | NO (-58.4%)                    | NO                    |
| L14.A.06 Bed    | NO (-88.1%)                    | NO                    |
| L14.B.01 Studio | NO (-83.2%)                    | NO                    |
| L15.A.01 Bed    | NO (-89.4%)                    | NO                    |
| L15.A.02 Bed    | NO (-84.2%)                    | NO                    |
| L15.A.03 Bed    | NO (-84.2%)                    | NO                    |
| L15.A.04 Bed    | NO (-58.4%)                    | NO                    |
| L15.A.05 Bed    | NO (-58.4%)                    | NO                    |
| L15.A.06 Bed    | NO (-88.1%)                    | NO                    |
| L15.B.01 Studio | NO (-83.2%)                    | NO                    |

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

Separate submission

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

Separate submission

#### **EPBD (Recast): Consideration of alternative energy systems**

|                                                                                               |     |
|-----------------------------------------------------------------------------------------------|-----|
| <b>Were alternative energy systems considered and analysed as part of the design process?</b> | 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 |
|-------------------------------------------------------|---------|----------|
| Area [m <sup>2</sup> ]                                | 7187.5  | 7187.5   |
| External area [m <sup>2</sup> ]                       | 6218.9  | 6218.9   |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3       | 3        |
| Average conductance [W/K]                             | 1874.71 | 3825.86  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.3     | 0.62     |
| Alpha value* [%]                                      | 10.11   | 10       |

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

## Building Use

### % Area Building Type

A1/A2 Retail/Financial and Professional services  
A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways  
B1 Offices and Workshop businesses  
B2 to B7 General Industrial and Special Industrial Groups  
B8 Storage or Distribution  
C1 Hotels  
C2 Residential Institutions: Hospitals and Care Homes  
C2 Residential Institutions: Residential schools  
**100 C2 Residential Institutions: Universities and colleges**  
C2A Secure Residential Institutions  
Residential spaces  
D1 Non-residential Institutions: Community/Day Centre  
D1 Non-residential Institutions: Libraries, Museums, and Galleries  
D1 Non-residential Institutions: Education  
D1 Non-residential Institutions: Primary Health Care Building  
D1 Non-residential Institutions: Crown and County Courts  
D2 General Assembly and Leisure, Night Clubs, and Theatres  
Others: Passenger terminals  
Others: Emergency services  
Others: Miscellaneous 24hr activities  
Others: Car Parks 24 hrs  
Others: Stand alone utility block

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

|                 | Actual        | Notional     |
|-----------------|---------------|--------------|
| Heating         | 9.8           | 23.99        |
| Cooling         | 0             | 0            |
| Auxiliary       | 7.8           | 4.37         |
| Lighting        | 6.43          | 13.11        |
| Hot water       | 96.42         | 95.62        |
| Equipment*      | 39.68         | 39.68        |
| <b>TOTAL **</b> | <b>120.45</b> | <b>137.1</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 31.47  | 74.44    |
| Primary energy* [kWh/m <sup>2</sup> ]         | 172.19 | 198.26   |
| Total emissions [kg/m <sup>2</sup> ]          | 30.1   | 34.7     |

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

| HVAC Systems Performance                                                                            |                   |                   |                    |                    |                   |               |               |                  |                  |  |
|-----------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|--|
| System Type                                                                                         | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |  |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 52                | 0                 | 16.2               | 0                  | 3.5               | 0.89          | 0             | 0.95             | 0                |  |
| Notional                                                                                            | 32.4              | 0                 | 10.4               | 0                  | 1.8               | 0.86          | 0             | ----             | ----             |  |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 36.6              | 0                 | 11.4               | 0                  | 11.1              | 0.89          | 0             | 0.95             | 0                |  |
| Notional                                                                                            | 105.7             | 0                 | 34.1               | 0                  | 6.2               | 0.86          | 0             | ----             | ----             |  |
| [ST] No Heating or Cooling                                                                          |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                              | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |  |
| Notional                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | ----             | ----             |  |

## Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs*  |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|------------------------------------------|
| Wall                                                                     | 0.23               | 0.15                                                               | L100002E:Surf[1]                         |
| Floor                                                                    | 0.2                | 0.13                                                               | L000001A:Surf[0]                         |
| Roof                                                                     | 0.15               | 0.13                                                               | L00000E6:Surf[0]                         |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.2                                                                | L00001A8:Surf[2]                         |
| Personnel doors                                                          | 1.5                | 1.5                                                                | L0000061:Surf[0]                         |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | No Vehicle access doors in building      |
| High usage entrance doors                                                | 1.5                | -                                                                  | No High usage entrance doors in building |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                          |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                          |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 3             |

## Project name

**211025 Avonmouth House Student Energy (be Green)**

As designed

Date: Mon Oct 25 10:23:58 2021

## Administrative information

## Building Details

Address: Address 1, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.13

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.13

BRUKL compliance check version: v5.6.b.0

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 30.6                |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 30.6                |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 24.9                |
| Are emissions from the building less than or equal to the target?                                  | BER ≤ TER           |
| Are as built details the same as used in the BER calculations?                                     | Separate submission |

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

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

## Building fabric

| Element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | Surface where the maximum value occurs*  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Wall**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.35                  | 0.15                 | 0.15                 | L0000061:Surf[2]                         |
| Floor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.25                  | 0.15                 | 0.15                 | LB000021:Surf[0]                         |
| Roof                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.25                  | 0.13                 | 0.15                 | SP000026:Surf[6]                         |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.2                   | 1.2                  | 1.2                  | L00001A8:Surf[2]                         |
| Personnel doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.2                   | 1.5                  | 1.5                  | L0000061:Surf[0]                         |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5                   | -                    | -                    | No Vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.5                   | -                    | -                    | No High usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)]<br>* There might be more than one surface where the maximum U-value occurs.<br>** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>*** Display windows and similar glazing are excluded from the U-value check.<br>N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 3             |

## Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- ASHP, No MVHR

|                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                | 3.13               | -                  | 0.2                | 0             | -             |
| <b>Standard value</b>                                                                                                                                             | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                              |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 2- ASHP, MVHR

|                                                                                                                                                                   | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                | 3.13               | -                  | 0.2                | 0             | 0.85          |
| <b>Standard value</b>                                                                                                                                             | 2.5*               | N/A                | N/A                | N/A           | 0.5           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                              |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards. |                    |                    |                    |               |               |

### 1- ASHP, DHW

|                                                                                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|--------------------------------------------------------------------------------|--------------------------|-----------------------------------------|
| <b>This building</b>                                                           | 2.58                     | 0.003                                   |
| <b>Standard value</b>                                                          | 2*                       | N/A                                     |
| * Standard shown is for all types except absorption and gas engine heat pumps. |                          |                                         |

## Local mechanical ventilation, exhaust, and terminal units

| ID | System type in Non-domestic Building Services Compliance Guide                                          |
|----|---------------------------------------------------------------------------------------------------------|
| A  | Local supply or extract ventilation units serving a single area                                         |
| B  | Zonal supply system where the fan is remote from the zone                                               |
| C  | Zonal extract system where the fan is remote from the zone                                              |
| D  | Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery |
| E  | Local supply and extract ventilation system serving a single area with heating and heat recovery        |
| F  | Other local ventilation units                                                                           |
| G  | Fan-assisted terminal VAV unit                                                                          |
| H  | Fan coil units                                                                                          |
| I  | Zonal extract system where the fan is remote from the zone with grease filter                           |

