

## Project name

**190318\_8031\_Southampton  
Row BeGreen**

As built

Date: Tue May 14 12:49:30 2019

## Administrative information

## Building Details

Address: 8-10 Southampton Row, London, WC1B 4AE

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.10

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.10

BRUKL compliance check version: v5.4.b.0

## Owner Details

Name:

Telephone number:

Address: , ,

## Certifier details

Name:

Telephone number:

Address: , ,

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

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

|                                                                                                    |                     |
|----------------------------------------------------------------------------------------------------|---------------------|
| CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum | 65.1                |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum               | 65.1                |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum             | 66.1                |
| 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                  | 1.27                 | 3.2                  | GH00000A:Surf[0]                         |
| Floor                                                                                                                                                                                                                                                                             | 0.25                  | 3.08                 | 3.37                 | 1H000001:Surf[20]                        |
| Roof                                                                                                                                                                                                                                                                              | 0.25                  | 0.26                 | 0.45                 | 2H000006:Surf[13]                        |
| Windows***, roof windows, and rooflights                                                                                                                                                                                                                                          | 2.2                   | 1.5                  | 1.8                  | 1H000012:Surf[0]                         |
| Personnel doors                                                                                                                                                                                                                                                                   | 2.2                   | 2.2                  | 2.2                  | GH00000B:Surf[2]                         |
| 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.                                                                                                                                                                                                          |                       |                      |                      |                                          |
| ** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.                                                                                                                                                    |                       |                      |                      |                                          |
| *** Display windows and similar glazing are excluded from the U-value check.                                                                                                                                                                                                      |                       |                      |                      |                                          |
| N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.                                                                                                                                    |                       |                      |                      |                                          |

| Air Permeability                             | Worst acceptable standard | This building |
|----------------------------------------------|---------------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 10                        | 15            |

## 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- AHU4 - Basement Wall Mounted VRF (PKA-M100KA.TH)

|                                                                                                                                                                                     | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                                  | 4.4                | 3.95               | 0                  | 1.8           | 0.75          |
| <b>Standard value</b>                                                                                                                                                               | 2.5*               | 3.2                | N/A                | 1.6^          | 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.                   |                    |                    |                    |               |               |
| ^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide. |                    |                    |                    |               |               |

### 2- Kitchen (AHU 5)

|                                                                                                                                                                                     | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                                  | 0.92               | -                  | 0.2                | 0.64          | -             |
| <b>Standard value</b>                                                                                                                                                               | 0.91               | N/A                | N/A                | 1.5^          | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                                                                |                    |                    |                    |               | YES           |
| ^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide. |                    |                    |                    |               |               |

### 3- FCU (AHU2, VRF350, Fifth Floor NEW)

|                                                                                                                                                                                     | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                                  | 2.93               | 2.33               | 0                  | 2.11          | 0.74          |
| <b>Standard value</b>                                                                                                                                                               | 2.5*               | 2.55               | N/A                | 1.6^          | 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.                   |                    |                    |                    |               |               |
| ^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide. |                    |                    |                    |               |               |

### 4- Internal Stairs (Elec. radiator heating only)

|                                                                                                      | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                   | 0.81               | -                  | 0.2                | 0             | -             |
| <b>Standard value</b>                                                                                | N/A                | 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> |                    |                    |                    |               | NO            |

### 5- FCU (AHU3, VRF300, First+Ground Floors)

|                                                                                                                                                                                     | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                                  | 3.17               | 2.78               | 0                  | 2.07          | 0.75          |
| <b>Standard value</b>                                                                                                                                                               | 2.5*               | 2.55               | N/A                | 1.6^          | 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.                   |                    |                    |                    |               |               |
| ^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide. |                    |                    |                    |               |               |

6- FCU (AHU1, VRF400, 2nd,3rd,4th,6th,7th Floors EXISTING)

|                                                                                                                                                                                     | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                                  | 3.06               | 3.24               | 0                  | 2.11          | 0.76          |
| <b>Standard value</b>                                                                                                                                                               | 2.5*               | 2.55               | N/A                | 1.6^          | 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.                   |                    |                    |                    |               |               |
| ^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide. |                    |                    |                    |               |               |

7- EnSuite Bathrooms (Elec. radiator heating only)

|                                                                                                      | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                   | 0.81               | -                  | 0.2                | 0             | -             |
| <b>Standard value</b>                                                                                | N/A                | 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> |                    |                    |                    |               | NO            |

8- Linen Store (Elec Radiator + Extract)

|                                                                                                      | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                   | 1                  | -                  | 0.2                | 0             | 0.74          |
| <b>Standard value</b>                                                                                | N/A                | 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> |                    |                    |                    |               | NO            |

9- Store (Extract Only)

|                                                                                                      | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                   | 1                  | -                  | 0.2                | 0             | 0.74          |
| <b>Standard value</b>                                                                                | N/A                | 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> |                    |                    |                    |               | NO            |

10- FCU (AHU1, VRF350, Fifth Floor EXISTING)

|                                                                                                                                                                                     | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                                                                                                  | 2.93               | 2.33               | 0                  | 1.99          | 0.76          |
| <b>Standard value</b>                                                                                                                                                               | 2.5*               | 2.55               | N/A                | 1.6^          | 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.                   |                    |                    |                    |               |               |
| ^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide. |                    |                    |                    |               |               |

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

1- CHECK2-CHP

|                       | CHPQA quality index | CHP electrical efficiency |
|-----------------------|---------------------|---------------------------|
| <b>This building</b>  | 140                 | 0.3                       |
| <b>Standard value</b> | 105                 | 0.2                       |

### 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 |   |               |          |
| Standard value             | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 |   | Zone          | Standard |
| 1_Hotel_BOH_P              | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Emergency Exit_P   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Lobby BOH_I        | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Lobby_P            | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Restaurant 1_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Restaurant 1_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Restaurant 2_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Restaurant 3_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Restaurant 4_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 1_Hotel_Restaurant 5_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.01_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.02_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.03_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.04_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.05_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.06_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.07_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.08_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.09_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.10_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.11_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.12_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.13_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.14_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_2.15_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_Lobby 1_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_Lobby 2_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_Lower Lift Lobby_I | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 2_Hotel_Upper Lift Lobby_P | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 3_Hotel_3.01_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |
| 3_Hotel_3.02_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | - | -             | N/A      |

| Zone name                  | SFP [W/(l/s)] |     |     |     |     |     |     |     |   |      | HR efficiency |  |
|----------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|------|---------------|--|
| ID of system type          | A             | B   | C   | D   | E   | F   | G   | H   | I |      |               |  |
| Standard value             | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone | Standard      |  |
| 3_Hotel_3.03_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.04_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.05_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.06_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.07_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.08_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.09_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.10_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.11_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.12_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.13_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.14_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.15_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_3.16_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_Lobby 1_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_Lobby 2_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_Lower Lift Lobby_I | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 3_Hotel_Upper Lift Lobby_P | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.01_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.02_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.03_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.04_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.05_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.06_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.07_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.08_Bedroom_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.08_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.09_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.10_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.11_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.12_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.13_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.14_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.15_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_4.16_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_Lobby 1_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_Lobby 2_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_Lower Lift Lobby_I | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 4_Hotel_Upper Lift Lobby_P | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 5_Hotel_5.01_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 5_Hotel_5.02_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 5_Hotel_5.03_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 5_Hotel_5.04_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |

