

Project name

171024 Stag B C1 Hotel

As designed

Date: Thu Nov 08 00:07:01 2018

Administrative information

Building Details

Address: 171024 Stag B C1 Hotel, London, SW14 7ED

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.9

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.9

BRUKL compliance check version: v5.4.a.1

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

| | |
|--|---------------------|
| CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum | 41.7 |
| Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum | 41.7 |
| Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum | 40.2 |
| 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 -Limit | U _a -Calc | U _i -Calc | Surface where the maximum value occurs* |
|---|-----------------------|----------------------|----------------------|--|
| Wall** | 0.35 | 0.2 | 0.2 | 01000001:Surf[2] |
| Floor | 0.25 | 0.2 | 0.2 | BS000000:Surf[0] |
| Roof | 0.25 | 0.2 | 0.2 | 01000001:Surf[0] |
| Windows***, roof windows, and rooflights | 2.2 | 1.6 | 1.6 | 01000001:Surf[1] |
| Personnel doors | 2.2 | - | - | No Personnel doors in building |
| Vehicle access & similar large doors | 1.5 | - | - | No Vehicle access doors in building |
| High usage entrance doors | 3.5 | - | - | No High usage entrance doors in building |
| U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)] | | | | |
| * 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 |
|--|---------------------------|---------------|
| m ³ /(h.m ²) at 50 Pa | 10 | 5 |

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- Stag Brewery VRF

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 0.91 | 5 | 0 | 0 | 0.85 |
| Standard value | 0.91* | 3.2 | N/A | N/A | 0.65 |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | YES |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. | | | | | |

2- Stag Brewery Radiator

| | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|---|--------------------|--------------------|--------------------|---------------|---------------|
| This system | 0.95 | - | 0 | 0 | - |
| Standard value | 0.91* | N/A | N/A | N/A | N/A |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | | | | YES |
| * Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82. | | | | | |

"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 | |
|--------------------------|---------------|-----|-----|-----|-----|-----|-----|-----|---|------|---------------|--|
| | A | B | C | D | E | F | G | H | I | Zone | Standard | |
| ID of system type | | | | | | | | | | | | |
| Standard value | 0.3 | 1.1 | 0.5 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | | | |
| 01_4ppl Suite 4 | - | 0.3 | 0 | - | - | - | - | - | - | - | N/A | |
| 01_4ppl Suite4 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 3 | - | 0.3 | 0 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 3 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 5 | - | 0.3 | 0 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 5 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 6 | - | 0.3 | 0 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 6 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 7 | - | 0.3 | 0 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 7 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | N/A | |
| 01_2ppl Suite 8 | - | 0.3 | 0 | - | - | - | - | - | - | - | 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 | 1.9 | 1.6 | 0.5 | 1.1 | 0.5 | 1 | | |
| 01_2ppl Suite 8 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 9 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 9 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 10 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 10 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 01_4ppl Suite 11 Suite | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 2 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 2 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 1 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 01_2ppl Suite 1 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 01_4ppl Suite 11 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 15 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 02_4ppl Suite 16 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 12 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 13 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 14 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 14 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 15 Bathroom | - | - | 0.5 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 16 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 12 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 02_2ppl Suite 13 | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |
| 00_Hotel Reception | - | 0.3 | 0 | - | - | - | - | - | - | - | - | N/A |

| General lighting and display lighting | | Luminous efficacy [lm/W] | | | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name | Standard value | Luminaire | Lamp | Display lamp | |
| 01_4ppl Suite 4 | 60 | - | 90 | - | 98 |
| 01_4ppl Suite4 Bathroom | 60 | - | 90 | - | 26 |
| 01_Housekeeping/Storage | 90 | - | - | - | 21 |
| 01_2ppl Suite 3 | 60 | - | 90 | - | 66 |
| 01_2ppl Suite 3 Bathroom | 60 | - | 90 | - | 27 |
| 01_2ppl Suite 5 | 60 | - | 90 | - | 48 |
| 01_2ppl Suite 5 Bathroom | 60 | - | 90 | - | 25 |
| 01_2ppl Suite 6 | 60 | - | 90 | - | 46 |
| 01_2ppl Suite 6 Bathroom | 60 | - | 90 | - | 25 |
| 01_2ppl Suite 7 | 60 | - | 90 | - | 40 |
| 01_2ppl Suite 7 Bathroom | 60 | - | 90 | - | 25 |
| 01_2ppl Suite 8 | 60 | - | 90 | - | 51 |
| 01_2ppl Suite 8 Bathroom | 60 | - | 90 | - | 28 |
| 01_2ppl Suite 9 Bathroom | 60 | - | 90 | - | 26 |
| 01_2ppl Suite 9 | 60 | - | 90 | - | 45 |
| 01_2ppl Suite 10 | 60 | - | 90 | - | 46 |
| 01_2ppl Suite 10 Bathroom | 60 | - | 90 | - | 26 |

