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the BIG Biodiversity Challenge
do one thing

Sussex Power Supply Upgrade
Whyteleafe South
Siemens Mobility Ltd, Rail Electrification & Network Rail

BIG Biodiversity Challenge Award Category: *Biodiversity Legacy*

Project overview

Siemens was awarded a contract by Network Rail to renew and upgrade an electrical substation at Whyteleafe South in Surrey. The site was surrounded by mature woodland habitat on three sides and the railway on the fourth. The remit involved constructing a heavy access road through the neighbouring environmentally sensitive woodland.

What were the biodiversity conditions on site, prior to the enhancement?

The remit required welfare and site access be established through the mature woodland containing numerous tree preservation orders. The woodland contained a badger set, a rich variety of ride vegetation and understory flora. The railway corridor bordering the woodland contained cable routes and general undergrowth. Initial surveys identified several tree's and shrubs required to be removed for access, there was soils compaction and damage from previous contractors works from the previous year and a significant number of trees needed crown lifting to enable large vehicle access. The tree roots required protection throughout. Habitat would be lost.

What were the reasons behind this project ?

Because of the ecological impacts of the project access requirements, the project team decided a delay to the project would enable them to undertake a sustainability by design review which was agreed by the client. The purpose of the review was to see if the project could be delivered in a different way to reduce impacts not only on the immediate environment but to the local rural community through which numerous heavy vehicles would have to travel. The project required some demolition of existing buildings and installation of new transformers.

Demolition Material Hibernacula prior to being landscaped with soils

Demolition Material Hibernacula prior to being landscaped with soils

What were the biodiversity measures taken?

By undertaking the sustainability by design review, the programme and methodology was significantly changed, and alternative practices were identified. The largest mobile crane in the country was secured to enable a heavy lift of both the decommissioned transformers from the site and the new ones into site from the station carpark on the other side of the railway which previously had been considered impossible due to the weight and the length of reach required and the rural location. The lifts were done during weekend night track possessions. This enabled the woodland track to be downgraded from 36t weight limit using a huge amount of imported aggregate to 5t limt using imported renewable hardwood chip and resueable recycled plastic roadplates. This reduced lorry movements through the community as less material was needed and all the woodchip was left on site to create woodland paths and understory improvements, no waste was created. Only two non-protected trees were removed, chosen to improve a glade area of the woodland but no other trees needed to be removed, pruned or damaged due to the reduce size of plant and equipment going through the woodland.

The waste from the demolition was considered and a hibernacula creation scheme was designed to be built along the Network Rail corridor adjacent to the woodland. The necessary waste exceptions were obtained, and all the building waste was used and was then landscaped over using excavation material for the new transformer pads. The resulting hibernacula created along 250 metres corridor significantly increased mammal and amphibian refuge as well as insect and invertebrate habitat benefiting the woodland and railway corridor. This eliminated waste from demolition and removed need for additional HGV movements through the local rural road network. The final landscaping was specifically planted with indigenous pollinating wildflowers and understory woodland plants.

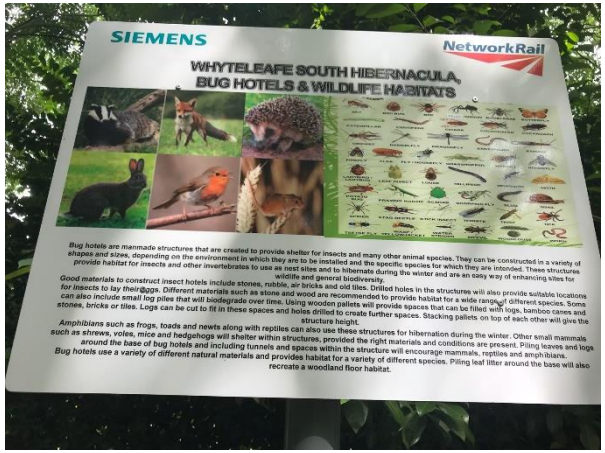
Insect and bug hotel made from project waste pallets

Construction of the hibernacula corridor adjacent to woodland from project demolition material

Further information

All work within the woodland was controlled through strict biosecurity controls to prevent the import and export of any potential woodland disease and pathogens, ash dieback was identified in the woodland which the project didn't want to spread further. All vehicles, equipment and personal were disinfected upon entry and exit. The woodland was left in a better condition than before the works began with additional drainage introduced to some poor areas, improved pathways and the opening up a glade to improve light and species diversity and the significant creation of the hibernacula directly adjacent. The local Authority Senior Tree Preservation Officer visited the site during the works and again after demobilisation which prompted him to write to the client expressing his gratitude of how well Siemens had protected and enhanced the woodland and wished all contractors behaved in such a sympathetic way to the ecological requirements of the woodland, protecting the tree roots and creating hibernacula. Further ecological surveys will be conducted in 12 months' time to monitor the biodiversity net-gain improvements.

Over £70K was saved by introducing sustainability by design changes including eliminating virgin aggregates for road construction and re-purposing demolition waste. The carbon footprint of the project was reduced by well over 30% by significantly reducing materials, waste, HGV movements and laying a 600m power cable to eliminate the need for diesel generators for welfare. No wood waste was produced with all the formwork being turned into bird and bat boxes erected in the woodland periphery.



Information boards to inform Network Rail staff visiting the location

Information board to inform passengers on the station platform of the hidden world created behind it.

Project Team

Siemens
Julian Pointon-Bell, Senior Project Manager
Paul Maslen, Project Manager
Neil Mullens, Construction Manager
Genero Henderson-Park, Site Manager
Martin Gregson, Environmental Manager

Network Rail
Phillip Mallalue,
Scheme Project Manager
Karin Skelton,
Scheme Project Manager

What was the motivation for carrying out the enhancement?

From the very start, the Project Manager was determined to have a fully integrated sustainable approach and recognised the project had to be delivered differently. At every stage sustainability was at the forefront of thinking and behaviour. Understanding that this was a sensitive environmental habitat, he negotiated a delay with the client, and guided the designs back through the process to realise additional benefits.

The entire project team was absolutely engaged throughout with even with the site manager looking after landowners resident geese while they went on holiday, getting to work early to get them up and staying back late to put them to bed.

Temporary woodland track utilising renewable hardwood chip and recycled road plates

Tree protection measure along the woodland track: