

# GEOMELETI



GEOTECHNICAL & CIVIL ENGINEERS & GEOLOGISTS

**RENEWABLE ENERGY PROJECTS PRESENTATION**

**GEOTECHNICAL INVESTIGATIONS AND DESIGN**

**STRUCTURAL DESIGN**





GEOTECHNICAL INVESTIGATION & DESIGN - CONSULTING SERVICES

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**GEOMELETI is a Consulting Engineering Company**, managed and operated by experienced engineers / geologists committed to the art and science of Geotechnical / Infrastructure engineering, always aiming in giving high quality, simple and cost-effective solutions to the projects undertaken.

GEOMELETI, is staffed with experienced Engineers and Engineering Geologists and managed by P. Laskaratos and T. Katsoularis, having extensive experience respectively, among others, in all aspects of Geotechnical / Infrastructure Engineering (Renewable Energy Projects, Railway Projects, Hydraulic works, Road and Bridge design, Buildings / Foundation design, Tunnels, Slope design etc).

The Company has available modern equipment including drilling-rigs, in situ and laboratory testing devices for the Geotechnical Investigations and with the use of specialized software, can give reliable, fast and economical design solutions to all Geotechnical Problems.

The experience of our company in the field of investigations and design of **Renewable Energy Projects**, is extensive and includes, during the past 10 years, a significant amount of similar projects such as Wind Farms, Photovoltaic Plants, Small Hydroelectric Units and Hydrothermal Power Plants.

Our company has the ability to prepare, the **Geological** and **Geotechnical** Investigation and Design, as well as the **Structural** Design of the W/T's Foundations, as well as to provide Consulting Services during the construction phase.

In the following pages indicative Renewable Energy Projects for which the investigations and designs were carried out by our company, are presented.

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>WINDFARM AT “BOURLARI” AREA, EVIA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ITA S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 65.250€
<b>DESIGN PERIOD:</b>	2000 – 2001
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the <b>13</b> Wind-turbines of the Wind-farm, as well as Consulting Services during Construction. Specific issues / difficulties encountered during the works for the wind-farm included the presence of underground water at various foundation locations. Special drainage measures were constructed in order to resolve the issue.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of Coring and Non-coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design, Consulting Services during Construction Phase.



**“BOURLARI” WINDFARM  
EVIA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>WINDFARM AT “VOSKERO” AREA, HERAKLION PREFECTURE, CRETE ISLAND, GREECE</b>
<b>AWARDING AUTHORITY:</b>	DOMIKI KRITIS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 24.863€
<b>DESIGN PERIOD:</b>	2002 – 2003
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the 7 Wind-turbines of the Wind-farm, as well as Consulting Services during Construction period. Specific issues / difficulties encountered during the works for the wind-farm included mainly dense karstic voids and cavities at the limestone substrata. In order to resolve the issue, some Wind-turbines were relocated to safe positions (when possible), while in other cases an injection / grouting schedule was implemented in order to form a firm foundation layer.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of Coring and Non-coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design, Consulting Services during Construction Phase.



**“VOSKERO” WINDFARM  
HERAKLION PREFECTURE (CRETE)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>WINDFARM AT “AGIOS IOANNIS” AREA, LASSITHI PREFECTURE, CRETE ISLAND, GREECE</b>
<b>AWARDING AUTHORITY:</b>	PLASTIKA KRITIS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 20.543€
<b>DESIGN PERIOD:</b>	2002 - 2003
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the <b>8</b> Wind-turbines of the Wind-farm. Specific issues / difficulties encountered during the works for the wind-farm mainly included foundation in heterogeneous materials (rock – soil) which presented danger/risk of differential settlements. The issue was treated with special dimensioning of the foundation in combination with a specialized subsoil consolidation design.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of Coring and Non-coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design.



**“AGIOS IOANNIS” WINDFARM  
LASSITHI PREFECTURE (CRETE)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“SIDIROKASTRO” WINDFARM, SERRES PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	AIOLIKI SIDIROKASTROU S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 70.455€
<b>DESIGN PERIOD:</b>	2005
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the <b>20</b> Wind-turbines of the Wind-farm. Specific issues / difficulties encountered from a geotechnical / geological point of view during the works at the wind-farm included foundation partly in rock and partly in soil which presented danger of differential settlements, foundation in expandable soils and need to design slopes of significant height for the formation of the square. These issues were dealt with, by adopting slope support measures, special dimensioning of the foundation and specialized waterproofing together with a specialized subsoil consolidation design.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of Coring and Non-coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design, Consulting Services during Construction Phase.