| Zone name         | SFP [W/(l/s)] |     |     |     |     |     |     |     |   |   | HR efficiency |          |
|-------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---|---------------|----------|
| ID of system type | A             | B   | C   | D   | E   | F   | G   | H   | I |   | Zone          | Standard |
| Standard value    | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |   |               |          |
| L00 WC            | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |
| L02.A LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |
| L02.A.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |
| L02.A.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |
| L02.A.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |
| L02.A.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |
| L02.A.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L02.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.A.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.B.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L02.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name    | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|--------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|              | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|              | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L03.A LKD    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.04 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.04 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.05 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.05 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.06 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.06 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.07 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.07 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.08 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.A.08 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B LKD    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.04 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.04 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.05 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.05 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.06 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.06 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.07 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.07 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.08 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.B.08 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C LKD    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.01 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.01 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.02 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.02 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.03 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.03 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.04 Bed |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.04 WC  |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name         | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|-------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type | A             | B   | C   | D   | E   | F   | G   | H   | I |               |          |
| Standard value    | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L03.C.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.C.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.D.01 Studio   | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L03.D.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.08 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.A.08 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.08 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.B.08 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L04.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L04.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.A.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L05.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.B.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L05.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.A.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L06.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.08 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.B.08 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.C.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.D.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L06.D.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L07.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.01 studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.02 studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.03 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L07.C.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L08.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L09.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L09.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name         | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|-------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type | A             | B   | C   | D   | E   | F   | G   | H   | I |               |          |
| Standard value    | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L10.A.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.A.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B. LKD        | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.B.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.C.01 Studio   | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L10.C.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A LKD         | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.04 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.04 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.05 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.05 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.06 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.06 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.07 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.A.07 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B. LKD        | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.01 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.01 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.02 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.02 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.03 Bed      | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.03 WC       | -             | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L11.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L11.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L12.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L13.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.A.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B. LKD      |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.07 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.B.07 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.C.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L13.C.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| Zone name       | SFP [W/(l/s)]     |     |     |     |     |     |     |     |     |   | HR efficiency |          |
|-----------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
|                 | ID of system type | A   | B   | C   | D   | E   | F   | G   | H   | I |               |          |
|                 | Standard value    | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| L14.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.B.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L14.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A LKD       |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.01 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.02 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.02 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.03 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.03 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.04 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.04 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.05 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.05 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.06 Bed    |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.A.06 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.B.01 Studio |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |
| L15.B.01 WC     |                   | -   | -   | -   | 1   | -   | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L00 bin store                         |                | 100                      | -    | -            | 54                   |
| L00 Circ                              |                | -                        | 100  | -            | 54                   |
| L00 Circ                              |                | -                        | 100  | -            | 53                   |
| L00 concierge                         |                | -                        | 100  | 60           | 191                  |
| L00 lift lobby                        |                | -                        | 100  | 60           | 97                   |
| L00 office                            |                | 100                      | -    | -            | 274                  |
| L00 Plant                             |                | 100                      | -    | -            | 100                  |
| L00 post                              |                | 100                      | -    | -            | 171                  |
| L00 stairs                            |                | -                        | 100  | -            | 47                   |
| L00 WC                                |                | -                        | 100  | -            | 33                   |
| L00 WC Circ                           |                | -                        | 100  | -            | 22                   |
| L01 Circ                              |                | -                        | 100  | -            | 67                   |
| L01 Stairs                            |                | -                        | 100  | -            | 37                   |
| L02 Circ                              |                | -                        | 100  | -            | 52                   |
| L02 Stairs                            |                | -                        | 100  | -            | 31                   |
| L02.A Circ                            |                | -                        | 100  | -            | 56                   |
| L02.A LKD                             |                | -                        | 100  | -            | 230                  |
| L02.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L02.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L02.A.02 WC                           |                | -                        | 100  | -            | 19                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L02.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L02.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L02.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L02.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L02.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L02.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L02.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B Circ                            |                | -                        | 100  | -            | 72                   |
| L02.B LKD                             |                | -                        | 100  | -            | 321                  |
| L02.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L02.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L02.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C Circ                            |                | -                        | 100  | -            | 58                   |
| L02.C LKD                             |                | -                        | 100  | -            | 264                  |
| L02.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L02.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L02.C.06 Bed                          |                | -                        | 100  | -            | 24                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L02.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L02.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L02.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L03 Circ                              |                | -                        | 100  | -            | 52                   |
| L03 Stairs                            |                | -                        | 100  | -            | 31                   |
| L03.A Circ                            |                | -                        | 100  | -            | 56                   |
| L03.A LKD                             |                | -                        | 100  | -            | 230                  |
| L03.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L03.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L03.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L03.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L03.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L03.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L03.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L03.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L03.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B Circ                            |                | -                        | 100  | -            | 72                   |
| L03.B LKD                             |                | -                        | 100  | -            | 321                  |
| L03.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L03.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L03.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L03.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L03.C Circ                            |                | -                        | 100  | -            | 58                   |
| L03.C LKD                             |                | -                        | 100  | -            | 264                  |

