



The Hut Group – King Street Townhouse Hotel

DDN MEP 201 ENERGY STATEMENT





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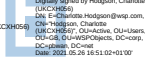
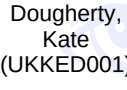
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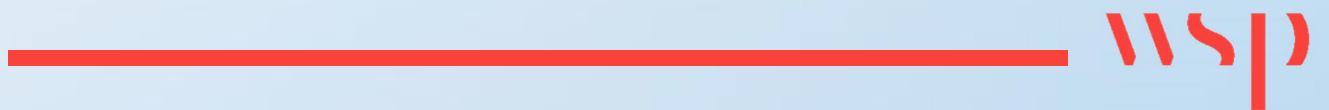


EXECUTIVE SUMMARY

This statement sets out the low carbon design principles which have been integrated into the refurbishment and new rooftop extension of King Street Townhouse Hotel. Due to the heritage listed nature of the building façade and the constraints of the site, low carbon design interventions are limited. However, they have been included wherever possible. These include:

- All new building elements have high efficiency fabric u values
 - In depth thermal modelling of roof top bar to limit solar gains and reduce cooling
 - High efficiency building services
 - Intelligent control system to reduce heating and cooling energy
 - Renewable energy options assessment
-

LOW CARBON DESIGN PRINCIPLES



LOW CARBON DESIGN PRINCIPLES

1. BUILDING FABRIC

Consideration has been given to how the building fabric will respond to its environment to reduce the energy consumption of the building, due to the listed nature of this building it may not be possible to improve all of the current u values however, the façade will be replaced from the fifth to the eighth floor in order to achieve a more consistent and cohesive design, this addition will be optimised to have high efficiency u values that go beyond minimum requirements. This will reduce the energy required to heat and cool these spaces. The windows in the façade up to the fourth floor are not original, and hence already have energy efficient properties. Windows are currently planned to be replaced with more efficient units on the ground floor Booth Street elevation. An inspection will be carried out at the beginning of Stage 3 to understand if replacing any windows could further improve the energy efficiency of the building.

.Table 1 sets out the fabric parameters of the proposed replaced elements

Construction type	U value	G value
Roof of rooftop bar	0.2	
new wall elements	0.28	
New glazing	1.3	0.28
New rooflight	1.52	0.28

Table 1 - Building fabric u values

2. THERMAL MODELLING

Figure 1 - Rooftop bar thermal modelIn depth thermal modelling of the rooftop bar has been undertaken to limit solar gains throughout the year and hence reduce cooling required. Steps have been taken to increase the sustainability of this design. The figure below shows the render of the thermal model.

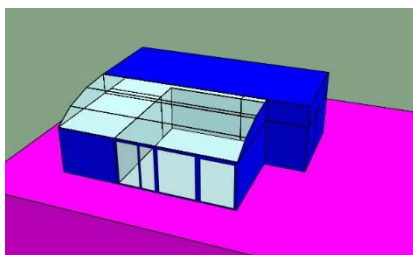


Figure 1: Rooftop bar thermal model

1. Low G value glass (0.28)

- Total cooling load= 6kW, August

Keeping the glass g value low reduced the cooling load by 15% compared to the baseline model with a G value of 0.4.

Figure 2 - Thermal model render

3. BUILDING SERVICES

The existing building is served via a highly efficient variable refrigerant flow (VRF) system to provide space heating and cooling. As part of the works it is proposed to reuse this system where possible, existing pipework and fan coil units will be retained and relocated to suit the new proposed development.

Reuse of existing high efficiency systems will significantly reduce the embodied carbon associated with the refurbishment.

Where systems do require replacement, they will be replaced with high efficiency systems to exceed the requirements of the Non-domestic Building Services Compliance Guide.

The existing lighting is proposed to be stripped out and replaced with a high efficiency LED lighting scheme, this will result in significant operational carbon reductions.

4. INTELLIGENT CONTROL SYSTEMS

It is proposed to provide intelligent controls to provide highly efficient running of systems.

5. RENEWABLE ENERGY TECHNOLOGY FEASIBILITY

Several renewable technologies have been evaluated to determine their potential applicability to the proposed development. Photovoltaic panels have been shown to be the only technically feasible option. Space for PV panels has been allocated on the roof of the rooftop toilet area. This will be investigated further at stage 3.

