

ENERGY COST SAVING REPORT

for McKay Securities PLC



GREYFRIARS

Reading, RG1 1JG

ISSUE LOG



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COMMENT

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Energy cost Saving Report

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1.0 INTRODUCTION



The proposed development is an existing 4—storey office building located at 9 Greyfriars Road in Reading, Berkshire. The office building shall be undergoing a major refurbishment and shall comply with Part L2A of the Building Regulations 2013. This study was carried out using the government-approved software, IES compliance version 7.0.2. Using climatic data, building geometry, layout, occupancy, fabric information and HVAC/renewable energy system usage informs a detailed mathematical simulation. This simulation captures the heat transfer process into and through the building, as well as its thermal capacity. This thermal simulation is known as ApacheSim within the IES software suite.

Although the energy consumption figures have been taken from the design stage simulation model via the government-approved software IES, it should be noted that discrepancies can occur based on the actual periods of operation and occupancy etc. of the development once occupied.

2.0 BUILDING/DESIGN DATA

The following drawings were used to generate the IES model in respect to its geometry.

DRAWINGS

- | | |
|--|--|
| - 5NR-9 Greyfriars Road (PS)(Revised May 2013).dwg | - PP-18-Proposedelevations-Floorplan-ProposedKeyplan.dwg |
| - Elevations clad option.dwg | - PP-20 – Proposed cycle shelter and gate.dwg |
| - PP-01, PP-02 – Location & Site Plans P1.dwg | - Proposed floor layout 140818.dwg |
| - PP-17-Proposedelevations-Elevation-ProposedEastElevation.dwg | - Proposed site plan rev P1.dwg |

The building shall be constructed to adhere to Part L2A 2013 of the building regulations.

3.0 FIXED BUILDING SERVICES



The proposed building services included within the IES model are in accordance with the M&E Outline Specification dated September 2014 and all associated architectural drawings including:

MECHANICAL SERVICES

Offices served by VRV IV

Daikin RYYQ44T, EER: 3.54, SEER: 6.62, COP: 3.98

Outside air via roof mounted AHU (supply/extract): SFP
2.0 W/s Class L1

All ductwork to be leakage tested to class D

Main entrance/circulation/WC/showers to be served by radiators (heating only)

Toilet extract system: Roof mounted fan @ 10ACH. SFP:
0.5 W/s

Domestic hot water via Daikin VRV plant

Storage volume: 500L

Storage losses: 0.00470 kWh/l.day

LIGHTING

Lighting to have provision for metering including warnings for 'out of range' values

4.0 ENERGY SAVING RESULTS



A comparison of natural gas and electricity consumption between the proposed development at 9 Greyfriars Road against good practice and a typical office of the same type can be seen below.

	Gas (kWh/m2.year)	Electricity (kWh/m2.year)
9 Greyfriars Rd	12.77*	66.02*
Good practice UK Office, air-conditioned, prestige	114.00**	234.00**
Typical UK Office, airconditioned, prestige	210.00**	358.00**

* Data taken from IESVE Apache Simulation Model

** Data taken from CIBSE Guide F for "A prestigious air conditioned office"

£ / sq m
per annum



Good Practice
UK Office

Typical
UK Office

£400

£300

£200

£100

£0



£ / sq m
per annum



Good Practice
UK Office

Typical
UK Office

£400

£300

£200

£100

£0



From the table and graph shown above, it is anticipated the proposed office development at 9 Greyfriars Rd shall consume 88% less natural gas compared to good practice and 93% less compared with a typical office of the same type. Additionally the electrical consumption is expected to be 71% less than good practice and 81% less than a typical office of the same type.

5.0 FINANCIAL SAVINGS



A financial cost analysis indicating the potential savings from utility expenses (gas & electricity) has been performed for the development at 9 Greyfriars Rd. Costs have been assessed and compared to that of a typical office and good practice benchmarks of the same building type and size.

Current prices for electricity and gas have been taken from the department of energy and climate change – prices of fuels purchased by non-domestic consumers in the UK for Q1 2015.

Due to the proposed fabric enhancements and efficient fixed building services detailed earlier in this report, it can be seen that the utility costs for the new development are lower than good practice benchmarks and considerably inferior to that of a typical air conditioned office of the same size. The cost benefits for this proposed development can be seen below:

Comparative Energy Costs for 9 Greyfriars Road

Energy Costs	9 Greyfriars Rd	Good Practice UK Office	Typical UK Office
Gas Consumption	55018 kWh*	491055 kWh**	904575 kWh**
Electrical Consumption Regulated	108855 kWh*	1007955 kWh**	1542085 kWh**
Unregulated	175505 kWh*	inc above	inc above
	284360 kWh*	1007955 kWh**	1542085 kWh**
Gas Cost £ per kWh 0.02992	£1,646	£14,692	£27,065
Electric Cost £ per kWh 0.1235	£35,118	£124,482	£190,447
Total Cost	£36,765	£139,175	£217,512
Total Cost per m ²	£8.54	£32.31	£50.50

