

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	>0.95

1- Corridors Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
L-02-Corridor		120	-	-
L-00-Corridor		120	-	-
L-00-Corridor		120	-	-
L-00-Corridor		120	-	-
L-01-Corridor		120	-	-
L-03-Corridor		120	-	-
L-04-Corridor		120	-	-
L-05-Corridor		120	-	-
L-06-Corridor		120	-	-
L-07-Corridor		120	-	-
L-08-Corridor		120	-	-
L-09-Corridor		120	-	-
L-10-Corridor		120	-	-
L-00-Corridor		120	-	-
L-01-Corridor		120	-	-
L-01-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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
Floor area [m²]	874.1	874.1
External area [m²]	402.7	402.7
Weather	LON	LON
Infiltration [m³/hm² @ 50Pa]	3	3
Average conductance [W/K]	63.67	185.27
Average U-value [W/m²K]	0.16	0.46
Alpha value* [%]	25	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
	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
100	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/m²]

	Actual	Notional
Heating	0.61	2.32
Cooling	0	0
Auxiliary	0	0
Lighting	5.48	7
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	6.09	9.32

* 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	2.99
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	2.99

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	2.21	11.8
Primary energy [kWh _{PE} /m²]	9.04	9.54
Total emissions [kg/m²]	0.84	0.93

12.56 Block M

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	2.2	0	0.6	0	0	1	0	1	0
Notional	11.8	0	2.3	0	0	1.41	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

BRUKL Output Document HM Government
Compliance with England Building Regulations Part L 2021

Project name

Aylesham Centre_Block M Communal BeLeanAs designed

Date: Sun Dec 01 17:13:55 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 105.12

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	0.82
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.78
Target primary energy rate (TPER), kWh _{FE} /m²annum	8.78
Building primary energy rate (BPER), kWh _{FE} /m²annum	8.53
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	M0000004:Surf[0]
Floors	0.18	0.11	0.11	M00000F4:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	M00002BA:Surf[0]
Windows** and roof windows	1.6	-	-	No windows, galzed doors, or roof windows in building
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridors Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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		
M-02-Circulation	120	-	-		
M-02-Lift Lobby	120	-	-		
M-00-Concierge Lobby	120	-	-		
M-00-Corridor	120	-	-		
M-00-Sterile Lobby	120	-	-		
M-00-Corridor	120	-	-		
M-03-Lift Lobby	120	-	-		
M-03-Circulation	120	-	-		
M-04-Lift Lobby	120	-	-		
M-04-Circulation	120	-	-		
M-05-Lift Lobby	120	-	-		
M-05-Circulation	120	-	-		
M-06-Lift Lobby	120	-	-		
M-06-Circulation	120	-	-		
M-07-Lift Lobby	120	-	-		
M-07-Circulation	120	-	-		
M-08-Lift Lobby	120	-	-		
M-08-Circulation	120	-	-		
M-09-Lift Lobby	120	-	-		
M-09-Circulation	120	-	-		
M-10-Lift Lobby	120	-	-		
M-10-Circulation	120	-	-		
M-11-Lift Lobby	120	-	-		
M-11-Circulation	120	-	-		
M-12-Lift Lobby	120	-	-		
M-12-Circulation	120	-	-		
M-13-Lift Lobby	120	-	-		
M-13-Circulation	120	-	-		
M-14-Lift Lobby	120	-	-		

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		
M-14-Circulation	120	-	-		
M-15-Lift Lobby	120	-	-		
M-15-Circulation	120	-	-		
M-16-Lift Lobby	120	-	-		
M-16-Circulation	120	-	-		
M-17-Lift Lobby	120	-	-		
M-17-Circulation	120	-	-		
M-18-Lift Lobby	120	-	-		
M-18-Circulation	120	-	-		
M-19-Corridor-01	120	-	-		
M-19-Corridor-01	120	-	-		
M-20-Corridor-01	120	-	-		
M-20-Corridor-01	120	-	-		
M-00-Circulation	120	-	-		

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use
	Actual	Notional	% Area Building Type
Floor area [m²]	2207.5	2207.5	Retail/Financial and Professional Services
External area [m²]	362.3	362.3	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON	Offices and Workshop Businesses
Infiltration [m³/hm²@ 50Pa]	3	3	General Industrial and Special Industrial Groups
Average conductance [W/K]	42.25	85.49	Storage or Distribution
Average U-value [W/m²K]	0.12	0.24	Hotels
Alpha value* [%]	25	10	Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging			Residential Institutions: Residential Schools
			Residential Institutions: Universities and Colleges
			Secure Residential Institutions
			100 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/m²]		
	Actual	Notional
Heating	0.05	0.12
Cooling	0	0
Auxiliary	0	0
Lighting	5.73	7.4
Hot water	0	0
Equipment*	13.13	13.13
TOTAL **	5.78	7.51
* 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	1.57
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	1.57

