

Building services

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

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

1- VRF - Be Green

|                | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|----------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system    | 5                  | 6                  | -                  | 1.5           | 0.8           |
| Standard value | 2.5*               | 5                  | N/A                | 2^            | N/A           |

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

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

1- SYST0005-DHW

|                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|----------------|--------------------------|-----------------------------------------|
| This building  | 2.86                     | -                                       |
| Standard value | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| G-00-Office-01                        |                | 120               | -                    | -                    |
| G-00-RET-02                           |                | 120               | 85                   | 1.765                |
| G-00-F&B-03                           |                | 120               | 85                   | 1.765                |

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

| Zone           | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------|--------------------------------|-----------------------|
| G-00-Office-01 | NO (-61.3%)                    | YES                   |
| G-00-RET-02    | NO (-69.7%)                    | NO                    |
| G-00-F&B-03    | NO (-68.5%)                    | NO                    |

Regulation 25A: Consideration of high efficiency 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  |        |          | Building Use |                                                         |
|-----------------------------|--------|----------|--------------|---------------------------------------------------------|
|                             | Actual | Notional | % Area       | Building Type                                           |
| Floor area [m²]             | 438.1  | 438.1    | 40           | Retail/Financial and Professional Services              |
| External area [m²]          | 898.3  | 898.3    | 47           | Restaurants and Cafes/Drinking Establishments/Takeaways |
| Weather                     | LON    | LON      | 14           | Offices and Workshop Businesses                         |
| Infiltration [m³/hm²@ 50Pa] | 3      | 3        |              | General Industrial and Special Industrial Groups        |
| Average conductance [W/K]   | 218.11 | 250.81   |              | Storage or Distribution                                 |
| Average U-value [W/m²K]     | 0.24   | 0.28     |              | Hotels                                                  |
| Alpha value* [%]            | 36.03  | 23.3     |              | Residential Institutions: Hospitals and Care Homes      |

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

Residential Institutions: Residential Schools  
Residential Institutions: Universities and Colleges  
Secure Residential Institutions  
Residential Spaces  
Non-residential Institutions: Community/Day Centre  
Non-residential Institutions: Libraries, Museums, and Galleries  
Non-residential Institutions: Education  
Non-residential Institutions: Primary Health Care Building  
Non-residential Institutions: Crown and County Courts  
General Assembly and Leisure, Night Clubs, and Theatres  
Others: Passenger Terminals  
Others: Emergency Services  
Others: Miscellaneous 24hr Activities  
Others: Car Parks 24 hrs  
Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 2.11   | 3.46     |
| Cooling    | 15.55  | 13.86    |
| Auxiliary  | 6.09   | 17.7     |
| Lighting   | 17.47  | 19.01    |
| Hot water  | 19.99  | 23.68    |
| Equipment* | 67.43  | 67.43    |
| TOTAL**    | 61.21  | 77.7     |

\* 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/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 13.24  | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 13.24  | 0        |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 271.93 | 252.39   |
| Primary energy [kWh <sub>PE</sub> /m²] | 70.53  | 114.48   |
| Total emissions [kg/m²]                | 6.5    | 10.48    |

## 12.41 Block H

| 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] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                          | 38.9              | 233               | 2.1                | 15.5               | 6.1               | 5.11          | 4.16          | 5                | 6                |
| Notional                                                                        | 32.9              | 219.5             | 3.5                | 13.9               | 15.4              | 2.64          | 4.4           | ----             | ----             |

## 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                                                                                   |

## BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

H Be Green Commercial

As designed

Date: Thu Nov 28 12:16:24 2024

## Administrative information

## Building Details

Address: Address 1, Address 2, City, Postcode

## Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

## Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

BRUKL compliance module version: v6.1.e.1

Foundation area [m²]: 240.58

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

|                                                                           |                           |
|---------------------------------------------------------------------------|---------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²·annum   | 13.06                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²·annum | 7.97                      |
| Target primary energy rate (TPER), kWh <sub>ep</sub> /m²·annum            | 142.49                    |
| Building primary energy rate (BPER), kWh <sub>ep</sub> /m²·annum          | 86.06                     |
| Do the building's emission and primary energy rates exceed the targets?   | BER =< TER   BPER =< TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | U <sub>a-Limit</sub> | U <sub>a-Calc</sub> | U <sub>i-Calc</sub> | First surface with maximum value                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|---------------------|--------------------------------------------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.26                 | 0.15                | 0.15                | H0000008_W3                                                                    |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.18                 | 0.11                | 0.11                | H0000008_F                                                                     |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.16                 | -                   | -                   | No heat loss pitched roofs                                                     |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.18                 | 0.11                | 0.11                | H0000164_C                                                                     |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.6                  | 1.3                 | 1.3                 | H0000008_W3_O0                                                                 |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2.2                  | -                   | -                   | No external rooflights                                                         |
| Personnel doors <sup>^</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.6                  | -                   | -                   | No external personnel doors                                                    |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.3                  | -                   | -                   | No external vehicle access doors                                               |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                    | -                   | -                   | No external high usage entrance doors                                          |
| U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check.      *** Values for rooflights refer to the horizontal position.<br><sup>^</sup> For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                      |                     |                     | U <sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m²K)] |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Limiting standard    |                     | This building       |                                                                                |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8                    |                     | 3                   |                                                                                |

**Building services**

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

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

## 1- VRF - Be Green

|                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>    | 5                  | 6                  | -                  | 1.5           | 0.8           |
| <b>Standard value</b> | 2.5*               | 5                  | N/A                | 2^            | N/A           |

**Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system**

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

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

## 1- SYST0005-DHW

|                       | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|-----------------------------------------|
| <b>This building</b>  | 3                        | -                                       |
| <b>Standard value</b> | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                       | General luminaire | Display light source |                      |
|---------------------------------------|-----------------------|-------------------|----------------------|----------------------|
| Zone name                             |                       | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | <b>Standard value</b> | 95                | 80                   | 0.3                  |
| H-00-RET-02                           |                       | 120               | 85                   | 1.765                |
| H-00-F&B Restaurant                   |                       | 120               | 85                   | 1.765                |

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

| Zone                | Solar gain limit exceeded? (%) | Internal blinds used? |
|---------------------|--------------------------------|-----------------------|
| H-00-RET-02         | NO (-74.2%)                    | NO                    |
| H-00-F&B Restaurant | NO (-59.6%)                    | NO                    |

**Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m²]                                                                                   | 240.6  | 240.6    | 35           | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 493.1  | 493.1    | 65           | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm²@ 50Pa]                                                                       | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 169.95 | 168.03   |              | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.34   | 0.34     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 48.73  | 34.13    |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              |                                                                 |
|                                                                                                   |        |          |              | Residential Institutions: Residential Schools                   |
|                                                                                                   |        |          |              | Residential Institutions: Universities and Colleges             |
|                                                                                                   |        |          |              | Secure Residential Institutions                                 |
|                                                                                                   |        |          |              | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

**Energy Consumption by End Use [kWh/m²]**

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 5.42         | 6.12         |
| Cooling        | 13.53        | 15.07        |
| Auxiliary      | 13.15        | 21.37        |
| Lighting       | 14.43        | 20.71        |
| Hot water      | 26.31        | 33.37        |
| Equipment*     | 81.87        | 81.87        |
| <b>TOTAL**</b> | <b>72.83</b> | <b>96.64</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/m²]**

|                              | Actual       | Notional |
|------------------------------|--------------|----------|
| Photovoltaic systems         | 14.46        | 0        |
| Wind turbines                | 0            | 0        |
| CHP generators               | 0            | 0        |
| Solar thermal systems        | 0            | 0        |
| <i>Displaced electricity</i> | <i>14.46</i> | <i>0</i> |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 302.5  | 296.91   |
| Primary energy [kWh <sub>PE</sub> /m²] | 86.06  | 142.49   |
| Total emissions [kg/m²]                | 7.97   | 13.06    |

12.42 Block J1J2

| 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>SSEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |      |
| [ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |              |               |                  |                  |      |
|                                                                                 | Actual            | 99.7              | 202.8              | 5.4                | 13.5              | 13.1         | 5.11          | 4.16             | 5                | 6    |
|                                                                                 | Notional          | 58.1              | 238.8              | 6.1                | 15.1              | 17.4         | 2.64          | 4.4              | ----             | ---- |

| 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                                                                                   |

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

J1J2 Be Green Commercial

As designed

Date: Fri Nov 29 17:26:03 2024

Administrative information

Building Details

Address: Address 1, Address 2, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 93.04

| The CO <sub>2</sub> emission and primary energy rates of the building must not exceed the targets |            |              |
|---------------------------------------------------------------------------------------------------|------------|--------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum               | 5.89       |              |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum             | 3.51       |              |
| Target primary energy rate (TPER), kWh <sub>ep</sub> /m <sup>2</sup> annum                        | 63.9       |              |
| Building primary energy rate (BPER), kWh <sub>ep</sub> /m <sup>2</sup> annum                      | 38.55      |              |
| Do the building's emission and primary energy rates exceed the targets?                           | BER =< TER | BPER =< TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|---------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.26                  | 0.15                 | 0.15                 | J1000001_W-1                          |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.18                  | 0.11                 | 0.11                 | J1000001_F                            |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.16                  | -                    | -                    | No heat loss pitched roofs            |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18                  | -                    | -                    | No heat loss flat roofs               |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                   | 1.3                  | 1.3                  | J1000001_W-1_O0                       |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.2                   | -                    | -                    | No external rooflights                |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | -                    | -                    | No external personnel doors           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.3                   | -                    | -                    | No external vehicle access doors      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                     | -                    | -                    | No external high usage entrance doors |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                       |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Limiting standard     |                      | This building        |                                       |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                     |                      | 3                    |                                       |

## Building services

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

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

1- VRF - Be Green

|                                                                                                      | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                   | 5                  | 6.1                | -                  | 1.3           | 0.8           |
| <b>Standard value</b>                                                                                | 2.5*               | 5                  | N/A                | 2^            | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b> |                    |                    |                    |               | YES           |

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

<sup>a</sup> Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- SYST0006-DHW

|                       | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|-----------------------------------------|
| <b>This building</b>  | 2.86                     | -                                       |
| <b>Standard value</b> | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting | General luminaire | Display light source |                      |
|---------------------------------------|-------------------|----------------------|----------------------|
| Zone name                             | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
| Standard value                        | 95                | 80                   | 0.3                  |
| J1-00-Retail-01                       | 120               | 85                   | 1.765                |

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

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| J1-00-Retail-01 | YES (+29.3%)                   | NO                    |

