Sustainability Assessment and Energy Statement

THE PRIORITY SCHOOL BUILDING PROGRAMME (PSBP)

COLLIS PRIMARY SCHOOL, TEDDINGTON

Department for Education

initiative
By Styles&Wood and Extraspace Solutions

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Author:
Dmitri Korolenko, Building Physics & Sustainability Engineer
S I Sealy & Associates Ltd
Inwood Court
Stuart Road
Bredbury
Stockport
SK6 2SR
0161 430 2044
d.korolenko@sisealy.co.uk

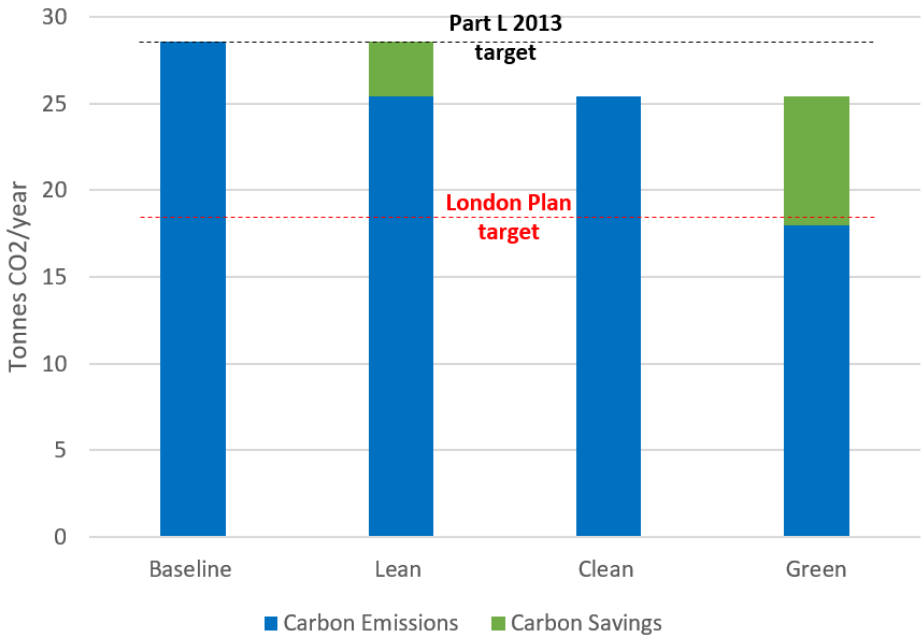
CONTENTS

1 EXECUTIVE SUMMARY

The construction of the new 2-storey School Block is planned for Collis Primary School. The proposal consists of a main 3 form entry school building and a small detached administrative block.

The local planning area for this new School building is within the London Borough of Richmond upon Thames, so the project must consider The London Plan and its policies. The building shall also comply with Part L2A 2013 as is mandatory for all new buildings in the UK.

The Figure below summarises the area weighted resultant carbon emissions for both proposed blocks. It can be seen that a 36.5% reduction of carbon emission below the 2013 Building regulations baseline is achieved. Initial assessment has revealed there are no current opportunities to connect the building to a district heating network. Therefore, the London Plan target is met through demand reduction, efficient system design and renewable energy generation. The proposed renewable generation system provides a reduction in CO_2 emissions on the Be Lean scenario of 25%.



The following design measures have been applied to achieve a design that is efficient, comfortable and complies with all regulatory and planning targers:

- Efficient internal and external fabric specifications
- Low-emissivity solar control glazing
- High efficiency condensing boiler system
- Natural ventilation as primary means of cooling
- High efficiency hybrid ventilation units boost cooling is summer pre-condition air in winter
- High efficiency LED luminaires
- Occupancy and photocell lighting controls
- Integrated photovoltaic electricity generation system

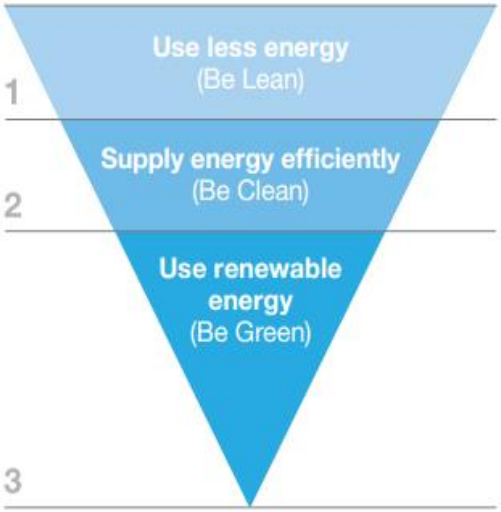
2 INTRODUCTION

This report is submitted as part of the planning application for the establishment of the new Collis Primary School Building. The aim of this report is to demonstrate compliance with Part L2A 2013 of the Building Regulations and the London Plan Chapter 5 and Richmond Local Plan policies.

The proposal is to provide a new Main Block comprising general classrooms, a library, dining hall and staff spaces. A new Administrative Block is provided comprising offices, SEN room and interview room.

All classrooms spaces are provided with hybrid ventilation system that assists natural ventilation via opening windows and louvres. The office rooms also use natural ventilation via opening windows with room that have no access to external openings treated by a Mechanical Ventilation with Heat Recovery (MVHR). Designated areas such as toilet facilities in the school are served with local extract fans.

The process undertaken to achieve compliance with Part L2A 2013 is derived from S I Sealy & Associates Energy Process Map where the intention is to achieve compliance by using passive design measures. The image below shows the process taken by S. I. Sealy Energy Process Map - be lean, be clean and be green.



The energy demand and Carbon Dioxide emissions are calculated by means of Dynamic Thermal Simulation (DTM) calculations using the EDSL TAS v.9.4.4 (Thermal Analysis Simulation) Software by an experienced thermal modeller. The carbon emission figures are reported against a Part L 2013 baseline scheme targeting a reduction in CO_2 emissions beyond Part L 2013.

3 PLANNING POLICY CONTEXT

2013 Building Regulations, Approved Document L2A: Conservation of fuel and power in new buildings other than dwellings

The energy efficiency requirements of the Building Regulations are set out in Part L of Schedule 1 to the Building Regulations and in a number of specific building regulations, while technical guidance is provided by the Approved Documents.

Compliance is achieved by satisfying five criteria, three of which concern design:

- The calculated CO_2 emission rate for the building should not exceed the target
- The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency
- The spaces in the building should have appropriate passive control measures to limit solar gains
- The performance of the building, as built, should be consistent with the calculated BER
- The necessary provisions for enabling energy-efficient operation of the building should be in place

The London Plan, 2016

In specific with London and Greater London, stricter development strategy is required for all new establishments. The goals and the means to achieve sustainable development and face the Climate Change are described explicitly in the London Plan issued in July 2016. In Policy 5.2 – Minimising Carbon Dioxide Emissions, it is stated that:

A) Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use renewable energy

B) The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations leading to zero carbon residential buildings from 2016 and zero carbon non-domestic buildings from 2019.

Currently, all non-domestic buildings should demonstrate at least a 35% on-site reduction beyond Part L 2013.

C) Major development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy.

D) As a minimum, energy assessments should include the following details:

a) calculation of the energy demand and carbon dioxide emissions covered by the Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations at each stage of the energy hierarchy
b) proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services
c) proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP)
d) proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.
e) the carbon dioxide reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

Richmond Local Plan Policy LP 22

Sustainable Design and Construction

A) Developments will be required to achieve the highest standards of sustainable design and construction to mitigate the likely effects of climate change. Applicants will be required to complete the following:
1. Development of 1 dwelling unit or more, or 100sqm or more of non-residential floor space (including extensions) will be required to complete the Sustainable Construction Checklist SPD. A completed Checklist has to be submitted as part of the planning application.
2. Development that results in a new residential dwelling, including conversions, change of use, and extensions that result in a new dwelling unit, will be required to incorporate water conservation measures to achieve maximum water consumption of 110 litres per person per day for homes (including an allowance of 5 litres or less per person per day for external water consumption).
3. New non-residential buildings over 100sqm will be required to meet BREEAM 'Excellent' standard.
4. Proposals for change of use to residential will be required to meet BREEAM Domestic Refurbishment 'Excellent' standard (where feasible).

Reducing Carbon Dioxide Emissions

B) Developers are required to incorporate measures to improve energy conservation and efficiency as well as contributions to renewable and low carbon energy generation. Proposed developments are required to meet the following minimum reductions in carbon dioxide emissions:
1. All new major residential developments (10 units or more) should achieve zero carbon standards in line with London Plan policy.

2. All other new residential buildings should achieve a 35% reduction.
3. All non-residential buildings over 100sqm should achieve a 35% reduction. From 2019 all major non-residential buildings should achieve zero carbon standards in line with London Plan policy.

Targets are expressed as a percentage improvement over the target emission rate (TER) based on Part L of the 2013 Building Regulations.