**“SIDIROKASTRO” WINDFARM  
SERRES PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>CONSTRUCTION OF A PV PARK TEGEA AREA, ARKADIA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ITA S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 27.000€
<b>DESIGN PERIOD:</b>	2009
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the PV Systems. Specific issues / difficulties encountered during the works for the PV Park, included the foundation on soft subsoil with high ground water level. Foundation measures were proposed including the distribution of the loads via micropiles to a deeper layer consisting of gravely material, which also operates as "conduit" for the discharge of the ground water.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations, Supervision of Field Investigations, Geotechnical Interpretation Report and Geotechnical Foundation Design.



**PART OF "TEGEA AREA" PV PARK  
ARKADIA PREFECTURE**



## PROJECT PRESENTATION SHEET

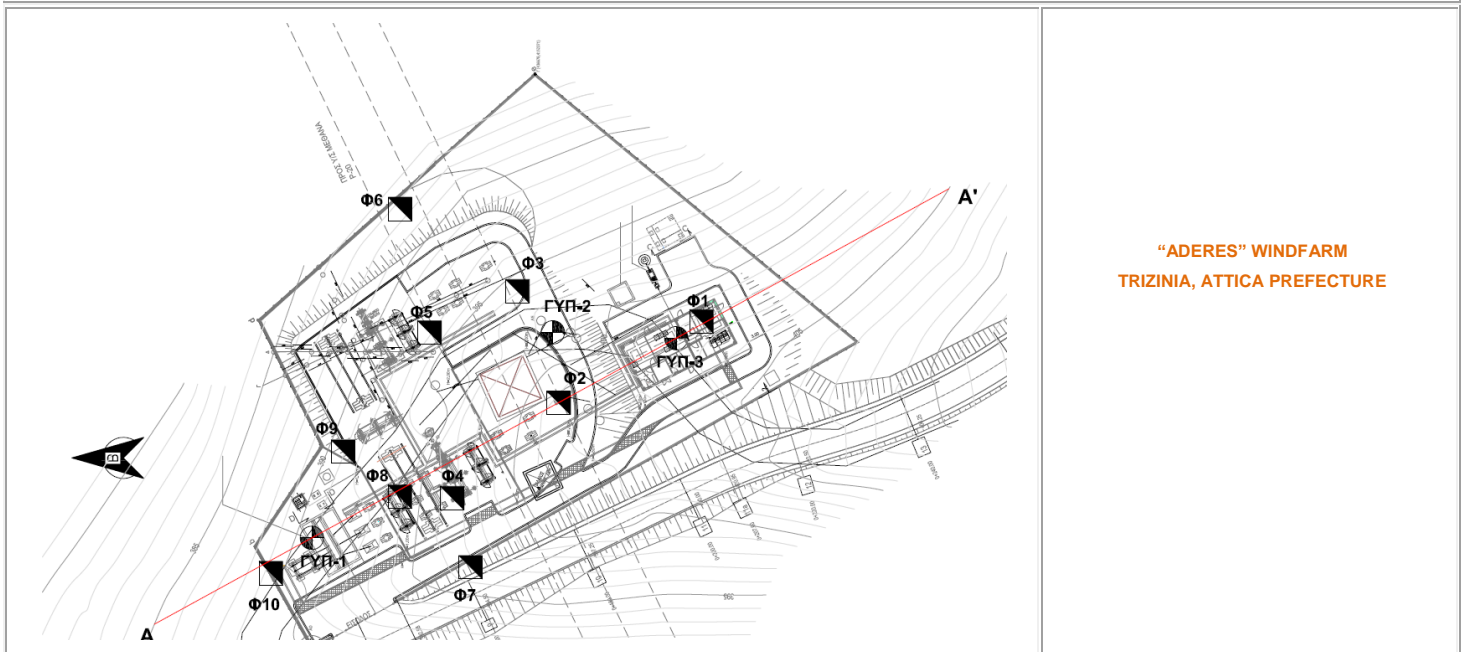
<b>PROJECT:</b>	<b>“ADERES” WINDFARM, TRIZINIA, ATTICA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	BUSINESS ENERGY TRIZINIAS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 35.000€
<b>DESIGN PERIOD:</b>	2010
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the <b>5 Wind-turbines</b> of the Wind-farm. Specific issues / difficulties encountered, from a geotechnical point of view during the works at the wind-farm included existence of karstic voids at the limestone substrata and differential settlement issues at the area of some of the Wind-turbines. The issues were treated by relocating the Wind-turbines at a safe location and design of a specialized subsoil consolidation system.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of ERT and GPR Geophysical Investigations with Coring and Non-Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design.