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

|                                                                                               |           |
|-----------------------------------------------------------------------------------------------|-----------|
| <b>Were alternative energy systems considered and analysed as part of the design process?</b> | <b>NO</b> |
| 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                            |        |          | Building Use |                                                                 |
|-------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                       | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m <sup>2</sup> ]                          | 93     | 93       | 100          | Retail/Financial and Professional Services                      |
| External area [m <sup>2</sup> ]                       | 198.3  | 198.3    |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                               | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                             | 101.39 | 84.27    |              | Storage or Distribution                                         |
| Average U-value [W/m <sup>2</sup> K]                  | 0.51   | 0.42     |              | Hotels                                                          |
| Alpha value* [%]                                      | 35.8   | 30.16    |              | Residential Institutions: Hospitals and Care Homes              |
|                                                       |        |          |              | Residential Institutions: Residential Schools                   |
|                                                       |        |          |              | Residential Institutions: Universities and Colleges             |
|                                                       |        |          |              | Secure Residential Institutions                                 |
|                                                       |        |          |              | Residential Spaces                                              |
|                                                       |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                       |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                       |        |          |              | Non-residential Institutions: Education                         |
|                                                       |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                       |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                       |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                       |        |          |              | Others: Passenger Terminals                                     |
|                                                       |        |          |              | Others: Emergency Services                                      |
|                                                       |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                       |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                       |        |          |              | Others: Stand Alone Utility Block                               |

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

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 5.42         | 9.37         |
| Cooling        | 13.69        | 7.48         |
| Auxiliary      | 4.97         | 11.3         |
| Lighting       | 7.95         | 14.45        |
| Hot water      | 0.59         | 0.59         |
| Equipment*     | 20.26        | 20.26        |
| <b>TOTAL**</b> | <b>32.61</b> | <b>43.19</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         | 6.23   | 0        |
| Wind turbines                | 0      | 0        |
| CHP generators               | 0      | 0        |
| Solar thermal systems        | 0      | 0        |
| <i>Displaced electricity</i> | 6.23   | 0        |

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

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 308.94 | 207.46   |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 38.55  | 63.9     |
| Total emissions [kg/m <sup>2</sup> ]                | 3.51   | 5.89     |

12.43 Block K

| 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] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                          | 98.8              | 210.1             | 5.4                | 13.7               | 5                 | 5.07          | 4.26          | 5                | 6.1              |
| Notional                                                                        | 89                | 118.4             | 9.4                | 7.5                | 11.3              | 2.64          | 4.4           | ----             | ----             |

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                                                                                   |

BRUKL Output Document  HM Government  
Compliance with England Building Regulations Part L 2021

Project name  
**K Be Green Commercial** As designed

Date: Fri Nov 29 20:33:57 2024

Administrative information

|                                                                                                                      |                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Building Details</b><br>Address: Address 1, Address 2, Postcode                                                   | <b>Certification tool</b><br>Calculation engine: SBEM<br>Calculation engine version: v6.1.e.1<br>Interface to calculation engine: Virtual Environment<br>Interface to calculation engine version: v7.0.26<br>BRUKL compliance module version: v6.1.e.1 |
| <b>Certifier details</b><br>Name: ME Engineers<br>Telephone number: Phone<br>Address: Street Address, City, Postcode |                                                                                                                                                                                                                                                        |
| Foundation area [m²]: 510.35                                                                                         |                                                                                                                                                                                                                                                        |

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

|                                                                          |                         |
|--------------------------------------------------------------------------|-------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum   | 4.78                    |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum | 3.09                    |
| Target primary energy rate (TPER), kWh <sub>e</sub> /m²annum             | 52.22                   |
| Building primary energy rate (BPER), kWh <sub>e</sub> /m²annum           | 33.46                   |
| Do the building's emission and primary energy rates exceed the targets?  | BER =< TER BPER =< TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|---------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.26                  | 0.15                 | 0.15                 | C000006B_W1                           |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.18                  | 0.11                 | 0.11                 | C000006B_F                            |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.16                  | -                    | -                    | No heat loss pitched roofs            |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18                  | 0.11                 | 0.11                 | K0000000_C                            |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                   | 1.3                  | 1.3                  | C000006B_W1_O0                        |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.2                   | -                    | -                    | No external rooflights                |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | -                    | -                    | No external personnel doors           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.3                   | -                    | -                    | No external vehicle access doors      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                     | -                    | -                    | No external high usage entrance doors |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                       |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Limiting standard     | This building        |                      |                                       |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                     | 3                    |                      |                                       |

**Building services**

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

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

## 1- VRF - Be Green

|                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>    | 5                  | 6.1                | -                  | 1.3           | 0.8           |
| <b>Standard value</b> | 2.5*               | 5                  | N/A                | 2^            | N/A           |

**Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system**

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

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

## 1- SYST0006-DHW

|                       | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|-----------------------------------------|
| <b>This building</b>  | 3                        | -                                       |
| <b>Standard value</b> | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                       | General luminaire | Display light source |                      |
|---------------------------------------|-----------------------|-------------------|----------------------|----------------------|
| Zone name                             |                       | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | <b>Standard value</b> | 95                | 80                   | 0.3                  |
| K-00-Office-02                        |                       | 120               | -                    | -                    |
| K-01-Leisure                          |                       | 120               | 85                   | 1.765                |
| K-00-Leisure-01                       |                       | 120               | 85                   | 1.765                |
| K-00-RET-01                           |                       | 120               | 85                   | 1.765                |

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

| Zone            | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------|--------------------------------|-----------------------|
| K-00-Office-02  | NO (-65.1%)                    | YES                   |
| K-01-Leisure    | NO (-63.2%)                    | NO                    |
| K-00-Leisure-01 | NO (-56.4%)                    | NO                    |
| K-00-RET-01     | NO (-60.6%)                    | NO                    |

**Regulation 25A: Consideration of high efficiency 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 |
|-----------------------------|--------|----------|
| Floor area [m²]             | 1020.7 | 1020.7   |
| External area [m²]          | 1202.8 | 1202.8   |
| Weather                     | LON    | LON      |
| Infiltration [m³/hm²@ 50Pa] | 3      | 3        |
| Average conductance [W/K]   | 532.47 | 441.93   |
| Average U-value [W/m²K]     | 0.44   | 0.37     |
| Alpha value* [%]            | 46.03  | 37.1     |

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

**Building Use**

| % Area | Building Type                                                   |
|--------|-----------------------------------------------------------------|
| 94     | <b>Retail/Financial and Professional Services</b>               |
|        | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| 6      | <b>Offices and Workshop Businesses</b>                          |
|        | General Industrial and Special Industrial Groups                |
|        | Storage or Distribution                                         |
|        | Hotels                                                          |
|        | Residential Institutions: Hospitals and Care Homes              |
|        | Residential Institutions: Residential Schools                   |
|        | Residential Institutions: Universities and Colleges             |
|        | Secure Residential Institutions                                 |
|        | Residential Spaces                                              |
|        | Non-residential Institutions: Community/Day Centre              |
|        | Non-residential Institutions: Libraries, Museums, and Galleries |
|        | Non-residential Institutions: Education                         |
|        | Non-residential Institutions: Primary Health Care Building      |
|        | Non-residential Institutions: Crown and County Courts           |
|        | General Assembly and Leisure, Night Clubs, and Theatres         |
|        | Others: Passenger Terminals                                     |
|        | Others: Emergency Services                                      |
|        | Others: Miscellaneous 24hr Activities                           |
|        | Others: Car Parks 24 hrs                                        |
|        | Others: Stand Alone Utility Block                               |

**Energy Consumption by End Use [kWh/m²]**

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 2.69         | 2.58         |
| Cooling        | 4.43         | 6.48         |
| Auxiliary      | 5.9          | 10.69        |
| Lighting       | 11.91        | 15.06        |
| Hot water      | 0.59         | 0.62         |
| Equipment*     | 21.53        | 21.53        |
| <b>TOTAL**</b> | <b>25.51</b> | <b>35.43</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/m²]**

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 2.84   | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 2.84   | 0        |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 117    | 127.19   |
| Primary energy [kWh <sub>PE</sub> /m²] | 33.46  | 52.22    |
| Total emissions [kg/m²]                | 3.09   | 4.78     |

| 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] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                          | 49                | 68                | 2.7                | 4.4                | 5.9               | 5.07          | 4.26          | 5                | 6.1              |
| Notional                                                                        | 24.5              | 102.7             | 2.6                | 6.5                | 10.7              | 2.64          | 4.4           | -----            | -----            |

| 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                                                                                   |

12.44 Block L

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

Aylesham Centre\_Block L\_Be Green

As designed

Date: Sun Dec 01 21:39:08 2024

Administrative information

Building Details

Address: Address 1, Address 2, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 18.49

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

|                                                                          |                           |
|--------------------------------------------------------------------------|---------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum   | 6.61                      |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum | 3.7                       |
| Target primary energy rate (TPER), kWh <sub>ep</sub> /m²annum            | 71.35                     |
| Building primary energy rate (BPER), kWh <sub>ep</sub> /m²annum          | 40.28                     |
| Do the building's emission and primary energy rates exceed the targets?  | BER <= TER   BPER <= TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | U <sub>a-Limit</sub> | U <sub>a-Calc</sub> | U <sub>i-Calc</sub> | First surface with maximum value      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|---------------------|---------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.26                 | 0.15                | 0.15                | L0000075_W1                           |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.18                 | 0.11                | 0.11                | L0000075_F                            |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.16                 | -                   | -                   | No heat loss pitched roofs            |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.18                 | -                   | -                   | No heat loss flat roofs               |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.6                  | 1.3                 | 1.3                 | L0000075_W1_O0                        |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.2                  | -                   | -                   | No external rooflights                |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.6                  | -                   | -                   | No external personnel doors           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.3                  | -                   | -                   | No external vehicle access doors      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3                    | -                   | -                   | No external high usage entrance doors |
| U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                      |                     |                     |                                       |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Limiting standard    | This building       |                     |                                       |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8                    | 3                   |                     |                                       |

**Building services**

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

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

## 1- VRF - Be Green

|                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>    | 5                  | 6.1                | -                  | 1.3           | 0.8           |
| <b>Standard value</b> | 2.5*               | 5                  | N/A                | 2^            | N/A           |

**Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system**

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

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

## 1- SYST0006-DHW

|                       | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|-----------------------------------------|
| <b>This building</b>  | 3                        | -                                       |
| <b>Standard value</b> | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                       | General luminaire | Display light source |                      |
|---------------------------------------|-----------------------|-------------------|----------------------|----------------------|
| Zone name                             |                       | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | <b>Standard value</b> | 95                | 80                   | 0.3                  |
| L-00-RET-01                           |                       | 120               | 85                   | 1.765                |

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

| Zone        | Solar gain limit exceeded? (%) | Internal blinds used? |
|-------------|--------------------------------|-----------------------|
| L-00-RET-01 | YES (+1.2%)                    | YES                   |

**Regulation 25A: Consideration of high efficiency 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 |
|-----------------------------|--------|----------|
| Floor area [m²]             | 18.5   | 18.5     |
| External area [m²]          | 44.7   | 44.7     |
| Weather                     | LON    | LON      |
| Infiltration [m³/hm²@ 50Pa] | 3      | 3        |
| Average conductance [W/K]   | 22.53  | 20.29    |
| Average U-value [W/m²K]     | 0.5    | 0.45     |
| Alpha value* [%]            | 36.3   | 26.66    |

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

**Building Use**

| % Area | Building Type                                                   |
|--------|-----------------------------------------------------------------|
| 100    | <b>Retail/Financial and Professional Services</b>               |
|        | Restaurants and Cafes/Drinking Establishments/Takeaways         |
|        | Offices and Workshop Businesses                                 |
|        | General Industrial and Special Industrial Groups                |
|        | Storage or Distribution                                         |
|        | Hotels                                                          |
|        | Residential Institutions: Hospitals and Care Homes              |
|        | Residential Institutions: Residential Schools                   |
|        | Residential Institutions: Universities and Colleges             |
|        | Secure Residential Institutions                                 |
|        | Residential Spaces                                              |
|        | Non-residential Institutions: Community/Day Centre              |
|        | Non-residential Institutions: Libraries, Museums, and Galleries |
|        | Non-residential Institutions: Education                         |
|        | Non-residential Institutions: Primary Health Care Building      |
|        | Non-residential Institutions: Crown and County Courts           |
|        | General Assembly and Leisure, Night Clubs, and Theatres         |
|        | Others: Passenger Terminals                                     |
|        | Others: Emergency Services                                      |
|        | Others: Miscellaneous 24hr Activities                           |
|        | Others: Car Parks 24 hrs                                        |
|        | Others: Stand Alone Utility Block                               |

**Energy Consumption by End Use [kWh/m²]**

|                | Actual      | Notional    |
|----------------|-------------|-------------|
| Heating        | 6.81        | 12.17       |
| Cooling        | 12.14       | 7.11        |
| Auxiliary      | 5.95        | 10.89       |
| Lighting       | 8.24        | 17.34       |
| Hot water      | 0.57        | 0.59        |
| Equipment*     | 20.26       | 20.26       |
| <b>TOTAL**</b> | <b>33.7</b> | <b>48.1</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

**Energy Production by Technology [kWh/m²]**

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 6.27   | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 6.27   | 0        |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 310.51 | 228.22   |
| Primary energy [kWh <sub>PE</sub> /m²] | 40.28  | 71.35    |
| Total emissions [kg/m²]                | 3.7    | 6.61     |

| HVAC Systems Performance                                                        |                |                |                 |                 |                |            |            |               |               |
|---------------------------------------------------------------------------------|----------------|----------------|-----------------|-----------------|----------------|------------|------------|---------------|---------------|
| System Type                                                                     | Heat dem MJ/m2 | Cool dem MJ/m2 | Heat con kWh/m2 | Cool con kWh/m2 | Aux con kWh/m2 | Heat SSEFF | Cool SSEER | Heat gen SEFF | Cool gen SEER |
| [ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                |                |                 |                 |                |            |            |               |               |
| Actual                                                                          | 124.1          | 186.4          | 6.8             | 12.1            | 6              | 5.07       | 4.26       | 5             | 6.1           |
| Notional                                                                        | 115.6          | 112.6          | 12.2            | 7.1             | 10.9           | 2.64       | 4.4        | -----         | -----         |

| 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                                                                                   |

12.45 Block N

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

N Be Green Commercial

As designed

Date: Thu Nov 28 12:58:24 2024

Administrative information

Building Details

Address: Address 1, Address 2, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 99.19

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

|                                                                          |                            |
|--------------------------------------------------------------------------|----------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum   | 5.55                       |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum | 3.34                       |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m²annum            | 60.7                       |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m²annum          | 36.74                      |
| Do the building's emission and primary energy rates exceed the targets?  | BER =< TER    BPER =< TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|---------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.26                  | 0.15                 | 0.15                 | N000005A_W1                           |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.18                  | 0.11                 | 0.11                 | N000005A_F                            |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.16                  | -                    | -                    | No heat loss pitched roofs            |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.18                  | -                    | -                    | No heat loss flat roofs               |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.6                   | 1.3                  | 1.3                  | N000005A_W1_O0                        |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2.2                   | -                    | -                    | No external rooflights                |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.6                   | -                    | -                    | No external personnel doors           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.3                   | -                    | -                    | No external vehicle access doors      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3                     | -                    | -                    | No external high usage entrance doors |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check.      *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                       |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Limiting standard     | This building        |                      |                                       |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8                     | 3                    |                      |                                       |

**Building services**

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

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

## 1- VRF - Be Green

|                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>    | 5                  | 6.1                | -                  | 1.3           | 0.8           |
| <b>Standard value</b> | 2.5*               | 5                  | N/A                | 2^            | N/A           |

**Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system**

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

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

## 1- SYST0006-DHW

|                       | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|-----------------------------------------|
| <b>This building</b>  | 3                        | -                                       |
| <b>Standard value</b> | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                       | General luminaire | Display light source |                      |
|---------------------------------------|-----------------------|-------------------|----------------------|----------------------|
| Zone name                             |                       | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | <b>Standard value</b> | 95                | 80                   | 0.3                  |
| N-00-Retail-01                        |                       | 120               | 85                   | 1.765                |

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

| Zone           | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------|--------------------------------|-----------------------|
| N-00-Retail-01 | YES (+40.4%)                   | YES                   |

**Regulation 25A: Consideration of high efficiency 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 |
|-----------------------------|--------|----------|
| Floor area [m²]             | 99.2   | 99.2     |
| External area [m²]          | 165.8  | 165.8    |
| Weather                     | LON    | LON      |
| Infiltration [m³/hm²@ 50Pa] | 3      | 3        |
| Average conductance [W/K]   | 60.89  | 59.4     |
| Average U-value [W/m²K]     | 0.37   | 0.36     |
| Alpha value* [%]            | 36.15  | 24.23    |

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

**Building Use**

| % Area | Building Type                                                   |
|--------|-----------------------------------------------------------------|
| 100    | <b>Retail/Financial and Professional Services</b>               |
|        | Restaurants and Cafes/Drinking Establishments/Takeaways         |
|        | Offices and Workshop Businesses                                 |
|        | General Industrial and Special Industrial Groups                |
|        | Storage or Distribution                                         |
|        | Hotels                                                          |
|        | Residential Institutions: Hospitals and Care Homes              |
|        | Residential Institutions: Residential Schools                   |
|        | Residential Institutions: Universities and Colleges             |
|        | Secure Residential Institutions                                 |
|        | Residential Spaces                                              |
|        | Non-residential Institutions: Community/Day Centre              |
|        | Non-residential Institutions: Libraries, Museums, and Galleries |
|        | Non-residential Institutions: Education                         |
|        | Non-residential Institutions: Primary Health Care Building      |
|        | Non-residential Institutions: Crown and County Courts           |
|        | General Assembly and Leisure, Night Clubs, and Theatres         |
|        | Others: Passenger Terminals                                     |
|        | Others: Emergency Services                                      |
|        | Others: Miscellaneous 24hr Activities                           |
|        | Others: Car Parks 24 hrs                                        |
|        | Others: Stand Alone Utility Block                               |

**Energy Consumption by End Use [kWh/m²]**

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 2.01         | 3.71         |
| Cooling        | 12.34        | 8.3          |
| Auxiliary      | 5.95         | 12.88        |
| Lighting       | 10.15        | 15.72        |
| Hot water      | 0.57         | 0.59         |
| Equipment*     | 20.26        | 20.26        |
| <b>TOTAL**</b> | <b>31.02</b> | <b>41.21</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/m²]**

|                              | Actual      | Notional |
|------------------------------|-------------|----------|
| Photovoltaic systems         | 5.85        | 0        |
| Wind turbines                | 0           | 0        |
| CHP generators               | 0           | 0        |
| Solar thermal systems        | 0           | 0        |
| <i>Displaced electricity</i> | <i>5.85</i> | <i>0</i> |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 226.11 | 166.76   |
| Primary energy [kWh <sub>PE</sub> /m²] | 36.74  | 60.7     |
| Total emissions [kg/m²]                | 3.34   | 5.55     |

| 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] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                          | 36.7              | 189.4             | 2                  | 12.3               | 6                 | 5.07          | 4.26          | 5                | 6.1              |
| Notional                                                                        | 35.2              | 131.5             | 3.7                | 8.3                | 12.9              | 2.64          | 4.4           | -----            | -----            |

| 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                                                                                   |

12.46      Morrisons

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

Morrisons Be Green Commercial

As designed

Date: Thu Nov 28 15:49:44 2024

Administrative information

Building Details

Address: Address 1, Address 2, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 3814.01

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

|                                                                          |                            |
|--------------------------------------------------------------------------|----------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum   | 4.94                       |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum | 3.2                        |
| Target primary energy rate (TPER), kWh <sub>e</sub> /m²annum             | 54.23                      |
| Building primary energy rate (BPER), kWh <sub>e</sub> /m²annum           | 34.82                      |
| Do the building's emission and primary energy rates exceed the targets?  | BER <= TER    BPER <= TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|---------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.26                  | 0.15                 | 0.15                 | P000007B_W3                           |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.18                  | 0.11                 | 0.11                 | P000007B_F                            |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.16                  | -                    | -                    | No heat loss pitched roofs            |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.18                  | -                    | -                    | No heat loss flat roofs               |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | 1.3                  | 1.3                  | P0000087_W3_O0                        |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2.2                   | -                    | -                    | No external rooflights                |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.6                   | -                    | -                    | No external personnel doors           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.3                   | -                    | -                    | No external vehicle access doors      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3                     | -                    | -                    | No external high usage entrance doors |
| <div>U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m²K)]</div> <div>U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m²K)]</div> <div>U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m²K)]</div> <div>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.</div> <div>** Display windows and similar glazing are excluded from the U-value check.      *** Values for rooflights refer to the horizontal position.</div> <div>^ For fire doors, limiting U-value is 1.8 W/m²K</div> <div>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.</div> |                       |                      |                      |                                       |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Limiting standard     | This building        |                      |                                       |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8                     | 3                    |                      |                                       |

