

Research on the Bidding and Evaluation Methods for Engineering Supervision under a Highly Open Market Environment——A Case Study of a Large Public Building Project

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Keywords: Highly Open Market; Engineering Supervision; Bidding and Evaluation Methods; Large Public Buildings

Abstract: Amidst the evolving competitive landscape of engineering supervision under a very open market environment, this paper investigates bidding and evaluation for engineering supervision with respect to standardization and effectiveness. It provided a case analysis to systematize evaluation methods that fit into highly open markets. Using case analysis and process decomposition methods, this study sampled the supervision bidding practice of a large-scale public building project and systematically performed an integrated analysis of its whole bidding and evaluation processes. Summarizes a four-dimensional assessment framework stressing the notion of "holistic strength evaluation, better proposal feasibility vetting, past project performance quality tested for verification and awarding scoring on service response efficiency." The Essentials of Operation and Time Control Method for Each Assessment Stage is elaborate. The aim is to prove that this four-dimensional framework can be utilized to adapt dynamic nature of bid representatives and information transparency amongst very open markets, enhance justice and scientific precision of evaluation outcomes, enrich new references for supervision bidding as well as assessment towards comparable projects.

1. Introduction

As China's construction market opens wider, the engineering supervision field is being unshackled from regional and qualification monopolies into a new pattern of bidding entities, competitive dimensions and service standards. The traditional price-oriented evaluation model is unable to meet the market demand for supervision service quality. In this context, how to build a few methods used to identify high quality supervisory unit which comply with the rules of a highly open market has attracted great attention from both owners and industrial regulators. As a conventional large public building project, its supervision bidding and evaluation process strictly abide by the market openness requirements, integrating multiple dimensions such as comprehensive strength assessment and proposal feasibility demonstration; so it has certain practical reference value. This paper takes such a project as the research subject to analyze the design logic and implementation process of its evaluation methods, in order to provide inspiration for optimizing engineering supervision bidding and evaluation system in a highly open market.

2. Characteristics of Engineering Supervision Bidding in a Highly Open Market

2.1 Diversified Bidding Entities and Fiercer Competition

The first effect inherent in the diversity of engineering supervision bidding entities is to further lower market access barriers under large scale open market conditions. In addition to traditional local supervision enterprises, chain supervision institutions with cross-regional service capabilities and professional supervision teams specializing in niche areas can also compete, break through the previous regionalized homogenization competition landscape. Stronger competition also forces the supervision enterprise to change from "price competition" to "value competition". Owners' increasingly stringent screening criteria require enterprises to focus on supervision team and process

control mechanisms, so that they can have differentiated advantages. In the next few years, such advantages will force an upgrade in the overall service quality of the industry.

2.2 Significant Improvement in Bidding Information Transparency

In the context of a highly open market, ability to access engineering supervision bidding information goes far beyond traditional offline releases or local platforms. Instead, it depends on national public resources transaction platform and industry bidding websites to achieve "whole process" announcement. All key information, from project bidding announcements and tender documents to the publicity of successful candidate publicity and announcement of winning results, is disclosed according to unified standards, avoiding "black box operations" caused by information asymmetry. Information transparency is also reflected in "process traceability." Some regions require that Q&A documents and clarification notices during the bidding process be simultaneously archived on the platform, and communication records between owners and bidders must be retained for future reference.

2.3 Increasingly High Requirements for Supervision Service Standards

As market openness increases, owners' demands for engineering supervision no longer be restricted to basic functions such as "quality supervision and progress control" but extend to "full-cycle value empowerment," driving supervision service standards towards higher dimensions ^[1]. In terms of quality control, supervision enterprises are required not only to identify problems but also to provide targeted solutions and involve third-party testing agencies for joint verification to ensure a closed loop in quality management. Regarding cost control, they need to assist owners with bill of quantities review, variation visa approval, and reduce unnecessary costs through meticulous management. In compliance management, we must be familiar with the latest applicable industry regulations (such as safety production rules and environmental acceptance standards), so that the fully compliant state of the project can run through each stage of implementation. You are also trained to respond quickly and efficiently in emergencies when you have the necessary first aid and should be able to help with developing countermeasures in prurption such as construction safety accident or natural disasters, which requires a thorough and integrated approach to satisfy project needs for further high-quality advancement.

