IN-LB	Inch-Pound Units
SI	International System of Units

Design and Construction of Fixed Offshore Concrete Structures—Guide

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This document is a guide for the design and construction of fixed reinforced and prestressed concrete structures for service in a marine environment. Only fixed structures that are founded on the seabed are covered.

Contents include materials and durability; dead, deformation, live, environmental, and accidental loads; design and analysis; foundations; construction and installation; and inspection and repair. The two appendixes discuss environmental loads such as wave, wind, and ice loads in detail, and the design of offshore concrete structures for earthquake resistance.

Keywords: concrete construction; cracking; dynamic loads; earthquakes; earthquake-resistant structures; fatigue; foundations; gravity-based structure(s); grouting; harbor structures; ice; inspection; marine; offshore structures; platform; post-tensioning; prestressed concrete; slipforming; underwater construction; waves.

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CHAPTER 1—GENERAL

1.1—Introduction

Concrete structures have been constructed and used all over the world, including for fixed offshore structures. As concrete and construction technology continues to advance, fixed concrete structures are increasingly being used in areas with relatively shallow water depths and/or regions subjected to extreme waves and ice/iceberg impact loads. This guide summarizes considerations for the design and construction of fixed offshore concrete structures. Widianto et al. (2016, 2019) described distinctive characteristics of offshore concrete gravity-based structures (GBSs) compared to typical buildings and bridges.

Where adequate data are available, specific recommendations are made, whereas in less developed areas, particular points are indicated for consideration by the designer. The design of offshore structures requires much creativity from the designer, and it is intended that this guide encourage creativity and continuing research advancements in the development of structures that are safe, serviceable, and economical. Widianto et al. (2018) presents innovative design and effective execution method in one of the recent offshore structures supported by concrete GBS.

1.2—Scope

This guide is intended to be used for the design of fixed concrete structures for service in a marine environment.