# BRUKL Output Document

**HM Government**

## Compliance with England Building Regulations Part L 2013

**Project name**

# 2020_Hall School Be Green_Imp2b

As designed

**Date:** Thu Dec 03 11:33:55 2020

## Administrative information

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

### Certification tool
**Calculation engine:** Apache

**Calculation engine version:** 7.0.12

**Interface to calculation engine:** IES Virtual Environment

**Interface to calculation engine version:** 7.0.12

**BRUKL compliance check version:** v5.6.a.1

### Owner Details
**Name:** Name

**Telephone number:** Phone

**Address:** Street Address, City, Postcode

### Certifier details
**Name:** Name

**Telephone number:** Phone

**Address:** Street Address, City, Postcode

## Criterion 1: The calculated $CO_2$ emission rate for the building must not exceed the target

| | |
|---|---|
| $CO_2$ emission rate from the notional building, kg$CO_2$/m².annum | 16.9 |
| Target $CO_2$ emission rate (TER), kg$CO_2$/m².annum | 16.9 |
| Building $CO_2$ emission rate (BER), kg$CO_2$/m².annum | 13.4 |
| Are emissions from the building less than or equal to the target? | BER =< TER |
| Are as built details the same as used in the BER calculations? | Separate submission |

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

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

**Building fabric**

| Element | $U_{a\text{-}Limit}$ | $U_{a\text{-}Calc}$ | $U_{i\text{-}Calc}$ | Surface where the maximum value occurs* |
|---|---|---|---|---|
| Wall** | 0.35 | 0.13 | 0.13 | L1000001:Surf[1] |
| Floor | 0.25 | 0.12 | 0.12 | BS000000:Surf[0] |
| Roof | 0.25 | 0.1 | 0.18 | L000001E:Surf[1] |
| Windows***, roof windows, and rooflights | 2.2 | 1.17 | 1.2 | L1000000:Surf[2] |
| Personnel doors | 2.2 | - | - | No Personnel doors in building |
| Vehicle access & similar large doors | 1.5 | 1.18 | 1.18 | L1000004:Surf[6] |
| High usage entrance doors | 3.5 | - | - | No High usage entrance doors in building |

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]
$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

\* There might be more than one surface where the maximum U-value occurs.
\** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
\*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air Permeability | Worst acceptable standard | This building |
|---|---|---|
| m³/(h.m²) at 50 Pa | 10 | 3 |

**Building services**

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

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

### 1- Nat Vent - ASHP

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.77 | - | 0 | 0 | - |
| **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. For types <=12 kW output, refer to EN 14825 for limiting standards.

### 2- L00-L01 - MVHR ceiling + VRF_1.0 w Cooling - ASHP

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.77 | 3.93 | 0 | 1 | 0.8 |
| **Standard value** | 2.5* | 2.55 | N/A | 1.6^ | 0.45 |
| **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. For types <=12 kW output, refer to EN 14825 for limiting standards.

^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

### 3- Extract only - ASHP

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.77 | - | 0 | 0 | - |
| **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. For types <=12 kW output, refer to EN 14825 for limiting standards.

### 4- L02 - MVHR ceiling + VRF_1.3 w Cooling - ASHP

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.77 | 3.93 | 0 | 1.3 | 0.8 |
| **Standard value** | 2.5* | 2.55 | N/A | 1.6^ | 0.45 |
| **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. For types <=12 kW output, refer to EN 14825 for limiting standards.

^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

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

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

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

| Zone name | SFP [W/(l/s)] | | | | | | | | | HR efficiency | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ID of system type | A | B | C | D | E | F | G | H | I | Zone | Standard |
| Standard value | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | | |
| L-2.0_01_LOBBY | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-2.0_01_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-1.0_01_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-1.0_02_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-1.0_03_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-1.0_04_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-1.0_01_STAFF | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_01_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_02_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_01_LOBBY | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_03_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_05_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_06_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_07_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_01_SCIEN | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_04_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L01.0_01_SCIEN | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L01.0_02_SCIEN | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L01.0_03_SCIEN | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_02_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_01_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_03_SUPPO | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_01_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_01_SUPPO | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_02_SUPPO | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L01.0_04_SCIEN | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.0_03_CLASS | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L00.0_01_OFFIC | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L-1.0_01_ENTRA | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.5_01_CHIMN | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.5_01_APREP | - | - | - | - | - | - | - | 0.3 | - | - | N/A |
| L02.5_01_ARTRO | - | - | - | - | - | - | - | 0.3 | - | - | N/A |