**Building services**

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

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

## 1- VRF - Be Green

|                       | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>    | 5                  | 6.1                | -                  | 1.3           | 0.8           |
| <b>Standard value</b> | 2.5*               | 5                  | N/A                | 2^            | N/A           |

**Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system**

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

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

## 1- SYST0006-DHW

|                       | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|-----------------------------------------|
| <b>This building</b>  | 3                        | -                                       |
| <b>Standard value</b> | 2*                       | N/A                                     |

\* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                       | General luminaire |  | Display light source |                      |
|---------------------------------------|-----------------------|-------------------|--|----------------------|----------------------|
| Zone name                             |                       | Efficacy [lm/W]   |  | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | <b>Standard value</b> | 95                |  | 80                   | 0.3                  |
| P-00-Morrison's Retail                |                       | 120               |  | 85                   | 1.765                |
| P-00-Morrison's Sales Floor           |                       | 120               |  | 85                   | 1.765                |
| P-00-Morrison's BOH                   |                       | 120               |  | 85                   | 1.765                |
| P-00-Morrison's Sales Floor           |                       | 120               |  | 85                   | 1.765                |
| P-00-Morrison's Cafe                  |                       | 120               |  | 85                   | 1.765                |
| P-00-Morrison's Sales Lobby           |                       | 120               |  | 85                   | 1.765                |

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

| Zone                        | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------------------|--------------------------------|-----------------------|
| P-00-Morrison's Retail      | N/A                            | N/A                   |
| P-00-Morrison's Sales Floor | NO (-52.9%)                    | NO                    |
| P-00-Morrison's BOH         | N/A                            | N/A                   |
| P-00-Morrison's Sales Floor | N/A                            | N/A                   |
| P-00-Morrison's Cafe        | N/A                            | N/A                   |
| P-00-Morrison's Sales Lobby | YES (+103.7%)                  | NO                    |

**Regulation 25A: Consideration of high efficiency 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 |
|-----------------------------|--------|----------|
| Floor area [m²]             | 3814   | 3814     |
| External area [m²]          | 4084.2 | 4084.1   |
| Weather                     | LON    | LON      |
| Infiltration [m³/hm²@ 50Pa] | 3      | 3        |
| Average conductance [W/K]   | 506.98 | 752.56   |
| Average U-value [W/m²K]     | 0.12   | 0.18     |
| Alpha value* [%]            | 8.53   | 6.62     |

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

**Building Use**

| % Area | Building Type                                                   |
|--------|-----------------------------------------------------------------|
| 100    | <b>Retail/Financial and Professional Services</b>               |
|        | Restaurants and Cafes/Drinking Establishments/Takeaways         |
|        | Offices and Workshop Businesses                                 |
|        | General Industrial and Special Industrial Groups                |
|        | Storage or Distribution                                         |
|        | Hotels                                                          |
|        | Residential Institutions: Hospitals and Care Homes              |
|        | Residential Institutions: Residential Schools                   |
|        | Residential Institutions: Universities and Colleges             |
|        | Secure Residential Institutions                                 |
|        | Residential Spaces                                              |
|        | Non-residential Institutions: Community/Day Centre              |
|        | Non-residential Institutions: Libraries, Museums, and Galleries |
|        | Non-residential Institutions: Education                         |
|        | Non-residential Institutions: Primary Health Care Building      |
|        | Non-residential Institutions: Crown and County Courts           |
|        | General Assembly and Leisure, Night Clubs, and Theatres         |
|        | Others: Passenger Terminals                                     |
|        | Others: Emergency Services                                      |
|        | Others: Miscellaneous 24hr Activities                           |
|        | Others: Car Parks 24 hrs                                        |
|        | Others: Stand Alone Utility Block                               |

**Energy Consumption by End Use [kWh/m²]**

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 0.08         | 0.24         |
| Cooling        | 9.14         | 6.88         |
| Auxiliary      | 5.95         | 9.27         |
| Lighting       | 15.29        | 19.9         |
| Hot water      | 0.57         | 0.59         |
| Equipment*     | 20.26        | 20.26        |
| <b>TOTAL**</b> | <b>31.03</b> | <b>36.89</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/m²]**

|                              | Actual | Notional |
|------------------------------|--------|----------|
| Photovoltaic systems         | 7.3    | 0        |
| Wind turbines                | 0      | 0        |
| CHP generators               | 0      | 0        |
| Solar thermal systems        | 0      | 0        |
| <i>Displaced electricity</i> | 7.3    | 0        |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 141.8  | 111.32   |
| Primary energy [kWh <sub>PE</sub> /m²] | 34.82  | 54.23    |
| Total emissions [kg/m²]                | 3.2    | 4.94     |

APPENDIX E Communal Corridors – Be Lean

12.47 Block ABC

| HVAC Systems Performance                                                        |                |                |                 |                 |                |            |            |               |               |
|---------------------------------------------------------------------------------|----------------|----------------|-----------------|-----------------|----------------|------------|------------|---------------|---------------|
| System Type                                                                     | Heat dem MJ/m2 | Cool dem MJ/m2 | Heat con kWh/m2 | Cool con kWh/m2 | Aux con kWh/m2 | Heat SSEEF | Cool SSEER | Heat gen SEFF | Cool gen SEER |
| [ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                |                |                 |                 |                |            |            |               |               |
| Actual                                                                          | 1.4            | 140.4          | 0.1             | 9.1             | 6              | 5.07       | 4.26       | 5             | 6.1           |
| Notional                                                                        | 2.3            | 109            | 0.2             | 6.9             | 9.3            | 2.64       | 4.4        | -----         | -----         |

| 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                                                                                   |

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

|                                |             |
|--------------------------------|-------------|
| Project name                   |             |
| ABC Communal Be Lean           | As designed |
| Date: Fri Nov 29 18:49:02 2024 |             |

| Administrative information              |                                                          |
|-----------------------------------------|----------------------------------------------------------|
| Building Details                        | Certification tool                                       |
| Address: Address 1, City, Postcode      | Calculation engine: Apache                               |
|                                         | Calculation engine version: 7.0.27                       |
|                                         | Interface to calculation engine: IES Virtual Environment |
|                                         | Interface to calculation engine version: 7.0.27          |
|                                         | BRUKL compliance module version: v6.1.e.1                |
| Certifier details                       |                                                          |
| Name: ME Engineers                      |                                                          |
| Telephone number: Phone                 |                                                          |
| Address: Street Address, City, Postcode |                                                          |
|                                         | Foundation area [m²]: 53                                 |

| The CO <sub>2</sub> emission and primary energy rates of the building must not exceed the targets |           |             |
|---------------------------------------------------------------------------------------------------|-----------|-------------|
| The building does not comply with England Building Regulations Part L 2021                        |           |             |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum                            | 1.24      |             |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum                          | 1.41      |             |
| Target primary energy rate (TPER), kWh <sub>pe</sub> /m²annum                                     | 12.39     |             |
| Building primary energy rate (BPER), kWh <sub>pe</sub> /m²annum                                   | 14.69     |             |
| Do the building's emission and primary energy rates exceed the targets?                           | BER > TER | BPER > TPER |

| The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                      |                     |                     |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | U <sub>a</sub> Limit | U <sub>a</sub> Calc | U <sub>i</sub> Calc | First surface with maximum value         |
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.26                 | 0.15                | 0.15                | 00000015:Surf[0]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.18                 | 0.11                | 0.11                | 0000000A:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.16                 | -                   | -                   | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.18                 | 0.11                | 0.11                | B0000011:Surf[1]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.6                  | 1.3                 | 1.3                 | B0000020:Surf[0]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2.2                  | -                   | -                   | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.6                  | -                   | -                   | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.3                  | -                   | -                   | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3                    | -                   | -                   | No high usage entrance doors in building |
| U <sub>a</sub> Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check.      *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                      |                     |                     |                                          |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Limiting standard    | This building       |                     |                                          |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 8                    | 3                   |                     |                                          |

Building services

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

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

1- Corridor Heaters

|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | YES                |                    |                    |               |               |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| A-00-RET-Circulation                  |                | 120               | -                    | -                    |
| A-01-RET-Circulation                  |                | 120               | -                    | -                    |
| A-02-Circulation                      |                | 120               | -                    | -                    |
| A-03-Circulation                      |                | 120               | -                    | -                    |
| A-04-Circulation                      |                | 120               | -                    | -                    |
| B-01-Circulation                      |                | 120               | -                    | -                    |
| B-01-Circulation                      |                | 120               | -                    | -                    |
| B-01-Circulation                      |                | 120               | -                    | -                    |
| B-02-Circulation                      |                | 120               | -                    | -                    |
| B-03-Circulation                      |                | 120               | -                    | -                    |
| B-03-Circulation                      |                | 120               | -                    | -                    |
| B-04 -Circulation                     |                | 120               | -                    | -                    |
| B-05 -Circulation                     |                | 120               | -                    | -                    |
| B-05 -Circulation                     |                | 120               | -                    | -                    |
| B-05 -Circulation                     |                | 120               | -                    | -                    |
| B-05 -Circulation                     |                | 120               | -                    | -                    |
| B-05 -Circulation                     |                | 120               | -                    | -                    |
| C-00-Corridors                        |                | 120               | -                    | -                    |
| C-01-Corridors                        |                | 120               | -                    | -                    |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m²]                                                                                   | 371    | 371      |              | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 322.3  | 322.3    |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm² @ 50Pa]                                                                      | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 70.59  | 133.75   |              | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.22   | 0.41     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 18.17  | 10       |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              |                                                                 |
|                                                                                                   |        |          | 100          | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 4.56   | 5.28     |
| Cooling    | 0      | 0        |
| Auxiliary  | 0      | 0        |
| Lighting   | 5.14   | 7.52     |
| Hot water  | 0      | 0        |
| Equipment* | 13.13  | 13.13    |
| TOTAL **   | 9.71   | 12.8     |

\* 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/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 4.7      |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 4.7      |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 16.43  | 26.82    |
| Primary energy [kWh <sub>PE</sub> /m²] | 14.69  | 12.39    |
| Total emissions [kg/m²]                | 1.41   | 1.24     |