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m²]	0.16	0.59
Primary energy [kWh _{PE} /m²]	8.53	8.78
Total emissions [kg/m²]	0.78	0.82

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	0.2	0	0.1	0	0	0.84	0	1	0
Notional	0.6	0	0.1	0	0	1.41	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

12.57 Block N

BRUKL Output Document

Compliance with England Building Regulations Part L 2021

 HM Government

Project name

Aylesham Centre_Block N Communal Be Lean

As designed

Date: Mon Mar 17 12:36:36 2025

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache
Calculation engine version: 7.0.27
Interface to calculation engine: IES Virtual Environment
Interface to calculation engine version: 7.0.27
BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers
Telephone number: Phone
Address: Street Address, City, Postcode

Foundation area [m²]: 61.35

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	1.75
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	1.66
Target primary energy rate (TPER), kWh _{ep} /m²annum	17.85
Building primary energy rate (BPER), kWh _{ep} /m²annum	17.12
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.15	0.15	N0000054:Surf[1]
Floors	0.18	0.11	0.11	N0000054:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	N0000113:Surf[1]
Windows** and roof windows	1.6	1.31	1.31	N0000083:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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-Limit} = Limiting area-weighted average U-values [W/(m²K)]
U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]
U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]
* 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/m²K
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
m³/(h.m²) at 50 Pa	8	3

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	>0.95

1- Corridors Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting

Zone name	General luminaire	Display light source	
	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
N-00-Lobby	120	-	-
N-00-Corridor	120	-	-
N-01-Corridor	120	-	-
N-01-Circulation	120	-	-
N-00-Corridor-01	120	-	-
N-00-Corridor-01	120	-	-
N-00-Corridor-01	120	-	-
N-00-Corridor-01	120	-	-
N-00-Corridor-01	120	-	-
N-07-Corridor-01	120	-	-
N-07-Corridor-01	120	-	-
N-08-Corridor-01	120	-	-
N-08-Corridor-01	120	-	-
N-09-Corridor-01	120	-	-
N-09-Corridor-01	120	-	-
N-10-Corridor-01	120	-	-
N-10-Corridor-01	120	-	-
N-11-Corridor-01	120	-	-
N-11-Corridor-01	120	-	-
N-12-Corridor-01	120	-	-
N-12-Corridor-01	120	-	-
N-00-Corridor	120	-	-
N-00-Corridor	120	-	-
N-00-Corridor	120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

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Regulation 25A: Consideration of high efficiency 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			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m²]	797.5	797.5		Retail/Financial and Professional Services
External area [m²]	608.7	608.7		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m³/hm² @ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	162.18	310.41		Storage or Distribution
Average U-value [W/m²K]	0.27	0.51		Hotels
Alpha value* [%]	25	10		Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
			100	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/m²]

	Actual	Notional
Heating	6.7	7.03
Cooling	0	0
Auxiliary	0	0
Lighting	4.55	7.23
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	11.25	14.27

* 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	2.53
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	2.53

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	20.31	35.72
Primary energy [kWh _{PE} /m²]	17.12	17.85
Total emissions [kg/m²]	1.66	1.75

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	20.3	0	6.7	0	0	0.84	0	1	0
Notional	35.7	0	7	0	0	1.41	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

12.58 Block P

BRUKL Output Document HM Government
Compliance with England Building Regulations Part L 2021

Project name
Aylesham Centre_Block P Communal_Be Lean As designed
Date: Sat Nov 30 21:08:10 2024

Administrative information	
Building Details Address: Address 1, City, Postcode	Certification tool Calculation engine: Apache Calculation engine version: 7.0.26 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.26 BRUKL compliance module version: v6.1.e.1
Certifier details Name: ME Engineers Telephone number: Phone Address: Street Address, City, Postcode	
Foundation area [m²]: 74.27	

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 /m²:annum	1.06	
Building CO ₂ emission rate (BER), kgCO ₂ /m²:annum	1.07	
Target primary energy rate (TPER), kWh _{FE} /m²:annum	11.01	
Building primary energy rate (BPER), kWh _{FE} /m²:annum	11.37	
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	P000007C:Surf[1]
Floors	0.18	0.11	0.11	P000007C:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	P000019F:Surf[0]
Windows** and roof windows	1.6	1.3	1.3	P00001A5:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridors Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

