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PEOPLE'S REPUBLIC OF CHINA**

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**Technical standard for multi-story and high rise timber
buildings**

多高层木结构建筑技术标准

(English Translation)

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1 General

1.0.1

This standard is formulated in order to standardize the design, manufacture, installation, acceptance and maintenance of multi-story wooden buildings, to achieve advanced technology, safety and applicability, economical rationality, quality assurance and environmental protection.

1.0.2

This standard applies to the design, manufacture, installation, acceptance and maintenance of multi-storey wooden structure civil buildings, high-rise wooden residential buildings and office buildings.

1.0.3

The design, fabrication, installation, acceptance and maintenance of multi-story wooden buildings shall not only comply with this standard, but also comply with the current relevant national standards.

2.1.1 Multi-story and high rise timber buildings

Timber structure buildings with more than 3 storeys. The wood structure used is divided into pure wood structure and wood mixed structure.

2.1.2 Pure timber structure

The load-bearing components are all made of wood or wood products, including square log structures, glued wood structures and light wood structures.

2.1.3 Hybrid timber structure

A structural system that is composed of wood structural members, steel structural members, and reinforced concrete structural members, and uses wood structures as the main structural form, including upper and lower mixed wood structures with reinforced concrete structures or steel structures at the bottom and pure wood structures at the top, and concrete structures. Core tube timber structure, etc.

2.1.4 Wood post-and-beam structure with bracing system

Beams and columns are used as the main vertical load-bearing members to support the wooden structure as the main lateral force-resistant member, and the supporting materials can be wood or other materials.

2.1.5 Post-and-beam structure with wood shear wall system

A timber structure that uses beams and columns as the main vertical load-bearing members and shear walls as the main lateral force-resisting members. The shear wall can adopt light wood structure wall or cross-glued wood wall.

2.1.6 Cross laminated timber shear wall structure

A timber structure using cross-laminated timber (CLT) shear walls as the main force-bearing members.

2.1.7 Vertical hybrid timber structure

In the wood composite structure, the lower part adopts a concrete structure or steel structure, and the upper part adopts a structural system of pure wood structure.

2.1.8 Timber structure with concrete tube

In the wood composite structure, the main lateral force-resisting member adopts a reinforced concrete core tube, and the rest of the load-bearing members adopt a structural system of wooden members.

2.2.1 Mechanical properties of materials

--Design value of bending strength of steel;

c, 90--Design value of wood transverse grain compressive strength;

bt--design value of tensile strength of ordinary bolts.

2.2.2 Actions and action effects

G_i, G_j--respectively, the design value of the gravity load of the i-th and j-th floors;

N_t--design value of bolt axial tension;

R_d--design value of the bearing capacity of the member;

S_d--effect design value of load combination;

V_i, V_{i+1}--Standard values of seismic shear force of the i-th layer and the i+1-th layer.

2.2.3 Geometric parameters

A_e - the effective cross-sectional area of the bolt;

D_i--elastic equivalent lateral stiffness of the i-th floor;

EJ_d--elastic equivalent lateral stiffness in the direction of a major axis of the structure;

e_i--the centroid offset value of the i layer;

h_i, h_{i+1}--the height of the i-th floor and the i+1-th floor;

H - the height of the house;

L_{Bi}--the length of the building on the i-th floor perpendicular to the direction of earthquake action;

r_i--the radius of rotation of the floor plane where the corresponding mass point of the i-th floor is located;

n--the total number of layers of structure calculation;

Δ_i, Δ_{i+1}--the interstory displacement of the i-th layer and the i+1-th layer under the standard value of seismic action.

2.2.4 Coefficients

α--ratio of lateral stiffness;

β--seismic action amplification coefficient;

γ₀--structural importance coefficient;

γ_2 --Story lateral stiffness ratio considering story height correction;

γ_{RE} --Seismic adjustment coefficient of bearing capacity.

2.2.5 Others

C--Deformation limit specified according to the normal service requirements of structural members.

3.1 Structural timber

3.1.1

Structural timber used in multi-story timber structure buildings can be divided into square timber, logs, dimension timber, plywood, cross-glued timber, structural composite timber, wood-based structural panels and other sawn timber for structures. The grade should comply with the provisions of the current national standard "Code for Design of Timber Structures" GB 50005.

3.1.2

The product quality and strength design indicators of structural timber shall comply with the current national standards "Code for Design of Timber Structures" GB 50005, "Technical Specifications for Glued-Laminated Timber Structures" GB/T 50708 and "Glulam for Structural Use" GB/T 26899 Regulation.

3.1.3

The moisture content of structural wood shall meet the following requirements.

- 1 When square wood and logs are used as wooden splints for tension member connection, it should not exceed 18%, and in other cases, square wood and logs should not exceed 25%;
- 2 Size timber, square timber visually graded by the factory and sawn timber for other structures shall not exceed 19%;
- 3-ply glulam and cross-laminated glulam should not exceed 15%;
- 4 Structural composite wood should not exceed 12%;
- 5 When the wood other than square wood and logs is used as connecting parts, it should not exceed 15%.

3.2 Steel and metal connectors

3.2.1

The steel used in the load-bearing timber structure should adopt Q235 steel, Q345 steel, Q390 steel or Q420 steel, and should comply with the current national standard "Carbon