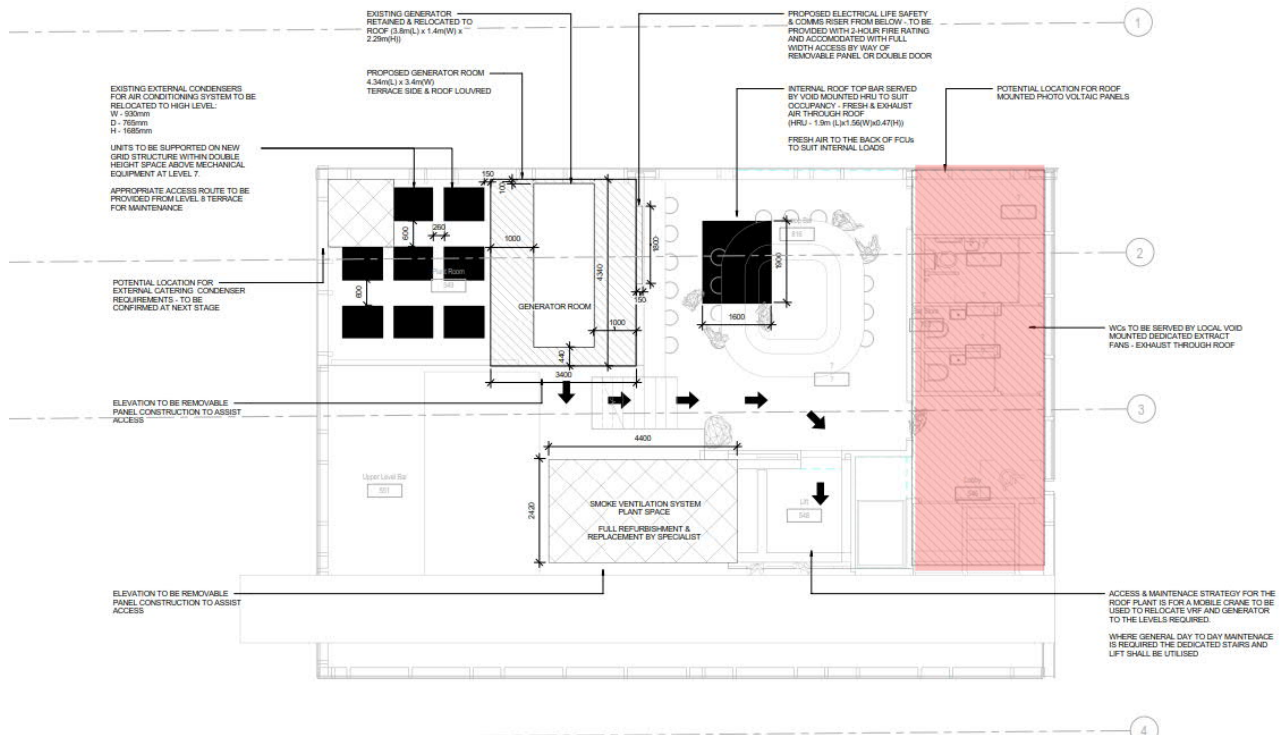


Figure 3 - Roof top layout indicating area set aside for PV (shaded in red)

TECHNOLOGY	DESCRIPTION	CAPITAL COST	MAINTENANCE	CARBON/ENERGY SAVINGS	RECOMMENDED FOR KING STREET TOWNHOUSE?
Wind Power	Turbine/ generator converts wind energy to electrical power	£ Low-medium for small scale turbines in built up urban areas	Medium Requires regular maintenance. Access may be an issue	Low For small scale	No Not suitable for built up urban environment
Solar Hot Water	Solar energy used to heat water, usually for domestic hot water purposes	£ Low-Medium	Medium Increased legionella risk can cause additional maintenance	Low – Medium	No No available roof space (only available roof space allocated for PV)

TECHNOLOGY	DESCRIPTION	CAPITAL COST	MAINTENANCE	CARBON/ENERGY SAVINGS	RECOMMENDED FOR KING STREET TOWNHOUSE?
PV panels	Converts sunlight to electrical power	££ Low – medium	Low No moving parts. Regular visual inspection required	Medium – high	Yes Roof space allocated on stage 2 drawings
Biomass Boiler	Uses plant-derived organic material to produce heat	££ Medium. Cost and availability of fuel can fluctuate	High Deliveries to site can be particularly problematic	Medium – High Depending on carbon content of fuel	No Not viable due to deliveries on site, fuel availability and air quality
Ground source heat pump	Provides low carbon heating and cooling by using the ground as a heat source and sink	£££ Cost of drilling boreholes would be very high	Low – medium Relatively few moving parts	Medium	No Deep boreholes would be required to meet load No suitable outside area to drill boreholes Energy piles not applicable to existing building



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