| General lighting and display lighting | Luminous efficacy [lm/W] |      |              |                      |
|---------------------------------------|--------------------------|------|--------------|----------------------|
| Zone name                             | Luminaire                | Lamp | Display lamp | General lighting [W] |
| Standard value                        | 60                       | 60   | 22           |                      |
| L03.C.01 Bed                          | -                        | 100  | -            | 24                   |
| L03.C.01 WC                           | -                        | 100  | -            | 17                   |
| L03.C.02 Bed                          | -                        | 100  | -            | 24                   |
| L03.C.02 WC                           | -                        | 100  | -            | 17                   |
| L03.C.03 Bed                          | -                        | 100  | -            | 24                   |
| L03.C.03 WC                           | -                        | 100  | -            | 17                   |
| L03.C.04 Bed                          | -                        | 100  | -            | 24                   |
| L03.C.04 WC                           | -                        | 100  | -            | 17                   |
| L03.C.05 Bed                          | -                        | 100  | -            | 24                   |
| L03.C.05 WC                           | -                        | 100  | -            | 17                   |
| L03.C.06 Bed                          | -                        | 100  | -            | 24                   |
| L03.C.06 WC                           | -                        | 100  | -            | 17                   |
| L03.D.01 Studio                       | -                        | 100  | -            | 31                   |
| L03.D.01 WC                           | -                        | 100  | -            | 29                   |
| L04 Circ                              | -                        | 100  | -            | 52                   |
| L04 Stairs                            | -                        | 100  | -            | 31                   |
| L04.A Circ                            | -                        | 100  | -            | 56                   |
| L04.A LKD                             | -                        | 100  | -            | 230                  |
| L04.A.01 Bed                          | -                        | 100  | -            | 22                   |
| L04.A.01 WC                           | -                        | 100  | -            | 19                   |
| L04.A.02 Bed                          | -                        | 100  | -            | 22                   |
| L04.A.02 WC                           | -                        | 100  | -            | 19                   |
| L04.A.03 Bed                          | -                        | 100  | -            | 25                   |
| L04.A.03 WC                           | -                        | 100  | -            | 20                   |
| L04.A.04 Bed                          | -                        | 100  | -            | 24                   |
| L04.A.04 WC                           | -                        | 100  | -            | 19                   |
| L04.A.05 Bed                          | -                        | 100  | -            | 24                   |
| L04.A.05 WC                           | -                        | 100  | -            | 19                   |
| L04.A.06 Bed                          | -                        | 100  | -            | 23                   |
| L04.A.06 WC                           | -                        | 100  | -            | 19                   |
| L04.A.07 Bed                          | -                        | 100  | -            | 23                   |
| L04.A.07 WC                           | -                        | 100  | -            | 16                   |
| L04.A.08 Bed                          | -                        | 100  | -            | 24                   |
| L04.A.08 WC                           | -                        | 100  | -            | 17                   |
| L04.B Circ                            | -                        | 100  | -            | 72                   |
| L04.B LKD                             | -                        | 100  | -            | 321                  |
| L04.B.01 Bed                          | -                        | 100  | -            | 24                   |
| L04.B.01 WC                           | -                        | 100  | -            | 17                   |
| L04.B.02 Bed                          | -                        | 100  | -            | 26                   |
| L04.B.02 WC                           | -                        | 100  | -            | 17                   |
| L04.B.03 Bed                          | -                        | 100  | -            | 26                   |
| L04.B.03 WC                           | -                        | 100  | -            | 17                   |
| L04.B.04 Bed                          | -                        | 100  | -            | 26                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L04.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L04.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L04.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C Circ                            |                | -                        | 100  | -            | 58                   |
| L04.C LKD                             |                | -                        | 100  | -            | 264                  |
| L04.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L04.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L04.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L04.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L04.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L05 Circ                              |                | -                        | 100  | -            | 52                   |
| L05 Stairs                            |                | -                        | 100  | -            | 31                   |
| L05.A Circ                            |                | -                        | 100  | -            | 56                   |
| L05.A LKD                             |                | -                        | 100  | -            | 230                  |
| L05.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L05.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L05.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L05.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L05.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L05.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L05.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L05.A.07 WC                           |                | -                        | 100  | -            | 16                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L05.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B Circ                            |                | -                        | 100  | -            | 72                   |
| L05.B LKD                             |                | -                        | 100  | -            | 321                  |
| L05.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L05.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L05.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C Circ                            |                | -                        | 100  | -            | 58                   |
| L05.C LKD                             |                | -                        | 100  | -            | 264                  |
| L05.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.05 WC                           |                | -                        | 100  | -            | 17                   |
| L05.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L05.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L05.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L05.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L06 Circ                              |                | -                        | 100  | -            | 52                   |
| L06 Stairs                            |                | -                        | 100  | -            | 31                   |
| L06.A Circ                            |                | -                        | 100  | -            | 56                   |
| L06.A LKD                             |                | -                        | 100  | -            | 230                  |
| L06.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L06.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.02 Bed                          |                | -                        | 100  | -            | 22                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L06.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L06.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L06.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L06.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L06.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L06.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L06.A.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.A.08 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B Circ                            |                | -                        | 100  | -            | 72                   |
| L06.B LKD                             |                | -                        | 100  | -            | 321                  |
| L06.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.02 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.05 Bed                          |                | -                        | 100  | -            | 26                   |
| L06.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.06 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.07 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.07 WC                           |                | -                        | 100  | -            | 17                   |
| L06.B.08 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.B.08 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C Circ                            |                | -                        | 100  | -            | 58                   |
| L06.C LKD                             |                | -                        | 100  | -            | 264                  |
| L06.C.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.01 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.02 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.03 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.03 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.04 WC                           |                | -                        | 100  | -            | 17                   |
| L06.C.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.05 WC                           |                | -                        | 100  | -            | 17                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L06.C.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L06.C.06 WC                           |                | -                        | 100  | -            | 17                   |
| L06.D.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L06.D.01 WC                           |                | -                        | 100  | -            | 29                   |
| L07 Stairs                            |                | -                        | 100  | -            | 31                   |
| L07.A Circ                            |                | -                        | 100  | -            | 47                   |
| L07.A LKD                             |                | -                        | 100  | -            | 230                  |
| L07.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L07.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L07.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L07.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L07.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L07.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L07.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L07.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L07.B Circ                            |                | -                        | 100  | -            | 61                   |
| L07.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L07.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L07.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L07.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L07.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L07.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L07.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L07.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L07.C Circ                            |                | -                        | 100  | -            | 79                   |
| L07.C.01 studio                       |                | -                        | 100  | -            | 30                   |
| L07.C.01 WC                           |                | -                        | 100  | -            | 21                   |
| L07.C.02 studio                       |                | -                        | 100  | -            | 29                   |
| L07.C.02 WC                           |                | -                        | 100  | -            | 21                   |
| L07.C.03 Studio                       |                | -                        | 100  | -            | 31                   |
| L07.C.03 WC                           |                | -                        | 100  | -            | 29                   |
| L08 Circ                              |                | -                        | 100  | -            | 52                   |
| L08 Stairs                            |                | -                        | 100  | -            | 31                   |
| L08.A Circ                            |                | -                        | 100  | -            | 47                   |
| L08.A LKD                             |                | -                        | 100  | -            | 230                  |
| L08.A.01 Bed                          |                | -                        | 100  | -            | 22                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L08.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L08.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L08.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L08.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L08.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L08.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L08.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L08.B Circ                            |                | -                        | 100  | -            | 79                   |
| L08.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L08.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L08.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L08.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L08.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L08.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L08.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L08.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L08.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L08.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L09 Circ                              |                | -                        | 100  | -            | 52                   |
| L09 Stairs                            |                | -                        | 100  | -            | 31                   |
| L09.A Circ                            |                | -                        | 100  | -            | 47                   |
| L09.A LKD                             |                | -                        | 100  | -            | 230                  |