12.48 Block D

| HVAC Systems Performance                                                                                              |                   |                   |                    |                    |                   |               |               |                  |                  |
|-----------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                                           | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                                                | 16.4              | 0                 | 4.6                | 0                  | 0                 | 1             | 0             | 1                | 0                |
| Notional                                                                                                              | 26.8              | 0                 | 5.3                | 0                  | 0                 | 1.41          | 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

BRUKL Output Document HM Government  
Compliance with England Building Regulations Part L 2021

Project name  
Corridors Aylesham Centre\_D\_Be Lean\_ As designed

Date: Sat Nov 30 19:14:38 2024

Administrative information

**Building Details**  
Address: Address 1, City, Postcode

**Certification tool**  
Calculation engine: Apache  
Calculation engine version: 7.0.26  
Interface to calculation engine: IES Virtual Environment  
Interface to calculation engine version: 7.0.26  
BRUKL compliance module version: v6.1.e.1

**Certifier details**  
Name: ME Engineers  
Telephone number: Phone  
Address: Street Address, City, Postcode

Foundation area [m²]: 30.6

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

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

|                                                                           |                       |
|---------------------------------------------------------------------------|-----------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²:annum   | 2.53                  |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²:annum | 2.72                  |
| Target primary energy rate (TPER), kWh <sub>e</sub> /m²:annum             | 25.29                 |
| Building primary energy rate (BPER), kWh <sub>e</sub> /m²:annum           | 28.09                 |
| Do the building's emission and primary energy rates exceed the targets?   | BER > TER BPER > TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.26                  | 0.15                 | 0.15                 | D0000005:Surf[1]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.18                  | 0.11                 | 0.11                 | D0000005:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.16                  | -                    | -                    | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18                  | -                    | -                    | No flat roofs in building                |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                   | 1.3                  | 1.3                  | D000002B:Surf[1]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.2                   | -                    | -                    | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                     | -                    | -                    | No high usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |

| Air permeability   | Limiting standard | This building |
|--------------------|-------------------|---------------|
| m³/(h.m²) at 50 Pa | 8                 | 3             |

Building services

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

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

1- Corridor Heaters

|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | YES                |                    |                    |               |               |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| D-00-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-00-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-00-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-00-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-01-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-01-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-01-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-02-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-02-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-02-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-03-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-03-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-03-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-04-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-04-Comm-Corridor                    |                | 120               | -                    | -                    |
| D-04-Comm-Corridor                    |                | 120               | -                    | -                    |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m²]                                                                                   | 153    | 153      |              | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 244.7  | 244.7    |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm²@ 50Pa]                                                                       | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 58.43  | 128.52   |              | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.24   | 0.53     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 18.29  | 10       |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              | Residential Institutions: Residential Schools                   |
|                                                                                                   |        |          |              | Residential Institutions: Universities and Colleges             |
|                                                                                                   |        |          |              | Secure Residential Institutions                                 |
|                                                                                                   |        |          | 100          | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 10.87  | 12.39    |
| Cooling    | 0      | 0        |
| Auxiliary  | 0      | 0        |
| Lighting   | 7.63   | 10.67    |
| Hot water  | 0      | 0        |
| Equipment* | 13.12  | 13.12    |
| TOTAL**    | 18.49  | 23.06    |

\* 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/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 6.58     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 6.58     |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 39.11  | 62.92    |
| Primary energy [kWh <sub>FE</sub> /m²] | 28.09  | 25.29    |
| Total emissions [kg/m²]                | 2.72   | 2.53     |

| HVAC Systems Performance                                                                                              |                |                |                 |                 |                |            |            |               |               |
|-----------------------------------------------------------------------------------------------------------------------|----------------|----------------|-----------------|-----------------|----------------|------------|------------|---------------|---------------|
| System Type                                                                                                           | Heat dem MJ/m2 | Cool dem MJ/m2 | Heat con kWh/m2 | Cool con kWh/m2 | Aux con kWh/m2 | Heat SSEEF | Cool SSEER | Heat gen SEFF | Cool gen SEER |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                |                |                 |                 |                |            |            |               |               |
| Actual                                                                                                                | 39.1           | 0              | 10.9            | 0               | 0              | 1          | 0          | 1             | 0             |
| Notional                                                                                                              | 62.9           | 0              | 12.4            | 0               | 0              | 1.41       | 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                                                                                   |

12.49 Block E

BRUKL Output Document  HM Government  
Compliance with England Building Regulations Part L 2021

|              |                                                 |             |
|--------------|-------------------------------------------------|-------------|
| Project name | Residential Corridors_Aylesham Centre_E_Be Lean | As designed |
| Date:        | Sat Nov 30 20:16:37 2024                        |             |

Administrative information

|                                         |                                                          |
|-----------------------------------------|----------------------------------------------------------|
| Building Details                        | Certification tool                                       |
| Address: Address 1, City, Postcode      | Calculation engine: Apache                               |
|                                         | Calculation engine version: 7.0.26                       |
|                                         | Interface to calculation engine: IES Virtual Environment |
| Certifier details                       | Interface to calculation engine version: 7.0.26          |
| Name: ME Engineers                      | BRUKL compliance module version: v6.1.e.1                |
| Telephone number: Phone                 |                                                          |
| Address: Street Address, City, Postcode |                                                          |

Foundation area [m²]: 59.31

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

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

|                                                                           |                         |
|---------------------------------------------------------------------------|-------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²:annum   | 0.81                    |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²:annum | 0.91                    |
| Target primary energy rate (TPER), kWh <sub>pe</sub> /m²:annum            | 8.63                    |
| Building primary energy rate (BPER), kWh <sub>pe</sub> /m²:annum          | 9.9                     |
| Do the building's emission and primary energy rates exceed the targets?   | BER > TER   BPER > TPER |

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

| Fabric element                       | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value                      |
|--------------------------------------|-----------------------|----------------------|----------------------|-------------------------------------------------------|
| Walls*                               | 0.26                  | 0.15                 | 0.15                 | 0000001E:Surf[1]                                      |
| Floors                               | 0.18                  | 0.11                 | 0.11                 | 0000002A:Surf[0]                                      |
| Pitched roofs                        | 0.16                  | -                    | -                    | No pitched roofs in building                          |
| Flat roofs                           | 0.18                  | 0.11                 | 0.11                 | 0900003D:Surf[0]                                      |
| Windows** and roof windows           | 1.6                   | -                    | -                    | No windows, galzed doors, or roof windows in building |
| Rooflights***                        | 2.2                   | -                    | -                    | No roof lights in building                            |
| Personnel doors^                     | 1.6                   | -                    | -                    | No personnel doors in building                        |
| Vehicle access & similar large doors | 1.3                   | -                    | -                    | No vehicle access doors in building                   |
| High usage entrance doors            | 3                     | -                    | -                    | No high usage entrance doors in building              |

U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m²K)]  
U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m²K)]  
U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m²K)]  
\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.  
\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.  
^ For fire doors, limiting U-value is 1.8 W/m²K  
NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability   | Limiting standard | This building |
|--------------------|-------------------|---------------|
| m³/(h.m²) at 50 Pa | 8                 | 3             |

Building services

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

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

1- Corridor Heaters

|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | YES                |                    |                    |               |               |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                | General luminaire | Display light source |                                   |
|---------------------------------------|----------------|-------------------|----------------------|-----------------------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m <sup>2</sup> ] |
|                                       | Standard value | 95                | 80                   | 0.3                               |
| E-00-Office-Corridor                  |                | 120               | -                    | -                                 |
| E-00-Office-Corridor                  |                | 120               | -                    | -                                 |
| E-00-Office-Corridor                  |                | 120               | -                    | -                                 |
| E-00-Office-Corridor                  |                | 120               | -                    | -                                 |
| E-00-Office-Lobby                     |                | 120               | -                    | -                                 |
| E-02-Corridor                         |                | 120               | -                    | -                                 |
| E-02-Corridor                         |                | 120               | -                    | -                                 |
| E-03-Corridor                         |                | 120               | -                    | -                                 |
| E-03-Corridor                         |                | 120               | -                    | -                                 |
| E-03-Corridor                         |                | 120               | -                    | -                                 |
| E-04-Corridor                         |                | 120               | -                    | -                                 |
| E-04-Corridor                         |                | 120               | -                    | -                                 |
| E-04-Corridor                         |                | 120               | -                    | -                                 |
| E-05-Corridor                         |                | 120               | -                    | -                                 |
| E-05-Corridor                         |                | 120               | -                    | -                                 |
| E-05-Corridor                         |                | 120               | -                    | -                                 |
| E-06-Corridor                         |                | 120               | -                    | -                                 |
| E-06-Corridor                         |                | 120               | -                    | -                                 |
| E-06-Corridor                         |                | 120               | -                    | -                                 |
| E-07-Corridor                         |                | 120               | -                    | -                                 |
| E-07-Corridor                         |                | 120               | -                    | -                                 |
| E-07-Corridor                         |                | 120               | -                    | -                                 |
| E-08-Corridor                         |                | 120               | -                    | -                                 |
| E-08-Corridor                         |                | 120               | -                    | -                                 |
| E-08-Corridor                         |                | 120               | -                    | -                                 |
| E-09-Corridor                         |                | 120               | -                    | -                                 |
| E-09-Corridor                         |                | 120               | -                    | -                                 |
| E-09-Corridor                         |                | 120               | -                    | -                                 |
| E-10-Corridor                         |                | 120               | -                    | -                                 |

Technical Data Sheet (Actual vs. Notional Building)

| Building Global Parameters                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m <sup>2</sup> ]                                                                      | 593.1  | 593.1    |              | Retail/Financial and Professional Services                      |
| External area [m <sup>2</sup> ]                                                                   | 146    | 146      |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]                                             | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 16.38  | 25.05    |              | Storage or Distribution                                         |
| Average U-value [W/m <sup>2</sup> K]                                                              | 0.11   | 0.17     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 25     | 10       |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              | Residential Institutions: Residential Schools                   |
|                                                                                                   |        |          |              | Residential Institutions: Universities and Colleges             |
|                                                                                                   |        |          |              | Secure Residential Institutions                                 |
|                                                                                                   |        |          | 100          | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

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

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 0.26   | 0.27     |
| Cooling    | 0      | 0        |
| Auxiliary  | 0      | 0        |
| Lighting   | 6.44   | 8.86     |
| Hot water  | 0      | 0        |
| Equipment* | 13.13  | 13.13    |
| TOTAL**    | 6.7    | 9.13     |

\* 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      | 3.29     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 3.29     |