| General lighting and display lighting | | Luminous efficacy [lm/W] | | | General lighting [W] |
|---------------------------------------|----------------|--------------------------|------|--------------|----------------------|
| Zone name | Standard value | Luminaire | Lamp | Display lamp | |
| | | 60 | 60 | 22 | |
| 01_4ppl Suite 11 Suite | | - | 90 | - | 86 |
| 01_2ppl Suite 2 | | - | 90 | - | 50 |
| 01_2ppl Suite 2 Bathroom | | - | 90 | - | 27 |
| 01_Hotel Corridor | | - | 90 | - | 115 |
| 01_Hotel Lounge | | - | 90 | - | 98 |
| 01_2ppl Suite 1 | | - | 90 | - | 70 |
| 01_2ppl Suite 1 Bathroom | | - | 90 | - | 27 |
| 01_4ppl Suite 11 Bathroom | | - | 90 | - | 32 |
| 02_2ppl Suite 15 | | - | 90 | - | 56 |
| 02_Hotel Corridor | | - | 90 | - | 87 |
| 02_4ppl Suite 16 | | - | 90 | - | 111 |
| 02_2ppl Suite 12 Bathroom | | - | 90 | - | 22 |
| 02_2ppl Suite 13 Bathroom | | - | 90 | - | 30 |
| 02_2ppl Suite 14 Bathroom | | - | 90 | - | 21 |
| 02_2ppl Suite 14 | | - | 90 | - | 62 |
| 02_2ppl Suite 15 Bathroom | | - | 90 | - | 23 |
| 02_2ppl Suite 16 | | - | 90 | - | 15 |
| 02_2ppl Suite 12 | | - | 90 | - | 60 |
| 02_2ppl Suite 13 | | - | 90 | - | 59 |
| 00_Hotel Reception | | - | 90 | 90 | 92 |
| BS01_Hotel BOH | | 90 | - | - | 135 |
| BS01_Hotel BOH | | 90 | - | - | 206 |

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? |
|------------------------|--------------------------------|-----------------------|
| 01_4ppl Suite 4 | NO (-45.2%) | NO |
| 01_2ppl Suite 3 | NO (-69.9%) | NO |
| 01_2ppl Suite 5 | NO (-37.4%) | NO |
| 01_2ppl Suite 6 | NO (-41.6%) | NO |
| 01_2ppl Suite 7 | NO (-55.5%) | NO |
| 01_2ppl Suite 8 | NO (-74.6%) | NO |
| 01_2ppl Suite 9 | NO (-49.7%) | NO |
| 01_2ppl Suite 10 | NO (-43%) | NO |
| 01_4ppl Suite 11 Suite | NO (-55.3%) | NO |
| 01_2ppl Suite 2 | NO (-51.9%) | NO |
| 01_2ppl Suite 1 | NO (-54%) | NO |
| 02_2ppl Suite 15 | N/A | N/A |
| 02_4ppl Suite 16 | NO (-95%) | NO |
| 02_2ppl Suite 14 | NO (-64.4%) | NO |
| 02_2ppl Suite 16 | N/A | N/A |
| 02_2ppl Suite 12 | NO (-85.4%) | NO |
| 02_2ppl Suite 13 | NO (-78.9%) | NO |
| 00_Hotel Reception | NO (-23.5%) | 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? | 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 |
|---|--------|----------|
| Area [m ²] | 1169.6 | 1169.6 |
| External area [m ²] | 1341.5 | 1341.5 |
| Weather | LON | LON |
| Infiltration [m ³ /hm ² @ 50Pa] | 5 | 3 |
| Average conductance [W/K] | 371.12 | 501.61 |
| Average U-value [W/m ² K] | 0.28 | 0.37 |
| Alpha value* [%] | 9.84 | 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

100 C1 Hotels

C2 Residential Institutions: Hospitals and Care Homes
 C2 Residential Institutions: Residential schools
 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
 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 | 28.11 | 26.89 |
| Cooling | 0.39 | 1.06 |
| Auxiliary | 3.84 | 3.56 |
| Lighting | 4.94 | 9.08 |
| Hot water | 136.45 | 133.91 |
| Equipment* | 5.82 | 5.82 |
| TOTAL** | 173.72 | 174.5 |

* 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 & CO₂ Emissions Summary

| | Actual | Notional |
|---|--------|----------|
| Heating + cooling demand [MJ/m ²] | 95.5 | 97.88 |
| Primary energy* [kWh/m ²] | 228.19 | 237.17 |
| Total emissions [kg/m ²] | 40.2 | 41.7 |

* 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 SSEFF | Cool SSEER | Heat gen SEFF | Cool gen SEER |
|--|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| [ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity | | | | | | | | | |
| Actual | 41.8 | 11.5 | 13 | 0.9 | 2.4 | 0.89 | 3.74 | 0.91 | 5 |
| Notional | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ---- | ---- |
| [ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity | | | | | | | | | |
| Actual | 404.1 | 0 | 125.8 | 0 | 7.5 | 0.89 | 0 | 0.95 | 0 |
| Notional | 44.2 | 31.9 | 14.3 | 2.3 | 4.5 | 0.86 | 3.79 | ---- | ---- |
| [ST] No Heating or Cooling | | | | | | | | | |
| Actual | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Notional | 359 | 0 | 115.7 | 0 | 8.5 | 0.86 | 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

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

| Element | U _{i-Typ} | U _{i-Min} | Surface where the minimum value occurs* |
|---|--------------------|---|--|
| Wall | 0.23 | 0.2 | 01000001:Surf[2] |
| Floor | 0.2 | 0.2 | BS000000:Surf[0] |
| Roof | 0.15 | 0.2 | 01000001:Surf[0] |
| Windows, roof windows, and rooflights | 1.5 | 1.6 | 01000001:Surf[1] |
| Personnel doors | 1.5 | - | No Personnel doors in building |
| Vehicle access & similar large doors | 1.5 | - | No Vehicle access doors in building |
| High usage entrance doors | 1.5 | - | No High usage entrance doors in building |
| U _{i-Typ} = Typical individual element U-values [W/(m ² K)] | | U _{i-Min} = Minimum individual element U-values [W/(m ² K)] | |
| * There might be more than one surface where the minimum U-value occurs. | | | |

| Air Permeability | Typical value | This building |
|--|---------------|---------------|
| m ³ /(h.m ²) at 50 Pa | 5 | 5 |