515208.000-THE HALL SCHOOL HAMSTEAD
PV TECHNICAL NOTE
JUNE 2019

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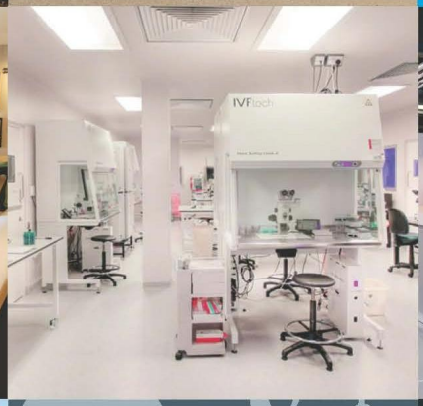
BRUNSWICK

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DOCUMENT CONTROL

Issue	Description	Date	Prepared By	Signed Off
0	Technical Notes	07-Jun-2019	KA	NK

1 PV TECHNICAL NOTE

Elementa were requested to undertake a review of the PV panels, Elementa's original energy report (2016) showed a requirement of 20,104 kWh which equated to 155m2, due to the construction of the roof and further review of the orientation, health and safety and practical installation of PV panels on the roof, Elementa updated the energy report in 2019 and revised the PV panels on the roof to a more practical solution to maximise efficiency of the panels, while minimising health and safety risks, this resulted in a reduced output of 16,826kWh which equated to 166.5 m2 of pv panels producing 30.89% reduction against part L2A with an approximate cash contribution requirement of £4,190, as per our latest energy report.

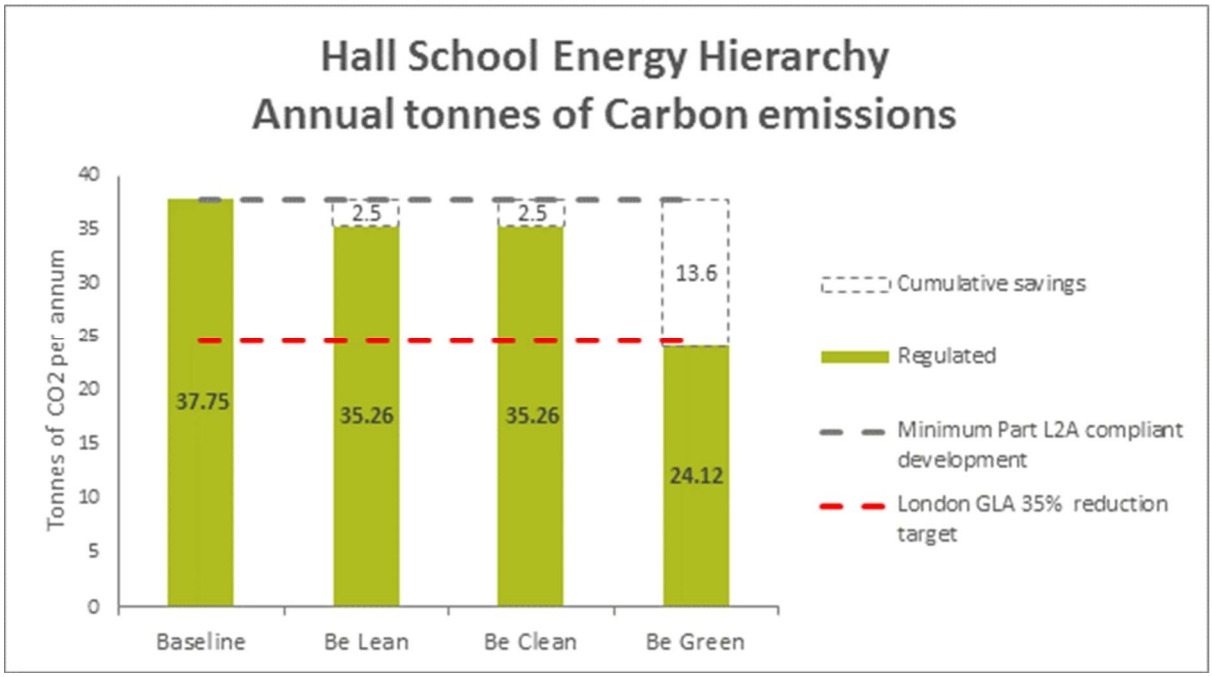
Following comments made by Camden's Sustainability Officer, we have reviewed the PV array for Hall School and made some amendments.

A PV system (with an assumed nominal efficiency of 18%) will be used to maximise the carbon emission savings against building regulations minimum requirements. Through detailed calculation we estimate that revised output of 20610 kWh will be generated by the PV array. The proposed PV array has a total area of 167 m2 across both the pitched roofs orientated to the East and West and the flat roof oriented to the South. This would result in an overall carbon emissions reduction of 36.1% against Part L2A. As we are now meeting the 35% reduction target there is no need for a cash-in-lieu contribution.

This increase in performance is due to the increase in manufacturers panel sizes from 1.5m2 typically to 1.7m2.

This proposal will result in the Hall School Building passing Part L2A, achieving the minimum 20% of carbon reduction through renewables and the 35% overall carbon reduction measures set by Camden Council.

Orientation	Number of Panels	PV Area (m^2) (1.67 m^2/panel)	PV Model Efficiency	Panel Tilt
East	46	76.8	18%	45°
South	37	53.4	18%	30°
West	23	36.7	18%	45°



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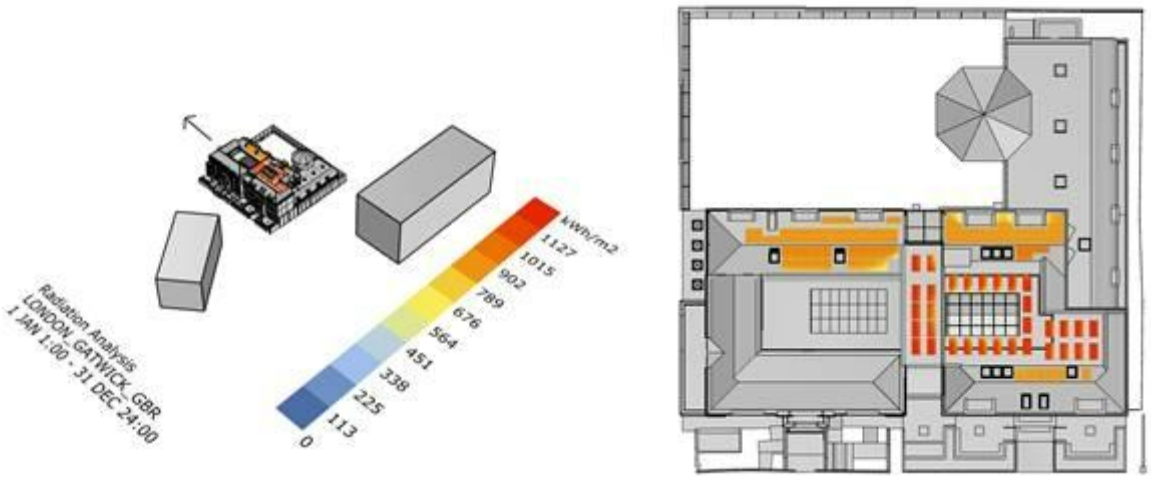
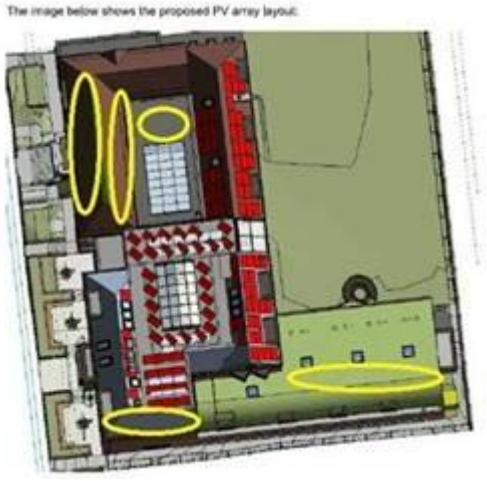
	Reduction in Carbon Dioxide Emissions	
	Tonnes CO2 per annum	%
Be Lean: Saving through passive design and energy efficient measures	2.48	6.6%
Be Clean: Savings through use of district heating schemes or CHP	0.00	0.0%
Be Green: Savings through use of renewable energy technology	11.14	31.6%
Total cumulative savings	13.62	36.1%

Images from over shading analysis and yield calculations…



It was highlighted that there are areas of the roof where PV hasn't been proposed without justification, the reasons are as follows…

- PV not proposed on the existing roof because of the structural load.
- PV not proposed on the lower roof due to concerns of over shading, and to maintain roof space for mechanical plant and access.
- PV not proposed on Green Roof as this intention is to keep fully green.
- PV not proposed on South pitched roof due to aesthetics.



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