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

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 0.93   | 1.36     |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 9.9    | 8.63     |
| Total emissions [kg/m <sup>2</sup> ]                | 0.91   | 0.81     |

| General lighting and display lighting |  | General luminaire | Display light source |                      |
|---------------------------------------|--|-------------------|----------------------|----------------------|
| Zone name                             |  | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
| Standard value                        |  | 95                | 80                   | 0.3                  |
| E-10-Corridor                         |  | 120               | -                    | -                    |
| E-10-Corridor                         |  | 120               | -                    | -                    |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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 |

| 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>SSEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |              |               |                  |                  |
| Actual                                                                                                                | 0.9               | 0                 | 0.3                | 0                  | 0                 | 1            | 0             | 1                | 0                |
| Notional                                                                                                              | 1.4               | 0                 | 0.3                | 0                  | 0                 | 1.41         | 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

12.50 Block F

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Residential Corridors\_Aylesham Centre\_F Be Lean

As designed

Date: Sat Nov 30 21:06:21 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 40.77

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

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

|                                                                           |                          |
|---------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²·annum   | 0.59                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²·annum | 1                        |
| Target primary energy rate (TPER), kWh <sub>ep</sub> /m²·annum            | 5.92                     |
| Building primary energy rate (BPER), kWh <sub>ep</sub> /m²·annum          | 10.62                    |
| Do the building's emission and primary energy rates exceed the targets?   | BER > TER    BPER > TPER |

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

| Fabric element                       | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|--------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                               | 0.26                  | 0.15                 | 0.15                 | F0000010:Surf[2]                         |
| Floors                               | 0.18                  | 0.11                 | 0.11                 | F0000015:Surf[0]                         |
| Pitched roofs                        | 0.16                  | -                    | -                    | No pitched roofs in building             |
| Flat roofs                           | 0.18                  | 0.11                 | 0.11                 | BF000079:Surf[0]                         |
| Windows** and roof windows           | 1.6                   | 1.3                  | 1.3                  | F0000010:Surf[1]                         |
| Rooflights***                        | 2.2                   | -                    | -                    | No roof lights in building               |
| Personnel doors^                     | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors            | 3                     | -                    | -                    | No high usage entrance doors in building |

U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m²K)]

U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m²K)]

U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m²K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check.      \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

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

| Air permeability   | Limiting standard | This building |
|--------------------|-------------------|---------------|
| m³/(h.m²) at 50 Pa | 8                 | 3             |

Building services

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

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

1- Corridor Heaters

|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system |                    |                    |                    |               | YES           |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting | General luminaire |                 |                 | Display light source |  |
|---------------------------------------|-------------------|-----------------|-----------------|----------------------|--|
|                                       | Zone name         | Efficacy [lm/W] | Efficacy [lm/W] | Power density [W/m²] |  |
|                                       | Standard value    | 95              | 80              | 0.3                  |  |
|                                       | F-04-Circulation  | 120             | -               | -                    |  |
|                                       | F-04-Circulation  | 120             | -               | -                    |  |
|                                       | F-04-Circulation  | 120             | -               | -                    |  |
|                                       | F-04-Circulation  | 120             | -               | -                    |  |
|                                       | F-04-Circulation  | 120             | -               | -                    |  |
|                                       | F-04-Circulation  | 120             | -               | -                    |  |
|                                       | F-04-Lobby        | 120             | -               | -                    |  |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use                                                    |
|                                                                                                   | Actual | Notional | % Area Building Type                                            |
| Floor area [m²]                                                                                   | 244.6  | 244.6    | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 144.9  | 144.9    | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm²@ 50Pa]                                                                       | 3      | 3        | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 35.41  | 37.95    | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.24   | 0.26     | Hotels                                                          |
| Alpha value* [%]                                                                                  | 16.27  | 10       | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          | Residential Institutions: Residential Schools                   |
|                                                                                                   |        |          | Residential Institutions: Universities and Colleges             |
|                                                                                                   |        |          | Secure Residential Institutions                                 |
|                                                                                                   |        |          | 100 Residential Spaces                                          |
|                                                                                                   |        |          | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          | Non-residential Institutions: Education                         |
|                                                                                                   |        |          | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          | Others: Passenger Terminals                                     |
|                                                                                                   |        |          | Others: Emergency Services                                      |
|                                                                                                   |        |          | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          | Others: Stand Alone Utility Block                               |

| Energy Consumption by End Use [kWh/m²]                                                                |        |          |
|-------------------------------------------------------------------------------------------------------|--------|----------|
|                                                                                                       | Actual | Notional |
| Heating                                                                                               | 1.9    | 1.46     |
| Cooling                                                                                               | 0      | 0        |
| Auxiliary                                                                                             | 0      | 0        |
| Lighting                                                                                              | 5.21   | 7.96     |
| Hot water                                                                                             | 0      | 0        |
| Equipment*                                                                                            | 13.13  | 13.13    |
| TOTAL**                                                                                               | 7.1    | 9.42     |
| * 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/m²] |        |          |
|------------------------------------------|--------|----------|
|                                          | Actual | Notional |
| Photovoltaic systems                     | 0      | 5.48     |
| Wind turbines                            | 0      | 0        |
| CHP generators                           | 0      | 0        |
| Solar thermal systems                    | 0      | 0        |
| Displaced electricity                    | 0      | 5.48     |

| Energy & CO <sub>2</sub> Emissions Summary |        |          |
|--------------------------------------------|--------|----------|
|                                            | Actual | Notional |
| Heating + cooling demand [MJ/m²]           | 6.82   | 7.42     |
| Primary energy [kWh <sub>PE</sub> /m²]     | 10.62  | 5.92     |
| Total emissions [kg/m²]                    | 1      | 0.6      |

| 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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                                                | 6.8               | 0                 | 1.9                | 0                  | 0                 | 1             | 0             | 1                | 0                |
| Notional                                                                                                              | 7.4               | 0                 | 1.5                | 0                  | 0                 | 1.41          | 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                                                                                   |

12.51 Block G

BRUKL Output Document

Compliance with England Building Regulations Part L 2021

 HM Government

Project name

Residential\_Corridor\_Aylesham  
Centre G Be Lean

As designed

Date: Sun Dec 01 17:17:39 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache  
Calculation engine version: 7.0.26  
Interface to calculation engine: IES Virtual Environment  
Interface to calculation engine version: 7.0.26  
BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers  
Telephone number: Phone  
Address: Street Address, City, Postcode

Foundation area [m²]: 71.5

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

|                                                                           |                           |
|---------------------------------------------------------------------------|---------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²:annum   | 1.22                      |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²:annum | 1.1                       |
| Target primary energy rate (TPER), kWh <sub>e</sub> /m²:annum             | 12.54                     |
| Building primary energy rate (BPER), kWh <sub>e</sub> /m²:annum           | 11.53                     |
| Do the building's emission and primary energy rates exceed the targets?   | BER <= TER   BPER <= TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.26                  | 0.15                 | 0.15                 | C0000094:Surf[2]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.18                  | 0.11                 | 0.11                 | C0000094:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.16                  | -                    | -                    | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18                  | 0.11                 | 0.11                 | C0000094:Surf[1]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                   | 1.3                  | 1.3                  | C00000E7:Surf[1]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.2                   | -                    | -                    | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                     | -                    | -                    | No high usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Limiting standard     | This building        |                      |                                          |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                     | 3                    |                      |                                          |

Building services

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

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

1- Corridor Heaters

|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system |                    |                    |                    |               | YES           |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| G-00-Circulation-06                   |                | 120               | -                    | -                    |
| G-00-Lobby-01                         |                | 120               | -                    | -                    |
| G-00-Corridor-01                      |                | 120               | -                    | -                    |
| G-00-Corridor-01                      |                | 120               | -                    | -                    |
| G-02-Corridor-01                      |                | 120               | -                    | -                    |
| G-02-Corridor-01                      |                | 120               | -                    | -                    |
| G-03-Corridor-01                      |                | 120               | -                    | -                    |
| G-03-Corridor-01                      |                | 120               | -                    | -                    |
| G-04-Corridor-01                      |                | 120               | -                    | -                    |
| G-04-Corridor-01                      |                | 120               | -                    | -                    |
| G-05-Corridor-01                      |                | 120               | -                    | -                    |
| G-05-Corridor-01                      |                | 120               | -                    | -                    |
| G-06-Corridor-01                      |                | 120               | -                    | -                    |
| G-06-Corridor-01                      |                | 120               | -                    | -                    |
| G-07-Corridor-01                      |                | 120               | -                    | -                    |
| G-07-Corridor-01                      |                | 120               | -                    | -                    |
| G-08-Corridor-01                      |                | 120               | -                    | -                    |
| G-08-Corridor-01                      |                | 120               | -                    | -                    |
| G-09-Corridor                         |                | 120               | -                    | -                    |
| G-10-Corridor                         |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| G-Corridor                            |                | 120               | -                    | -                    |
| G-Corridor                            |                | 120               | -                    | -                    |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m²]                                                                                   | 858    | 858      |              | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 420.1  | 420.1    |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm² @ 50Pa]                                                                      | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 134.61 | 224.68   |              | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.32   | 0.53     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 15.43  | 10       |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              |                                                                 |
|                                                                                                   |        |          | 100          | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 2.76   | 3.53     |
| Cooling    | 0      | 0        |
| Auxiliary  | 0      | 0        |
| Lighting   | 4.9    | 7.52     |
| Hot water  | 0      | 0        |
| Equipment* | 13.13  | 13.13    |
| TOTAL**    | 7.66   | 11.05    |

\* 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/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 2.74     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 2.74     |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 9.95   | 17.91    |
| Primary energy [kWh <sub>PE</sub> /m²] | 11.53  | 12.54    |
| Total emissions [kg/m²]                | 1.1    | 1.22     |

| HVAC Systems Performance                                                                                              |                   |                   |                    |                    |                   |               |               |                  |                  |
|-----------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                                           | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                                                | 9.9               | 0                 | 2.8                | 0                  | 0                 | 1             | 0             | 1                | 0                |
| Notional                                                                                                              | 17.9              | 0                 | 3.5                | 0                  | 0                 | 1.41          | 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                                                                                   |

12.52 Block H

BRUKL Output Document HM Government  
Compliance with England Building Regulations Part L 2021

Project name  
Residential\_Corridors\_Aylesham\_Centre  
H Be Lean As designed  
Date: Sun Dec 01 16:58:17 2024

