Denbrook Wind Farm, Devon—Civil & Ancillary Works

Project Profile

Client: RES UK Ltd

Designers: JNP Group &
McCloy Consulting

Value: £5.1m

Design and Construct contract for Civil and Ancillary Works for a 9 turbine wind farm site constructed in largely undulating pastoral farmland near Crediton in Devon. The wind turbines procured for the site by RES were Vestas V90 2.0 MW units with 120m tip height. Turbine erection was completed in October 2016 and the site was generating electricity by the end of 2016. the installed capacity equates to 18 MW of renewable electricity sufficient to met the needs of 9,000 homes.

The main construction work included;

- Establishment of temporary and permanent works compounds.
- Topsoil strip to working areas with specific stockpiling and storage within each landowner boundary.
- Significant cut/fill earthworks required to accommodate the road and hardstand profiles.
- 7.5km of minimum 5.0m wide type 1 surfaced site roads and turbine spurs, widened at bends and junctions to suit swept path of turbine delivery vehicles.
- 2 areas of archaeological interest required 'floated' road construction above existing ground level.
- 9nr 40m x 20m crane hardstandings with split type 1 and Truckpave finished surface.
- Lime/cement soil modification was used to stabilise the formations of all site roads and crane hardstandings. The 300mm stabilised layer acts as a stone capping layer replacement and also satisfies frost susceptibility criteria. This was offered as a value engineering alternative to the contract, as well as a significant cost saving to the client, this has also had significant environmental benefits - reduced the volume of surplus soils and the number of imported stone lorry movements to provide the 150mm type 1 stone surface layer. Specialist contractor SGE completed the stabilisation works.
- The site roads to 3 of the turbine locations cross the existing Dartmoor Railway line via a new level crossing. The line is a private rail line however extensive liaison was required with the operators and weekly planning was required to work programme the work in line with the weekly operating notice of train movements.
- A maintenance track also connects the 3 turbines across the rail line. This passes through an existing tunnel to ensure that turbines can be accessed at all times without have to use the level crossing.

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- 9nr 17.0m dia octagonal reinforced concrete gravity turbine foundations with cast-in place bolt cages
- Each turbine base required 265m^3 of concrete completed in one main pour followed by a 35m^3 plinth pour. Thermocouples were installed in the bases to monitor temperature throughout the curing period.
- Construction of the hardstand and working platform for the 20m x 6m control building.
- Sustainable drainage system to the whole site including; 8 km of profiled swales with check dams, mini-settlement & stilling ponds and controlled outfalls to existing water courses with gabion basket headwalls.
- Culverted crossings up to 1800mm dia of numerous existing streams and watercourses.
- Provision of silt fencing to all downslope working area fences.
- Fencing included 6,000m of temporary and 10,000m of permanent stockproof fencing to working areas.
- Section 278 Off-site highway works were required in 3 locations;
    - ◊ Whiddon Down diversion involved 180m of new carriageway and junction works to improve traffic flow, visibility and road safety. This work required extensive liaison with the highway authority, local residents and businesses.
    - ◊ De Bathe crossroads—changing fence lines & overrun areas.
    - ◊ Hollycombe Ford—widening and lowering verge
- 5.5km of MV cable and telecoms cable installation.
- A Spoil Management Plan was developed to retain topsoil and excavated soils in specifically identified areas agreed with each landowner/farmer which allowed careful re-soiling and seeding of road & crane pad margins and swales.

The site crossed a number of landowner boundaries and continuous liaison was required with each landowner to ensure preparation, construction and reinstatement work was carried out to their satisfaction and that our activities did not impinge on field access, harvesting, livestock movement or other operations.

Working closely as a team with RES project management and engineering staff and our designers ensured that any problem areas encountered were quickly resolved and did not impact on the tight delivery programme.