

KOJO RESTAURANT
32-34 ROSSLYN HILL
NW3 1NH

COOLING HIERARCHY COMPLIANCE

For:

Landmark Group

March 2022

Project no. 13799

KOJO RESTAURANT

32-34 ROSSLYN HILL

LONDON

NW3 1NH

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REVISION	DATE	PREPARED BY	REVIEWED BY	COMMENTS
0	03/2022	Dan Chadwick	M Heptonstall	To issue

The results generated and analysed in this report are based upon complex arithmetical calculation that takes into consideration a number of design criteria and evaluations in a dynamic simulation. It gives an indication of the predicted environmental conditions based on climatic data and anticipated operating strategies of the building.

The predicted simulated internal temperatures may also not meet the actual internal air temperatures due to several reasons, namely change in space function, use of equipment, natural wear and tear of building elements, global climate change and meteorological changes, change in operational management of apertures etc.

C80 Solutions cannot be held liable for temperatures that vary from the simulated results as these have been calculated in a controlled virtual environment.

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1 Introduction

1.1 About C80 Solutions Ltd

C80 Solutions are independent Sustainability and Energy Consultants providing carbon reduction solutions to help the UK achieve its carbon emission reduction target of 80% by 2050 - as set out in the Government's Climate Change Act 2008.

Our range of affordable but comprehensive solutions for the construction industry are broken down into two sectors: i) Building Compliance and ii) Consultancy.

Building Compliance:

Our Building Compliance services include Code for Sustainable Homes Assessments, SAP Calculations, On Construction Energy Performance Certificates, Water Efficiency Calculations, SBEM Calculations, Commercial EPCs, BREEAM assessments, Thermal comfort analysis, Air Tightness Testing and Sound Testing.

Consultancy:

Our experience and exposure to building compliance combined with previous experience and IEMA accredited training means we have built up a vast amount of knowledge which enables us to provide our clients with invaluable advice. Our Consultancy services include Renewable Energy Feasibility Reports, Energy Statements for planning, Sustainability Statements and Building Compliance Advisory Reports.

1.2 Executive Summary

C80 Solutions have been instructed by Landmark Group to prepare a cooling hierarchy report for a proposed development at Kojo Restaurant, 32-34 Rosslyn Hill.

The project assessed anticipates the provision of cooling within the Kojo restaurant following some recent works undertaken at the premises.

Simulations have been undertaken for Kojo restaurant using Designbuilder EnergyPlus, which is a dynamic simulation modelling software that can accurately simulate predicted internal environments and temperatures for the purposes of identifying area which are at a risk of overheating and will therefore benefit from the use of cooling. The same model can then be used to simulate multiple iterations of the proposed building, to account for stages within the cooling hierarchy.

The dynamic modelling simulations have been used to identify the operative temperatures within the building and to ascertain the requirement for cooling after the various stages of the cooling hierarchy have been considered where applicable to the building.

The plan of the proposed development can be seen in Figures 1 and 2 below:

