

The main contractors estimators action on receipt construction essay



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1. Introduction

1.1 Structure of sub-contracting

The Hong Kong Construction Industry are made up of mainly three layers though the process of tendering, which include the tendering from developers to main contractors and the sub-contracting main contractors to sub-contractors. In the report, sub-contracting will be further discussed.

In the process of sub-contracting, the estimator of main contractors breaks down the whole construction work into various tasks. For instance, breaks down a building construction work into basement, substructure, bamboo scaffolding, superstructure and finishes. The estimator will then undergo tendering process and sub-contract these various works to favourable tenderers.

In addition, quotation is a document plays a role in the tendering process. It is a priced document which derived from tender that main contractor released and can be regarded as a reduced size of priced Bills of Quantity that tenders submit to the main contractor. Since quotation contains monetary terms and which can result in several companies' interest, it has to be kept highly confidential to avoid collusion or unequal situation to happen.

1.2 Role of cost estimator

To clarify, it is to discuss the role of main contractors' cost estimator in this report. First of all, the estimator is not merely one person but a team with, for example, quantity surveyor, project manager, contract manager and planning engineer. The roles of cost estimator before award of project are to

estimate the cost of construction works, prepare initial budget, price the Bills of Quantity and arrange for man power, materials supply and plants for proposed project.

After the award of project, the cost estimator will break down the works as described above, prepare sub-contacting schedule which stated the time to finish tendering of specific tasks and deadline of commencement of different work, and prepare the tender document with self estimated budget not enclosed. After the receipt of quotation, the cost estimator will select to sub-contract to the most suitable tenderer with equal basis.

Besides, there is other role that is significant to cost estimator. They are to balance the quality and price for selection of sub-contractors, materials and plant, keep all the monetary details highly confidential even within the company and do not receipt of any kind of interest to avoid collusion which keep the tendering process undergoing in equal basis.

1. 3 Sub-contracting procedure after receipt of quotation

The general sub-contracting procedure can be illustrated by figure 1. 3. After the preparation of the quotation documents and the sub-contractor list for open invitation of quotation, a request for quotation will be issued to the sub-contractors on the list. Interested sub-contractors will prepare their quotations and submit them by depositing to the bid box before the deadline set in the quotation documents.

Upon the deadline for submission, a number of quotations would be received from different sub-contractors. The main contractor's estimator is then

started to assess and evaluate those quotations being received. The major
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actions of the estimator after receipt of quotation include checking of the quotations for their compliancy, errors and adjustments as well as selection of the preferred quotation by quality/price mechanism. A quotation report will also be prepared afterward. If the main contractor finally gets the tender from the client (i. e. the developer), performance evaluation may be conducted by the estimating team for future works.

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Figure 1. 3 Sub-contracting procedure after receipt of quotations

2. Checking of the quotations (with Appendix 1)

Upon receipt of quotations from the sub-contractors, the date should be entered on the enquiry record. Basic information of the sub-contractors should be checked and the database is to be updated wherever necessary. To avoid any erroneous price submitted, the estimator of the main contractor then has the responsibility to read, check and verify the quotations for the following:

Whether the quotations are in line with requirements set out in the enquires;

Whether the costs are consistent

If there are any errors;

If the prices provided by the sub-contractor are reasonable

How are the prices when they are compared with the market prices.

2. 1 Checking of compliancy with requirements

After the quotations are received from the sub-contractors, the main contractor's estimator has to make an in depth examination on the quotations in order to assure that they are made in accordance with the enquires' requirements and no alternative offer have been submitted. Any breakdowns of price should always be checked while the rates are being entered into a computerized estimating system to ensure they are correct. The quotations should also be checked against the terms and conditions (Fig. 2. 1. a) and content of the enquires (Fig. 2. 1. b) for any arithmetic errors, missing items, reality and consistency of rates, tender qualification, validity period of tender, and signatures properly provided.

2. 1. 1 Quotations from Material Suppliers

The quotations for material supply should be recorded on a " Materials Comparison Form" (Fig. 2. 1. 1. a) and in accordance with the enquires provided by the main contractor or the clients. The rates are entered during the pricing stage, and any divergence discovered from the provided enquires are to be recorded for later assessment.

