



## Crossing the Bjørnafjord with a multi-span suspension bridge on floating foundations – Concept Overview

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### Abstract

By combining well proven technology from suspension bridge engineering with offshore deep water technology it is found possible to realize a crossing for the 5 km wide and 550 meter deep Bjørnafjord in the western part of Norway. The proposed concept consists of a three span suspension bridge with two rock anchored towers on each side of the fjord, and two floating TLP (Tension Legged Platform) towers midfjord. The two side spans has a length of 1385 meters, the mid span has a length of 1325 meters, and the floaters are anchored at a depth of 550 meters and 450 meters utilizing a combination of suction and gravity anchors or possibly piled anchors. The floaters can be constructed with concrete or steel and two different shapes are looked upon. The superstructure consists of PPWS (Prefabricated Parallel Wire Strands) main cables, hangers and an aero-dynamical box girder. The effect of different configurations of connections and the introduction of a top tie cable to improve global behaviour in the vertical plane are addressed. Major challenges identified are related to ground conditions, environmental loadings, deep sea operations and maintenance and operation.

**Keywords:** Suspensions bridge, Multi-span, Floating structure, Concept development, Anchors, Tension Legged Platform