# BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

**Project name**

## Refurbished Haringey Civic Centre Green Stage 3+

As designed

**Date:** Mon Sep 04 09:58:00 2023

## Administrative information

### Building Details

**Address:** River Park House, 225 High Rd, London, N22 8HQ

### Certifier details

**Name:** David Richard Kingstone

**Telephone number:** 07753829637

**Address:** Buro Happold, 3 Wellington Place, Leeds, LS1 4AP

### 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 [$m^2$]:** 1236.74

## The $CO_2$ 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 $CO_2$ emission rate (TER), $kgCO_2/m^2$.annum | 3.38 | |
| Building $CO_2$ emission rate (BER), $kgCO_2/m^2$.annum | 4.11 | |
| Target primary energy rate (TPER), $kWh_{PE}/m^2$.annum | 36.66 | |
| Building primary energy rate (BPER), $kWh_{PE}/m^2$.annum | 43.88 | |
| 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 | $U_{a\text{-}Limit}$ | $U_{a\text{-}Calc}$ | $U_{i\text{-}Calc}$ | First surface with maximum value |
|---|---|---|---|---|
| Walls* | 0.26 | 0.3 | 0.3 | 01000001:Surf[36] |
| Floors | 0.18 | 0.25 | 0.25 | 0000001C:Surf[0] |
| Pitched roofs | 0.16 | - | - | No pitched roofs in building |
| Flat roofs | 0.18 | 0.18 | 0.18 | 0100003D:Surf[1] |
| Windows** and roof windows | 1.6 | 1.8 | 1.8 | 0000001C:Surf[1] |
| Rooflights*** | 2.2 | - | - | No roof lights in building |
| Personnel doors^ | 1.6 | 2.2 | 2.2 | 01000003:Surf[0] |
| 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 |

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]

$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* 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 $W/m^2K$

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 | 5 |

## 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** | <0.9 |

1- 02. FCUs_MVHR

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.5 | 4.34 | 0 | 1.6 | 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.

2- 03. Open office FCUs

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.5 | 4.34 | 0 | 1.6 | 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.

3- 05. Radiators circ and store

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.5 | - | 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- 06. Toilet mech vent

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.5 | - | 0.2 | - | 0.8 |
| **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- 04. DX (Comms)

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.5 | 5.55 | - | - | - |
| **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.

6- 01. Aud All air AHU

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|---|---|---|---|---|
| **This system** | 3.5 | 4.34 | 0 | 1.6 | 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.

1- 07. DHW Building

| | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|---|---|---|
| **This building** | 1 | 0.005 |
| **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 | SFP [W/(l/s)] | | | | | | | | | HR efficiency | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ID of system type | A | B | C | D | E | F | G | H | I | | |
| Standard value | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone | Standard |
| 00 - Changing Places Space | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Civic Bridge Welcome Area/Circulation | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Entrance Lobby/Reception 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Entrance Lobby/Reception 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Flexible Meeting/Event Space | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 04 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 05 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 06 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 07 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 08 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Meeting Room 09 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Open Office 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Open Office 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Quiet Room | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 00 - Study Room | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Committee 01 & 2 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |

| Zone name | SFP [W/(l/s)] | | | | | | | | | HR efficiency | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ID of system type | A | B | C | D | E | F | G | H | I | | |
| Standard value | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone | Standard |
| 01 - Committee 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Mayor Robing | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Mayor's Aid & Wating Area | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Mayors Parlour | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Meeting 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Meeting 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Meeting 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Meeting 04 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Meeting 05 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Open Office 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Open Office 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Open Office 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Open Office 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Opposition Leader's Office | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Study Room 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Study Room 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 01 - Study Room 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Meeting Room 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Meeting Room 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Open Office 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Open Office 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Open Office 04 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Police Secure Room | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Study Room 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Study Room 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Study Room 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 03 - Booth | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 03 - MASH | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 03 - Open Office 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 03 - Open Office 02 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 03 - Open Office 03 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 03 - Police Secure Room | - | - | - | - | - | - | - | 0.2 | - | - | N/A |
| 02 - Open Office 01 | - | - | - | - | - | - | - | 0.2 | - | - | N/A |