Figure 1: Proposed Floor Plans

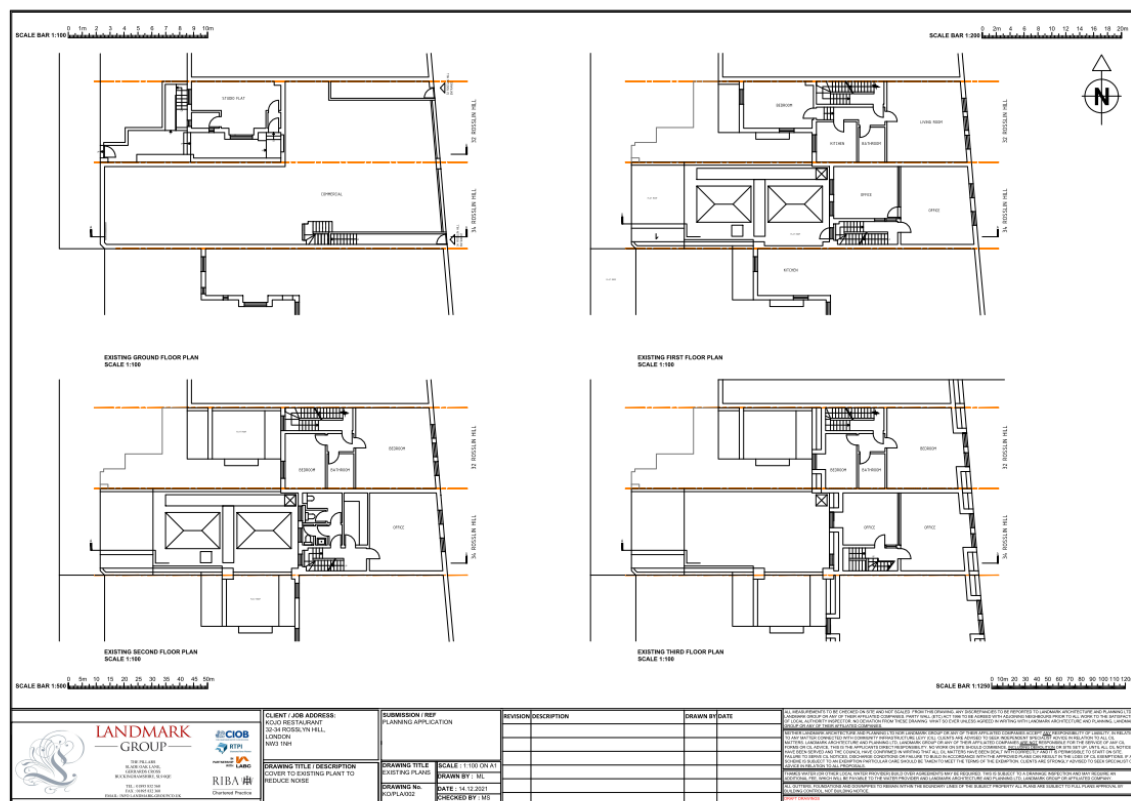
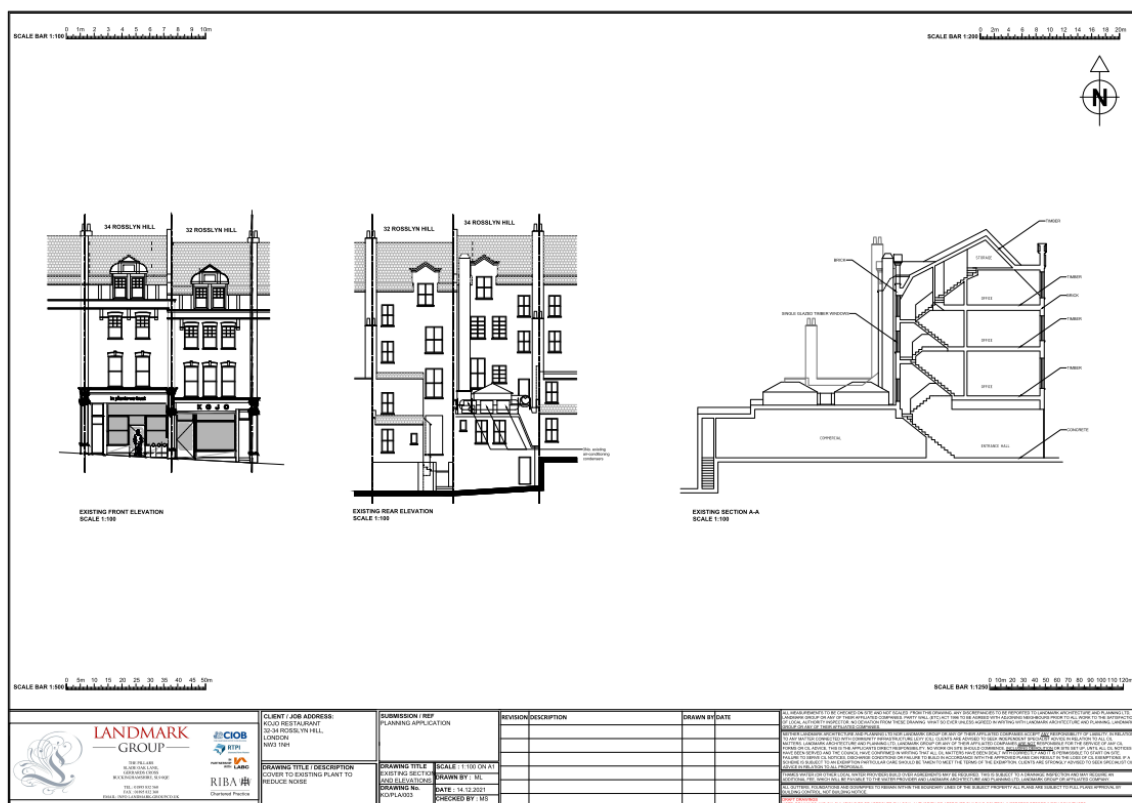


Figure 2: Plan of proposed Elevations



2 Software Calculation Specification

This analysis was conducted using the Designbuilder EnergyPlus software package.