C) This should be achieved by following the Energy Hierarchy:
1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use renewable energy

Decentralised Energy Networks

D) Council requires developments to contribute towards the Mayor of London target of 25% of heat and power to be generated through localised decentralised energy (DE) systems by 2025. The following will be required:
1. All new development will be required to connect to existing DE networks where feasible. This also applies where a DE network is planned and expected to be operational within 5 years of the development being completed.
2. Development proposals of 50 units or more, or new non-residential development of 1000sqm or more, will need to provide an assessment of the provision of on-site decentralised energy (DE) networks and combined heat and power (CHP).
3. Where feasible, new development of 50 units or more, or new non-residential development of 1000sqm or more, as well as schemes for the Proposal Sites identified in this Plan, will need to provide on-site DE and CHP; this is particularly necessary within the clusters identified for DE opportunities in the borough-wide Heat Mapping Study. Where on-site provision is not feasible, provision should be made for future connection to a local DE network should one become available.

Applicants are required to consider the installation of low, or preferably ultra-low, NOx boilers to reduce the amount of NOx emitted in the borough.
Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged where appropriate.

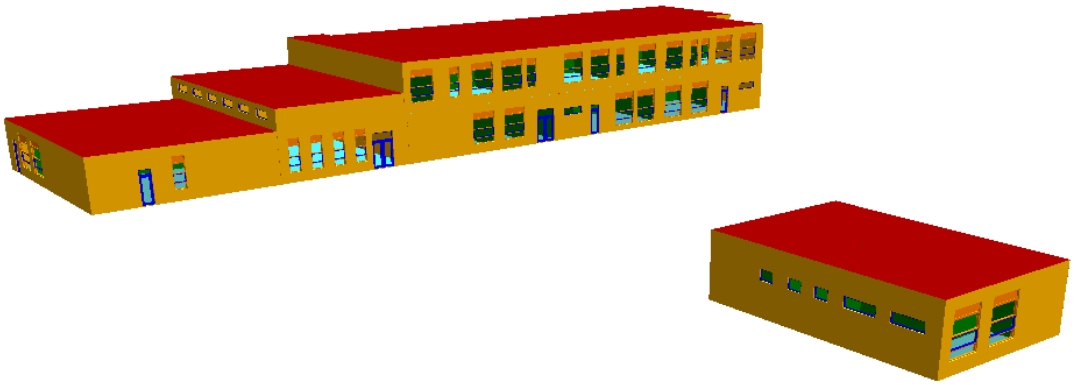
Retrofitting

E) High standards of energy and water efficiency in existing developments will be supported wherever possible through retrofitting. Householder extensions and other development proposals that do not meet the thresholds set out in this policy are encouraged to complete and submit the Sustainable Construction Checklist SPD as far as possible, and opportunities for micro-generation of renewable energy will be supported in line with other policies in this Plan.

4 METHODOLOGY

It should be noted that the current Sustainability and Energy Assessment is based on Stage 2 design assumptions. Therefore, the energy output is subject to alterations depending on detailed design of the building fabric and systems as design develops.

The calculation methodology used to determine the CO_2 emission rates was SBEM via EDSL Tas Part L 2013 software producing a Building Regulations UK Part L (BRUKL) Report. The Part L Assessment Software produces evaluations of energy use in non-residential buildings for compliance with the Building Regulations and for Building Energy Performance Certification (EPC) purposes. A notional building of the same geometry, space use, construction and specific features for HVAC, hot water and lighting systems is generated along with the actual building that is assessed. Compliance with Part L is based on comparison between the energy use and Target Emission Rate (TER) derived from the notional and the energy use and the actual Building Emission Rate where the actual building emission rate must be less then, or equal to the target emission rate.



The technologies proposed in the next section were determined during design stage, following the course outlined in the Energy Hierarchy Framework.

5 ENERGY STRATEGY

5.1 Summary

This energy strategy for the proposed development of Collis Primary School follows the passive first approach. Across the design stage a "Be Lean, Be Clean, Be Green" hierarchy methodology has been utilized, as defined by the Greater London Authority Supplementary Planning Guidance.

The following sections outline the detail of the energy strategy using the "Be Lean", "Be Clean", and "Be Green" philosophy: Where "Be Lean" incorporates demand reduction through passive measures and energy efficient systems; "Be Clean" is the integration and specification of low carbon technology; and "Be Green" utilises renewable technology. As mentioned before, this framework was adopted as it ensures that passive design is prioritised in order to reduce the demand for energy in the first instance.

