# 121 FINCHLEY ROAD THE GYM GROUP SWISS COTTAGE ENERGY STATEMENT







# **Issue History**

DOCUMENT TITLE: Energy Statement
PROJECT TITLE: 121 Finchley Road

PROJECT NUMBER: 1129

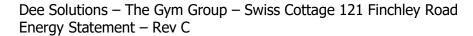
Revision C	Revision Control:						
Revision	Description	Originator	Date	Approved by	Date		
Α	Planning Issue	Andy Dee	04/03/25	Nick Burree	07/03/25		
В	Planning Issue	Andy Dee	27/03/25	Nick Burree	27/03/25		
С	Planning Issue	Andy Dee	01/04/25	Nick Burree	01/04/25		

# Report Prepared by Andy Dee

**Dee Environmental Solutions Ltd** 

Building Services Consulting Engineers
Suite 1.16, Pure Offices
Ferneberga House
Alexandra Road
Farnborough
Hampshire GU14 6DQ

Tel: 01252 757684





# 1.0 Introduction

This Energy Strategy aims to provide evidence of the following, in order to demonstrate compliance of the development with the local planning authority for the fitout gym at the existing unit at 121 Finchley Road.

# 2.0 Proposed Energy Strategy

The Gym Group are committed to reducing our carbon emissions, and we recognise the importance of the Paris Agreement to limit global warming to 1.5°C. Our sustainability strategy acknowledges this and sets out our responsibility to the environment. Our road to net zero Our stated commitment to net zero was accepted by Science Based Targets initiative ('SBTi') and we have now made our full submission; this defines our pathway to net zero in compliance with the latest science based standards and guidelines.

We are committed to achieving our near term target of 50% reduction in Scope 1 and 2 emissions by 2030 and decarbonising these emissions by 2035. In addition, we have committed to a science based target to achieve net zero by 2045.

We are so keen that we are also offsetting our current carbon emissions by investing in high-quality offsetting projects. And these aren't any old projects, they are all carefully selected and certified by internationally recognised bodies. Because of this, we are super proud to have become **the UK's first carbon neutral gym chain**.

The enable us to achieve our carbon emissions reductions we will be installing and upgrading the following services to enable the reduction of energy and carbon emissions.

# Water

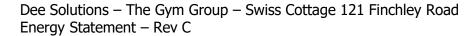
The gym group use ultra low flow rate showers using only 4.5I/min of water by utilising aerated shower heads to make the shower flow rates feel much higher for their customers. The showers are controlled via push bush timed controls to help limit water usage.

WC's cistern are 4/2.6l dual flush units with water recovery systems to collect the condensate water form the air conditioning systems to fill the WC cisterns to help reduce water usage.

All wash hand basins are fitting with flow limiting taps with a flow rate of 3.2 l/min and are push button controlled to limit water usage.

### **Hot Water Generation**

The hot water for the unit is to be generated via an Air Source Heat Pump (ASHP) specifically designed for commercial sanitary hot water application which provides a low





carbon solution. The ASHP utilises the natural and stable refrigerant CO2 (R744), the environmentally clean solution enables compliance. Compounded by the increasing decarbonisation of the electrical grid and the UK's commitment to Net Zero 2050, the QAHV provides a high efficiency, low carbon hot water solution.

The hot water ASHP has a high COP energy efficiency of 388% which enables the hot water for The Gym Group to be provided via a low energy and low carbon solution.



Fig1 - Hot Water ASHP

# Ventilation

The ventilation system to be installed will be a packaged air handling unit with high efficiency heat recovery thermal wheel system which will recovery up to 88% of the extract ventilation energy help minimising energy usage to temper external fresh air. The ventilation system includes carbon dioxide monitoring to help reduce ventilation rates and energy usage during lower occupancy periods.





Fig 2 - Ventilation AHU

# Lighting

New high efficiency LED lighting shall be installed throughout the fitout. All lighting is ultra efficient providing up to 150 Lumens per circuit Watt.

All lighting shall include integral controls to allow dimming controls and occupancy sensing to dim and turn off lighting in areas not in use or of low occupancy.





Fig 3 – LED Lighting

# Heat Pump Heating and Cooling

The building will be installed with a new high efficiency VRF heat pump system to provide the buildings heating and cooling requirements. The systems has a high COP energy efficiency is up to 427% meaning the heating and cooling for the building is provided via a highly efficient low energy and low carbon solution.

Dee Solutions – The Gym Group – Swiss Cottage 121 Finchley Road Energy Statement – Rev C



The heat pump controls include occupancy sensors for set back temperature controls and central monitoring control to ensure all systems are operating efficiency and within set temperature and energy limits to help reduce energy consumption.





