THE RELIABILITY AND EFFECTIVENESS OF DEPARTMENT ESTIMATE IN TENDER EVALUATION.

CHE KU SUFIAH BT CHE KU ABDULLAH

A project report submitted in partial fulfillment of the requirements for the award of the degree of Master Science (Construction Management)

Faculty of Civil Engineering

MAY 2011
ACKNOWLEDGEMENT

First and foremost, I would like to thank to Allah S.W.T. for giving me the strength and blessing to complete this project. It is really a great pleasure after working on this study completely. Alhamdulilhah.

I would also like to address my sincere appreciation to my thesis supervisor, Prof. Dr. Aminah bt. Md Yusof for her guidance, advice and invaluable assistance to successfully complete this project.

I would also like to take this opportunity to extend my gratitude to the staff of PWD and individuals who are involved directly and indirectly for their assistance and cooperation in giving relevant information while conducting this project.

Last but not least, a special thanks is forwarded to my family and friends for giving me the moral support throughout my study.
ABSTRACT

The selection of tender is a very significant process during the pre-contract stage and need to assess meticulously. Hence, Public Works Department (PWD) has introduced a statistical method called as cut-off system to guide the selection of tender. Department estimate as one of the data need to be incorporated in the system and also become as a basis to guide the selection of tender. However, the department estimate used is considered unreasonable by certain parties when there is a high divergence with the cut-off level. Today, most of the tender also awarded based on the cut-off level and ignoring the level of department estimate. Therefore this study will be conducted to investigate the function of department estimate, the reliability of department estimate and the effectiveness of department estimate in cut-off system. The objectives of the research are to study the process of evaluating the tender in PWD, to review the process and procedures in the preparation of department estimate in PWD and to assess the effectiveness of department estimate in the tender evaluation. Expectantly, the study will assist the estimator to enhance the reasonableness of the department estimate and often take into consideration the department estimate as a basis to select the most qualified contractor.
ABSTRAK

CHAPTER 1

INTRODUCTION

1.1 Introduction

The construction industry in Malaysia generally can be divided into two areas. The first area is general construction such as residential, non-residential and civil works. Meanwhile, the second area is special trade or specialist work such as electrical, mechanical, carpentry and metal work. Basically, the construction industry is a very important industry in supporting and complementing other industries. This is proven when other industries require building and infrastructure to operate their activities and they are provided by construction industry. Construction industry also is considered very unique industry since it produces a variety type of product in terms of design and specification. The construction product varies depending on customers demand, regulation requirement, environmental needs and external factors. Therefore it involves many processes to fulfill these criteria. The construction process generally will go through the planning process, design, procurement, implementation, testing and demolition process.
In order to accomplish these processes it requires many stakeholders and parties in multi disciplines to produce building and infrastructure. Every stakeholder and party involve has their own responsibility and liability to ensure the project completed within the stipulated design, specification, time, cost and quality. One of the significant processes in the construction industry is procurement process and one of the elements in the procurement process is the selection of the contractor. The selection of competent contractor and competitive price among the bidders are the challenges need to be faced by the evaluator in the assessment of tender. Meanwhile, contractor also faces problems in preparing and compiling the documentations required within the restricted time and need to compete with other contractors.

The selection of tender is a very significant process during the pre-contract stage and need to assess meticulously. Hence, every party involves in the evaluation of tenders regardless the private or public sector, has their own system and technique to evaluate the tender effectively. Generally, the basis of evaluation and factor of consideration should be similar.

Traditionally, tenders have been assessed based on the lowest price offered by the contractor. This probably led to bidders reducing their tender price at the first place for the sake of winning the tender. Furthermore, they will increase the price through variations of works and claims. Essentially, the lowest tender price will result in low quality of building and infrastructure. Therefore we cannot only judge the lowest price as the most qualified bidders and ignoring other consideration. In essence, tender must be assessed based on the value for money and meet the client’s requirement.

The most important criteria in determining the rationality of the tender price is through the department estimate and this method had been practiced by the Public Works Department (PWD) previously. However, there was an issue when the estimate
is unreasonable and any amendment towards the department estimate is only giving advantage to the certain contractors. Therefore the PWD has introduced a method that approach on the statistical method in which the reasonableness of the tender price is compared to the level of cut-off.

