

Sustainability & Energy Statement

“ Hard paved car park with 121 spaces and toilet facilities adjacent to Saint Hill Road, Hard paved access road servicing both Juhring and Hobbs , Engineered grass surfaced provision of 619 spaces for temporary parking for specific events in Juhring field, Re-contouring of Hobbs field with grassed surface and provision of permanent pads for the marquee together with washroom facilities and substation with backup generator.”

JUHRING AND HOBBS FIELD AT SAINT HILL MANOR,
SAINT HILL ROAD,
EAST GRINSTEAD,
RH19 4JY.

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1. Executive Summary

This sustainability report outlines the environmental strategy for the proposed development of two washroom blocks featuring green roofs and timber-clad facades. The design has evolved to meet ambitious sustainability goals, including enhanced thermal performance, water efficiency, biodiversity net gain, and responsible waste management. The buildings are designed to meet or exceed the notional Part L U-values for non-domestic structures, ensuring excellent thermal insulation and reduced energy demand. Heating will be provided via electric panel heaters, chosen for their suitability in remote, intermittently used spaces, offering responsive and low-maintenance operation. Domestic hot water will be supplied by an air source water heater, delivering high efficiency and reduced carbon emissions. Water efficiency is a key priority, with all fittings specified to meet or exceed Part G requirements. Greywater harvesting from the green roofs will further reduce potable water demand. The development also achieves a biodiversity net gain of over 10%, through a combination of on-site enhancements—including green roofs, rewilded car park borders, and a reinforced grid system in the adjacent field—and off-site ecological improvements. Foul water will be discharged into a private pipe network within the client's ownership, connecting to the upgraded Saint Hill Manor Sewage Treatment Plant (STP). The STP is located downhill from the site, potentially eliminating the need for active pumping and reducing energy use. The suitability of the existing network will be confirmed at the technical design stage.

2. Sustainability Objectives

The project has evolved with a clear focus on reducing environmental impact through thoughtful design and material selection. The washroom blocks are conceived as low-energy, low-maintenance facilities that support biodiversity and resource efficiency. The inclusion of green roofs, timber cladding, and greywater harvesting reflects a commitment to sustainable architecture and responsible construction practices. The design also aligns with the energy hierarchy principles: Be Lean, Be Clean, Be Green, as outlined in national and local planning policy.

3. Energy Strategy

Our Energy Strategy utilises two pieces of technology that have been growing in popularity recently and have a proven track record of reducing energy consumption.

Electric Panel Heaters: Suitability and Efficiency

Electric panel heaters have been selected for this project due to their simplicity, responsiveness, and suitability for intermittent use. The washroom blocks are located in relatively remote areas and are expected to experience sporadic occupancy, primarily during peak visitor hours or seasonal events. In such scenarios, panel heaters offer a low-maintenance, on-demand heating solution that avoids the complexity and energy waste associated with centralised systems.

Unlike traditional gas boilers, which require continuous operation to maintain system pressure and heat distribution, panel heaters can be individually controlled and activated only when needed. This is particularly beneficial for buildings with low and variable occupancy, where heating demand is not constant. The absence of pipework and wet systems also reduces installation costs and eliminates the risk of leaks or frost damage in underused spaces.

From an efficiency standpoint, electric panel heaters convert nearly 100% of electrical energy into heat at the point of use. While electricity may have a higher carbon intensity than gas (depending on the grid mix), the targeted and time-specific use of panel heaters can result in lower overall energy consumption, especially when paired with high-performance building fabric. In contrast, traditional boiler systems operating in buildings with poor thermal envelopes (i.e., high U-values) often suffer from significant heat loss, leading to higher energy demand and operational costs.

The washroom blocks have been designed to meet or exceed Part L notional U-values, ensuring that the building envelope retains heat effectively. This synergy between efficient heating systems and high-performance insulation maximizes thermal comfort while minimizing energy use.

Air Source Water Heater

To further enhance energy efficiency, the project proposes the use of an air source water heater for domestic hot water supply. These systems extract heat from the ambient air and use it to heat water, offering a low-carbon alternative to conventional electric or gas water heaters. Air source water heaters are particularly effective in buildings with modest hot water demand, such as washroom blocks, where they can operate efficiently without the need for large thermal stores.

Compared to direct electric water heating, air source systems can achieve efficiencies of 250–300%, meaning they produce 2.5 to 3 times more heat energy than the electrical energy they consume. This makes them an ideal choice for reducing operational carbon emissions and aligning with the “Be Green” principles of the energy hierarchy.

