



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

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Code for design of concrete structures

混凝土结构通用规范

(English Translation)

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1 General

1.0.1

This Code is formulated to ensure the quality of concrete structural engineering, the safety of people's lives and property, personal health, and promote the green and high-quality development of concrete structural engineering.

1.0.2

This Code must be implemented for concrete structural engineering.

1.0.3 Whether the technical methods and measures adopted in engineering construction

comply with the requirements of this Code shall be determined by the relevant responsible parties. Among them, innovative technical methods and measures shall be demonstrated and meet the performance requirements of this Code.

2 Basic regulations

2.0.1

Concrete structural engineering shall determine its structural design working life, structural safety level, seismic fortification category, structural action and action combination. Structural bearing capacity limit state, normal service limit state, and durability design shall be carried out. They shall meet the functional and structural performance requirements of the project.

2.0.2

The selection of strength grade for structural concrete shall meet the requirements for bearing capacity, stiffness, and durability of the engineering structure. For concrete structures with a design service life of 50 years, the strength grade of structural concrete shall also comply with the following regulations. For concrete structures with a design service life greater than 50 years, the minimum strength grade of structural concrete shall be higher than the following regulations.

2.0.3

Ordinary steel bars and prestressed steel bars used in concrete structures shall have strength and elongation that meet the requirements of engineering structures in the ultimate bearing capacity and normal service limit states.

3.1 Concrete

3.1.1

The main control indicators of cement used in structural concrete shall include cementation time, stability, mortar strength and chloride ion content. The type and quantity of mixed materials used in cement shall be clearly stated in the exit-factory documents.

3.1.2

The sand used for structural concrete shall meet the following requirements.

3.1.3

The firmness indicator of coarse aggregate for structural concrete shall not be greater than 12%. For concrete with impermeability, frost resistance, corrosion resistance, wear resistance or other special requirements, the mud content and mud block content in the coarse aggregate shall not exceed 1.0% and 0.5% respectively. The firmness indicator shall not be greater than 8%. The mud content and mud block content of coarse aggregate for high-strength concrete shall not be greater than 0.5% and 0.2% respectively.

3.1.4

Admixtures for structural concrete shall meet the following requirements.

3.1.5

Concrete mixing water shall control pH, sulfate ion content, chloride ion content, insoluble content, soluble content. When the concrete aggregate has alkali activity, the alkali content shall also be controlled. Surface water, ground water, and reclaimed water shall be tested for radioactivity before first use.

4.1 General provisions

4.1.1

The action on the concrete structure and the calculation of its action effect shall meet the following requirements.

4.1.2 The seismic fortification objectives and anti-seismic measures of concrete

structures shall be determined according to the seismic fortification intensity of the project location, site category, design earthquake grouping, project's seismic fortification category, and seismic performance requirements.

4.1.3 When the stress expression is used to calculate the limit state of the bearing capacity of concrete structural components, the following requirements shall be met.

4.1.4 The prefabricated concrete structure shall determine the connection structure method and carry out connection and node design according to the structural performance and the convenience requirements of component production and installation construction.

4.1.5 The connection between concrete structural components and between non-

structural components and structural components shall comply with the following requirements.

4.2 Structural system

4.2.1

The concrete structural system shall meet the load-bearing capacity, stiffness and ductility performance requirements of the project.

4.2.2

The design of the concrete structure system shall meet the following requirements.

4.2.3

The concrete floor of the house building shall meet the requirements of vertical vibration comfort of the floor. Concrete structure high-rise buildings shall meet the vibration comfort requirements of the 10-year return period horizontal wind load.

4.3.4 When using static or dynamic elastic-plastic analysis methods for structural

analysis of concrete structures, the following requirements shall be met.

4.3.5 Concrete structures shall be analyzed and calculated for overall structural stability and anti-overturning calculations and shall meet the safety requirements required by the project.

4.3.6 For concrete structures or structural components with long spans and long

cantilevers, when the seismic fortification intensity is not lower than 7 degrees (0.15g), the calculation and analysis of vertical seismic action shall be carried out.

4.4 Component design

4.4.1

Concrete structural components shall be calculated according to the stress conditions of normal section, oblique section, twisted section, punching shear and local compression. For concrete structures or components subjected to dynamic cycles, the fatigue bearing capacity of the components shall also be checked.

5.1 General provisions

5.1.1

The construction of concrete structures shall ensure the realization of the design requirements and shall comply with the following regulations.

5.1.2

Materials, components, utensils and semi-finished products shall be inspected and accepted at the site. They can only be used after they are accepted.