

Luminous Oak SEMH School P13332 Sustainability Report

- **BREEAM.** The proposals have been designed to achieve a BREEAM rating of Excellent. To achieve an Excellent rating a score of in excess of 70 is required. The current predicted score is 73.8%. This has been achieved through a variety of measures, focusing on credits such as Management, Health and Wellbeing, Energy, Transport, Water, Materials, Waste, Land Use and Ecology, and Pollution. Key strategies to achieve these credits include implementing robust management practices, optimizing energy efficiency through passive design and renewables, enhancing occupant comfort, improving biodiversity, reducing water consumption, minimizing waste and pollution, and ensuring sustainable materials are selected. I attach a letter of comfort from our BREEAM assessor Scott White and Hookins confirming the position. I have requested sight of the pre-assessment and will be able to forward this to you shortly.
- **Thermal Performance.** The thermal performance of the building will exceed the current building regulations requirement in terms of fabric U values and airtightness by at least 15% in accordance with Eastleigh Borough Councils requirements.
- **Biodiversity Net Gain.** Through the careful design of the external spaces and prioritising soft landscaping elements that will enhance biodiversity, a net gain score of over 90% will be achieved in area-based biodiversity and nearly 300% net gain in linear habitat value. Set against a statutory minimum target of 10% net gain this is a significant enhancement over statute.
- **Building Form and Orientation.** The arrangement of the site and orientation of the building has been carefully planned to enhance energy efficiency, environmental performance, and occupant comfort. The two-storey building form is compact and has a low external wall to floor area ratio, thereby minimizing the heat loss during the winter months. By maximizing exposure to daylight throughout the day, the building reduces reliance on artificial lighting, thereby lowering overall energy consumption. The building orientation supports passive heating and cooling strategies, allowing for solar heat gain during colder months while minimizing overheating in the summer, thus reducing the need for mechanical heating and cooling systems. Full exposure of the roof allows for the incorporation of photovoltaics to further enhance energy efficiency through on-site renewable energy generation. The compact building footprint maximises the available green space, which supports increased biodiversity, mitigates the risk of surface water flooding and provides outdoor learning and play spaces.
- **Low Energy Ventilation System.** Integrated louvre panels within the glazed openings enable the use of a hybrid ventilation system. The Natural Ventilated Heat Recovery Units (NVHRs) work in conjunction with natural ventilation which is provided by strategically placed opening windows. This allows for occupants to determine their thermal comfort level, while reducing reliance on mechanical ventilation. The hall employs wind catchers placed on the roof to provide passive ventilation.
- **Solar Shading.** The brise soleil installation is part of the overall passive design strategy. It consists of both horizontal and vertical fins to limit solar gain and glare on the South and East elevation. It assists in preventing excessive heat buildup while still allowing diffused natural daylight to enter the spaces. This in turn reduces reliance on mechanical cooling systems, improving the overall energy efficiency of the building. An additional benefit of brise soleil is the optimization of seasonal performance, by blocking high summer sun to prevent overheating, while allowing lower-angle winter sunlight to penetrate, contributing to passive heating when

required. To further prevent overheating during the summer months trees are located adjacent to the south façade, which will in time, assist in shading the building.

- **Proposed Heating System and Photovoltaic Array.** To reduce the maximum heating demand and the annual consumption for the building the following measures will be employed.
 - Ensuring low air permeability of the facade to minimise heat loss.
 - Improved fabric U values for better thermal insulation.
 - Installing high-performance Low E glazing to enhance energy efficiency.
 - Implementing a highly efficient heating system to maximize energy savings.
 - Incorporating energy-efficient lighting, such as LED, to further reduce energy consumption.

Two options for the space heating of the building are being investigated due to the current uncertainty around the electrical capacity within the local infrastructure.

- If sufficient electrical capacity is available (within the project time and cost constraints) a hybrid system comprising gas fire boilers and air source heat pumps (ASHP) will be employed
- If it is not possible to secure sufficient electrical capacity in the available time and cost constraints, a high efficiency gas fired condensing boiler system will be employed.

Our preferred option is to use a hybrid system approach for the following reasons

- Reduced CO2 emissions in the day to day running of the school when compared to a full gas fired system.
- Cost efficient system which utilises ASHP's for the majority of the time and only uses the gas fire boilers as a backup when external temperatures are very low and the ASHP's are at their most inefficient.
- Option to move to a full ASHP system in the future when electricity and gas prices become more aligned.

Secondary heating distributions systems will be sized to run at low temperatures to be heat pump ready regardless of the option employed.

If ASHP's are installed, they will be located in the central zone of the roof and will be screened by the brick parapet walls so as not to be visible from the surrounding area. Acoustic screening will be employed locally around the units as necessary to minimise any noise impact on the surrounding area.

The heating system employed will impact the amount of Photovoltaic (PV) installed to achieve the BREEAM Excellent rating for the project.

- If a gas fired system is employed a 106-Kilowatt peak (KWp) PV array will be installed.
- If a hybrid system is employed a PV array of between 70KWp and 25KWp will be installed depending on the percentage split between the ASHP and gas boiler provision.

All the PV will be installed on the roof and will be screened by the brick parapet wall so as not to be visible from the surrounding area.

- **Electric Car Charging points and Infrastructure.** Two electric car charging points will be installed. One of these will be located adjacent to an accessible bay. Ducting to allow for future expansion of the provision will also be installed.