

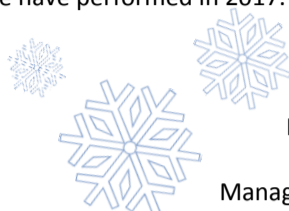
Season's greetings from Norway

Dr.techn.Olav Olsen aims to be in the forefront of the development within structural, marine and civil engineering.

As part of our project portfolio we of course carry out more "conventional" projects that primarily depend on solid and sound engineering and cooperation skills. However, also in 2017 we have performed a large number of cutting-edge activities, for example in the fields of digitization, advanced analyses and in the development of new solutions, calculation tools and methodologies. In addition, we have continued to invest significantly in R&D and competence building. The purpose is not technology in itself - although it is always motivating for an engineer! - but that enables us to create value for clients and end users, and ultimately, contribute to the development of society.

Below we have briefly presented some of the many exciting projects we have performed in 2017. You can find more information on our website - or by following us on Facebook and LinkedIn.

I wish you a joyous holiday season and a prosperous new year!



Kind regards
Olav Weider
Managing Director



Photo: Svalbard Global Seed Vault/Statsbygg

Ports and Industry:

The business area presented a broad variation of projects throughout 2017. Floating quays, industrial buildings and wave-analysis for ports

and coastal facilities are amongst the projects we have worked on this year. Svalbard Global Seed Vault is an extraordinarily building, designed and built to secure future life on earth. For us one of the most prestigious projects in 2017. Dr.techn. Olav Olsen was chosen by Statsbygg based on our unique experience and high competence with durable concrete structures in rough environmental conditions. The seed vault is a very important project due to its purpose being securing the worlds biological gene material for future generations. The project is being developed for Statsbygg in cooperation with ECT, E&H, NGI, Instanes Polar and Snøhetta.



Ill: NPRA/Via Nova

Infrastructure:

Infrastructure is an expanding business area in Olav Olsen, and again we can look back on a busy year with interesting and challenging projects. Our special expertise within ultra-long

bridges has led to yet new fjord crossing studies in 2016 and we are currently working on developing crossing solutions for major sites as the Sulafjord, Halsafjord and Rovdefjord. In collaboration with Norconsult, Aker Solutions and Ife, we also participated in a concept optimization of the end anchored floating bridge alternative for the approx. 5 km wide Bjørnafjord. The group achieved significant cost savings and made an important contribution to future realization. Among projects on 'dry land' the new E16 highway between Nymoene - Olum is emphasized, in which OO is engaged in both 2 sections with development planning and client consulting for Design & Build, respectively.



Foto: Hebronproject.com

Offshore/ Oil & Gas:

We have had an extensive cooperation with Technip in 2017, developing concrete floater concepts for arctic applications for Lundin and OMV. One of the concepts was recently verified - by CFD and model tests in

Canada, all with excellent results as expected. In cooperation with Kværner and Technip we have developed a spar-floater for Canadian prospects for Statoil. Further, we have been working a lot on modifications, verification and tie-ins on existing platforms like Troll A, Heidrun/Zidane and Gullfaks with Kværner and Aibel. The Hebron platform was successfully installed in June 2017 and achieved first oil on Nov 27th. OO participated in the Civil Engineering team in St John's, the Construction team at Bull Arms site in Newfoundland and the DNV-GL verification team in Oslo.



Photo: Fishfarming Innovation

OO FUTURUM: Fishfarming:

The world needs food, and Norway does not manage to increase the production of salmon, for reasons closed bucket farming

solves. The picture shows the first closed concrete fish farming bucket in the world, developed and designed for Fishfarming Innovation. The experience is very good, for the salmon and for the people working on the bucket. Our experience from offshore is valuable, but not enough. Fortunately we also have experience with design of innovative structures in general, ordinary and inexpensive structures, and advanced design.



Academic and social activities:

As in previous years, we also conducted a number of social and academic activities in 2017. We have participated in skiing-, and soccer tournaments, terrain rides, shared training sessions, cycling to work competition, OO Grand Prix on bike, and conducted a number of professional and cultural joint activities. "Young in OO" has had their own tours and events. The annual mountain hike, was held in beautiful Aurlandsdalen. A beautiful hike in an exciting and - for some, challenging terrain ☺



Illustration: LPO Arkitekter/Team Veidekke

Buildings/Innovation competition Ulven:

The Ulven Area development is one of OBOS largest development projects. In total, there can be about 3,000 homes. The

innovation competition was first launched on Byggedagene in 2016 and OBOS's goals with the competition: Developing affordable housing without compromising on living and housing quality. To create good living environments with a forward-looking profile, and organize for innovation and industrialization that benefit the customer. We are looking forward to helping achieve these goals when detail design starts in 2018. Together in our team with Erichsen & Horgen, Oras, Stema, Rambøll, Brekke & Strand, Veidekke and LPO Architects.



Photo: Sintef/Dr.techn.Olav Olsen AS

Renewable Energy:

The worlds' first floating windfarm, Hywind Scotland, opened late 2017, and we have contributed significantly to the success of the project with extensive engineering work. The company is now

positioned to take a share in the future floating wind market. A step forward is also the development of our in-house concept OO-Star Wind Floater. As a part of the EC-project LIFES50+ the concept was upscaled to a 10 MW floater and in November the it was subject to extensive testing at the facilities of Sintef Ocean. After successful model testing the OO-Star WF is now qualified for full scale demonstration projects in rough seas. We are now following different leads towards realization of such full scale testing. Bottom fixed wind turbines has in 2017 seen a significant cost reduction and is about to become cost-effective without subsidies. As a result of this we see a growing interest for our GBS and jacket substructures as well as our installation methods.



Dam Reinokvatn, Statkraft/Photo: Thomas Konow, Dr.techn.Olav Olsen

Dams and Hydraulic Structures:

Dr. Techn. Olav Olsen are now well established as a consultant within the field of dams and water resources, delivering all required services, with a

staff of 7. The assignments range from determining dimensioning flood to detailed engineering and construction supervision. In 2017, we have shown that we are at the forefront of the field by performing both probabilistic analyzes and non-linear FE analyzes of dams presented at international peer reviewed conferences.



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Division Trondheim:

By establishing the Trondheim office we have expanded our geographical presence. The Trondheim office was recently given the

responsibility for construction design of Kronetorp Park in Malmø, shown in the picture above. The builder wants to use fibre reinforced concrete, in which we have expertise and experience! The project involves about 40 quarter, and now we are designing quarter three. February 1st, we will move to a new, renovated location. We will then have facilities to welcome new skilled colleagues.