| L09.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L09.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L09.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L09.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L09.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.A.04 WC                           |                | -                        | 100  | -            | 19                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L09.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L09.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L09.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L09.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L09.B Circ                            |                | -                        | 100  | -            | 79                   |
| L09.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L09.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L09.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L09.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L09.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L09.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L09.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L09.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L09.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L09.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L10 Circ                              |                | -                        | 100  | -            | 52                   |
| L10 Stairs                            |                | -                        | 100  | -            | 31                   |
| L10.A Circ                            |                | -                        | 100  | -            | 47                   |
| L10.A LKD                             |                | -                        | 100  | -            | 230                  |
| L10.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L10.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L10.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L10.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L10.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L10.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L10.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L10.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L10.B Circ                            |                | -                        | 100  | -            | 79                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L10.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L10.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L10.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L10.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L10.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L10.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L10.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L10.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L10.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L10.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L11 Circ                              |                | -                        | 100  | -            | 52                   |
| L11 Stairs                            |                | -                        | 100  | -            | 31                   |
| L11.A Circ                            |                | -                        | 100  | -            | 47                   |
| L11.A LKD                             |                | -                        | 100  | -            | 230                  |
| L11.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L11.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L11.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L11.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L11.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L11.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L11.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L11.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L11.B Circ                            |                | -                        | 100  | -            | 79                   |
| L11.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L11.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L11.B.03 WC                           |                | -                        | 100  | -            | 17                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L11.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L11.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L11.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L11.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L11.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L11.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L11.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L11.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L12 Circ                              |                | -                        | 100  | -            | 52                   |
| L12 Stairs                            |                | -                        | 100  | -            | 31                   |
| L12.A Circ                            |                | -                        | 100  | -            | 47                   |
| L12.A LKD                             |                | -                        | 100  | -            | 230                  |
| L12.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L12.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L12.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L12.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L12.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L12.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L12.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L12.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L12.B Circ                            |                | -                        | 100  | -            | 79                   |
| L12.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L12.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L12.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L12.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L12.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L12.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L12.B.07 Bed                          |                | -                        | 100  | -            | 29                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L12.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L12.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L12.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L13 Circ                              |                | -                        | 100  | -            | 52                   |
| L13 Stairs                            |                | -                        | 100  | -            | 31                   |
| L13.A Circ                            |                | -                        | 100  | -            | 47                   |
| L13.A LKD                             |                | -                        | 100  | -            | 230                  |
| L13.A.01 Bed                          |                | -                        | 100  | -            | 22                   |
| L13.A.01 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L13.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.03 Bed                          |                | -                        | 100  | -            | 25                   |
| L13.A.03 WC                           |                | -                        | 100  | -            | 20                   |
| L13.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.A.04 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.A.05 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.06 Bed                          |                | -                        | 100  | -            | 23                   |
| L13.A.06 WC                           |                | -                        | 100  | -            | 19                   |
| L13.A.07 Bed                          |                | -                        | 100  | -            | 23                   |
| L13.A.07 WC                           |                | -                        | 100  | -            | 16                   |
| L13.B Circ                            |                | -                        | 100  | -            | 79                   |
| L13.B. LKD                            |                | -                        | 100  | -            | 283                  |
| L13.B.01 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.01 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.02 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.02 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.03 Bed                          |                | -                        | 100  | -            | 26                   |
| L13.B.03 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.04 Bed                          |                | -                        | 100  | -            | 26                   |
| L13.B.04 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.05 WC                           |                | -                        | 100  | -            | 17                   |
| L13.B.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L13.B.06 WC                           |                | -                        | 100  | -            | 18                   |
| L13.B.07 Bed                          |                | -                        | 100  | -            | 29                   |
| L13.B.07 WC                           |                | -                        | 100  | -            | 19                   |
| L13.C.01 Studio                       |                | -                        | 100  | -            | 31                   |
| L13.C.01 WC                           |                | -                        | 100  | -            | 29                   |
| L14 Circ                              |                | -                        | 100  | -            | 50                   |
| L14 Stairs                            |                | -                        | 100  | -            | 31                   |
| L14.A Circ                            |                | -                        | 100  | -            | 61                   |
| L14.A LKD                             |                | -                        | 100  | -            | 243                  |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| L14.A.01 Bed                          |                | -                        | 100  | -            | 21                   |
| L14.A.01 WC                           |                | -                        | 100  | -            | 20                   |
| L14.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L14.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L14.A.03 Bed                          |                | -                        | 100  | -            | 22                   |
| L14.A.03 WC                           |                | -                        | 100  | -            | 19                   |
| L14.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L14.A.04 WC                           |                | -                        | 100  | -            | 17                   |
| L14.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L14.A.05 WC                           |                | -                        | 100  | -            | 16                   |
| L14.A.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L14.A.06 WC                           |                | -                        | 100  | -            | 16                   |
| L14.B.01 Studio                       |                | -                        | 100  | -            | 29                   |
| L14.B.01 WC                           |                | -                        | 100  | -            | 22                   |
| L15 Circ                              |                | -                        | 100  | -            | 50                   |
| L15 Stairs                            |                | -                        | 100  | -            | 31                   |
| L15.A Circ                            |                | -                        | 100  | -            | 61                   |
| L15.A LKD                             |                | -                        | 100  | -            | 243                  |
| L15.A.01 Bed                          |                | -                        | 100  | -            | 21                   |
| L15.A.01 WC                           |                | -                        | 100  | -            | 20                   |
| L15.A.02 Bed                          |                | -                        | 100  | -            | 22                   |
| L15.A.02 WC                           |                | -                        | 100  | -            | 19                   |
| L15.A.03 Bed                          |                | -                        | 100  | -            | 22                   |
| L15.A.03 WC                           |                | -                        | 100  | -            | 19                   |
| L15.A.04 Bed                          |                | -                        | 100  | -            | 24                   |
| L15.A.04 WC                           |                | -                        | 100  | -            | 17                   |
| L15.A.05 Bed                          |                | -                        | 100  | -            | 24                   |
| L15.A.05 WC                           |                | -                        | 100  | -            | 16                   |
| L15.A.06 Bed                          |                | -                        | 100  | -            | 24                   |
| L15.A.06 WC                           |                | -                        | 100  | -            | 16                   |
| L15.B.01 Studio                       |                | -                        | 100  | -            | 29                   |
| L15.B.01 WC                           |                | -                        | 100  | -            | 22                   |
| LB1 Circ                              |                | -                        | 100  | -            | 54                   |
| LB1 stairs                            |                | -                        | 100  | -            | 47                   |
| LB2 Circ                              |                | -                        | 100  | -            | 41                   |
| LB2 Circ                              |                | -                        | 100  | -            | 44                   |
| LB2 Circ                              |                | -                        | 100  | -            | 69                   |
| LB2 cycle store                       |                | 100                      | -    | -            | 156                  |
| LB2 cycle store                       |                | 100                      | -    | -            | 60                   |
| LB2 laundry                           |                | -                        | 100  | -            | 133                  |
| LB2 plant                             |                | 100                      | -    | -            | 87                   |
| LB2 plant                             |                | 100                      | -    | -            | 911                  |
| LB2 stairs                            |                | -                        | 100  | -            | 47                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              |
|---------------------------------------|----------------|--------------------------|------|--------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |
|                                       | Standard value | 60                       | 60   | 22           |
| LB2 store                             |                | 100                      | -    | -            |
|                                       |                |                          |      | 24           |

### Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L00 concierge   | NO (-48.4%)                    | NO                    |
| L00 lift lobby  | NO (-27.8%)                    | NO                    |
| L00 office      | NO (-45.7%)                    | NO                    |
| L00 post        | N/A                            | N/A                   |
| L02.A.01 Bed    | NO (-83.8%)                    | NO                    |
| L02.A.02 Bed    | NO (-91.1%)                    | NO                    |
| L02.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L02.A.04 Bed    | NO (-73%)                      | NO                    |
| L02.A.05 Bed    | NO (-73%)                      | NO                    |
| L02.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L02.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L02.A.08 Bed    | NO (-57%)                      | NO                    |
| L02.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L02.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L02.B.03 Bed    | NO (-57%)                      | NO                    |
| L02.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L02.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L02.B.06 Bed    | NO (-57%)                      | NO                    |
| L02.B.07 Bed    | NO (-57%)                      | NO                    |
| L02.B.08 Bed    | NO (-57%)                      | NO                    |
| L02.C.01 Bed    | NO (-69.9%)                    | NO                    |
| L02.C.02 Bed    | NO (-70%)                      | NO                    |
| L02.C.03 Bed    | NO (-70.6%)                    | NO                    |
| L02.C.04 Bed    | NO (-71.3%)                    | NO                    |
| L02.C.05 Bed    | NO (-74.8%)                    | NO                    |
| L02.C.06 Bed    | NO (-79.2%)                    | NO                    |
| L02.D.01 Studio | NO (-94.9%)                    | NO                    |
| L03.A.01 Bed    | NO (-75%)                      | NO                    |
| L03.A.02 Bed    | NO (-87%)                      | NO                    |
| L03.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L03.A.04 Bed    | NO (-73%)                      | NO                    |
| L03.A.05 Bed    | NO (-73%)                      | NO                    |
| L03.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L03.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L03.A.08 Bed    | NO (-57%)                      | NO                    |
| L03.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L03.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L03.B.03 Bed    | NO (-57%)                      | NO                    |
| L03.B.04 Bed    | NO (-56.1%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L03.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L03.B.06 Bed    | NO (-57%)                      | NO                    |
| L03.B.07 Bed    | NO (-57%)                      | NO                    |
| L03.B.08 Bed    | NO (-57%)                      | NO                    |
| L03.C.01 Bed    | NO (-68.4%)                    | NO                    |
| L03.C.02 Bed    | NO (-68.2%)                    | NO                    |
| L03.C.03 Bed    | NO (-68.2%)                    | NO                    |
| L03.C.04 Bed    | NO (-68.2%)                    | NO                    |
| L03.C.05 Bed    | NO (-71.1%)                    | NO                    |
| L03.C.06 Bed    | NO (-73.9%)                    | NO                    |
| L03.D.01 Studio | NO (-92%)                      | NO                    |
| L04.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L04.A.02 Bed    | NO (-84%)                      | NO                    |
| L04.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L04.A.04 Bed    | NO (-73%)                      | NO                    |
| L04.A.05 Bed    | NO (-73%)                      | NO                    |
| L04.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L04.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L04.A.08 Bed    | NO (-57%)                      | NO                    |
| L04.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L04.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L04.B.03 Bed    | NO (-57%)                      | NO                    |
| L04.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L04.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L04.B.06 Bed    | NO (-57%)                      | NO                    |
| L04.B.07 Bed    | NO (-57%)                      | NO                    |
| L04.B.08 Bed    | NO (-57%)                      | NO                    |
| L04.C.01 Bed    | NO (-68.4%)                    | NO                    |
| L04.C.02 Bed    | NO (-68.2%)                    | NO                    |
| L04.C.03 Bed    | NO (-67.8%)                    | NO                    |
| L04.C.04 Bed    | NO (-67.4%)                    | NO                    |
| L04.C.05 Bed    | NO (-67.9%)                    | NO                    |
| L04.C.06 Bed    | NO (-70.6%)                    | NO                    |
| L04.D.01 Studio | NO (-89.6%)                    | NO                    |
| L05.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L05.A.02 Bed    | NO (-84%)                      | NO                    |
| L05.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L05.A.04 Bed    | NO (-73%)                      | NO                    |
| L05.A.05 Bed    | NO (-73%)                      | NO                    |
| L05.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L05.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L05.A.08 Bed    | NO (-57%)                      | NO                    |
| L05.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L05.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L05.B.03 Bed    | NO (-57%)                      | NO                    |
| L05.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L05.B.05 Bed    | NO (-67.4%)                    | NO                    |
| L05.B.06 Bed    | NO (-57%)                      | NO                    |
| L05.B.07 Bed    | NO (-57%)                      | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L05.B.08 Bed    | NO (-57%)                      | NO                    |
| L05.C.01 Bed    | NO (-68%)                      | NO                    |
| L05.C.02 Bed    | NO (-67.8%)                    | NO                    |
| L05.C.03 Bed    | NO (-67.7%)                    | NO                    |
| L05.C.04 Bed    | NO (-67.3%)                    | NO                    |
| L05.C.05 Bed    | NO (-67.9%)                    | NO                    |
| L05.C.06 Bed    | NO (-70.5%)                    | NO                    |
| L05.D.01 Studio | NO (-89.6%)                    | NO                    |
| L06.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L06.A.02 Bed    | NO (-84%)                      | NO                    |
| L06.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L06.A.04 Bed    | NO (-73%)                      | NO                    |
| L06.A.05 Bed    | NO (-73%)                      | NO                    |
| L06.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L06.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L06.A.08 Bed    | NO (-57%)                      | NO                    |
| L06.B.01 Bed    | NO (-57.1%)                    | NO                    |
| L06.B.02 Bed    | NO (-67.4%)                    | NO                    |
| L06.B.03 Bed    | NO (-56.7%)                    | NO                    |
| L06.B.04 Bed    | NO (-56.1%)                    | NO                    |
| L06.B.05 Bed    | NO (-67.2%)                    | NO                    |
| L06.B.06 Bed    | NO (-57%)                      | NO                    |
| L06.B.07 Bed    | NO (-57%)                      | NO                    |
| L06.B.08 Bed    | NO (-57%)                      | NO                    |
| L06.C.01 Bed    | NO (-67.9%)                    | NO                    |
| L06.C.02 Bed    | NO (-67.8%)                    | NO                    |
| L06.C.03 Bed    | NO (-67.7%)                    | NO                    |
| L06.C.04 Bed    | NO (-67.2%)                    | NO                    |
| L06.C.05 Bed    | NO (-67.9%)                    | NO                    |
| L06.C.06 Bed    | NO (-70.5%)                    | NO                    |
| L06.D.01 Studio | NO (-89.6%)                    | NO                    |
| L07.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L07.A.02 Bed    | NO (-84%)                      | NO                    |
| L07.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L07.A.04 Bed    | NO (-73%)                      | NO                    |
| L07.A.05 Bed    | NO (-73%)                      | NO                    |
| L07.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L07.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L07.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L07.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L07.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L07.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L07.C.01 studio | NO (-79.2%)                    | NO                    |
| L07.C.02 studio | NO (-80.7%)                    | NO                    |
| L07.C.03 Studio | NO (-89.6%)                    | NO                    |
| L08.A.01 Bed    | NO (-68.1%)                    | NO                    |
| L08.A.02 Bed    | NO (-84%)                      | NO                    |
| L08.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L08.A.04 Bed    | NO (-73%)                      | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L08.A.05 Bed    | NO (-73%)                      | NO                    |
| L08.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L08.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L08.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L08.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L08.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L08.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L08.B.05 Bed    | NO (-64.3%)                    | NO                    |
| L08.B.06 Bed    | NO (-64.9%)                    | NO                    |
| L08.B.07 Bed    | NO (-88.7%)                    | NO                    |
| L08.C.01 Studio | NO (-89.6%)                    | NO                    |
| L09.A.01 Bed    | NO (-68%)                      | NO                    |
| L09.A.02 Bed    | NO (-84%)                      | NO                    |
| L09.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L09.A.04 Bed    | NO (-73%)                      | NO                    |
| L09.A.05 Bed    | NO (-73%)                      | NO                    |
| L09.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L09.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L09.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L09.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L09.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L09.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L09.B.05 Bed    | NO (-64.4%)                    | NO                    |
| L09.B.06 Bed    | NO (-64.9%)                    | NO                    |
| L09.B.07 Bed    | NO (-88.7%)                    | NO                    |
| L09.C.01 Studio | NO (-89.5%)                    | NO                    |
| L10.A.01 Bed    | NO (-68%)                      | NO                    |
| L10.A.02 Bed    | NO (-84%)                      | NO                    |
| L10.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L10.A.04 Bed    | NO (-73%)                      | NO                    |
| L10.A.05 Bed    | NO (-73%)                      | NO                    |
| L10.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L10.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L10.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L10.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L10.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L10.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L10.B.05 Bed    | NO (-63.8%)                    | NO                    |
| L10.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L10.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L10.C.01 Studio | NO (-89.4%)                    | NO                    |
| L11.A.01 Bed    | NO (-68%)                      | NO                    |
| L11.A.02 Bed    | NO (-84%)                      | NO                    |
| L11.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L11.A.04 Bed    | NO (-73%)                      | NO                    |
| L11.A.05 Bed    | NO (-73%)                      | NO                    |
| L11.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L11.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L11.B.01 Bed    | NO (-58.4%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L11.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L11.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L11.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L11.B.05 Bed    | NO (-63.8%)                    | NO                    |
| L11.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L11.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L11.C.01 Studio | NO (-89.4%)                    | NO                    |
| L12.A.01 Bed    | NO (-68%)                      | NO                    |
| L12.A.02 Bed    | NO (-84%)                      | NO                    |
| L12.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L12.A.04 Bed    | NO (-73%)                      | NO                    |
| L12.A.05 Bed    | NO (-73%)                      | NO                    |
| L12.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L12.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L12.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L12.B.02 Bed    | NO (-58.5%)                    | NO                    |
| L12.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L12.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L12.B.05 Bed    | NO (-63.8%)                    | NO                    |
| L12.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L12.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L12.C.01 Studio | NO (-89.4%)                    | NO                    |
| L13.A.01 Bed    | NO (-67.8%)                    | NO                    |
| L13.A.02 Bed    | NO (-83.9%)                    | NO                    |
| L13.A.03 Bed    | NO (-89.3%)                    | NO                    |
| L13.A.04 Bed    | NO (-73%)                      | NO                    |
| L13.A.05 Bed    | NO (-73%)                      | NO                    |
| L13.A.06 Bed    | NO (-71.9%)                    | NO                    |
| L13.A.07 Bed    | NO (-86.6%)                    | NO                    |
| L13.B.01 Bed    | NO (-58.4%)                    | NO                    |
| L13.B.02 Bed    | NO (-58.4%)                    | NO                    |
| L13.B.03 Bed    | NO (-68.5%)                    | NO                    |
| L13.B.04 Bed    | NO (-58.4%)                    | NO                    |
| L13.B.05 Bed    | NO (-63.6%)                    | NO                    |
| L13.B.06 Bed    | NO (-64.4%)                    | NO                    |
| L13.B.07 Bed    | NO (-88.6%)                    | NO                    |
| L13.C.01 Studio | NO (-89.4%)                    | NO                    |
| L14.A.01 Bed    | NO (-89.4%)                    | NO                    |
| L14.A.02 Bed    | NO (-84.2%)                    | NO                    |
| L14.A.03 Bed    | NO (-84.2%)                    | NO                    |
| L14.A.04 Bed    | NO (-58.4%)                    | NO                    |
| L14.A.05 Bed    | NO (-58.4%)                    | NO                    |
| L14.A.06 Bed    | NO (-88.1%)                    | NO                    |
| L14.B.01 Studio | NO (-83.2%)                    | NO                    |
| L15.A.01 Bed    | NO (-89.4%)                    | NO                    |
| L15.A.02 Bed    | NO (-84.2%)                    | NO                    |
| L15.A.03 Bed    | NO (-84.2%)                    | NO                    |
| L15.A.04 Bed    | NO (-58.4%)                    | NO                    |
| L15.A.05 Bed    | NO (-58.4%)                    | NO                    |