| 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 |
| 00 - Changing Places Space | 122 | - | - |
| 00 - Civic Bridge Welcome Area/Circulation | 112 | - | - |
| 00 - Entrance Lobby/Reception 02 | 111 | 80 | 1.688 |
| 00 - Entrance Lobby/Reception 03 | 111 | 80 | 1.688 |
| 00 - Flexible Meeting/Event Space | 122 | - | - |
| 00 - Meeting Room 01 | 122 | - | - |

| 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 |
| 00 - Meeting Room 02 | 122 | - | - |
| 00 - Meeting Room 04 | 122 | - | - |
| 00 - Meeting Room 05 | 122 | - | - |
| 00 - Meeting Room 06 | 122 | - | - |
| 00 - Meeting Room 07 | 122 | - | - |
| 00 - Meeting Room 08 | 122 | - | - |
| 00 - Meeting Room 09 | 122 | - | - |
| 00 - Open Office 01 | 114 | - | - |
| 00 - Open Office 02 | 114 | - | - |
| 00 - Quiet Room | 122 | - | - |
| 00 - Study Room | 122 | - | - |
| 00_Circ_01 | 112 | - | - |
| 00_Circ_03 | 112 | - | - |
| 00_Circ_04 | 112 | - | - |
| 00_Circ_05 | 112 | - | - |
| 00_Circ_02 | 112 | - | - |
| 00_Civic_Bridge_Kitchen/Storage | 108 | - | - |
| 00_Civic_Bridge_WC_Lobby | 112 | - | - |
| 00_Civic_Bridge_WCs | 108 | - | - |
| 00_Cleaners Cup. | 108 | - | - |
| 00_Comms_Room | 156 | - | - |
| 00_Draft_Lobby | 112 | - | - |
| 00_Draught_Lobby_01 | 112 | - | - |
| 00_Lobby | 112 | - | - |
| 00_Lobby | 112 | - | - |
| 00_Stairs_01 | 147 | - | - |
| 00_Stairs_02 | 147 | - | - |
| 00_WC_Lobby_01 | 112 | - | - |
| 00_WCs_01 | 108 | - | - |
| 00_WCs_02 | 108 | - | - |
| 01 - Civic Chamber 01 | 97 | - | - |
| 01 - Committee 01 & 2 | 122 | - | - |
| 01 - Committee 03 | 122 | - | - |
| 01 - Mayor Robing | 122 | - | - |
| 01 - Mayor Robing - WC | 108 | - | - |
| 01 - Mayor's Aid & Wating Area | 122 | - | - |
| 01 - Mayors Parlour | 122 | - | - |
| 01 - Meeting 01 | 122 | - | - |
| 01 - Meeting 02 | 122 | - | - |
| 01 - Meeting 03 | 122 | - | - |
| 01 - Meeting 04 | 122 | - | - |
| 01 - Meeting 05 | 122 | - | - |
| 01 - Open Office 01 | 114 | - | - |