| General lighting and display lighting | Luminous efficacy [lm/W] | | | |
|---|---|---|---|---|
| Zone name | Luminaire | Lamp | Display lamp | General lighting [W] |
| Standard value | 60 | 60 | 22 | |
| L-2.0_01_WATER | 75 | - | - | 70 |
| L-2.0_01_STORE | 75 | - | - | 22 |
| L-2.0_01_STAIR | - | 75 | - | 45 |
| L-2.0_01_PLANT | 75 | - | - | 44 |
| L-2.0_01_SCORE | - | 75 | - | 77 |
| L-2.0_01_LIFTS | - | 75 | - | 20 |
| L-2.0_01_LOBBY | - | 75 | - | 18 |

| General lighting and display lighting | Luminous efficacy [lm/W] | | | |
|---|---|---|---|---|
| Zone name | Luminaire | Lamp | Display lamp | General lighting [W] |
| Standard value | 60 | 60 | 22 | |
| L-2.0_01_TOILE | - | 75 | - | 101 |
| L-2.0_01_ACCWC | - | 75 | - | 29 |
| L-2.0_01_CHANG | - | 75 | - | 208 |
| L-2.0_01_OFFIC | 90 | - | - | 99 |
| L-2.0_01_CORRI | - | 75 | - | 40 |
| L-1.0_01_PLANT | 75 | - | - | 71 |
| L-1.0_01_STAIR | - | 75 | - | 69 |
| L-1.0_01_ATRIU | 75 | - | - | 708 |
| L-1.0_01_OFFIC | 90 | - | - | 126 |
| L-1.0_02_OFFIC | 90 | - | - | 200 |
| L-1.0_03_OFFIC | 90 | - | - | 104 |
| L-1.0_04_OFFIC | 90 | - | - | 91 |
| L-1.0_01_SCORE | - | 75 | - | 63 |
| L-1.0_01_LIFTS | - | 75 | - | 21 |
| L-1.0_02_SCORE | - | 75 | - | 80 |
| L-1.0_01_STAFF | - | 90 | - | 112 |
| L-1.0_02_PLANT | 75 | - | - | 49 |
| L-1.0_03_SCORE | - | 75 | - | 60 |
| L-1.0_01_ACCWC | - | 75 | - | 39 |
| L00.0_01_CLASS | 90 | - | - | 234 |
| L00.0_02_CLASS | 90 | - | - | 264 |
| L00.0_01_SCORE | - | 75 | - | 6 |
| L00.0_01_LOBBY | - | 75 | - | 29 |
| L00.0_01_LIFTS | - | 75 | - | 26 |
| L00.0_03_CLASS | 90 | - | - | 213 |
| L00.0_01_ACCWC | - | 75 | - | 42 |
| L00.0_01_PLANT | 75 | - | - | 12 |
| L00.0_02_SCORE | - | 75 | - | 59 |
| L00.0_05_CLASS | 90 | - | - | 218 |
| L00.0_06_CLASS | 90 | - | - | 213 |
| L00.0_07_CLASS | 90 | - | - | 209 |
| L00.0_01_STAIR | - | 75 | - | 39 |
| L01.0_01_STORE | 75 | - | - | 11 |
| L00.0_01_SCIEN | 90 | - | - | 165 |
| L00.0_01_CORRI | - | 75 | - | 137 |
| L00.0_04_CLASS | 90 | - | - | 280 |
| L01.0_02_STORE | 75 | - | - | 12 |
| L01.0_01_SCORE | - | 75 | - | 6 |
| L01.0_01_SCIEN | 90 | - | - | 921 |
| L01.0_02_SCIEN | 90 | - | - | 977 |
| L01.0_01_PLANT | 75 | - | - | 12 |
| L01.0_02_SCORE | - | 75 | - | 52 |
| L01.0_01_ACCWC | - | 75 | - | 38 |