| Zone name                  | SFP [W/(l/s)] |     |     |     |     |     |     |     |   | HR efficiency |          |
|----------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|---------------|----------|
| ID of system type          | A             | B   | C   | D   | E   | F   | G   | H   | I |               |          |
| Standard value             | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone          | Standard |
| 5_Hotel_5.05_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.06_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.07_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.08_Bedroom_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.08_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.09_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.10_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.11_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.12_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.13_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.14_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.15_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_5.16_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_Lobby 1_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_Lobby 2_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_Lower Lift Lobby_I | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 5_Hotel_Upper Lift Lobby_P | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.02_Bedroom 1_P   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.02_Bedroom 2_P   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.03_Bedroom 1_P   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.03_Bedroom 2_P   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.03_Lobby 1_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.04_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.05_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.06_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.07_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.08_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.09_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.10_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.11_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.12_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_6.13_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_Lobby 1_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_Lobby 2_I          | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_Lower Lift Lobby_I | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 6_Hotel_Upper Lift Lobby_P | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.01_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.02_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.03_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.04_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.05_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.06_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |
| 7_Hotel_7.07_Bedroom_P     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -             | N/A      |

| Zone name                        | SFP [W/(l/s)] |     |     |     |     |     |     |     |   |      | HR efficiency |  |
|----------------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|------|---------------|--|
| ID of system type                | A             | B   | C   | D   | E   | F   | G   | H   | I |      |               |  |
| Standard value                   | 0.3           | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | Zone | Standard      |  |
| 7_Hotel_7.08_Bedroom_P           | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 7_Hotel_7.09_Bedroom_P           | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 7_Hotel_Lobby 1_P                | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 7_Hotel_Lobby 2_I                | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 7_Hotel_Lobby 2_I                | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 7_Hotel_Lower Lift Lobby_I       | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 7_Hotel_Upper Lift Lobby_P       | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 8_LLord_Plant Lobby_I            | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 8_Plant Room_P                   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| 9_LLord_Lobby_P                  | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_BOH_I                   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_BOH_I                   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_Lobby_I                 | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_Lobby_I                 | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_Plant Room_I            | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_Plant_I                 | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_Stair to Basement_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_WC 1_I                  | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Hotel_WC 2_I                  | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B1_Staff Change_I                | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B2_Hotel_Plant Circulation_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B2_Hotel_Water Tanks North_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| B2_Hotel_Water Tanks South_I     | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Bar_P                    | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_BOH_I                    | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_BOH_P                    | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Emergency Exit_P         | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Entrance Lobby_P         | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Lobby_I                  | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Reception Desk_P         | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Reception_P              | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Staff/Service Entrance_P | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Hotel_Stair to Basement_P      | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | N/A           |  |
| G_Substation_P                   | -             | -   | -   | -   | -   | -   | -   | 0.3 | - | -    | 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           |                      |
| 1_Hotel_BOH_P                         |                | -                        | 51   | -            | 70                   |
| 1_Hotel_Emergency Exit_P              |                | -                        | 67   | -            | 57                   |
| 1_Hotel_Kitchen_P                     |                | -                        | 60   | -            | 571                  |
| 1_Hotel_Lobby BOH_I                   |                | -                        | 71   | -            | 70                   |
| 1_Hotel_Lobby_P                       |                | -                        | 162  | -            | 34                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 1_Hotel_Main Stair_I                  |                | -                        | 126  | -            | 29                   |
| 1_Hotel_Restaurant 1_P                |                | -                        | 128  | 15           | 37                   |
| 1_Hotel_Restaurant 1_I                |                | -                        | 153  | 15           | 21                   |
| 1_Hotel_Restaurant 2_P                |                | -                        | 125  | 15           | 52                   |
| 1_Hotel_Restaurant 3_P                |                | -                        | 122  | 15           | 58                   |
| 1_Hotel_Restaurant 4_P                |                | -                        | 128  | 15           | 37                   |
| 1_Hotel_Restaurant 5_P                |                | -                        | 127  | 15           | 62                   |
| 2_Hotel_2.01_Bedroom_P                |                | -                        | 130  | -            | 53                   |
| 2_Hotel_2.02_Bedroom_P                |                | -                        | 132  | -            | 51                   |
| 2_Hotel_2.03_Bathroom_I               |                | -                        | 165  | -            | 33                   |
| 2_Hotel_2.03_Bedroom_P                |                | -                        | 124  | -            | 53                   |
| 2_Hotel_2.04_Bedroom_P                |                | -                        | 123  | -            | 49                   |
| 2_Hotel_2.05_Bedroom_P                |                | -                        | 132  | -            | 51                   |
| 2_Hotel_2.06_Bedroom_P                |                | -                        | 125  | -            | 52                   |
| 2_Hotel_2.07_Bedroom_P                |                | -                        | 133  | -            | 45                   |
| 2_Hotel_2.08_Bathroom_I               |                | -                        | 171  | -            | 28                   |
| 2_Hotel_2.08_Bathroom_I               |                | -                        | 216  | -            | 22                   |
| 2_Hotel_2.08_Bathroom_I               |                | -                        | 185  | -            | 23                   |
| 2_Hotel_2.08_Bathroom_P               |                | -                        | 191  | -            | 22                   |
| 2_Hotel_2.08_Bathroom_P               |                | -                        | 164  | -            | 35                   |
| 2_Hotel_2.08_Bathroom_P               |                | -                        | 159  | -            | 32                   |
| 2_Hotel_2.08_Bathroom_P               |                | -                        | 176  | -            | 25                   |
| 2_Hotel_2.08_Bedroom_P                |                | -                        | 119  | -            | 97                   |
| 2_Hotel_2.09_Bathroom_I               |                | -                        | 219  | -            | 21                   |
| 2_Hotel_2.09_Bedroom_P                |                | -                        | 119  | -            | 88                   |
| 2_Hotel_2.10_Bathroom_I               |                | -                        | 201  | -            | 25                   |
| 2_Hotel_2.10_Bedroom_P                |                | -                        | 130  | -            | 58                   |
| 2_Hotel_2.11_Bathroom_P               |                | -                        | 233  | -            | 21                   |
| 2_Hotel_2.11_Bedroom_P                |                | -                        | 134  | -            | 52                   |
| 2_Hotel_2.12_Bathroom_I               |                | -                        | 225  | -            | 21                   |
| 2_Hotel_2.12_Bedroom_P                |                | -                        | 139  | -            | 72                   |
| 2_Hotel_2.13_Bathroom_I               |                | -                        | 222  | -            | 22                   |
| 2_Hotel_2.13_Bedroom_P                |                | -                        | 124  | -            | 84                   |
| 2_Hotel_2.14_Bathroom_I               |                | -                        | 224  | -            | 22                   |
| 2_Hotel_2.14_Bedroom_P                |                | -                        | 136  | -            | 63                   |
| 2_Hotel_2.15_Bathroom_I               |                | -                        | 227  | -            | 21                   |
| 2_Hotel_2.15_Bedroom_P                |                | -                        | 132  | -            | 65                   |
| 2_Hotel_2nd Stair_I                   |                | -                        | 129  | -            | 54                   |
| 2_Hotel_Linen Store_P                 |                | 59                       | -    | -            | 26                   |
| 2_Hotel_Lobby 1_I                     |                | -                        | 173  | -            | 17                   |
| 2_Hotel_Lobby 2_I                     |                | -                        | 191  | -            | 58                   |
| 2_Hotel_Lower Lift Lobby_I            |                | -                        | 213  | -            | 11                   |
| 2_Hotel_Main Stair_I                  |                | -                        | 102  | -            | 30                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 2_Hotel_Upper Lift Lobby_P            |                | -                        | 155  | -            | 30                   |
| 3_Hotel_2nd Stair_I                   |                | -                        | 122  | -            | 28                   |
| 3_Hotel_3.01_Bathroom_I               |                | -                        | 175  | -            | 28                   |
| 3_Hotel_3.01_Bedroom_P                |                | -                        | 132  | -            | 53                   |
