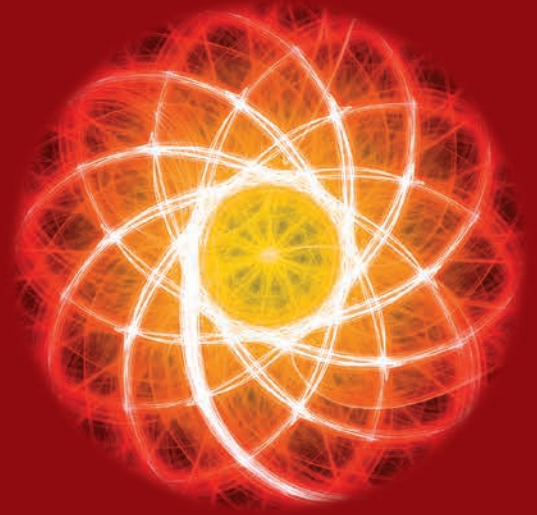


Prospero

Energy Cost Saving Report





Energy Cost Saving Report

at

Prospero
73 London Road Redhill, Surrey

for



3511/DH

Issue 3

24 March 2015

Table of Contents

1.0 Introduction 1

2.0 Development Outline Specification..... 1

2.1 Building Envelope 1

2.2 Building Services..... 1

3.0 Energy Savings Study 2

4.0 Financial Savings..... 3

5.0 Conclusion..... 4

Appendix 1 - 'As Designed' Energy Performance Certificate and Energy Consumption

1.0 Introduction

RHB Partnership LLP have been commissioned by Lamron Developments (Redhill) Ltd on behalf of McKay Securities Plc to produce an Energy Cost Saving Report for the proposed office development at 73 London Road, Redhill.

The project consists of a proposed 5000m² office building of 4 storeys with an underground car park below.

The property will be constructed to ensure CO₂ emissions are 25% less than the Part L 2010 target emissions rate and this document will demonstrate how this will be achieved in addition to detailing the energy and financial savings when compared against a Typical Pre 2002 Office Building.

The building will be assessed under BREEAM for Offices 2011 to target and achieve an 'Excellent' rating.

The Bentley Hevacomp version V25.05 SBEM V4.1C computer software programme has been used to model the buildings CO₂ emissions and kWh energy consumption.

Section 2 of this document states the specification the building will be built to.

Sections 3 and 4 set out the energy and financial savings respectively when compared against typical office stock.

A conclusion is provided in Section 5.

2.0 Development Outline Specification

The building fabric and associated services will be designed to exceptional standards to meet the required sustainability standards demanded by McKay Securities and Lamron Developments (Redhill) Ltd and Part L 2010 of the Building Regulations.

2.1 Building Envelope

The building will be constructed to a high standard to ensure fabric and infiltration heat losses and heat gains area are at an absolute minimum.

- Wall 'U' values to be 0.22w/m²k.
- Roof 'U' values to be 0.18w/m²k.
- Windows to be double glazed with a 'U' value of 1.5w/m²k with solar control.
- Air permeability to be 3m³/hr.m²@50pa.
- Thermal bridging and all junctions to robust accredited details.

