



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

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Code for mine seismic design of coal industry

煤炭工业矿井抗震设计规范

(English Translation)

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Table of Contents

- 1 General
- 2 Basic regulations
 - 2.1 Fortification classification
 - 2.2 Structural system
 - 2.3 Seismic isolation and energy dissipation
 - 2.4 Materials and Construction
- 4 General plan and off-site roads
 - 4.1 Site selection
 - 4.2 General layout
 - 4.3 Roads and bridges
- 5 Downhole engineering
 - 5.1 General provisions
 - 5.2 Shaft support
 - 5.3 Safety exit
 - 5.4 Underground main drainage
 - 5.5 Lifting facilities
- 6 Mine surface engineering
 - 6.1 General provisions
 - 6.2 Derrick
 - 6.3 Well Tower

1 General

1.0.1

In order to implement the National Earthquake Prevention and Disaster Mitigation Law, implement the policy of putting prevention first, rationally resist earthquakes, mitigate earthquake disasters, avoid casualties, reduce economic losses, and combine the characteristics of the coal industry, this specification is formulated.

1.0.2

This code is applicable to the seismic design of new construction, reconstruction and expansion projects and facilities of mines and coal preparation plants in areas with seismic fortification intensity of 6 degrees and above.

1.0.3

The seismic fortification intensity shall be determined by the current national standard "Zoning Map of Seismic Motion Parameters in China" GB 18306-2015 or the documents issued according to the authority stipulated by the state. For mine and coal preparation plant projects, the seismic fortification intensity should be selected according to the location of the industrial site.

1.0.4

The seismic design of mines and coal preparation plants shall meet the following requirements.

- 1 Focused and coordinated with each other, it is beneficial to post-earthquake recovery.
- 2 To prevent secondary earthquake disasters such as submerged mines, fires and explosions during major earthquakes.
- 3 Ensure the safety of the escape route and its water, electricity and ventilation facilities.

1.0.5

Mine and coal preparation plant projects should be designed with new concepts and concepts of seismic design in combination with their functions and characteristics.

1.0.6

The anti-seismic design of mines and coal preparation plants shall not only comply with this code, but also comply with the current relevant national standards.

2.1 Fortification classification

2.1.1

The anti-seismic fortification classification of mines and coal preparation plants shall meet the following requirements.

- 1 Lifeline-related projects that cannot be interrupted during an earthquake and need to be restored as soon as possible, and projects that may cause a large number of casualties and other major disaster consequences during an earthquake, and require improved fortification standards, should be classified as key fortifications (Category B).
- 2 Except for Category B and Category D, the project fortified according to standard requirements shall be standard fortification category (Category C).
- 3 For projects with few people and earthquake damage that will not cause secondary disasters, it is allowed to appropriately reduce their seismic measures compared with the requirements for seismic fortification intensity in the local area..

2.1.2

The anti-seismic fortification classification of mines and coal preparation plants shall be determined according to Table 2.1.2 according to the characteristics of the industry, the casualties caused by damage, economic losses and the difficulty of recovery.

Table 2.1.2 Seismic Fortification Classification of Mine and Coal Preparation Plant Engineering

Note: 1 The unlisted mines and coal preparation plant projects are all Category C.

2 The seismic fortification classification of administrative and public buildings in mine engineering shall be determined according to the current national standards "Standards for Seismic Fortification Classification of Construction Engineering" GB 50223 and "Code for Design of Building Structures in Coal Mine" GB 50592.

2.2 Structural system

2.2.1

The engineering structure system of mines and coal preparation plants shall meet the following requirements.

- 1 It has a clear calculation diagram and a reasonable transmission path of earthquake action.
- 2 Avoid the loss of the seismic capacity of the whole structure due to the damage of some structures or components.
3. It has the necessary seismic bearing capacity, good deformation capacity and the ability to consume seismic energy.
- 4 Measures should be taken to improve the seismic capacity of the weak parts.

2.2.2

The engineering structure system of mines and coal preparation plants should meet the following requirements.

- 1 There are multiple anti-seismic lines.
- 2 Reasonable distribution of stiffness and bearing capacity; avoid excessive stress concentration or plastic deformation concentration due to local weakening or mutation forming weak parts.
- 3 It is not advisable to adopt a self-heavy cantilever structure.
- 4 The dynamic characteristics of the structure in the two main axis directions should be similar.

2.2.3

When mines and coal preparation plants are under earthquake action, the seismic support system of the structure should be able to ensure the integrity and stability of the structure, and should be able to reliably transmit the horizontal earthquake action.

2.3 Seismic isolation and energy dissipation

2.3.1

The seismic isolation and energy dissipation design can be used in mines and coal preparation plants that have high requirements for seismic safety and use functions.

2.3.2

Mine and coal preparation plant projects classified as Class B for seismic fortification shall meet the following requirements.

- 1 When the seismic fortification intensity is 8 degrees, the seismic isolation and energy dissipation design should be adopted.
- 2 When the seismic fortification intensity is 9 degrees, the seismic isolation and energy dissipation design shall be adopted.

2.3.3

The seismic isolation and energy dissipation design shall comply with the provisions of the current national standard "Code for Seismic Design of Buildings" GB 50011.

2.4 Materials and Construction

3.4.3 When one of the following conditions is met, the impact of the dislocation of the seismic fault on the mine and coal preparation plant can be ignored.

- 1 The seismic fortification intensity is less than 7 degrees.
- 2 Inactive breaks.
- 3 The seismic fortification intensity is 7 degrees, 8 degrees and the thickness of the soil layer covering the hidden fault is greater than 60m, or the seismic fortification intensity is 9 degrees and the thickness of the soil layer covering the hidden fault is greater than 90m.

3.4.4 For mines and coal preparation plant projects that do not meet the conditions in Article 3.4.3 of this code, the main fault zone should be avoided, and the avoidance distance should not be less than the provisions in Table 3.4.4.

Table 3.4.4 Minimum Avoidance Distance of Seismic Fracture (m)

Note: 1 The avoidance distance refers to the distance between the fracture edge and the proposed ground construction project, and the width of the fracture zone should be deducted during calculation.