| 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 |
| 01 - Open Office 02 | 114 | - | - |
| 01 - Open Office 03 | 114 | - | - |
| 01 - Open Office 03 | 114 | - | - |
| 01 - Opposition Leader's Office | 122 | - | - |
| 01 - Study Room 01 | 122 | - | - |
| 01 - Study Room 02 | 122 | - | - |
| 01 - Study Room 03 | 122 | - | - |
| 01_Acc. WC | 108 | - | - |
| 01_Aud_Circ_01 | 112 | - | - |
| 01_Aud_Circ_02 | 97 | - | - |
| 01_Circ_03 | 112 | - | - |
| 01_Circ_04 | 112 | - | - |
| 01_Circ_04 | 112 | - | - |
| 01_Circ_04 | 112 | - | - |
| 01_Circ_05 | 112 | - | - |
| 01_Circulation | 112 | - | - |
| 01_Civic_Bridge_Circ_01 | 112 | - | - |
| 01_Comms Room | 156 | - | - |
| 01_Stairs_01 | 147 | - | - |
| 01_WC_Lobby_01 | 112 | - | - |
| 01_WCs | 108 | - | - |
| 01_WCs_01 | 108 | - | - |
| 01_WCs_03 | 108 | - | - |
| 01_WCs_03 | 108 | - | - |
| 01_WCs_04 | 108 | - | - |
| 01_WCs_Cleaner's_Cupboard | 108 | - | - |
| 01_WCs_Lobby | 112 | - | - |
| 02 - Civic Auditorium | 97 | - | - |
| 02 - Civic Seating | 97 | - | - |
| 02 - Meeting Room 01 | 122 | - | - |
| 02 - Meeting Room 02 | 122 | - | - |
| 02 - Open Office 02 | 114 | - | - |
| 02 - Open Office 03 | 114 | - | - |
| 02 - Open Office 04 | 114 | - | - |
| 02 - Police Secure Room | 122 | - | - |
| 02 - Study Room 01 | 122 | - | - |
| 02 - Study Room 01 | 122 | - | - |
| 02 - Study Room 02 | 122 | - | - |
| 02_Aud_Circ_01 | 97 | - | - |
| 02_Ciculation | 112 | - | - |
| 02_Circ_02 | 112 | - | - |
| 02_Circ_03 | 112 | - | - |
| 02_Circ_04 | 112 | - | - |

| 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 |
| 02_Comms_Room | 156 | - | - |
| 02_Stairs | 147 | - | - |
| 02_Stairs_01 | 147 | - | - |
| 02_Store | 108 | - | - |
| 02_WC_01 | 108 | - | - |
| 02_WC_02 | 108 | - | - |
| 02_WC_03 | 108 | - | - |
| 02_WC_Lobby | 112 | - | - |
| 02_WC_Lobby_01 | 112 | - | - |
| 02_WCs_01 | 108 | - | - |
| 03 - Booth | 122 | - | - |
| 03 - MASH | 114 | - | - |
| 03 - Open Office 01 | 114 | - | - |
| 03 - Open Office 02 | 114 | - | - |
| 03 - Open Office 03 | 114 | - | - |
| 03 - Police Secure Room | 122 | - | - |
| 03_Circ_01 | 112 | - | - |
| 03_Circ_02 | 112 | - | - |
| 03_Circ_03 | 112 | - | - |
| 03_Circ_04 | 112 | - | - |
| 03_Circ_05 | 112 | - | - |
| 03_Cleaners_01 | 108 | - | - |
| 03_Comms_Room | 156 | - | - |
| 03_Council_Chamber_Comms_Room | 156 | - | - |
| 03_Stairs_01 | 147 | - | - |
| 03_Stairs_02 | 147 | - | - |
| 03_WC | 108 | - | - |
| 03_WCs_01 | 108 | - | - |
| 03_WCs_Lobby | 112 | - | - |
| B0_Circ_ 01 | 112 | - | - |
| B0_Comms_Room | 156 | - | - |
| B0_Domestic_Water_Tank | 156 | - | - |
| B0_General_Storage | 108 | - | - |
| B0_General_Storage_02 | 108 | - | - |
| B0_General_Storage_03 | 108 | - | - |
| B0_General_Storage_04 | 108 | - | - |
| B0_IT_Secure_Storage | 108 | - | - |
| B0_Life_Lobby | 112 | - | - |
| B0_Life_Safety_Room | 156 | - | - |
| B0_Lobby | 112 | - | - |
| B0_LV_Room | 156 | - | - |
| B0_Plant_Space | 156 | - | - |
| B0_Stair_02 | 147 | - | - |

| 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 |
| B0_Stairs_01 | 147 | - | - |
| B0_Storage | 108 | - | - |
| 02 - Open Office 01 | 114 | - | - |