2.2 Building Services

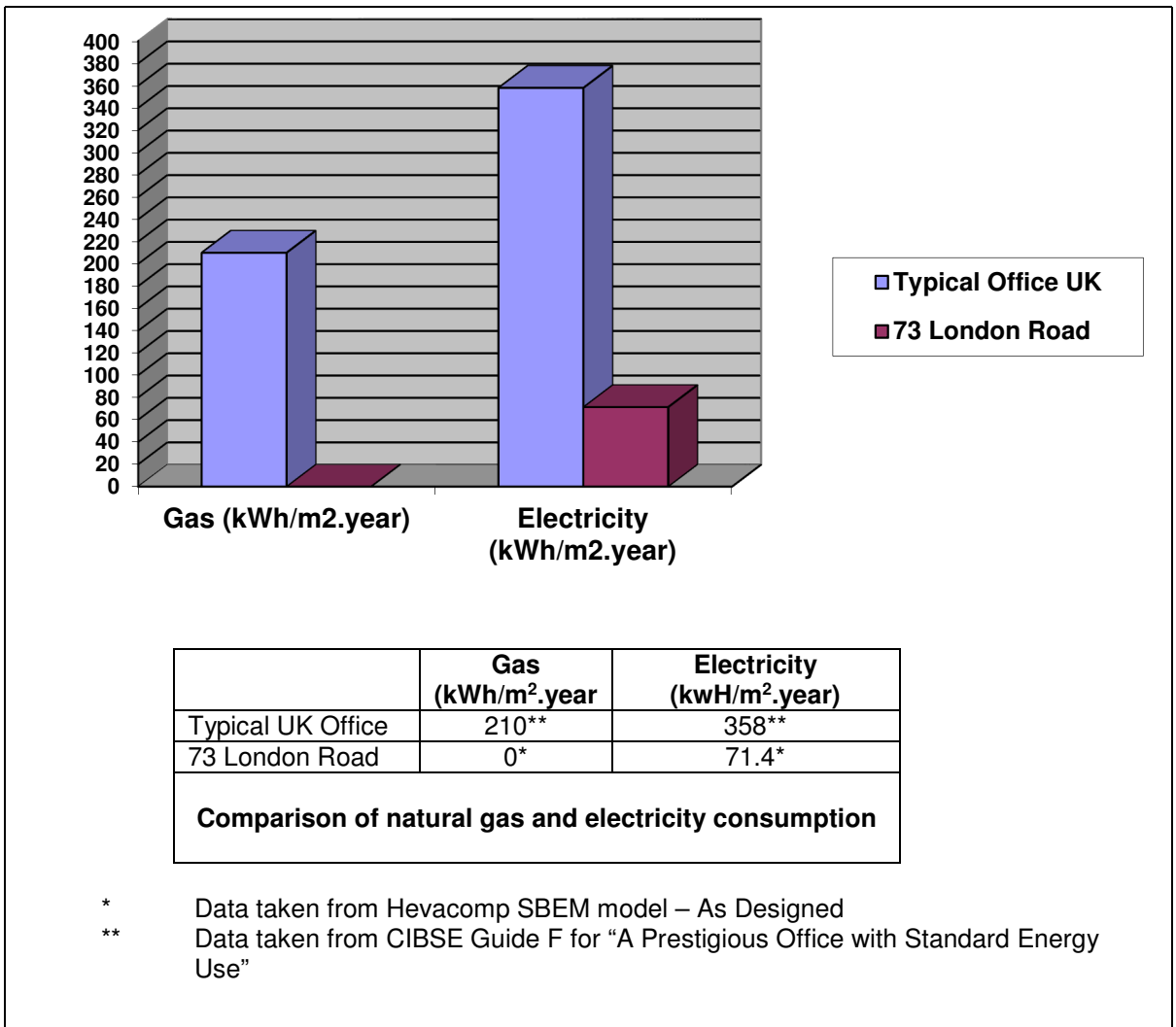
The services shall ensure compliance with Part L 2010 Requirements.

- Building Management System with Energy M&T (Monitoring and Targeting) Software.
- Power Factor = 0.95.
- VRF high COP heat pump heat recovery systems serving the offices and reception.
- Heat pump system heating in ancillary rooms such as toilets, changing rooms and corridors.
- Mechanical ventilation with heat pump heating and thermal wheel heat recovery to reception and offices.
- Toilet extract system.

- Air source heat pump preheat cylinder with rejected heat from the reception air conditioning used to preheat the water in summer and direct heat pump heating used in winter.
- Low energy LED light fittings with daylight and occupancy sensors in the offices.
- Low energy light fittings with occupancy sensors in the toilets, changing rooms and corridors.
- Roof mounted/photovoltaic panels.

