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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 55021-2021

Standard for seismic appraisal of buildings

既有建筑鉴定与加固通用规范

(English Translation)

Issued by: Ministry of Housing and Urban-Rural Development of the People's Republic of China;
State Administration for Market Regulation

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1 General

1.0.1
This specification is formulated to ensure the quality and safety of existing buildings, ensure the safety of people's lives, property and personal health, prevent and reduce engineering accidents in existing building reinforcement, renovation and renewal activities, and improve the safety level of existing buildings.

1.0.2 The inspection, identification and reinforcement of existing buildings must implement this code.

1.0.3 The identification and reinforcement of existing buildings should follow the principle of inspection and identification first, followed by reinforcement design, construction and acceptance.

1.0.4 Whether the technical methods and measures adopted in the project construction meet the requirements of this specification shall be judged by the relevant responsible parties. Among them, innovative technical methods and measures should be demonstrated and meet the performance requirements in this specification.

2 Basic regulations

2.0.1
Existing buildings should be regularly inspected for safety, and corresponding measures should be taken in a timely manner based on the inspection results.

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2.0.2 Existing buildings shall be appraised under the following circumstances.

1 It needs to be used continuously after reaching the design working life;

2 Before reconstruction, expansion, relocation and changes in building use or use environment;

3.The original design did not consider the seismic fortification or the requirements for seismic fortification have been increased;

4 After a disaster or accident;

5 There are relatively serious quality defects or damage, fatigue, deformation, vibration effects, and adjacent engineering construction effects;

6 Potential safety hazards are found in daily use;

7 When there is a requirement for quality evaluation.

2.0.3 Existing buildings shall be reinforced under the following circumstances.

1 The need to improve the safety of structural components is confirmed by the safety appraisal;

2 It is confirmed by the seismic identification that it is necessary to strengthen the integrity, improve the stress condition of the components, and improve the comprehensive seismic capacity.

2.0.4 The identification and reinforcement of existing buildings shall comply with the following regulations.

1 The appraisal of existing buildings shall carry out safety appraisal and seismic appraisal at the same time;

2 Reinforcement of existing buildings should carry out reinforcement of bearing capacity and earthquake resistance, and should aim at restoring the safe use function of the building and prolonging its working life;

3 Existing buildings should meet the overall firmness against collapse, and safety emergency function requirements such as personnel evacuation from the building in an emergency state.

2.0.5 The reinforcement of existing buildings must use materials, products and equipment that are of qualified quality and meet the requirements of safety, sanitation and environmental protection.

2.0.6 The reinforcement of existing buildings must be designed according to the prescribed procedures; the appraisal report shall not be used directly for construction.

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2.0.7 The reinforcement construction of the existing buildings must carry out the construction quality inspection and completion acceptance of the reinforcement project; it is allowed to be put into use after passing the qualification.

3.1 General provisions

3.1.1

Before the identification and reinforcement of existing buildings, engineering drawings should be consulted and data collected, and on-site investigations and inspections should be conducted on the building's use conditions, use environment, and structural status, and monitoring should be carried out when necessary. The scope, content, depth and technical requirements of its work shall meet the needs of appraisal and reinforcement work.

3.1.2

When the engineering drawings and materials of existing buildings are incomplete or distorted, detailed on-site inspection and testing shall be carried out.

3.1.3

Existing building identification, structural investigation, inspection and monitoring before reinforcement shall comply with the following regulations.

1 The detection and monitoring methods suitable for the current structure and field operations shall be adopted;

2 When the sampling amount of the existing building structure is limited by conditions, it should be treated as a case by special research;

3 The material performance test results and deformation and damage test and monitoring results of existing building structural components should be able to provide a reliable basis for structural appraisal. Without a comprehensive analysis of the test and monitoring results, no appraisal conclusions can be made directly;

4.Measures should be taken to ensure the safety of on-site inspection and monitoring operations, and an emergency response plan should be formulated;

5 After the inspection and monitoring are completed, the local damage to the structural components caused by it should be repaired in time.

3.2 Site and foundations

3.2.1

For the investigation, detection and monitoring of the site where the existing buildings are located, the previous disasters of the buildings in the site, the engineering geology and seismic geology of the site should be collected, and the stability and other properties of the slope site should be investigated..

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3.2.2
The investigation, testing and monitoring of the foundation status of existing buildings shall comply with the following regulations.

1 Collect the original geotechnical engineering investigation report and drawings and materials related to foundation design;

2 Check the response of foundation deformation in the main structure and surrounding buildings;

3 When deformation and damage develop, detection and monitoring shall be carried out;

4 When it is necessary to determine the rock-soil performance or foundation bearing capacity of the foundation through on-site inspection, a close-up survey of the site and foundation rock and soil should be carried out.

3.3 Main structure

3.3.1
The investigation, detection and monitoring of the current status of the main structure shall include the following contents.

1 Structural system and its structural arrangement;

2 Structural components and their connections;

3 Structural defects, damage and corrosion;

4 Structural displacement and deformation;

5 Non-structural components affecting building safety.

3.3.2
For reinforced concrete structural members and masonry structural members, the overall inclination, local flashing, member cracking, aging, structural connection damage, and the material and strength of structural members should be checked.

3.3.3
For steel structural components and wooden structural components, the material properties, deformation, cracks, damage and defects of the components, joints and connections shall be inspected, and the following parts shall be inspected mainly for the corrosion of steel or the decay and moth-eaten conditions of wood.

1.The part close to the ground or water surface buried in the ground or submerged in water;

2 Areas that are prone to water accumulation or are attacked by water vapor;

3 Nodes and connecting parts subject to the alternating action of dryness and wetness;

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