

## Project name

**57 Prince Street - Additional Measures**

As designed

Date: Tue May 07 13:53:12 2024

## Administrative information

## Building Details

Address: 57 Prince Street - Additional Measures, Bristol,  
BS1 4QH

## Certifier details

Name: [REDACTED]

Telephone number: [REDACTED]

Address: [REDACTED]

## Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.2.0

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

Foundation area [m<sup>2</sup>]: 220.22The CO<sub>2</sub> 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 <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum	52.09
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum	73.84
Target primary energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	285.1
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> annum	406.84
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-Limit</sub>	U <sub>a-Calc</sub>	U <sub>i-Calc</sub>	First surface with maximum value
Walls*	0.26	1.7	1.7	3F 1 - 302 - Corridor_W_12
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	0.13	0.18	4F3 - 440 - Room 408_R_7
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	1.84	2.46	3F 2 - 329 - Room 316_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors <sup>^</sup>	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U<sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]U<sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]U<sub>a-Calc</sub> = Calculated area-weighted average 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	25

## 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	<0.9

### 1- Baseline HVAC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	0.93	-	-	-	-
<b>Standard value</b>	0.93*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

### 1- Baseline DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	Hot water provided by HVAC system	0.006
<b>Standard value</b>	N/A	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	Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
3F 1 - 306 - Ensuite 302	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 1 - 310 - Ensuite 304	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 1 - 312 - Ensuite 305	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 1 - 314 - Ensuite 306	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 1 - 308 - Ensuite 303	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 1 - 316 - Ensuite 307	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 1 - 304 - Ensuite 301	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 3 - 345 - Ensuite 310	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 3 - 347 - Ensuite 311	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 3 - 341 - Ensuite 308	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 3 - 343 - Ensuite 309	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 3 - 351 - Ensuite 320	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 2 - 324 - Ensuite 313	-	-	0.3	-	-	-	-	-	-	-	-	N/A
3F 2 - 326 - Ensuite 314	-	-	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 value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
3F 2 - 328 - Ensuite 315	-	-	0.3	-	-	-	-	-	-	-	N/A
3F 2 - 330 - Ensuite 316	-	-	0.3	-	-	-	-	-	-	-	N/A
3F 2 - 334 - Ensuite 318	-	-	0.3	-	-	-	-	-	-	-	N/A
3F 2 - 332 - Ensuite 317	-	-	0.3	-	-	-	-	-	-	-	N/A
3F 2 - 336 - Ensuite 319	-	-	0.3	-	-	-	-	-	-	-	N/A
3F 2 - 322 - Ensuite 312	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 406 - Ensuite 402	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 410 - Ensuite 404	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 412 - Ensuite 405	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 414 - Ensuite 406	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 408 - Ensuite 403	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 416 - Ensuite 407	-	-	0.3	-	-	-	-	-	-	-	N/A
4F 1 - 404 - Ensuite 401	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 433 - Ensuite 418	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 431 - Ensuite 417	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 429 - Ensuite 416	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 421 - Ensuite 412	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 436 - Ensuite 419	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 423 - Ensuite 413	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 425 - Ensuite 414	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 427 - Ensuite 415	-	-	0.3	-	-	-	-	-	-	-	N/A
4F2 - 418 - Services	-	-	0.3	-	-	-	-	-	-	-	N/A
4F3 - 443 - Ensuite 409	-	-	0.3	-	-	-	-	-	-	-	N/A
4F3 - 441 - Ensuite 408	-	-	0.3	-	-	-	-	-	-	-	N/A
4F3 - 451 - Ensuite 420	-	-	0.3	-	-	-	-	-	-	-	N/A
4F3 - 447 - Ensuite 411	-	-	0.3	-	-	-	-	-	-	-	N/A
4F3 - 445 - Ensuite 410	-	-	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 <sup>2</sup> ]
Standard value	95	80	0.3	
3F 1 - 306 - Ensuite 302	120	-	-	
3F 1 - 302 - Corridor	120	-	-	
3F 1 - 310 - Ensuite 304	120	-	-	
3F 1 - 311 - Room 305	120	-	-	
3F 1 - 312 - Ensuite 305	120	-	-	
3F 1 - 314 - Ensuite 306	120	-	-	
3F 1 - 313 - Room 306	120	-	-	
3F 1 - 315 - Room 307	120	-	-	
3F 1 - 307 - Room 303	120	-	-	
3F 1 - 308 - Ensuite 303	120	-	-	
3F 1 - 309 - Room 304	120	-	-	
3F 1 - 305 - Room 302	120	-	-	