The system will be installed in a discreet location with adequate ventilation and noise control, ensuring minimal impact on users and the surrounding environment. It will be integrated with smart controls to optimize performance based on usage patterns and ambient conditions.

4. Water Strategy

Greywater Harvesting

Rainwater from the green roofs will be collected and reused for WC flushing, significantly reducing the demand for potable water. The system will be designed to comply with BS EN 16941-1:2018 (Rainwater Harvesting Systems – Code of Practice), ensuring safe and effective reuse. Overflow will be directed to permeable paving or soakaway systems, supporting sustainable drainage.

Water Efficiency

All water fittings will be specified to meet or exceed Part G of the Building Regulations, which sets a maximum consumption of 125 litres per person per day. The design includes dual-flush toilets with average flush volumes below 3.5 litres, low-flow taps restricted to ≤ 5 litres/min, and showers restricted to ≤ 8 litres/min. These specifications align with BREEAM Wat 01 criteria and EU taxonomy standards for sustainable finance. The design intent is to achieve water consumption levels significantly below the regulatory threshold, contributing to long-term resource efficiency.

5. Materials and Construction

The external facades will be clad in FSC-certified timber, chosen for its low embodied carbon, renewability, and aesthetic warmth. Timber was selected early in the design process to reflect the natural setting and to support a biophilic approach. The cladding system has been detailed to ensure durability and ease of maintenance.

Green roofs will be installed on both blocks, using sedum or wildflower planting to support biodiversity and improve thermal performance. These roofs help regulate internal temperatures, reduce rainwater runoff, and provide habitat for pollinators. Their inclusion was a key sustainability goal from the outset.

All major construction materials have been selected based on their environmental credentials, with preference given to those rated A+ to B in the BRE Green Guide. Where possible, materials will be sourced locally to reduce transport emissions and support the regional economy.

6. Waste Management

A Construction Waste Management Plan will be implemented to minimize landfill waste and promote recycling. The design incorporates prefabricated elements where feasible, reducing on-site waste and improving build efficiency. Recycling facilities will be provided within the blocks to support ongoing waste reduction during operation.

7. Surface Water Management

Surface water will be managed through a combination of permeable paving and SUDS-compliant drainage systems. The site layout has been designed to ensure that rainfall up to 5mm is retained on-site, with no discharge to watercourses. This approach reduces flood risk and supports water quality, aligning with best practice in sustainable drainage.

8. Health and Wellbeing

The washroom blocks have been designed to maximize natural daylight through rooflights and windows, creating a pleasant and well-lit environment. Ventilation will be provided via trickle vents and extract fans, ensuring good air quality and user comfort. All finishes and materials will be non-toxic and low-VOC, supporting occupant health and indoor environmental quality.

9. Ecology and Biodiversity

The proposed development has been carefully designed to deliver a biodiversity net gain exceeding 10%, in line with national planning policy and best practice guidance. This has been achieved through a strategic combination of on-site and off-site enhancements, ensuring that ecological value is maximized both within the immediate footprint of the washroom blocks and across the wider landscape.

The washroom blocks will feature extensive green roofs, planted with a mix of sedum and native wildflowers to support pollinators and invertebrates. The rewilded borders of the car park will be planted with native grasses, shrubs, and wildflowers, forming ecological corridors that connect fragmented habitats and encourage species movement. A

reinforcement grid system will be installed in the adjacent field to stabilize the ground while allowing vegetation to flourish. Together, these features form a cohesive ecological network, enhancing biodiversity across multiple layers of the site.

To complement the on-site measures, the project includes off-site habitat improvements in nearby green spaces under the same ownership or stewardship. These may include tree planting, hedgerow restoration, or wetland enhancement, depending on local ecological priorities. By extending the scope of biodiversity interventions beyond the immediate site, the development ensures a meaningful and measurable uplift in ecological value.

The integration of green roofs, rewilded margins, and permeable surfaces creates a multifunctional landscape that supports biodiversity, improves microclimate conditions, and contributes to the overall sustainability of the development. These interventions have been guided by ecological assessments and biodiversity metric calculations, confirming that the scheme will deliver a net gain of more than 10%.

10. Monitoring and Management

Energy and water usage will be monitored via smart meters, allowing for ongoing performance tracking and optimization. A maintenance plan will be developed for the green roofs and greywater systems to ensure long-term functionality. A user guide will be provided to support sustainable operation and encourage responsible use of resources.

