

# **CIVIL ENGINEERING CONSTRUCTION**

## **SBC2253**

### **CIVIL ENGINEERING PROCEDURE**

**Sr Dr. Mohd Saidin Misnan**

**Department of Quantity Surveying**

**Faculty of Built Environment**

**Universiti Teknologi Malaysia**



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# INTRODUCTION

- The construction industry covers many facets and these are all bound together.
- Generally speaking, building works is confined to building structures of conventional modern design, whilst civil engineering works can be completely divorced from any such building.



- Civil engineering deals with the design, construction and maintenance of the physical and natural built environment, including works such as bridges, roads, canals, and dams.
- It is traditionally broken into several sub-disciplines including environmental engineering, geotechnical engineering, structural engineering, transportation engineering, water resources engineering, materials engineering, coastal engineering, surveying, and construction engineering.
- Civil engineering takes place on all levels: in the public sector from municipal through to federal levels, and in the private sector from individual homeowners through to international companies.

# Bridge Construction- Sg. Skudai, Johor Bahru, Johor, Malaysia



# ORGANIZATION AND WORKING METHOD TO CIVIL ENGINEERING INDUSTRY

- The carrying through of a civil engineering project requires that its object should first be identified.
- Then the scheme has to be planned and thereafter implemented.
- All these stages require not only vision and thought, but also the most important thing is organization.

# ORGANIZATION AND WORKING METHOD TO CIVIL ENGINEERING INDUSTRY (CONT'D)

- On signing the contract, the contractor will use the data from the preliminary planning stage to establish and set up an appropriate organization.
- This organization will include layout of the site: access road (for sites limited to water: the use of barges , temporary jetties, conveyors etc.)

# ORGANIZATION AND WORKING METHOD TO CIVIL ENGINEERING INDUSTRY (CONT'D)

- storage areas
- hutting
- spoil heaps
- accommodation
- plant areas etc.



# ORGANIZATION AND WORKING METHOD TO CIVIL ENGINEERING INDUSTRY (CONT'D)

- Method used in civil engineering works depends on the types of civil engineering to be carried out.
- The two most common method:
  - critical path analysis techniques
  - bar charts
- By producing the work programme, the most suitable method of carrying out the many different operations in civil engineering can be determined.

# CONTRACT SYSTEM TO CIVIL ENGINEERING WORKS

- A contract is essentially an agreement between 2 or more parties
- A contract stems from
  - offer
  - acceptance
  - intention to create legal relation
  - capacity to contract
  - consent

# CONTRACT SYSTEM TO CIVIL ENGINEERING WORKS (CONT'D)

- Civil engineering contracts are invariably formed by a process of offer and acceptance (both in writing)
- Offer is made by a contractor to an employer → to carry out work set out in contract documents (normally on form of tender issued to him)
- A simple contract is formed when a tender submitted by a tenderer (offer) is accepted by the employer

# CONTRACT SYSTEM TO CIVIL ENGINEERING WORKS (CONT'D)

- Civil engineering works is usually executed under a contract entered into between the employer and a contractor.

# MEASUREMENT METHOD TO CIVIL ENGINEERING WORKS

- For Civil Engineering works, measurement will be carried out using :
  - MyCESMM – Malaysian Standard Method of Measurement for Civil Engineering Works.
- The MyCESMM lays down a standard format for BQ.

# MEASUREMENT METHOD TO CIVIL ENGINEERING WORKS (CONT'D)

- The objective of MyCESMM is to set forth the procedure according to which the Bill of Quantities shall be prepared and priced and the quantities of work expressed and measured.
- The first edition (1st edition) was published in 2007 and the latest edition (2nd edition) was published in 2011.

# MEASUREMENT METHOD TO CIVIL ENGINEERING WORKS (CONT'D)

## EFFECT OF CESMM ON PRICING

- Permits greater standardisation in the format of bills of quantities and this assists contractors in pricing.
- More consistent with work adequately itemised and described to include cost-significant items with a constant level of detail.
- The coding system permits estimating, valuation, purchasing and cost control to use the same numerical references and that these will also simplify computerised data processing.

## **MEASUREMENT METHOD TO CIVIL ENGINEERING WORKS (CONT'D)**

### **APPLICATION OF THE WORK CLASSIFICATION**

- The Work Classification provides the basic framework of MyCESMM constituting, as it does a list of the commonly occurring components of civil engineering work.
- It will assist with contractor's cost control, recording of prices as a basis or pre-contract estimating, computer processing and specification preparation.



## **MEASUREMENT METHOD TO CIVIL ENGINEERING WORKS (CONT'D)**

### **APPLICATION OF THE WORK CLASSIFICATION**

- Each class of work contains a set of measurement, definition, coverage and additional description rules, which amplify and clarify the information.
- The Work Classification prescribes the unit of measurement to be used for each billed item, ranging from stated sums and numbered items, linear items in metres, areas in square metres, (hectares for general site clearance), volumes in cubic metres and weight (mass) in tonnes.