| General lighting and display lighting | Luminous efficacy [lm/W] | | | |
|---|---|---|---|---|
| Zone name | Luminaire | Lamp | Display lamp | General lighting [W] |
| Standard value | 60 | 60 | 22 | |
| L01.0_01_LIFTS | - | 75 | - | 21 |
| L01.0_03_SCIEN | 90 | - | - | 947 |
| L02.0_02_CLASS | 90 | - | - | 326 |
| L02.0_01_CLASS | 90 | - | - | 204 |
| L02.0_03_SUPPO | 90 | - | - | 85 |
| L02.0_01_OFFIC | 90 | - | - | 118 |
| L02.0_01_ACCWC | - | 75 | - | 34 |
| L02.0_01_LIFTS | - | 75 | - | 22 |
| L02.0_01_SUPPO | 90 | - | - | 87 |
| L02.0_02_SUPPO | 90 | - | - | 87 |
| L01.0_04_SCIEN | 90 | - | - | 142 |
| L02.0_02_SCORE | - | 75 | - | 42 |
| L02.0_03_CLASS | 90 | - | - | 212 |
| L02.0_02_STORE | 75 | - | - | 10 |
| L02.0_01_SCORE | - | 75 | - | 6 |
| L02.0_01_STORE | 75 | - | - | 5 |
| L-2.0_02_STORE | 75 | - | - | 24 |
| L-1.0_01_WHALL_UPPER | - | 90 | - | 20 |
| L-1.0_01_WHALL_LOWER | - | 90 | - | 1425 |
| L00.0_01_OFFIC | 90 | - | - | 144 |
| L-1.0_01_ENTRA | - | 75 | - | 104 |
| L00.0_01_ATRIU (Stack) | - | 75 | - | 26 |
| L00.0_01_ATRIU | - | 75 | - | 240 |
| L01.0_01_ATRIU (Stack) | - | 75 | - | 7 |
| L01.0_01_ATRIU | - | 75 | - | 193 |
| L02.0_01_ATRIU | - | 75 | - | 175 |
| L02.0_01_ATRIU (Stack) | - | 75 | - | 7 |
| L02.5_01_CHIMN | 90 | - | - | 30 |
| L02.5_01_APREP | 90 | - | - | 81 |
| L02.5_01_ARTRO | 90 | - | - | 527 |

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

| Zone | Solar gain limit exceeded? (%) | Internal blinds used? |
|---|---|---|
| L-2.0_01_LOBBY | N/A | N/A |
| L-2.0_01_OFFIC | N/A | N/A |
| L-1.0_01_ATRIU | NO (-99.5%) | NO |
| L-1.0_01_OFFIC | NO (-54.6%) | NO |
| L-1.0_02_OFFIC | NO (-73%) | YES |
| L-1.0_03_OFFIC | N/A | N/A |
| L-1.0_04_OFFIC | NO (-75.9%) | YES |
| L-1.0_01_STAFF | NO (-77.9%) | YES |
| L00.0_01_CLASS | NO (-57.6%) | YES |
| L00.0_02_CLASS | NO (-73.5%) | YES |

| Zone | Solar gain limit exceeded? (%) | Internal blinds used? |
|---|---|---|
| L00.0_01_LOBBY | N/A | N/A |
| L00.0_03_CLASS | NO (-59.2%) | YES |
| L00.0_05_CLASS | NO (-82.7%) | NO |
| L00.0_06_CLASS | NO (-81.2%) | NO |
| L00.0_07_CLASS | NO (-87.9%) | YES |
| L00.0_01_SCIEN | N/A | N/A |
| L00.0_04_CLASS | NO (-88%) | NO |
| L01.0_01_SCIEN | NO (-52%) | YES |
| L01.0_02_SCIEN | NO (-66%) | YES |
| L01.0_03_SCIEN | NO (-73.6%) | YES |
| L02.0_02_CLASS | NO (-71.6%) | YES |
| L02.0_01_CLASS | NO (-63%) | YES |
| L02.0_03_SUPPO | N/A | N/A |
| L02.0_01_OFFIC | NO (-79.8%) | YES |
| L02.0_01_SUPPO | NO (-53.3%) | NO |
| L02.0_02_SUPPO | NO (-51.7%) | NO |
| L01.0_04_SCIEN | N/A | N/A |
| L02.0_03_CLASS | NO (-33.2%) | YES |
| L-1.0_01_WHALL_UPPER | NO (-28.2%) | NO |
| L-1.0_01_WHALL_LOWER | NO (-93.5%) | NO |
| L00.0_01_OFFIC | NO (-29.9%) | NO |
| L-1.0_01_ENTRA | NO (-8.3%) | NO |
| L02.5_01_CHIMN | N/A | N/A |
| L02.5_01_APREP | N/A | N/A |
| L02.5_01_ARTRO | NO (-69%) | NO |

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

Separate submission

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

Separate submission

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

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

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|  | Actual | Notional |
|---|---|---|
| Area [m²] | 2174 | 2174 |
| External area [m²] | 3206.9 | 3206.9 |
| Weather | LON | LON |
| Infiltration [m³/hm²@ 50Pa] | 3 | 4 |
| Average conductance [W/K] | 782.41 | 1286.4 |
| Average U-value [W/m²K] | 0.24 | 0.4 |
| Alpha value* [%] | 10 | 10 |

