ICS 27.140
CCS P 59

NB

ENERGY INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

NB/T 35026-2022

Replacing NB/T 35026-2014

Code for design of concrete gravity dams

混凝土重力坝设计规范

Issued on: November 4, 2022 **Implemented on: May 4, 2023**

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Foreword

This document was issued on 4 November 2022 by the National Energy Administration of the PRC and takes effect on 4 May 2023.

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It replaces NB/T 35026-2014, which is superseded.

This code was revised in accordance with the requirements of the plan of the National Energy Administration for the formulation and revision of industry standards in the energy field. The drafting group carried out extensive investigation and research, carefully summarised practical experience, and revised this code on the basis of wide consultation.

This code replaces NB/T 35026-2014 Design code for concrete gravity dams and NB/T 10332-2019, merging the two documents into one.

The main technical content of this code is: general provisions; terms and symbols; layout of the gravity dam; dam profiles and types of release structures; hydraulic design of the release structures; dam concrete; basic rules for structural calculation; design of the dam sections; foundation treatment design; dam detailing; crack prevention and temperature control; monitoring design; construction requirements; and initial impoundment, operation and maintenance.

This code is administered by the National Energy Administration, and the organizations named in it are responsible for the interpretation of the specific technical content.

1 Scope

NB/T 35026-2022 is the Chinese design code for concrete gravity dams on rock foundations, and at 232 pages it is one of the largest single design codes in the energy series. A gravity dam holds back the reservoir by weight alone: it is a wedge of concrete

heavy enough that the water pushing on its upstream face cannot slide it or tip it over. That simplicity is why the type is still built for the biggest projects, and it is also why the design turns entirely on a handful of numbers that must be got right - the shear strength of the rock joints under the dam, the uplift pressure of water working its way into the foundation and trying to float the dam off it, and the temperature of the concrete as it cures. The document is organised around those. It classifies dams as low below 30 m, medium from 30 to 70 m, high above 70 m and extra-high at 200 m and above, then works through the layout, the dam profiles and the release structures, and the hydraulic design of those structures including discharge and energy dissipation, cavitation prevention in high-velocity areas, and the erosion control facilities - with the vocabulary of Chinese energy dissipation practice defined precisely, from the end-flared pier and combined energy dissipation to the distorted and slit-type flip buckets. Dam concrete gets its own clause covering zoning and design criteria, including roller-compacted concrete, the RCC layer joint, the layer placement duration and grout-enriched vibrated RCC. The structural clauses set the limit state framework, then the design of the dam sections by the gravity method, by rigid body limit equilibrium, by finite elements, and the design of prestressed anchors with the design anchoring force, design tension and extra design tension defined. Foundation treatment covers excavation, consolidation grouting, seepage control and drainage, the treatment of fault zones and weak discontinuities, and seepage control in karst. Further clauses cover dam detailing - crest, galleries, joints, waterstops and drainage - crack prevention and temperature control with its criteria and measures, monitoring design, construction requirements and initial impoundment, operation and maintenance. Eight appendices carry the calculations: weir surface curves and pressures, outlet works shape, hydraulic design, sliding stability and stress by the single safety factor method, peak and residual shear strengths of dam and foundation, stress formulae for solid gravity dams, deep-seated sliding stability, and the calculation of temperatures and temperature stresses. It was issued on 4 November 2022 by the National Energy Administration, took effect on 4 May 2023, and replaces NB/T 35026-2014 together with NB/T 10332-2019.

1.0.1 This code is formulated in order to standardise the design of concrete gravity dams, to guarantee the quality of the design, to satisfy the requirements of safe and reliable operation, and to comply with the requirements of environmental friendliness, resource saving, technical advancement and economic reasonableness.

1.0.2 This code applies to the design of concrete gravity dams on rock foundations in newly built, reconstructed and extended hydropower projects.

1.0.3 Concrete gravity dams shall be divided into low, medium and high dams according to dam height, as follows: 1 a dam of height below 30 m is a low dam; 2 a dam of height from 30 m to 70 m is a medium dam; 3 a dam of height above 70 m is a high dam, and among these a dam of height 200 m and above is an extra-high dam.

1.0.4 The reasonable service life of a concrete gravity dam shall comply with the relevant