Fig 4 – VRF Heat Pump System

# 3.0 Cooling Hierarchy

The Camden Local plan requires a statement demonstrating how the London Plan 'cooling hierarchy' has informed the building design. Dee Solutions have used dynamic thermal software developed by Integrated Environmental Solutions (IES) applied in accordance with CIBSE AM11 "Building Energy and Environmental Modelling". It has been used to analyse and anticipate internal temperatures & plant loads cool the development at Swiss Cottage. A TM52 calculation has also been undertaken for overheating analysis.

The Cooling Hierarchy requirements.

• Minimise internal heat generation through energy efficient design.

The gym group minimise the internal heat generation via the use of high efficiency LED lighting and the installation of Bluetooth Mesh Wireless Network Lighting Control system With Bluetooth mesh sensor for light harvesting and presence detection to allow dimming control.

 Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation & green roof & walls.

Due to this being an existing building we are unable to reduce the heat entering the building via thermal elements but we will include install solar film on the existing glazing to reduce solar gains and help reduce cooling requirements and energy consumption.

# Dee Solutions – The Gym Group – Swiss Cottage 121 Finchley Road Energy Statement – Rev C



Manage the heat within the building through exposed internal mass and high ceilings.

Due to this being an existing development we are not able to alter these thermal mass of the building but the design of the gym is an exposed design to the existing building elements and the use of high ceilings to help reduce cooling requirements and energy consumption.

### Passive Ventilation

This is not applicable due to the existing building not having openable windows for cross ventilation and conflicts with acoustic break out noise issues.

### • Mechanical Ventilation

A full mechanical ventilation system will be installed with an MVHR system with summer bypass to use passive cooling to help reduce cooling loads. This still is not sufficient to cool the building appropriately as shown in the TM52 overheating analysis below.

Overall						
Passed:	0 rooms:					
Failed:	12 rooms:					
Unoccupied:	2 rooms:					
Data:						
Building category:	Category II	II(existing builds.)				
Weather file:	LondonTR'	Y05.fwt				
Days data=	365		31-Dec			
Days (summer)=	153	3 01-May	30-Sep			
Data OK?	OK	Full summer				
Occupancy:						
Note:	This report	assesses occupied per	iods only. Please be aware that TM52 si	nould be conducted for occupied a	nd/or "available hours".	
	Use of edu	cational NCM profiles n	nay be seen as inappropriate due to pro	longed unoccupied periods during	summer months.	
	See Sectio	n 6.1.2 (a) of TM52 for fu	urther information.			
Passed:	0 rooms:					
Room Name	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
Failed:	12 rooms:					
Room Name	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
00 FREE WEIGHTS	1	100	5.5		59	6 1&2&3
00 PLATE LOADED	2					9 1&2&3
00 GYM SPACE	3				91	7 1&2&3
00 CIRC	4				50	5 1&2&3
01 CHANGE	1000000	100	10.4		76	9 1&2&3
01 GYM AREA	1000001	100			03	10 1&2&3
01 CONCESSION	1000002			_		15 1&2&3
01 COMMS	1000003				59	7 1&2&3
01 ENTRANCE	1000004					17 1&2&3
01 STRETCH	1000005				12	11 1&2&3
01 CONSULT	1000006				78	8 1&2&3
01 STAFF	1000007	7 100	10.8	7	76	8 1&2&3
Unoccupied:	2 rooms:					
Room Name	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
00 PLANT	0				0	0 -
n/a		C	0		0	0 1&2&3
Note:	ATM 52 20	13 analysis provides an	assessment of comfort compliance ba	sed on bulk air modelling		
	i.e. each s	pace is considered idea	lised and the air in the space perfectly r	nixed. The assessment does		
	not assess	placement of space fea	atures e.g. windows & openings, airflow	patterns or discomfort issues.		
	The user sl	hould assess these desi	gn aspects outside of the TM52 analysi	S.		

# Dee Solutions – The Gym Group – Swiss Cottage 121 Finchley Road Energy Statement – Rev C



### Active Cooling

Active cooling will be installed to prevent the building overheating a TM52 overheating analysis has been undertaken to show that this will stop the building from overheating please see below which shows it now passes TM52.

### Swiss Cottage TM52 With Mechanical Ventilation & Cooling

Overall

Passed: 12 rooms: Failed: 0 rooms: Unoccupie: 2 rooms:

Data:

Building cat Category III(existing builds.)