3.0 Energy Savings Study

The reduced demand of fuel consumption of 73 London Road, Redhill compared to a typical UK office building can be seen below:-



It is expected that consumption of natural gas will be 100% lower than a typical UK office building for 73 London Road, as all heating and domestic hot water will be produced by electric heat pumps.

In addition, it is expected that consumption of electricity will be 80% lower than a typical UK office building for 73 London Road.

4.0 Financial Savings

A financial analysis has been performed to quantify the savings that will be made by the occupiers (energy bill payers) of 73 London Road, Redhill as compared to occupiers of a typical UK office of the same gross internal floor area.

Energy costs have been modelled using the most recent and appropriate energy pricing information.

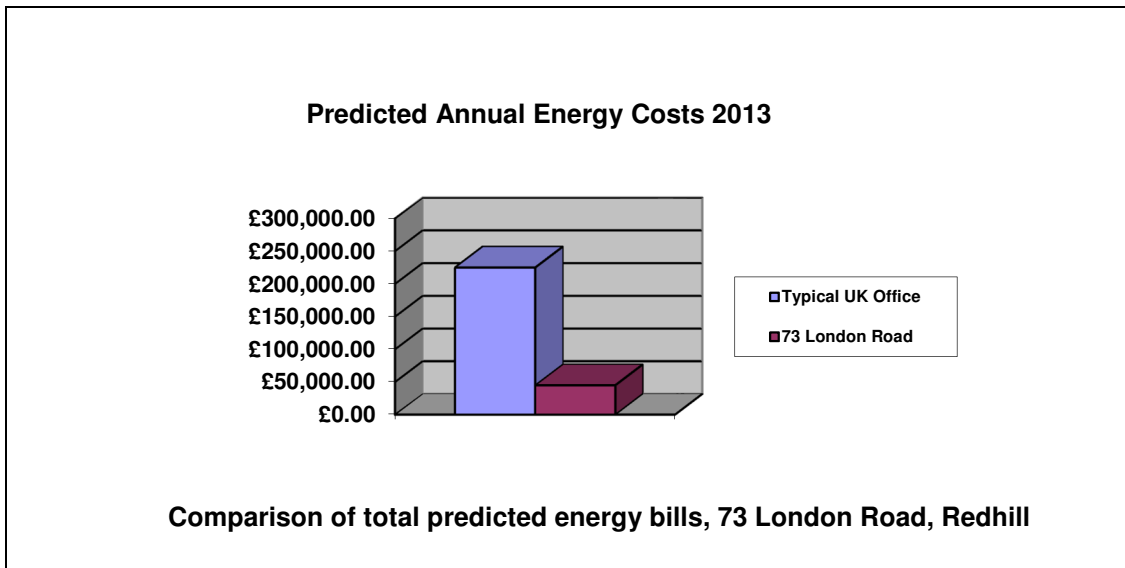
Potential occupants of 73 London Road, Redhill can be assured that operating costs for the building due to energy bills will be drastically lower than offices typical of the UK's existing stock as demonstrated below:-

Comparative Energy Costs for 73 London Road, Redhill

Energy Costs		73 London Road, Redhill	Typical Benchmark Pre 2002 Office Building
Gas Consumption	=	0kWh*	1105440kWh**
Electrical Consumption = Regulated	=	207875kWh*	1884512kWh**
= Unregulated	=	188135kWh*	Included above
		396010kWh	1884512kWh
Gas Cost			
kWh x 3.4p/kWh	=	£0.00	£37585.00
Electrical Cost			
kWh x 10.2p/kWh	=	£40393.00	£192220.00
TOTAL COST	=	£40393.00	£229805.00
÷ 5264m ²	=	£7.67/sqm	£43.66/sqm

* Data taken from Hevacomp SBEM model – As Designed

** Data taken from CIBSE Guide F for “A Prestigious Office with Standard Energy Use”



The above presents the total annual energy costs that are expected for 73 London Road, Redhill. It denotes that savings can be made for occupiers of 73 London Road when compared to offices typical of the existing UK building stock.