1.2 Problem statement

Public Works Department (PWD) has been using cut-off method since 2002 for evaluating the tender price offered by the contractors. The level of cut-off will be determined by the statistical method and the tender price will be compared with the cut-off level. The cut-off level is considered as the lowest price by taking into consideration the current market price. Therefore, the tender price is considered too low if its position is below than cut-off level and it possibly will affect the contractor’s performance. Department estimate is one of the data or price to be incorporated in this statistical system.

Previously before 2009 the privilege criteria had been used for the tender price below the cut-off level as a basis for evaluating the tender. The tender below the cut-off level can be considered if it fulfills the requirement in terms of experience, financial and the performance of the current job in hand must be excellent. However this method has been superseded by the Treasury’s Instruction Letter date 15 January 2009. According to the Treasury’s Instruction Letter date 15 January 2009, tender below the cut-off level can be considered if it is fulfilling all the evaluation requirements, the price offered should be not less than 15% the builder’s work mean and the position of the bidder must be the nearest to the cut-off level. This is to ensure that the contractor capable to implement the project by considering the fluctuation of price in the future. This circular
has become a guideline for the PWD on the tender using the cut-off method when selecting the contractor. Department estimate is an important data to be incorporated in the cut-off system. Furthermore, this estimate is also functioning as a basis for comparing the tender price submitted by the contractors and to ensure the tender rate is relevant to be accepted.

According to the Director General Of Public Works Department Instruction Letter date 13 Mei 2009, the assessment of tender must be made towards the tender prices offered until (-)15.99% of the builder’s work mean. Formerly the evaluation was only carried out for those who offer the price (-)15% of the builder’s work and above. By referring to the Director General’s Letter, the Board of Acquisition of the Public Works Department has more space and alternative to select the contractor.

The department estimate is prepared based on the architectural drawing and structural detail drawing after the tender closing date. This estimate is also prepared by collecting the quotations from the suppliers particularly for the special item and prepare the build-up rate to obtain a single rate. However, when the department estimate is incorporated into the cut-off system it will indicate a high divergence between the cut-off level and department estimate. Therefore, the department estimate is considered unreasonable when the difference between the cut-off level and department estimate is high since the cut-off level is considered as the lowest level to be assessed. Occasionally the department estimate is below than the cut-off level and less than 15% of the builder’s work mean which is cannot be considered as according to the Treasury’s circular. Additionally, the department estimate is not effective to guide the selection of the contractor since the difference between cut-off level and department estimate is high.

The department estimate in addition is considered as not according to the current market price when there is a huge divergence between the cut-off level. This situation probably can happen when the time is very limited to prepare the estimate. The
department sometimes merely uses the existing rate and mark up the rate using the percentage particularly for the normal item. Hence, the selection of tender tends to rely on cut-off level and ignoring the department estimate.

On the other hand, contractors may possibly manipulate the price of tender among of them which will be affecting the position of department estimate. Consequently, the department estimate probably lower than cut-off level or less than 15% of the builder’s work mean. As a result, the department estimate is considered unreasonable as according to the Treasury’s Circular. The Board of Acquisition also has realized this matter when they found that the contractor who is qualified to be awarded offer the price enormously higher or lower than department estimate. They give rise to the several issues such as how the cut-off level has been determined in practice? And to what extend the department estimate contribute to the cut-off determination? A study need to be carried out to investigate what is the function of department estimate, the reliability of department estimate and the effectiveness of department in cut-off system. It is important to see how they will affect the credibility of the department estimate.

1.3 Aim and Objective

The aim of this study is to analyze the use, effectiveness and reliability of department estimate in tender evaluating process. In order to achieve this aim the following objectives have been determined:

1) To study the process of evaluating the tender in Public Works Department (PWD).
2) To review the process and procedures in the preparation of department estimate in Public Works Department (PWD).
3) To assess the effectiveness of department estimate in the tender evaluation.