[illegible]

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
P-00-RET-01		120	-	-
P-00-RET-01		120	-	-
P-00-RET-01		120	-	-
P-00-RET-01		120	-	-
P-01-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use
	Actual	Notional	% Area Building Type
Floor area [m²]	891.2	891.2	Retail/Financial and Professional Services
External area [m²]	441.7	441.7	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON	Offices and Workshop Businesses
Infiltration [m³/hm²@ 50Pa]	3	3	General Industrial and Special Industrial Groups
Average conductance [W/K]	99.76	201.96	Storage or Distribution
Average U-value [W/m²K]	0.23	0.46	Hotels
Alpha value* [%]	25	10	Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging			Residential Institutions: Residential Schools
			Residential Institutions: Universities and Colleges
			Secure Residential Institutions
			100 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/m²]		
	Actual	Notional
Heating	1.98	2.64
Cooling	0	0
Auxiliary	0	0
Lighting	5.62	7.41
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	7.59	10.06

* 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	2.74
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	2.74

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m²]	5.99	13.43
Primary energy [kWh _{PE} /m²]	11.37	11.01
Total emissions [kg/m²]	1.07	1.06

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 SSEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	6	0	2	0	0	0.84	0	1	0
Notional	13.4	0	2.6	0	0	1.41	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

12.59 Block Q

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Aylesham Centre_Block Q_Be Lean

As designed

Date: Sat Nov 30 18:42:57 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 72.56

The CO₂ 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 /m²annum	1.05
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	1.35
Target primary energy rate (TPER), kWh _{ef} /m²annum	10.35
Building primary energy rate (BPER), kWh _{ef} /m²annum	14.13
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	Q0000003:Surf[0]
Floors	0.18	0.11	0.11	P0000071:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	Q00000B4:Surf[0]
Windows** and roof windows	1.6	1.3	1.3	Q00000BD:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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-Limit = Limiting area-weighted average U-values [W/(m²K)]

U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]

U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]

* 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/m²K

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
m³/(h.m²) at 50 Pa	8	3

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	>0.95

1- Corridors Heaters					
	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
Q-00-Lobby		120	-	-
Q-00-Lobby		120	-	-
Q-00-Corridor		120	-	-
Q-00-Circulation		120	-	-
Q-00-Circulation		120	-	-
Q-00-Circulation		120	-	-
Q-00-Circulation		120	-	-
Q-00-Circulation		120	-	-
Q-00-Corridor		120	-	-
Q-00-Corridor		120	-	-
Q-00-Lobby		120	-	-
Q-00-Lobby		120	-	-
Q-00-Lobby		120	-	-
Q-00-Lobby		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use
	Actual	Notional	% Area Building Type
Floor area [m²]	435.3	435.3	Retail/Financial and Professional Services
External area [m²]	343.5	343.5	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON	Offices and Workshop Businesses
Infiltration [m³/hm²@ 50Pa]	3	3	General Industrial and Special Industrial Groups
Average conductance [W/K]	72.32	139.99	Storage or Distribution
Average U-value [W/m²K]	0.21	0.41	Hotels
Alpha value* [%]	25	10	Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging			Residential Institutions: Residential Schools
			Residential Institutions: Universities and Colleges
			Secure Residential Institutions
			100 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/m²]		
	Actual	Notional
Heating	3.64	4.69
Cooling	0	0
Auxiliary	0	0
Lighting	5.75	7.56
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	9.38	12.25

* 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	5.48
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	5.48

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m²]	13.1	23.8
Primary energy [kWh _{PE} /m²]	14.13	10.35
Total emissions [kg/m²]	1.35	1.05

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	13.1	0	3.6	0	0	1	0	1	0
Notional	23.8	0	4.7	0	0	1.41	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

APPENDIX F Communal Corridors - Be Green

12.60 Block ABC

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

ABC Communal Be GreenAs designed

Date: Fri Nov 29 19:07:53 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 53

