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Quality Inspection and Evaluation Standards for Highway Engineering - Section 1 Civil Engineering

公路工程质量检验评定标准 - 第一册 土建工程

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Chief development department: Research Institute of Highway, Ministry of Transport
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Foreword

The professional standard "Quality inspection and Evaluation Standards for Highway Engineering" (JTJ071-98) was issued by the Ministry of Transport of the People's Republic of China on November 3, 1998 in a Document of JGLF [1998] No. 670 and was put in force on July 1, 1999. As on major technical regulation that must be enforced strictly in the construction of highway engineering, this standard plays a vital role in enhancing the engineering technical management and quality monitoring.

In recent years, the investment in highway construction has been increased in a large amount, the construction progress has been accelerated greatly, the mileage of expressway has been grown rapidly, and extensive experiences also have accumulated. Therefore, the Ministry of Communications, Highway Department issued the revision mission of the "Quality inspection and Evaluation Standards for Highway Engineering" (JTJ071-98) in 2001.

The broad contents of this revision are: the General Provisions was revised and the chapter of Terms was added; the Engineering Quality Evaluation Method was listed as one single chapter, and the detection and evaluation dominant items on subdivisional works and their requirements are added; the contents of pavement, bridges, culvert engineering and tunnel engineering were supplemented; the quality standards for traffic safety devices were adjusted appropriately, the quality inspection and evaluation criteria for highway electromechanical engineering were supplemented and issued in independent sections; the technical contents of environmental protection engineering were supplemented; the quality evaluation management software was developed, and the necessary amendments were carried out on the problems, some literal expressions as well as partial provisions existed in the text of this standard. The "Quality inspection and Evaluation Standards for Highway Engineering" was revised to be in harmony with the newly issued national standards and professional standards on communication.

The revised "Quality inspection and Evaluation Standards for Highway Engineering" definitely will promote the healthy development of highway construction and ensure the steady improvement of engineering quality.

All relevant organizations are kindly requested to inform the problems and opinions that are discovered in the actual practices during the process of implementing this standard to the Research Institute of Highway, Ministry of Transport (Address: No. 8, Xitucheng Road, Hai Dian District, Beijing City, 100088, China) with a view to being referred in future revision.

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1 General Provisions

1.0.1 Purpose

This standard was developed in order to enhance the quality management of highway engineering, unify the quality control standards and evaluation criteria of highway engineering and assure the engineering quality.

1.0.2 Application scope

This standard is applicable to the quality inspection and evaluation on the construction and reconstruction engineering of Class IV and above highways, and the part on their environmental protection and electromechanical engineering shall be implemented according to corresponding specific provisions.

This standard is applicable to the management, monitoring, inspection and evaluation of the construction organization of highway engineering, engineering supervision organization, construction organization, quality detection organization and quality supervision department on the quality of highway engineering.

1.0.3 Relationship with relevant specifications

The quality inspection and evaluation on highway engineering shall be subject to this standard. And it should be subject to the newly issued edition if the quality standard is inconsistent with other specifications.

The inspection and evaluation on the highway construction, quality management and engineering quality shall not only meet the requirements stipulated in this standard, but also shall meet those specified in the relevant current specifications issued by the state or the Ministry of Communications.

1.0.4 Special engineering

As for the grand bridges, super long tunnels, special area, or the engineering adopted with new materials, new construction and new process, if this standard does not cover the appropriate technology provisions, corresponding technical standards may be developed by making reference to the relevant standards or according to the actual conditions and shall be reported to the competent department as required for approval.

2 Terms

2.0.1 Inspection

The activity to measure and examine the properties of inspection items, compare the results with those specified in the standard specifications so as to determine whether each property is qualified

2.0.2 Evaluation

The activity to evaluate the engineering quality and determine the engineering grade based on the inspection result.

2.0.3 Dominant item

The observed items in the subdivisional works that play decisive roles in safety, health, environmental protection and public interest

2.0.4 General item

The observed items in the subdivisional works except for the dominant items

2.0.5 Quality of appearance

The external quality of engineering reflected by observation and necessary measurement

2.0.6 Weight number

The value assigned onto the project item or detection index according to their significance levels.

