

Project name

1MS (Be Lean)

As designed

Date: Mon Apr 24 15:52:14 2023

Administrative information

Building Details

Address: Address 1, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street 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 [m²]: 975.66The CO₂ emission and primary energy rates of the building must not exceed the targets

| | |
|---|---------------------------|
| Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum | 3.21 |
| Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum | 2.85 |
| Target primary energy rate (TPER), kWh _{PE} /m ² annum | 35.15 |
| Building primary energy rate (BPER), kWh _{PE} /m ² annum | 30.71 |
| 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 _{a-Limit} | U _{a-Calc} | U _{i-Calc} | First surface with maximum value |
|--------------------------------------|----------------------|---------------------|---------------------|--|
| Walls* | 0.26 | 0.12 | 0.12 | G1000799:Surf[0] |
| Floors | 0.18 | 0.18 | 0.18 | G2000190:Surf[1] |
| Pitched roofs | 0.16 | - | - | No pitched roofs in building |
| Flat roofs | 0.18 | 0.18 | 0.18 | G10007CA:Surf[0] |
| Windows** and roof windows | 1.6 | 1.43 | 1.45 | L0000040: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_{a-Limit} = Limiting area-weighted average U-values [W/(m²K)]
U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]
U_{i-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 |
|--|-------------------|---------------|
| m ³ /(h.m ²) 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- Radiators + Nat Vent

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|--|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 2.64 | - | 0.2 | - | - |
| Standard value | 2.5* | N/A | N/A | N/A | N/A |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | NO |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. | | | | | |

2- DX Split

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|--|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 2.64 | 6.7 | - | - | - |
| Standard value | 2.5* | 5 | N/A | N/A | N/A |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | NO |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. | | | | | |

3- Radiators + Zonal Ext

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|--|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 2.64 | - | 0.2 | - | - |
| Standard value | 2.5* | N/A | N/A | N/A | N/A |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | NO |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. | | | | | |

4- Radiators + Zonal HR

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|--|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 2.64 | - | 0.2 | - | 0.9 |
| Standard value | 2.5* | N/A | N/A | N/A | N/A |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | NO |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. | | | | | |

5- VRF + Central HR

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|--|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 2.64 | 4 | 0 | 1.5 | 0.8 |
| Standard value | 2.5* | N/A | N/A | 2^ | N/A |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | NO |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. | | | | | |
| ^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components. | | | | | |

6- Retail VRF

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

1- DHW

| | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|-----------------------|--------------------------|---|
| This building | 2.86 | 0.002 |
| Standard value | 2* | N/A |

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

2- Retail DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

| ID | System type in the Approved Documents |
|----|---|
| A | Local supply or extract ventilation units |
| B | Zonal supply system where the fan is remote from the zone |
| C | Zonal extract system where the fan is remote from the zone |
| D | Zonal balanced supply and extract ventilation system |
| E | Local balanced supply and extract ventilation units |
| F | Other local ventilation units |
| G | Fan assisted terminal variable air volume units |
| H | Fan coil units |
| I | Kitchen extract with the fan remote from the zone and a grease filter |

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

| Zone name | ID of system type | SFP [W/(l/s)] | | | | | | | | | HR efficiency | |
|--------------------|-----------------------|---------------|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
| | | A | B | C | D | E | F | G | H | I | Zone | Standard |
| | Standard value | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | | |
| G-1 Comms | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-1 Comms | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-1 Cycle Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-1 Cycle Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 Drying Room | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 FM Office | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Office Showers | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Office Showers | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Refuse Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 Refuse Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 Refuse Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 Refuse Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 Shower | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Shower | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Shower | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Shower Vent | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Showers | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Showers | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Staff Room | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 Unisex Shower | | - | - | - | 1.1 | - | - | - | - | - | - | N/A |
| G-2 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |

| Zone name | SFP [W/(l/s)] | | | | | | | | | | HR efficiency | |
|---------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
| | ID of system type | A | B | C | D | E | F | G | H | I | Zone | Standard |
| | Standard value | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | | |
| G-2 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| G-2 WC Extract | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-00 Cycle Store Entrance | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-00 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-00 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-01 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-01 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-02 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-02 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-03 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-03 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-04 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-04 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-05 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-05 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-06 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-06 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-07 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-07 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-08 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-08 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-09 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-10 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-11 Cleaner | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-11 Store | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-11 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-11 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-11 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-12 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-13 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-14 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-15 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-16 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-17 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |
| L-18 WC | | - | - | 0.3 | - | - | - | - | - | - | - | N/A |