| 3_Hotel_3.02_Bathroom_P               |                | -                        | 163  | -            | 32                   |
| 3_Hotel_3.02_Bedroom_P                |                | -                        | 133  | -            | 51                   |
| 3_Hotel_3.03_Bathroom_I               |                | -                        | 168  | -            | 33                   |
| 3_Hotel_3.03_Bedroom_P                |                | -                        | 126  | -            | 53                   |
| 3_Hotel_3.04_Bathroom_P               |                | -                        | 167  | -            | 35                   |
| 3_Hotel_3.04_Bedroom_P                |                | -                        | 124  | -            | 49                   |
| 3_Hotel_3.05_Bathroom_P               |                | -                        | 180  | -            | 25                   |
| 3_Hotel_3.05_Bedroom_P                |                | -                        | 134  | -            | 51                   |
| 3_Hotel_3.06_Bathroom_P               |                | -                        | 195  | -            | 22                   |
| 3_Hotel_3.06_Bedroom_P                |                | -                        | 127  | -            | 52                   |
| 3_Hotel_3.07_Bathroom_I               |                | -                        | 190  | -            | 23                   |
| 3_Hotel_3.07_Bedroom_P                |                | -                        | 135  | -            | 45                   |
| 3_Hotel_3.08_Bathroom_I               |                | -                        | 196  | -            | 22                   |
| 3_Hotel_3.08_Bedroom_P                |                | -                        | 124  | -            | 69                   |
| 3_Hotel_3.09_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 3_Hotel_3.09_Bedroom_P                |                | -                        | 129  | -            | 62                   |
| 3_Hotel_3.10_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 3_Hotel_3.10_Bedroom_P                |                | -                        | 125  | -            | 70                   |
| 3_Hotel_3.11_Bathroom_I               |                | -                        | 176  | -            | 26                   |
| 3_Hotel_3.11_Bedroom_P                |                | -                        | 124  | -            | 51                   |
| 3_Hotel_3.12_Bathroom_I               |                | -                        | 192  | -            | 24                   |
| 3_Hotel_3.12_Bedroom_P                |                | -                        | 122  | -            | 68                   |
| 3_Hotel_3.13_Bathroom_P               |                | -                        | 190  | -            | 22                   |
| 3_Hotel_3.13_Bedroom_P                |                | -                        | 124  | -            | 80                   |
| 3_Hotel_3.14_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 3_Hotel_3.14_Bedroom_P                |                | -                        | 122  | -            | 70                   |
| 3_Hotel_3.15_Bathroom_I               |                | -                        | 198  | -            | 21                   |
| 3_Hotel_3.15_Bedroom_P                |                | -                        | 124  | -            | 67                   |
| 3_Hotel_3.16_Bathroom_I               |                | -                        | 199  | -            | 21                   |
| 3_Hotel_3.16_Bedroom_P                |                | -                        | 123  | -            | 69                   |
| 3_Hotel_Linen Store_P                 |                | 55                       | -    | -            | 26                   |
| 3_Hotel_Lobby 1_I                     |                | -                        | 179  | -            | 17                   |
| 3_Hotel_Lobby 2_I                     |                | -                        | 171  | -            | 63                   |
| 3_Hotel_Lower Lift Lobby_I            |                | -                        | 194  | -            | 11                   |
| 3_Hotel_Main Stair_I                  |                | -                        | 110  | -            | 28                   |
| 3_Hotel_Store_I                       |                | 93                       | -    | -            | 7                    |
| 3_Hotel_Upper Lift Lobby_P            |                | -                        | 161  | -            | 30                   |
| 4_Hotel_2nd Stair_I                   |                | -                        | 122  | -            | 28                   |
| 4_Hotel_4.01_Bathroom_P               |                | -                        | 168  | -            | 29                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 4_Hotel_4.01_Bedroom_P                |                | -                        | 134  | -            | 47                   |
| 4_Hotel_4.02_Bathroom_P               |                | -                        | 160  | -            | 32                   |
| 4_Hotel_4.02_Bedroom_P                |                | -                        | 132  | -            | 51                   |
| 4_Hotel_4.03_Bathroom_I               |                | -                        | 165  | -            | 33                   |
| 4_Hotel_4.03_Bedroom_P                |                | -                        | 125  | -            | 53                   |
| 4_Hotel_4.04_Bathroom_P               |                | -                        | 164  | -            | 35                   |
| 4_Hotel_4.04_Bedroom_P                |                | -                        | 123  | -            | 49                   |
| 4_Hotel_4.05_Bathroom_P               |                | -                        | 177  | -            | 25                   |
| 4_Hotel_4.05_Bedroom_P                |                | -                        | 132  | -            | 51                   |
| 4_Hotel_4.06_Bathroom_P               |                | -                        | 191  | -            | 22                   |
| 4_Hotel_4.06_Bedroom_P                |                | -                        | 125  | -            | 52                   |
| 4_Hotel_4.07_Bathroom_I               |                | -                        | 186  | -            | 23                   |
| 4_Hotel_4.07_Bedroom_P                |                | -                        | 133  | -            | 45                   |
| 4_Hotel_4.08_Bedroom_I                |                | -                        | 196  | -            | 15                   |
| 4_Hotel_4.08_Bedroom_P                |                | -                        | 124  | -            | 69                   |
| 4_Hotel_4.09_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 4_Hotel_4.09_Bedroom_P                |                | -                        | 129  | -            | 62                   |
| 4_Hotel_4.10_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 4_Hotel_4.10_Bedroom_P                |                | -                        | 125  | -            | 70                   |
| 4_Hotel_4.11_Bathroom_I               |                | -                        | 176  | -            | 26                   |
| 4_Hotel_4.11_Bedroom_P                |                | -                        | 124  | -            | 51                   |
| 4_Hotel_4.12_Bathroom_I               |                | -                        | 192  | -            | 24                   |
| 4_Hotel_4.12_Bedroom_P                |                | -                        | 122  | -            | 68                   |
| 4_Hotel_4.13_Bathroom_P               |                | -                        | 190  | -            | 22                   |
| 4_Hotel_4.13_Bedroom_P                |                | -                        | 124  | -            | 80                   |
| 4_Hotel_4.14_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 4_Hotel_4.14_Bedroom_P                |                | -                        | 122  | -            | 70                   |
| 4_Hotel_4.15_Bathroom_I               |                | -                        | 198  | -            | 21                   |
| 4_Hotel_4.15_Bedroom_P                |                | -                        | 124  | -            | 67                   |
| 4_Hotel_4.16_Bathroom_I               |                | -                        | 199  | -            | 21                   |
| 4_Hotel_4.16_Bedroom_P                |                | -                        | 123  | -            | 69                   |
| 4_Hotel_Linen Store_P                 |                | 55                       | -    | -            | 26                   |
| 4_Hotel_Lobby 1_I                     |                | -                        | 177  | -            | 17                   |
| 4_Hotel_Lobby 2_I                     |                | -                        | 171  | -            | 63                   |
| 4_Hotel_Lower Lift Lobby_I            |                | -                        | 194  | -            | 11                   |
| 4_Hotel_Main Stair_I                  |                | -                        | 109  | -            | 28                   |
| 4_Hotel_Store_I                       |                | 93                       | -    | -            | 7                    |
| 4_Hotel_Upper Lift Lobby_P            |                | -                        | 159  | -            | 30                   |
| 5_Hotel_2nd Stair_I                   |                | -                        | 122  | -            | 28                   |
| 5_Hotel_5.01_Bathroom_P               |                | -                        | 164  | -            | 29                   |
| 5_Hotel_5.01_Bedroom_P                |                | -                        | 132  | -            | 47                   |
| 5_Hotel_5.02_Bathroom_P               |                | -                        | 157  | -            | 32                   |
| 5_Hotel_5.02_Bedroom_P                |                | -                        | 130  | -            | 51                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 5_Hotel_5.03_Bathroom_I               |                | -                        | 162  | -            | 33                   |
| 5_Hotel_5.03_Bedroom_P                |                | -                        | 123  | -            | 53                   |
| 5_Hotel_5.04_Bathroom_P               |                | -                        | 161  | -            | 35                   |
| 5_Hotel_5.04_Bedroom_P                |                | -                        | 122  | -            | 49                   |
| 5_Hotel_5.05_Bathroom_P               |                | -                        | 173  | -            | 25                   |
| 5_Hotel_5.05_Bedroom_P                |                | -                        | 130  | -            | 51                   |
| 5_Hotel_5.06_Bathroom_P               |                | -                        | 187  | -            | 22                   |
| 5_Hotel_5.06_Bedroom_P                |                | -                        | 124  | -            | 52                   |
| 5_Hotel_5.07_Bathroom_I               |                | -                        | 182  | -            | 23                   |
| 5_Hotel_5.07_Bedroom_P                |                | -                        | 131  | -            | 45                   |
| 5_Hotel_5.08_Bedroom_I                |                | -                        | 196  | -            | 15                   |
| 5_Hotel_5.08_Bedroom_P                |                | -                        | 124  | -            | 69                   |
| 5_Hotel_5.09_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 5_Hotel_5.09_Bedroom_P                |                | -                        | 129  | -            | 62                   |
| 5_Hotel_5.10_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 5_Hotel_5.10_Bedroom_P                |                | -                        | 125  | -            | 70                   |
| 5_Hotel_5.11_Bathroom_I               |                | -                        | 176  | -            | 26                   |
| 5_Hotel_5.11_Bedroom_P                |                | -                        | 124  | -            | 51                   |
| 5_Hotel_5.12_Bathroom_I               |                | -                        | 192  | -            | 24                   |
| 5_Hotel_5.12_Bedroom_P                |                | -                        | 122  | -            | 68                   |
| 5_Hotel_5.13_Bathroom_P               |                | -                        | 190  | -            | 22                   |
| 5_Hotel_5.13_Bedroom_P                |                | -                        | 124  | -            | 80                   |
| 5_Hotel_5.14_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 5_Hotel_5.14_Bedroom_P                |                | -                        | 122  | -            | 70                   |
| 5_Hotel_5.15_Bathroom_I               |                | -                        | 198  | -            | 21                   |