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| L15.A.06 Bed    | NO (-88.1%)                    | NO                    |
| L15.B.01 Studio | NO (-83.2%)                    | NO                    |

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

Separate submission

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

Separate submission

#### EPBD (Recast): Consideration of alternative energy systems

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Area [m <sup>2</sup> ]                                | 7187.5  | 7187.5   |
| External area [m <sup>2</sup> ]                       | 6218.9  | 6218.9   |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3       | 3        |
| Average conductance [W/K]                             | 1874.71 | 3825.86  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.3     | 0.62     |
| Alpha value* [%]                                      | 10.11   | 10       |

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

## Building Use

### % Area Building Type

A1/A2 Retail/Financial and Professional services  
A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways  
B1 Offices and Workshop businesses  
B2 to B7 General Industrial and Special Industrial Groups  
B8 Storage or Distribution  
C1 Hotels  
C2 Residential Institutions: Hospitals and Care Homes  
C2 Residential Institutions: Residential schools  
**100 C2 Residential Institutions: Universities and colleges**  
C2A Secure Residential Institutions  
Residential spaces  
D1 Non-residential Institutions: Community/Day Centre  
D1 Non-residential Institutions: Libraries, Museums, and Galleries  
D1 Non-residential Institutions: Education  
D1 Non-residential Institutions: Primary Health Care Building  
D1 Non-residential Institutions: Crown and County Courts  
D2 General Assembly and Leisure, Night Clubs, and Theatres  
Others: Passenger terminals  
Others: Emergency services  
Others: Miscellaneous 24hr activities  
Others: Car Parks 24 hrs  
Others: Stand alone utility block

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

|                 | Actual       | Notional     |
|-----------------|--------------|--------------|
| Heating         | 2.97         | 8.08         |
| Cooling         | 0            | 0            |
| Auxiliary       | 7.8          | 4.37         |
| Lighting        | 6.43         | 13.11        |
| Hot water       | 34.11        | 38.57        |
| Equipment*      | 39.68        | 39.68        |
| <b>TOTAL **</b> | <b>51.32</b> | <b>64.14</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 2.14   | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 31.47  | 74.44    |
| Primary energy* [kWh/m <sup>2</sup> ]         | 153.6  | 191.98   |
| Total emissions [kg/m <sup>2</sup> ]          | 24.9   | 30.6     |

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

| HVAC Systems Performance                                                                                                 |                   |                   |                    |                    |                   |               |               |                  |                  |  |
|--------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|--|
| System Type                                                                                                              | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |  |
| [ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                                                   | 52                | 0                 | 4.9                | 0                  | 3.5               | 2.94          | 0             | 3.13             | 0                |  |
| Notional                                                                                                                 | 32.4              | 0                 | 3.5                | 0                  | 1.8               | 2.56          | 0             | ----             | ----             |  |
| [ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                                                   | 36.6              | 0                 | 3.5                | 0                  | 11.1              | 2.94          | 0             | 3.13             | 0                |  |
| Notional                                                                                                                 | 105.7             | 0                 | 11.5               | 0                  | 6.2               | 2.56          | 0             | ----             | ----             |  |
| [ST] No Heating or Cooling                                                                                               |                   |                   |                    |                    |                   |               |               |                  |                  |  |
| Actual                                                                                                                   | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |  |
| Notional                                                                                                                 | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | ----             | ----             |  |

### Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

# Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

## Building fabric

| Element                                                                  | U <sub>i-Typ</sub> | U <sub>i-Min</sub>                                                 | Surface where the minimum value occurs*  |
|--------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------|------------------------------------------|
| Wall                                                                     | 0.23               | 0.15                                                               | L100002E:Surf[1]                         |
| Floor                                                                    | 0.2                | 0.13                                                               | L000001A:Surf[0]                         |
| Roof                                                                     | 0.15               | 0.13                                                               | L00000E6:Surf[0]                         |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.2                                                                | L00001A8:Surf[2]                         |
| Personnel doors                                                          | 1.5                | 1.5                                                                | L0000061:Surf[0]                         |
| Vehicle access & similar large doors                                     | 1.5                | -                                                                  | No Vehicle access doors in building      |
| High usage entrance doors                                                | 1.5                | -                                                                  | No High usage entrance doors in building |
| U <sub>i-Typ</sub> = Typical individual element U-values [W/(m²K)]       |                    | U <sub>i-Min</sub> = Minimum individual element U-values [W/(m²K)] |                                          |
| * There might be more than one surface where the minimum U-value occurs. |                    |                                                                    |                                          |

| Air Permeability   | Typical value | This building |
|--------------------|---------------|---------------|
| m³/(h.m²) at 50 Pa | 5             | 3             |

5.2 Heat Pump Data

# TECHNICAL PRODUCT SUBMITTAL

## AMICUS LAHP-852HT AIR SOURCE HEAT PUMP

| EFFICIENCY DATA -Part L2                               |                   |               |
|--------------------------------------------------------|-------------------|---------------|
| Heating Capacity (EN14511) external air+7C 30/35 flow  | kW                | 80.1          |
| Total Power input (EN14511) external air+7C 30/35 flow | kW                | 18.4          |
| COP (EN14511) external air+7C 30/35 flow               | W/W               | 4.35          |
| EFFICIENCY DATA -ErP and Energy Label                  |                   |               |
| Energy Label Rating Low temperature                    |                   | A++           |
| SCOP Low Temperature                                   |                   | 3.83          |
| Seasonal Efficiency Low temperature                    | %                 | 150.1         |
| Energy Label Rating High temperature                   |                   | A+            |
| SCOP High Temperature                                  |                   | 3.13          |
| Seasonal Efficiency High temperature                   | %                 | 122           |
| GENERAL                                                |                   |               |
| Refrigerant type                                       |                   | R410A         |
| Compressor Type                                        |                   | E.V.I. Scroll |
| Number of Compressors                                  |                   | 2             |
| Number of Circuits                                     |                   | 1             |
| Capacity steps                                         |                   | 2             |
| Minimum capacity step                                  | %                 | 50            |
| ELECTRICAL DATA                                        |                   |               |
| Power supply                                           | V/Ph/Hz           | 415/3+N/50    |
| Maximum input power                                    | kW                | 40            |
| Maximum input current standard unit                    | A (per phase)     | 71            |
| Peak input current standard unit                       | A (per phase)     | 213           |
| Peak input current unit with soft start option fitted  | A (per phase)     | 143           |
| Fuse rating (delayed)                                  | A                 | 125           |
| Optional Hydraulic kit input power                     | kW                | 1.1           |
| Optional Hydraulic kit maximum input current           | A                 | 2.45          |
| FANS                                                   |                   |               |
| Fan type (standard unit)                               |                   | Axial         |
| Number of fans (standard unit)                         |                   | 2             |
| Air flow rate for design                               | m <sup>3</sup> /h | 32192         |
| Sound power level <sup>2</sup>                         | dB(A)             | 74            |
| Sound pressure level <sup>3</sup>                      | dB(A)             | 42            |
| WATER                                                  |                   |               |
| Flow/Return connections                                | inch              | 2             |
| Nominal flow rate                                      | L/sec             | 4.98          |
| Pressure drop across the heat exchanger                | kPa               | 24.9          |
| Minimum water content in the user circuit              | litre             | 800           |
| BREEAM DATA                                            |                   |               |
| Total refrigerant charge                               | kg                | 22.5          |
| Operational life                                       | Years             | 20            |
| Global warming potential                               |                   | 2088          |

