

## Project name

Vine Lane (Be Lean)

As designed

Date: Tue Apr 25 13:17:56 2023

## Administrative information

## Building Details

Address: Address 1, City, Postcode

## Certifier details

Name: Name

Telephone number:

Address: Address, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.19

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.19

BRUKL compliance module version: v6.1.e.0

Foundation area [m<sup>2</sup>]: 82.55The 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   | 2.92                      |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 2.36                      |
| Target primary energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> annum            | 31.42                     |
| Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum          | 25.21                     |
| 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                 | G_000000:Surf[2]                    |
| Floors                               | 0.18                  | 0.12                 | 0.12                 | G_000000:Surf[0]                    |
| Pitched roofs                        | 0.16                  | -                    | -                    | No pitched roofs in building        |
| Flat roofs                           | 0.18                  | 0.12                 | 0.12                 | G_000000:Surf[1]                    |
| Windows** and roof windows           | 1.6                   | 1.27                 | 1.5                  | G_000002:Surf[16]                   |
| Rooflights***                        | 2.2                   | -                    | -                    | No roof lights in building          |
| Personnel doors <sup>^</sup>         | 1.6                   | 1.5                  | 1.5                  | G_000003:Surf[3]                    |
| Vehicle access & similar large doors | 1.3                   | -                    | -                    | No vehicle access doors in building |
| High usage entrance doors            | 3                     | 1.5                  | 1.5                  | G_000002:Surf[16]                   |

U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]  
U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]  
U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.  
\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.  
<sup>^</sup> For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K  
NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability                             | Limiting standard | This building |
|--|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) 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 | NO    |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- VRF Retail

|  | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|--|--------------------|--------------------|--------------------|---------------|---------------|
| <b>This system</b>   | 2.64               | 4                  | 0                  | 1.1           | 0.9           |
| <b>Standard value</b>  | 2.5*               | N/A                | N/A                | 2^            | N/A           |
| <b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>                                   |                    |                    |                    |               | NO            |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.  |                    |                    |                    |               |               |
| ^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components. |                    |                    |                    |               |               |

### 1- DHW

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

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

| Zone name                           | General lighting and display lighting | General luminaire | Display light source |                                   |
|-------------------------------------|---------------------------------------|-------------------|----------------------|-----------------------------------|
|                                     | Standard value                        | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m <sup>2</sup> ] |
| UKPN SUBSTATION                     | 95                                    | 110               | -                    | -                                 |
| ENTRANCE LOBBY/BASEMENT FIRE ESCAPE | 95                                    | 110               | -                    | -                                 |
| RETAIL FLEXIBLE CLASS E             | 95                                    | 110               | 80                   | 1.5                               |
| LOBBY                               | 95                                    | 110               | -                    | -                                 |
| RETAIL FLEXIBLE CLASS E             | 95                                    | 110               | 80                   | 1.5                               |
| LIFT LOBBY                          | 95                                    | 110               | -                    | -                                 |
| RESIDENTIAL STAIRS LOBBY            | 95                                    | 110               | -                    | -                                 |
| RETAIL FLEXIBLE CLASS E             | 95                                    | 110               | 80                   | 1.5                               |
| RETAIL FLEXIBLE CLASS E             | 95                                    | 110               | 80                   | 1.5                               |
| RESIDENTIAL CYCLE STORE             | 95                                    | 140               | -                    | -                                 |
| RESIDENTIAL ENTRANCE LOBBY          | 95                                    | 110               | -                    | -                                 |
| REFUSE STORE                        | 95                                    | 110               | -                    | -                                 |

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

| Zone                    | Solar gain limit exceeded? (%) | Internal blinds used? |
|-------------------------|--------------------------------|-----------------------|
| RETAIL FLEXIBLE CLASS E | NO (-62.4%)                    | NO                    |
| RETAIL FLEXIBLE CLASS E | NO (-31.3%)                    | NO                    |
| RETAIL FLEXIBLE CLASS E | NO (-75.5%)                    | NO                    |
| RETAIL FLEXIBLE CLASS E | NO (-45.3%)                    | NO                    |

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

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|   | Actual | Notional |
|---|--------|----------|
| Floor area [m <sup>2</sup> ]                          | 582.5  | 582.5    |
| External area [m <sup>2</sup> ]                       | 1380.1 | 1380.1   |
| Weather   | LON    | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3      | 3        |
| Average conductance [W/K]                             | 331.61 | 403.78   |
| Average U-value [W/m <sup>2</sup> K]                  | 0.24   | 0.29     |
| Alpha value* [%]                                      | 26.77  | 10       |

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

## Building Use

| % Area    | Building Type  |
|-----------|--|
| <b>80</b> | <b>Retail/Financial and Professional Services</b><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  |
| <b>20</b> | <b>Residential Spaces</b><br>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/m<sup>2</sup>]

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 4.53         | 3.7          |
| Cooling        | 1.12         | 0.67         |
| Auxiliary      | 2.93         | 4.48         |
| Lighting       | 7.38         | 11.37        |
| Hot water      | 0.96         | 0.91         |
| Equipment*     | 41.13        | 41.13        |
| <b>TOTAL**</b> | <b>16.93</b> | <b>21.13</b> |

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

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

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

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

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

|   | Actual | Notional |
|---|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 51.44  | 43.83    |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 25.21  | 31.42    |
| Total emissions [kg/m <sup>2</sup> ]                | 2.36   | 2.92     |

## HVAC Systems Performance

| System Type  | Heat dem<br>MJ/m <sup>2</sup> | Cool dem<br>MJ/m <sup>2</sup> | Heat con<br>kWh/m <sup>2</sup> | Cool con<br>kWh/m <sup>2</sup> | Aux con<br>kWh/m <sup>2</sup> | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
|--|-------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|---------------|---------------|------------------|------------------|
| <b>[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b> |                               |                               |                                |                                |                               |               |               |                  |                  |
| <b>Actual</b>  | 71.8                          | 19                            | 8                              | 2                              | 5.2                           | 2.49          | 2.65          | 2.64             | 4                |
| <b>Notional</b>  | 65.2                          | 12.1                          | 6.5                            | 1.2                            | 7.9                           | 2.78          | 2.84          | ----             | ----             |
| <b>[ST] No Heating or Cooling</b>  |                               |                               |                                |                                |                               |               |               |                  |                  |
| <b>Actual</b>  | 0                             | 0                             | 0                              | 0                              | 0                             | 0             | 0             | 0                | 0                |
| <b>Notional</b>  | 0                             | 0                             | 0                              | 0                              | 0                             | 0             | 0             | ----             | ----             |

### Key to terms

|                                |   |
|--------------------------------|---|
| Heat dem [MJ/m <sup>2</sup> ]  | = Heating energy demand   |
| Cool dem [MJ/m <sup>2</sup> ]  | = Cooling energy demand   |
| Heat con [kWh/m <sup>2</sup> ] | = Heating energy consumption  |
| Cool con [kWh/m <sup>2</sup> ] | = Cooling energy consumption  |
| Aux con [kWh/m <sup>2</sup> ]  | = 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   |