

ICS 27.140
CCS P 59

DL

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

DL/T 5786-2019

Hydraulic plastic concrete mix design procedure

水工塑性混凝土配合比设计规程

(English Translation)

Issued on: June 4, 2019

Implemented on: October 1, 2019

Issued by: National Energy Administration

Table of Contents

- 1 General
- 2 Terms and Symbols
 - 2.1 Terminology
 - 2.2 Symbols
- 3 Basic regulations
- 4 Raw materials
- 5 Preparation strength and basic parameters
- 6 Determination of mix ratio
 - 6.1 Calculation
 - 6.2 Trial, adjustment and confirmation
- Explanation of terms used in this regulation
- List of Reference Standards
- Article description
- 1 General
 - 1.0.1 In order to standardize the design of plastic concrete mix ratio for hydropower and water conservancy projects, this specification is formulated.
 - 1.0.2 This regulation is applicable to hydropower and water conservancy projects.
 - 1.0.3 The mix ratio design of plastic concrete shall not only comply with this regulation, but also comply with the current relevant national standards.
- 2 Terms and symbols
 - 2.1 Term
 - 2.1.1 Plastic concrete

Foreword

This Regulation is based on the "Notice of the National Energy Administration on Issuing the First Batch of Industry Standards (Revision) Plans in the Energy Sector in 2013" (Guoneng Technology [2013] No. 235).

In the process of compiling this regulation, extensive investigations, studies and special tests have been carried out, and the mix ratio of plastic concrete at home and abroad has been summarized.

The design method and test data of the company absorb the latest research results of plastic concrete and refer to the relevant content of relevant standards.

The main technical contents of this regulation include. basic regulations; raw materials; preparation strength and basic parameters; determination of mix ratio.

This regulation was proposed by the China Electricity Council.

This regulation is under the jurisdiction of the Hydropower Construction Standardization Technical Committee of the Electric Power Industry.

The main author of this regulation. China Gezhouba Group Co., Ltd.

Gezhouba Group Testing and Inspection Co., Ltd.

The main writers of this regulation. Zhang Zhenyu, Chen Weilie, Zhu Shengmin, Jiang Juanmei, Jinyou, Chen Zhiyuan, Wu Weijian Nie Weiping Xu Na Zeng Wei Wang Jin Shi Xiaogang Zhu Huirong Main reviewers of this regulation. Sun Laicheng, Ji Guojin, Wang Yi, Chu Yuexian, Mei Jinyu, Gao Xiang, Zhang Hong Li Zhigang Wu Gao meets Wu Xu Wang Jun Zhong Yanxiang Yang Tao He Xiaoxiong Yao Fuhai Lin Peng Zhu Star Lu Zhilin Tan Kaiyan Ding Kai Wang Pengyu Cheng Zhihua Lu Qian If you have any comments and suggestions during the implementation of this regulation, please feedback to the Standardization Management Center of the China Electricity Council (Address.

No. 1, Ertiao, Baiguang Road, Beijing, Postal Code. 100761)

Table of contents

1 General...1

2 Terms and Symbols...2

2.1 Terminology...2

2.2 Symbols...2

3 Basic regulations...3

4 Raw materials...4

5 Preparation strength and basic parameters...5

6 Determination of mix ratio...7

6.1 Calculation...7

6.2 Trial, adjustment and confirmation...7 Explanation of terms used in this regulation...8

List of Reference Standards...9 Article description...10

1 General

1.0.1

In order to standardize the design of plastic concrete mix ratio for hydropower and water conservancy projects, this specification is formulated.

1.0.2

This regulation is applicable to hydropower and water conservancy projects.

1.0.3

The mix ratio design of plastic concrete shall not only comply with this regulation, but also comply with the current relevant national standards.

2.1.1 Plastic concrete

The high-fluidity concrete mixed with bentonite, clay and other materials has low cement content, low strength and low elastic modulus.

2.1.2 Cementing material

In the composition of plastic concrete, the general term for fine-grained raw materials such as cement, bentonite, clay, and fly ash.

2.1.3 Water-binder ratio

The mass ratio of mixing water and cementitious material in plastic concrete.

2.2 Symbols

f_{cu} --The compounding strength of concrete, MPa;

f_{kcu} --the standard value of cubic compressive strength of concrete for design age, MPa;

t --Probability coefficient;

C_v --the dispersion coefficient of intensity;

P --Concrete strength guarantee rate, %.

3 Basic regulations

3.0.1

Prior to the design of the plastic concrete mix ratio, the origins of raw materials such as cementitious materials, admixtures, sand and gravel aggregates and mixing water should be collected, Variety, quality and other information, if necessary, conduct tests.

3.0.2

When designing the plastic concrete mix ratio, relevant engineering design data should be collected to clarify the following design requirements;

1 Concrete strength grade and strength guarantee rate;

2 The elastic modulus, permeability drop, permeability coefficient and other performance

indicators of concrete;

3 The workability of concrete;

4 Maximum particle size of aggregate;

5 Other requirements.

3.0.3

When designing the plastic concrete mix ratio, the mix ratio parameters should be selected and selected according to the performance of the raw materials and the technical requirements of the concrete.

Calculate and determine after trial matching and adjustment in the laboratory. The mix ratio determined by the indoor test should be based on site conditions and economy.

Necessary adjustments.

3.0.4

Plastic concrete with special design requirements shall be subject to special demonstration.

4 Raw materials

4.0.1

Cement, fly ash and other mineral admixtures, aggregates, admixtures and mixing water used for plastic concrete shall comply with the current industry standard "Water the requirements of DL/T 5144 in the Construction Code for Industrial Concrete.

4.0.2

The quality of bentonite and clay for plastic concrete shall conform to the current industry standard "Construction Rules for Concrete Impervious Walls of Hydropower and Water Conservancy Engineering Fan" DL/T 5199.

4.0.3

Medium-coarse sand should be used for plastic concrete, and the maximum size of coarse aggregate should not be greater than 20mm. When the maximum particle size of coarse aggregate is greater than 20mm, the amount of aggregate larger than 20mm should not exceed 50% of the amount of coarse aggregate, and the maximum particle size shall not exceed 40mm.

5 Preparation strength and basic parameters

5.0.1

The mixed strength of plastic concrete is calculated according to formula (5.0.1-1).