

ICS 27.140
CCS P 59

NB

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

NB/T 10802-2021

Replacing DL/T 5176-2003

**Code for design of prestressed anchorage for hydropower
projects**

水电工程预应力锚固设计规范

Issued on: November 16, 2021

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Foreword

This document was issued on 16 November 2021 by the National Energy Administration of the PRC and takes effect on 16 May 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It replaces DL/T 5176-2003, which is superseded.

This code has been revised by the code revision group in accordance with the requirements of the Notice of the National Energy Administration on Issuing the Second Batch of Development and Revision Plans for Industry Standards in the Energy Sector for 2014 (Guo Neng Ke Ji [2015] No. 12), on the basis of extensive investigation and research, careful summing up of practical experience, and wide solicitation of opinions.

The main technical contents of this code are: general provisions; terms and symbols; basic requirements; anchorage system design; anchorage for slopes; anchorage for underground caverns; anchorage for hydraulic structures; anchorage test; and safety monitoring.

The main technical contents revised in this code are as follows.

The overall structure of the code has been revised.

The terms for prestressed anchor bolt, installation load and others have been revised.

The protection design of the anchorage system has been revised.

The partial safety factor method used in the former code has been changed to a single safety factor method.

Tension control criteria for the steel strands of prestressed gate piers have been added.

Design content for the anchorage of gate chambers, stilling basins and retaining walls has been added.

Design content for safety monitoring has been added.

The calculation formulas for the stability of the surrounding rock of underground caverns and for the anchorage of rock wall crane beams have been deleted.

The content dealing with foundation anchorage has been deleted.

The content of the former code concerning field tests on the mutual influence of anchoring forces in anchor bolt tests has been deleted.

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

Chief editing organizations of this code: China Renewable Energy Engineering Institute, and PowerChina Northwest Engineering Corporation Limited.

Participating organizations of this code: PowerChina Chengdu Engineering Corporation Limited; PowerChina Beijing Engineering Corporation Limited; PowerChina Kunming Engineering Corporation Limited; Sichuan University; and Beijing Huakeshi Engineering Technology Co., Ltd.

The foreword lists 31 chief drafting personnel and 22 chief reviewing personnel by name; the drafting team is drawn from the chief editing and participating organizations named above.

Publication Data

Standard designation: NB/T 10802-2021, an energy industry standard of the People's Republic of China issued by the National Energy Administration.

Chinese title as printed on the cover, in transliteration: Shui Dian Gong Cheng Yu Ying Li Mao Gu She Ji Gui Fan.

Official English title as printed on the cover and repeated on the title page: Code for Design of Prestressed Anchorage for Hydropower Projects.

Classification data printed on the cover: ICS 27.140, covering hydraulic engineering, and the Chinese classification code P 59; the professional classification letter P appears at the head of the cover block.

Date of issue: 16 November 2021, printed on the cover as 2021-11-16 followed by the Chinese word for issued.

Date of implementation: 16 May 2022, printed on the cover as 2022-05-16 followed by the Chinese word for implemented; the title page repeats the effective date as 16 May 2022.

Replaced standard: this code supersedes DL/T 5176-2003, as stated on the cover under the heading meaning replaces, and confirmed in the industry standard catalogue reproduced in the front matter.

Issuing announcement: National Energy Administration Announcement No. 5 of 2021, dated 16 November 2021, which approved 326 energy industry standards headed by Design Method for Well Structure of Geothermal Wells, 19 foreign language versions of energy industry standards headed by Code for Seismic Design of Hydraulic Structures of Hydropower Project, and 3 amendment notices for energy industry standards. The announcement is issued under the Standardization Law of the People's Republic of China and the Measures for the Administration of Energy Standardization.

Catalogue entry: in Annex 1 of the announcement, the Catalogue of Industry Standards, this code appears as serial number 107, standard number NB/T 10802-2021, replaced

standard DL/T 5176-2003, approval date 2021-11-16 and implementation date 2022-05-16. No adopted international standard number is shown in the catalogue, so the code is an original Chinese document and not an adoption.

Administrative departments recorded on the title page: the chief editing department is the China Renewable Energy Engineering Institute and the approving department is the National Energy Administration.

Publisher: China Water and Power Press, Beijing, 2022.

Structure of the Document

The body of the code is arranged in nine chapters followed by one appendix and three closing items, as set out in the official bilingual table of contents printed in the front matter.

Chapter 1, General Provisions, begins on page 1 and states the purpose, the scope of application, the policy on new technology and the relationship with other standards.

Chapter 2, Terms and Symbols, begins on page 2 and is divided into 2.1 Terms, beginning on page 2, and 2.2 Symbols, beginning on page 4.

Chapter 3, Basic Requirements, begins on page 6 and is divided into 3.1 Basic Data on page 6, 3.2 Anchorage Materials on page 6, and 3.3 Basic Content of Anchorage Design on page 8.

Chapter 4, Anchorage System Design, begins on page 10 and is divided into 4.1 Anchorage Type and Selection on page 10, 4.2 Structural Design on page 10, 4.3 Tensioning Procedure on page 13, and 4.4 Anchorage System Protection on page 14.

Chapter 5, Anchorage for Slopes, begins on page 17.

Chapter 6, Anchorage for Underground Caverns, begins on page 18.

Chapter 7, Anchorage for Hydraulic Structures, begins on page 19 and is divided into 7.1 Anchorage for Prestressed Concrete Pier on page 19, 7.2 Prestressed Loop Anchorage for Hydraulic Tunnel on page 20, 7.3 Anchorage for Concrete Dam on page 21, and 7.4 Anchorage for Other Structures on page 21.

Chapter 8, Anchorage Test, begins on page 23.

Chapter 9, Safety Monitoring, begins on page 24.

Appendix A, Bonding Strength Between Cementing Material and Surrounding Rock, begins on page 25 and supplies the bond strength values used in the design of cemented anchored sections.

The closing items are Explanation of Wording in This Code on page 26, List of Quoted Standards on page 27, and the Addition entitled Explanations of Provisions, which begins on page 29 and forms the commentary to the code.