

# Research on the Complication of Documents for Large-scale Infrastructure Projects in Colleges and Universities

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**Abstract:** With the practical experience of construction bidding documentation, for example, in view of the large infrastructure project construction in colleges and universities bidding documents for the main body, the construction technology, qualification, performance requirements, bill of quantities, the terms of the contract set aspects were discussed, and put forward practical measures and methods, for similar project construction bidding document preparation to provide certain reference.

**Keywords:** Large infrastructure; Tender documents; Bill of quantities; Contract

**Publication date:** March, 2021

**Publication online:** 31 March, 2021

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## 1 Introduction

The large-scale infrastructure projects in colleges and universities in this paper refer to single buildings that cost more than 200 million CNY for a single project in colleges and universities, with distinctive features and unique shapes that can reflect the characteristics of colleges and universities. In 2008, the implementation of "Standard Construction Tender Documents" (hereinafter referred to as Tender Documents) regulated the preparation of tender documents for government investment projects, improved the quality of tender documents, and promoted the open, fair and just conduct of tender activities<sup>[1]</sup>. Based on the Tender Documents combined with practical experience, this paper analyzed and discussed the compilation of construction tender documents for large infrastructure

projects in universities, in order to provide references for similar projects.

## 2 Analysis of common problems in construction tender documents of large-scale infrastructure projects in universities

### 2.1 Unclear responsibility of the main body of compilation

According to the survey, colleges and universities will choose agents to bid for large infrastructure projects. However, due to the large number of projects and tight time when compiling the tender documents, there are various problems in the tender documents written by the personnel of the tender agency that need to be confirmed by infrastructure staff. College personnel will even be developed into the main body of the compilation. Although the tender agency has a more professional team, it does not play its role. And the repeated revision work between the two enterprises will lead to a low work efficiency and unclear responsibilities.

### 2.2 The scoring terms are not detailed

#### 2.2.1 Excessive technical and qualification requirements

When large-scale infrastructure projects are open for bidding, there are sometimes hundreds of bidders. Colleges and universities will need to select excellent enterprises with good reputation and high qualifications. When compiling construction tender documents, it must be compiled in strict accordance with relevant national regulations, and clauses cannot be arbitrarily formulated. The Construction Industry Enterprise Qualification Standards (hereinafter

referred to as the "Standards") that came into effect on January 1, 2015, and the Contents of Amendment of Building Area Indicators for General Contracting of Construction Engineering Construction Grade I and Below (hereinafter referred to as "Contents of Amendment") implemented on November 1, 2016 simplified some indicators in the Standards. The Standard specified the qualification classification, basic conditions and business scope in detail. For example, a college gymnasium has a building area of 42,000 square meters and a single span of 22 meters. Although the cost of it is close to 300 million, according to the Standard and Contents of Amendment, the construction company can only be required to be a third-grade qualification when compiling the construction tender documents.

### **2.2.2 The subjective score of the method of tender evaluation is too high**

The Tender Documents stipulated two evaluation methods, the lowest tender price method and the comprehensive evaluation method, for the tenderer to choose and apply according to the specific characteristics of the project<sup>[2]</sup>. At present, the allocation ratio of technical and commercial tenders in the construction tender documents is generally 6:4 or 7:3, and a few are set at 8:2. Among them, the score of construction organization design accounts for 80% of the total score of the technical standard, which is based on the subjective intention of the review experts, and is difficult to bridge the gap.

### **2.3 The bill of quantities is disputed**

The bill of quantities is an important part of the tender documents, an indispensable technical and economic document in the process of project tender, and the basic data for tender quotations<sup>[3]</sup>. When tender for large-scale infrastructure projects, problems such as incomplete design drawings, poor understanding of the drawings by the personnel who compile the bill, and unclear engineering practices will cause disputes over the bill.

### **2.4 Disputed contract terms**

#### **2.4.1 The priority of contract interpretation is not reasonable**

The agreement section of Tender Documents clarifies the other documents that constitute the contract documents, including: letter of acceptance; special

contract clauses; general contract clauses; technical standards and requirements; drawings; list of priced engineering quantities; other contract documents<sup>[2]</sup>. Many documents have more or less conflicts in content, which requires us to agree on the priority right of interpretation of the documents, order them, and avoid disputes.

#### **2.4.2 The agreement of contract price adjustment is not comprehensive**

The relevant clauses of the contract price adjustment should clearly stipulate the scope of the contract price adjustment. Unclear agreement in this part will lead to disputes over compensation claims. For large-scale infrastructure projects in colleges and universities, reasonable contract price adjustment clauses can avoid disputes and maintain the reputation of the school, provide a basis for engineering changes, prevent prevarication, and effectively promote the smooth progress of the project. The construction period of large-scale infrastructure projects is usually long, the price of human resources will inevitably fluctuate, and issues such as equipment grade are often ignored.