**“ADERES” WINDFARM  
TRIZINIA, ATTICA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“ADERES” WINDFARM SUBSTATION, TRIZINIA, ATTICA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	NOEL S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 12.200€
<b>DESIGN PERIOD:</b>	2011
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the <b>Substation</b> of the Aderes Wind-farm, including the surrounding area and heavy fencing. Specific issues / difficulties encountered, from a geotechnical point of view included risk assessment of differential settlements due to the existence of backfill under parts of the foundation area, as well as difficulties due to the proximity to steep ground slopes.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations, Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design.



## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“ADERES” WINDFARM, PAVEMENT CHECKING, TRIZINIA, ATTICA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	BUSINESS ENERGY TRIZINIAS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 25.000€
<b>DESIGN PERIOD:</b>	2016
<b>BRIEF DESCRIPTION OF PROJECT:</b>	During the construction phase, execution of quality controls / checks / tests for the pavement of the squares, in order to ensure the safe bearing of the 500t crane, needed for the construction of the Wind-Turbines.
<b>OFFERED SERVICES:</b>	Testing for consolidation, deformation and bearing capacity of the binder and surface course layers of squares A1 – A5 with PLT, DCP and Field Density tests, as well as laboratory testing



**“ADERES” WINDFARM  
TRIZINIA, ATTICA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>SOLAR - THERMAL POWER PLANT OF 25MW, AT "VITSILIA" LOCATION, LASSITHI PREFECTURE, CRETE ISLAND, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ABENGOA SOLAR S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 70.000€
<b>DESIGN PERIOD:</b>	2011 - 2012
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the Solar-Thermal Power Plant and the <b>Solar Power Tower</b> , approximately 200m in height. Specific issues / difficulties encountered from a geotechnical point of view during the works at the power plant included existence of karstic voids at the limestone substrata and differential settlement issues at the area of the Solar Power Tower.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of ERT and GPR Geophysical Investigations with Coring and Non-coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Designs.



**SOLAR POWER PLANT AND WINDFARM  
"VITSILIA", LASSITHI PREFECTURE  
(THIS PICTURE IS OF A SIMILAR  
CONSTRUCTED PROJECT IN SPAIN)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“KOKKINOLAKAS” WINDFARM, ARTA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	BUSINESS ENERGY S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 14.500€
<b>DESIGN PERIOD:</b>	2012 - 2013
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the <b>Preliminary</b> Geotechnical Overview of the Foundation locations for the <b>25</b> Wind-turbines of the Wind-Farm, which is located at an altitude of 1750m on the Pindos mountain ridge. Specific issues / difficulties encountered at the Wind-farm included karstic voids at the limestone substrata, “mixed” foundation formation layers consisting partly of solid and partly of loose formations and existence of very steep slopes in some Wind-turbine foundation areas.
<b>OFFERED SERVICES:</b>	Preliminary Geotechnical Overview of the locations of Wind-turbine foundations, calculation of optimal road access routes to the Wind-farm location, estimation of the Geotechnical Field Investigation to be required in the next stages.



**“KOKKINOLAKA” WIND-FARM AREA,  
ARTA PREFECTURE  
(PHOTOREALISTIC ADDITION OF WTS)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“GERAMPI” WIND-FARM, ARTA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	BUSINESS ENERGY S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 14.400€
<b>DESIGN PERIOD:</b>	2014
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the Preliminary Geotechnical Overview of the Foundation locations of the <b>12</b> Wind-turbines of the Wind-Farm, which is located at an altitude of 1500m on the Pindos mountain range. Specific issues / difficulties encountered from a Geotechnical point of view included karstic voids at the limestone substrata and existence of very steep slopes in some Wind-turbine foundation areas.
<b>OFFERED SERVICES:</b>	Preliminary Geotechnical Overview of the locations of Wind-turbine foundations, calculation of optimal road access routes to the Wind-farm location, estimation of the Geotechnical Field Investigation to be required in the next stages.