| 5_Hotel_5.15_Bedroom_P                |                | -                        | 124  | -            | 67                   |
| 5_Hotel_5.16_Bathroom_I               |                | -                        | 199  | -            | 21                   |
| 5_Hotel_5.16_Bedroom_P                |                | -                        | 123  | -            | 69                   |
| 5_Hotel_Linen Store_P                 |                | 55                       | -    | -            | 26                   |
| 5_Hotel_Lobby 1_I                     |                | -                        | 174  | -            | 17                   |
| 5_Hotel_Lobby 2_I                     |                | -                        | 171  | -            | 63                   |
| 5_Hotel_Lower Lift Lobby_I            |                | -                        | 194  | -            | 11                   |
| 5_Hotel_Main Stair_I                  |                | -                        | 108  | -            | 28                   |
| 5_Hotel_Store_I                       |                | 93                       | -    | -            | 7                    |
| 5_Hotel_Upper Lift Lobby_P            |                | -                        | 157  | -            | 30                   |
| 6_Hotel_2nd Stair_I                   |                | -                        | 122  | -            | 28                   |
| 6_Hotel_6.01_Bathroom_P               |                | -                        | 157  | -            | 32                   |
| 6_Hotel_6.02_Bathroom_P               |                | -                        | 135  | -            | 55                   |
| 6_Hotel_6.02_Bedroom 1_P              |                | -                        | 117  | -            | 79                   |
| 6_Hotel_6.02_Bedroom 2_P              |                | -                        | 122  | -            | 63                   |
| 6_Hotel_6.03_Bathroom_P               |                | -                        | 174  | -            | 25                   |
| 6_Hotel_6.03_Bedroom 1_P              |                | -                        | 117  | -            | 77                   |
| 6_Hotel_6.03_Bedroom 2_P              |                | -                        | 123  | -            | 52                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 6_Hotel_6.03_Lobby 1_I                |                | -                        | 227  | -            | 6                    |
| 6_Hotel_6.04_Bathroom_I               |                | -                        | 182  | -            | 23                   |
| 6_Hotel_6.04_Bedroom_P                |                | -                        | 128  | -            | 57                   |
| 6_Hotel_6.05_Bathroom_I               |                | -                        | 196  | -            | 22                   |
| 6_Hotel_6.05_Bedroom_P                |                | -                        | 124  | -            | 69                   |
| 6_Hotel_6.06_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 6_Hotel_6.06_Bedroom_P                |                | -                        | 129  | -            | 62                   |
| 6_Hotel_6.07_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 6_Hotel_6.07_Bedroom_P                |                | -                        | 125  | -            | 70                   |
| 6_Hotel_6.08_Bathroom_I               |                | -                        | 176  | -            | 26                   |
| 6_Hotel_6.08_Bedroom_P                |                | -                        | 124  | -            | 51                   |
| 6_Hotel_6.09_Bathroom_I               |                | -                        | 192  | -            | 24                   |
| 6_Hotel_6.09_Bedroom_P                |                | -                        | 122  | -            | 68                   |
| 6_Hotel_6.10_Bathroom_P               |                | -                        | 190  | -            | 22                   |
| 6_Hotel_6.10_Bedroom_P                |                | -                        | 124  | -            | 80                   |
| 6_Hotel_6.11_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 6_Hotel_6.11_Bedroom_P                |                | -                        | 122  | -            | 70                   |
| 6_Hotel_6.12_Bathroom_I               |                | -                        | 198  | -            | 21                   |
| 6_Hotel_6.12_Bedroom_P                |                | -                        | 124  | -            | 67                   |
| 6_Hotel_6.13_Bathroom_I               |                | -                        | 199  | -            | 21                   |
| 6_Hotel_6.13_Bedroom_P                |                | -                        | 123  | -            | 69                   |
| 6_Hotel_Linen Store_P                 |                | 55                       | -    | -            | 26                   |
| 6_Hotel_Lobby 1_I                     |                | -                        | 163  | -            | 19                   |
| 6_Hotel_Lobby 2_I                     |                | -                        | 183  | -            | 56                   |
| 6_Hotel_Lower Lift Lobby_I            |                | -                        | 194  | -            | 11                   |
| 6_Hotel_Main Stair_I                  |                | -                        | 108  | -            | 28                   |
| 6_Hotel_Store_I                       |                | 93                       | -    | -            | 7                    |
| 6_Hotel_Upper Lift Lobby_P            |                | -                        | 144  | -            | 30                   |
| 7_Hotel_2nd Stair_I                   |                | -                        | 122  | -            | 28                   |
| 7_Hotel_7.01_Bathroom_P               |                | -                        | 186  | -            | 28                   |
| 7_Hotel_7.01_Bedroom_P                |                | -                        | 133  | -            | 86                   |
| 7_Hotel_7.02_Bathroom_P               |                | -                        | 172  | -            | 30                   |
| 7_Hotel_7.02_Bedroom_P                |                | -                        | 123  | -            | 65                   |
| 7_Hotel_7.03_Bathroom_I               |                | -                        | 193  | -            | 23                   |
| 7_Hotel_7.03_Bedroom_P                |                | -                        | 162  | -            | 36                   |
| 7_Hotel_7.04_Bathroom_I               |                | -                        | 195  | -            | 22                   |
| 7_Hotel_7.04_Bedroom_P                |                | -                        | 126  | -            | 64                   |
| 7_Hotel_7.05_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 7_Hotel_7.05_Bedroom_P                |                | -                        | 124  | -            | 66                   |
| 7_Hotel_7.06_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 7_Hotel_7.06_Bedroom_P                |                | -                        | 117  | -            | 74                   |
| 7_Hotel_7.07_Bathroom_I               |                | -                        | 194  | -            | 22                   |
| 7_Hotel_7.07_Bedroom_P                |                | -                        | 126  | -            | 60                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |                      |
|                                       | Standard value | 60                       | 60   | 22           |                      |
| 7_Hotel_7.08_Bathroom_I               |                | -                        | 198  | -            | 21                   |
| 7_Hotel_7.08_Bedroom_P                |                | -                        | 129  | -            | 57                   |
| 7_Hotel_7.09_Bathroom_I               |                | -                        | 199  | -            | 21                   |
| 7_Hotel_7.09_Bedroom_P                |                | -                        | 130  | -            | 56                   |
| 7_Hotel_Linen Store_P                 |                | 65                       | -    | -            | 15                   |
| 7_Hotel_Linen/Cleaners_I              |                | 63                       | -    | -            | 16                   |
| 7_Hotel_Lobby 1_P                     |                | -                        | 166  | -            | 16                   |
| 7_Hotel_Lobby 2_I                     |                | -                        | 265  | -            | 6                    |
| 7_Hotel_Lobby 2_I                     |                | -                        | 183  | -            | 37                   |
| 7_Hotel_Lower Lift Lobby_I            |                | -                        | 194  | -            | 11                   |
| 7_Hotel_Main Stair_I                  |                | -                        | 111  | -            | 28                   |
| 7_Hotel_Store_P                       |                | 129                      | -    | -            | 3                    |
| 7_Hotel_Upper Lift Lobby_P            |                | -                        | 151  | -            | 29                   |
| 8_LLord_Plant Lobby_I                 |                | -                        | 231  | -            | 9                    |
| 8_Plant Room_P                        |                | 44                       | -    | -            | 832                  |
| 9_LLord_Lobby_P                       |                | -                        | 256  | -            | 17                   |
| B1_Hotel_BOH_I                        |                | -                        | 55   | -            | 112                  |
| B1_Hotel_BOH_I                        |                | -                        | 51   | -            | 221                  |
| B1_Hotel_Lobby_I                      |                | -                        | 177  | -            | 32                   |
| B1_Hotel_Lobby_I                      |                | -                        | 211  | -            | 14                   |
| B1_Hotel_Main Stair_I                 |                | -                        | 132  | -            | 27                   |
| B1_Hotel_Plant Room_I                 |                | 57                       | -    | -            | 212                  |
| B1_Hotel_Plant_I                      |                | 69                       | -    | -            | 147                  |
| B1_Hotel_Stair to Basement_I          |                | -                        | 143  | -            | 20                   |
| B1_Hotel_Store_I                      |                | 81                       | -    | -            | 14                   |
| B1_Hotel_Vaults_I                     |                | 67                       | -    | -            | 57                   |
| B1_Hotel_WC 1_I                       |                | -                        | 61   | -            | 114                  |
| B1_Hotel_WC 2_I                       |                | -                        | 60   | -            | 115                  |
| B1_Staff Change_I                     |                | -                        | 50   | -            | 155                  |
| B2_Hotel_Plant Circulation_I          |                | -                        | 162  | -            | 14                   |
| B2_Hotel_Water Tanks North_I          |                | 51                       | -    | -            | 213                  |
| B2_Hotel_Water Tanks South_I          |                | 49                       | -    | -            | 263                  |
| G_Hotel_Bar_P                         |                | -                        | 135  | 15           | 133                  |
| G_Hotel_BOH_I                         |                | -                        | 52   | -            | 119                  |
| G_Hotel_BOH_P                         |                | -                        | 56   | -            | 56                   |
| G_Hotel_Emergency Exit_P              |                | -                        | 69   | -            | 54                   |
| G_Hotel_Entrance Lobby_P              |                | -                        | 307  | -            | 7                    |
| G_Hotel_Lobby_I                       |                | -                        | 247  | -            | 5                    |
| G_Hotel_Main Stair_I                  |                | -                        | 157  | -            | 24                   |
| G_Hotel_Reception Desk_P              |                | -                        | 57   | 15           | 109                  |
| G_Hotel_Reception_P                   |                | -                        | 48   | 15           | 594                  |
| G_Hotel_Staff/Service Entrance_P      |                | -                        | 64   | -            | 36                   |
| G_Hotel_Stair to Basement_P           |                | -                        | 118  | -            | 25                   |