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
	<b>Standard value</b>	95	80	0.3
3F 1 - 316 - Ensuite 307		120	-	-
3F 1 - 301 - Stair Core-Corridor		120	-	-
3F 1 - 304 - Ensuite 301		120	-	-
3F 1 - 303 - Room 301		120	-	-
3F 3 - 338 - Corridor		120	-	-
3F 3 - 339 - Corridor		120	-	-
3F 3 - 344 - Room 310		120	-	-
3F 3 - 345 - Ensuite 310		120	-	-
3F 3 - 346 - Room 311		120	-	-
3F 3 - 347 - Ensuite 311		120	-	-
3F 3 - 342 - Room 309		120	-	-
3F 3 - 340 - Room 308		120	-	-
3F 3 - 341 - Ensuite 308		120	-	-
3F 3 - 343 - Ensuite 309		120	-	-
3F 3 - 348 - Corridor		120	-	-
3F 3 - 351 - Ensuite 320		120	-	-
3F 3 - 350 - Room 320		120	-	-
3F 3 - 337 - Stair Core		120	-	-
3F 3 - 349 - Store		120	-	-
3F 2 - 329 - Room 316		120	-	-
3F 2 - 321 - Room 312		120	-	-
3F 2 - 320 - Lift Core		120	-	-
3F 2 - 324 - Ensuite 313		120	-	-
3F 2 - 318 - Corridor		120	-	-
3F 2 - 326 - Ensuite 314		120	-	-
3F 2 - 328 - Ensuite 315		120	-	-
3F 2 - 327 - Room 315		120	-	-
3F 2 - 330 - Ensuite 316		120	-	-
3F 2 - 331 - Room 317		120	-	-
3F 2 - 333 - Room 318		120	-	-
3F 2 - 334 - Ensuite 318		120	-	-
3F 2 - 335 - Room 319		120	-	-
3F 2 - 317 - Stair Lobby		120	-	-
3F 2 - 332 - Ensuite 317		120	-	-
3F 2 - 319 - Stair Core		120	-	-
3F 2 - 336 - Ensuite 319		120	-	-
3F 2 - 325 - Room 314		120	-	-
3F 2 - 322 - Ensuite 312		120	-	-
3F 2 - 323 - Room 313		120	-	-
4F 1 - 406 - Ensuite 402		120	-	-
4F 1 - 402 - Corridor		120	-	-
4F 1 - 410 - Ensuite 404		120	-	-
4F 1 - 411 - Room 405		120	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
	<b>Standard value</b>	95	80	0.3
4F 1 - 412 - Ensuite 405		120	-	-
4F 1 - 414 - Ensuite 406		120	-	-
4F 1 - 413 - Room 406		120	-	-
4F 1 - 415 - Room 407		120	-	-
4F 1 - 407 - Room 403		120	-	-
4F 1 - 408 - Ensuite 403		120	-	-
4F 1 - 409 - Room 404		120	-	-
4F 1 - 405 - Room 402		120	-	-
4F 1 - 416 - Ensuite 407		120	-	-
4F 1 - 401 - Stair Core-Corridor		120	-	-
4F 1 - 404 - Ensuite 401		120	-	-
4F 1 - 403 - Room 401		120	-	-
4F2 - 417 - Corridor		120	-	-
4F2 - 435 - Room 419		120	-	-
4F2 - 426 - Room 415		120	-	-
4F2 - 433 - Ensuite 418		120	-	-
4F2 - 432 - Room 418		120	-	-
4F2 - 424 - Room 414		120	-	-
4F2 - 430 - Room 417		120	-	-
4F2 - 422 - Room 413		120	-	-
4F2 - 431 - Ensuite 417		120	-	-
4F2 - 429 - Ensuite 416		120	-	-
4F2 - 421 - Ensuite 412		120	-	-
4F2 - 428 - Room 416		120	-	-
4F2 - 434 - Store		120	-	-
4F2 - 436 - Ensuite 419		120	-	-
4F2 - 420 - Room 412		120	-	-
4F2 - 423 - Ensuite 413		120	-	-
4F2 - 425 - Ensuite 414		120	-	-
4F2 - 427 - Ensuite 415		120	-	-
4F2 - 419 - Store		120	-	-
4F2 - 418 - Services		120	-	-
4F3 - 437 - Stair Core		120	-	-
4F3 - 440 - Room 408		120	-	-
4F3 - 443 - Ensuite 409		120	-	-
4F3 - 441 - Ensuite 408		120	-	-
4F3 - 451 - Ensuite 420		120	-	-
4F3 - 449 - Store		120	-	-
4F3 - 447 - Ensuite 411		120	-	-
4F3 - 446 - Room 411		120	-	-
4F3 - 445 - Ensuite 410		120	-	-
4F3 - 444 - Room 410		120	-	-
4F3 - 439 - Corridor		120	-	-



