BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Regal Cinema New LEAN

As designed

Date: Mon Jun 23 09:12:40 2025

Administrative information

Building Details

Address: Regal Cinema, Cumbrian Way, Uxbridge,

Certifier details

Name: Neil Ingham

Telephone number:

Address: The Mille 1000GWR, Brentford, TW8 9DW

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 1289.99

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	14.92	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	10.09	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	161.04	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	108.61	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.2	0.2	Floor 1 - GF - Rooms_W_6
Floors	0.18	0.15	0.15	Floor 1 - GF - Rooms_F_3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	Floor 1 - GF - Circulation NEW_R_5
Windows** and roof windows	1.6	1.4	1.4	Floor 1 - GF - Rooms_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average 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
$m^3/(h.m^2)$ 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	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Notional AC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.69	3.61	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- Notional Heat Pump

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3.05	0.001
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Floor 1 - GF - Rooms	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st - Rooms	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st - Rooms	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st 2 - Rooms 1	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st 2 - Rooms	-	-	0.4	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Floor 1 - GF - Rooms	120	-	-
Floor 1 - GF - Circulation NEW	120	-	-
Floor 1 - GF - Circulation NEW	120	-	-
Floor 1 - GF - Reception	120	105	1.286

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
Floor 2 - 1st - Rooms	120	-	-
Floor 2 - 1st - Rooms	120	-	-
Floor 2 - 1st 2 - Rooms 1	120	-	-
Floor 2 - 1st 2 - Rooms	120	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Floor 1 - GF - Rooms	NO (-52.6%)	NO
Floor 1 - GF - Circulation NEW	NO (-55.8%)	NO
Floor 1 - GF - Circulation NEW	YES (+75%)	NO
Floor 1 - GF - Reception	NO (-12.6%)	NO
Floor 2 - 1st - Rooms	NO (-57%)	NO
Floor 2 - 1st - Rooms	NO (-20.1%)	NO
Floor 2 - 1st 2 - Rooms 1	NO (-57%)	NO
Floor 2 - 1st 2 - Rooms	NO (-20.1%)	NO

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]	1290	1290
External area [m^2]	1326.6	1326.6
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	3
Average conductance [W/K]	499.57	529.58
Average U-value [W/m^2K]	0.38	0.4
Alpha value* [%]	18.96	21.74

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
100	**Hotels**
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	16.74	18.71
Cooling	4.72	4.13
Auxiliary	11.01	16.96
Lighting	6.93	6.78
Hot water	31.88	62
Equipment*	11.65	11.65
TOTAL**	**71.29**	**108.58**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

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

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	204.87	218.01
Primary energy [kWh_{PE}/m^2]	108.61	161.04
Total emissions [kg/m^2]	10.09	14.92

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] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	159	45.9	16.7	4.7	10.7	2.64	2.7	2.69	3.61
	Notional	177.9	40.2	18.7	4.1	16	2.64	2.7	----	----

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

Regal Cinema Refurb BASE

As designed

Date: Mon Jun 23 08:55:02 2025

Administrative information

Building Details

Address: Regal Cinema, Cumbrian Way, Uxbridge,

Certifier details

Name: Neil Ingham

Telephone number:

Address: The Mille 1000GWR, Brentford, TW8 9DW

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 943.44

The CO_2 emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	6.16	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	8.66	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	65.42	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	92.3	
Do the building's emission and primary energy rates exceed the targets?	BER > TER	BPER > TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.3	0.3	Floor 1 - GF - WC_W_10
Floors	0.18	0.25	0.25	Floor 1 - GF - Kitchen_F_3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.18	0.18	Floor 2 - 1st 2 - Room OLD 1_R_4
Windows** and roof windows	1.6	1.4	1.4	Floor 1 - GF - WC staff_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.4	1.4	Floor 1 - GF - Stair_D_7
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average 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
$m^3/(h.m^2)$ at 50 Pa	8	25

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Panel Rad

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
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					NO

2- Notional AC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	5	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- Notional Heat Pump

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.5	0
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Floor 1 - GF - Kitchen	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 1 - GF - WC	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 1 - GF - WC staff	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st - Room OLD	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st - Room OLD	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st 1 - Room OLD 1	-	-	0.4	-	-	-	-	-	-	-	N/A
Floor 2 - 1st 2 - Room OLD 1	-	-	0.4	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Floor 2 - 1st 2 - Room OLD	-	-	0.4	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Floor 0 LG - Stores	60	-	-
Floor 0 LG - Plant	60	-	-
Floor 1 - GF - Store	60	-	-
Floor 2 - 1st - Store OLD	60	-	-
Floor 2 - 1st 1 - Store OLD	60	-	-
Floor 2 - 1st 2 - Store OLD	60	-	-
Floor 1 - GF - Kitchen	60	-	-
Floor 1 - GF - WC	60	-	-
Floor 1 - GF - WC staff	60	-	-
Floor 1 - GF - Stair	60	-	-
Floor 0 LG - Circ	60	-	-
Floor 1 - GF - Circulation OLD	60	-	-
Floor 2 - 1st - Room OLD	60	-	-
Floor 2 - 1st - Circulation Old	60	-	-
Floor 2 - 1st - Room OLD	60	-	-
Floor 2 - 1st 1 - Room OLD 1	60	-	-
Floor 2 - 1st 1 - Circulation Old	60	-	-
Floor 2 - 1st 2 - Room OLD 1	60	-	-
Floor 2 - 1st 2 - Circulation Old	60	-	-
Floor 2 - 1st 2 - Room OLD	60	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Floor 0 LG - Circ	NO (-58.7%)	NO
Floor 1 - GF - Circulation OLD	N/A	N/A
Floor 2 - 1st - Room OLD	NO (-58.6%)	NO
Floor 2 - 1st - Circulation Old	NO (-88.5%)	NO
Floor 2 - 1st - Room OLD	NO (-87.3%)	NO
Floor 2 - 1st 1 - Room OLD 1	NO (-55.1%)	NO
Floor 2 - 1st 1 - Circulation Old	NO (-87.5%)	NO
Floor 2 - 1st 2 - Room OLD 1	NO (-55.1%)	NO
Floor 2 - 1st 2 - Circulation Old	NO (-87.5%)	NO
Floor 2 - 1st 2 - Room OLD	NO (-87.3%)	NO

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]	1136.4	1136.4
External area [m²]	1222.5	1222.5
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	25	3
Average conductance [W/K]	343.22	317.65
Average U-value [W/m²K]	0.28	0.26
Alpha value* [%]	13.07	16.95

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
100	**Hotels**
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	18.03	12.72
Cooling	0.37	2.69
Auxiliary	4.27	7.17
Lighting	16.48	9.15
Hot water	21.13	19.59
Equipment*	39.98	39.98
TOTAL**	**60.28**	**51.32**

* 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	7.43
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*7.43*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	279.62	263.39
Primary energy [kWh_{PE}/m^2]	92.3	65.42
Total emissions [kg/m²]	8.66	6.16

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] No Heating or Cooling										
	Actual	208.4	498.6	0	0	0	0	0	0	0
	Notional	108.5	503.1	0	0	0	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Room heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	121.8	278.1	42.3	0	11.8	0.8	0	1	0
	Notional	130.1	283.8	27	0	17.7	1.34	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	163.9	6.3	19.5	0.5	4.3	2.33	3.55	2.5	5
	Notional	133.9	34.8	14.1	3.6	6.5	2.64	2.7	----	----

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