



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

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Unified standard for reliability design of engineering structures

工程结构通用规范

(English Translation)

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1 General

1.0.1

In order to implement the construction policy in engineering construction, ensure the safety, applicability, durability of the project structure, meet the needs of normal use and green development of construction projects, this Code is hereby formulated.

1.0.2

The engineering structure must implement this Code.

1.0.3

Whether the technical methods and measures, which are adopted in the engineering construction, meet the requirements of this Code, shall be determined by the relevant responsible entities. Among them, innovative technical methods and measures shall be demonstrated AND meet the relevant performance requirements in this Code.

2.1 Basic requirements

2.1.1

The structure must meet the following requirements, within the design service life.

2.1.2

The structure system shall have a reasonable force transmission path, which can transmit the various actions, that the structure may bear, from the point of action to the force-resisting members.

2.1.3

When accidental events, such as explosions, collisions, rare earthquakes, etc. as well as human errors, that may be encountered, the structure shall maintain the overall stability. There shall be no destructive consequence, that is not commensurate with the cause. In the event of a fire, the structure shall be able to maintain the bearing capacity and overall stability, within the specified time.

2.1.4

According to the impact of environmental conditions on durability, structural materials shall take corresponding protective measures.

2.1.5

The structural design shall include the following basic contents.

2.1.6

The structure shall be constructed, in accordance with the design documents. During the construction process, technical measures and management measures shall be taken, to ensure construction quality and construction safety.

2.1.7

The structure shall be used, according to the purpose, which is specified in the design. It shall check the structure regularly; carry out necessary maintenance and repair. The following behaviors, that affect the safety of the structure, are strictly prohibited.

2.1.8

Before dismantling the structure or its components, it shall formulate a detailed dismantling scheme and plan; establish an emergency plan for unexpected situations, that may occur during the dismantling process. The demolition of the structure shall follow the principles of reduction, resource utilization, recycling.

2.2 Safety level and design service life

2.2.1

In structural design, different safety levels shall be adopted, according to

2.3 Structural analysis

2.3.1

The action effects of structural members and their connections shall be determined, by a structural analysis method, that considers factors such as mechanical equilibrium conditions, deformation coordination conditions, material time-varying characteristics, stability.

2.3.2

The calculation model, which is used in the structural analysis, shall be able to reasonably reflect the effect of the structure, under the action of related factors. The simplifications or assumptions, which are used in the analysis, shall be based on theory and engineering practice. If there is no mature experience, the rationality shall be verified through tests. The boundary conditions set during the analysis shall conform to the actual situation of the structure.

2.4 Action and combination of actions

2.4.1

The structural actions shall be divided into permanent actions, variable actions, accidental actions, according to the time-varying characteristics. Their representative values shall meet the following requirements.

2.4.3

A unified design base period shall be adopted, when determining the representative value of variable actions. When the design base period, which is adopted by the structure, is not 50 years, the variable action value, which is specified in this Code, shall be adjusted, in accordance with the principle of consistency of the indicators.

2.4.4

For the various actions, that may appear during the construction and use of the structure, BUT are not specified in this Code, the magnitude of the value shall be determined,

according to the design service life of the structure, the design reference period, and the guaranteed rate.

2.5 Material and geotechnical properties AND structural

geometric parameters

2.5.1 When selecting structural material types and material specifications, for

structural design, it shall consider various environmental factors, that may affect durability.

2.5.2 Material properties shall be determined, by standardized test methods.

Where there is a difference between the actual application conditions and the test conditions, the test value shall be corrected.

3.1 Design method of partial coefficient in limit state

3.1.1

The limit state, which involves personal safety and structural safety, shall be regarded as the limit state of bearing capacity. When a structure or structural member is in one of the following states, it shall be considered that the load-bearing capacity limit state is exceeded.

3.1.2

The limit state, which involves the normal use function, the comfort of the personnel, the appearance of the building, of the structure or structural unit, shall be regarded as the normal use limit state. When a structure or structural member is in one of the following states, it shall be deemed to have exceeded the normal use limit state.

3.1.10

When the structure or structural member is designed, according to the limit state of bearing capacity, the following requirements shall be met.

3.1.11

When the structure or structural member is designed, according to the normal use limit state, the effect design value of the action combination shall not exceed the effect limit, which is required by the design.

3.1.12

The structural importance factor γ_0 shall not be less than the provisions

3.1.13

The partial coefficient of the action of the building structure shall be taken, according to the following provisions.