**VIEW OF RIDGES WHERE THE WIND-FARM “GERAMPI” WILL BE CONSTRUCTED  
ARTA PREFECTURE  
(PHOTOREALISTIC ADDITION OF WTS)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“GAVROVO” WINDFARM, AETOLOAKARNANIA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	BUSINESS ENERGY S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 57.500€
<b>DESIGN PERIOD:</b>	2014-2015
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the Preliminary Geotechnical Investigations and Foundation Design of the <b>10</b> Wind-turbines of the “Gavrovo” Wind-Farm, as well as its detail foundation design. The wind- turbines area is located at the Pindos mountain range, at an altitude of approximately 1750m. Specific issues / difficulties encountered from a Geotechnical point of view encountered during the works at the “Gavrovo” Wind-Farm included the existence of karstic voids, dolines and sinkholes in the limestone substrata as well as the existence of very steep slopes at some of the foundation locations of the Wind-turbines.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of ERT and GPR Geophysical Investigations with Coring and Non-Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



**VIEW OF SINKHOLE AT THE MOUNTAIN  
RIDGE WHERE THE “GAVROVO” WIND-  
FARM IS TO BE CONSTRUCTED  
AETOLOAKARNANIA PREFECTURE  
(PHOTOREALISTIC ADDITION OF WTS)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“PLATY VOUNO” WIND-FARM, EVIA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	AIOLIKI AIGAIΟΥ S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 19.000€
<b>DESIGN PERIOD:</b>	2015
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the necessary Geotechnical Investigation and Foundation Design of the 2 Wind-turbines of the Wind-Farm. Specific issues / difficulties encountered from a geotechnical point of view during the works at the Wind-farm included existence of karstic voids at the marble substrata and differential settlement issues at the area of the Wind-turbines.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of ERT and GPR Geophysical Investigations with Coring and Non-Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Geotechnical Foundation Design, Slope Stability Design, Consulting Services during Construction Phase.



**VIEW OF THE MOUNTAIN RIDGE WHERE  
THE “PLATY VOUNO” WINDFARM IS TO  
BE CONSTRUCTED  
EVIA PREFECTURE**

**(PHOTOREALISTIC ADDITION OF WTS)**



## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“CHIONAKI” WINDFARM, AETOLOAKARNANIA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	BUSINESS ENERGY S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 30.190€
<b>DESIGN PERIOD:</b>	2016
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the Preliminary Geotechnical Investigations and Foundation Design of the 7 Wind-turbines of the “Chionaki” Wind-Farm, as well as its detail foundation design. The wind- turbines area is located at the Pindos mountain range, at an altitude of approximately 1550m. Specific issues / difficulties encountered from a Geotechnical point of view encountered during the works at the “Chionaki” Wind-Farm included the existence of karstic voids, dolines and sinkholes in the limestone substrata as well as the existence of very steep slopes at some of the foundation locations of the Wind-turbines.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of ERT and GPR Geophysical Investigations with Coring and Non-Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



**VIEW OF PART AT THE MOUNTAIN  
RIDGE WHERE THE “CHIONAKI” WIND-  
FARM IS TO BE CONSTRUCTED  
AETOLOAKARNANIA PREFECTURE  
(PHOTOREALISTIC ADDITION OF WTS)**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“AERAS” AND “AFENTIKO” WINDFARM, THESSALY PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	PUBLIC POWER CORPORATION S.A. - HELLAS
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 73.400€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the Geotechnical Investigations and Foundation Design of the <b>15</b> Wind-turbines of the “Aeras” and “Afentiko” Wind-Farm. The wind- turbines area is located at the Pindos mountain range, at an altitude of approximately 1500m. Specific issues / difficulties encountered from a Geotechnical point of view encountered during the works at the Wind-Farm included the existence of extremely weathered/fragmented rockmass at some of the foundation locations of the Wind-turbines and the possibility of karstic features.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of MASW and GPR Geophysical Investigations with Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



**VIEW OF THE GEOTECHNICAL INVESTIGATIONS EXECUTED AT “AERAS” & “AFENTIKO” RIDGE FOR THE CONSTRUCTION OF THE WIND PARK KARDITSA PERFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“KALOGEROVOUNI - POULOS” WINDFARM, LAKONIA, PELOPONNESE PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ELLINIKI TECHNODOMIKI ANEMOS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 58.250€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the Preliminary Geotechnical Investigations and Foundation Design of the <b>19</b> Wind-turbines of the “Kalogerovouni-Poulos” Wind-Farm, as well as its detail foundation design. The wind- turbines area is located at the southern extension of the Paronass mountain, at an altitude of approximately 950m. Specific issues / difficulties encountered from a Geotechnical point of view encountered during the works at the “Kalogerovouni-Poulos” Wind-Farm included the existence of karstic voids, dolines and sinkholes in the limestone substrata as well as the existence of very steep slopes at some of the foundation locations of the Wind-turbines.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (Non-Coring boreholes, geological mapping, discontinuities orientation measurements), as well as investigations for the Quality Control with DCP of the backfill layer at the Wind Turbines Base Areas, Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



