Ferdinand Place
Response to Camden's Planning Comments
26 August 2016

Camden Planning Offices Comments in RED

PDA Answer in BLACK.

Energy

Carbon offset required £7,965

Camden policies require developments with more than one occupier to install communal heating systems. A well designed communal heating system can be more efficient and will give the development the opportunity to provide low carbon heating in the future. The distribution losses can be minimized as long as the system is designed properly. If a communal heating system is completely not possible, evidence would be required. Applicant will also be required to provide contributions to the development of decentralized energy networks in the borough. This is calculated as follows: 2,535sq.m/300sq.m x £2,800 = £23,660

Actions for applicant:

1. **Clarify why building regulations compliance report indicates some units are failing in regards to building fabric energy efficiency performance**.

The Block Compliance is used to achieve a uniform U values across the building. The block compliance method compares the average dwelling fabric efficiency with average target fabric energy efficiency to show building regulation compliance. (See the Block Compliance Reports attached). This enable walls to have uniform U value but some individual dwelling may not achieve individual fabric energy efficiency compliance. This is acceptable within the building regulations.

2. **Applicant should clarify the tilt of the solar panels. Solar PV details to be secured through condition (see suggested conditions towards end of this email).**

It is proposed to use a low angle (10° to 30°) PV racking (see Figure 1 &2). This is a system is design for use on flat roofs and has the following advantages:

- Low angle reduce the wind resistance, reducing the vulnerability of the PV array in strong winds.
- The low angle allows higher density of panels within the array as it reduce shading from the neighbouring panels.
- The higher the density of the panels the greater amount of electricity generated.
- Diffuse light PV panels are preferred as This type of panel general generates higher levels of electricity across the year, and is optimised for overcast skies and low light angles.
- The clip together system reduces the need for ballast and therefore the weight on the roof
- Blue Roof requires the rainwater to percolate through the panels.

- The panels reduce the maintenance of the blue roof by limiting the available area for wind-borne seed to take root..
- The PV racks do not penetration of the roof membrane.

	Energy	Emissions
Regulated	233,242 kWh	56,616 kgCO2
Un regulated	56,663 kWh	29,408 kgCO2
Building Regulation 2013	233,242 kWh	56,616 kgCO2
Renewables	21,817 kWh	-11,323 kgCO2
Regulated reduction	9.35%	-20.00%

Table 10 20% Onsite regulated Renewable Energy Calculation

PV Variables	
Location	Thames
Direction	South
Panel Angle	10°
Shading Factor	None or very little
Array Sizes	25.2 kW
Annual electricity	21,817 kWh
Size of array	252 m²

Table 11 PV Array Estimation

	Jan	Feb	Mar	Apr	May	Jun
Electricity From PV Array	548 kWh	880 kWh	1,612 kWh	2,395 kWh	3,007 kWh	3,213 kWh
Cumulative	548 kWh	1,428 kWh	3,040 kWh	5,435 kWh	8,441 kWh	11,654 kWh
	Jul	Aug	Sep	Oct	Nov	Dec
Electricity From PV Array	3,116 kWh	2,698 kWh	1,983 kWh	1,241 kWh	679 kWh	445 kWh
Cumulative	14,770 kWh	17,468 kWh	19,451 kWh	20,692 kWh	21,372 kWh	21,817 kWh

Table 12 Predication of the Average Monthly Energy from the PV Array.

Figure 1 Extract from Energy Report

Figure 2 Example of the proposed Low angle PV array.

3. **In line with policy requirements, applicant should consider communal heating system for development and where relevant update energy and sustainability statements. Applicant will also be required to future proof development to enable connection to a future DEN should one become available. Applicant should provide details of future proofing (refer to CPG 3 for guidance)**

The energy report using the London Heat Map has identified that there are no proposals for district heating schemes in the vicinity of the Ferdinand Place. The development is too small for the economic use of the combined heat power, or the use of centralised communal boiler heating system. The GLA London Plan, Energy Planning document (March 2016), recommends that CHP is consider for site with over 500 residential units or in mixed uses developments with simultaneous heat and power demand in excess of 5000 hours per annum. This is not the case for the proposed development. The energy proposal is for individual domestic condensing boiler in each dwelling.

The energy report considered communal heating systems (see Figures 3&4), but discounted the use communal heating system without CHP for the following reasons:

- The SAP energy model suggest that communal will be 10% less efficient that than proposed system due to thermal pipework losses, and addition pumping energy.
- Communal heating systems are operate 24/7 and to ensure a continual supply of heat and or hot water. This results in wasting heat and pumping energy.
- Small communal heating systems are more expensive to operate and maintain the standard domestic boilers, as the heating system requires commercial registered engineers who general maintain large boiler house and tend to charge premium for small communal heating system. This general results in reduced maintenance of the boiler ancillary equipment, and loss the overall system efficiency from poor control.
- The advantage of communal heating system increase with number of dwelling connected. Unfortunately linking both sites together was considered prohibitively expensive and will affect the project viability.
- Modern ‘A’ energy rated domestic condensing an improved efficiency compared to boiler sold ten years previously. This is result of new modulating burner control matching heat to the boiler output. This is main reason why individual boilers outperform communal heating systems in developments of less than 50 units.

