# The New Storstrøm Bridge - Construction Tolerances and Precast Structures Installation Challenges

**Marco Raimondi**

*CLO, Andermann Engineering, Denmark*

**Alessandro Toscan**

*Technical Manager, SBJV, Denmark*

**Contact:** raimondi@andermanngroup.com

## Abstract

The construction of the Storstrøm Bridge faced and is facing a number of challenges, to ensure the alignment with design assumptions and project requirements. The main constraints related to tolerances and quality requirement are hereby described together with the strategy implemented to execute works. From the positioning of precast foundations to the erection of the girders a number of constraints pose a challenge to the general contractor (SBJV) since their fulfillment is crucial to ensure that the bridge performance standards are met, the construction program is followed and works disruption does not occur. The geotechnical settlements represent a particular challenge since the natural uncertainties related to their calculation require SBJV to adopt solutions that can accommodate any deviation from the predicted ones. In light of the above, a crucial role is played by advanced planning risk management and monitoring during construction operations.

**Keywords:** bridge construction, construction tolerances, foundation, precast elements, settlements

## 1 Introduction

The new Storstrøm Bridge will replace the existing bridge to satisfy the needs of the future road traffic and of the high-speed rail. The bridge will link the coastal location of Masnedø island in the North with the coast of Orehoved in the South. The Storstrøm Bridge stetches over a sea channel with low depth and is composed by 3 main viaducts, separated by 2 expansion joints. It is supported by 44 standard piers, 1 central cable stayed pylon and 2 abutments. The central cable-stayed bridge features 2 spans of 160m, while the typical 44 spans are 80m long. Fixed piers are the 15S, 14S and 13S (in the south) and 14N, 13N and 12N (north side) and 1C. Expansion joints are present at abutments and pier 6N and 6S.

The construction method foresees the use of prefabricated elements, produced near the final bridge location, for foundations, piers and girders; in order to limit the off-shore castings to some in-situ stiches. These are used as well for compensations of settlements and positioning deviations.

## 2 Typical Construction sequence

### 2.1 Foundations and piers

The foundation caisson of the typical precast piers and of the cable stayed pylon are prefabricated on-shore. The lower part of the pier is executed as well in the precast yard and, when the assembly of the 2 parts is finalized, they are lowered in their final position by means of a catamaran.

The construction method for the typical offshore piers is divided in three main phases, the execution and inspection of gravel bed, the placement of the