| General lighting and display lighting |                | Luminous efficacy [lm/W] |      |              |
|---------------------------------------|----------------|--------------------------|------|--------------|
| Zone name                             |                | Luminaire                | Lamp | Display lamp |
|                                       | Standard value | 60                       | 60   | 22           |
| G_Substation_P                        |                | 52                       | -    | -            |
|                                       |                |                          |      | 148          |

### 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? |
|----------------------------|--------------------------------|-----------------------|
| 1_Hotel_BOH_P              | N/A                            | N/A                   |
| 1_Hotel_Emergency Exit_P   | N/A                            | N/A                   |
| 1_Hotel_Lobby BOH_I        | N/A                            | N/A                   |
| 1_Hotel_Lobby_P            | YES (+37.1%)                   | NO                    |
| 1_Hotel_Restaurant 1_P     | NO (-27.1%)                    | NO                    |
| 1_Hotel_Restaurant 1_I     | YES (+49.3%)                   | NO                    |
| 1_Hotel_Restaurant 2_P     | NO (-43.5%)                    | NO                    |
| 1_Hotel_Restaurant 3_P     | YES (+39.7%)                   | NO                    |
| 1_Hotel_Restaurant 4_P     | NO (-7.9%)                     | NO                    |
| 1_Hotel_Restaurant 5_P     | NO (-4.7%)                     | NO                    |
| 2_Hotel_2.01_Bedroom_P     | NO (-63.3%)                    | NO                    |
| 2_Hotel_2.02_Bedroom_P     | NO (-44%)                      | NO                    |
| 2_Hotel_2.03_Bedroom_P     | NO (-20.8%)                    | NO                    |
| 2_Hotel_2.04_Bedroom_P     | YES (+0.2%)                    | NO                    |
| 2_Hotel_2.05_Bedroom_P     | NO (-54.9%)                    | NO                    |
| 2_Hotel_2.06_Bedroom_P     | NO (-78.3%)                    | NO                    |
| 2_Hotel_2.07_Bedroom_P     | NO (-64.2%)                    | NO                    |
| 2_Hotel_2.08_Bedroom_P     | NO (-46%)                      | NO                    |
| 2_Hotel_2.09_Bedroom_P     | NO (-20.6%)                    | NO                    |
| 2_Hotel_2.10_Bedroom_P     | YES (+1.7%)                    | NO                    |
| 2_Hotel_2.11_Bedroom_P     | YES (+15.1%)                   | NO                    |
| 2_Hotel_2.12_Bedroom_P     | NO (-27.3%)                    | NO                    |
| 2_Hotel_2.13_Bedroom_P     | NO (-1.7%)                     | NO                    |
| 2_Hotel_2.14_Bedroom_P     | YES (+29.6%)                   | NO                    |
| 2_Hotel_2.15_Bedroom_P     | YES (+20.2%)                   | NO                    |
| 2_Hotel_Lobby 1_I          | NO (-100%)                     | NO                    |
| 2_Hotel_Lobby 2_I          | NO (-99.2%)                    | NO                    |
| 2_Hotel_Lower Lift Lobby_I | N/A                            | N/A                   |
| 2_Hotel_Upper Lift Lobby_P | NO (-50.2%)                    | NO                    |
| 3_Hotel_3.01_Bedroom_P     | NO (-65.1%)                    | NO                    |
| 3_Hotel_3.02_Bedroom_P     | NO (-47.8%)                    | NO                    |
| 3_Hotel_3.03_Bedroom_P     | NO (-20.7%)                    | NO                    |
| 3_Hotel_3.04_Bedroom_P     | YES (+0.2%)                    | NO                    |
| 3_Hotel_3.05_Bedroom_P     | NO (-55.2%)                    | NO                    |
| 3_Hotel_3.06_Bedroom_P     | NO (-79.4%)                    | NO                    |
| 3_Hotel_3.07_Bedroom_P     | NO (-63.8%)                    | NO                    |
| 3_Hotel_3.08_Bedroom_P     | NO (-65.1%)                    | NO                    |
| 3_Hotel_3.09_Bedroom_P     | NO (-36.9%)                    | NO                    |
| 3_Hotel_3.10_Bedroom_P     | NO (-16.8%)                    | NO                    |

