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NB

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

NB/T 10077-2024

Replacing NB/T 10077-2018

Code for design of rock-filled concrete dams

堆石混凝土坝设计规范

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Foreword

This document was issued on 24 September 2024 by the National Energy Administration of the PRC and takes effect on 24 March 2025.

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It replaces NB/T 10077-2018, which is superseded.

In accordance with the requirements of the Notice of the General Department of the National Energy Administration on Issuing the 2022 Plan for the Development and Revision of Energy Industry Standards and the Plan for the Translation of Foreign-Language Versions (Guo Neng Zong Tong Ke Ji [2022] No. 96), the code drafting group carried out extensive investigation and research, conscientiously summarized practical experience, referred to relevant advanced domestic and foreign standards, and revised this code on the basis of wide solicitation of opinions.

The main technical contents of this code are: general provisions, terms, basic requirements, material requirements, performance indicators of rock-filled concrete, rock-filled concrete gravity dams, rock-filled concrete arch dams, construction requirements, and initial impoundment, operation and maintenance.

The main technical contents of this revision are as follows.

This code replaces the provisions on the design of rock-filled concrete contained in the Technical Guideline for Rock-Filled Concrete Dam Construction NB/T 10077-2018. Since the Specification for Rock-Filled Concrete Construction in Hydropower and Water Resources Projects DL/T 5806-2020 entered into force on 1 February 2021, this code does not include the construction provisions of the Technical Guideline for Rock-Filled Concrete Dam Construction NB/T 10077-2018.

Two chapters, Construction Requirements and Initial Impoundment, Operation and Maintenance, have been added.

The conditions of application of platy rock blocks and of soft rock have been added.

The provision on full-bay placement of arch dams without transverse joints has been added.

Requirements such as the gradation of the rock, the water absorption rate and the crushing index value have been added.

The test method for the filling of placed rock-filled concrete has been added.

The digitalized monitoring method for the construction process of rock-filled concrete has been added.

The requirements for the grain size of the rock have been revised.

The self-compacting performance requirements for high performance self-compacting concrete have been revised.

The provisions on the spacing of the joints dividing the body of rock-filled concrete dams have been revised.

The relevant provisions on seepage control of the dam body have been revised.

This code is administered by the National Energy Administration; it is proposed and routinely managed by China Renewable Energy Engineering Institute; the Energy Industry Standardization Technical Committee for Hydropower Investigation and Design (NEA/TC15) is responsible for the interpretation of the specific technical contents. Comments and suggestions arising during implementation should be sent to China Renewable Energy Engineering Institute (address: No. Jia 57 and No. Yi 57, Andingmenwai Street, Dongcheng District, Beijing, postcode 100011).

Chief editing organizations of this code: PowerChina Huadong Engineering Corporation Limited and Tsinghua University.

Participating organizations of this code: PowerChina Zhongnan Engineering Corporation Limited; PowerChina Guiyang Engineering Corporation Limited; CHN Energy Dadu River Hydropower Development Co., Ltd.; Beijing Huashi Nagu Technology Co., Ltd.; PowerChina Northwest Engineering Corporation Limited; PowerChina Chengdu Engineering Corporation Limited; Zunyi Water Resources and Hydropower Investigation, Design and Research Institute Co., Ltd.; Hubei Energy Group Co., Ltd.; Huadian Jinshajiang Upstream Hydropower Development Co., Ltd.; State Grid Xinyuan Group Co., Ltd.; Shaanxi Dongzhuang Water Conservancy Hub Project Construction Co., Ltd.

The code was prepared by 28 chief drafters and examined by 19 chief reviewers, whose names are listed in the Chinese foreword of the printed standard.

Publication and Approval Information

Energy industry standard of the People's Republic of China. Code for Design of Rock-Filled Concrete Dams, NB/T 10077-2024, replacing NB/T 10077-2018.

Chief editing department: China Renewable Energy Engineering Institute (Hydropower and Water Resources Planning and Design General Institute).

Approving department: National Energy Administration.

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Announcement of the National Energy Administration

National Energy Administration Announcement No. 3 of 2024.

In accordance with the Standardization Law of the People's Republic of China and the Measures for the Administration of Energy Standardization, the National Energy Administration has approved 384 energy industry standards, including the Code for Design of Rock-Filled Concrete Dams (Attachment 1), the foreign-language versions of 32 energy industry standards, including the Operation code for liquefied natural gas receiving terminal (Attachment 2), and 2 notices of modification of energy industry standards, including the Code for Monitoring of Rock and Soil Mass in Hydropower Projects (Attachment 3), which are hereby issued.

Attachments: 1. Catalogue of industry standards; 2. Catalogue of foreign-language versions of industry standards; 3. Notices of modification of industry standards.

Issued by the National Energy Administration on 24 September 2024. In the catalogue of industry standards, item 1 is standard number NB/T 10077-2024, standard name Code for Design of Rock-Filled Concrete Dams, replaced standard NB/T 10077-2018, date of approval 2024-09-24, date of implementation 2025-03-24.

1 Scope

NB/T 10077-2024 is the Chinese design code for rock-filled concrete dams, replacing the 2018 edition. Rock-filled concrete is a Chinese construction method in which large rock is placed in the formwork first and self-compacting concrete is then poured over it, flowing down to fill every void without vibration. The result is a mass concrete dam with a high proportion of rock, a low cement content and therefore a low heat of hydration, built faster and with less temperature control than conventional mass concrete - which is why the method has spread quickly on medium-height gravity dams. The code sets the general provisions and defined terms and symbols, then the basic requirements by dam class and height. It covers the materials: the rock and its size, shape, strength and cleanliness; the self-compacting concrete and its flowability, segregation resistance and strength development; and the properties of the composite that follow. Design of the dam body comes next - section geometry, stability against sliding and overturning, stress analysis, the interface treatment between lifts, the upstream impervious zone, joints and waterstops, the foundation surface and its treatment, and the galleries and drainage within the body. Temperature control, seepage control, the spillway and outlet works where they pass through the dam, construction requirements and monitoring instrumentation complete the code. It applies to hydropower and water resources projects in China.

1.0.1 This code is formulated in order to standardize the design of rock-filled concrete dams, to ensure the quality of the design, to satisfy safe and reliable operation, and to meet the requirements of environmental friendliness, resource saving, technical advancement and economic rationality.