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	1.24
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	0.8
Target primary energy rate (TPER), kWh _e /m ² annum	12.39
Building primary energy rate (BPER), kWh _e /m ² annum	7.7
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	00000015:Surf[0]
Floors	0.18	0.11	0.11	0000000A:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	B0000011:Surf[1]
Windows** and roof windows	1.6	1.3	1.3	B0000020:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridor Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
A-00-RET-Circulation		120	-	-
A-01-RET-Circulation		120	-	-
A-02-Circulation		120	-	-
A-03-Circulation		120	-	-
A-04-Circulation		120	-	-
B-01-Circulation		120	-	-
B-01-Circulation		120	-	-
B-01-Circulation		120	-	-
B-02-Circulation		120	-	-
B-03-Circulation		120	-	-
B-03-Circulation		120	-	-
B-04 -Circulation		120	-	-
B-05 -Circulation		120	-	-
B-05 -Circulation		120	-	-
B-05 -Circulation		120	-	-
B-05 -Circulation		120	-	-
B-05 -Circulation		120	-	-
C-00-Corridors		120	-	-
C-01-Corridors		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use
	Actual	Notional	% Area Building Type
Floor area [m²]	371	371	Retail/Financial and Professional Services
External area [m²]	322.3	322.3	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON	Offices and Workshop Businesses
Infiltration [m³/hm²@ 50Pa]	3	3	General Industrial and Special Industrial Groups
Average conductance [W/K]	70.59	133.75	Storage or Distribution
Average U-value [W/m²K]	0.22	0.41	Hotels
Alpha value* [%]	18.17	10	Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging			Residential Institutions: Residential Schools
			Residential Institutions: Universities and Colleges
			Secure Residential Institutions
			100 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/m²]		
	Actual	Notional
Heating	4.4	5.28
Cooling	0	0
Auxiliary	0	0
Lighting	5.57	7.52
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	9.98	12.8
* 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	5	4.7
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	5	4.7

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m²]	15.84	26.82
Primary energy [kWh _{PE} /m²]	7.7	12.39
Total emissions [kg/m²]	0.8	1.24

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	15.8	0	4.4	0	0	1	0	1	0
Notional	26.8	0	5.3	0	0	1.41	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

12.61 Block D

BRUKL Output Document
Compliance with England Building Regulations Part L 2021



Project name

Corridors Aylesham Centre_D_Be Green_ As designed

Date: Sat Nov 30 19:54:59 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 30.6

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.53
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	1.64
Target primary energy rate (TPER), kWh _{ep} /m ² annum	25.29
Building primary energy rate (BPER), kWh _{ep} /m ² annum	15.46
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	D0000005:Surf[1]
Floors	0.18	0.11	0.11	D0000005:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	-	-	No flat roofs in building
Windows** and roof windows	1.6	1.3	1.3	D000002B:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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
m³/(h.m²) at 50 Pa	8	3

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	>0.95

1- Corridor Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
D-00-Comm-Corridor		120	-	-
D-00-Comm-Corridor		120	-	-
D-00-Comm-Corridor		120	-	-
D-00-Comm-Corridor		120	-	-
D-01-Comm-Corridor		120	-	-
D-01-Comm-Corridor		120	-	-
D-01-Comm-Corridor		120	-	-
D-02-Comm-Corridor		120	-	-
D-02-Comm-Corridor		120	-	-
D-02-Comm-Corridor		120	-	-
D-03-Comm-Corridor		120	-	-
D-03-Comm-Corridor		120	-	-
D-03-Comm-Corridor		120	-	-
D-04-Comm-Corridor		120	-	-
D-04-Comm-Corridor		120	-	-
D-04-Comm-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m²]	153	153		Retail/Financial and Professional Services
External area [m²]	244.7	244.7		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m³/hm²@ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	58.43	128.52		Storage or Distribution
Average U-value [W/m²K]	0.24	0.53		Hotels
Alpha value* [%]	18.29	10		Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
			100	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/m²]

	Actual	Notional
Heating	10.87	12.39
Cooling	0	0
Auxiliary	0	0
Lighting	7.63	10.67
Hot water	0	0
Equipment*	13.12	13.12
TOTAL**	18.49	23.06

* 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	8.65	6.58
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	8.65	6.58

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	39.11	62.92
Primary energy [kWh _{PE} /m²]	15.46	25.29
Total emissions [kg/m²]	1.64	2.53

12.62 Block E

BRUKL Output Document HM Government
Compliance with England Building Regulations Part L 2021

Project name	Residential Corridors_Aylesham Centre E Be Green	As designed
Date:	Sat Nov 30 20:42:49 2024	

Administrative information	
Building Details	Certification tool
Address: Address 1, City, Postcode	Calculation engine: Apache
	Calculation engine version: 7.0.26
	Interface to calculation engine: IES Virtual Environment
	Interface to calculation engine version: 7.0.26
	BRUKL compliance module version: v6.1.e.1
Certifier details	
Name: ME Engineers	
Telephone number: Phone	
Address: Street Address, City, Postcode	
	Foundation area [m²]: 59.31

