MLM

Addendum Energy Statement

for

317 Finchley Road, Camden
London

produced for

317 Finchley Road Limited

www.mlm.uk.com

MLM Consulting Engineers Ltd
3rd Floor Eldon House, 2 Eldon Street, London, EC2M 7LS
Main Tel: 020 7422 7800

Project Revision Sheet

Revision No:	Date	Status	Changes	Author	Approved
00	19.08.2016	Addendum to Energy Statement Ref GC/7133428/CKN Revision 07 dated 18.08.2016	N/A	C Knabe-Nicol	G Harden

Document Ref: GH/7133428/CKN
Revision: 00
Date: 19 August 2016

Prepared: Cyril Knabe-Nicol
Principal Building Energy Consultant

Contact Details: Tel: 0207 422 7800
Email: Cyril.knabe-nicol@mlm.uk.com

Checked: Grant Harden
Associate

Contents

		Page
1	Introduction	3
2	Combined Heat and Power Unit	4
Heat Distributor		4
Control panel		5
Thermal Storage Vessel		5
Cost Savings		6
CHP Contribution to Electrical Needs of User Centre		6
CHP Contribution to Heat Needs of User Centre		7
3	Conclusion	8

Appendices

Appendix A
Plant Room Schematic

1 Introduction

MLM were commissioned to undertake an addendum Energy Statement to accompany the planning application for the re-development of the site at 317 Finchley Road, Camden, London.

The development consists of the demolition of existing buildings and erection of 22 new build residential units and one commercial unit, associated landscaping and ancillary works.

The proposed development is located in the London Borough of Camden. The Greater London Authority and London Borough of Camden are the Regional and Local Bodies that set the Planning Policy Context, referencing to National Standards and Regulations.

The proposed development is required by the London Borough of Camden and the Greater London Authority to make carbon emission reductions in accordance with the London Plan's Energy Hierarchy and meet a 35% carbon emissions reduction over the current Building Regulations Part L2013 minimum requirements. The London Borough of Camden requires the development to achieve 20% carbon reduction by renewable energy on-site where feasible.

The aim of this report is to assess the feasibility of the Combined Heat and Power (CHP) system.

2 Combined Heat and Power Unit

The proposed development will include the installation of a fully modulating combined heat and power (CHP) system. Natural gas fired CHP plant shall generate heat for heating and domestic hot water and electricity for use within the development. CHP will be integrated into central LTHW heating system and shall operate in preference to the boilers. CHP shall operate in parallel to the grid and feed generated electricity into building LV network.

The CHP unit shall operate to supply combined heat and power for the development, as predicted in the initial energy assessment. The CHP supplier shall provide a project-specific Carbon Reduction Assessment, to quantify the savings to be expected from the CHP installation in terms of CO_2 emissions as per the energy strategy provided for the planning application and financial cost.

The performance requirement is based on a 6kW electric CHP. The CHP specification shall be as follows:

CHP Unit	**CHP Unit to be selected at Detailed Design**
Energy Efficiency Label	A+++
Seasonal space heating energy efficiency of CHP package with Flow Master	180%
Power Output (automatically modulating)	3 – 6 kWe
Electrical Efficiency	31%
Thermal Output	8.2 – 12.2 kWth
Thermal Efficiency	63%
Total Efficiency	94%
Fuel	Natural gas
Fuel Consumption (natural gas)	1.2 – 1.9 m^3/h
Fuel Supply Pressure	10 – 50 mbar
Noise Level at 1 m	49 dB(A)
NOx Emission	< 319 mg/Nm^3
Flow Temperature (to LTHW system)	constant 80°C
Return Temperature (from LTHW system)	variable, shall be as low as possible
Generator	4 pole asynchronous
Output - voltage	400V, 3 phase
Output - current	12A
Service Interval	min. 10,000 hours

Heat Distributor

The Heat Distributor shall produce a constant flow temperature, irrespective of site return water temperature. The constant flow temperature out of the CHP Heat Distributor shall match the LTHW system flow temperature and therefore it shall be controllable in the range of up to 80°C.