1.4 Scope of study

Previously the study regarding the cut-off system and estimate had been carried out. One of the study is “Keberkesanan Sistem Anggaran Kos Yang Dipraktikkan Oleh Jurukur Bahan Di Malaysia” completed in 2005. The study focused on the current estimating system used by QS firms in Malaysia in aspect to identify the effectiveness of the current estimating system practiced by QS firms in Malaysia, problems faced by the QS and also methods to minimize the problems faced and the effectiveness of the system. Furthermore, a study regarding the ‘cut-off’ system had been carried out entitled “Contractor’s Perception of The Use of Statistical Approach In The Tender Process At The Public Works Department, Malaysia” and completed in 2006. This study focused on the contractor’s perception towards the use of cut-off system in the evaluation of tender whereby the analysis had been done to find out whether the contractor agree with this system. In 2008 another study regarding the cut-off system had also been carried out in the title of “Kajian Ke atas Penggunaan ‘Cut-Off’ Dalam Sistem Penilaian Tender JKR”. The study focused on the method of using the cut-off system in the evaluation of tender and the problems faced by the user.

Nevertheless, the scope of this study is to focus and confine to the reliability and effectiveness of department estimate in the selection of tender that using the cut-off method. The study will be restricted to:

i) Tender for conventional work.

ii) Cut-off system in the Public Works Department

iii) Preparation of estimate by the Public Works Department
1.5 Research Methodology

The study will be conducted in several stages to achieve the objectives of the study. The first stage is establish the problem statement, aim and objectives of the study to be carried out. The second stage is identifying the scope of study. The third stage is the preparation of literature review to give a preliminary understanding regarding the topic of study. Basically, the literature review will explain in relation to the estimating and tender evaluation. The literature review will be prepared in accordance with the theory from the reference books, guideline issued by the PWD, Circular of Treasury and PWD, information obtained from the internet and PWD website. Furthermore, the study will be continued by collecting the information from the previous documents. The information obtained will be analyzed to find out the result of the study. Additionally, the interview among the estimators in PWD also will be carried out in order to enhance the information required consecutively will be supporting the finding of the study. The interview will be covering the topic on how the cut-off level is determined in practice, a real method of preparation of the department estimate practiced by the estimator in PWD and factors of high divergence between department estimate and cut-off level. Finally, the conclusion will be done and the recommendation will be proposed based on the result obtained. A flowchart of the process can be illustrated in Figure 1.1.
Figure 1.1: Research Methodology Flow chart

- Formulation of the problem statement
- Select the topic
- Determination of Aim & Objectives
  - Reference book, Article and Journal
  - Guideline of PWD
  - Circular of Treasury & PWD
  - Internet & PWD Website
- Identification of the scope of study
- Literature review
  - Reference book, Article and Journal
  - Guideline of PWD
  - Circular of Treasury & PWD
  - Internet & PWD Website
- Collection of data
  - Documents analysis
  - Questionnaire Survey
- Analyze the data collection
- Result & Finding
- Conclusion & recommendation
REFERENCES


Jabatan Kerja Raya. *Prosedur Perolehan Kerja*. JKR Malaysia. JKR.PK(0).03. 2005


TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td></td>
<td>i</td>
</tr>
<tr>
<td>DECLARATION</td>
<td></td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td></td>
<td>iii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td></td>
<td>iv</td>
</tr>
<tr>
<td>ABSTRAK</td>
<td></td>
<td>v</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td></td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
<td>xi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
<td>xii</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td></td>
<td>xiv</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td></td>
<td>xv</td>
</tr>
</tbody>
</table>

1 INTRODUCTION

1.1 Introduction 1
1.2 Problem statement 3
1.3 Aim and Objective 5
1.4 Scope of study 6
1.5 Research Methodology 7
2 TENDER EVALUATION

2.1 Introduction 9
2.2 Types of tender 9
  2.2.1 Open tender/Bumiputera open tender 10
  2.2.2 Selected tender 10
  2.2.3 Direct negotiation tender 11
  2.2.4 Pre-qualification 11
  2.2.5 ‘Perbelanjaan Darurat tender’ 12
2.3 Process of conventional acquisition in PWD 13
  2.3.1 Process of acquisition of open tender (conventional) 14
  2.3.2 Process of acquisition of Selected Tender (conventional) 17
2.4 The criteria of tender evaluation 19
2.5 Process and criteria of tender evaluation in PWD 20
  2.5.1 First Level of Evaluation 20
  2.5.2 Second level of evaluation 22
  2.5.3 Third level of evaluation 27
2.6 Cut-off price 27
  2.6.1 Freak 28
2.7 Summary 29