5.0 Conclusion

This report has presented the results of an energy modelling exercise for 73 London Road. The analysis is based upon a model of the building based on the Government Approved National Calculation Method (NCM) therefore variations to the results could occur depending upon the actual usage patterns of the building.

It has been demonstrated through the financial analysis that significant energy cost savings could be made by potential occupiers of 73 London Road, Redhill and annual energy bills will be less than 20% of that of a typical UK office building due to the exceptionally high fabric and M&E services specification the building is to be constructed to.

Appendix 1

'As Designed' Energy Performance Certificate
and
Energy Consumption

Energy Performance Certificate

Non-Domestic Building



73 London Road
Redhill

Certificate Reference Number:
9790-0900-0309-0000-0004

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information on the Government's website www.communities.gov.uk/epbd.

Energy Performance Asset Rating

More energy efficient



Net zero CO₂ emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

◀ **30**

This is how energy efficient the building is.

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m ²):	5264
Building complexity (NOS level):	4
Building emission rate (kgCO ₂ /m ²):	18.61

Benchmarks

Buildings similar to this one could have ratings as follows:

30 ▶ If newly built

80 ▶ If typical of the existing stock

Administrative information

This is an Energy Performance Certificate as defined in SI2007:991 as amended

Assessment Software: Design Database v25.05 using calculation engine SBEM v4.1.d.0

Property Reference: 000000000000

Assessor Name: Dean Hunt

Assessor Number: LCEA028520

Accreditation Scheme: CIBSE Certification Ltd

Employer/Trading Name: RHB Partnership LLP

Employer/Trading Address: The Old Vicarage, Popham, Hampshire, SO21 3BJ

Issue Date: 18 Jun 2012

Valid Until: 17 Jun 2022 (unless superseded by a later certificate)

Related Party Disclosure: Employed by the owner

Recommendations for improving the property are contained in Report Reference Number: 9000-4009-0090-0090-0075

If you have a complaint or wish to confirm that the certificate is genuine

Details of the assessor and the relevant accreditation scheme are on the certificate. You can get contact details of the accreditation scheme from the Government's website at www.communities.gov.uk/epbd, together with details of the procedures for confirming authenticity of a certificate and for making a complaint.



For advice on how to take action and to find out about technical and financial assistance schemes to help make buildings more energy efficient visit www.carbontrust.co.uk or call us on 0800 085 2005

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	5263.8	5263.8
External area [m ²]	4140.1	4140.1
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	2455.1	2804.58
Average U-value [W/m ² K]	0.59	0.68
Alpha value* [%]	17.59	13.22

* 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
100 B1 Offices and Workshop businesses
B2 to B7 General Industrial and Special Industrial Groups
B8 Storage or Distribution
C1 Hotels
C2 Residential Inst.: Hospitals and Care Homes
C2 Residential Inst.: Residential schools
C2 Residential Inst.: Universities and colleges
C2A Secure Residential Inst.
Residential spaces
D1 Non-residential Inst.: Community/Day Centre
D1 Non-residential Inst.: Libraries, Museums, and Galleries
D1 Non-residential Inst.: Education
D1 Non-residential Inst.: Primary Health Care Building
D1 Non-residential Inst.: Crown and County Courts
D2 General Assembly and Leisure, Night Clubs and Theatres
Others: Passenger terminals
Others: Emergency services
Others: Telephone exchanges
Others: Miscellaneous 24hr activities
Others: Car Parks 24 hrs
Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	1.6	2.84
Cooling	7.17	7.81
Auxiliary	7.71	6.06
Lighting	20.36	16.08
Hot water	2.65	3
Equipment*	35.74	35.74
TOTAL	39.49	35.79

* Energy used by equipment does not count towards the total for calculating emissions.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	3.4	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m ²]	156.81	135.02
Total consumption [kWh/m ²]	39.49	35.79
Total emissions [kg/m ²]	18.6	18.5