Melin

London | Bristol | Llanelli

St Martin's House, 480 Wellsway, Bath

As Built SBEM and Commercial EPC Carbon Emissions Calculation – Part L2a

For

Iesis Consult

30th September 2019

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A connected approach to sustainable building solutions

Melin Consultants are accredited to provide a range of calculation, assessment and testing services. They are members of CIBSE Low Carbon Consultants.

Melin Consultants fully check all work prior to completion and a robust audit trail exists to demonstrate accountability.

All information within this document is based on evidence provided in the form of drawings and specifications.

CPD (Continual Professional Development) records are kept and all technical staff are required to complete a minimum 20 hours per year in training activities.

Low Carbon Consultants have the expertise and necessary qualifications to offer advice in a professional capacity on matters relating to Part L of the Building Regulations and sustainability within the construction sector.

This document contains the following information:

- Commercial EPC and As Built SBEM

Report Date: 30th September 2019

Report author: Darren Baker

Function: Senior Consultant

Authorised by: Jamie Best

Function: Director

Energy Performance Certificate

Non-Domestic Building

HM Government

St. Martin's House
480 Wellsway
BATH
BA2 2UB

Certificate Reference Number:
9529-3051-0415-0000-0125

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

34 This is how energy efficient the building is.

Less energy efficient

Technical Information

Main heating fuel:	Natural Gas
Building environment:	Heating and Natural Ventilation
Total useful floor area (m^2):	621
Assessment Level:	4
Building emission rate ($kgCO_2/m^2$ per year):	50.91
Primary energy use (kWh/m^2 per year):	291.94

Benchmarks

Buildings similar to this one could have ratings as follows:

31 If newly built

92 If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine SBEM v5.6.a.1
Property Reference:	595410520000
Assessor Name:	Darren Baker
Assessor Number:	LCEA125299
Accreditation Scheme:	CIBSE Certification Limited
Employer/Trading Name:	Melin Consultants
Employer/Trading Address:	The Beacon, Llanelli, SA14 8LQ
Issue Date:	30 Sep 2019
Valid Until:	29 Sep 2029 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0050-0041-2459-9521-1006.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by CIBSE Certification Limited. You can obtain contact details of the Accreditation Scheme at cibsecertification.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Wellsway

As built

Date: Mon Sep 30 17:07:00 2019

Administrative information

Building Details

Address: Student Accomodation, St Martin's House, 480 Wellsway, Bath, BA2 2UB

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.2.g.3

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.6

BRUKL compliance check version: v5.2.g.3

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name: Darren Baker

Telephone number: 0845 094 1593

Address: Melin Consultants, The Beacon, Llanelli, SA14 8LQ

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	48.7
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	48.7
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	44.2
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 the building services should achieve reasonable overall standards of energy efficiency

Values not achieving 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	0.23	0.23	RM000003_W1
Floor	0.25	0.18	0.18	NT000000_F
Roof	0.25	0.18	0.18	RM000008_C
Windows***, roof windows, and rooflights	2.2	1.6	1.6	RM000004_W1_O0
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

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

* 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	6.45

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	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Main system

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	0.98	-	-	-	-
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					NO

* 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.

1- SYST0000-DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	Hot water provided by HVAC system	0.01
Standard value	N/A	N/A

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**		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	**Zone**	**Standard**
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
Kitchen	-	-	-	-	-	-	-	-	-	-	N/A
Shiwers	-	-	0.5	-	-	-	-	-	-	-	N/A
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Studio - B3	-	-	-	-	-	-	-	-	-	-	N/A
En Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
En SUite	-	-	0.5	-	-	-	-	-	-	-	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	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
Studio B4	-	-	-	-	-	-	-	-	-	-	N/A
Entrance Lobby	-	-	-	-	-	-	-	-	-	-	N/A
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
Kitchen	-	-	-	-	-	-	-	-	-	-	N/A
Shiwers	-	-	0.5	-	-	-	-	-	-	-	N/A
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Studio - B1	-	-	-	-	-	-	-	-	-	-	N/A
En Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
En SUite	-	-	0.5	-	-	-	-	-	-	-	N/A
Studio B2	-	-	-	-	-	-	-	-	-	-	N/A
Stairs	-	-	-	-	-	-	-	-	-	-	N/A
Bedroom	-	-	-	-	-	-	-	-	-	-	N/A
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
Bedrooms	-	-	-	-	-	-	-	-	-	-	N/A
Room	-	-	-	-	-	-	-	-	-	-	N/A
Room	-	-	-	-	-	-	-	-	-	-	N/A
Studio B6	-	-	-	-	-	-	-	-	-	-	N/A
Showers	-	-	0.5	-	-	-	-	-	-	-	N/A
Kitchen	-	-	-	-	-	-	-	-	-	-	N/A
Corridor	-	-	-	-	-	-	-	-	-	-	N/A
En Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
Studio B5	-	-	-	-	-	-	-	-	-	-	N/A
En Suite	-	-	0.5	-	-	-	-	-	-	-	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	
Corridor	-	88	-	15
Kitchen	-	88	-	302
Shiwers	-	88	-	41
Corridor	-	88	-	42
Bedroom	-	88	-	20
Bedroom	-	88	-	19
Bedroom	-	88	-	18