Heating Systems

The SAP 2012 energy modelling software has shown that the most energy efficient solution is the use of high efficiency "A" rated gas condensing combination boilers with enhanced heating controls. Since the introduction of the energy rating of boilers, there has been massive improvement in the quality and efficiency of domestic boilers, especially in heating mode. Modern combination boilers use premix burner technology design to modulate the flame/heat output reducing the energy lost to the flue. There are many A rated combination boilers with efficiency above 90%, which results in lower energy bills. Combination boilers are extremely reliable and low cost to repair and replace when compared with larger communal boilers.

It has been shown through energy monitoring that combination boilers are generally more efficient than central larger communal boilers for developments with less than fifty dwellings, such as this development.

Figure 3 Extract from Energy Report

Communal Boiler Plant with Small CHP.

The design explored the use of single plant room with Combined heat power for both sites. This was not considered practical solution mainly due to the substantial increased capital cost of providing CHP.

- Increased cost for excavating a basement plant room (under site B) and thermal connection between the two sites.
- A negative increase risk of local poor air quality (CHP machines have high level of NO_x in the flue gasses).
- Additional for mechanical plant room ventilation and for the location
- Addidtional costs for constructing and locating boiler and CHP flues out of site and in clean air.

Figure 4 Extract from Energy Report.

Camden requires that in unlikely event of future district heating scheme that the development proposal include suitable space allowance for future connection. A future district heating connection requires space for pump set and plate heat exchanger, interface between the building and the district heating scheme. The size the developments only requires a small heat exchanger (250kW) which can be wall mounted, therefore requires very small amount of floor space.

The space allowance allocated for future connection of district energy network:

- Site A: space for wall mounted plate exchanger and pump set in ground floor vehicle loading area.
- Site B: Space for wall mounted plate heat exchanger and pump set in the basement.
- Boilers are replaced with Heat interface units in each apartment.
- Space for new heating flow and return pipework in communal stair well following the route of the now redundant gas pipes.

This is system used in Denmark and Holland to connect existing into new district heating schemes.

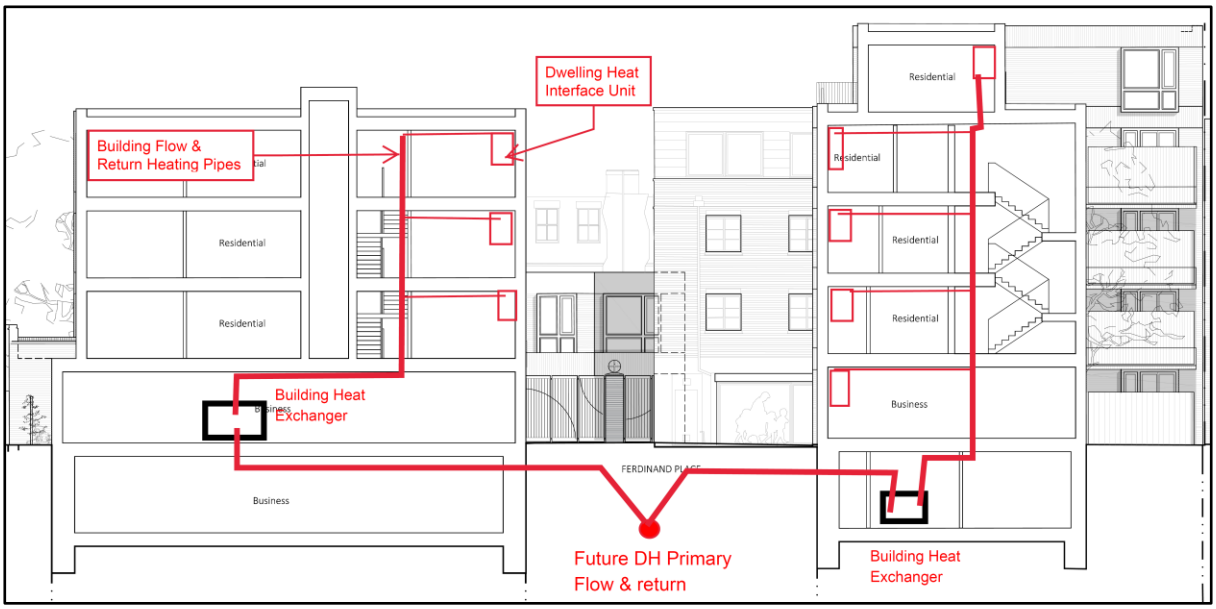

Figure 5 Method for Future Connection into a District Heating System

4. DEN contributions (£23,660) and Carbon Offset contributions (£7,965) to be secured through S106.

Noted applicants action.