11. Foul Water Disposal Strategy

The proposed washroom blocks will discharge foul water into an existing private pipe network owned by the client, which ultimately connects to the Saint Hill Manor Sewage Treatment Plant (STP). This system has been designed to accommodate significantly increased flows and loads, with a treatment capacity of 180m³/day, nearly six times greater than the treatment plants' predecessor. The STP uses a multi-stage biological treatment process, including submerged aerated filters (SAF) and moving bed biofilm reactors (MBBR), to achieve high effluent quality standards set by the Environment Agency.

The foul water from the washroom blocks will be conveyed via gravity through the client's existing pipework. The topography of the site places the STP downhill from the proposed development, which may eliminate the need for active pumping systems. This gravity-fed arrangement offers significant sustainability benefits by reducing energy consumption, lowering operational costs, and minimizing maintenance requirements associated with mechanical pumping.

The suitability of the existing network will be assessed during the technical design stage to ensure it can accommodate the additional flows without risk of surcharge or failure. Preliminary assessments suggest that the system is robust and well-maintained, with

sufficient capacity to handle the modest increase in foul water from the washroom blocks.

The STP is designed to meet stringent discharge standards, including Biochemical Oxygen Demand (BOD) ≤ 20 mg/l, Suspended Solids (SS) ≤ 30 mg/l, and Ammonia (NH₃) ≤ 10 mg/l. These parameters ensure that the treated effluent meets environmental compliance and supports the broader sustainability goals of the development. The STP also includes features such as sludge minimization, odour control dosing, and energy-efficient PLC-controlled systems, further enhancing its environmental credentials.

12. Energy Efficiency Hierarchy

12.1 Be Lean – Reduce Energy Demand

The design embraces a fabric-first approach, prioritizing thermal performance through high-quality insulation and airtight detailing. The building envelope is specified to meet the notional Part L U-values for non-domestic buildings: Roof ≤ 0.18 W/m²K, External walls ≤ 0.26 W/m²K, Floor ≤ 0.22 W/m²K, Windows ≤ 1.6 W/m²K. These targets ensure minimal heat loss, reduced energy demand, and improved comfort. Natural daylighting is maximized through rooflights, reducing reliance on artificial lighting. All finishes and materials will be non-toxic and low-VOC, supporting occupant health and indoor environmental quality.

12.2 Be Clean – Supply Energy Efficiently

Electric panel heaters have been selected for this project due to their simplicity, responsiveness, and suitability for intermittent use. The washroom blocks are located in relatively remote areas and are expected to experience sporadic occupancy. Panel heaters offer a low-maintenance, on-demand heating solution that avoids the complexity and energy waste associated with centralised systems. They convert nearly 100% of electrical energy into heat at the point of use, and when paired with high-performance building fabric, result in lower overall energy consumption. LED lighting with motion sensors and smart thermostats will further optimize energy use.

12.3 Be Green – Use Renewable Energy

An air source water heater will be used for domestic hot water supply. These systems extract heat from the ambient air and use it to heat water, offering a low-carbon alternative to conventional electric or gas water heaters. They can achieve efficiencies of 250–300%, making them ideal for reducing operational carbon emissions. The system will be installed with smart controls to optimize performance based on usage patterns and ambient conditions.

12.4 Offset – Compensate for Residual Emissions

While the development does not currently include formal offsetting measures, the overall strategy minimizes residual emissions through efficient design, renewable energy use, and biodiversity enhancements. Future opportunities for offsetting may include participation in carbon credit schemes or local reforestation projects.

13. Conclusion

The proposed washroom blocks demonstrate a comprehensive and integrated approach to sustainable design. Through careful material selection, efficient energy systems, and ecological enhancements, the development exceeds regulatory requirements and contributes positively to the local environment.

The use of electric panel heaters and an air source water heater aligns with the building's intermittent use and remote location, offering energy-efficient solutions with minimal maintenance. The building envelope has been optimized to meet Part L standards, ensuring long-term thermal performance and reduced operational energy demand.

Water conservation measures—including low-flow fittings and greywater reuse—ensure compliance with Part G and support responsible resource management. The biodiversity strategy delivers a net gain of over 10%, enhancing ecological value both on-site and off-site.

The foul water disposal strategy leverages existing infrastructure and a modern treatment facility, with gravity-fed drainage offering further sustainability benefits. The overall proposal reflects a commitment to environmental stewardship, operational efficiency, and long-term resilience.