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Ref: AT/CSH/18F

Andy Paps,
Papa Architects Ltd
SENT VIA EMAIL

17th February 2015

Dear Andy,

Sustainable Design & Construction Statement – Planning Addendum Letter – 18-20 Frognal

With regards to the email from Alex McDougall, Senior Planning Officer for the London Borough of Camden on the 10th February 2015, please find below a series of clarifications based on the issues raised regarding the Sustainable Design and Construction Statement for 18-20 Frognal.

Issue – "27 PV panels are proposed (8.8 kWp) to be mounted on the pitched roof, however a roof plan has not been submitted showing the layout and the elevations do not show the proposed PV location. The panels will probably take up somewhere around 50-70m2 of roof space and should ideally be faced south. The building has a complicated roof arrangement and there is concern that PV would not be a suitable technology for this development given the space restrictions. Please provide a roof plan with PV layout so this can be more clearly assessed."

NRG Reply - A drawing showing how 27 PV Panels fit onto the Roof is included in Appendix 5 of the submitted Energy Statement.

Issue – "ASHPs should be given further consideration for feasibility to provide heating."

NRG Reply - The use of Air Source Heat Pumps was considered extensively for the project. However, due to the units being flats with no space for outside plant, this would necessitate the use of a specific type of heat pumps, Exhaust Air Heat Pumps.

This type of Heat Pump differs to that of a normal split system in that:

- All the equipment is in one internal unit.
- A Mechanical Extract System is integrated into the unit for the purpose of getting fresh air into the unit.

A sample datasheet of such a system is attached to this letter as an Appendix.

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From this, the following feasibility issues appear:

- Due to the required MEV system, external penetrations will be required and will alter the external appearance of the building and may detract from the character and visual amenity. Furthermore, designing this into an existing building is very difficult.

- The size of the unit is prohibitive being approx. 600 x 600 x 2100mm which reduces cupboard space for the tenants in the Airing Cupboard.

- The weight of the unit (205kg when empty) also causes long term replacement issues given that it will be incredibly difficult to remove and replace. The units also have a 15 year warranty so will require replacing more than once in the lifetime of the development.

- These systems work best, due to the drawing of internal heat, in highly insulated properties. All manufacturer efficiencies given the Air Temperature at 20 degrees Celsius. In reality, due to the nature of the project, these dwellings will be insulated less than comparative new build dwellings due to the issues of the existing building therefore, in Winter, the temperature will be much lower and therefore the system will have a lower COP than stated.

- Even using the manufacturer efficiency of 274% based on an Air Temperature of 20 degrees Celsius and a Hot Water Temperature of 55 degrees Celsius, an Immersion Heater will still be required to heat the water to 60 degrees Celsius. This will further increase the cost of the units.

- Comparing EAHPs to Gas Boilers, the following costs apply:

	Gas	EAHP
Carbon Factor	0.216	0.519
Cost per Unit (From Energy Saving Trust)	4.29p	14.05p

Therefore, with the efficiencies of the systems (274% of EAHP versus 90% for Gas) the figures for both CO2 savings and cost savings are negligible with the Gas System having lower running costs and the ASHP slightly less CO2 emissions.

The negative benefits of this system, albeit combined with other factors such as poor education and potential mis-sizing has seen significant issues with the reality of the system. This BBC News article offers an example among many- http://www.bbc.co.uk/news/business-19511637

Therefore, for these reasons, EAHP's were, and still are, considered non-suitable to this development.

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Issue – "Camden Policy requires a 20% reduction through renewable technologies (after fabric upgrades) wherever feasible and the energy statement needs to include a calculation to demonstrate how far this target has been achieved."

NRG Reply - The maximum amount of PV Panels able to fit on the roof (as per the Drawing in Appendix 5) is 27 Panels which generate 327 watts each. This leads to 8.829 kWp, which will offset 4 tonnes/CO_2/year.

The total emissions following fabric upgrades is 27.3 tonnes/CO_2/year.

Therefore, this leads to a reduction in carbon emissions, after passive measures, through PV of 14.7%. Unfortunately this is lower than the 20% reduction required by Camden Council, but due to the nature of the development (a refurbishment), the fact that the roof has been fully optimized with regards for its PV potential, and as previously discussed other renewable technologies are infeasible, this is considered to be the maximum feasible reduction through renewable technologies.

I trust that this is satisfactory to your requirements but if we can be of any further assistance, please do not hesitate to contact us.

Yours sincerely,

Alex Timperley
For NRG Consulting