



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

**GB 55006-2021**

---

**Code for design of steel structures**

钢结构通用规范

**(English Translation)**

**Issued on: April 9, 2021**

**Implemented on: January 1, 2022**

---

**Issued by: Ministry of Housing and Urban-Rural Development of PRC**

## Table of Contents

|                                                                |    |
|----------------------------------------------------------------|----|
| Foreword...                                                    | 3  |
| 1 General...                                                   | 6  |
| 2 Basic requirements...                                        | 6  |
| 3 Materials...                                                 | 8  |
| 4 Components and connection design...                          | 9  |
| 4.1 Ordinary steel components...                               | 9  |
| 4.2 Cold-formed steel components...                            | 10 |
| 4.3 Stainless steel components...                              | 10 |
| 4.4 Steel structure connection...                              | 11 |
| 4.5 Fatigue...                                                 | 11 |
| 4.6 Construction requirements...                               | 12 |
| 5 Structural design...                                         | 12 |
| 5.1 Steel structure of light-weight house with portal frame... | 12 |
| 5.2 Multi-floor and high-rise steel structures...              | 13 |
| 5.3 Large-span steel structure...                              | 14 |
| 5.4 Tower mast steel structure...                              | 15 |
| 5.5 Steel silo structure...                                    | 16 |
| 5.6 Urban steel bridge...                                      | 17 |
| 6 Seismic and protection design...                             | 17 |
| 6.1 Seismic design...                                          | 17 |
| 6.2 Seismic isolation and damping design...                    | 18 |
| 6.3 Protection design...                                       | 19 |
| 7 Construction and acceptance...                               | 19 |
| 7.1 Production and installation...                             | 19 |
| 7.2 Welding...                                                 | 20 |
| 7.3 Acceptance...                                              | 21 |
| 8 Maintenance and removal...                                   | 22 |
| 8.1 Maintenance...                                             | 22 |
| 8.2 Structural disposal...                                     | 22 |
| 8.3 Demolition...                                              | 23 |

## **1 General**

### **1.0.1**

In order to ensure the quality and safety of steel structure projects, implement policies on resource and energy conservation and rational utilization, protect the ecological environment, ensure the safety of people's lives and property and personal health, prevent and reduce steel structure engineering accidents, improve the level of green development of steel structure projects, this specification is hereby formulated.

### **1.0.2**

Except for the following projects, steel structure projects must implement this specification.

### **1.0.3**

The construction of steel structures shall follow the following principles.

### **1.0.4**

Whether the technical methods and measures, which are adopted in the project construction, meet the requirements of this specification, 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 specification.

## **2 Basic requirements**

### **2.0.1**

For the steel structure engineering, it shall determine the design service life, based on factors such as use function, construction cost, use and maintenance cost, environmental impact. It shall adopt different safety levels, according to the severity of the possible consequences of structural damage;

reasonably determine the structural action and action combination, seismic action and action combination; adopt appropriate design methods, to ensure the safety, applicability, durability of the structure.

**2.0.4 The use and maintenance of steel structures and components, within the design service life, shall meet the following requirements.**

**2.0.7 When building steel structures support power equipment or precision**

instruments, in addition to meeting the requirements for bearing capacity, deformation, seismic performance, the horizontal vibration of the structure and the vertical vibration of the floor, shall meet the control requirements of vibration displacement, speed, acceleration

of the equipment and instruments, as well as the requirements for structural fatigue check & calculation.

### **3.0.1 The designations, technical conditions, performance indexes of the steel**

materials, which are selected for steel structure projects, shall all comply with the current relevant national standards.

3.0.2 The steel, which is used for load-bearing members of steel structures, shall have the qualified guarantee for yield strength, elongation at break, tensile strength, sulfur and phosphorus content.

### **3.0.3 When calculating the structural strength and stability, according to the limit**

state design method, the steel strength shall take the design value of steel strength, which shall be obtained by dividing the standard value of steel yield strength by the steel's resistance sub-factor.

3.0.4 Engineering steel and connecting materials shall be managed in a standardized manner. The steel and connecting materials shall be ordered, in accordance with the material selection requirements of the design documents.

## **4.1 Ordinary steel components**

### **4.1.1**

The axial compression components shall be subject to the verification of stability. For the stable bearing capacity, it shall be calculated, according to the gross section of the member; it shall be checked separately, according to the two main axis directions of the section. For the members whose section centroid does not coincide with the shear center, it shall verify the bending-torsional buckling bearing capacity.

### **4.1.2 In the calculation of the bearing capacity of solid-web axial compression**

members, when local buckling of the plate is not allowed, the local buckling of the plate shall not precede the overall instability of the member; when the local buckling of the plate is allowed, it shall consider the influence of local buckling on the section strength and overall instability; the three-sided supporting plate shall not use the post-buckling strength.

## **4.2 Cold-formed steel components**

### **4.2.1**

For the axial tension members and tension-bending members, which are mainly under tension, shall be subject to the verification of strength and rigidity.

#### **4.2.2 Axial compression members, bending members, compression-bending**

members, tension-bending members which are mainly subjected to bending, shall be checked for strength, stability, rigidity.

#### **4.4 Steel structure connection**

##### **4.4.1**

The calculation model of the connection and the connector shall be consistent with the actual bearing capacity of the connection; meanwhile, it shall respectively calculate and design a single connector, according to the bearing capacity limit state and the normal service limit state.

##### **4.4.2 For ordinary bolted connections, rivet connections, high-strength bolted**

connections, it shall calculate the combined bearing capacity of bolts (rivets) under shear,

##### **4.5.1 For steel structural members and their connections, that directly bear the**

repeated action of dynamic loads, when the number of cycles of stress change,  $n$ , is greater than or equal to  $5 \times 10^4$ , it shall carry out the fatigue calculation.

##### **4.5.2 For components that require fatigue check calculations, the steel used**

shall have a qualified guarantee for impact toughness.

4.5.3 High-strength bolt pressure-bearing connection shall not be used for the connection of components, that directly bear the repeated action of dynamic load AND require fatigue calculation.

4.5.4 For the bolt-welding combined connection, it shall follow the principles that all the shear force is borne by the weld, to carry out the fatigue verification on the weld.

#### **4.6 Construction requirements**

##### **4.6.1**

The structure shall be equipped with a reliable support system, according to the geometric form, construction process, load-bearing state. In each temperature zone, earthquake-proof zone or phased construction zone, of the building (structure), it shall provide an independent support system, respectively.

For large-span planar structures, the support system shall be set up, through calculations, according to the requirements for structural stability, seismic, wind resistance performance.