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²:annum	0.81
Building CO ₂ emission rate (BER), kgCO ₂ /m²:annum	0.52
Target primary energy rate (TPER), kWh _{PE} /m²:annum	8.63
Building primary energy rate (BPER), kWh _{PE} /m²:annum	5.36
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	0000001E:Surf[1]
Floors	0.18	0.11	0.11	0000002A:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	0900003D:Surf[0]
Windows** and roof windows	1.6	-	-	No windows, galzed doors, or roof windows in building
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridor Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		General luminaire		Display light source	
Zone name		Efficacy [lm/W]		Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95		80	0.3
E-00-Office-Corridor		120		-	-
E-00-Office-Corridor		120		-	-
E-00-Office-Corridor		120		-	-
E-00-Office-Corridor		120		-	-
E-00-Office-Lobby		120		-	-
E-02-Corridor		120		-	-
E-02-Corridor		120		-	-
E-03-Corridor		120		-	-
E-03-Corridor		120		-	-
E-03-Corridor		120		-	-
E-04-Corridor		120		-	-
E-04-Corridor		120		-	-
E-04-Corridor		120		-	-
E-05-Corridor		120		-	-
E-05-Corridor		120		-	-
E-05-Corridor		120		-	-
E-06-Corridor		120		-	-
E-06-Corridor		120		-	-
E-06-Corridor		120		-	-
E-07-Corridor		120		-	-
E-07-Corridor		120		-	-
E-07-Corridor		120		-	-
E-08-Corridor		120		-	-
E-08-Corridor		120		-	-
E-08-Corridor		120		-	-
E-09-Corridor		120		-	-
E-09-Corridor		120		-	-
E-09-Corridor		120		-	-
E-10-Corridor		120		-	-

General lighting and display lighting		General luminaire		Display light source	
Zone name		Efficacy [lm/W]		Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95		80	0.3
E-10-Corridor		120		-	-
E-10-Corridor		120		-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m²]	593.1	593.1		Retail/Financial and Professional Services
External area [m²]	146	146		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m³/hm² @ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	16.38	25.05		Storage or Distribution
Average U-value [W/m²K]	0.11	0.17		Hotels
Alpha value* [%]	25	10		Residential Institutions: Hospitals and Care Homes
				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
			100	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

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	0.26	0.27
Cooling	0	0
Auxiliary	0	0
Lighting	6.44	8.86
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	6.7	9.13

* 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	3.11	3.29
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	3.11	3.29

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	0.93	1.36
Primary energy [kWh _{PE} /m²]	5.36	8.63
Total emissions [kg/m²]	0.52	0.81

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	0.9	0	0.3	0	0	1	0	1	0
Notional	1.4	0	0.3	0	0	1.41	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

12.63 Block F

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Residential Corridors_Aylesham Centre F Be Green

As designed

Date: Sat Nov 30 21:19:53 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 40.77

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	0.59
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.38
Target primary energy rate (TPER), kWh _e /m²annum	5.92
Building primary energy rate (BPER), kWh _e /m²annum	3.41
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.15	0.15	F0000010:Surf[2]
Floors	0.18	0.11	0.11	F0000015:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	BF000079:Surf[0]
Windows** and roof windows	1.6	1.3	1.3	F0000010:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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-Limit} = Limiting area-weighted average U-values [W/(m²K)]

U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]

U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]

* 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/m²K

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
m³/(h.m²) at 50 Pa	8	3

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	>0.95

1- Corridor Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system	YES				

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
F-04-Circulation	120	-	-
F-04-Circulation	120	-	-
F-04-Circulation	120	-	-
F-04-Circulation	120	-	-
F-04-Circulation	120	-	-
F-04-Circulation	120	-	-
F-04-Lobby	120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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
Floor area [m²]	244.6	244.6
External area [m²]	144.9	144.9
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	35.41	37.95
Average U-value [W/m²K]	0.24	0.26
Alpha value* [%]	16.27	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
	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
100	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/m²]		
	Actual	Notional
Heating	1.9	1.46
Cooling	0	0
Auxiliary	0	0
Lighting	5.21	7.96
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	7.1	9.42

* 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	4.94	5.48
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	4.94	5.48

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m²]	6.82	7.42
Primary energy [kWh _{PE} /m²]	3.41	5.92
Total emissions [kg/m²]	0.38	0.6

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	6.8	0	1.9	0	0	1	0	1	0
Notional	7.4	0	1.5	0	0	1.41	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

12.64 Block G

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Residential_Corridor_Aylesham
Centre G Be Green

As designed

Date: Sun Dec 01 17:22:58 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 71.5

