

# Bill of quantity in civil engineering



**ASSIGN  
BUSTER**

## INTRODUCTION

As stated in the assignment brief, the objective of this assignment is to appreciate and disseminate the knowledge, techniques and skills of measurement into actual practice and to expose the students with the production of Bills of Quantity referring to the measurement work done as part of tender documentation requirements. Based on CESMM, measurements can be classified as coordination and planning of quantities and also to list the details of the work to ensure it is running with a consistent, systematic and new construction techniques were explained well. Bill of Quantities is prepared by Quantity Surveyor based on measurement from the construction drawings / building plans. This document has been used in the construction of buildings which has been detailed in the context of the quantity of each category of work performed. For an example, building works, mechanical, electrical works, civil, structural works and infrastructure works. The contractor will priced or estimate all the works associated in completing the buildings during pre-construction stage. The civil works measurement referred to a document called ‘ Civil Engineering Standard Method of Measurement ‘(CESMM).

Before this document is produced, the party who responsible for the working measurement refers to the method adopted in the United Kingdom named ‘ CESMM 2nd Edition or 3rd Edition’. There are most of the benchmark method used in building works, they use their own measurement system. This leads to inconsistencies in the measurement procedure. As a result, contractors are having difficulty to appreciate the tender.

Work on the actual measurement must take into account the complexity of the work undertaken. Work measurement for any item of work is also closely associated with the activities and construction methodology.

## TASK 1

Discuss the importance of Civil Engineering Standard Method of Measurement (CESMM) in the civil engineering works / projects taking-off.

Civil Engineering Standard Method of Measurement (CESMM) is to be used in conjunction with the Conditions of Contract for Civil Engineering Works.

CESMM does not deal with the preparation of Bills of Quantity for mechanical & electrical engineering work, building work or work which is seldom encountered in civil engineering contracts. If any such work to be included in the contract, such work shall be measured in accordance with their respective Standard Method of Measurement and shall be stated in the Preambles to the Bills of Quantity.

CESMM provides a standard format, either in the form of items components and how they should be measured. A multi-level classification introduced in CESMM or space for a description of the work that can be developed.

In the other hand, CESMM is to understand the purpose of using a standardised method of measurement. CESMM measurement method using the concept of method-related charges to present the cost of construction at the site in more obvious, such as covering the cost of site preparation and building machinery operating costs, and labor force. The importance of CESMM are be able to prepare bill items and re-measure completed work in

accordance in civil engineering works. Be aware of the structure and application of Method Related Charges, unique to CESMM and the benefits arising from this facility. Be aware and appreciate the relationship of the Method of Measurement and the Conditions of Contract in the civil engineering works.

## TASK 2

1. Identify and discuss the contents of the tender document to be prepared for the tendering stage.
1. The tendering stage is the process of selecting and appointing the contractor for the main construction contract. The contents of the tender document to be prepared for the tendering stage are:
  2. Letter of Invitation to tender- The bidder produce a formal letter to the tenderer, stated the tender closing date and time.
  3. Introduction-The tenderer invites bidder to submit a detailed proposal on the provision of equipment/system/software/services/works are detailed in the Tender Document.
  4. Conditions of contract – A written agreement is intended to bind the contractor appointed by the employer based on the laws and conditions imposed and agreed.
  5. Contract Drawings – technical / detailed construction drawings for measurement / costing by Quantity Surveyor / engineers – prepared by architect / engineers.