* Data taken from IESVE Apache Simulation Model – As designed

** Data taken from CIBSE Guide F for “A prestigious office”

5.0 FINANCIAL SAVINGS



£ / sq m
per annum



Good Practice
UK Office

Typical
UK Office

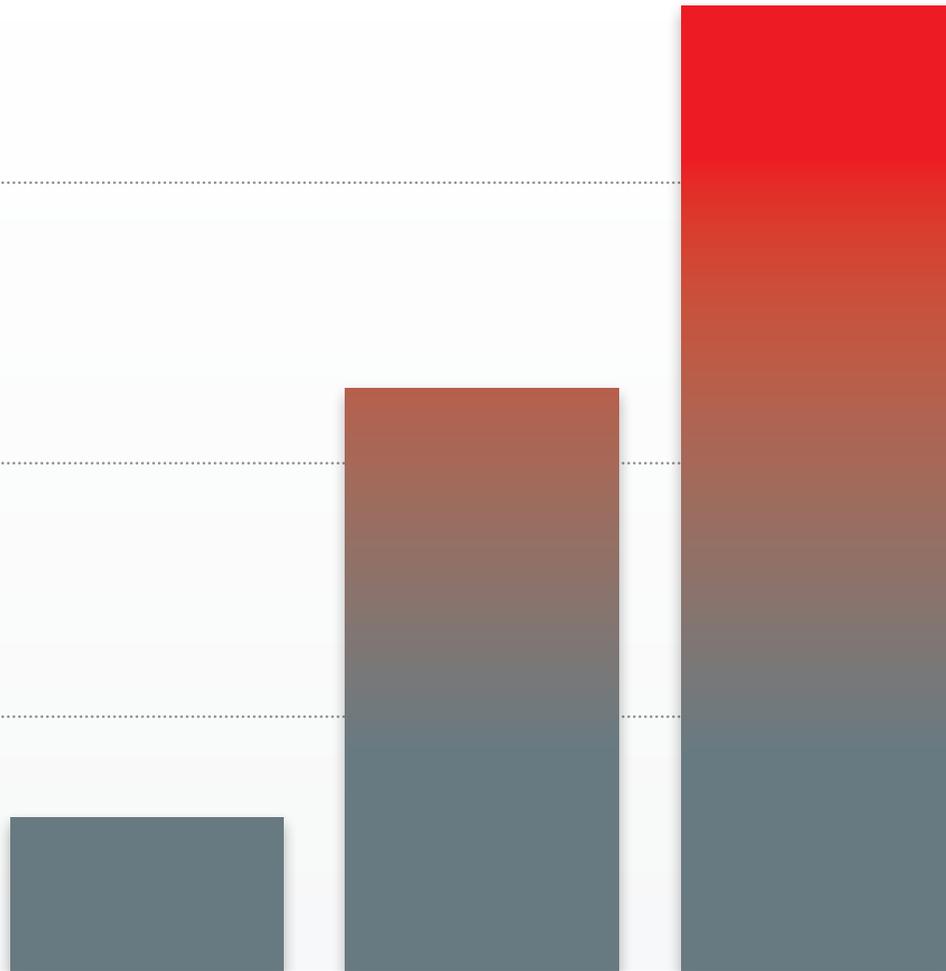
£200,000

£150,000

£100,000

£50,000

£0



Predicted annual energy costs 2015

The graph shown above indicates the likely annual energy costs for 9 Greyfriars Road when compared to good practice benchmarks and a typical office of the same type and size. It is apparent that occupiers will pay significantly less than a typical office development for its energy use. The benchmarks for good/typical practice have been taken from CIBSE Guide F, which contains all the known UK energy available at the time of publication (December 2003).

6.0 CONCLUSIONS



This report has been prepared to outline the energy costs savings for the proposed 4-storey office development at 9 Greyfriars Road compared with a typical office development of the same type and size. It outlines the savings in kWh and pounds per square meter to ensure transparency against comparison data.

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A simulation model was prepared using the government-approved software, IES version 7.0.2 to identify the likely energy consumption of the proposed development. The model uses climatic data, building geometry, layout, occupancy, fabric information and HVAC system usage to calculate energy consumption and carbon emissions.

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A direct comparison has been made between the proposed development at 9 Greyfriars Road with CIBSE Good and Typical benchmarks resulting in a significant reduction of energy consumed by the anticipated office building. Energy consumption data indicates that the proposed scheme at 9 Greyfriars Road shall utilise approximately 7% (gas) and 19% (electric) of a typical office building of the same time and size. The key reasons for this reduction in energy consumption are the enhancements to the fabric of the building; the air tightness/leakage rate of the development and the highly efficient fixed building services (HVAC and lighting) proposed.

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7.0 APPENDIX



As designed Energy Performance Certificate and Energy Consumption from the BRUKL output document.

Energy Performance Certificate

Non-Domestic Building



9-27 Greyfriars Road
Reading
RG1 1JG

Certificate Reference Number:
0000-0040-0030-9000-0803

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

A+

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less Energy efficient

Net zero CO₂ emissions

25

This is how energy efficient the building is.

Technical information

Main heating fuel:	Grid supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m²):	4307.453
Building complexity (NOW level):	5
Building emission rate (kgCO₂/m²):	15.55

Benchmarks

Buildings similar to this one could have ratings as follows:

26 If newly built

69 If typical of the existing stock