Calculation Engine: DesignBuilder EnergyPlus

Calculation Engine Version: v6.1.0.6



2.1 Weather File Detail

As outlined within CIBSE Technical Memorandum 52, CIBSE DSY weather files are used to replicate the weather data most applicable to the site, the DSY1 weather file for the most appropriate location nearest to the development has been used for this development.

The DSY represents warmer than typical year and is used to evaluate overheating risk within buildings.

The specific weather location chosen for this assessment was London weather centre DSY.

3 Cooling Hierarchy Planning Policies

3.1 London Plan – Greater London Authority

Chapter 9 of the London plan states that Major developments should reduce the risk of potential overheating and therefore dependence on air-conditioning systems using the following cooling hierarchy:

1. reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
2. minimise internal heat generation through energy efficient design
3. manage the heat within the building through exposed internal thermal mass and high ceilings
4. provide passive ventilation
5. provide mechanical ventilation
6. provide active cooling systems.

Where the above hierarchy applies to major developments, it can still be adapted and used on minor developments.

3.2 Camden Council

Following the Policies applicable within the Greater London Authority, Camden Council requires that all developments follow the cooling hierarchy approach.

The policy applicable to this can be found within Chapter 10 of the Camden Planning Guidance; Energy Efficiency and adaptation document, specifically 10.7.

This cooling hierarchy shown within this document matches that within the GLA Guidance and covers each of the points from 1-6 above.

4 Design compliance of development

The information provided within this section is used to demonstrate compliance with the policies mentioned earlier within this report.

The fabric performance detailed in Table 1 has been based on the proposed performance detailed in the project design brief and anticipated construction where this information was readily available, where this is unknown, the information has been assumed.

The information detailed should be reviewed in detail for consistency with the design proposals.

Building Element	G Value/ Visible Light Transmission	U Value (W/m ² k)	Notes
External Walls	-	2.1	
Floors	-	0.91	
Roofs	-	0.25	
Windows	0.82 / 0.88	5.76	
Roof Lanterns	0.60 / 0.80	1.6	

Table 1

4.1 Design Principles

The following is a summary of the design features reviewed in line with the cooling hierarchy with the aim to minimize the need for cooling.

1. The layout of the building has been considered to ensure the most optimum layout for both the use of the building and the heat entering the building.
2. The proposed use LED lighting and energy efficient services have been utilised throughout the property.
3. Where present pipe and ductwork has been insulated with ductwork having PIB insulation installed.
4. Architectural design of Kojo ensures that a full energy efficient outfit of the building was completed.
5. Awnings have been installed to the front of the development where the heaviest amount of glazing is present, additionally the glazing within these units is frosted to enable filtering of sunlight throughout the day.
6. The proposed roof lantern utilizes double glazing which contains an argon gas to reduce heat gains through these openings.

7. Energy efficient insulation is proposed and door seals have been added to reduce the amount of heat entering the building during summer months, doors are also proposed to be kept closed when not being used for entry to the building.
8. High ceilings have remained in place at the premises and remain unchanged from previous.
9. Openable windows to the front and rear are openable, though given the location of the building, the surrounding area and the use of the building, these are limited in use.
10. Mechanical ventilation is installed at the property.

Internal operating temperatures within the premises are targeted to be between 22 and 25 degrees Celsius in line with CIBSE guidance. Temperature acceptability tolerance for this building is determined as 4 degrees above this temperature, meaning the temperature limit is defined as 29°C, which would still be considered by many as an uncomfortable environment to be in.

5 Results and Conclusion

Dynamic thermal comfort modelling has been undertaken on the development and simulations have been completed on the building with the details specified within section 3 of this report including all the proposed design principles.

The simulation results can be used to show that the buildings would not overheat, to show this, the building should comply with the criteria set out in CIBSE TM52.

The results of the dynamic thermal comfort modelling indicate that the spaces do not comply with the thermal comfort requirements set out within CIBSE TM52 and would therefore likely overheat and present uncomfortable operative temperatures for occupants. The results show that 10% of the time the temperature exceeds 29°C which is the absolute maximum upper threshold under CIBSE guides, with numerous events in which the temperature exceeds 30°C, this would indicate that there will be an even higher percentage of time when the temperatures exceed the suggested temperature range of 22°C to 25°C.

As cooling is recommended and required to keep comfortable temperatures within the building, to comply with the final part of the cooling hierarchy, it is proposed that Samsung 360 blade-less cassettes are installed, not only are the Samsung systems optimized for efficiency and comfort throughout the spaces installed, but this new system will replace the existing system which was outdated and inefficient.