## 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? |
|---|---|---|
| 00 - Changing Places Space | YES (+0.3%) | NO |
| 00 - Civic Bridge Welcome Area/Circulation | YES (+29%) | NO |
| 00 - Entrance Lobby/Reception 02 | YES (+181.4%) | NO |
| 00 - Entrance Lobby/Reception 03 | YES (+137.6%) | NO |
| 00 - Flexible Meeting/Event Space | YES (+16.8%) | NO |
| 00 - Meeting Room 01 | YES (+7.7%) | NO |
| 00 - Meeting Room 02 | YES (+99%) | NO |
| 00 - Meeting Room 04 | YES (+9.5%) | NO |
| 00 - Meeting Room 05 | YES (+9.8%) | NO |
| 00 - Meeting Room 06 | YES (+9.3%) | NO |
| 00 - Meeting Room 07 | YES (+8.5%) | NO |
| 00 - Meeting Room 08 | YES (+105.6%) | NO |
| 00 - Meeting Room 09 | NO (-24%) | NO |
| 00 - Open Office 01 | YES (+27.7%) | NO |
| 00 - Open Office 02 | YES (+7.1%) | NO |
| 00 - Quiet Room | NO (-81.5%) | NO |
| 00 - Study Room | YES (+13.1%) | NO |
| 00_Comms_Room | N/A | N/A |
| 01 - Civic Chamber 01 | YES (+2.1%) | NO |
| 01 - Committee 01 & 2 | YES (+4.7%) | NO |
| 01 - Committee 03 | YES (+53.5%) | NO |
| 01 - Mayor Robing | YES (+43%) | NO |
| 01 - Mayor's Aid & Wating Area | N/A | N/A |
| 01 - Mayors Parlour | YES (+50.6%) | NO |
| 01 - Meeting 01 | YES (+22.7%) | NO |
| 01 - Meeting 02 | YES (+16.9%) | NO |
| 01 - Meeting 03 | YES (+16.6%) | NO |
| 01 - Meeting 04 | YES (+38.4%) | NO |
| 01 - Meeting 05 | YES (+7.7%) | NO |
| 01 - Open Office 01 | YES (+37.5%) | NO |
| 01 - Open Office 02 | NO (-31%) | NO |
| 01 - Open Office 03 | NO (-6.3%) | NO |
| 01 - Open Office 03 | NO (-0.1%) | NO |
| 01 - Opposition Leader's Office | YES (+0.7%) | NO |
| 01 - Study Room 01 | YES (+9.6%) | NO |
| 01 - Study Room 02 | NO (-2.9%) | NO |
| 01 - Study Room 03 | YES (+52.7%) | NO |

| Zone | Solar gain limit exceeded? (%) | Internal blinds used? |
|---|---|---|
| 01_Aud_Circ_02 | YES (+16%) | NO |
| 01_Comms Room | N/A | N/A |
| 02 - Civic Auditorium | NO (-63.3%) | NO |
| 02 - Civic Seating | YES (+21.8%) | NO |
| 02 - Meeting Room 01 | YES (+21.9%) | NO |
| 02 - Meeting Room 02 | YES (+10.3%) | NO |
| 02 - Open Office 02 | NO (-42.6%) | NO |
| 02 - Open Office 03 | NO (-5.7%) | NO |
| 02 - Open Office 04 | NO (-4.7%) | NO |
| 02 - Police Secure Room | NO (-16.6%) | NO |
| 02 - Study Room 01 | YES (+4.5%) | NO |
| 02 - Study Room 01 | YES (+13.9%) | NO |
| 02 - Study Room 02 | NO (-3.4%) | NO |
| 02_Comms_Room | N/A | N/A |
| 03 - Booth | YES (+41.8%) | NO |
| 03 - MASH | YES (+38.1%) | NO |
| 03 - Open Office 01 | YES (+52.9%) | NO |
| 03 - Open Office 02 | YES (+35.2%) | NO |
| 03 - Open Office 03 | YES (+25.8%) | NO |
| 03 - Police Secure Room | YES (+4.1%) | NO |
| 03_Comms_Room | N/A | N/A |
| 03_Council_Chamber_Comms_Room | N/A | N/A |
| B0_Comms_Room | N/A | N/A |
| 02 - Open Office 01 | NO (-2.9%) | 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? | NO |
| Are any such measures included in the proposed design? | YES |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

