Alton Towers,
Proposed Spa Extension

Energy Statement

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Introduction

The issue of sustainability will be with us for some considerable time and will certainly increase in profile. Increasing emphasis is being put on good design to reduce the environmental impact new build commercial developments have. This document shall demonstrate how the proposed Spa extension at Alton Towers will reduce its environmental impact through energy efficient design and use of renewable technology.

The proposed development is to be located at the existing hotel and spa within the grounds of the Alton Towers Resort. Merlin Attractions Operations Ltd is proposing to extend the spa facility, to provide additional treatment areas, reception and a walled garden.

Energy Efficiency

Implementing renewable technology will obviously significantly reduce the energy consumption of the development and impact on the overall carbon footprint. However reducing the energy requirement of the development through good design practices can be equally effective in reducing energy consumption. Addressing the efficient use of energy within the development not only reduces energy consumption and therefore running costs but also reduces the carbon footprint of the development.

1. Lighting

Lighting has a major and direct impact on carbon emissions. Electricity has considerably higher carbon intensity than other fuels, although there is little choice to its use for modern lighting. Therefore there is more incentive to examine lighting design and specifically with this development, emphasis shall be given to:

- Prevention of Overlighting
- Lighting Efficacy
- Control

1.1. Overlighting

There are well established design criteria for internal lighting. However these are often regarded as minimum lighting levels, which tend to result in areas being overlit. During the detailed design stage the development will be designed to achieve optimum lighting levels and care shall be taken to ensure overlighting does not occur within lit zones. Increased internal gains from lighting will increase the likelihood of overheating in summer months and therefore to achieve the desired omission of comfort cooling it is essential that designed lighting levels are not exceeded.

1.2. Lighting Efficacy

The Building Regulations (Part L2A) detail stringent minimum efficacy levels to be achieved in all areas. To demonstrate compliance with these Regulations the building's lighting efficacy must be greater than 55 lm/W (lamp lumens per circuit watt) in general areas and 22 lm/W for display lighting within the restaurant area. It is the desired intent to better the target lighting efficacy by at least 10% averaged across all of the internal light fittings installed.

1.3. Lighting Control

There is a strong desire to eliminate unnecessary lighting of unoccupied areas, as this is believed to be an often overlooked discipline. Good robust technologies such as presence detection (PIR devices, detecting a person's presence within a room and switching lighting accordingly) shall be employed wherever possible. All store rooms and "back of house" areas shall employ occupancy detection to switch lighting.

2. Building Fabric

The insulation values of the building must also be addressed to ensure the optimum envelope construction and reduce the heating requirement of the building. Part L building regulations require certain minimum values of fabric thermal performance (U-values) be met for all components of the building extension's external thermal envelope.

The extension has been designed by the architect, with U-values for external walls, floors, roof areas, windows and doors in excess of the current Building Regulations standards

Consideration has also be given to ensuring the development is not subject to overheating from large solar gains during the summer months. The development has been designed to reduce solar gains through solar shading techniques wherever possible to reduce the capacity of any comfort cooling installed.

3. Ventilation

The spa extension will be ventilated by means of heat exchange units, recovering heat energy from the extract to pre-heat the supply air and reduce demand on the heating system. The heat exchange units will be the source of the ventilation requirements and shall be sized to ensure that the air flow rates within the areas are set to achieve Building Regulation requirements.

Renewable Energy

The extension will utilise a heat recovery VRF system to provide both heating and cooling to the area. VRF technology has been demonstrated to be an energy efficient option for use within modern buildings. The additional presence of heat recovery within the system reduces the load on the outdoor compressor units and therefore reduces energy consumption of the system. The VRF system is beneficial due to the way it operates and "moves" heat around the building. The VRF system will therefore move excess heat from one area and introduce it to another area where heating is required, instead of dumping the heat to the external condensers.
We have found that in certain instances the heat recovery air source VRF system actually gives a much better carbon footprint per annum than that of ground source heat pumps. As such it can often be considered as a renewable energy source and is now accepted by many local authorities as such.

Conclusion

The proposed spa extension development intends to reduce energy consumption through efficient design and a heat recovery VRF system providing heating & cooling to the building.