5.2 Be Lean

The LEAN strategy key features implemented in the design are:
- **Fabric optimisation** to minimise the energy demand resulting from façade sensitive study
- **Good air tightness** – 5 m^3/m^2h at 50 Pa
- **High efficiency heating and lighting systems** – Condensing boiler and sensor-controlled LED luminaires

5.2.1 Energy Modelling Input

Be Lean building fabric and servicing assumptions have been outlined in the following table. These inputs have been used to generate the Be Lean outputs which have been used to highlight key factors that can be potentially improved for demand reduction and subsequent carbon emission reduction over baseline demands.

Element	Values
Fabric	Wall - 0.20 W/m^2k Floor – 0.18 W/m^2k Roof – 0.15 W/m^2k Glazing – 1.7 W/m^2k g value - 0.40
Air Tightness	5 m^3/m^2h at 50 Pa
Heating & DHW	Central condensing boilers (95% efficiency) coupled with 750l cylinder
Ventilation	Natural Ventilation: • Through manually controlled windows & louvers (where applicable) MVHR: • Ventilation heat recovery: 70% eff AHU SFP 1.1 W/l/s (office) Hybrid Ventilation: • Unit SFP 0.14 W/l/s (classrooms) Extract: • Fans SFP 0.50 W/l/s (toilets and storage)

Element	Values
Lighting	Lamp – 100 lm/W all spaces, occupancy and daylight controls on all fittings

5.2.2 Be Lean Results

This section outlines the results obtained from BRUKL report (Building Regulation UK Part L), the tables below show the predicated energy consumption by end use under the Be Lean scenario, and the predicted total carbon emissions under the Be Lean scenario, compared to the baseline (notional) carbon emission.

Be Lean energy consumption (kWh/m^2.year)				
Space heating	Cooling	Auxiliary	Lighting	DHW
18.23	0.31	3.46	8.15	20.65

Be Lean Carbon Emissions (kg CO_2/m^2/year)		
Baseline (Notional)	Be Lean	Be Lean Improvement
16.2	14.2	11.2%

5.3 Be Clean

Local surrounding energy demands, and heat networks have been investigated and it has been found that there are currently no local networks that would allow feasible connection at time of construction. It is therefore proposed to design the system with a district heating connection in place to allow future connection when a local network becomes available.

5.4 Be Green

This section outlines the strategic approach applied to renewable energy to achieve the necessary carbon reduction requirement for the proposed development. The initial feasibility review highlighted the suitability of the roofs for solar PV panels. These will contribute to reducing the carbon emissions of the development significantly due to the high carbon factor of electricity.

5.4.1 Photo Voltaic Panels

The proposed development has been assessed to analyse possible solar PV array placement and potential energy yield. The roof space available has been deemed suitable to house a 100m^2 PV array that is capable of generating a significant portion of on-site electricity. Using PV as renewable generation benefits this type of building as times of peak generation coincide with times of peak demand.

Solar PV panel parameters	
Panel conversion efficiency	18%
Inverter efficiency	95%
Panel orientation	True South

Solar PV panel parameters	
Panel inclination	15°
Proposed array size	100m^2
CO_2 factor of electricity	0.519 kg CO_2/kWh

5.4.2 Be Green Carbon Emissions

Table below summarise the carbon emissions at each stage of the proposed energy strategy. Through integrating the proposed PV array a carbon reduction of 25.3% on the Be Lean scenario has been achieved.

Be Lean Carbon Emissions (kg CO_2/m^2/year)		
Be Lean	Be Clean	Be Clean Improvement
14.2	10.2	25.3%

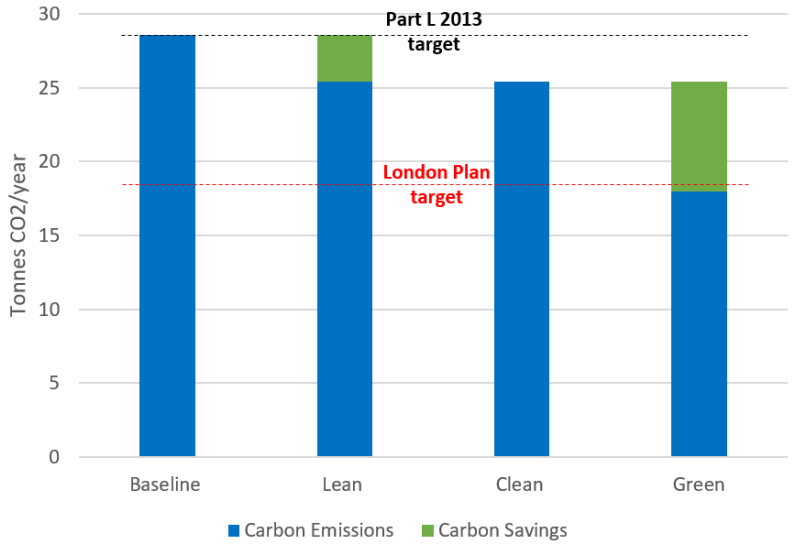
6 CONCLUSIONS

1. Through the use of high-performance fabric, system and lighting design the proposed solution achieves Part L 2013 regulation compliance without the requirement for renewable technology.