General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
	<b>Standard value</b>	95	80	0.3
4F3 - 438 - Corridor		120	-	-
4F3 - 442 - Room 409		120	-	-
4F3 - 450 - Room 420		120	-	-
4F3 - 448 - Corridor		120	-	-

**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?
3F 1 - 311 - Room 305	NO (-73.9%)	NO
3F 1 - 313 - Room 306	N/A	N/A
3F 1 - 315 - Room 307	YES (+13.4%)	NO
3F 1 - 307 - Room 303	NO (-77.6%)	NO
3F 1 - 309 - Room 304	NO (-73.5%)	NO
3F 1 - 305 - Room 302	NO (-88.1%)	NO
3F 1 - 303 - Room 301	NO (-62.4%)	NO
3F 3 - 344 - Room 310	NO (-33.7%)	NO
3F 3 - 346 - Room 311	NO (-23.9%)	NO
3F 3 - 342 - Room 309	NO (-48.1%)	NO
3F 3 - 340 - Room 308	NO (-56.3%)	NO
3F 3 - 350 - Room 320	NO (-84%)	NO
3F 2 - 329 - Room 316	YES (+11%)	NO
3F 2 - 321 - Room 312	NO (-6%)	NO
3F 2 - 327 - Room 315	N/A	N/A
3F 2 - 331 - Room 317	NO (-18.8%)	NO
3F 2 - 333 - Room 318	N/A	N/A
3F 2 - 335 - Room 319	N/A	N/A
3F 2 - 325 - Room 314	N/A	N/A
3F 2 - 323 - Room 313	N/A	N/A
4F 1 - 411 - Room 405	NO (-73.9%)	NO
4F 1 - 413 - Room 406	N/A	N/A
4F 1 - 415 - Room 407	YES (+38.2%)	NO
4F 1 - 407 - Room 403	NO (-77.6%)	NO
4F 1 - 409 - Room 404	NO (-73.5%)	NO
4F 1 - 405 - Room 402	NO (-88.1%)	NO
4F 1 - 403 - Room 401	NO (-90.7%)	NO
4F2 - 435 - Room 419	N/A	N/A
4F2 - 426 - Room 415	N/A	N/A
4F2 - 432 - Room 418	N/A	N/A
4F2 - 424 - Room 414	N/A	N/A
4F2 - 430 - Room 417	N/A	N/A
4F2 - 422 - Room 413	N/A	N/A
4F2 - 428 - Room 416	NO (-8%)	NO
4F2 - 420 - Room 412	NO (-6.4%)	NO
4F3 - 440 - Room 408	NO (-56.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
4F3 - 446 - Room 411	NO (-23.9%)	NO
4F3 - 444 - Room 410	NO (-33.7%)	NO
4F3 - 442 - Room 409	NO (-48.1%)	NO
4F3 - 450 - Room 420	NO (-80.8%)	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?	NO

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

	Actual	Notional
Floor area [m <sup>2</sup> ]	1101.1	1101.1
External area [m <sup>2</sup> ]	1035.9	1035.9
Weather	CAR	CAR
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	25	3
Average conductance [W/K]	876.53	392.57
Average U-value [W/m <sup>2</sup> K]	0.85	0.38
Alpha value* [%]	7.61	24.52

\* 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  
 Offices and Workshop Businesses  
 General Industrial and Special Industrial Groups  
 Storage or Distribution

### 100 Hotels

Residential Institutions: Hospitals and Care Homes  
 Residential Institutions: Residential Schools  
 Residential Institutions: Universities and Colleges  
 Secure Residential Institutions  
 Residential Spaces  
 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<sup>2</sup>]

	Actual	Notional
Heating	137.92	54.91
Cooling	0	0
Auxiliary	6.84	7.33
Lighting	7.33	7.82
Hot water	204.36	187.78
Equipment*	13.36	13.36
<b>TOTAL**</b>	<b>356.45</b>	<b>257.85</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	7.14
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>7.14</i>

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	457.45	223.88
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	406.84	285.1
Total emissions [kg/m <sup>2</sup> ]	73.84	52.09



## HVAC Systems Performance

System Type	Heat dem MJ/m <sup>2</sup>	Cool dem MJ/m <sup>2</sup>	Heat con kWh/m <sup>2</sup>	Cool con kWh/m <sup>2</sup>	Aux con kWh/m <sup>2</sup>	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	412.1	45.3	137.9	0	6.8	0.83	0	0.93	0
Notional	170	53.9	54.9	0	6.3	0.86	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