

Blade Test Facility

Contract Value	£1.0M	Commenced	May 2004
Contract Period	23 Weeks	Completed	Oct 2004

Features

- Design and construct project for NaREC (New and Renewable Energy Centre).
- Reinforced concrete foundation structure for a wind turbine blade testing facility.
- Construction within an existing fabrication shed.
- 3500 m³ reinforced concrete; largest single pour 540 m³
- Concrete is prestressed using the post tensioning method.
- Fabrication and installation in the superstructure of two 35 tonne metal plate and tube assemblies.

Brief Description

New and Renewable Energy Centre (NaREC) is a Government funded *Centre of Excellence* organisation promoting the use and development of renewable energy by undertaking feasibility studies, and prototype evaluation and testing of proposals through to their early commercialisation.

The Centre is based in Blyth, north of Newcastle. www.narec.co.uk

The blade test facility will allow the stress and fatigue characteristics of the next generation of wind turbine blade designs to be tested. The new facility is designed to accommodate blades up to 70m in length, and is believed to be the largest facility of this kind in the world. Rapid cyclic loading of blades over of a 3-5 months continuous period provides information on the typical 20-25 year life cycles of wind turbine blades.



The contract provided for design and construction of a 70 x 22 metre reinforced concrete base slab with test rig superstructure, constructed within a former fabrication building on the Ark Royal site. Byzak's alternative tender increased slab base thickness to around 2 metres but dispensed with the need for piled foundations. This offered significant cost savings and also avoided safety concerns relating to piling operations in the building. Consultants IMC White Young Green were commissioned for the design.

The superstructure works were a negotiated extension to the contract. Originally proposed as a steel structure, a pre-stressed concrete alternative was developed, again with significant cost saving to the client. Consultants Dorman Long were engaged to design the superstructure.

The superstructure works incorporated 2500 metres of post tensioned Macalloy bar within grease filled ducts. Extensive temporary works included the use of hydraulic lifting units to position the two 35tonne metal plate and tube assemblies, and the special shuttering and false work system.

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