# TECHNICAL PRODUCT SUBMITTAL

## AMICUS LAHP-852HT AIR SOURCE HEAT PUMP

| LAHP-852HT                 |     |                  | Heating OUT |       |       |       |       |       |       | Max Outlet |
|----------------------------|-----|------------------|-------------|-------|-------|-------|-------|-------|-------|------------|
| Water Delivery Temperature |     |                  | 35C         | 40C   | 45C   | 50C   | 55C   | 60C   | 65C   |            |
| performance data           | -10 | Heat Output (KW) | 46.1        | 46.3  | 46.4  | 46.8  | 47.3  | 47.9  | 49.2  | 65°C       |
|                            |     | Efficiency COP   | 2.6         | 2.4   | 2.2   | 2.0   | 1.8   | 1.6   | 1.5   |            |
|                            | -9  | Heat Output (KW) | 47.3        | 47.5  | 47.7  | 47.8  | 48.4  | 48.9  | 50.2  | 65°C       |
|                            |     | Efficiency COP   | 2.6         | 2.4   | 2.2   | 2.0   | 1.8   | 1.6   | 1.5   |            |
|                            | -8  | Heat Output (KW) | 48.5        | 48.6  | 48.9  | 49.0  | 49.4  | 50.1  | 51.3  | 65°C       |
|                            |     | Efficiency COP   | 2.7         | 2.5   | 2.3   | 2.0   | 1.8   | 1.7   | 1.5   |            |
|                            | -7  | Heat Output (KW) | 49.7        | 49.8  | 50.0  | 50.1  | 50.6  | 51.2  | 52.5  | 65°C       |
|                            |     | Efficiency COP   | 2.8         | 2.5   | 2.3   | 2.1   | 1.9   | 1.7   | 1.6   |            |
|                            | -6  | Heat Output (KW) | 50.9        | 51.0  | 51.2  | 51.4  | 51.8  | 52.3  | 53.7  | 65°C       |
|                            |     | Efficiency COP   | 2.8         | 2.6   | 2.4   | 2.1   | 1.9   | 1.7   | 1.6   |            |
|                            | -5  | Heat Output (KW) | 52.1        | 52.2  | 52.4  | 52.6  | 52.9  | 53.5  | 54.9  | 65°C       |
|                            |     | Efficiency COP   | 2.9         | 2.6   | 2.4   | 2.2   | 2.0   | 1.8   | 1.6   |            |
|                            | -4  | Heat Output (KW) | 53.8        | 53.9  | 54.3  | 54.7  | 55.1  | 55.8  | 57.5  | 65°C       |
|                            |     | Efficiency COP   | 3.0         | 2.7   | 2.5   | 2.3   | 2.0   | 1.8   | 1.7   |            |
|                            | -3  | Heat Output (KW) | 56.4        | 56.4  | 56.7  | 57.2  | 57.7  | 58.3  | 60.2  | 65°C       |
|                            |     | Efficiency COP   | 3.1         | 2.8   | 2.5   | 2.3   | 2.1   | 1.9   | 1.8   |            |
|                            | -2  | Heat Output (KW) | 58.8        | 58.8  | 59.2  | 59.7  | 60.4  | 61.0  | 62.9  | 65°C       |
|                            |     | Efficiency COP   | 3.2         | 2.9   | 2.7   | 2.4   | 2.2   | 2.0   | 1.8   |            |
|                            | 0   | Heat Output (KW) | 63.8        | 64.3  | 64.4  | 65.0  | 65.9  | 67.0  | 68.5  | 65°C       |
|                            |     | Efficiency COP   | 3.5         | 3.2   | 2.9   | 2.6   | 2.4   | 2.2   | 2.0   |            |
|                            | 5   | Heat Output (KW) | 76.1        | 76.9  | 77.8  | 78.6  | 79.6  | 80.7  | 82.5  | 65°C       |
|                            |     | Efficiency COP   | 4.1         | 3.8   | 3.4   | 3.1   | 2.8   | 2.6   | 2.3   |            |
|                            | 10  | Heat Output (KW) | 84.7        | 85.3  | 86.0  | 86.7  | 87.6  | 88.7  | 90.1  | 65°C       |
|                            |     | Efficiency COP   | 4.6         | 4.2   | 3.8   | 3.4   | 3.1   | 2.8   | 2.5   |            |
|                            | 15  | Heat Output (KW) | 92.8        | 93.4  | 94.0  | 94.7  | 95.3  | 96.2  | 97.5  | 65°C       |
|                            |     | Efficiency COP   | 5.2         | 4.6   | 4.1   | 3.7   | 3.3   | 3.0   | 2.7   |            |
|                            | 20  | Heat Output (KW) | 99.4        | 99.9  | 100.0 | 101.0 | 102.0 | 102.0 | 104.0 | 65°C       |
|                            |     | Efficiency COP   | 5.6         | 5.0   | 4.4   | 4.0   | 3.6   | 3.2   | 2.9   |            |
|                            | 25  | Heat Output (KW) | 106.0       | 107.0 | 108.0 | 108.0 | 109.0 | 110.0 | 112.0 | 65°C       |
|                            |     | Efficiency COP   | 6.1         | 5.4   | 4.8   | 4.2   | 3.8   | 3.4   | 3.1   |            |

| Optional Hydraulic kit Pump details |         |            |
|-------------------------------------|---------|------------|
| Model                               |         | LAHP-852HT |
| Nominal Input power                 | kW      | 1.1        |
| Nominal Input current               | A       | 2.45       |
| Nominal water flow rate             | l/h     | 13790      |
| Total head available at the pump    | kPa     | 178        |
| Available head for system pipework  | kPa     | 122        |
| Power supply                        | V/ph/Hz | 400/3/50   |

Amicus air to water heat pumps must be installed and maintained in line with the Installation Commissioning and Maintenance Instructions which are available on the Literature & Downloads section of [www.lochinvar.ltd.uk](http://www.lochinvar.ltd.uk)

# TECHNICAL PRODUCT SUBMITTAL

## LBT1000 THERMAL STORE

### LBT1000

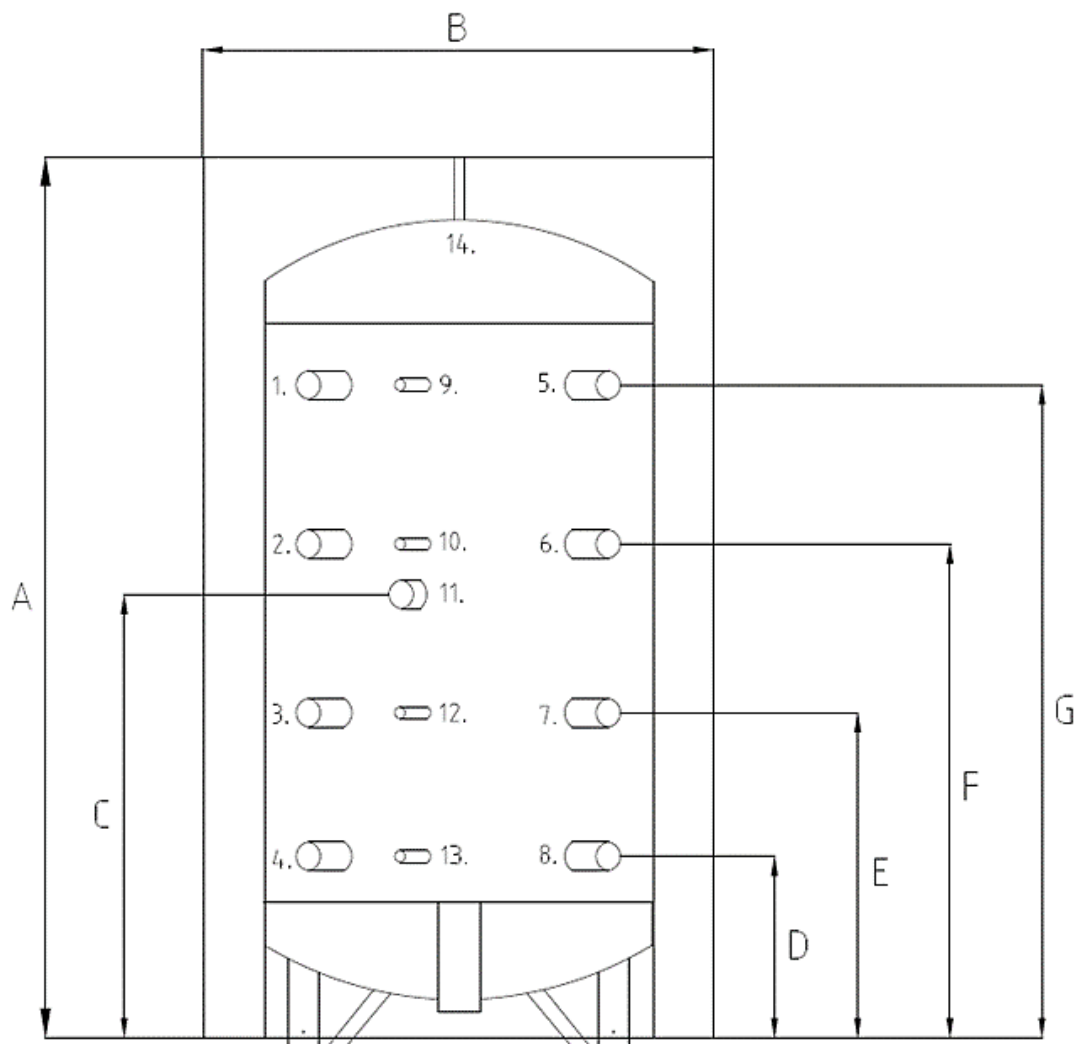
| EFFICIENCY DATA-Part L2              |         |
|--------------------------------------|---------|
| Insulation Thickness                 | mm      |
| Insulation Type                      |         |
| Heat Loss                            | kWh/24h |
| EFFICIENCY DATA ErP AND ENERGY LABEL |         |
| Ecodesign Energy Label rating        |         |
| Standing Loss                        | W       |
| GENERAL DATA                         |         |
| Storage Capacity                     | litres  |
| Weight Empty                         | kg      |
| Weight Full and Insulated            | kg      |
| Maximum Vessel Pressure              | bar     |
| Maximum Vessel Temperature           | °C      |

