

ICS 27.140
CCS P 59

NB

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

NB/T 10871-2021

Replacing DL/T 5016-2011

Code for design of concrete face rockfill dams

混凝土面板堆石坝设计规范

Issued on: December 22, 2021

Implemented on: June 22, 2022

Issued by: National Energy Administration of the PRC

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Foreword

This document was issued on 22 December 2021 by the National Energy Administration of the PRC and takes effect on 22 June 2022.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 27.140, Chinese classification P 59.

It replaces DL/T 5016-2011, which is superseded.

This code has been revised in accordance with the requirements of the Notice of the General Department of the National Energy Administration on Issuing the 2017 Plan for the Formulation and Revision of Industry Standards in the Energy Sector and the Plan for the Translation and Publication of English Versions (Guo Neng Zong Tong Ke [2017] No. 52). The drafting group carried out extensive investigation and research, conscientiously summarized practical engineering experience, and completed the revision on the basis of a wide solicitation of comments.

The main technical contents of this code are: general provisions; terms and symbols; basic requirements; project layout and dam zoning; filling materials and filling criteria; plinth; face slab; joints and waterstops; foundation treatment; analysis and calculation of the dam body; seismic measures; staged construction and dam heightening; safety monitoring; construction requirements; and initial impoundment, operation and maintenance.

The main technical contents revised in this code are listed in the paragraphs that follow.

The terms dam zoning and horizontal joint have been added.

Requirements relating to extra-high dams with a dam height of 200 m and above have been added.

Design requirements have been added for the use of extruded concrete side walls and of reversed-form mortar slope protection on the upstream side of the cushion material.

Design requirements for the toe wall have been added.

A new chapter on construction requirements has been added.

A new chapter on initial impoundment, operation and maintenance has been added.

The scope of application and the classification of dams by height have been revised.

The gradation and filling requirements for dam materials have been revised.

The structural design requirements for face slab jointing, reinforcement arrangement and related items have been revised.

The requirements for the configuration of joints and waterstops and for the corresponding materials have been revised.

The requirements and methods for the calculation of stress and deformation of the dam body and of the face slab have been revised.

This code is under the administration of the National Energy Administration. China Renewable Energy Engineering Institute proposed this code and is responsible for its routine administration. The Energy Industry Standardization Technical Committee for Hydropower Investigation and Design (NEA/TC15) is responsible for the interpretation of its specific technical contents. Comments and suggestions arising during implementation should be sent to China Renewable Energy Engineering Institute (address: No. 2 Liupukang Beixiaojie, Xicheng District, Beijing; postcode 100120).

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1 Scope

NB/T 10871-2021 is the Chinese design code for concrete face rockfill dams, replacing DL/T 5016-2011. A concrete face rockfill dam carries water against a thin reinforced concrete slab laid on the upstream face of a compacted rockfill embankment, and almost everything in its design follows from the fact that the slab must deform with the fill without cracking. The code opens with general provisions and a full set of defined terms and symbols, then sets the basic requirements by dam class and height. It goes on to the project layout and the zoning of the embankment - cushion, transition, main and downstream rockfill - with the gradation, placement thickness and compaction required of each zone, and the criteria for accepting the rockfill materials. The face slab itself is treated in detail: thickness, reinforcement, panel widths, the construction sequence and the timing relative to embankment settlement. The perimeter joint and the vertical and horizontal joints receive their own treatment, with the waterstop systems that make them work. The plinth and its foundation, the grout curtain beneath it, the toe slab and the dam crest and parapet wall complete the water barrier. Stability and stress-deformation analysis, seismic design, the flood-handling arrangements during construction, slope protection, and the instrumentation installed to monitor the dam in service close the document. It applies to the design of concrete face rockfill dams on hydropower and water resources projects in China.

1.0.1 This code is formulated in order to standardize the design of concrete face rockfill dams and to make such design safe and reliable, economically rational, technically advanced, environmentally friendly and resource-saving.

1.0.2 This code applies to the design of concrete face rockfill dams for newly built,