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

## Building Use

| % Area | Building Type |
|---|---|
|  | A1/A2 Retail/Financial and Professional services |
|  | A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways |
|  | B1 Offices and Workshop businesses |
|  | B2 to B7 General Industrial and Special Industrial Groups |
|  | B8 Storage or Distribution |
|  | C1 Hotels |
|  | C2 Residential Institutions: Hospitals and Care Homes |
|  | C2 Residential Institutions: Residential schools |
| 9 | C2 Residential Institutions: Universities and colleges |
|  | C2A Secure Residential Institutions |
|  | Residential spaces |
|  | D1 Non-residential Institutions: Community/Day Centre |
|  | D1 Non-residential Institutions: Libraries, Museums, and Galleries |
| 91 | D1 Non-residential Institutions: Education |
|  | D1 Non-residential Institutions: Primary Health Care Building |
|  | D1 Non-residential Institutions: Crown and County Courts |
|  | D2 General Assembly and Leisure, Night Clubs, and Theatres |
|  | Others: Passenger terminals |
|  | Others: Emergency services |
|  | Others: Miscellaneous 24hr activities |
|  | Others: Car Parks 24 hrs |
|  | Others: Stand alone utility block |

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

|  | Actual | Notional |
|---|---|---|
| Heating | 2.5 | 5.44 |
| Cooling | 2.2 | 1.81 |
| Auxiliary | 9.5 | 7.55 |
| Lighting | 8.35 | 14.77 |
| Hot water | 3.9 | 3.8 |
| Equipment* | 17 | 17 |
| **TOTAL**** | **26.45** | **33.37** |

* 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 | 0 |
| Wind turbines | 0 | 0 |
| CHP generators | 0 | 0 |
| Solar thermal systems | 0 | 0 |

## Energy & CO$_2$ Emissions Summary

|  | Actual | Notional |
|---|---|---|
| Heating + cooling demand [MJ/m²] | 54.09 | 74.8 |
| Primary energy* [kWh/m²] | 98.32 | 127.54 |
| Total emissions [kg/m²] | 13.4 | 16.9 |

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

## 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] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 25.1 | 56.3 | 2.1 | 5.1 | 18.5 | 3.25 | 3.05 | 3.77 | 3.93 |
| | **Notional** | 37.5 | 54 | 4.1 | 4 | 14.9 | 2.56 | 3.79 | ---- | ---- |
| **[ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 30 | 51.2 | 2.6 | 4.6 | 15.9 | 3.19 | 3.11 | 3.77 | 3.93 |
| | **Notional** | 47.2 | 53 | 5.1 | 3.9 | 15.1 | 2.56 | 3.79 | ---- | ---- |
| **[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 13.1 | 0 | 1.1 | 0 | 2.5 | 3.36 | 0 | 3.77 | 0 |
| | **Notional** | 43.2 | 0 | 4.7 | 0 | 1.2 | 2.56 | 0 | ---- | ---- |
| **[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 40.2 | 0 | 3.3 | 0 | 2.2 | 3.36 | 0 | 3.77 | 0 |
| | **Notional** | 62.8 | 0 | 6.8 | 0 | 1.1 | 2.56 | 0 | ---- | ---- |
| **[ST] No Heating or Cooling** | | | | | | | | | | |
| | **Actual** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Notional** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ---- | ---- |

## Key to terms

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

# Key Features

**Building fabric**

| Element | $U_{i-Typ}$ | $U_{i-Min}$ | Surface where the minimum value occurs* |
|---|---|---|---|
| Wall | 0.23 | 0.13 | L1000001:Surf[1] |
| Floor | 0.2 | 0.12 | BS000000:Surf[0] |
| Roof | 0.15 | 0.1 | BS000000:Surf[1] |
| Windows, roof windows, and rooflights | 1.5 | 0.9 | L000000E:Surf[0] |
| Personnel doors | 1.5 | - | No Personnel doors in building |
| Vehicle access & similar large doors | 1.5 | 1.18 | L1000004:Surf[6] |
| High usage entrance doors | 1.5 | - | No High usage entrance doors in building |
| $U_{i-Typ}$ = Typical individual element U-values [W/(m²K)] | | | $U_{i-Min}$ = Minimum individual element U-values [W/(m²K)] |
| * There might be more than one surface where the minimum U-value occurs. | | | |

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