| Zone                       | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------|--------------------------------|-----------------------|
| 3_Hotel_3.11_Bedroom_P     | NO (-12.7%)                    | NO                    |
| 3_Hotel_3.12_Bedroom_P     | YES (+13.6%)                   | NO                    |
| 3_Hotel_3.13_Bedroom_P     | NO (-73.9%)                    | NO                    |
| 3_Hotel_3.14_Bedroom_P     | YES (+15%)                     | NO                    |
| 3_Hotel_3.15_Bedroom_P     | YES (+14.2%)                   | NO                    |
| 3_Hotel_3.16_Bedroom_P     | YES (+6.8%)                    | NO                    |
| 3_Hotel_Lobby 1_I          | N/A                            | N/A                   |
| 3_Hotel_Lobby 2_I          | NO (-99%)                      | NO                    |
| 3_Hotel_Lower Lift Lobby_I | N/A                            | N/A                   |
| 3_Hotel_Upper Lift Lobby_P | NO (-48.6%)                    | NO                    |
| 4_Hotel_4.01_Bedroom_P     | NO (-68.9%)                    | NO                    |
| 4_Hotel_4.02_Bedroom_P     | NO (-51.1%)                    | NO                    |
| 4_Hotel_4.03_Bedroom_P     | NO (-38.6%)                    | NO                    |
| 4_Hotel_4.04_Bedroom_P     | NO (-22.6%)                    | NO                    |
| 4_Hotel_4.05_Bedroom_P     | NO (-58.1%)                    | NO                    |
| 4_Hotel_4.06_Bedroom_P     | NO (-81.3%)                    | NO                    |
| 4_Hotel_4.07_Bedroom_P     | NO (-64.2%)                    | NO                    |
| 4_Hotel_4.08_Bedroom_I     | N/A                            | N/A                   |
| 4_Hotel_4.08_Bedroom_P     | NO (-64.4%)                    | NO                    |
| 4_Hotel_4.09_Bedroom_P     | NO (-35.5%)                    | NO                    |
| 4_Hotel_4.10_Bedroom_P     | NO (-14.5%)                    | NO                    |
| 4_Hotel_4.11_Bedroom_P     | NO (-10.6%)                    | NO                    |
| 4_Hotel_4.12_Bedroom_P     | YES (+16.2%)                   | NO                    |
| 4_Hotel_4.13_Bedroom_P     | NO (-44.6%)                    | NO                    |
| 4_Hotel_4.14_Bedroom_P     | YES (+17.4%)                   | NO                    |
| 4_Hotel_4.15_Bedroom_P     | YES (+16.6%)                   | NO                    |
| 4_Hotel_4.16_Bedroom_P     | YES (+9.1%)                    | NO                    |
| 4_Hotel_Lobby 1_I          | N/A                            | N/A                   |
| 4_Hotel_Lobby 2_I          | NO (-99%)                      | NO                    |
| 4_Hotel_Lower Lift Lobby_I | N/A                            | N/A                   |
| 4_Hotel_Upper Lift Lobby_P | NO (-48.8%)                    | NO                    |
| 5_Hotel_5.01_Bedroom_P     | NO (-88.7%)                    | NO                    |
| 5_Hotel_5.02_Bedroom_P     | NO (-88.1%)                    | NO                    |
| 5_Hotel_5.03_Bedroom_P     | NO (-40.3%)                    | NO                    |
| 5_Hotel_5.04_Bedroom_P     | NO (-24%)                      | NO                    |
| 5_Hotel_5.05_Bedroom_P     | NO (-89.5%)                    | NO                    |
| 5_Hotel_5.06_Bedroom_P     | NO (-93.8%)                    | NO                    |
| 5_Hotel_5.07_Bedroom_P     | NO (-71.8%)                    | NO                    |
| 5_Hotel_5.08_Bedroom_I     | N/A                            | N/A                   |
| 5_Hotel_5.08_Bedroom_P     | NO (-64.2%)                    | NO                    |
| 5_Hotel_5.09_Bedroom_P     | NO (-35.3%)                    | NO                    |
| 5_Hotel_5.10_Bedroom_P     | NO (-13.9%)                    | NO                    |
| 5_Hotel_5.11_Bedroom_P     | NO (-10.1%)                    | NO                    |
| 5_Hotel_5.12_Bedroom_P     | YES (+16.4%)                   | NO                    |
| 5_Hotel_5.13_Bedroom_P     | NO (-44.6%)                    | NO                    |
| 5_Hotel_5.14_Bedroom_P     | YES (+17.4%)                   | NO                    |
| 5_Hotel_5.15_Bedroom_P     | YES (+16.6%)                   | NO                    |
| 5_Hotel_5.16_Bedroom_P     | YES (+9.1%)                    | NO                    |
| 5_Hotel_Lobby 1_I          | N/A                            | N/A                   |