6. Specification / Preambles – A brief description of the materials and workmanship, the standard or quality of workmanship . It must convey the architect and engineer’s requirements.
7. Bill of Quantities – Prepared by the Quantity Surveyor/stint on the size of the construction drawing plan / building. This document has detailed all the quantities for each category of work used in the construction of buildings. For example, building works, mechanical, electrical, civil, structural works, infrastructure works and other contractors would cost / budget all work related to the completion of pre-construction building.
8. Investigate the Tenderer Financial standing – Look back into the audited accounts for past three years whether they have stable financial background. Get confidential report from firm’s bank.
9. Instructions to Bidder –
  - Purpose of Instructions.
  - Tender Acknowledgement.
  - Tender Document
  - Preparation of Proposals.
  - Submission of Proposals – (technical & unpriced commercial proposals, priced commercial proposals, softcopy format)
  - Acceptance of Bidder’s Proposal.
  - Validity of Bidder’s Proposals.
  - Queries
  - Confidentially of Tender Document.
  - Audit of Bidder’s Facilities.
  - . Pre-award Meetings.

- Bidder Questionnaires Forms.
- Suspension and cancellation
- Award of Contract.

10. Proposal Submission Guidelines.
11. Scope of Works, Technical Specifications & Requirements.
12. Bill of Quantity (BQ) and Price Schedules.
13. Bidder's Compliances to Tenderer General's Terms and Conditions.
14. Tender Acknowledgement Form.

2. One of the contents in the tender document is conditions of contract.

What are the available conditions of contract, which are commonly used in the construction project?

1. Contract Agreement.
2. Letter of Acceptance.
3. Tender and Appendix to Tender (as submitted by the Contractor in the Tender)
4. Particular Conditions of Contract, Conditions Part 11(Part of Tender Document)
5. General Conditions of Contract, Conditions Part 1(Example, as published by DM)
6. Specifications(parts of Tender Documents)
7. Drawings.
8. Priced Bill of Quantities.

### 3. What are the functions of the conditions of contract?

The functions of Contract Conditions is to set out the principal legal relationship between the parties to a construction project, determining the allocation of risk and consequently, price. Conditions of contract must be read in conjunction with specification documents, drawings bills of quantities, activity schedules and special conditions. Standard form contracts often comprise suites of contracts with ‘back to back’ subcontracts, consultant appointments and collateral warranties.

The formal conditions of contract in a tendering process is:

1. Certification of free competition – For the purpose of restricting competition to the price in the tender shall not be taken in consultation discretion.
2. Restriction of publicity action – Tenderers are not authorised to mention in their publicity that they have been invited to tender, are tendering or have tendered.
3. Validity period of tender – The tender shall specifically state a period of validity of 4 months from the closing date for the receipt of tenders, or such other period as may be provided for in the Special Conditions of Tender.
4. Period for tender preparation – The closing date for submission of tenders is stated in the cover letter. Extensions of this period, requested in writing, will only be considered by the Agency if operational requirements so permit, and if, in the case of competitive tendering, fair competition is not thereby impaired. Requests for

extensions received less than two weeks before the closing date will, not be considered.

5. Right to audit – During its validity period, to request the tenderer to provide evidence of any element of his quotation and may call for additional detailed information irrespective of the type of price proposed. The Agency reserves the right to audit the quoted prices.
6. Negotiation prior to contract award – The Agency reserves the right to negotiate with one or more tenderers before taking a decision on the placing of a contract. The offer shall remain valid until changes are agreed in writing. The original offer, as modified shall constitute a binding revised offer.

## CONCLUSION

Civil Engineering is a broad field containing many engineering sub-fields, such as transportation engineering, environmental engineering, geotechnical engineering and construction engineering. I understand the knowledge, techniques and skills of measurement with the production of Bills of Quantity referring to the measurement work according to the requirements of Tender Documents. In addition, I must also thank to my group members and also my lecturer, Mr. Kumarason, as they helped me a lot in the measurement part in Task 2. It helps to create clear open channels of measurements and the procedures in tendering documents, improved my productivity in measurements skills and help keep morale high. In short, this assignment helps me to accept the idea of working in a construction site in future, following the rules and achieving correct Tendering Document. Therefore,



this assignments helped me share ideas which ultimately lead me to innovation and better opportunity in my future undertakings.

## REFERENCES

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