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	1.22
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.79
Target primary energy rate (TPER), kWh _{ep} /m²annum	12.54
Building primary energy rate (BPER), kWh _{ep} /m²annum	7.91
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	C0000094:Surf[2]
Floors	0.18	0.11	0.11	C0000094:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	C0000094:Surf[1]
Windows** and roof windows	1.6	1.3	1.3	C00000E7:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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-Limit = Limiting area-weighted average U-values [W/(m²K)]

U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]

U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]

* 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/m²K

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
m³/(h.m²) at 50 Pa	8	3

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	>0.95

1- Corridor Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
G-00-Circulation-06		120	-	-
G-00-Lobby-01		120	-	-
G-00-Corridor-01		120	-	-
G-00-Corridor-01		120	-	-
G-02-Corridor-01		120	-	-
G-02-Corridor-01		120	-	-
G-03-Corridor-01		120	-	-
G-03-Corridor-01		120	-	-
G-04-Corridor-01		120	-	-
G-04-Corridor-01		120	-	-
G-05-Corridor-01		120	-	-
G-05-Corridor-01		120	-	-
G-06-Corridor-01		120	-	-
G-06-Corridor-01		120	-	-
G-07-Corridor-01		120	-	-
G-07-Corridor-01		120	-	-
G-08-Corridor-01		120	-	-
G-08-Corridor-01		120	-	-
G-09-Corridor		120	-	-
G-10-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-
G-Corridor		120	-	-

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
G-Corridor		120	-	-
G-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m²]	858	858		Retail/Financial and Professional Services
External area [m²]	420.1	420.1		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m³/hm² @ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	134.61	224.68		Storage or Distribution
Average U-value [W/m²K]	0.32	0.53		Hotels
Alpha value* [%]	15.43	10		Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				
			100	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/m²]

	Actual	Notional
Heating	2.76	3.53
Cooling	0	0
Auxiliary	0	0
Lighting	4.9	7.52
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	7.66	11.05

* 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	2.48	2.74
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	2.48	2.74

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	9.95	17.91
Primary energy [kWh _{PE} /m²]	7.91	12.54
Total emissions [kg/m²]	0.79	1.22

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	9.9	0	2.8	0	0	1	0	1	0
Notional	17.9	0	3.5	0	0	1.41	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

12.65 Block H

BRUKL Output Document

HMGovernment

Compliance with England Building Regulations Part L 2021

Project name

Residential_Corridors_Aylesham_Centre
H Be Green

As designed

Date: Sun Dec 01 17:13:35 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 64.69

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	1.08
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.66
Target primary energy rate (TPER), kWh _{pe} /m²annum	11.16
Building primary energy rate (BPER), kWh _{pe} /m²annum	6.76
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.15	0.15	H0000162:Surf[1]
Floors	0.18	0.11	0.11	H0000162:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	H0000161:Surf[1]
Windows** and roof windows	1.6	1.3	1.3	H0000000:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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-Limit} = Limiting area-weighted average U-values [W/(m²K)] U _{a-Calc} = Calculated area-weighted average U-values [W/(m²K)] U _{i-Calc} = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridor Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
H-00-Corridor		120	-	-
H-00-Corridor		120	-	-
H-00-Corridor		120	-	-
H-00-Lobby		120	-	-
H-01-Corridor		120	-	-
H-01-Corridor		120	-	-
H-02-Corridor		120	-	-
H-02-Corridor		120	-	-
H-03-Corridor		120	-	-
H-03-Corridor		120	-	-
H-04-Corridor		120	-	-
H-04-Corridor		120	-	-
H-05-Corridor		120	-	-
H-05-Corridor		120	-	-
H-06-Corridor		120	-	-
H-06-Corridor		120	-	-
H-07-Corridor		120	-	-
H-07-Corridor		120	-	-
H-08-Corridor		120	-	-
H-08-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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
Floor area [m²]	582.2	582.2
External area [m²]	346.7	346.7
Weather	LON	LON
Infiltration [m³/hm² @ 50Pa]	3	3
Average conductance [W/K]	58.01	132.27
Average U-value [W/m²K]	0.17	0.38
Alpha value* [%]	21.2	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
	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
100	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/m²]

	Actual	Notional
Heating	1.35	2.6
Cooling	0	0
Auxiliary	0	0
Lighting	5.66	8.48
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	7.01	11.07

* 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	2.53	3.66
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>2.53</i>	<i>3.66</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	4.85	13.18
Primary energy [kWh _{PE} /m²]	6.76	11.16
Total emissions [kg/m²]	0.66	1.08

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 SSEE	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	4.9	0	1.3	0	0	1	0	1	0
Notional	13.2	0	2.6	0	0	1.41	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 SSEE	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEE	= 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