| Zone                         | Solar gain limit exceeded? (%) | Internal blinds used? |
|------------------------------|--------------------------------|-----------------------|
| 5_Hotel_Lobby 2_I            | NO (-99.2%)                    | NO                    |
| 5_Hotel_Lower Lift Lobby_I   | N/A                            | N/A                   |
| 5_Hotel_Upper Lift Lobby_P   | NO (-65.6%)                    | NO                    |
| 6_Hotel_6.02_Bedroom 1_P     | NO (-67.8%)                    | NO                    |
| 6_Hotel_6.02_Bedroom 2_P     | NO (-95.1%)                    | NO                    |
| 6_Hotel_6.03_Bedroom 1_P     | NO (-67.7%)                    | NO                    |
| 6_Hotel_6.03_Bedroom 2_P     | NO (-96.6%)                    | NO                    |
| 6_Hotel_6.03_Lobby 1_I       | N/A                            | N/A                   |
| 6_Hotel_6.04_Bedroom_P       | NO (-0.8%)                     | NO                    |
| 6_Hotel_6.05_Bedroom_P       | NO (-64%)                      | NO                    |
| 6_Hotel_6.06_Bedroom_P       | NO (-34.9%)                    | NO                    |
| 6_Hotel_6.07_Bedroom_P       | NO (-13.2%)                    | NO                    |
| 6_Hotel_6.08_Bedroom_P       | NO (-9.8%)                     | NO                    |
| 6_Hotel_6.09_Bedroom_P       | YES (+16.6%)                   | NO                    |
| 6_Hotel_6.10_Bedroom_P       | NO (-44.6%)                    | NO                    |
| 6_Hotel_6.11_Bedroom_P       | YES (+17.4%)                   | NO                    |
| 6_Hotel_6.12_Bedroom_P       | YES (+16.6%)                   | NO                    |
| 6_Hotel_6.13_Bedroom_P       | YES (+9.1%)                    | NO                    |
| 6_Hotel_Lobby 1_I            | NO (-79.7%)                    | NO                    |
| 6_Hotel_Lobby 2_I            | N/A                            | N/A                   |
| 6_Hotel_Lower Lift Lobby_I   | N/A                            | N/A                   |
| 6_Hotel_Upper Lift Lobby_P   | YES (+81.1%)                   | NO                    |
| 7_Hotel_7.01_Bedroom_P       | NO (-81.5%)                    | NO                    |
| 7_Hotel_7.02_Bedroom_P       | NO (-84.7%)                    | NO                    |
| 7_Hotel_7.03_Bedroom_P       | NO (-41.6%)                    | NO                    |
| 7_Hotel_7.04_Bedroom_P       | NO (-57%)                      | NO                    |
| 7_Hotel_7.05_Bedroom_P       | NO (-13.3%)                    | NO                    |
| 7_Hotel_7.06_Bedroom_P       | YES (+7%)                      | NO                    |
| 7_Hotel_7.07_Bedroom_P       | YES (+23.4%)                   | NO                    |
| 7_Hotel_7.08_Bedroom_P       | YES (+21.1%)                   | NO                    |
| 7_Hotel_7.09_Bedroom_P       | YES (+25.6%)                   | NO                    |
| 7_Hotel_Lobby 1_P            | YES (+130.8%)                  | NO                    |
| 7_Hotel_Lobby 2_I            | N/A                            | N/A                   |
| 7_Hotel_Lobby 2_I            | N/A                            | N/A                   |
| 7_Hotel_Lower Lift Lobby_I   | N/A                            | N/A                   |
| 7_Hotel_Upper Lift Lobby_P   | YES (+89.9%)                   | NO                    |
| 8_LLord_Plant Lobby_I        | N/A                            | N/A                   |
| 8_Plant Room_P               | N/A                            | N/A                   |
| 9_LLord_Lobby_P              | NO (-24.2%)                    | NO                    |
| B1_Hotel_BOH_I               | N/A                            | N/A                   |
| B1_Hotel_BOH_I               | N/A                            | N/A                   |
| B1_Hotel_Lobby_I             | N/A                            | N/A                   |
| B1_Hotel_Lobby_I             | N/A                            | N/A                   |
| B1_Hotel_Plant Room_I        | N/A                            | N/A                   |
| B1_Hotel_Plant_I             | N/A                            | N/A                   |
| B1_Hotel_Stair to Basement_I | N/A                            | N/A                   |
| B1_Hotel_WC 1_I              | N/A                            | N/A                   |
| B1_Hotel_WC 2_I              | N/A                            | N/A                   |
| B1_Staff Change_I            | N/A                            | N/A                   |

