

Sustainability Statement

Workdry International Chandler's Ford Site – New HQ Building

Revision – P01

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EDP

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1.0 Introduction & Executive Summary

This report has been prepared to meet the requirements of the Planning Application for the new Workdry International, Head Quarters Office Building, Chandlers Ford, Eastleigh. The building comprises of general office areas, Meeting rooms, reception/waiting area and sanitary facilities.

It has been prepared to satisfy the requirements of Part L2(2021) of the Building Regulations and Eastleigh Borough Local Plan (2016-2036), Policy DM2 and DM2.

The designs have been developed to be energy efficient and environmentally responsible incorporating sustainable design, low/zero carbon technology and modular construction methods as follows;

- Efficient U-Values and building air test.
- Very efficient Air-Air Source heat pumps (ASHP), providing heating and cooling, are proposed in all the main occupied areas of the building.
- Very efficient Air-Water Source heat pumps (ASHP), providing heating to low temperature hot water to ancillary area of the building ie WCs, corridors etc.
- Mechanical ventilation with heat recovery and CO2 controls for the majority of areas (including most toilets) to maximise heat recovery with several local extract systems for ancillary areas.
- Domestic Hot water using very efficient Air-Water Source heat pumps (ASHP), providing heating to domestic hot water.
- Very efficient LED lighting is proposed throughout with daylight dimming of lighting and occupancy controls to minimise energy consumption.
- PV mounted the roof that exceeds the planning requirement.

In addition to the above the building has been assessed under BREEAM and the construction is targeting Excellent as required for building in excess of 500m².

Workdry International as a company, have the aspiration for 40% of the energy consumed on the site to be generated on site via Photovoltaic cells(PV). The building will be accessed under the requirement and the Roof mounted PV panels will be maximised

To achieve the 40% criteria TM54 computer modelling analysis using Dynamic simulation modelling (DSM) computer software (Compliant with CIBSE AM11) has been created to predict the on-site energy consumption of the proposed building. This prediction is then used to calculate how much energy will be saved by the efficient services and renewables to confirm whether this building will achieve the 40%.

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2.0 Demand reduction

This scheme has been developed with the knowledge that environmental sustainability is a key driver for the services. This has been incorporated into the design solution as it has been developed in a number of ways including the following:

- The benefits of waste reduction of using an off-site construction procurement method are captured.
- Increased air tightness of the building, due to its quality-controlled factory construction, helps reduce the energy demand of the building. The off-site modular construction is achieving air permeability levels typically less than 3m³/(hr.m²).
- Using efficient fixed building services installations to ensure that the lighting, heating and ventilation of the buildings are as efficient as possible within the budgetary constraints of the service (occupancy and daylight-controlled LED lighting throughout helps reduce the energy consumption).
- With regard to active design measures, in occupied spaces the natural ventilation provided by the openable windows is supplemented by localised heat recovery mechanical ventilation controlled by occupancy, CO₂ and temperature sensors in such a manner that the requirements of Building Regulations are achieved.
- Reduced water consumption with the incorporation of low water content WCs, urinal and low flow brassware to achieve the 110litre/person/day. In addition, a Rainwater harvesting system is proposed to serve the WCs and Irrigation, whenever possible.

Alternative energy supply, fabric and HVAC options have been analysed as part of this assessment.

3.0 Thermal Fabric

The Fabric efficiency of the building will be as follows).

Part L2 (2021) U-Values:

Element	Proposed U-Value (W/m ² K)
Ground Floor	0.18
External Walls	0.26
Roof	0.18
Windows & Doors	1.60

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4.0 Consideration of Renewable and Low Carbon Technologies

The detailed design for this scheme is based on ensuring the provision of renewable and low carbon technologies.