Control Panel

The CHP will be supplied with a Control Panel, which shall provide automatic control of the CHP system and interface to the electrical supply. The CHP shall automatically and instantaneously modulate its electrical output to match building electrical demand. The scope of modulation shall be from 100% to 50% of the CHP electrical output. A fully automatically modulating output shall be provided, rather than a static or stepped output. The CHP shall “learn” the building load patterns and the control system will then automatically adjust the CHP operation to maximise its efficiency and performance based on the actual building load profiles.

In order to optimize CHP operation and to achieve automatic modulation, CHP electrical connection shall be made on the mains incoming supply. After the CHP electricity feed in connection a set of current transformers (CTs) for a reference meter shall be installed.

Thermal Storage Vessel

In order to ensure maximum utilisation of the available CHP capacity, a thermal store will be provided within the CHP package so that heat can be generated and stored during periods of high electricity demand and low heating demand. The temperature of the thermal store contents will be controllable by a fully automatic multi-sensor system. To prevent unwanted mixing of flow and return water inside the thermal store, single pipe connections will be used at the top and bottom of the vessel. The capacity and type of vessel will be selected in-line with the CHP manufacturer’s guidance to ensure the correct operation and optimised efficiency of the system. The specifically designed and connected storage vessel will maintain a separation layer between the cold return water and the hot flow water.

Cost Savings

Comparisons are shown between the operational costs of a conventional system (mains supply/gas boiler) and a CHP unit (3 – 6 kWe).

The annual electricity consumption has been assumed at 10,000 kWh

Energy cost have been assumed to be as follow:

Electricity price (without CCL) 13.19 p/kWh

Annual gas consumption 112,941 kWh

Gas price (without CCL) 3.48 p/kWh

Electricity export price 5p/kWh

10,000 kWh x 0.1319 £/kWh = £1,319

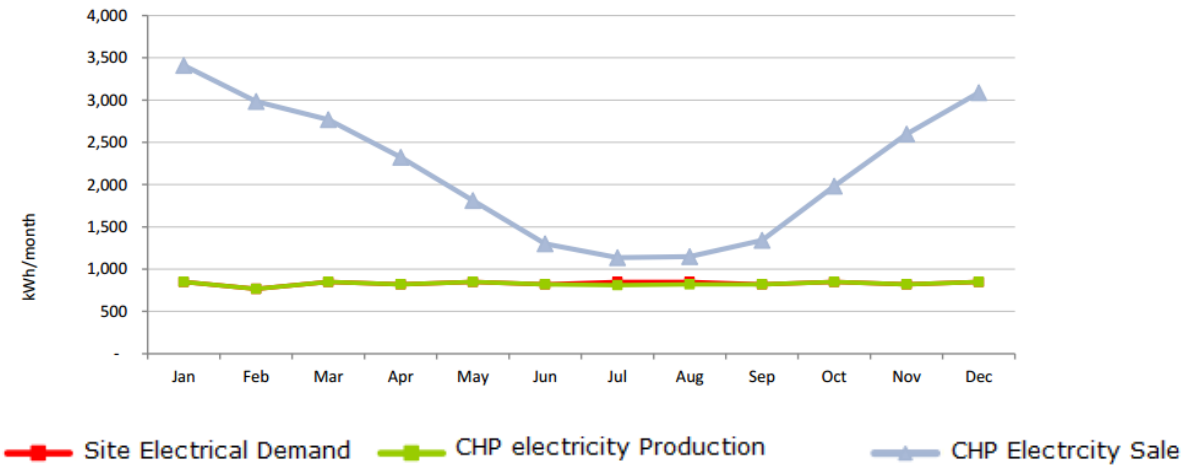
112,941 kWh x 0.0348 £/kWh = £3,930

	Gas Boiler	CHP
Electricity	£1,319.00	£9.00
Gas (boiler)	£3,930.00	£608.00
Gas (CHP)	0	£4,831.00
Electricity Export	0	-£1,295.00
Total	£5,249.00	£4,154.00

The use of CHP unit (3 – 6 kWe).would result in annual savings of £5,249 - £4,154 = £1,096 pa relative to a conventional mains supply/boiler system.

