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18/ENG08/020

BIOMEDICAL ENGINEERING

**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 % 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)

ANSWER

1. **Scope of work in order of occurrence**
* Relocating of personnel’s i.e. ICT, Bookshop
* Clearing of the chairs, curtains
* Securing the site
* Removal of roofing
* Removal of all the electrical connections
* Scaffolding
* Main works commences:
* Roofing
* Plastering
* Installation of wiring and plumbing
* Screeding
* Repainting
* Cleaning
* Moving back of the equipment’s removed
1. Prepare a project Gant chart

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Start date | End date | Duration |
| Relocating of Personnel's | 28-Feb-20 | 29-Mar-20 | 30 |
| Clearing of the chairs,curtains | 1-Mar-20 | 6-Mar-20 | 5 |
| Securing the site | 7-Mar-20 | 18-Mar-20 | 11 |
| Removal of all electrical connections | 19-Mar-20 | 10-Apr-20 | 22 |
| Removal of roofing | 11-Apr-20 | 17-Apr-20 | 6 |
| Scaffolding | 18-Apr-20 | 28-Apr-20 | 10 |
| Main work commences | 29-Apr-20 | 30-Apr-20 | 1 |
| Roofing | 1-May-20 | 9-May-20 | 8 |
| Plastering | 10-May-20 | 17-May-20 | 7 |
| Installation of wiring and plumbering | 18-May-20 | 25-May-20 | 7 |
| Screeding | 26-May-20 | 31-May-20 | 5 |
| Repainting | 1-Jun-20 | 15-Jun-20 | 14 |
| Cleaning | 16-Jun-20 | 20-Jun-20 | 4 |
| Moving of the equipments removed | 21-Jun-20 | 25-Jun-20 | 4 |

1. Human resources needed
* Architects
* Bricklayers
* Plumbers
* Carpenters
* Plumbers
* Painters

Project team involves:

* Consulting engineers (Lead Consultant)
* Construction engineers
* Civil engineers
* Structural engineers
* Mechanical engineers
* Electrical engineers
* Building services engineer
* Main contractor
* Site engineers
* Project manager
* Sub-contractors
* Project board
1. Explain why site was secured

It was secured for security reasons(to avoid unnecessary theft), safety purposes(to prevent unnecessary injuries).

1. Develop a BEME for the project

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S/N | Description | Qty | Unit | Rate(₦) | Total Cost(₦) |
| 1 | Cement | 50 | Bag | 2800 | 140000 |
| 2 | Sharp sand | 4 | Per 20 tonne | 46000 | 184000 |
| 3 | Paint | 6 | Per bucket | 34000 | 204000 |
| 4 | Granite | 4 | Per 20 tonne | 85000 | 340000 |
| 5 | Doors | 4 | Per 20 tonne | 19000 | 76000 |
| 6 | Windows | 8 | - | 12000 | 96000 |
| 7 | Wood | 100 | - | 850 | 85000 |
| 8 | Labourers fee | - | - | - | 900000 |
| 9 | Light Bulbs | 40 | Per pack(100) | 36000 | 1440000 |
| 10 | Projectors | 3 | - | 100000 | 300000 |
| 11 | Transportation | - | - | - | 700000 |
| 12 | Nails | 2 | Per bag(213) | 6400 | 12800 |
| 13 | Steel rods 16mm | 2 | Per tonne(100 pieces) | 150000 | 300000 |
| 14 | Miscellaneous | - | - | - | 600000 |
| 15 | Consulting fee | - | - | - | 750000 |
| 16 | Site preparations and clearing after completion | - | - | - | 100000 |
| 17 | Profit | - | - | - | 1000000 |
|  |  |  |  | Total | 7227800 |

1. Prepare a payment schedule

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S/N | Month | Pay On | Payment(s) | Amount(₦) |
| 1 | February | 1st | Mobilisation | 400000 |
| 2 | March | 3rd | 50% completion | 1200000 |
| 3 | April | 12th | Final Payment | 7500000 |
| 4 | May | 20th | Retained tec | 7720000 |

1. What is BEME, Defect Liability Period, Lead Consultant, Project Life Cycle, Environmental Impact Assessment (EIA).
* **BEME**: BEME stands for Bill of Engineering Measurement and Evaluation. It is a tool used before, during and post construction to assess and value the cost of construction works.
* **Defect Liability Period**: **The defects liability period (or 'DLP') is a fixed period of time, starting from the date of practical completion, during which the contractor has an express contractual right to return to the site to rectify defects.**
* **Lead Consultant:** The [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant) is the [consultant](https://www.designingbuildings.co.uk/wiki/Consultants) that directs the [work](https://www.designingbuildings.co.uk/wiki/Works) of the [consultant team](https://www.designingbuildings.co.uk/wiki/Consultant_team) and is the main [point](https://www.designingbuildings.co.uk/wiki/Points) of contact for communication between the [client](https://www.designingbuildings.co.uk/wiki/Clients) and the [consultant team](https://www.designingbuildings.co.uk/wiki/Consultant_team), except for on significant [design](https://www.designingbuildings.co.uk/wiki/Design) issues where the [lead designer](https://www.designingbuildings.co.uk/wiki/Lead_designer) may become the main [point](https://www.designingbuildings.co.uk/wiki/Points) of contact.
* **Project Life Cycle**: The [project life cycle](https://www.gartner.com/it-glossary/product-lifecycle-management-plm/) refers to the four-step process that is followed by nearly all project managers when moving through stages of project completion.
* **Environmental Impact Assessment:** This is the environmental sequences of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.