Discounted Renewable Technology	Summary Evaluation
Heat Networks	Heat Networks, if available locally, can provide a useful sustainable and efficient energy source for heating systems and even cooling. At the time of writing, we are unaware of any heat networks in or around the locality to serve this project.
Biomass Heating	Biomass boilers can provide significant contribution carbon saving from the building space heating and hot water systems from burning waste biofuel or low carbon fuels like rapeseed oil or coppiced timber-based fuel. A Biomass system is not considered to be suitable given its high capital cost of the equipment and additional plant/fuel storage areas/compound required. Additionally, the increase of heavy transportation vehicles to the site and increased levels of noise and air pollution associated with this technology are not considered.
Combined Heat & Power (using fossil fuels)	CHP uses fossil/bio fuels to generate electricity with a by-product of a lot of spare heat (approx. 2/3rds of the fuel energy used). If there is no use for this significant quantity of spare heat, the unit is switched off so a significant base heating level is required throughout the buildings daily operation to make use of the waste heat. The substantial level of de-carbonisation of the National Grid that has already been installed has had a significant impact on lowering the carbon emissions associated with electricity generation. This improvement of the carbon factor, which is certain to continue improving, makes CHP (from fossil fuels eg Natural Gas, Fuel Oil etc) unattractive, compared to only a few years ago. CHP (fuelled by fossil fuels) has become worse than the grid and completely unviable. CHP from waste heat, on the other hand, would still be worthwhile. This building does not have a significant and continuous heating and/or hot water demand throughout each and every day to justify CHP and it is therefore, not recommended.

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Discounted Renewable Technology (Cont'd)	Summary Evaluation (Cont'd)
Wind turbines	Initial research suggests that the average wind speed on the site would be suitable. Therefore, there is fair potential to benefit from the installation of a wind turbine with a reasonable payback from 10-15 years depending on the type of wind turbine. However, there are substantial surrounding buildings in an urban setting which would severely hinder the performance. Also, noise could attract objections/ complications from the neighbours and/or planning and is therefore not considered appropriate for the development.
Solar Hot Water	Solar Hot Water panels would provide an effective contribution to offset energy requirements for hot water within the building. With the low hot water demand in this building the payback period is not currently attractive and not included in this development.

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Below is a list of technologies that will be adopted on this development from the outset (highlighted in green) Table 2.

Adopted Renewable Technology	Summary Evaluation
Photovoltaic Panels (PV)	A PV array located on the substantial roof is required on this development to comply with Part L2(2021) carbon emissions. It is proposed to increase the amount of PV to generating 40% of the predicted on-site energy demand. The dual orientation of the PV will provide a more even power generation throughout the day offering the best chance of using all the power generated on-site, avoiding the need to export at poor returns. There will be substantial areas of roof spare on site to add further PV to head towards net zero in future.
Air Source Heat Pumps	Since this building requires cooling the heating for the majority of the building will be provided by very efficiency air source heat pumps. The hot water demand for the building will utilise air to water heat pumps to generate the heat. Ancillary areas will be heated using Low Temperature Hot Water (LTHW), the heat will be provided by air to water heat pumps.

In developing the design, it has therefore been concluded that the planning requirement can be most cost effectively achieved by utilising the latest high efficiency air to air sourced heat pump technology and renewable energy generated from solar PV.

5.0 Energy Prediction Results

A thermal model using IESVE (Version 2024.1.0.0) DSM software has been created to predict the energy consumption of the proposed building and was carried as part of the design process, the results for Part L compliance and the 40% on site generation will be provided as part of the ongoing design.

6.0 Conclusion

The proposed building will be provided with very efficient building services & lighting and meet the Planning requirement. In fact, the quantity of PV of renewables will be exceed to achieve the on-site energy consumption.

The building should also exceed the Building Regulations Part L2(2021) carbon emissions. The EPC rating should be 'A'.

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Being all electric the building will continue to reduce carbon emissions as the UK electricity grid continues to decarbonise, improving the buildings carbon emissions credentials further in future, even without any changes.

In addition, there is significant roof area available elsewhere on the site to add further PV in the future to head towards Net Zero.

This building far exceeds the Planning Approval Notice for Energy Production from renewables.