2. No feasible district heating connections have been identified and the design is therefore recommended to include a district heating connection for potential future integration.

3. The proposed 100m^2 photovoltaic array achieves a carbon reduction of 25.3% on the Be Lean scenario and allows the proposed design to achieve 36.5% improvement on the Part L 2013 baseline.

The following chart and tables demonstrate how the building achieves all targets set.



Building Carbon Emissions (kg CO_2/m^2/year)			
Typology	Baseline (Notional)	Be Green	Improvement
Non-residential	16.2	10.2	36.5%

	Regulated Carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)**
Savings from Be Lean	3.17	11.2 %
Savings from Be Clean	0	0 %
Savings from Be Green	7.40	25.3%
Total Cumulative Savings	10.57	36.5%

APPENDIX A. DESIGN BRUKL EXTRACT – MAIN BLOCK

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Collis Primary School — As designed

Date: Wed Jul 24 20:59:15 2019

Administrative information

Building Details

Address: Teddington, London,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.4.4"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.4.4

BRUKL compliance check version: v5.6.a.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

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

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	16.2
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	16.2
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	10.3
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	External Wall
Floor	0.25	0.18	0.18	Ground Floor
Roof	0.25	0.15	0.15	Roof
Windows***, roof windows, and rooflights	2.2	1.73	1.86	5 Glazed Door
Personnel doors	2.2	1.34	1.34	1 Win Louver
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

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

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	5

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	1763	1763
External area [m²]	3470	3470
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	3
Average conductance [W/K]	1033	1143
Average U-value [W/m²K]	0.3	0.33
Alpha value* [%]	7.7	7.7

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

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
99	**D1 Non-residential Institutions: Education**
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger terminals
	Others: Emergency services
1	**Others: Miscellaneous 24hr activities**
	Others: Car Parks 24 hrs
	Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	18.19	14.02
Cooling	0.31	0.34
Auxiliary	3.46	4.01
Lighting	8.44	12.25
Hot water	20.65	22.22
Equipment*	27.61	27.61
TOTAL**	51.05	52.83

* 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	8.24	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	64.8	48.13
Primary energy* [kWh/m²]	83.93	93.89
Total emissions [kg/m²]	10.3	16.2

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

APPENDIX B. DESIGN BRUKL EXTRACT – ADMIN BLOCK

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Collis Primary School As designed

Date: Tue Jul 23 17:26:28 2019

Administrative information

Building Details

Address: Teddington, London,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.4.4"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.4.4

BRUKL compliance check version: v5.6.a.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

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

CO_2 emission rate from the notional building, kgCO_2/m².annum	15.9
Target CO_2 emission rate (TER), kgCO_2/m².annum	15.9
Building CO_2 emission rate (BER), kgCO_2/m².annum	11.4
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	External Wall
Floor	0.25	0.18	0.18	Ground Floor
Roof	0.25	0.15	0.15	Roof
Windows***, roof windows, and rooflights	2.2	1.71	1.74	7 Small top window
Personnel doors	2.2	1.34	1.34	1 Win Louver
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

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

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
m³/(h.m²) at 50 Pa	10	5

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	133	133
External area [m²]	466	466
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	5
Average conductance [W/K]	141	199
Average U-value [W/m²K]	0.3	0.43
Alpha value* [%]	11.82	11.82

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

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
100	**D1 Non-residential Institutions: Education**
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	27.82	29.98
Cooling	0	0
Auxiliary	1.33	1.41
Lighting	11.63	16.37
Hot water	6.91	1.86
Equipment*	19.12	19.12
TOTAL**	47.69	49.62

* 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	5.21	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	90.14	93.02
Primary energy* [kWh/m²]	81.17	92.07
Total emissions [kg/m²]	11.4	15.9

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

S I Sealy & Associates Ltd
Inwood Court
Stuart Road
Bredbury
Stockport
SK6 2SR

Tel: 0161 430 2044
www.sisealy.co.uk
info@sisealy.co.uk