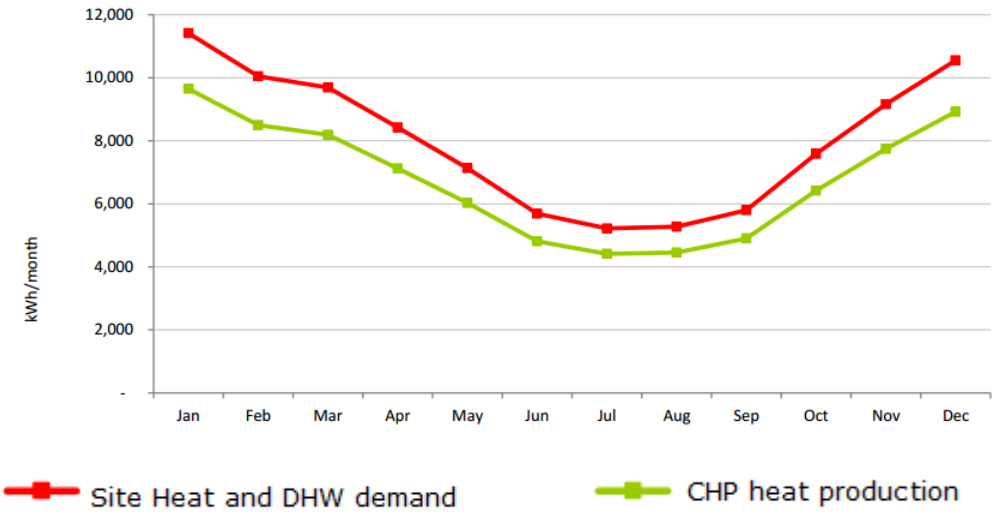
CHP Contribution to Electrical Needs of User Centre

Typical seasonal variations in electricity consumption have been assumed, in producing an approximate consumption pattern for the User Centre.



CHP Contribution to Heat Needs of User Centre

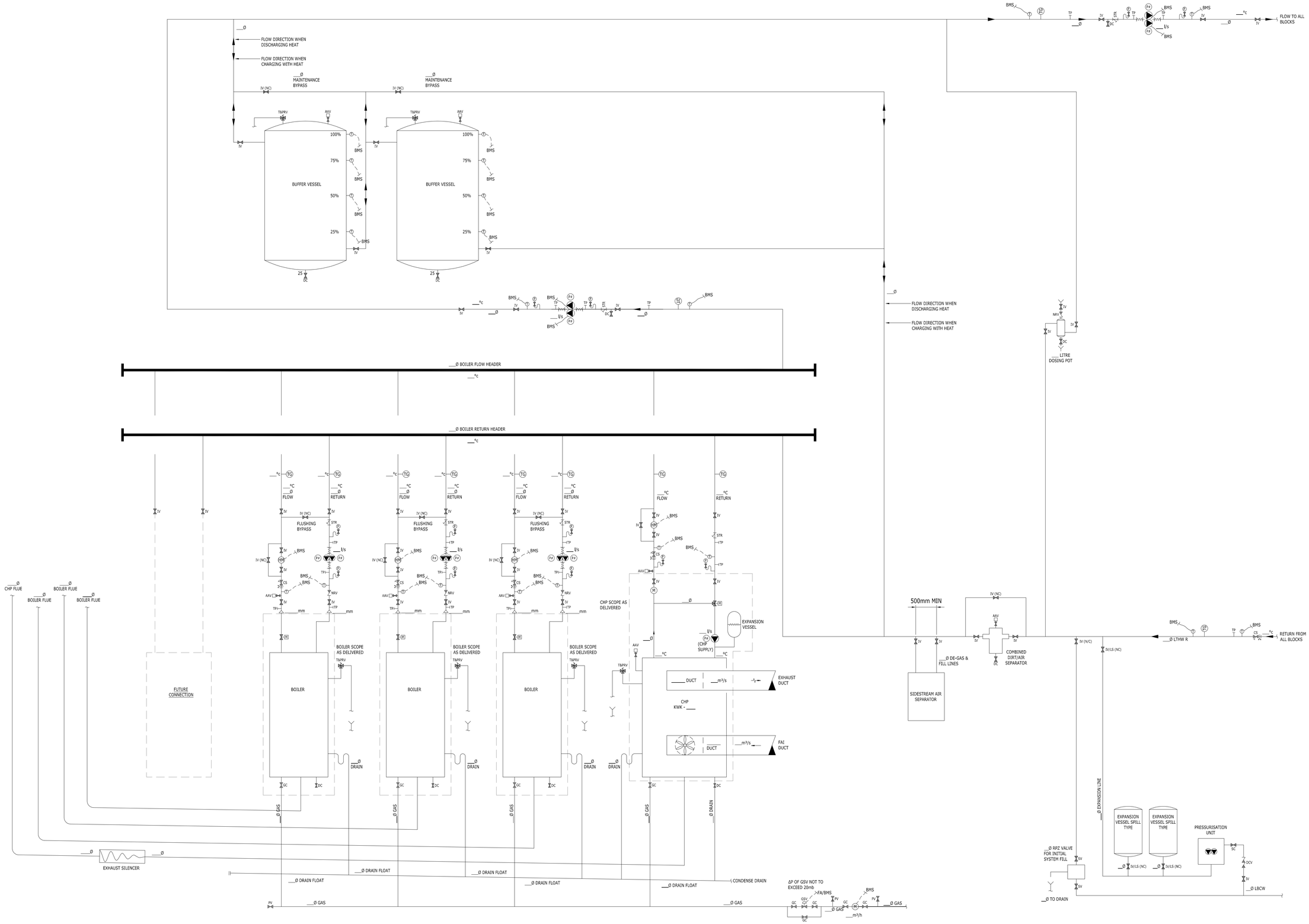
Typical seasonal variations in heat requirements have been assumed, in producing an approximate consumption pattern for the User Centre. The CHP units can maintain a similar profile for heat production, as shown below



