ONSHORE WIND – CIVIL WORKS DESIGN AND ENGINEERING

Civil works construction forms the basis for reliable, successful & cost-effective onshore wind projects. Ramboll provides innovative experts and project managers to cover all phases within the lifecycle of an onshore wind project.

Sustainable and cost-effective solutions for the wind industry are a multidisciplinary challenge. As one of the largest consultancies in northern Europe, Ramboll covers all engineering disciplines from undertaking structural assignments to feasibility studies, detailed engineering and operation and maintenance on already established wind farms.

In addition to the more traditional design services, our range of expertise covers geophysics, ground and storm water management, site preparation and supervision. In combination with a uniform project management approach, it allows us to act as a one-stop-shop within expert services of civil works design and implementation.

Experience and competences
Ramboll has more than 30 years of experience in the wind industry. By working across cultures and geographical regions, Ramboll has developed valuable knowledge, enabling us to provide optimal and cost-efficient solutions in a constantly developing market. We educate our project managers to deliver world class project management. Management of processes and stakeholders becomes increasingly complex, leading to a higher demand for project management skills.

With more than 15.000 experts in more than 300 offices worldwide, we aim at providing local presence together with our global knowledge and expertise.

Innovation and development
At Ramboll it is part of our culture to be open-minded and we interact with our clients and follow the market closely to understand future demands. The combination of having highly skilled people, an advanced pool of professional software and a creative mind-set in-house, allows us to be a preferred partner in development projects.

Full-range service provider
Ramboll is an international full-range service provider. This is particularly useful when a project encounters unexpected obstacles.

We possess all the required competences in-house, which enables us to quickly present alternatives or assistance to the client and deal with any emerging issues.

For further information, please visit www.ramboll.com or contact us directly:

CONTACT
Thomas Brink Laursen
Business Development Director
Wind and Towers
Tel +45 5161 6853
THBL@ramboll.dk

Geotechnical services

Ramboll provides geotechnical and geophysical services. We see expert geotechnical understanding as a vital part of the civil works, to obtain accurate boundaries for the structural design. Our structural engineers and geotechnical engineers are working closely together to ensure solid and economical design solutions.

Through our work in the Nordics, Ramboll has built up a solid knowledge in rock engineering and has provided a significant amount of rock anchored solutions to the wind industry.

Ramboll has expert knowledge for geotechnical studies and design within the following areas:

- Ground survey programs and execution of necessary surveys
- Geotechnical calculations (stability, settlement, bearing capacity, etc.)
- Laboratory tests
- Geotechnical maps and section drawings
- Defining level of ground water and planning of drainage
- Geo-structures

Foundation design

Throughout the years, Ramboll has built up specialised competencies to provide our clients with highly efficient and site-specific solutions for wind projects.

By constantly challenging codes and standards and development of innovative solutions for gravity and rock-anchored foundations, we are actively contributing to lowering the levelised cost of energy.

Design of roads and crane pads

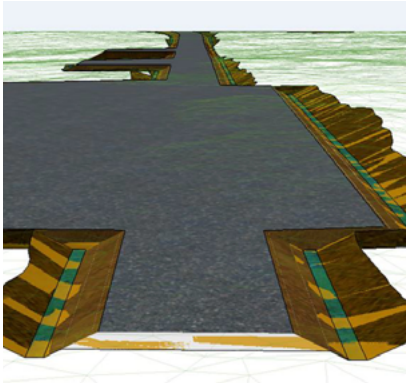
For the design of roads, crane pads and substructures, Ramboll offers a full range of design services.
In our design work, we often utilise our 3D design software to provide our clients with a good insight on the plans during the design process. This design method also enables prompt changes to the design at any time during the construction. The optimised road and crane pad layout is key to significant costs savings. To ensure the feasibility of vertical and horizontal geometry of the layout plans for long blade transports, we use a simulation tool for swept path analysis.

Masts and towers

Since the founding of the company in 1945, Ramboll has been heavily involved in the design of masts and towers for various applications.
We contribute to national and international standards in this area.
For masts and towers, Ramboll is actively engaged in the wind industry.
Our focus covers structures for meteorological measurements and development of innovative wind turbine tower concepts.

Innovative tower and foundation solutions

Ramboll is constantly developing innovative solutions in close cooperation with our clients. We are always open to discuss new solutions and ideas with our clients, in support of further developing the market.



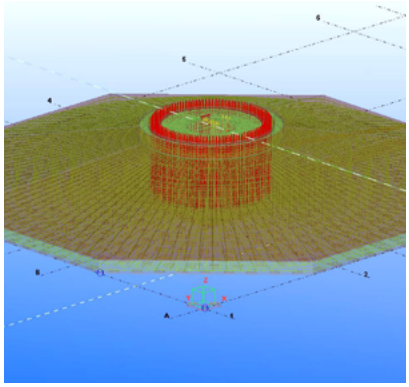
METSÄLÄ WIND FARM CIVIL WORKS DESIGN

CLIENT
EPV Tuulivoima Oy

LOCATION
Finland

PERIOD
2016

SERVICE PROVIDED
Detailed design of civil works incl. cost-efficient site specific solutions for roads and hardstands for 34 WTG including geotechnical surveys.



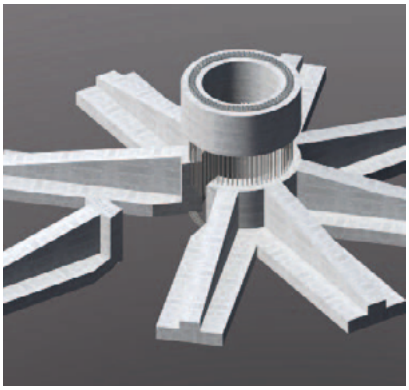
DEVELOPMENT OF FOUNDATION CONCEPTS FOR ONSHORE WIND TURBINES

CLIENT
Peikko Group Oy

LOCATION
Global markets

PERIOD
2009–2019

SERVICE PROVIDED
Design of innovative gravity based foundation concepts incl. rock anchor, anchor bolt, anchor plate and load spreading plate designs for different wind turbine models.



DEVELOPMENT OF PREFABRICATED WTG FOUNDATION

CLIENT
LafargeHolcim

LOCATION
Hamburg, Germany

PERIOD
2015–2017

SERVICE PROVIDED
Basic design, prototype design and development lead of innovative prefabricated concrete foundation.