3. Bidding Evaluation Methods for Engineering Supervision in a Highly Open Market

3.1 Emphasizing the Consideration of the Supervision Unit's Comprehensive Strength

The first step in the bid evaluation committee is to check the qualification documents submitted by the bidding units when verifying their qualifications, of which the business scope of the business license is whether it meets the requirements of a project, and if there are specializations related to CDM construction and an understanding supervision qualification level. In addition, it verifies whether the certificates of registered test engineers and technical professionals are still valid, and checks the historical bad records of the enterprise through the industry regulatory platform to get rid of units with low qualifications or poor credit ^[2]. In the indicator quantification section, comprehensive strength must be decomposed into specific indicators, and four dimensions have been set: Enterprise Qualifications (weight 20%), Team Configuration (weight 30%), Technical Equipment (weight 25%) and Financial Status(weight 25%). Team configuration should be refined, such as "number of registered supervision engineers and professional coverage", "the proportion of senior technical titles", "allocated safety supervision personnel dedicated" Available infrastructures include checking whether the agent has engineering testing equipment and information management systems. Loanable funds eligibility shall be determined by making use of upto three years history of their audit reports to check if they have stayed solvent and functional ^[3]. For the cross-review stage, we followed a "dual independent scoring + collective deliberation" model. Individual ratings are given based on the quantitative indicators before average scores are calculated, and items where there is a large discrepancy in scoring between raters is then discussed collaboratively. The final

comprehensive strength score is determined considering the enterprise's past industry reputation, avoiding the impact of a single rater's subjective bias on the result.

3.2 Strengthening the Feasibility Evaluation of the Supervision Proposal

During the proposal completeness review, the bid evaluation committee first checks whether the supervision proposal covers core modules such as "project overview analysis, definition of supervision scope, setting of supervision objectives, organizational structure setup, key process control measures, and emergency plans," ensuring no content is missing. It also checks whether the proposal compilation complies with industry standards and project-specific requirements, eliminating frameworking, non-specific proposals ^[4]. In the technical detail breakdown stage, the assessment focuses on core supervision work modules. For quality control, it examines whether "acceptance standards for sub-division works, inspection frequency for concealed works, material incoming inspection procedures" are clearly defined, and whether a "closed-loop mechanism for quality issue rectification" is established. For progress control, it verifies whether "supervision progress control nodes, delay warning thresholds, progress correction measures" are formulated based on the project schedule, and whether the impact of seasonal construction on progress is considered. For safety supervision, it checks whether a "list of potential safety hazards, review process for specialized construction plans, emergency drill plan" is clearly defined ^[5]. In the risk point demonstration stage, raters are organized to assess the relevance and feasibility of the supervision measures against the project risks mentioned in the proposal. Using the logic of "risk identification - measure matching - effect prediction," they judge whether the proposal can effectively avoid or address potential problems. The feasibility score is finally calculated based on the weights: Completeness (30%), Technical Rationality (40%), and Risk Response Capability (30%).

3.3 Focusing on Verification of Past Project Performance Quality

For performance authenticity verification, the bid evaluation committee requires bidding units to provide performance proof materials for similar projects in the past 3-5 years, including "Letter of Acceptance, key pages of the supervision contract, project completion acceptance report." It queries the project filing information through the construction department's regulatory platform and public resource trading platform in the project location, checking for consistency between information such as project name, construction unit, supervision period, supervision scope, and the submitted materials. Simultaneously, it conducts phone follow-ups with the construction units of some projects to verify the actual performance of the supervision unit, eliminating performances whose authenticity cannot be verified ^[6]. In project matching analysis, the degree of similarity between past performance and bidding project is evaluated from 3 dimensions according to "project size, project type, technical difficulty", and giving priority to: to those which has the similar performance ^[7]. During the stage of quality achievement evaluation, we review the "quality acceptance reports, awards and evaluations from industry regulatory departments" of past projects to judge the quality control capability of the supervision unit. It also verify whether there are "records of quality accident, records of administrative penalties" on the projects. Content with major quality problems is gets a "one-vote veto." The final performance verification score is obtained by using the weights of Authenticity (40%), Matching Degree (35%) and Quality achievements (25%). This guarantees that the evaluation results are consistent with project needs.