Administrative information

|                                                                                                               |                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Building Details<br>Address: Address 1, City, Postcode                                                        | Certification tool<br>Calculation engine: Apache<br>Calculation engine version: 7.0.26<br>Interface to calculation engine: IES Virtual Environment<br>Interface to calculation engine version: 7.0.26<br>BRUKL compliance module version: v6.1.e.1 |
| Certifier details<br>Name: ME Engineers<br>Telephone number: Phone<br>Address: Street Address, City, Postcode |                                                                                                                                                                                                                                                    |

Foundation area [m²]: 64.69

The CO2 emission and primary energy rates of the building must not exceed the targets

|                                                                         |                         |
|-------------------------------------------------------------------------|-------------------------|
| Target CO2 emission rate (TER), kgCO2/m²annum                           | 1.08                    |
| Building CO2 emission rate (BER), kgCO2/m²annum                         | 0.98                    |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m²annum           | 11.16                   |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m²annum         | 10.45                   |
| Do the building's emission and primary energy rates exceed the targets? | BER <= TER BPER <= TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | U <sub>a</sub> Limit | U <sub>a</sub> Calc | U <sub>i</sub> Calc | First surface with maximum value         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.26                 | 0.15                | 0.15                | H0000162:Surf[1]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.18                 | 0.11                | 0.11                | H0000162:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.16                 | -                   | -                   | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.18                 | 0.11                | 0.11                | H0000161:Surf[1]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.6                  | 1.3                 | 1.3                 | H0000000:Surf[0]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.2                  | -                   | -                   | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.6                  | -                   | -                   | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.3                  | -                   | -                   | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3                    | -                   | -                   | No high usage entrance doors in building |
| U <sub>a</sub> Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                      |                     |                     |                                          |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Limiting standard    | This building       |                     |                                          |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8                    | 3                   |                     |                                          |

Building services

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

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

1- Corridor Heaters

|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system |                    |                    |                    |               | YES           |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| H-00-Corridor                         |                | 120               | -                    | -                    |
| H-00-Corridor                         |                | 120               | -                    | -                    |
| H-00-Corridor                         |                | 120               | -                    | -                    |
| H-00-Lobby                            |                | 120               | -                    | -                    |
| H-01-Corridor                         |                | 120               | -                    | -                    |
| H-01-Corridor                         |                | 120               | -                    | -                    |
| H-02-Corridor                         |                | 120               | -                    | -                    |
| H-02-Corridor                         |                | 120               | -                    | -                    |
| H-03-Corridor                         |                | 120               | -                    | -                    |
| H-03-Corridor                         |                | 120               | -                    | -                    |
| H-04-Corridor                         |                | 120               | -                    | -                    |
| H-04-Corridor                         |                | 120               | -                    | -                    |
| H-05-Corridor                         |                | 120               | -                    | -                    |
| H-05-Corridor                         |                | 120               | -                    | -                    |
| H-06-Corridor                         |                | 120               | -                    | -                    |
| H-06-Corridor                         |                | 120               | -                    | -                    |
| H-07-Corridor                         |                | 120               | -                    | -                    |
| H-07-Corridor                         |                | 120               | -                    | -                    |
| H-08-Corridor                         |                | 120               | -                    | -                    |
| H-08-Corridor                         |                | 120               | -                    | -                    |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m²]                                                                                   | 582.2  | 582.2    |              | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 346.7  | 346.7    |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm² @ 50Pa]                                                                      | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 58.01  | 132.27   |              | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.17   | 0.38     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 21.2   | 10       |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              |                                                                 |
|                                                                                                   |        |          | 100          | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 1.35   | 2.6      |
| Cooling    | 0      | 0        |
| Auxiliary  | 0      | 0        |
| Lighting   | 5.66   | 8.48     |
| Hot water  | 0      | 0        |
| Equipment* | 13.13  | 13.13    |
| TOTAL**    | 7.01   | 11.07    |

\* 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/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 3.66     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 3.66     |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 4.85   | 13.18    |
| Primary energy [kWh <sub>PE</sub> /m²] | 10.45  | 11.16    |
| Total emissions [kg/m²]                | 0.98   | 1.08     |

| HVAC Systems Performance                                                                                              |                   |                   |                    |                    |                   |               |               |                  |                  |
|-----------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                                           | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                                                | 4.9               | 0                 | 1.3                | 0                  | 0                 | 1             | 0             | 1                | 0                |
| Notional                                                                                                              | 13.2              | 0                 | 2.6                | 0                  | 0                 | 1.41          | 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                                                                                   |

12.53 Block J1J2

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Residential\_Corridor\_Aylesham  
Centre Block J1J2 Be Lean

As designed

Date: Sun Dec 01 00:29:18 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 70.37

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

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

|                                                                           |                          |
|---------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²·annum   | 0.95                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²·annum | 0.98                     |
| Target primary energy rate (TPER), kWh <sub>ep</sub> /m²·annum            | 10.11                    |
| Building primary energy rate (BPER), kWh <sub>ep</sub> /m²·annum          | 10.54                    |
| Do the building's emission and primary energy rates exceed the targets?   | BER > TER    BPER > TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.26                  | 0.15                 | 0.15                 | J100001A:Surf[1]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.18                  | 0.11                 | 0.11                 | J100001A:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.16                  | -                    | -                    | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.18                  | 0.11                 | 0.11                 | BJ0000C5:Surf[0]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.6                   | 1.3                  | 1.3                  | J2000003:Surf[2]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2.2                   | -                    | -                    | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3                     | -                    | -                    | No high usage entrance doors in building |
| <div>U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m²K)]</div> <div>U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m²K)]</div> <div>U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m²K)]</div> <div>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.</div> <div>** Display windows and similar glazing are excluded from the U-value check.    *** Values for rooflights refer to the horizontal position.</div> <div>^ For fire doors, limiting U-value is 1.8 W/m²K</div> <div>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.</div> |                       |                      |                      |                                          |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Limiting standard     | This building        |                      |                                          |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8                     | 3                    |                      |                                          |

### Building services

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

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

### 1- Corridors Heaters

|                                                                                                      | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>                                                                                   | 1                  | -                  | 0.2                | -             | -             |
| <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> |                    |                    |                    |               | YES           |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

| General lighting and display lighting | General luminaire | Display light source |                      |
|---------------------------------------|-------------------|----------------------|----------------------|
| Zone name                             | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
| Standard value                        | 95                | 80                   | 0.3                  |
| J1-00-Lobby                           | 120               | -                    | -                    |
| J1-00-Corridor                        | 120               | -                    | -                    |
| J1-00-Circulation                     | 120               | -                    | -                    |
| J1-00-Lobby-02                        | 120               | -                    | -                    |
| J1-00-Lobby-01                        | 120               | -                    | -                    |
| J1-00-Circulation                     | 120               | -                    | -                    |
| J2-00-01-Lobby                        | 120               | -                    | -                    |
| J2-00-01-Lobby                        | 120               | -                    | -                    |
| J2-00-01-Lobby                        | 120               | -                    | -                    |
| J2-00-01-Lobby                        | 120               | -                    | -                    |
| BJ1-00-Corridor                       | 120               | -                    | -                    |
| BJ1-01-Lobby                          | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |
| BJ2-02-Corridor                       | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ2-02-Lift Lobby                     |                | 120               | -                    | -                    |
| BJ2-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-02-Corridor                       |                | 120               | -                    | -                    |
| BJ1-L11-Corridor                      |                | 120               | -                    | -                    |
| BJ1-L11-Corridor                      |                | 120               | -                    | -                    |
| BJ1-L11-Corridor                      |                | 120               | -                    | -                    |
| BJ1-L11-Corridor                      |                | 120               | -                    | -                    |
| BJ1-L11-Corridor                      |                | 120               | -                    | -                    |
| BJ1-01-Corridor                       |                | 120               | -                    | -                    |
| BJ1-01-Corridor                       |                | 120               | -                    | -                    |
| BJ2-00-Corridor                       |                | 120               | -                    | -                    |
| BJ2-01-Corridor                       |                | 120               | -                    | -                    |

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

**There are no zones in the building where the solar gain check is applicable.**

### Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                   | Actual | Notional | % Area Building Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Floor area [m²]                                                                                   | 1196.3 | 1196.3   | Retail/Financial and Professional Services<br>Restaurants and Cafes/Drinking Establishments/Takeaways<br>Offices and Workshop Businesses<br>General Industrial and Special Industrial Groups<br>Storage or Distribution<br>Hotels<br>Residential Institutions: Hospitals and Care Homes<br>Residential Institutions: Residential Schools<br>Residential Institutions: Universities and Colleges<br>Secure Residential Institutions                                                                                        |
| External area [m²]                                                                                | 315.9  | 315.9    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Weather                                                                                           | LON    | LON      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Infiltration [m³/hm²@ 50Pa]                                                                       | 3      | 3        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Average conductance [W/K]                                                                         | 56.12  | 82.99    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Average U-value [W/m²K]                                                                           | 0.18   | 0.26     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Alpha value* [%]                                                                                  | 25     | 10       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                   |        |          | 100 Residential Spaces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                   |        |          | Non-residential Institutions: Community/Day Centre<br>Non-residential Institutions: Libraries, Museums, and Galleries<br>Non-residential Institutions: Education<br>Non-residential Institutions: Primary Health Care Building<br>Non-residential Institutions: Crown and County Courts<br>General Assembly and Leisure, Night Clubs, and Theatres<br>Others: Passenger Terminals<br>Others: Emergency Services<br>Others: Miscellaneous 24hr Activities<br>Others: Car Parks 24 hrs<br>Others: Stand Alone Utility Block |

| Energy Consumption by End Use [kWh/m²] |        |          |
|----------------------------------------|--------|----------|
|                                        | Actual | Notional |
| Heating                                | 0.72   | 0.7      |
| Cooling                                | 0      | 0        |
| Auxiliary                              | 0      | 0        |
| Lighting                               | 6.39   | 8.06     |
| Hot water                              | 0      | 0        |
| Equipment*                             | 13.13  | 13.13    |
| TOTAL**                                | 7.11   | 8.75     |

\* 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/m²] |        |          |
|------------------------------------------|--------|----------|
|                                          | Actual | Notional |
| Photovoltaic systems                     | 0      | 1.94     |
| Wind turbines                            | 0      | 0        |
| CHP generators                           | 0      | 0        |
| Solar thermal systems                    | 0      | 0        |
| Displaced electricity                    | 0      | 1.94     |

| Energy & CO <sub>2</sub> Emissions Summary |        |          |
|--------------------------------------------|--------|----------|
|                                            | Actual | Notional |
| Heating + cooling demand [MJ/m²]           | 2.59   | 3.53     |
| Primary energy [kWh <sub>PE</sub> /m²]     | 10.54  | 10.11    |
| Total emissions [kg/m²]                    | 0.98   | 0.95     |

| 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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                                                | 2.6               | 0                 | 0.7                | 0                  | 0                 | 1             | 0             | 1                | 0                |
| Notional                                                                                                              | 3.5               | 0                 | 0.7                | 0                  | 0                 | 1.41          | 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                                                                                   |