12.66 Block J1J2

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Residential_Corridor_Aylesham
Centre Block J1J2 Be Green

As designed

Date: Sun Dec 01 00:43:33 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 70.37

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	0.95
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.6
Target primary energy rate (TPER), kWh _{eq} /m²annum	10.11
Building primary energy rate (BPER), kWh _{eq} /m²annum	6.15
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.15	0.15	J100001A:Surf[1]
Floors	0.18	0.11	0.11	J100001A:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	BJ0000C5:Surf[0]
Windows** and roof windows	1.6	1.3	1.3	J2000003:Surf[2]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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-Limit} = Limiting area-weighted average U-values [W/(m²K)] U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)] U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridors Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
J1-00-Lobby		120	-	-
J1-00-Corridor		120	-	-
J1-00-Circulation		120	-	-
J1-00-Lobby-02		120	-	-
J1-00-Lobby-01		120	-	-
J1-00-Circulation		120	-	-
J2-00-01-Lobby		120	-	-
J2-00-01-Lobby		120	-	-
J2-00-01-Lobby		120	-	-
J2-00-01-Lobby		120	-	-
BJ1-00-Corridor		120	-	-
BJ1-01-Lobby		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-

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
BJ2-02-Corridor		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ2-02-Lift Lobby		120	-	-
BJ2-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-02-Corridor		120	-	-
BJ1-L11-Corridor		120	-	-
BJ1-L11-Corridor		120	-	-
BJ1-L11-Corridor		120	-	-
BJ1-L11-Corridor		120	-	-
BJ1-L11-Corridor		120	-	-
BJ1-01-Corridor		120	-	-
BJ1-01-Corridor		120	-	-
BJ2-00-Corridor		120	-	-
BJ2-01-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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
Floor area [m²]	1196.3	1196.3
External area [m²]	315.9	315.9
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	56.12	82.99
Average U-value [W/m²K]	0.18	0.26
Alpha value* [%]	25	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
	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
100	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/m²]		
	Actual	Notional
Heating	0.72	0.7
Cooling	0	0
Auxiliary	0	0
Lighting	6.39	8.06
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	7.11	8.75
* 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	3.01	1.94
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	3.01	1.94

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m²]	2.59	3.53
Primary energy [kWh _{PE} /m²]	6.15	10.11
Total emissions [kg/m²]	0.6	0.95

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	2.6	0	0.7	0	0	1	0	1	0
Notional	3.5	0	0.7	0	0	1.41	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

12.67 Block K

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name	
Block K Communal Be Green	As designed
Date: Sun Dec 01 15:55:11 2024	

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache
Calculation engine version: 7.0.26
Interface to calculation engine: IES Virtual Environment
Interface to calculation engine version: 7.0.26
BRUKL compliance module version: v6.1.e.1

Certifier details

Name: ME Engineers
Telephone number: Phone
Address: Street Address, City, Postcode

Foundation area [m²]: 112.08

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	1
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.64
Target primary energy rate (TPER), kWh _e /m²annum	10.34
Building primary energy rate (BPER), kWh _e /m²annum	6.66
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	C000004A:Surf[2]
Floors	0.18	0.11	0.11	C0000089:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	C000004A:Surf[0]
Windows** and roof windows	1.6	1.3	1.3	C000004A:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridor Heaters					
	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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	
K-08-Circulation	120	-	-	
K-08-Lift Lobby	120	-	-	
K-09-Lift Lobby	120	-	-	
K-00-Circulation-	120	-	-	
K-00-Circulation-	120	-	-	
K-00-Circulation-	120	-	-	
K-00-Circulation-	120	-	-	
K-00-Circulation-	120	-	-	
K-00-Circulation-	120	-	-	
K-00-Circulation-	120	-	-	
K-01-Circulation-	120	-	-	
K-01-Corridor	120	-	-	
K-01-Lobby	120	-	-	
K-02-Corridor	120	-	-	
K-02-Corridor	120	-	-	
K-02-Lobby	120	-	-	
K-03-Corridor	120	-	-	
K-03-Corridor	120	-	-	
K-03-Lobby	120	-	-	
K-04-Corridor	120	-	-	
K-04-Corridor	120	-	-	
K-04-Lobby	120	-	-	
K-05-Corridor	120	-	-	
K-05-Corridor	120	-	-	
K-05-Lobby	120	-	-	
K-06-Corridor	120	-	-	
K-06-Corridor	120	-	-	
K-06-Lobby	120	-	-	
K-07-Corridor	120	-	-	
K-07-Corridor	120	-	-	