| Zone                             | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------|--------------------------------|-----------------------|
| B2_Hotel_Plant Circulation_I     | N/A                            | N/A                   |
| B2_Hotel_Water Tanks North_I     | N/A                            | N/A                   |
| B2_Hotel_Water Tanks South_I     | N/A                            | N/A                   |
| G_Hotel_Bar_P                    | NO (-9.8%)                     | NO                    |
| G_Hotel_BOH_I                    | N/A                            | N/A                   |
| G_Hotel_BOH_P                    | N/A                            | N/A                   |
| G_Hotel_Emergency Exit_P         | N/A                            | N/A                   |
| G_Hotel_Entrance Lobby_P         | YES (+76.7%)                   | NO                    |
| G_Hotel_Lobby_I                  | N/A                            | N/A                   |
| G_Hotel_Reception Desk_P         | NO (-34.1%)                    | NO                    |
| G_Hotel_Reception_P              | YES (+47.5%)                   | NO                    |
| G_Hotel_Staff/Service Entrance_P | N/A                            | N/A                   |
| G_Hotel_Stair to Basement_P      | N/A                            | N/A                   |
| G_Substation_P                   | N/A                            | N/A                   |

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

Separate submission

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

Separate submission

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

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Were alternative energy systems considered and analysed as part of the design process? | NO |
| Is evidence of such assessment available as a separate submission?                     | NO |
| Are any such measures included in the proposed design?                                 | NO |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual | Notional |
|-------------------------------------------------------|--------|----------|
| Area [m <sup>2</sup> ]                                | 4211.6 | 4211.6   |
| External area [m <sup>2</sup> ]                       | 3944.9 | 3944.9   |
| Weather                                               | LON    | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 15     | 3        |
| Average conductance [W/K]                             | 5376.2 | 0        |
| Average U-value [W/m <sup>2</sup> K]                  | 1.36   | 0        |
| Alpha value* [%]                                      | 10.13  | 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

### 100 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         | 44            | 17.31         |
| Cooling         | 3.64          | 6.51          |
| Auxiliary       | 28.72         | 24.87         |
| Lighting        | 11.33         | 15.5          |
| Hot water       | 226.04        | 163.76        |
| Equipment*      | 41.7          | 41.7          |
| <b>TOTAL **</b> | <b>262.16</b> | <b>227.96</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  | 0.56   | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 51.57  | 0        |
| Solar thermal systems | 0      | 0        |

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

|                                               | Actual | Notional |
|-----------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ] | 311.16 | 157.23   |
| Primary energy* [kWh/m <sup>2</sup> ]         | 416.93 | 370.93   |
| Total emissions [kg/m <sup>2</sup> ]          | 66.1   | 65.1     |

\* 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] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity                        |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 26.2              | 65.4               | 2.6                | 5.1               | 37.8          | 2.79          | 3.58             | 2.93             | 4.65 |
|                                                                                                                           | Notional          | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | ----             | ---- |
| [ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity                        |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 272.9             | 56.3               | 26                 | 4.4               | 39.4          | 2.91          | 3.54             | 3.06             | 4.6  |
|                                                                                                                           | Notional          | 17.8              | 82.9               | 1.9                | 6.1               | 27            | 2.56          | 3.79             | ----             | ---- |
| [ST] Central heating using air distribution, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 752.2             | 0                  | 195.8              | 0                 | 0             | 1.07          | 0                | 0.81             | 0    |
|                                                                                                                           | Notional          | 58.2              | 101.8              | 6.3                | 7.5               | 31.2          | 2.56          | 3.79             | ----             | ---- |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity     |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 75.5              | 0                  | 26.2               | 0                 | 29.8          | 0.8           | 0                | 1                | 0    |
|                                                                                                                           | Notional          | 406.8             | 0                  | 131.1              | 0                 | 31.6          | 0.86          | 0                | ----             | ---- |
| [ST] Central heating using air distribution, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity                       |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 30.3              | 0                  | 10.9               | 0                 | 12.1          | 0.77          | 0                | 0.92             | 0    |
|                                                                                                                           | Notional          | 68.5              | 0                  | 22.1               | 0                 | 28.3          | 0.86          | 0                | ----             | ---- |
| [ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity                        |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 226               | 147.8              | 20.9               | 11                | 47.8          | 3.01          | 3.75             | 3.17             | 4.85 |
|                                                                                                                           | Notional          | 0                 | 0                  | 0                  | 0                 | 20.9          | 0.86          | 0                | ----             | ---- |
| [ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity                        |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 385.6             | 11.9               | 38.7               | 0.9               | 33.7          | 2.77          | 3.61             | 2.93             | 4.65 |
|                                                                                                                           | Notional          | 42.2              | 226.9              | 4.6                | 16.6              | 33.9          | 2.56          | 3.79             | ----             | ---- |
| [ST] Central heating using air distribution, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 152.7             | 0                  | 39.8               | 0                 | 0             | 1.07          | 0                | 0.81             | 0    |
|                                                                                                                           | Notional          | 38                | 174                | 4.1                | 12.8              | 28.5          | 2.56          | 3.79             | ----             | ---- |
| [ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity                        |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 448.1             | 27.8               | 30.3               | 1.5               | 20.9          | 4.11          | 5.04             | 4.4              | 6.4  |
|                                                                                                                           | Notional          | 0.2               | 0                  | 0.1                | 0                 | 8.4           | 0.86          | 0                | ----             | ---- |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity     |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 1567.6            | 0                  | 544.3              | 0                 | 0.9           | 0.8           | 0                | 1                | 0    |
|                                                                                                                           | Notional          | 14.4              | 129                | 1.6                | 9.5               | 12.3          | 2.56          | 3.79             | ----             | ---- |
| [ST] No Heating or Cooling                                                                                                |                   |                   |                    |                    |                   |               |               |                  |                  |      |
|                                                                                                                           | Actual            | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                | 0    |
|                                                                                                                           | Notional          | 109.6             | 0                  | 35.3               | 0                 | 0.9           | 0.86          | 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                                                               | 1H000002:Surf[1]                         |
| Floor                                                                    | 0.2                | 0.1                                                                | G_00000F:Surf[0]                         |
| Roof                                                                     | 0.15               | 0.12                                                               | 5H000007:Surf[1]                         |
| Windows, roof windows, and rooflights                                    | 1.5                | 1.3                                                                | 1H00000F:Surf[0]                         |
| Personnel doors                                                          | 1.5                | 2.2                                                                | GH00000B:Surf[2]                         |
| 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             | 15            |