



SIKA AT WORK

Wind energy park, Perganti, Akarnanian Mountains, Etoloakarnania, Greece

Concrete production: Sika® Plastiment®-20 R, Sika® ViscoCrete® Ultra-450, Sika® Antisol® E

Waterproofing: Igol® A

Wind tower precision grout: SikaGrout®-3200

WIND ENERGY PARK, ETOLOAKARNANIA, GREECE



PROJECT DESCRIPTION

The project concerns the construction of a wind energy park in the Akarnanian mountains of the municipality of Aktio - Vonitsa, which will consist of 11 wind turbines with a capacity of 3,8 MW each (41,8 MW total production capacity).

Each wind turbine foundation had a total volume of $\sim 600\text{m}^3$, with the specification stating the use of C30/37 concrete class for each foundation - hence a total of $\sim 7.000\text{m}^3$ of concrete. Each wind turbine pillar is 84m high and the opening of each wing is 65m.



For installation requirements of the wind turbines, an inland road system, 8 Km long and 5 to 10 m wide had to be constructed, within the area of the wind farm. At the same time, there was a need to build an underground electricity net as long as well as the internal road aforementioned and an operational building that would serve as a control center, with a total surface of 237 m².

Concerning adjacent projects which are required for the wind farm operation, these are a 36 / 150KW substation and a 9 Km high voltage overhead transmission grid for the transfer of electrical current produced from the wind farm to the substation. Also, a road will be constructed to access the ridge of the Akarnanian Mountains, where the wind farm will be installed.

PROJECT DEMANDS

The construction of a wind farm has very specific requirements in terms of concrete production. The dense reinforcement of the foundations and pumping in dozens of meters in height, required the use of highly fluid concrete, but extremely robust in terms of consistency and thixotropy. The concrete had to be pumped and remain cohesive after intense stress due to friction & heat buildup. Consequently, there were requirements to design a concrete mix according to strict specifications both during the wet and hardened phase. In addition, wind turbine mounts had to be filled using high strength, fatigue certified, high precision grout.



BUILDING TRUST



SIKA SOLUTION

During the construction of the wind farm, Sika Hellas was the key-supplier in providing all suitable products per application.

Concrete production: Concrete mix, C30/37 strength class and S4 slump category had to exhibit high flowability, feature robustness, cohesiveness and remain workable for a prolonged period. The concrete mix was produced using **Sika® Plastiment®-20 R** retarder and superplasticizer/water reducer **Sika® ViscoCrete® Ultra-450**. The mix should combine flowability and performance stability, as the foundation reinforcement was extremely dense:



Combination of these two admixtures enabled the production of a mix with the required initial flowability and prolonged slump maintainance.



Both admixtures carry CE Mark and Declaration of Performance according to EN 934-2.

After casting, **Sika® Antisol® E** curing compound was applied to the freshly laid concrete surface. **Sika® Antisol® E** is sprayed onto newly cast concrete surfaces and creates a thin film to reduce premature loss of mixing water. Without disturbing the setting process, concrete cures smoothly, in order to achieve its optimum and designed properties. **Sika® Antisol® E** is certified according to ASTM C 309-81 regarding its performance for preventing premature concrete water loss during the curing-hardening phase.



After hardening, on the concrete surfaces the 1-component, anionic asphalt emulsion **Igol®-A** was applied.



High performance precision grouting & joint filling: Structural void filling between grouting base plates and metal flange of the wind turbine was performed using the 1-component, high precision, fatigue certified for wind towers **SikaGrout®-3200**.

SikaGrout®-3200 is a 1-part, cementitious, fast hardening, free flowing grout which is shrinkage compensated and achieves high early and final strengths. It is specifically designed for onshore steel wind tower structural filling of joints and under grouting base plates.

SikaGrout®-3200 can achieve 60MPa compressive strength during the 1st day, while its final strengths are equivalent to C70/85 concrete class (~90 MPa at 28 days). **SikaGrout®-3200** carries CE marking and Declaration of Performance according to EN 1504-6 as anchoring product and is fatigue certified.



SIKA PRODUCTS IN VOLUMES:

Concrete retarder **Sika® Plastiment®-20 R**: 9tn

Concrete superplasticizer **Sika® ViscoCrete® Ultra-450**: 23tn

Concrete curing membrane **Sika® Antisol® E**: 1,7 tn

Asphaltic emulsion **Igol® A**: 4tn

Wind tower precision grout **SikaGrout®-3200**: 25tn



Owner: **PERGANTI AKARNANIKON S.A.**

Contractor of all construction work except supply of wind turbines:
THEMELI S.A.

Our most recent General Sales Terms shall apply.

Please consult the most recent Product Data Sheets prior to any use and processing.

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