

The Gravel bedding for a foundation of the Busan-Geoje Immersed Tunnel

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Summary

The GK immersed tunnel as a part of the Busan-Geoje Fixed Link Project, introduced the immersed tunnel method into Korea for the first time. This challenging project completed in 2010 open a new era to link oceans of the world with advanced technology and safety for future use. One of the most challenging construction item was a Screeded gravel bedding for the Immersed tunnel foundation due to very severe site condition. In order to overcome the severe conditon developed new accurate equipment. The gravel bedding was successfully done within the given tolerance have been verified by survey in the tunnel. We hope the techniques learned from the Busan-Geoje Fixed Link Project can be applied to further projects in the near future.

Keywords: Immersed tunnel; challenging project; screeded gravel bedding; new accurate equipment Introduction

1. Introduction

The Busan-Geoje Fixed Link is an 8.2km long motorway connecting Busan, Korea's southernmost and second largest city, to the island of Geoje where the Korean big two shipbuilding yard locate on with two normal traffic lanes in each direction. This motorway includes a 3,300m immersed tunnel



Fig.1 Overview of Busan-Geoje Fixed Link

which is one of the longest immersed tunnel in the world and two cable-stayed bridges each of 2km in length. The immersed tunnel consist of 18 elements and each element is approximately 180m long. The standard tunnel elements E1 to E16 have exterior dimensions of 26.46m width and 9.97m height. The width of element 17 to 18 increased to 28.46m because of climbing lane. This tunnel elements are prefabricated of reinforced concrete in a temporary dry dock and are towed to the site and lowered into final position in a dredged trench and are placed on a screeded gravel bed directly without temporary support.

The site locates in an exposed offshore, which is subjected to strong winds, large swell waves and strong tidal currents. These conditions together with the tunnel being at a deepest immersed tunnel ever built and the foundation condition is consisting of a very soft, normally to slightly over-consolidated marine clay, makes the project unique and one of the most challenging immersed tunnels ever built. Due to these conditions, there is no choice but to have very strict accuracy for operations such as trench dredging, gravel bedding and backfilling works that could induce differential settlement.