Weather file LondonTRY05.fwt

 Days data=
 365
 01-Jan
 31-Dec

 Days (sumr
 153
 01-May
 30-Sep

Data OK? OK Full summer

Occupancy:

Note: This report assesses occupied periods only. Please be aware that TM52 should be conducted for occupied and/or "available hours".

Use of educational NCM profiles may be seen as inappropriate due to prolonged unoccupied periods during summer months.

See Section 6.1.2 (a) of TM52 for further information.

Passed: 1	l2 rooms:								
Room Nam R	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)		Criteria 2 (Max. Daily Deg.Hrs)		Criteria 3 (Max. DeltaT)		Criteria failing
00 FREE WE	1	100		0		0		0	-
00 PLATE LO	2	100		0		0		0	-
00 GYM SP/	3	100		0		0		0	-
00 CIRC	4	100		0		0		0	-
01 CHANGI	1000000	100		0		0		0	-
01 GYM ARI	1000001	100		0		0		0	-
01 CONCES	1000002	100		0		0		0	-
01 COMMS	1000003	100		0		0		0	-
01 ENTRAN	1000004	100		0		0		0	-
01 STRETCI	1000005	100		0		0		0	-
01 CONSUI	1000006	100		0		0		0	-
01 STAFF	1000007	100		0		0		0	-
Failed: 0	rooms:								
Room Nam R	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)		Criteria 2 (Max. Daily Deg.Hrs)		Criteria 3 (Max. DeltaT)		Criteria failing
Unoccupie: 2	2 rooms:								
Room Nam R	Room ID	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)		Criteria 2 (Max. Daily Deg.Hrs)		Criteria 3 (Max. DeltaT)		Criteria failing
00 PLANT	0	0		0		0		0	-
n/a		0		0		0		0	1&2&3

Note: A TM 52 2013 analysis provides an assessment of comfort compliance based on bulk air modelling

i.e. each space is considered idealised and the air in the space perfectly mixed. The assessment does not assess placement of space features e.g. windows & openings, airflow patterns or discomfort issues.

The user should assess these design aspects outside of the TM52 analysis.



 Cooling loads have been calculated via the IES thermal model which has been used to size the Fan Coil Units please see table below to ensure the systems are not oversized and to ensure maximum energy efficiency.

Location	IES Heat Gain kW
00 FREE WEIGHTS	24.901
00 PLATE LOADED	7.759
00 GYM SPACE	8.564
00 CIRC	1.696
01 CHANGE	14.772
01 GYM AREA	47.749
01 CONCESSION	4.336
01 COMMS	1.226
01 ENTRANCE	4.458
01 STRETCH	7.097
01 CONSULT	0.627
01 STAFF	1.451

The building will be cooled via a high efficient VRF heat pump data sheet below.
 Refrigerant used is R32.

System seasonal efficiency cooling is 7.04

Air Conditioning Product Information

**PUZ-M200/250YKA R32** High Capacity Outdoor Units Standard Inverter Heat Pump





PUZ-M200/250YKA OUTDOOR UNITS		PUZ-M200YKA	PUZ-M250YKA
Capacity (kW)	Heating (nominal)	22.4	27.0
	Cooling (nominal)	19.0	22.0
SCOP (nsh) / SEER (nsc) (BS EN14825)*1		4.20 (165%) / 7.01 (277.3%)	4.18 (164.3%) / 7.04 (278.6%)
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	60 / 58	62 / 59
WEIGHT (kg)		129	138
DIMENSIONS (mm)	Width x Depth x Height	1050 x 330+40 x 1338	1050 x 330+40 x 1338
PIPE SIZE mm (in)	Gas	28.58 (1 1/8")	28.58 (1 1/8")
	Liquid	9.52 (3/8")	12.7 (1/2°)
ELECTRICAL SUPPLY		380-415v, 50Hz	380-415v, 50Hz
PHASE		Three	Three
SYSTEM POWER INPUT (kW)	Heating/Cooling (nominal)	5.93 / 5.21	7.78 / 6.84
	Heating/Cooling (UK)	5.34 / 4.32	7.00 / 5.67
STARTING CURRENT (A)		5	5
SYSTEM RUNNING CURRENT (A)	Heating/Cooling [MAX]	10.08 / 9.62 [22.5]	12.18 / 11.22 [22.5]
FUSE RATING (BS88) - HRC (A)		25	25
MAINS CABLE No. CORES		5	5
MAX PIPE LENGTH (m)		70	70
MAX HEIGHT DIFFERENCE (m)		30	30
CHARGE REFRIGERANT (kg) / CO <sub>2</sub> EQUIVALENT (t) R32 (GWP 675) - 30m		5.6 / 3.78	6.8 / 4.59
MAX ADDITIONAL REFRIGERANT (kg) / CO <sub>2</sub> EQUIVALENT (t) R32 (GWP 675)		1.6 / 1.08	2.4 / 1.62