The estimator should check for the followings:

The materials adopted comply with that stated in specification;

The quantities of materials are sufficient to meet the required amount as stated in the enquires;

The methods of delivering, unloading and handling of the materials comply with that required by the main contractor, special conditions for ordering and

payment, and the suppliers with the most competitive prices should be contacted to ensure that they had noted all the relevant restrictions on delivery to site;

The delivery dates meet with those required, otherwise additional enquires to maintain a full enquiry list may need to be sent;

The intended on-site or off-site storage of the materials and settlement of payment;

The conditions stated in the quotations is as same as the terms and conditions stated in the enquires and the quotations are not alternative offers.

2. 1. 2 Quotations from Plant Suppliers

The quotations for plant supply should be recorded and on a “ Plant Quotations Register” (Fig. 2. 1. 2. a). Wherever a performance specification for the usage of the plants is given, the quotations should be checked cautiously to make sure that all the plants provided accomplish the enquires’ requirements.

The estimator should check for the followings:

The plants are sufficient to meet the needs of the construction programme;

The wages for plant operators are included;

The working hours of plant operators comply with the intended site working hours;

The responsibilities and charges for maintenance are clearly identified.

2. 1. 3 Quotations from Labour-Only Sub-Contractors

The quotations for labour should be recorded on a “ Domestic Sub-contractors Register” (Fig. 2. 1. 3. a) which is used as a form for sub-contract comparison. Any divergence from the enquires discovered should also be recorded for later assessment and unit rates pricing when selecting quotations.

The estimator should check for the followings:

The conditions stated in the quotations is as same as the terms and conditions stated in the enquires and the quotations are not alternative offers;

The discounts comply with the enquires’ requirements;

The payment basis of the labour;

The ambiguities concerning the responsibilities for protections, storage, clearing up, unloading are resolved;

The supporting information including the schedules of rates and the programme information are given.

2. 2 Checking of errors and adjustments

The main contractor’s estimator should check whether the quotations are basing on complete and accurate information.

2. 2. 1 Domestic Sub-contractors

The main contractor's estimator should ensure that all the items for a particular trade are priced properly, and should request the sub-contractors for any missing rates. The rates provided should be checked for consistency with the bill of quantities, and they should be realistic although the cost will vary depending on the quantities, location and timing. The main contractor's estimator could withdraw or change an offer and report to the client if any obvious errors are detected or the tender document is found to be altered.

The estimator may apply a percentage or add a lump sum to certain rates in cases where considerations are taken for the following:

Work of specific builders which is not measured somewhere else is needed;

Certain attendances are needed to be included in the measured rates;

Specific trades requirement provided by the contractor;

Margin for over-heads and profit are to be included in the measured rates so the estimator could spread the over-heads to works which seems to be under-measured.

2. 2. 2 Nominated Sub-contractors

Nominated subcontractors are subcontractors required by the client to enter a contract for execution of work or the supply of things designated as "Prime Cost" or "PC" items. The main contractor's estimator should ensure that the PC sum is included in the bill calculations and a percentage for profit is added to the PC sum wherever necessary.

2. 2. 2. 1 General and Special Attendances

The main-contractor's estimator should also access the costs for general and special attendances. The costs for general attendances are normally provided in the evaluation of project over-heads for logistical requirements; while the special attendances are to be priced separately in the measured bills of quantities and the estimator may price the work if those attendances are properly described.

Figure 2. 2. 2. 1. a shows different types of attendances to be provided to the sub-contractor by the main contractor. These attendances should be priced in project over-heads and the amount required should depend on the sub-contractor. Therefore, the main contractor's estimator should adjust the amount of lump sum or added percentage to different types of sub-contractors carefully.

2. 3 Comparing of Prices

2. 3. 1 Comparing with Market Prices

The main contractor's estimator should compare the quotations provided by the sub-contractors with the market prices.

2. 3. 1. 1 Variations in unit rates

While comparing the prices, the estimator should also consider factors which may affect the rates of materials, plants, and labour. The rates for materials may depend on the suppliers' locations, the sizes of the materials, the delivery costs, and whether alternative materials are to be adopted should also be considered. The rates for plants could be affected by the prices for erecting and dismantling, maintenance, and insurance of the plants in the

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construction sites. As for the rates for labour, they depend very much on whether skilled labour is available in the area or extra payment for labour with special skills are needed, the location at which jobs are to be carried out should also be taken into consideration.

2. 3. 2 Comparing with other quotations

The main contractor's estimator should carefully compare each quotation submitted by all the sub-contractors. A spreadsheet such as the " Sub-contract Comparison Sheet" (Fig. 2. 3. 2. a) may be used for comparing as it facilitates listing, rates comparing as well as mathematical checking.