12.54 Block K

BRUKL Output Document  
Compliance with England Building Regulations Part L 2021



|                                |             |
|--------------------------------|-------------|
| Project name                   |             |
| Block K Communal Be Lean       | As designed |
| Date: Sat Nov 30 19:28:55 2024 |             |

|                                         |                                                          |
|-----------------------------------------|----------------------------------------------------------|
| Administrative information              |                                                          |
| Building Details                        | Certification tool                                       |
| Address: Address 1, City, Postcode      | Calculation engine: Apache                               |
|                                         | Calculation engine version: 7.0.26                       |
|                                         | Interface to calculation engine: IES Virtual Environment |
| Certifier details                       | Interface to calculation engine version: 7.0.26          |
| Name: ME Engineers                      | BRUKL compliance module version: v6.1.e.1                |
| Telephone number: Phone                 |                                                          |
| Address: Street Address, City, Postcode |                                                          |
| Foundation area [m²]: 112.08            |                                                          |

|                                                                                                   |            |              |
|---------------------------------------------------------------------------------------------------|------------|--------------|
| The CO <sub>2</sub> emission and primary energy rates of the building must not exceed the targets |            |              |
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum                            | 1          |              |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum                          | 0.9        |              |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m²annum                                     | 10.35      |              |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m²annum                                   | 9.59       |              |
| Do the building's emission and primary energy rates exceed the targets?                           | BER <= TER | BPER <= TPER |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |                      |                      |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |                      |                      |                                          |
| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.26                  | 0.15                 | 0.15                 | C000004A:Surf[2]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.18                  | 0.11                 | 0.11                 | C0000089:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.16                  | -                    | -                    | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18                  | 0.11                 | 0.11                 | C000004A:Surf[0]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                   | 1.3                  | 1.3                  | C000004A:Surf[1]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.2                   | -                    | -                    | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                     | -                    | -                    | No high usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Limiting standard     | This building        |                      |                                          |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                     | 3                    |                      |                                          |

Building services

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

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

|                                                                                           |                    |                    |                    |               |               |
|-------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| 1- Corridor Heaters                                                                       |                    |                    |                    |               |               |
|                                                                                           | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
| This system                                                                               | 1                  | -                  | 0.2                | -             | -             |
| Standard value                                                                            | N/A                | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system |                    |                    |                    |               | YES           |

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

|                                       |                 |                   |                      |  |
|---------------------------------------|-----------------|-------------------|----------------------|--|
| General lighting and display lighting |                 | General luminaire | Display light source |  |
| Zone name                             | Efficacy [lm/W] | Efficacy [lm/W]   | Power density [W/m²] |  |
| Standard value                        | 95              | 80                | 0.3                  |  |
| K-08-F1                               | 120             | -                 | -                    |  |
| K-08-F1                               | 120             | -                 | -                    |  |
| K-00-RET-01                           | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-00-Circulation-                     | 120             | -                 | -                    |  |
| K-01-Corridor                         | 120             | -                 | -                    |  |
| K-01-Lobby                            | 120             | -                 | -                    |  |
| K-02-Corridor                         | 120             | -                 | -                    |  |
| K-02-Corridor                         | 120             | -                 | -                    |  |
| K-02-Lobby                            | 120             | -                 | -                    |  |
| K-03-Corridor                         | 120             | -                 | -                    |  |
| K-03-Corridor                         | 120             | -                 | -                    |  |
| K-03-Lobby                            | 120             | -                 | -                    |  |
| K-04-Corridor                         | 120             | -                 | -                    |  |
| K-04-Corridor                         | 120             | -                 | -                    |  |
| K-04-Lobby                            | 120             | -                 | -                    |  |
| K-05-Corridor                         | 120             | -                 | -                    |  |
| K-05-Corridor                         | 120             | -                 | -                    |  |
| K-05-Lobby                            | 120             | -                 | -                    |  |
| K-06-Corridor                         | 120             | -                 | -                    |  |
| K-06-Corridor                         | 120             | -                 | -                    |  |
| K-06-Lobby                            | 120             | -                 | -                    |  |
| K-07-Corridor                         | 120             | -                 | -                    |  |
| K-07-Corridor                         | 120             | -                 | -                    |  |

| General lighting and display lighting |                | General luminaire |  | Display light source |                      |
|---------------------------------------|----------------|-------------------|--|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   |  | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                |  | 80                   | 0.3                  |
| K-07-Lobby                            |                | 120               |  | -                    | -                    |
| K-08-F1                               |                | 120               |  | -                    | -                    |
| K-08-F11-Corridor                     |                | 120               |  | -                    | -                    |
| K-09-12-Corridor                      |                | 120               |  | -                    | -                    |
| K-09-11-Corridor                      |                | 120               |  | -                    | -                    |
| K-09-10-Corridor                      |                | 120               |  | -                    | -                    |
| K-09-09-Corridor                      |                | 120               |  | -                    | -                    |

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

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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                                                                        |        |          | Building Use |                                                                 |
|---------------------------------------------------------------------------------------------------|--------|----------|--------------|-----------------------------------------------------------------|
|                                                                                                   | Actual | Notional | % Area       | Building Type                                                   |
| Floor area [m²]                                                                                   | 1120.8 | 1120.8   |              | Retail/Financial and Professional Services                      |
| External area [m²]                                                                                | 545.1  | 545.1    |              | Restaurants and Cafes/Drinking Establishments/Takeaways         |
| Weather                                                                                           | LON    | LON      |              | Offices and Workshop Businesses                                 |
| Infiltration [m³/hm²@ 50Pa]                                                                       | 3      | 3        |              | General Industrial and Special Industrial Groups                |
| Average conductance [W/K]                                                                         | 119.27 | 227.05   |              | Storage or Distribution                                         |
| Average U-value [W/m²K]                                                                           | 0.22   | 0.42     |              | Hotels                                                          |
| Alpha value* [%]                                                                                  | 18.16  | 10       |              | Residential Institutions: Hospitals and Care Homes              |
| * Percentage of the building's average heat transfer coefficient which is due to thermal bridging |        |          |              | Residential Institutions: Residential Schools                   |
|                                                                                                   |        |          |              | Residential Institutions: Universities and Colleges             |
|                                                                                                   |        |          |              | Secure Residential Institutions                                 |
|                                                                                                   |        |          | 100          | Residential Spaces                                              |
|                                                                                                   |        |          |              | Non-residential Institutions: Community/Day Centre              |
|                                                                                                   |        |          |              | Non-residential Institutions: Libraries, Museums, and Galleries |
|                                                                                                   |        |          |              | Non-residential Institutions: Education                         |
|                                                                                                   |        |          |              | Non-residential Institutions: Primary Health Care Building      |
|                                                                                                   |        |          |              | Non-residential Institutions: Crown and County Courts           |
|                                                                                                   |        |          |              | General Assembly and Leisure, Night Clubs, and Theatres         |
|                                                                                                   |        |          |              | Others: Passenger Terminals                                     |
|                                                                                                   |        |          |              | Others: Emergency Services                                      |
|                                                                                                   |        |          |              | Others: Miscellaneous 24hr Activities                           |
|                                                                                                   |        |          |              | Others: Car Parks 24 hrs                                        |
|                                                                                                   |        |          |              | Others: Stand Alone Utility Block                               |

Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 1.38   | 2.46     |
| Cooling    | 0      | 0        |
| Auxiliary  | 0      | 0        |
| Lighting   | 5.04   | 7.71     |
| Hot water  | 0      | 0        |
| Equipment* | 13.13  | 13.13    |
| TOTAL**    | 6.42   | 10.17    |

\* 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/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 3.29     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 3.29     |

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

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 4.97   | 12.5     |
| Primary energy [kWh <sub>PE</sub> /m²] | 9.59   | 10.35    |
| Total emissions [kg/m²]                | 0.9    | 1        |

| HVAC Systems Performance                                                                                              |                   |                   |                    |                    |                   |               |               |                  |                  |
|-----------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                                           | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                                                | 5                 | 0                 | 1.4                | 0                  | 0                 | 1             | 0             | 1                | 0                |
| Notional                                                                                                              | 12.5              | 0                 | 2.5                | 0                  | 0                 | 1.41          | 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                                                                                   |

12.55 Block L

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Aylesham Centre\_Block L\_Resi  
Communal Be Lean 14032025

As designed

Date: Fri Mar 14 19:01:22 2025

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache  
Calculation engine version: 7.0.27  
Interface to calculation engine: IES Virtual Environment  
Interface to calculation engine version: 7.0.27  
BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers  
Telephone number: Phone  
Address: Street Address, City, Postcode

Foundation area [m²]: 79.46

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

|                                                                          |                           |
|--------------------------------------------------------------------------|---------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m²annum   | 0.93                      |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m²annum | 0.84                      |
| Target primary energy rate (TPER), kWh <sub>e</sub> /m²annum             | 9.54                      |
| Building primary energy rate (BPER), kWh <sub>e</sub> /m²annum           | 9.04                      |
| Do the building's emission and primary energy rates exceed the targets?  | BER <= TER   BPER <= TPER |

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

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | U <sub>a</sub> -Limit | U <sub>a</sub> -Calc | U <sub>i</sub> -Calc | First surface with maximum value         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|------------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.26                  | 0.15                 | 0.15                 | L0000009:Surf[1]                         |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.18                  | 0.11                 | 0.11                 | L0000077:Surf[0]                         |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.16                  | -                    | -                    | No pitched roofs in building             |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18                  | 0.11                 | 0.11                 | L100001C:Surf[2]                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                   | 1.3                  | 1.3                  | L0000009:Surf[0]                         |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.2                   | -                    | -                    | No roof lights in building               |
| Personnel doors^                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.6                   | -                    | -                    | No personnel doors in building           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.3                   | -                    | -                    | No vehicle access doors in building      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                     | -                    | -                    | No high usage entrance doors in building |
| U <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m²K)]<br>U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m²K)]<br>U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m²K)]<br>* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.<br>** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br>^ For fire doors, limiting U-value is 1.8 W/m²K<br>NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. |                       |                      |                      |                                          |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Limiting standard     | This building        |                      |                                          |
| m³/(h.m²) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                     | 3                    |                      |                                          |