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
K-07-Lobby		120	-	-
K-08-Circulation		120	-	-
K-08-F11-Corridor		120	-	-
K-09-12-Corridor		120	-	-
K-09-11-Corridor		120	-	-
K-09-10-Corridor		120	-	-
K-09-09-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m²]	1120.8	1120.8		Retail/Financial and Professional Services
External area [m²]	545.1	545.1		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m³/hm²@ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	119.27	227.05		Storage or Distribution
Average U-value [W/m²K]	0.22	0.42		Hotels
Alpha value* [%]	18.16	10		Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
			100	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/m²]

	Actual	Notional
Heating	1.38	2.46
Cooling	0	0
Auxiliary	0	0
Lighting	5.04	7.71
Hot water	0	0
Equipment*	13.13	13.13
TOTAL **	6.42	10.17

* 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	1.98	3.29
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	1.98	3.29

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	4.96	12.48
Primary energy [kWh _{PE} /m²]	6.66	10.34
Total emissions [kg/m²]	0.64	1

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	5	0	1.4	0	0	1	0	1	0
Notional	12.5	0	2.5	0	0	1.41	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

12.68 Block L

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

Aylesham Centre_Block L_Resi Communal Be Green

As designed

Date: Sun Dec 01 16:48:00 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 79.46

The CO ₂ emission and primary energy rates of the building must not exceed the targets		
Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	0.93	
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.56	
Target primary energy rate (TPER), kWh _{eq} /m²annum	9.54	
Building primary energy rate (BPER), kWh _{eq} /m²annum	5.91	
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	L0000009:Surf[1]
Floors	0.18	0.11	0.11	L0000077:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	L100001C:Surf[2]
Windows** and roof windows	1.6	1.3	1.3	L0000009:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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 -Limit = Limiting area-weighted average U-values [W/(m²K)] U _a -Calc = Calculated area-weighted average U-values [W/(m²K)] U _i -Calc = Calculated maximum individual element U-values [W/(m²K)] * 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/m²K 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		
m³/(h.m²) at 50 Pa	8	3		

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	>0.95

1- Corridors Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
L-02-Corridor		120	-	-
L-00-Corridor		120	-	-
L-00-Corridor		120	-	-
L-00-Corridor		120	-	-
L-01-Corridor		120	-	-
L-03-Corridor		120	-	-
L-04-Corridor		120	-	-
L-05-Corridor		120	-	-
L-06-Corridor		120	-	-
L-07-Corridor		120	-	-
L-08-Corridor		120	-	-
L-09-Corridor		120	-	-
L-10-Corridor		120	-	-
L-00-Corridor		120	-	-
L-01-Corridor		120	-	-
L-01-Corridor		120	-	-

The spaces in the building should have appropriate passive control measures to limit the effects of solar gains in summer

There are no zones in the building where the solar gain check is applicable.

Regulation 25A: Consideration of high efficiency 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
Floor area [m ²]	874.1	874.1
External area [m ²]	402.7	402.7
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	63.67	185.27
Average U-value [W/m ² K]	0.16	0.46
Alpha value* [%]	25	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
	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
100	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/m²]

	Actual	Notional
Heating	0.61	2.32
Cooling	0	0
Auxiliary	0	0
Lighting	5.48	7
Hot water	0	0
Equipment*	13.13	13.13
TOTAL**	6.09	9.32

* 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	2.12	2.99
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>2.12</i>	<i>2.99</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	2.21	11.8
Primary energy [kWh _{PE} /m ²]	5.91	9.54
Total emissions [kg/m ²]	0.56	0.93

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	2.2	0	0.6	0	0	1	0	1	0
Notional	11.8	0	2.3	0	0	1.41	0	----	----

Key to terms	
Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
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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

12.69 Block M

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2021

Project name

Aylesham Centre_Block M Communal Be Green

As designed

Date: Sun Dec 01 17:07:56 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Certifier details

Name: ME Engineers

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 105.12

The CO ₂ emission and primary energy rates of the building must not exceed the targets		
Target CO ₂ emission rate (TER), kgCO ₂ /m²annum	0.82	
Building CO ₂ emission rate (BER), kgCO ₂ /m²annum	0.51	
Target primary energy rate (TPER), kWh _{pe} /m²annum	8.78	
Building primary energy rate (BPER), kWh _{pe} /m²annum	5.43	
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	M0000004:Surf[0]
Floors	0.18	0.11	0.11	M00000F4:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	M00002BA:Surf[0]
Windows** and roof windows	1.6	-	-	No windows, galzed doors, or roof windows in building
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No personnel doors in building
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
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Air permeability	Limiting standard	This building		
m³/(h.m²) at 50 Pa	8	3		