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| MATRIC. NUMBER | 19/ENG09/021 |
| DEPARTMENT | AEROSPACE ENGINEERING |
| COURSE CODE | ENG 284 |
| COURSE TITLE | THE ENGINEER IN SOCIETY |
| TOPIC | CONSULTANCY ASSIGNMENT |
| DATE | 2nd April 2020 |

TASK

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 Gantt 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 % tech 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 Mobilisation   (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, Environmental Impact Assessment (EIA)

SOLUTION

**SCOPE**

The Alfa Belgore hall is designed to be a multi-purpose hall, where lectures, meetings, interactive seminars and events can take place. Before it can be renovated, the previous or current structure has to be analyzed for any faults or areas requiring improvement. This will be the first stage, and will require:

* The Electrical Engineer, who will survey the wirings and installations of lights and all other electrical appliances in the building, as well as the flow of power into the building.
* The Sound Engineer, who will survey the effectiveness of the speakers and their placements, with respect to the shape and size of the hall.
* The Plumber, who will survey the water flow systems through washrooms, as well as fire-fighting installations.
* The Architect, who will generally survey the entire building.

After this stage is done, the building will be dismantled or demolished, giving way for the new, improved model to be implemented. For this stage, all the Engineers listed above will be required to effect improvements to their various areas of survey. By doing this, they will make the new building design much better than the older, removing any faults that previously existed. For this stage, the Engineers listed above will be joined by:

* The Masons, who will do the manual wood, brick and zinc building of the structure.
* The Painters, who will give the building, once completed, a beautiful finish-both internally and externally.
* Drivers of chattered machinery and materials transportation vehicles.

Before the masons begin to build, the architect must have a blue-print of the final building plan. Before this final building plan can be made, there must be inputs from the electrical engineer, the sound engineer and the plumber, who, together with the architect, will join heads together to produce a building plan that will not only contain all the improvements on the previous design, but will also meet the requirements and standards set by the owner and financer of the building project, Mr. Afe Babalola. Throughout the whole process of renovation, every professional will have their various important part to play, which will all be overseen by an architect. Therefore, the architect will be also employed as the lead consultant. So far, the old building structure analysis, as well as the demolition, have already been done, and so they will not be included in the Gantt chart. Due to the recent pandemic of COVID-19, the work has been paused to ensure safety for all workers. However, with professionals in the medical industry working tirelessly, the virus is expected to be exterminated by the end of April, allowing work to commence at the very beginning of May. Through online platforms, the architect, as well as all the other Engineers and professionals will be able to communicate efficiently enough to deduce a final building design, which should be available at the end of April. The building work, however, is expected to take three months to complete, leaving the estimated time of completion as the ending of July. This will however depend on whether or not the virus will be exterminated in time; if it is, then the Gantt chart below shows the working process that will be followed, being overseen by the architect.

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| **Working Aspect** | **April** | **May** | **June** | **July** |
| 16th to 23rd  | 24th to 29th  | 30th | 1st to 10th  | 11th to 20th  | 21st to 30th  | 31st | 1st to 10th  | 11th to 20th  | 21st to 30th  | 31st | 1st to 10th  | 11th to 20th  | 21st to 30th  | 31st |
| New design input by Plumber |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| New design input by Electrical Engineer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| New design input by Sound Engineer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| New design input by Architect |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Final design blue-print by Architect |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Building execution by masons |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Electrical installation by Electrical engineer and electricians |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Water flow systems installation, and fire-fighting water system installation by plumber |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Efficient Sound system installation by Sound Engineer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Internal and External painting by painters |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**GANTT CHART**

**THE SECURING OF THE SIGHT**

The sight was secured with four large zinc-covered bamboo walls before any renovation work began. This was done for the following reasons:

* To ensure that no pedestrian or animal wanders into the sight, endangering themselves in any way.
* To ensure that the sight is not tampered with, except by the engineers and workers employed to tamper with it.
* To ensure that no material is stolen or taken from the sight.
* To allow the work to be finished before made visible to the public.

**BILL OF ENGINEERING MEASUREMENT AND EVALUATION (BEME)**

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| **DESCRIPTION** | **ESTIMATED QUANTITY** | **ESTIMATED PRICE PER ITEM (NAIRA)** | **ESTIMATED LUMP SUM PROJECTION (NAIRA)** |
| Bags of Cement | 2000 | 2,700 | 5,400,000 |
| Masons | 200 | 4000 per day | 252,000 |
| Cement mixers | 200 | 2000 per day | 126,000 |
| Zinc for roofing | 7300 square meters | 1800 per square meters | 13,140,000 |
| Plumbers | 5 | 112,000 per month | 560,000 |
| Electrical Engineers | 2 | 190,000 per month | 1,900,000 |
| Electricians | 8 | 115,000 per month | 690,000 |
| Sound Engineers | 3 | 130,000 per month | 292,000 |
| Architect | 1 | 180,000 per month | 630,000 |
| Chattered transport vehicles | 2 | 240,000per month | 900,000 |
| Chattered drivers | 1 | 50,000 per month | 120,000 |
| **TOTAL ESTIMATED LUMP SUM** | 24,010,000 |

**PAYMENT SCHEDULE**

Giving out of payments for this project will be done by the following guidelines:

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| **SERVICE** | **PAYMENT GUIDELINE** |
| Bags of cement and chattered vehicles | Payment will be made once they are delivered to the sight by the merchant from whom the order is made. |
| Work done by masons, cement mixers, plumbers, architect, sound engineers, drivers, electrical engineers and electricians.  | Of the total sum required to be given to each of these individuals, * 30% will be given for mobilization.
* The next 30% will be given when 50% of the work is completed.
* The remaining 40% will be given when all the work is done.
* 10% will be withheld for a 6-month defect liability period and be given when the 6 months are completed.
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**TERMINOLOGIES**

* BEME: BEME stands for Bill of Engineering Measurement and Evaluation. It is a tool used before, during and after a construction process to assess the cost for the completion of the construction work, including cost of materials, cost of labor, cost of equipment, etc.
* Defect Liability period: This is a period of time after a contract work is completed, during which the contractor remains liable under the building contract for dealing with any defects which become apparent.
* Lead Consultant: A lead consultant is the consultant that directs the work of the consulting team, and is the main point of contact between the client and the consulting team.
* Project life cycle: The project life cycle are the stages that are followed in order the completely and adequately implement a project.
* Environmental Impact Assessment (EIA): This is the analysis or consideration of the effects the execution of a project can have on the environment.

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