3 Conclusion

Based on the analysis contained within this report the use of on-site CHP unit has been identified as the most suitable option to provide space heating and domestic hot water to the proposed development at 317 Finchley Road.

Appendix A – Plant Room Schematic



CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015

DESIGNERS HAZARD INFORMATION FOR CONSTRUCTION

1. IF YOU DO NOT FULLY UNDERSTAND THE RISKS INVOLVED DURING THE CONSTRUCTION OF THE ITEMS INDICATED ON THIS DRAWING ASK YOUR MANAGER, HEALTH & SAFETY ADVISOR OR A MEMBER OF THE DESIGN TEAM BEFORE PROCEEDING.

THE ABOVE NOTES REFER SPECIFICALLY TO THE INFORMATION SHOWN ON THIS DRAWING. REFER TO THE HEALTH AND SAFETY PLAN FOR FURTHER INFORMATION.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.
2. DO NOT SCALE FROM THIS DRAWING MANUALLY OR ELECTRONICALLY. WRITTEN PERMISSION MUST BE OBTAINED FROM MLM PRIOR TO SCALING ELECTRONICALLY OR USING THIS ELECTRONIC FILE.

LEGEND

PV	PURGE VALVE
GSV	GAS SHUT OFF VALVE
GC	GAS COCK
IV	ISOLATION VALVE
IV (NC)	FLUSHING VALVE (NORMALLY CLOSED)
	TEMPERATURE GAUGE
HM	HEAT METER
TS	TEMPERATURE SENSOR
	PRESSURE GAUGE
	GAS REDUCER
IV (NC)	ISOLATION VALVE (NORMALLY CLOSED)
M	METER
T&PRV	TEMPERATURE & PRESSURE REGULATING VALVE
AAV	AIR ADMITTANCE VALVE
NRV	NONE RETURN VALVE
DC	DRAIN COCK
STR	STRAINER
TP	TEST POINT
	PUMP
	2 PUMPS
	FLEX EXPANSION BELLOW
CS	COMMISSIONING SET

Rev	Date	Description	Made	Checked
A	03.05.2016	FOR PLANNING	DH/GC	GC/GH

Drawing Status: STAGE 2

MLM
Multidisciplinary Consulting
3rd Floor Eldon House, 2 Eldon Street, London EC2M 7LS
Tel: 020 7422 7800 Fax: 020 7426 2095
Website: www.mlm.uk.com

Client: 317 FINCHLEY ROAD LTD

Project: 317 FINCHLEY ROAD

Drawing Title: ENERGY CENTRE HEATING SCHEMATIC

Drawn/Design	AS/GC	Date	17.03.2016	Scales	N.T.S. @ A0
Checked	GC	Approved	GH		NTS @ A3

Drawing No.: 714618/M0701 Rev: A