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18/ENG02/007

COMPUTER ENGINEERING

ENGINEER IN SOCIETY

ENG 284

QUESTION

The Alfa Belgore rehabilitation project is ongoing. As a designated student consulting engineer you are expected to do the following:

1. Outline the scope of work in detail in order of occurrence.

2. Prepare a project gant chart.

3. List all the human resources needed and constitute the project team stating who the lead consultant is.

4. Explain why the site was secured.

5. Develop a BEME for the project by lump sum projections including 10% of the total estimated cost (tec) as miscellaneous, 15% tec as consultancy fee, 5% tec for site preparations and clearing after completion, 12% of tec for transport cost. 20% tec as profit.

6. Prepare a payment schedule as follows

 (a) 30% tec for mobilization (b) Next 30% tec at 50% completion (c) Final payment of 40% tec at completion and hand over. Retain 10% tec for a 6 months Defect liability period.

7. What is BEME, Defect liability period, lead consultant, project life cycle, environment impact assessment (EIA).

INTRODUCTION

 The Alfa belgore hall is located in Afe Babalola Universty Ado-Ekiti (ABUAD), the reason for the renovation of the hall is because of its inability to accommodate the entire population of the school and its narrow entrances for crowd to use.

SCOPE OF WORK

MEETING: - A meeting is held to discuss the rehabilitation project of Alfa Belgore Hall

ARCHITECTURAL PLANS: - The Architect will make plans for the renovation of the hall, and the parts where it should be demolished and renovated are chosen.

SITE WORK/PREPARATION: - Ensures that all environmental requirements are included. Dust control, Special Inspection and Monitoring.

DEMOLITION OF STRUCTURES: - structures planned by the architect to be demolished are demolished to make way for the renovation process.

RENOVATION: - The things in the hall are improved FOR EXAMPLES:

 CONCRETE: - Design mix obligations, reports, approvals, proper stripping of framework with obligation for surface consistency.

 CARPENTRY: - Material certifications, installations specifics like doors, windows etc

 MOISTURE PROTECTION: - Certifications of all roofing requirements, review of installed work.

 INTERIOR FINISHES: - Mock up requirements, cleaning and sealing of the finishes.

 ELECTRICAL: - Lightning and power requirements.

TEST: -The building is tested and mistakes in construction are found and rectified.

HANDOVER AND CLOSE-OUT: - After the construction, the employer is able to occupy the development but the contractor remains responsible for rectifying defects during a period known as the “Defects Liability Period or Rectification Period” which typically means lasts six to twelve months. A formal hand-over is needed to prevent arguments on terms and defects reporting protocol should be agreed on. This should all be done after inspection of the site. After all that is agreed upon, the contractor prepares an information exchange as required by the employer’s information requirements. This is where the client can then check whether the accounts are balanced or not.

IN-USE: - It is sometimes referred to as operation, describes the period after any defects have been rectified and fine tuning carried out when the development is in ‘normal’ operation.

 GANT CHART

HUMAN RESOURCES NEEDED AND THE PROJECT TEAM

 For the project to be successful and to be accomplished within the time given, a workforce of 30-40 men would be needed for the whole project if the project is to follow the estimated time given to it which is approximately 150 days to complete.

The project team would consist of following professional members;

- Quantity surveyors who will ensure that all the materials used for the project are of good quality and can used and also to ensure that the materials are in good shape.

- An electrical engineering that will ensure that all the electrical connections are correct and the electrical are installed correctly.

- An Architect who will design the new structure.

- A Structural Engineer that will ensure that the new structure can hold and can live up to its expectation.

- Water works engineer who will ensure that the water facilities are in good order, especially in the toilet.

The will also be a group of consultants who will advise the best way that the project will move. But the lead consultant should be the Architect as the renovation plans in drawn by him/her.

REASONS WHY THE SITE WAS SECURED

I) Injury to students from falling objects.

II) Accidents occurring between delivery vehicles to site and students.

III) Students from falling into excavation holes or piles of sand or gravel during renovation.

IV) Dust that affects students.

V) Students from stepping on sharp objects.

VI) Students from entering the renovated building when it is not safe.