3.4 Adding a Service Response Efficiency Scoring Item

In the process of response mechanism review, in order to verify the information of each bidding unit must submit based on the "Supervision Service Response System", first check need to check Bidding unit description of daily communication response mechanism, problem handling response process and personnel deployment response mechanism can be obtained under clear time standards and operational procedures, avoid cast doubt on fuzzy expression ^[8]. The response capability assessment is measured from two dimensions "Personnel Configuration" and "Technical Support". A "dedicated coordinator" should be evaluated for how well requests from owners are handled and

if the responsibilities of different positions are clearly understood. For technical support, it determines if an online communication platform is present to improve data transmission efficiency and asks whether an expert database has been set up so that immediate technical support can be given for complex problems [9]. You will be guided against the potential emergencies of the Project in the stage of emergency plan verification, reviewed by supervision unit "Emergency Response Plan" to evaluate "(1) emergency response time limit; (2) emergency handling procedures; and (3) emergency resource reserves. This is checked through means of "simulated scenario questions." Service response efficiency score as an output is weighted by the following baseline weights: Response Mechanism Completeness (30%); Response Capability Adaptability (40%); Emergency Plan Feasibility(30%). This weight help align the scoring with actual project requirements for service timeliness.

4. Case Analysis

A massive public building project with a 20,000 m² built area consisting of a mixed-use super high-rise hotel complement lastly honored the 45-day bidding and assessment timetable pursuant to highly open market standards. Day 1-3: The owner released the bidding announcement and tender documents at the same time on the national public resource trading platform, with clear requirements that bidding units must submit qualification documents and performance materials within 15 days, fully reflecting the full-process information publicity characteristics. From days 4-18, you could prepare and submit bids; Is SanyaNanou's Q & A on the latter two questions issued by platform The owner publishes a unified reply formulation answer on the platform On day 10, all communication records are kept for filing. Days 19–20: A preliminary review of the bid evaluation committee was conducted in which a total of 8 bidding units were qualified here and only 5 qualified for detailed evaluation, where two were disqualified because their performance underwent verification according to three-demand indicators with an insufficient qualification level. Days 21-23 were for detailed evaluation, focusing on 1-2 evaluation methods per day: Day 21 involved quantitative scoring based on weights (Enterprise Qualifications 20%, Team Configuration 30%, Technical Equipment 25%, Financial Status 25%), focusing on checking the professional match of registered supervision engineers and the list of testing equipment for each unit. Day 22 involved reviewing supervision proposals, scoring control measures for key processes like deep foundation pit support and curtain wall installation, deducting points for technical rationality from 2 proposals that failed to specify inspection frequency. Day 23 completed performance verification and service response efficiency scoring, verifying performance authenticity through the construction platform, and reducing the service response score for 1 unit that did not specify emergency response time limits. Days 24-25: The bid evaluation committee used the "dual independent scoring + collective deliberation" model to aggregate scores, discussing and confirming 3 items with significant scoring differences, finally determining the successful candidate. From Day 26, the winning result was publicity on the platform. After a 7-day publicity period without objections, the Letter of Acceptance was issued on Day 33. The entire process demonstrated the rigor of the evaluation methods and aligned with the dual requirements for efficiency and standardization in a highly open market.

5. Conclusion

The analysis leads to the following conclusions: Engineering supervision bidding and evaluation in a highly open market requires constructing a "four-dimensional synergistic" framework, where comprehensive strength assessment is the foundation, proposal feasibility evaluation is the core, performance quality verification is the support, and service response efficiency scoring is the supplement. These four elements are interconnected, which can completely avoid the deviation caused by single-dimensional evaluation. The evaluation has to stress on "the equilibrium of standardization and efficacy." From full-process publicity of the bids and traceability of Q&A records, to the phased division of preliminary and detailed review, and further to the setting of the

winning result publicity period, each stage shall weigh between ensuring market transparency requirements being met as well as that project advancement efficiency is never compromised; Evaluation standards should be more demanding regarding "technical detail orientation," as the little details are what guarantee that evaluation results correspond to true project needs (the focus). Based on the above methods, adopting a scoring model of "dual independent scoring + collective deliberation" can effectively reduce individual rater subjective bias and improve evaluation fairness considering the results are to be used as a reference for similar ones.

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