SIKA AT WORK

HIBIKI PROJECT MOCK-UP TRIAL, JAPAN

OFFSHORE & MARINE CONSTRUCTION
RENEWABLE ENERGY

BUILDING TRUST

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PROJECT DESCRIPTION

In preparation for the Hibiki Project in Japan, Sika conducted a mock-up trial at the Hibikinada trial site in September 2023.

Project name:	Hibiki Project Mock-Up Trial
Location:	Hibikinada trial site, Kitakyushu-city, Fukuoka Prefecture, Japan
Year:	2023
Application:	Monopile foundations
Product:	SikaGrout®-9500

PROJECT REQUIREMENTS

For the grouting of the connection between the wind turbine substructure (jacket) and the foundation pile (steel pipe pile), the grouting area (jacket leg/sleeve and steel pipe pile) was simulated on land using actual dimensions. Grouting is carried out using the actual materials used in this work (mixing plant, pump, etc.) and tests are conducted to confirm the filling, pressurisation, and construction of the grouting material.

The Hibiki Project took place during the hot weather months of June to September 2024. To prepare, additional trials were conducted before the offshore campaign, during which both the grout and mixing water were chilled, ensuring the material was mixed and pumped within the required temperature limits.

SIKA SOLUTIONS

Sika supplied 54 MT of SikaGrout®-9500 and 1.6 MT of SikaGrout®-9000 for the mock-up trial. SikaGrout®-9500 is a high-performance, cement-based grouting material designed for ultra-high strength and exceptional fatigue durability in offshore wind turbine installations. This product is widely used for grout connections in wind turbine foundations, including the interfaces between transition pieces and monopiles, as well as within steel jacket structures.

The purpose of the trial was to measure the behaviour of the SikaGrout®-9500 grouting material from storage in a chilled warehouse to transit from the warehouse to installation in hot temperatures. The technique of chilling dry grout powder before mixing has been successfully applied in previous onshore wind turbine installations.

At 28 days, the overall compressive strength of the trial material exceeded the minimum requirements. However, the effect of the chilled grout powder was less than anticipated when compared with onshore grouting.

CUSTOMER BENEFITS

- SikaGrout®-9500 enhances the durability, efficiency, and safety of wind energy projects, optimizing both performance and installation processes.
- Sika's Ultra High Performance Concrete (UHPC) and composites undergo extensive testing at MPA in Germany, including creep and fatigue assessments. Additionally, large-scale trials have been conducted under both low-temperature European conditions and high-temperature tropical environments to validate the materials' performance in extreme weather conditions. Sika's grout portfolio offers ultra-high-performance concrete and composites with strength and durability up to ten times greater than conventional cement products.

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