5.BILL OF ENGINEERING MEASUREMENT AND EVALUATION (BEME)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM NO | DESCRIPTON | QUANTITY |  UNIT COST  |  TOTAL COST  |
|  |  |  |  |  |
| 1 | Roofing sheet | 100 |  ₦ 1,400.00  |  ₦ 140,000.00  |
| 2 | cement bags  | 500 |  ₦ 180,000.00  |  ₦ 90,000,000.00  |
| 3 | Trucks of gravel | 12 |  ₦ 35,000.00  |  ₦ 420,000.00  |
| 4 | Trucks of sand  | 13 |  ₦ 45,000.00  |  ₦ 585,000.00  |
| 5 | Glass which will be brought as 12x12 | 10 |  ₦ 50,000.00  |  ₦ 500,000.00  |
| 6 | Light bulbs fittings | 40 |  ₦ 8,000.00  |  ₦ 320,000.00  |
| 7 | Light bulbs | 40 |  ₦ 2,500.00  |  ₦ 100,000.00  |
| 8 | Copper wires | 60 |  ₦ 2,000.00  |  ₦ 120,000.00  |
| 9 | Projector | 3 |  ₦ 150,000.00  |  ₦ 450,000.00  |
| 10 | T.V | 4 |  ₦ 100,000.00  |  ₦ 400,000.00  |
| 11 | Pipes of different sizes | 46 |  ₦ 80,000.00  |  ₦ 3,680,000.00  |
| 12 | Window  | 13 |  ₦ 450,000.00  |  ₦ 5,850,000.00  |
| 13 | CCTV cameras for security | 12 |  ₦ 25,000.00  |  ₦ 300,000.00  |
| 14 | CCTV system | 1 |  ₦ 50,000.00  |  ₦ 50,000.00  |
| 15 | Total estimated cost |  ₦ 102,915,000.00  |
| 16 | Miscellaneous (10%) |  ₦ 10,291,500.00  |
| 17 | Consultancy Fee (15%) |  ₦ 15,437,250.00  |
| 18 | Site preparations and clearing after completion (5%) |  ₦ 5,145,750.00  |
| 19 | Transportation (12%) |  ₦ 12,349,800.00  |
| 20 | Profit (20%) |  ₦ 20,583,000.00  |

6. PAYMENT SCHEDULE

30% of Total Estimated cost for Mobilisation.

30 % of Total Estimated cost.

50% of Total Estimated cost for completion.

Finally, payment of 40% of Total Estimated cost at completion and hand over.

Retain 10% of Total Estimated cost for a 6 months’ defect liability period.

7. DEFINITIONS

 BILL OF ENGINEERING MEASUREMENT AND EVALUATION (BEME)

For all engineering works, it is required to know beforehand the probable cost of construction known as estimated cost. Bill of Engineering Measurement and Evaluation (BEME) also referred to as 'Bill'; is a tool used before, during and post-construction to assess and value the cost of construction works. This includes the cost of materials, labour, equipment and all/any other resource(s) required for the success of any construction endeavour based on a pre-determined scope and specification.

DEFECT LIABILITY PERIOD

Is a period of time following practical completion during which a contractor remains liable under the building contract for dealing with any defects that become apparent. During this period the client reports any defects that arise to the contractor.

LEAD CONSULTANT

The lead consultant is the consultant that directs the work of the consultant team and is the main point of contact for communication between the client and the consultant team, except for on significant design issues where the lead designer may become the main point of contact. His role may include: coordinating, monitoring and reviewing the work of the consultant team (and others, such as specialist designers and specialist contractors), Arranging consultant team meetings and planning work stages, Preparing programmes and progress reports, Seeking instructions from the client, Advising the client on the choice of procurement route, Advising the client on the need to appoint additional advisers, consultants or specialist designers, Establishing change control procedures at key stages, for example when the project brief is frozen or when detailed design is frozen, Arranging value management exercises, Advising the client on the choice of contract and contract conditions, Assist the client in defining selection criteria for contractors and preparing pre-qualification questionnaires, coordinating the review of tenders.

PROJECT LIFE CYCLE

Is the sequence of phases that a project goes through from its initiation to its closure. The number and sequence of the cycle are determined by the management and various other factors like needs of the organization involved in the project, the nature of the project, and its area of application. The phases have a definite start, end, and control point and are constrained by time. The project lifecycle can be defined and modified as per the needs and aspects of the organization. Even though every project has a definite start and end, the particular objectives, deliverables, and activities vary widely. The lifecycle provides the basic foundation of the actions that has to be performed in the project, irrespective of the specific work involved.

ENVIRONMENT IMPACT ASSESSMENT (EIA)

This is the assessment of the environmental consequences of a plan, policy, program, or actual projects on the people or the natural resources in the area prior to the decision to move forward with the proposed action. In Nigeria, it must be sent to FCDA (Federal Capital Development Authority) or FHA (Federal Housing Authority).