3 ESTIMATING

3.1 Introduction 30
3.2 Estimate and Purpose of Estimating 30
3.3 Types of Estimate 31
  3.3.1 Approximate Estimate 32
3.3.2 Detailed Estimate

3.4 Contractor’s Estimate
  3.4.1 Site visit
  3.4.2 Construction method
  3.4.3 Construction schedule
  3.4.4 Quantity takes off
  3.4.5 Calculation of cost

3.5 Preparation of estimate
  3.5.1 Fluctuation of cost
  3.5.2 Traffic condition
  3.5.3 Restrictive work hours or method of work
  3.5.4 Small quantity of works
  3.5.5 Separated operation
  3.5.6 Handwork and inefficient operations
  3.5.7 Accessibility
  3.5.8 Geographic location
  3.5.9 Construction season
  3.5.10 Material shortage

3.6 PWD Estimate
  3.6.1 Department estimate
  3.6.2 Preparation of department estimate
    3.6.2.1 Locality
    3.6.2.2 Urgency of the project
    3.6.2.3 Complexity of the project
    3.6.2.4 Site condition
    3.6.2.5 Material supply
    3.6.2.6 Increasing of commodity price
    3.6.2.7 Construction technology
4  DATA COLLECTION
4.1  Introduction 46
4.2  Preparation of Questionnaire 47
4.3  Questionnaire survey 48
4.4  Document analysis 49
4.5  Content Analysis 50
4.6  Summary of Data 51
    4.6.1  Frequency analysis 52
    4.6.2  Average index 52
4.7  Summary 53

5  ANALYSIS AND RESULT
5.1  Introduction 54
5.2  Analysis 55
    5.2.1  Questionnaire Analysis 55
    5.2.2  Document analysis 91
5.3  Summary 98

6  CONCLUSION AND RECOMMENDATION
6.1  Introduction 99
6.2  Findings 99
    6.2.1  Objective 1 - To study the process of evaluating 100
           the tender in Public Works Department (PWD).
6.2.2 Objective 2 - To review the process and procedures in the preparation of department estimate in Public Works Department (PWD).