|              |
|--------------|
| 80           |
| Polyurethane |
| 3.01         |
| C            |
| 125.4        |
| 1000         |
| 125          |
| 1125         |
| 5            |
| 95           |

The LBT Thermal store must be installed and maintained in line with the Installation Commissioning and Maintenance Instructions which are available on the Literature & Downloads section of [www.lochinvar.ltd.uk](http://www.lochinvar.ltd.uk)

#### ErP and Warranty

ErP Data including Product Fiche and Energy Labels where applicable and Warranty information are also available at [www.lochinvar.ltd.uk](http://www.lochinvar.ltd.uk)



# TECHNICAL PRODUCT SUBMITTAL

## LBT1000 THERMAL STORE



| No | Description                                | Unit | LBT300 | LBT500 | LBT800 | LBT1000 | LBT1500 | LBT2000 |
|----|--------------------------------------------|------|--------|--------|--------|---------|---------|---------|
| A  | Total Height (with insulation)             | mm   | 1680   | 1715   | 1740   | 2100    | 2140    | 2470    |
| B  | Diameter of Water Heater (with insulation) | mm   | 610    | 710    | 990    | 990     | 1240    | 1340    |
| C  | Height of Immersion heater connection      | mm   | 880    | 975    | 845    | 1020    | 1085    | 1200    |
| D  | Connection ASHP return                     | mm   | 325    | 345    | 290    | 290     | 360     | 390     |
| E  | Height of Tank body connection             | mm   | 695    | 715    | 660    | 780     | 810     | 930     |
| F  | Height of Tank body connection             | mm   | 1065   | 1085   | 1030   | 1270    | 1260    | 1470    |
| G  | Connection ASHP flow                       | mm   | 1435   | 1455   | 1400   | 1760    | 1710    | 2010    |
| A  | Height of AAV Connection                   | mm   | 1680   | 1715   | 1740   | 2100    | 2140    | 2470    |

| No | Description                                | Unit | LBT300 | LBT500 | LBT800 | LBT1000 | LBT1500 | LBT2000 |
|----|--------------------------------------------|------|--------|--------|--------|---------|---------|---------|
| 1  | Connection heating system flow             | BSP  | 1¼"    | 1¼"    | 1½"    | 1½"     | 1½"     | 1½"     |
| 2  | Connection Tank body                       | BSP  | 1¼"    | 1¼"    | 1¼"    | 1¼"     | 1¼"     | 1¼"     |
| 3  | Connection heating system return           | BSP  | 1¼"    | 1¼"    | 1½"    | 1½"     | 1½"     | 1½"     |
| 4  | Connection alternate heating system return | BSP  | 1¼"    | 1¼"    | 1½"    | 1½"     | 1½"     | 1½"     |
| 5  | Connection ASHP flow                       | BSP  | 1¼"    | 1¼"    | 1½"    | 1½"     | 1½"     | 1½"     |
| 6  | Connection Tank body                       | BSP  | 1¼"    | 1¼"    | 1¼"    | 1¼"     | 1¼"     | 1¼"     |
| 7  | Connection Tank body                       | BSP  | 1¼"    | 1¼"    | 1¼"    | 1¼"     | 1¼"     | 1¼"     |
| 8  | Connection ASHP return                     | BSP  | 1¼"    | 1¼"    | 1½"    | 1½"     | 1½"     | 1½"     |
| 9  | Connection sensor point                    | BSP  | ½"     | ½"     | ½"     | ½"      | ½"      | ½"      |
| 10 | Connection sensor point                    | BSP  | ½"     | ½"     | ½"     | ½"      | ½"      | ½"      |
| 11 | Connection Immersion heater                | BSP  | 1½"    | 1½"    | 1½"    | 1½"     | 1½"     | 1½"     |
| 12 | Connection sensor point                    | BSP  | ½"     | ½"     | ½"     | ½"      | ½"      | ½"      |
| 13 | Connection sensor point                    | BSP  | ½"     | ½"     | ½"     | ½"      | ½"      | ½"      |
| 14 | Connection Air vent                        | BSP  | 1"     | 1"     | 1"     | 1"      | 1"      | 1"      |

# TECHNICAL PRODUCT SUBMITTAL



## LST Direct Storage vessel

### Key features Include:

- Clean out door
- Enamel lined storage vessel
- 3 year storage vessel warranty

### RANGE

|                                             |             |
|---------------------------------------------|-------------|
| Storage Capacity                            | litres      |
| <b>EFFICIENCY DATA-Part L2</b>              |             |
| Insulation Thickness                        | mm          |
| Insulation Type                             |             |
| Standing Loss                               | kWh/ltr/day |
| <b>EFFICIENCY DATA-ErP and Energy Label</b> |             |
| Ecodesign Energy Label rating               |             |
| Standing Loss                               | W           |
| <b>GENERAL DATA</b>                         |             |
| Recovery Rate @ 44°C                        | l/hr        |
| Recovery Rate @ 50°C                        | l/hr        |
| Recovery Rate @ 56°C                        | l/hr        |
| Dimensions (height )                        | mm          |
| Dimensions (diameter with insulation)       | mm          |
| Weight (empty)                              | kg          |
| Weight (full)                               | kg          |
| Minimum Working Pressure                    | bar         |
| Maximum Working Pressure                    | bar         |
| Hot Outlet Connection (inches)              | BSP         |
| Flow Connection (inches)                    | BSP         |
| Return Connection (inches)                  | BSP         |
| Relief Valve Tapping (inches)               | BSP         |
| Anode Quantity                              |             |

### Model

### LST550GE

|                      |
|----------------------|
| 2500                 |
| 100                  |
| Rockwool             |
| 0.005                |
| n/a                  |
| 232                  |
| Use heat source data |
| Use heat source data |
| Use heat source data |
| 2045                 |
| 1600                 |
| 485                  |
| 2985                 |
| 0.5                  |
| 7                    |
| 2                    |
| 2                    |
| 2                    |
| 2                    |
| 3                    |

LST Direct storage vessels must be installed and maintained in line with the Installation Commissioning and Maintenance Instructions which are available on the Literature & Downloads section of [www.lochinvar.ltd.uk](http://www.lochinvar.ltd.uk)

If the LST Direct storage vessel is being used alongside a gas fired water heater then the Installation Commissioning and Maintenance instructions for the gas appliance should also be consulted prior to installation as the installation requirements may differ.

Particular attention should be made to:-

- Dimensions and clearances
- Vented and Unvented installation requirements
- Maintenance

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### ErP and Warranty

ErP Data including Product Fiche and Energy Labels where applicable and Warranty information are also available at [www.lochinvar.ltd.uk](http://www.lochinvar.ltd.uk)