## **3 Compilation strategy of tender documents for construction of large infrastructure projects in universities**

### **3.1 Identify the person in charge of compiling the tender documents and establish a complete review system**

The compilation of tender documents requires repeated verification of words and sentences to ensure consistent requirements and clear logic. When selecting an agency tender, first of all, it is necessary to clarify the content of the work and arrange the tender work. Under the premise of allowing reasonable and sufficient time for the compiling of the tender documents, it needs to be cleared that the person in charge of the compilation of the tender documents is the agency personnel, and the infrastructure personnel of universities are only responsible for reviewing and determining key terms, so as to achieve clear division of labor, clear responsibilities, and complete review system to lay a solid foundation for the compilation of high-quality tender documents.

### **3.2 Set requirements for qualifications, technology and performance reasonably**

If the university has a good reputation, will not arbitrarily default on the project payment, and the staff are of high quality, the announcement of the tender announcement will attract many bidders. How to screen out companies with strong technology, high qualifications and outstanding performance without violating the tender requirements is also something that must be considered when compiling the tender documents. According to practical experience, although the grade of qualification should be set according to the project situation according to the law, it can be distinguished from the aspects of performance and technology in the tender documents, which can not only screen out strong bidders, but also ensure the strength of project managers.

### **3.3 Set a reasonable method of tender evaluation**

Comprehensive evaluation of the strength of bidders is a fair and just method of the evaluation of tender. Attention should be paid to the distribution of points in the tender evaluation methods and the calculation method of the tender benchmark price when using the method. Scientifically and reasonably determining the tender evaluation benchmark price used to evaluate and measure the competitiveness of tender quotations is essential to ensure the fairness and reasonableness of tender evaluation<sup>[4]</sup>. On the basis of suitable profit margins, it can be reasonably included in the calculation of the benchmark price to increase the probability of winning a reasonable quotation when there is a tender estimate; When there is a maximum tender price limit and without a tender estimate, the price limit shall be reasonably lowered to participate in the calculation of the benchmark price to avoid the randomness of the price of winning tender.

### **3.4 Ensure the quality of the compilation of the bill of quantity**

Engineering quantity is a key factor in determining the quality of the bill of quantity, especially for large-scale infrastructure projects. In order to accurately calculate the engineering quantity, the compiler must analyze the characteristics of the new project based on the familiarity with the design drawings in detailed. In addition, the description of the compilation of the bill of quantities is the basic for compilation.

### **3.5 Set contract terms accurately and effectively**

#### **3.5.1 Set the priority of contract interpretation reasonably**

The contract is the basis for resolving disputes. A reasonable order of the right to interpret all the documents that make up the contract can effectively resolve disputes and avoid wrangling. Different documents have different levels of explanation for the same problem. For example, the answer to the drawing is a good supplement or correction to the original design drawing. At this time, the right of interpretation of the answer to the drawing has priority over the drawing. It avoids the disputes in the later construction process and explains the inconsistency between the drawing design and the engineering bill of quantity.

#### **3.5.2 Determine the contract valuation correctly**

For large-scale infrastructure projects, a fixed comprehensive unit price contract should be the first choice. The fixed comprehensive unit price includes expenses other than regulations, taxes, and measures, which only needs to clarify the following points: 1. The unit price of each item is fixed for the sub-items and parts; 2. The adjustment measures for changes in the engineering quantity; 3. The adjustment measures for market price fluctuations; 4. The adjustment measures for the measure cost; 5. Whether labor and fee rates are adjusted due to other reasons. As long as the above five points are clear, most disputes in project settlement can be basically resolved.

#### **3.5.3 Set adjustable contract price clauses reasonably**

Changes in labor and material prices will inevitably cause project prices to fluctuate, which is the inevitable result of social development and a change that must be experienced during the construction of large projects. The agreed adjustment measures for labor and main material prices can avoid contract disputes. In addition, labor costs will not be adjusted for reasons other than those prescribed by law. In the actual projects known in the past, in order to better control the cost, Party A often agreed in the contract that the labor cost should not be adjusted. Although the contract was signed as scheduled, there will always be disputes over labor costs at the time of completion and settlement, and due to the large amount of money, they have to go to court. The normal performance of the contract can only be

guaranteed by fully considering the actual situation of the market and signing the contract clauses fairly and impartially under the condition of meeting the regulations.

#### **4 Conclusion**

The compilation of construction tender documents for large-scale infrastructure projects in colleges and universities has its particularities. This article discusses the clarification of the main body of compilation, technical, qualification, and performance requirements, reasonable setting of tender evaluation methods, improvement of design drawings and engineering bill of quantity compilation, setting of the right of prior interpretation of the contract, contract valuation methods, and reasonable setting

of adjustable contract price clauses, so as to find a practical method for compiling tender documents and to improve the quality of tender documents for large-scale infrastructure projects in universities.

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