

Best practice example:	Environmental Management: Low Carbon and Sustainable Solutions
Project:	Ancient woodland feature translocation
Client:	Fusion/HS2
Location:	Calvert, Buckinghamshire
Timescales:	2019 – 2020 (Feasibility study) 2020- 2021 (Translocation works)

Background

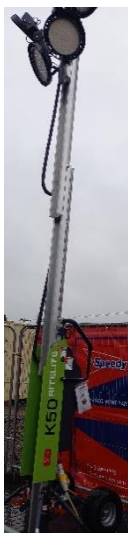
- HS2 is a high-profile project using public money, providing many opportunities to achieve wide reaching social, environmental and economic impacts and benefits and leave a strong legacy for the UK. That legacy is expressed in HS2’s sustainability approach and themes which underpin the Government’s guiding principles for sustainable development, as well as HS2’s vision and their strategic goals.
- It was crucial to carry out works to the highest environmental standards and to seek sustainable solutions to wherever practicable.

The challenges

- The site consisted of multiple work zones, located in an area where grid electricity & mains water was unavailable.
- A large workforce and numerous pieces of plant and machinery was required to achieve the programme deliverables. Provision of generator powered welfare and large numbers of plant and machinery require significant consumption of fuel with a high carbon footprint and potential risk of hydrocarbon leaks & spills.
- The underlying soil composition is heavy clay which is impermeable and liable to flood during heavy rainfall. Excavation of soil can also cause surface water run-off, which has the potential to impact local watercourses.

Solutions: Energy saving initiatives

Hybrid Power system: (main compound power source): When a balanced power demand is achieved, the Hybrid (stored energy) system takes over; an increase in demand on the system will automatically trigger reversion to main generator supply. The main generator supplied all main compound energy requirements through the day, with excess energy stored within a gokw energy saving unit. Essential welfare items used by site security (water heaters, drying room, canteen, compound lighting, radio charging points) were powered overnight from the Hybrid unit, using stored energy. After 2-3 weeks of operation, the integrated management system performance data was interrogated, enabling adjustments to be made to use surplus harvested energy during the normal working day. The unit was telemetry fitted so it could be remotely accessed at any time and adjusted as needed to optimize performance.



Energy efficient cabins: Due to the COVID-19 pandemic, operative numbers in cabins was restricted, meaning additional office and welfare space was required. Eco cabins with sensor operated LED lighting and time/temperature-controlled heating were sourced to reduce energy consumption as much as possible.

Quad pod lights: Used for main compound lighting, utilising existing power provision from the main compound generator, rather than separate generator powered units. This reduced noise impacts, CO² emissions and eliminated the potential for diesel leaks or spills. Quad pod lights have retro fitted Photocell units which monitor light levels and automatically activate at dusk and de-activate at dawn.

Hybrid Tower Light - satellite compound power source. This light is 90% battery powered; the remaining 10% is engine powered, meaning the light can run for 660 hours between fuel refills. The low power high efficiency LED lights have automatic light/ darkness sensors, providing a low noise/ low emissions solution. A Hybrid rather than solar

system was selected due to the constraints of winter operation and low sunlight levels with potential shadowing of photo-voltaic cells from the woodland trees.

Solutions: Pollution control (fuel and oil)

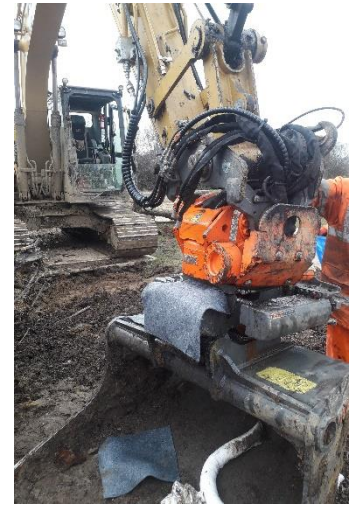
Green Rhino EnviroPads® were placed under all items of stationary plant, small generators and fuel filling areas. The pads use a smart polymer technology to solidify oil and fuel which is trapped in the pad. This removes the risk of overflowing and escape of oils and fuels during heavy rainfall, such as is experienced using standard drip trays.

SpillAway® products contain natural micro-organisms which change contaminant products into carbon dioxide and water. The products used are in liquid form, pH neutral, non-toxic and completely safe to handle including in or adjacent to water courses; this was an important factor in their selection due to the sensitive nature of the works areas. SpillAway® bioremediation spill kits were deployed throughout the



working areas. The SpillAway® Remediate product was used as an effective bioremediation solution for spills on soils to avoid the need for taking the soils off as

contaminated material. Felts impregnated with Remediate were also purchased – the pads can be re-used many times after cleaning with FleetKleen®. Some of the products are more expensive than standard industry alternatives, but the ability to reuse and/or dispose of as non-hazardous waste provides both a sustainable solution and a significant cost saving over time.



Solutions: Pollution control (silt management)

(i) Frog Environmental SiltMats & Floc Mats® were used to protect the central ditch running through one of the works areas from potential silt pollution generated by earth moving activities taking place in close proximity. The SiltMat is designed to capture suspended solids; once sediment is captured within the fibre matrix, it remains contained preventing resuspension at higher flows. The function of the FlocMat is to flocculate very fine particles, making them easier to separate from water. Used in conjunction with the SiltMat, this provides a safe, low carbon and easy solution to support the removal of suspended solids and associated pollutants. The mats are made from 100% sustainably sourced natural fibres and are fully biodegradable; they are therefore suitable to be left in situ as backfill (FlocMat) or seeded (SiltMat) to create an ecological enhancement

(ii) A Taytech® silt management system was used for the capture and treatment of surface run-off water across the site. As part of the treatment, an organic coagulant was used which is very effective at binding to the colloidal content of surface water run-off. This acts as a flocculent; due to its organic nature, it poses a much lower environmental risk than industry-standard metal-based coagulants. The system used remote monitoring technology to manage dosing of flocculant and coagulants to ensure optimum water quality at point of discharge. A solar telemetry device provided by Frog Environmental was used to remotely monitor the turbidity of discharged water with a warning if thresholds are exceeded, providing data for compliance with Environment Consent conditions.