6.2.3 Objective 3 - To assess the effectiveness of department estimate in the tender evaluation.

6.3 Conclusion

6.4 Recommendation

REFERENCES

APPENDICES
Appendix A
## LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Rating scale of Average Index</td>
<td>53</td>
</tr>
<tr>
<td>5.1</td>
<td>Time taken to prepare a department estimate</td>
<td>59</td>
</tr>
<tr>
<td>5.2</td>
<td>Factors of time required in preparing department estimate</td>
<td>62</td>
</tr>
<tr>
<td>5.3</td>
<td>Basis in preparing department estimate</td>
<td>64</td>
</tr>
<tr>
<td>5.4</td>
<td>Factors to be considered in the preparation of department estimate</td>
<td>67</td>
</tr>
<tr>
<td>5.5</td>
<td>Factors of accuracy of the department estimate</td>
<td>73</td>
</tr>
<tr>
<td>5.6</td>
<td>Revision of department estimate</td>
<td>76</td>
</tr>
<tr>
<td>5.7</td>
<td>Basis of cut-off price</td>
<td>78</td>
</tr>
<tr>
<td>5.8</td>
<td>Factors considered in the selection of contractor</td>
<td>81</td>
</tr>
<tr>
<td>5.9</td>
<td>Perception on department estimate and cut-off level</td>
<td>87</td>
</tr>
<tr>
<td>5.10</td>
<td>Department estimate and cut-off price</td>
<td>92</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Research Methodology Flow chart</td>
<td>8</td>
</tr>
<tr>
<td>2.1</td>
<td>Process of conventional acquisition in PWD</td>
<td>14</td>
</tr>
<tr>
<td>2.2</td>
<td>Process of acquisition of open tender (conventional)</td>
<td>16</td>
</tr>
<tr>
<td>2.3</td>
<td>Process of acquisition of Selected Tender (conventional)</td>
<td>18</td>
</tr>
<tr>
<td>4.1</td>
<td>Five measures of scale based on Likert Scale</td>
<td>48</td>
</tr>
<tr>
<td>5.1</td>
<td>Working experience of respondent</td>
<td>55</td>
</tr>
<tr>
<td>5.2</td>
<td>Experience in preparing department estimate</td>
<td>56</td>
</tr>
<tr>
<td>5.3</td>
<td>Number of Department Estimate Prepared by Internal Department</td>
<td>57</td>
</tr>
<tr>
<td>5.4</td>
<td>Number of Department Estimate Prepared by External Consultant</td>
<td>58</td>
</tr>
<tr>
<td>5.5</td>
<td>Time taken to prepare a department estimate</td>
<td>59</td>
</tr>
<tr>
<td>5.6</td>
<td>Factors of time required in preparing department estimate</td>
<td>62</td>
</tr>
<tr>
<td>5.7</td>
<td>Basis in preparing department estimate</td>
<td>65</td>
</tr>
<tr>
<td>5.8</td>
<td>Factors to be considered in the preparation of department estimate</td>
<td>68</td>
</tr>
<tr>
<td>5.9</td>
<td>Factors of accuracy of the department estimate</td>
<td>73</td>
</tr>
<tr>
<td>5.10</td>
<td>Number of Revision of department estimate</td>
<td>76</td>
</tr>
<tr>
<td>5.11</td>
<td>Basis of cut-off price</td>
<td>78</td>
</tr>
<tr>
<td>5.12</td>
<td>Factors considered in the selection of contractor</td>
<td>82</td>
</tr>
<tr>
<td>5.13</td>
<td>Perception on department estimate and cut-off level</td>
<td>88</td>
</tr>
</tbody>
</table>
5.14 Cut-off Price and Department Estimate 93
5.15 The Percentage Difference Between Cut-off And Department Estimate 94
5.16 Position of Cut-off And Department Estimate 95
5.17 Range of Percentage of Department Estimate 97
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACDA</td>
<td>As Completed Detailed Abstract</td>
</tr>
<tr>
<td>AKM</td>
<td>Anggaran Kakitangan Minimum</td>
</tr>
<tr>
<td>ATDA</td>
<td>As Tendered Detail Abstract</td>
</tr>
<tr>
<td>BPU</td>
<td>Bahagian Pembangunan Usahawan</td>
</tr>
<tr>
<td>BQ</td>
<td>Bill of Quantity</td>
</tr>
<tr>
<td>CV</td>
<td>Coefficient of Variation</td>
</tr>
<tr>
<td>FRH</td>
<td>Faktor Rendahan Harga</td>
</tr>
<tr>
<td>JKR</td>
<td>Jabatan Kerja Raya</td>
</tr>
<tr>
<td>KB</td>
<td>Keupayaan Biayawan</td>
</tr>
<tr>
<td>KK</td>
<td>Kemudahan Kredit</td>
</tr>
<tr>
<td>KWSP</td>
<td>Kumpulan Wang Simpanan Pekerja</td>
</tr>
<tr>
<td>MP</td>
<td>Modal Pusingan</td>
</tr>
<tr>
<td>NTBK</td>
<td>Nilai Tahunan Baki Kerja</td>
</tr>
<tr>
<td>NW</td>
<td>Nett Worth</td>
</tr>
<tr>
<td>PDA</td>
<td>Preliminary Detail Estimate</td>
</tr>
<tr>
<td>PKK</td>
<td>Pusat Khidmat Kontraktor</td>
</tr>
<tr>
<td>PWD</td>
<td>Public Works Department</td>
</tr>
<tr>
<td>QS</td>
<td>Quantity Surveyor</td>
</tr>
<tr>
<td>WDTS</td>
<td>Wang Dalam Tangan Semasa</td>
</tr>
</tbody>
</table>
# LIST OF APPENDICES

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Sample of Questionnaire</td>
<td>107</td>
</tr>
</tbody>
</table>