| General lighting and display lighting | | General luminaire | Display light source | |
|---------------------------------------|----------------|-------------------|----------------------|-----------------------------------|
| Zone name | | Efficacy [lm/W] | Efficacy [lm/W] | Power density [W/m ²] |
| | Standard value | 95 | 80 | 0.3 |
| G-1 Circulation | | 110 | - | - |

| General lighting and display lighting | | General luminaire | Display light source | |
|---------------------------------------|-----------------------|-------------------|----------------------|-----------------------------------|
| Zone name | | Efficacy [lm/W] | Efficacy [lm/W] | Power density [W/m ²] |
| | Standard value | 95 | 80 | 0.3 |
| G-1 Comms | | 140 | - | - |
| G-1 Comms | | 140 | - | - |
| G-1 Cycle Store | | 140 | - | - |
| G-1 Cycle Store | | 140 | - | - |
| G-1 Staircase | | 110 | - | - |
| G-2 AHU Plant | | 140 | - | - |
| G-2 AHU Plant | | 140 | - | - |
| G-2 Basement Ventilation | | 140 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Circulation | | 110 | - | - |
| G-2 Cold Water Storage | | 140 | - | - |
| G-2 Drying Room | | 110 | - | - |
| G-2 FM Office | | 110 | - | - |
| G-2 Heating Plant | | 140 | - | - |
| G-2 Loading Bay | | 110 | - | - |
| G-2 Office Showers | | 110 | - | - |
| G-2 Office Showers | | 110 | - | - |
| G-2 Refuse Store | | 140 | - | - |
| G-2 Refuse Store | | 140 | - | - |
| G-2 Refuse Store | | 140 | - | - |
| G-2 Refuse Store | | 140 | - | - |
| G-2 Shower | | 110 | - | - |
| G-2 Shower | | 110 | - | - |
| G-2 Shower | | 110 | - | - |
| G-2 Shower Vent | | 110 | - | - |
| G-2 Showers | | 110 | - | - |
| G-2 Showers | | 110 | - | - |
| G-2 Sprinkler Plant | | 140 | - | - |
| G-2 Sprinkler Plant | | 140 | - | - |
| G-2 Staff Room | | 110 | - | - |
| G-2 Staircase | | 110 | - | - |
| G-2 Staircase | | 110 | - | - |
| G-2 Storage | | 140 | - | - |
| G-2 Switch Room | | 140 | - | - |

| General lighting and display lighting | | General luminaire | Display light source | |
|--|-----------------------|-------------------|----------------------|-----------------------------------|
| Zone name | | Efficacy [lm/W] | Efficacy [lm/W] | Power density [W/m ²] |
| | Standard value | 95 | 80 | 0.3 |
| G-2 Unisex Shower | | 110 | - | - |
| G-2 WC | | 110 | - | - |
| G-2 WC | | 110 | - | - |
| G-2 WC | | 110 | - | - |
| G-2 WC | | 110 | - | - |
| G-2 WC | | 110 | - | - |
| G-2 WC | | 110 | - | - |
| G-2 WC Extract | | 110 | - | - |
| L-00 BOH | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Circulation | | 110 | - | - |
| L-00 Cycle Store Entrance | | 110 | - | - |
| L-00 Flexible Class E (cafe/workspace) | | 110 | - | - |
| L-00 Flexible Class E | | 110 | 80 | 1.5 |
| L-00 Flexible Class E | | 110 | 80 | 1.5 |
| L-00 Flexible Class E | | 110 | 80 | 1.5 |
| L-00 Flexible Class E | | 110 | 80 | 1.5 |
| L-00 Office Lobby | | 110 | 80 | 1.35 |
| L-00 Post Room | | 110 | - | - |
| L-00 Security & Fire Risk | | 110 | - | - |
| L-00 WC | | 110 | - | - |
| L-00 WC | | 110 | - | - |
| L-01 Circulation | | 110 | - | - |
| L-01 Circulation | | 110 | - | - |
| L-01 Circulation | | 110 | - | - |
| L-01 Circulation | | 110 | - | - |
| L-01 Circulation | | 110 | - | - |
| L-01 Circulation | | 110 | - | - |
| L-01 Cleaner | | 110 | - | - |
| L-01 Office | | 140 | - | - |
| L-01 WC | | 110 | - | - |
| L-02 Cleaner | | 110 | - | - |
| L-02 Circulation | | 110 | - | - |
| L-02 Circulation | | 110 | - | - |
| L-02 Circulation | | 110 | - | - |
| L-02 Circulation | | 110 | - | - |