3. Selection of the quotation (with Appendix 2)

Price3. 1 General criteria

Quality

TimeIn most of the case (i. e. except in case of nominated sub-contractor), there is still a long-list of sub-contractors, who compliant with the requirements, remain after checking the quotations with the enquiries. In order to identify the preferred sub-contractor(s), hence, a short-listing with several criteria should be processed. The most significant factor is price, while other criteria include experience and qualifications, financial and resources standing, reputation and management system.

3. 1. 1 Price

The quoted price in the quotation constitutes substantial effect on the decision making of the cost estimator. With a lower cost to hire a sub-

contractor, the main contractor can turn out give a lower bid in the tender to the developer and therefore, increase the opportunity of getting the project.

3. 1. 2 Experience and qualifications

An experienced and qualified sub-contractor on the type of work of the project means it can finish the work in a more effective way compares with those without (i. e. the completion time may be shortened due to its experience on the trade). In the case of specialized works such as demolition work and foundation work, experience is even more important. The cost estimator can evaluate the sub-contractor's past performance with the company or refer to different Registers[1]and professional bodies for determination its competence on the work.

3. 1. 3 Financial and resources standing

Financial standing of the sub-contractor is an important factor since inadequate working capital of the sub-contractor may hinder the working progress and lengthen the completion time. In addition, the cost estimator needs to ensure the sub-contractor is having sufficient resources (i. e. man power, material, plant, etc.) to deal with the work, especially in the case of supplier. By investigating into the liquidity, credibility and adequacy of resources of the sub-contractor, the cost estimator can so avoid delay of the entire construction of the project to minimize loss to the client.

3. 1. 4 Reputation and management system

Reputation of a sub-contractor is generated when it provided quality services in the field. By investigating the past performance (i. e. workmanship, time management, worker and material quality, etc.) of the sub-contractor, the

cost estimator can reasonably select sub-contractor(s) who can provide up-to-standard work. The management system should also contribute to the decision of the cost estimator, as proper management can generate synergy effect to the labour performance.

3. 2 Establishment of the quality/price mechanism

The major concern for the main contractor's estimators to select an appropriate quotation is to have a quotation of both low price and good quality. Hence, in order to maintain a good balance between quality and price, a quality / price mechanism should be established to facilitate the process.

3. 2. 1 Formulation of the quality / price ratio

The quality / price ratio should be formulated at the first stage. The ratio can depend on the complexity of the work, the degree of innovation and the flexibility. For instance, straightforward projects should be less complicated and less innovative. Therefore, the price factor should be given a higher weight. Thus, the quality / price ratio of 20/80 could be considered. Similar approach can be adopted for complex and repeat projects to obtain the ratio. Fig. 3. 1 shows the relationship between quality and price for different kinds of projects.

3. 2. 2 Weighting of the quality criteria

Different quality criteria should be weighted according to their importance to the project. Basically, there are four major criteria. They include the practice of the company, the project organization, the key project personnel and the project execution.

Practice of the company comprises the organization structure, financial stability, quality assurance, resources, management systems, relevant experience of the company and etc.

Project organization refers to the organization of the proposed project team and the authority level of team members.

Key project personnel includes the qualifications, communication skills and enthusiasm of the team members and the extent they understand the project brief.

Project execution refers to the programme, method and approach, as well as the management and control procedures of the project.

To weight the criteria, it is suggested that the key project personnel can occupy around 30 to 40% of the total weight, 20 to 30% each for the practice of the company and the project execution, 15-25% for the project organisation.

3. 2. 3 Establishment of the marking (scoring) system

After the quality / price ratio is formulated and the quality criteria is weighted at the first and second step, a quality threshold should be introduced to the marking system. It is the minimum marks that must be scored by the short-listed sub-contractors in the quality assessment so as to allow further consideration of the quotations. An assessment sheet can then be prepared for subsequent assessments of the quotations. In the assessment sheet, both the quality and price scores will be given and an

overall score will be added. An unfilled assessment sheet is shown as Fig. 3. 2.

3. 3 Assessment of the quotations

After returning the quotations from various sub-contractors, the main-contractors' estimators can start to do the assessment on the quality and price.

3. 3. 1 Quality assessment

Marks should be scored according to the quality criteria (i. e. practice of the company, project organization, key project personnel and project execution) and the weighting and marking system set down previously. If the scored mark of a quotation is below the targeted quality threshold, the quotation should not be further considered and should be discarded. However, if it is the situation that all the submitted quotations are below the threshold and there is a common failure of a specific criterion, then the estimators may re-assess the requirement to see if there is a need of amending it.