| | Actual | Notional |
|---|---|---|
| Floor area [$m^2$] | 5434.7 | 5434.7 |
| External area [$m^2$] | 7399.9 | 7399.9 |
| Weather | LON | LON |
| Infiltration [$m^3/hm^2$@ 50Pa] | 5 | 3 |
| Average conductance [W/K] | 4219.14 | 0 |
| Average U-value [$W/m^2K$] | 0.57 | 0 |
| Alpha value* [%] | 24.15 | 10 |

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

## Building Use

| % Area | Building Type |
|---|---|
| | Retail/Financial and Professional Services |
| | Restaurants and Cafes/Drinking Establishments/Takeaways |
| **92** | **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 |
| **8** | **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 [$kWh/m^2$]

| | Actual | Notional |
|---|---|---|
| Heating | 8.1 | 4.14 |
| Cooling | 5.06 | 2.91 |
| Auxiliary | 11.44 | 6.61 |
| Lighting | 10.2 | 9.59 |
| Hot water | 2.55 | 1.52 |
| Equipment* | 49.45 | 49.45 |
| **TOTAL**** | **37.35** | **24.77** |

* 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 [$kWh/m^2$]

| | Actual | Notional |
|---|---|---|
| Photovoltaic systems | 8.69 | 0 |
| Wind turbines | 0 | 0 |
| CHP generators | 0 | 0 |
| Solar thermal systems | 0 | 0 |
| *Displaced electricity* | *8.69* | *0* |

## Energy & $CO_2$ Emissions Summary

| | Actual | Notional |
|---|---|---|
| Heating + cooling demand [$MJ/m^2$] | 144.8 | 89.92 |
| Primary energy [$kWh_{PE}/m^2$] | 43.88 | 36.66 |
| Total emissions [$kg/m^2$] | 4.11 | 3.38 |

## 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] ASHP, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 91.6 | 120.4 | 8.5 | 10.3 | 13.4 | 2.99 | 3.24 | 3.5 | 4.34 |
| | **Notional** | 33.3 | 90.3 | 3.3 | 5.4 | 10.9 | 2.78 | 4.63 | ---- | ---- |
| **[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 128.5 | 0 | 11.4 | 0 | 1.1 | 3.12 | 0 | 3.5 | 0 |
| | **Notional** | 88.9 | 0 | 8.9 | 0 | 1 | 2.78 | 0 | ---- | ---- |
| **[ST] Constant volume system (variable fresh air rate), [HS] ASHP, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 112.4 | 87.2 | 10.5 | 10.2 | 47.1 | 2.97 | 2.38 | 3.5 | 4.34 |
| | **Notional** | 74.9 | 48.4 | 7.5 | 2.9 | 10.9 | 2.78 | 4.63 | ---- | ---- |
| **[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 0 | 0 | 0 | 0 | 0 | 3.26 | 3.94 | 3.5 | 5.55 |
| | **Notional** | 0 | 0 | 0 | 0 | 0 | 2.78 | 4.63 | ---- | ---- |
| **[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 82.9 | 76.4 | 7.7 | 6.6 | 12.1 | 2.99 | 3.24 | 3.5 | 4.34 |
| | **Notional** | 27.7 | 83.2 | 2.8 | 5 | 10.2 | 2.78 | 4.63 | ---- | ---- |
| **[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity** | | | | | | | | | | |
| | **Actual** | 87 | 0 | 7.7 | 0 | 0.7 | 3.12 | 0 | 3.5 | 0 |
| | **Notional** | 48.4 | 0 | 4.8 | 0 | 0.7 | 2.78 | 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