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
Bedroom	-	88	-	18
Bedroom	-	88	-	20
Bedroom	-	88	-	20
Bedroom	-	88	-	20
Bedroom	-	88	-	20
Studio - B3	-	88	-	25
En Suite	-	88	-	20
En SUite	-	88	-	20
Studio B4	-	88	-	31
Entrance Lobby	-	88	-	54
Corridor	-	88	-	15
Kitchen	-	88	-	302
Shiwers	-	88	-	41
Corridor	-	88	-	42
Corridor	-	88	-	47
Bedroom	-	88	-	20
Bedroom	-	88	-	19
Bedroom	-	88	-	18
Bedroom	-	88	-	18
Bedroom	-	88	-	20
Bedroom	-	88	-	20
Bedroom	-	88	-	20
Bedroom	-	88	-	20
Studio - B1	-	88	-	25
En Suite	-	88	-	20
En SUite	-	88	-	20
Studio B2	-	88	-	31
Stairs	-	88	-	31
Bedroom	-	88	-	18
Corridor	-	88	-	54
Bedrooms	-	88	-	92
Room	-	88	-	56
Room	-	88	-	30
Studio B6	-	88	-	29
Showers	-	88	-	42
Kitchen	-	88	-	297
Corridor	-	88	-	35
En Suite	-	88	-	20
Studio B5	-	88	-	28
En Suite	-	88	-	20

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?
Bedroom	NO (-83.6%)	NO
Bedroom	NO (-46.6%)	NO
Bedroom	NO (-37.4%)	NO
Bedroom	NO (-29%)	NO
Bedroom	NO (-54%)	NO
Bedroom	NO (-46.3%)	NO
Bedroom	NO (-86.5%)	NO
Bedroom	NO (-63.3%)	NO
Studio - B3	NO (-50.3%)	NO
Studio B4	NO (-70%)	NO
Bedroom	NO (-83.6%)	NO
Bedroom	NO (-46.6%)	NO
Bedroom	NO (-37.4%)	NO
Bedroom	NO (-29%)	NO
Bedroom	NO (-54%)	NO
Bedroom	NO (-46.3%)	NO
Bedroom	NO (-86.5%)	NO
Bedroom	NO (-63.3%)	NO
Studio - B1	NO (-50.3%)	NO
Studio B2	NO (-70%)	NO
Bedroom	NO (-64.1%)	NO
Bedrooms	NO (-72.2%)	NO
Studio B6	NO (-83.9%)	NO
Studio B5	NO (-84.9%)	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?	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]	620.6	620.6
External area [m^2]	966.8	966.8
Weather	SWI	SWI
Infiltration [m^3/hm^2@ 50Pa]	6	3
Average conductance [W/K]	261.87	495.41
Average U-value [W/m^2K]	0.27	0.51
Alpha value* [%]	11.55	19

* 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 Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
100	**C2 Residential Inst.: Universities and colleges**
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: 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/m^2]

	Actual	Notional
Heating	55.08	65.82
Cooling	0	0
Auxiliary	1.84	1.8
Lighting	12.27	14.32
Hot water	115.48	121.7
Equipment*	25.11	25.11
TOTAL**	**184.67**	**203.64**

* Energy used by equipment does not count towards the total for 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	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/m^2]	250.53	323.28
Primary energy* [kWh/m^2]	251.38	277.03
Total emissions [kg/m^2]	44.2	48.7

* 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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	173.3	77.2	55.1	0	1.8	0.87	0	0.98	0
	Notional	194.1	129.2	65.8	0	1.8	0.82	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 BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.23	RM000003_W1
Floor	0.2	0.18	NT000000_F
Roof	0.15	0.18	RM000008_C
Windows, roof windows, and rooflights	1.5	1.6	RM000004_W1_O0
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = 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	6.45