**VIEW OF INVESTIGATIONS FOR THE QUALITY CONTROL OF BACKFILL LAYER AT WIND TURBINES BASE AREA LAKONIA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“GROPES – RACHI GKIONI” WINDFARM, LAKONIA, PELOPONNESE PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ELLINIKI TECHNODOMIKI ANEMOS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 60.300€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out the Preliminary Geotechnical Investigations and Foundation Design of the <b>21</b> Wind-turbines of the “Gropes – Rachi Gkioni” Wind-Farm, as well as its detail foundation design. The wind- turbines area is located at the southern extension of the Parnonas mountain, at an altitude of approximately 850m. Specific issues / difficulties encountered from a Geotechnical point of view encountered during the works at the “Gropes – Rachi Gkioni” Wind-Farm included the existence of karstic voids, dolines and sinkholes in the limestone substrata as well as the existence of very steep slopes at some of the foundation locations of the Wind-turbines.
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (Non-Coring boreholes, geological mapping, discontinuities orientation measurements), as well as investigations for the Quality Control with DCP of the backfill layer at the Wind Turbines Base Areas, Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



**VIEW OF THE INVESTIGATIONS EXECUTED AT THE WIND TURBINES BASE AREAS AT THE MOUNTAIN RIDGE WHERE THE “GROPES – RACHI GKIONI” WIND-FARM IS TO BE CONSTRUCTED LAKONIA, PELOPONNESE PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“PEFKIAS” WINDFARM, VIOTIA PREFECTURE, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ELLINIKI TECHNODOMIKI ANEMOS S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 28.800€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	<p>Our office carried out the Preliminary Geotechnical Investigations and Foundation Design of the <b>3</b> Wind-turbines of the “Pefkias” Wind-Farm, as well as its detail foundation design. The wind- turbines area is located at the “Pekfias” ridges near Thisvi town, at an altitude of approximately 550m.</p> <p>Specific issues / difficulties encountered from a Geotechnical point of view encountered during the works at the “Pefkias” Wind-Farm included the existence of karstic voids and sinkholes in the limestone substrata as well as the existence of very steep slopes at some of the foundation locations of the Wind-turbines.</p>
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of ERT and GPR Geophysical Investigations with Non-Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



**VIEW OF THE CONSTRUCTION OF  
“PEFKIAS” WIND-FARM  
VIOTIA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>GROUNDING OF THE SUBSTATION HV OF NORTH DESFINA</b>
<b>AWARDING AUTHORITY:</b>	ENERCON GmbH, GREEK BRANCH
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 180.000€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office carried out non coring drillings for grounding purposes at the Substation Area of the “Desfina” Wind-Farm. The project area is located at the North part of the “Desfina” peninsula. Specific issues / difficulties encountered concerning the execution and maintenance of the open holes due to the extremely fragmented rockmass encountered in combination with the boreholes depth (270, 280 and 50m).
<b>OFFERED SERVICES:</b>	Programming and execution of three non-coring drilling for the installation of electrodes for grounding purposes.



**VIEW OF THE EXECUTION OF THE OPEN HOLES AT THE SUBSTATION AREA OF “DESFINA” WIND-FARM FOKIDA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“GAVROVO” AND “CHIONAKI” WINDFARM AETOLOAKARNANIA PREFECTURE, GREECE – CONSULTANT SERVICES DURING CONSTRUCTION</b>
<b>AWARDING AUTHORITY:</b>	RESTEC RENWABLE TECHNOLOGIES S.A.
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 20.500€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	Our office was appointed as Geotechnical Consultant during the construction phase of the “Gavrovo” and “Chionaki” Wind Farms at the Pindos mountain range. Specific issues / difficulties encountered from a Geotechnical point of view encountered during the construction at the “Gavrovo” and “Chionaki” Wind-Farm included the existence of karstic voids, dolines and sinkholes in the limestone substrata, the quality control of the square embankments, slope stability issues, etc.
<b>OFFERED SERVICES:</b>	Quality control of the contractor’s geotechnical works during construction, design check of the Geotechnical Interpretation and Study Reports issued by the geotechnical subcontractor.



