



GEOTECHNOLOGY IN WIND ENERGY

CAPABILITY STATEMENT

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RAMBOLL

GEOTECHNOLOGY IN WIND ENERGY

Unique integrated client services within the fields of geology, geophysics and geotechnics for wind turbine foundations

Ramboll's specialists within the fields of geology, geophysics and geotechnics work in close collaboration to innovate and illustrate the best design to our clients.

With our knowledge in high quality geotechnical models we can ensure optimized foundation design and identify ground based hazards for offshore wind projects.

We include geological descriptions and geotechnical design parameters in our 3D site models and incorporate statistical site data in our geodatabases.

Ramboll provides services in the following geotechnology software packages: Bentley gINT, Datgel, SMT Kingdom Suite, Bentley Microstation, GeoScene 3D, PDI GRLWEAP, PDI Capwap, FATIMA, Ramboll ROSAP, RONJA, FENRIS, SESAM, SIMULIA Abaqus, ANSYS, LUSAS, PLAXIS 2D&3D, GeoStudio GEOSLOPE, AQWA, GeoGis and many others.

Marine Geology

Understanding the geological setting, provides valuable knowledge of the site's history and spatial variation of geological strata.

Our services include:

- Feasibility studies and preliminary design including ground based desk studies
- Conceptual geological models
- Full 3D geological models

Marine Geophysics and Site Investigations

We plan, execute, supervise and interpret a variety of geophysical and geotechnical surveys including:

- Bathymetric
- Seismic
- Side scan sonar
- UXO Magnetometer
- Geodesy and geographical coordinate systems
- Cone Penetration Test
- Offshore Geotechnical Drillings

Marine Geotechnics

Our geotechnical expertise includes:

- Planning and specification of soil investigations
- Tender documents for soil investigations
- Assistance to procurement of soil investigations in standard contracts FIDIC, LOGIC, ICE ect.
- Certifying body & authority contacts
- Clients representatives on soil investigations
- Planning and specification for laboratory testing of soil samples
- Soil investigation interpretation
- Determination of design soil parameters
- Scour protection
- Evaluation of noise from pile driving
- Supervision of pile driving
- Probabilistic Seismic Hazard Assessment
- Seismic site response analysis
- Liquefaction assessment
- Cable burial studies

Geotechnical Design

Ramboll has a strong focus on introducing advanced design methods to optimise our offshore foundation designs. Services include:

- Choice of foundation concepts
- Monopile geotechnical design including e.g. PISA methodology
- Jacket pile design including CPT-based methods
- Pile design in rock
- Suction bucket design in installation and operation
- 2D&3D FE modelling
- Cyclic loading and cyclic degradation
- Driveability and driving induced fatigue analysis of steel piles
- Pile bearing capacity from pile driving analysis (PDA)
- Site Assessment for jack-up vessel operations
- Calculations of leg penetration and evaluation of punch-through risk for jack-up platforms
- Analysis of interaction between foundations and jack-up footprints

A large offshore wind turbine dominates the foreground, with several others visible in the distance across a blue sea under a clear sky. The turbine has a white tower and nacelle, and yellow-painted base. The blades are long and white, extending outwards.

WHO WE ARE

Ramboll has provided soil information for more than 60% of the existing offshore wind farms in the world.

Furthermore, we have 30 years of offshore experience within the fields of geotechnology from the oil and gas industry mostly in the North Sea.

The Ramboll Group employs 15.000 dedicated specialists. We are a leading knowledge-based company operating in a broad international context from 300 offices around the world. We provide engineering, consultancy, project development, and operating services within the areas of Buildings, Transport, Planning & Urban Design, Water, Environment & Health, Energy, Telecom and Management Consulting.

A large yellow offshore wind turbine structure is under construction in the ocean. The structure has multiple levels with railings and a crane. A sign on the side reads "TH SS". In the background, several other wind turbines are visible on the horizon under a clear blue sky.

CONTACT

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