3 Engineering Quality Evaluation

3.1 General provisions

3.1.1 According to the requirements of construction mission, construction management and quality inspection and evaluation, the construction items shall be divided into the unit engineering, partitioned project and subdivisional works during the construction preparation period according to Annex A of this standard. The construction organization, engineering supervision organization and construction organization shall conduct the monitoring and management on the engineering quality according to the division of same engineering item.

1 Unit engineering

It means the engineering with independent construction conditions in the construction items according to the signed contract.

2 Partitioned project

The unit engineering shall be divided into several partitioned projects according to the structure position, section length and construction characteristics or construction mission.

3 Subdivisional works

The partitioned project shall be divided into several subdivisional works according to different construction methods, materials, procedures and section length.

3.1.2 The engineering quality inspection and evaluation shall be carried out by adopting the one hundred score system in unit of subdivisional work. Based on the evaluation on subdivisional works, the evaluation scores of each corresponding partitioned project, unit engineering, contract section and construction item shall be calculated grade by grade.

3.1.3 The engineering quality evaluation grade is classified into qualified and unqualified and shall be evaluated according to the subdivisional, partitioned and unit engineering, as well as the contract section and construction item grade by grade.

3.1.4 The construction organization shall carry out self-checking on each subdivisional work according to the basic requirements, observed items and appearance appraisal specified in this standard, and shall submit the true and integral self-checking document according to the "Quality Inspection and Evaluation Sheet of Subdivisional Works" listed in Annex J and the relevant construction technical specifications.

The engineering supervision organization shall conduct independent random inspections on the engineering quality as required, confirm the inspection and evaluation documents of the construction organization by signing, and carry out evaluation on the engineering quality.

According to the quality inspection on engineering and the conditions grasped at original times, the development organization shall examine and approve the engineering quality and grade issued by the engineering supervision organization.

The quality monitoring department and the quality detection organization may detect quality detection and appraisal on highway engineering based on this standard.

3.2 Quality grading of engineering

3.2.1 Quality grading of subdivisional works

The contents of the quality inspection on subdivisional works include four parts: basic requirements, observed items, appearance appraisal and quality assurance document. Quality inspection and evaluation shall not be conducted onto the subdivisional works unless the used raw materials, semi-finished products, finished product and construction technology meeting those specified in the basic requirements, no severe appearance defect exists, and the quality assurance document is true and basically integral.

The important observed items referring to the structure safety and application function are the dominant items (being marked with "△" in this standard), their thereof eligibility rate shall not be less than 90% (that of the bridge hardwares processed and manufactured in plants shall not be less than 95%, that of electromechanical engineering shall not be less 100%), and the detection value shall not exceed the specified extreme value, otherwise, the subdivisional work must be reconstructed.

The specified extreme value of observed item is the limit value that will not be broken through by any detection value, if this specified extreme value is not met; the observed item will be rejected.

If the dominant items evaluated by adopting the methods specified from Annex B to Annex I fail to meet the requirement, this subdivisional work will be judged as "unqualified".

The full scores of the evaluation value of subdivisional work are one hundred, and the grade of subdivisional work shall be calculated according to observed items by adopting the weighted average method. If any appearance defect exists or the document is inadequate, the scores shall be reduced.

$$\text{Scores of subdivisional work} = \frac{\sum[\text{Scores of inspection item} \times \text{Weight number}]}{\sum \text{Weight number of inspection item}}$$

Evaluation scores of subdivisional work = Scores of subdivisional work-Reduced scores by appearance defect-Reduced scores by inadequate document

(1) Inspection of basic requirements

The basic requirements specified on the subdivisional works play a key role in the construction quality and the engineering shall be inspected earnestly according to the basic requirements. Those failing to meet the basic requirements shall not be conducted with the inspection and evaluation on engineering quality.

(2) Scoring of observed items

The specified inspection items shall be carried out by adopting with field sampling method, the construction quality of the subdivisional works shall be directly detected and scored with the frequency and the following scoring method as required.

Except for the items evaluated according to the mathematical statistical method, all the other items in the inspection items shall be evaluated whether to meet the standard requirements according to the single-point (group) measured value and shall be scored in the eligibility rate.

$$\text{Eligibility rate of inspection item} = \frac{\text{Quantity of qualified points (groups)}}{\text{Quantity of all the inspection points (groups) in this inspection item}} \times 100\%$$

Scores of inspection item = Eligibility rate of inspection item×100

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