**VIEW OF EMBANKMENT CONSTRUCTION  
OF WIND TURBINE SQUARE AT THE  
“GAVROVO” WIND-FARM  
AETOLOAKARNANIA PREFECTURE**

## PROJECT PRESENTATION SHEET

<b>PROJECT:</b>	<b>“TRAGOUDISTIS” WINDFARM SIFNOS ISLAND, GREECE</b>
<b>AWARDING AUTHORITY:</b>	ENERCON GmbH, GREEK BRANCH
<b>DESIGNER:</b>	GEOMELETI CONSULTING ENGINEERS
<b>PERCENTAGE ON DESIGN / FEE:</b>	100% / 25.500€
<b>DESIGN PERIOD:</b>	2017
<b>BRIEF DESCRIPTION OF PROJECT:</b>	<p>Our office carried out the Preliminary Geotechnical Investigations and Foundation Design of the 2 Wind-turbines of the “Tragoudistis” Wind-Farm, as well as its detail foundation design. The wind- turbines area is located at the north of Sifnos island, at Hersonisos peninsula, at an altitude of approximately 100m.</p> <p>Specific issues / difficulties from a Geotechnical point of view encountered during the works at the “Tragoudistis” Wind-Farm included the existence of karstic voids, in the marble substrata as well as the existence of very steep slopes near the foundation locations of the Wind-turbines.</p>
<b>OFFERED SERVICES:</b>	Programming of Geotechnical Field and Laboratory Investigations (combination of resistivity measurements with Wenner method and GPR Geophysical Investigations with Non-Coring boreholes, geological mapping, discontinuities orientation measurements), Supervision of Field Investigations, Geotechnical Interpretation Report, Slope Stability Design.



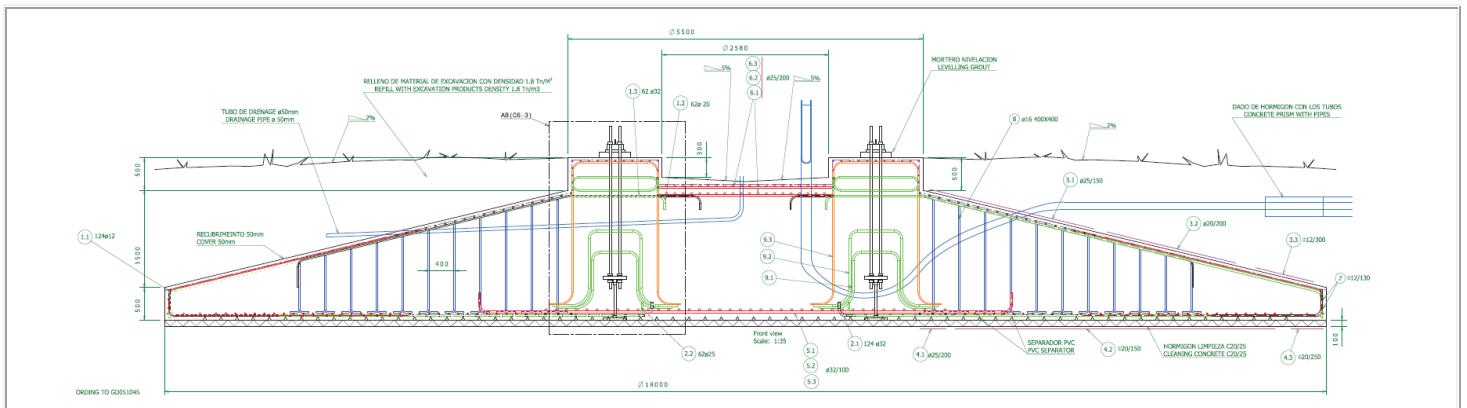
**VIEW OF THE INVESTIGATIONS  
EXECUTED WHERE THE  
“TRAGOUDISTIS” WIND-FARM IS TO BE  
CONSTRUCTED  
SIFNOS ISLAND**



## FOUNDATIONS STRUCTURAL DESIGN

Our office has prepared seven structural designs of Wind Farm Foundations, which include full dimensioning as well as value engineering of the foundations.

The designs, which were based on National (EKOS – EAK) and International Standards (EN), considered the loads applied on the foundation due to the superstructure as calculated by the WT provider.



**FOUNDATION OF SIDIROCASTRO WIND FARM**



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