

Compression Performance of Non-dispersible Concrete Columns

Wei-qiu ZHONG

Lecturer, Ph. D.
Dalian University of
Technology
Dalian, China
zhongweiqiu3000@yahoo.com.cn

Wei-qiu ZHONG, born 1974, received his civil engineering degree from Dalian University of Technology

Ming-shu GANG

Master Candidate
Dalian University of
Technology
Dalian, China
gangmingshu@163.com

Ming-shu GANG, born 1987, is studying in Dalian University of Technology

Hui-tao REN

Associate Professor, Ph. D.
Dalian University of
Technology
Dalian, China
772033829@qq.com

Hui-tao REN, born 1973, received his civil engineering degree from Dalian University of Technology

Summary

A large number of non-dispersible underwater concrete materials will be extensively used in works which span over rivers and sea, so it is important to study the performance of non-dispersible underwater concrete structures. Non-dispersible underwater concrete is the concrete mixing with special additives-anti-washout admixture, which is a kind of water-soluble polymers with long-chain structure and strong absorption capacity. In the present paper, the axial and eccentric compression performance of non-dispersible underwater concrete columns were experimentally investigated. The failure modes and loading capacity of the columns of non-dispersible underwater concrete were mainly discussed. The experimental results showed that the compression performance of non-dispersible underwater reinforced concrete columns and the common reinforced ones are similar in some aspects.

Keywords: non-dispersible underwater concrete; column; axial compression; eccentric compression.

1. Introduction

Non-dispersible underwater concrete is described as tremie concrete, is a new type concrete which can be poured underwater and whose aggregate and cement slurry separate in water is not like ordinary concrete.^[1]

In recent years, the construction of underwater projects is developing prosperously, concrete is still one of the most important and largest demand building materials in underwater engineering and the performance of underwater concrete will directly affect the quality of underwater engineering. Therefore, non-dispersible underwater concrete has increasingly become a research focus of scholars and engineers. At present, a number of researchers at home and abroad carried out a series of studies, and made a very significant achievement^{[2]-[4]}. Previous scholars have only focused on the research of material performance of non-dispersible underwater concrete^[5], non-dispersible underwater concrete beams have been reported abroad, but the literature of non-dispersible underwater concrete columns is rare. Because of the differences of mechanical property between non-dispersible underwater concrete and ordinary concrete, it's necessary to study the mechanical performance of columns. The articles will use the experiment and analysis way which study the mechanical performance of ordinary concrete columns, discuss the mechanical performance features of non-dispersible underwater concrete columns with the experiment of axial compression and eccentric compression and provide the reference to the research of the non-dispersible underwater concrete.