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

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Standard for engineering classification of rock masses

工程岩体分级标准

(English Translation)

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1 General

1.0.1

This standard is formulated to unify the classification method of engineering rock mass and provide basic basis for rock engineering survey, design, construction and operation.

1.0.2

This standard is applicable to rock mass classification of various types of rock engineering.

1.0.3

The grading of engineering rock mass shall adopt the method of combining qualitative and quantitative methods, and shall be carried out in two steps. Firstly, the basic quality of rock mass shall be determined, and then the grade of engineering rock mass shall be determined in combination with the characteristics of specific projects.

1.0.4

The grading of engineering rock masses shall not only comply with this standard, but also comply with the current relevant national standards.

2.1.1 Rock engineering rock engineering

The engineering that uses rock mass as the foundation or environment of engineering buildings and excavates or reinforces it mainly includes rock underground engineering, rock slope engineering and rock foundation engineering.

2.1.2 Engineering rock mass engineering rock mass

Rock mass within the sphere of influence of rock engineering.

2.1.3 Rock mass basic quality

The most basic property inherent in rock mass that affects the stability of engineering rock mass. This standard stipulates that the basic quality of rock mass is determined by the hardness of rock and the integrity of rock mass.

2.1.4 Structural plane (discontinuity)

The interior of the rock mass has a certain direction, a certain scale, a certain shape and characteristics of the surface, fracture, layer and band-shaped geological interface.

2.1.5 Intactness index of rock mass

The square of the ratio of the elastic longitudinal wave velocity of the rock mass to the elastic longitudinal wave velocity of the rock.

2.1.6 Volumetric joint count of rock mass

The number of structural planes per cubic meter of rock mass volume.

2.1.7 Point load strength index point load strength index

The point load strength of a cylindrical specimen with a diameter of 50 mm when it is radially compressed.

2.1.8 Initial geo-stress field

The stress field in the rock mass in the natural state is also called the natural stress field.

2.1.9 Stand-up time of engineering rock mass

The ability of engineered rock mass to maintain stability under unsupported or unreinforced conditions.

2.1.10 Basic value of bearing capacity of rock foundation

In rock foundation engineering, the load corresponding to the proportional limit or yield limit in the load-displacement curve of the rock mass.

2.2 Symbols

γ -gravity density of rock mass;

R_c - saturated uniaxial compressive strength of rock;

$Is(50)$ --rock point load strength index;

E -deformation modulus of rock mass;

μ -Poisson's ratio of rock mass;

ϕ --Inner friction angle of rock mass or structure;

c -cohesion of rock mass or structural surface;

K_v -rock mass integrity index;

J_v -volume joint number of rock mass;

K_1 --Correction coefficient for groundwater impact of underground engineering;

K_2 --Correction coefficient for the influence of the occurrence of main structural planes in underground engineering;

K_3 -the initial stress state influence correction coefficient;

K_4 --correction coefficient for groundwater impact of slope engineering;

K_5 --correction coefficient for the influence of the occurrence of the main structural plane of the slope engineering;

λ --main structural surface type and extensibility correction coefficient of slope engineering;

f_0 --Basic value of bearing capacity of bedrock of rock mass;

BQ -basic quality index of rock mass;

$[BQ]$ --engineering rock mass quality index;

H -the buried depth of rock underground engineering or the height of rock slope.

3.1 Grading factors and their determination methods

3.1.1

The basic quality of rock mass shall be determined by two factors. rock hardness and rock mass integrity.

3.1.2

The degree of rock hardness and integrity of rock mass shall be determined by qualitative division and quantitative index.

3.2 Qualitative division of grading factors

3.2.1

The qualitative classification of rock hardness shall comply with the provisions in Table 3.2.1.

Table 3.2.1 Qualitative classification of rock hardness

3.2.2

When qualitatively classifying rock hardness, its weathering degree shall be determined according to the provisions in Table 3.2.2.

Table 3.2.2 Classification of rock weathering degree

3.2.3

The qualitative division of rock mass integrity shall comply with the provisions in Table 3.2.3.

Table 3.2.3 Qualitative division of rock mass integrity

Note: The average spacing refers to the average spacing of main structural planes.

3.2.4

The bonding degree of the structural surface shall be determined according to Table 3.2.4 according to the characteristics of the structural surface.

Table 3.2.4 Classification of bonding degree of structural planes

3.3 Quantitative indicators of grading factors

3.3.1

The quantitative index of rock hardness shall be the saturated uniaxial compressive strength R_c of the rock. R_c should adopt the measured value. When the measured value is unconditionally obtained, the converted value of the measured rock point load strength index $Is(50)$ can also be used, and converted according to the following formula.

In the formula. R_c -rock saturated uniaxial compressive strength (MPa).