\*1 PUZ-M200YKA connected to 2 x PLA-M100EA, PUZ-M250YKA connected to 2 x PLA-M125EA



The hot Water will be produced via a refrigerant heat pump data sheet below. Refrigerant used is R744 System seasonal efficiency cooling is 3.44

Commercial Heating

**Product Information** 

**QAHV** Monobloc Air Source Heat Pump





OUTDOOR UNIT		QAHV-N560YA-HPB
WATER HEATING 65°C*1	CAPACITY (kW)	40
	POWER INPUT (kW)	10.31
	CURRENT INPUT (A)	16.3
	COP	3.88
WATER HEATING 65°C*2	CAPACITY (kW)	40
	POWER INPUT (kW)	10.97
	CURRENT INPUT (A)	18.3
	COP	3.65
WATER HEATING 65°C'3	CAPACITY (kW)	40
	POWER INPUT (kW)	11.6
	CURRENT INPUT (A)	18.7
	COP	3.44
WATER HEATING ENERGY EFFICIENCY CLASS	FOR MEDIUM TEMPERATURE APPLICATION	A
TEMPERATURE RANGE	INLET WATER TEMPERATURE (°C)	5 ~ 63
	OUTLET WATER TEMPERATURE (°C)	55 ~ 90
	OUTDOOR TEMPERATURE (°C')	-25~43
ELECTRICAL	MAX CURRENT INPUT (A)	33.8
	ELECTRICAL SUPPLY (V / Hz)	380-415v, 50Hz
	PHASE	3
	FUSE RATING - MCB SIZES (A)*5	40
WATER DETAIL	INLET / OUTLET (mm (in.))	19.05 (Rc 3/4"), screw pipe / 19.05 (Rc 3/4"), screw pipe
	ALLOWABLE EXTERNAL PUMP HEAD (kPa)	77
DIMENSIONS (mm)	WIDTH	1220
	DEPTH	760
	HEIGHT	1837 (1777 without legs)
WEIGHT (kg)		400
NOISE LEVEL	SOUND PRESSURE*4 (dB(A))	56
REFRIGERANT	TYPE	R744 (GWP 1)
	REFRIGERANT CHARGE (kg) / CO2 EQUIVALENT (t)	6.5 / 0.0065

# R744 Maintenance & Safety

The Mitsubishi QHAV R744 is a sealed system with the unit installed within the Mitsubishi factory pressure tested to 1.5 working pressure.

This unit is located in a permanently ventilation plantroom to outside to ensure any leak of refrigerant is not within a sealed space.

The system is monitored via the Mitsubishi controls and is linked to a central monitoring system by The Gym group to ensure the system is working correctly without faults. If any faults are detected The Gym Groups maintenance teams will respond to the fault within 24 hours.

The unit is maintained yearly and the refrigerant system will be pressure and integrity checked every 12 months as well as being monitored 24/7 via the controls system.

<sup>&</sup>quot;1 Under Normal heating conditions at the outdoor temp, 16°CDB/12°CWB, the outlet water temperature 65°C, and the inlet water temperature 17°C. air Normal heating conditions at the outdoor temp, 7°CDB/6°CWB, the outlet water temperature 65°C, and the inlet water temperature 9°C. are thought of the outlet water temperature 65°C, and the inlet water temperature 9°C. are Normal heating conditions at the outdoor temp, 7°CDB/6°CWB, the outlet water temperature 65°C, and the intervaler temperature 15°C, sured 1m from the front of the unit in an anechoic room. \*5 MCB Sizes BS EN80898-2 & BS EN80947-2



# 4.0 Conclusions

Overall The Gym Group are fully committed to reducing their energy usage and carbon emissions. The building will be fully electrical and all the electricity for the building will be provided from renewable energy sources.

The new fitout for the building will use low carbon and low energy technologies throughout and will use the latest and most efficient technologies and controls to ensure the buildings energy and carbon is as low as possible for the buildings type and usage.

As the cooling hierarchy shows the introduction of a cooling system is required to stop the development from overheating this is due to high internal gains from exercise. This has been calculated via calculations produced via an IES thermal model of the site and the internal gains have been reduction as far as practically feasible and only the minimum cooling shall be installed to achieve the TM52 requirements.