

Financial support for the experimental part of the industrial PhD "Strength of cracked concrete - shear behaviour of arch-shaped members"

The industrial PhD project "Strength of cracked concrete - shear behaviour of arch-shaped members" with the candidate Jens-Christian Kragh-Poulsen is carried out in cooperation between COWI's Marine & Foundation Engineering department, (Jens Mejer Frederiksen and Björn Frettlöhr), DTU Civil Engineering, (Linh Cao Hoang) and Aarhus University, School of Engineering, (Lars German Hagsten and Jakob Fisker). The three-year project will run from 2017 to 2020.

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An un-met need

Arch-shaped concrete members are commonly used in civil and marine structures such as caissons, offshore wind turbine foundations, silos, tunnels, etc. At present, the models for the shear strength of non-shear reinforced members in standards and guidelines are based on empirical formulas, which are calibrated on straight members. These formulas are often used on arch-shaped or thick members, despite the fact that they are not necessarily applicable to either.

Need for experimental data

At present, little experimental data is available on the strength and behaviour of reinforced arch-shaped concrete structures. Furthermore, the knowledge of the influence of crack width and composition of concrete on shear resistance is lacking for all types of structural elements. This industry-focused research project covers these subjects and includes experimental investigations, as neither standards nor guidelines are available.