3. 3. 2 Price assessment

Price assessment should be considered only if a quotation has passed the quality assessment. It is done in the way that the quotation with the lowest quoted price is considered to score 100 marks in this section. While for other quotations having a higher quoted price, their scored marks will be deducted with a proportional percentage. However, for particular quotations having an extraordinarily low price, they should be reviewed in order to ensure full compliance of the requirements.

Finally, the quality and price scores should be totalled and the assessment sheet should be dated and signed for later auditing purposes. Fig. 3. 3 shows an example of a completed assessment sheet.

3. 3. 3 Final assessment

After all the qualified and assessed quotations have been obtained, their overall scores can be compared with an assessment comparison sheet. The sub-contractor with the highest overall score will eventually win the bid. Fig. 3. 4 shows an example of a completed comparison sheet. It is seen that the assessments of different firms (i. e. firm A, B, C and D) have been done and the overall scores have been calculated onto the same sheet. Since firm A has got the highest overall score among the competitors, its quotation will be considered by the main contractor.

4. Quotation report

A quotation report is used to summarize all the necessary information and evaluation result of the assessment, and as a reference for the cost estimator to refer to if finally sub-contractor is needed to be awarded.

The quotation evaluation report should include the followings:

The sub-contractor list established at the beginning

A summary of the quotations received and opened

The results of the checking and selection of the quotations

The evaluated price of each quotation, showing any corrections, errors or adjustments

The scores and rankings of the quotations, according to the assessment

Recommendation to award the contract

5. Actions after tender is awarded by the developer

If the main contractor finally gets the tender from the developer, there are still several actions that the main contractor's estimator needs to do. Firstly, notification to the winned sub-contractor (i. e. the highest scorer in the final assessment) to ensure the selected team is still available. Once the award is made, advisement to all other discarded sub-contractors in writing should be processed.

Secondly, the estimating team should evaluate the performance of both the selected sub-contractor(s) and the quality/price mechanism. Evaluation to selected sub-contractor can be by the way of inspection during work or after completion. The results may be used in selection of sub-contractor in future works as mentioned in Part 3. Besides, the evaluation of the appropriateness of the quality and price ratio and the weighting system can used to adjust the mechanism and improve its operation in future works.

6. Conclusion

In conclusion, the main contractor's estimator's actions on receipt of quotations from their sub-contractors are first checking for their compliancy with the quotation documents, and sorting out any errors and adjustments. Secondly, the estimator needs to select the preferred sub-contractor(s) by considering their quoted price, experience, financial and resources standing, reputation, etc with the quality/price mechanism.

Thirdly, a quotation report will be prepared afterward. And if the main contractor finally gets the tender from the client (i. e. the developer), performance evaluation may be conducted.

The above actions and procedures conducted by the cost estimator can be further illustrated by the case study in the next part.

7. Case study

The case is from the main contractor - Chun Wo Construction and Engineering Limited, of project - Tuen Mun Western Trunk Sewerage (DC/2009/11). The cost estimator proposed to sub-contract the installation works of temporary water and electricity of site offices and underwent the following procedure.

In the first stage - preparation of documents, the estimator prepared the description of required work. Simply, it includes the description and details of proposed installation works. They then decided the adaptation of selective tendering rather than open tendering as time was limited and selected two contractors in the sub-contractor list. They are Wing Wo and Sky. Lastly, they prepared the tender document of the work, which contains common items to all tender documents, including general conditions of contract, standard conditions of sub-contract, special condition of contract, general specification and standard methods of measurement, and specific item details such as particular specification, particular preamble, schedule of rates and drawings. Figure 7a is the tender document list of the work. After prepared the tender document, they issued request of quotation to the two contractors.

In the second stage - the selection of sub-contractor, the estimator received the quotations by bid box and checked with the compliance, errors, adjustment and price as described in previous section. They selected the criteria for the work as quality to price ratio, experience and reputation. After the comparison of those criteria, they recommended Wing Wo as the sub-contractor since it had better quality to price ratio and experienced. Figure 7b is the tender report for comparison. Since the score of Wing Wo was the highest, its director was invited to have further negotiation to assure all details were known and the same in two parties, and price adjustment had done at that moment. Finally, estimator prepared sub-contract for the work in which an item concerning wage payment was added, and signed with the director and project manager.

Figure 7a Tender list Figure 7b Tender report