AFE BABALOLA UNIVERSITY ADO-EKITI, EKITI STATE

The Engineer in The Society
(ENG 284)

Alfa Belgore Rehabilitation

SUBMITTED BY:
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MECHATRONICS ENGINEERING
18/ENG05/056

Scope of Works

Alfa Belgore Hall is a multi-purpose hall that hosts most of Afe-Babalola University's events. From convocations, to matriculation, dinners to seminars and so on. It is used for gatherings when a large number of people are expected to be in attendance.

Problem Statement: Due to the constantly growing population of the school, there will come a time where the hall will not be able to accommodate the number of students.

Goal of project: The goal of this project is renovation and rehabilitation. This includes raising the building by a storey, general repairs, adding facilities such as rest rooms, new and improved roofing, new entrances and exit points, new windows and doors, more efficient plumbing and electric etc.

Deliverables:

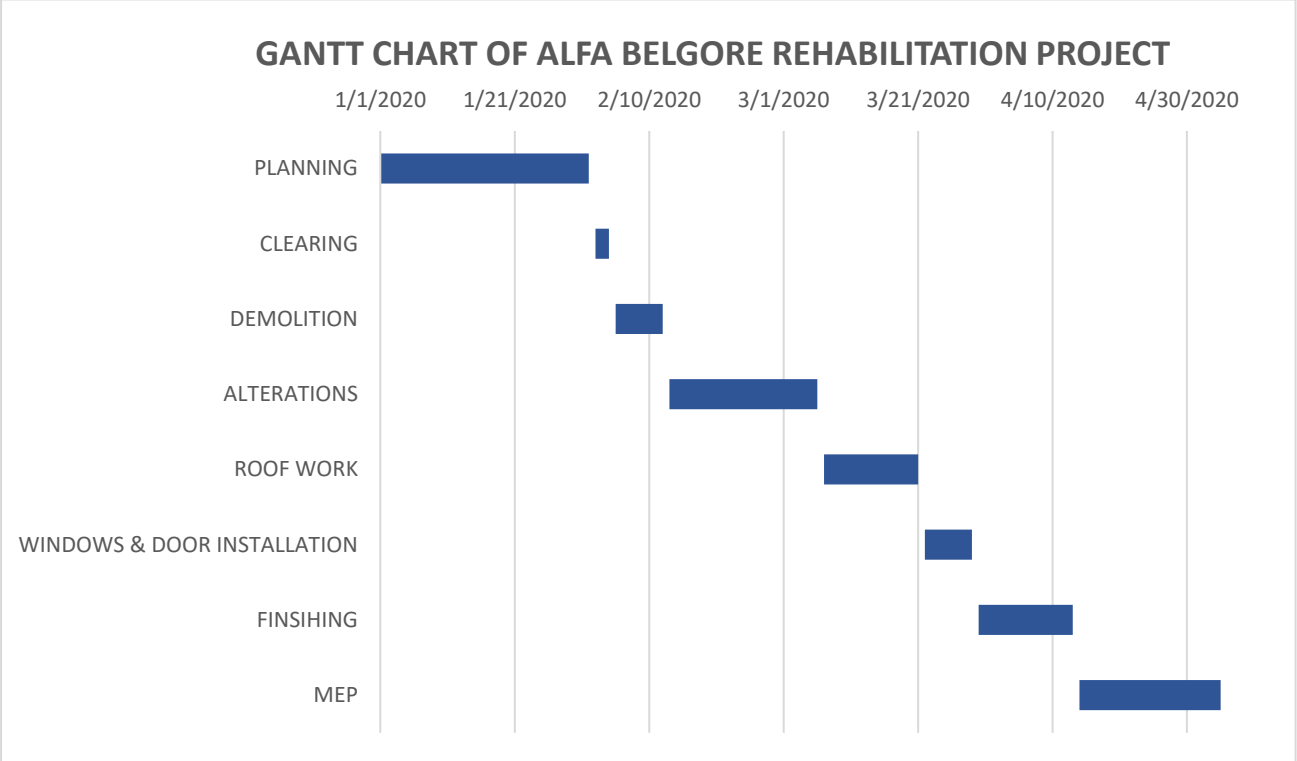
- A new storey
- New, improved facilities
- A generally more refined and altered appearance

Timeline:

- **Planning:** Extensive planning of the design, draughting, materials to be used, grade of materials to be used and so on is done before any physical work can start. At this stage, various engineers, architects and construction workers are employed to carry out the project.
- **Clearing:** All valuable appliances are taken out of the building and the construction site is demarcated to ensure maximum safety.
- **Demolition:** The existing roof, along with some other parts of the building are completely torn down by heavy machinery.
- **Alterations:** With regards to the structure of the building, many changes are going to be made such as the addition of a new storey, addition of rooms, etc. This includes erection of columns and laying of bricks that constitute the new storey.
- **Roof Work:** The building will be covered with high-grade Aluminium sheets.
- **Windows and Door Installation:** New windows and doors will need to be added to the new storey for easy accessibility and proper ventilation.

- **Finishing:** This is the final stage of the construction process that involves addition of finishes including painting, flooring and other decorative pieces to add to the visual aesthetic of the building.
- **Mechanical, Electrical and Plumbing (MEP):** The electric cables and pipes are set up in such a way to maximise efficiency and avoid one affecting the other negatively by MEP engineers. This also involves setting up head, ventilation and air condition (HVAC) for optimal comfort of occupants.

GANTT CHART



Project Team

1.) Civil Engineers (Including the Lead Consultant)
2.) Architect
3.) Mechanical Engineers
4.) Electrical Engineers
5.) Quantity Surveyor

6.) Carpenters
7.) Masons
8.) Electricians
9.) P.O.P workers
10.) Painters

Why Was This Site Secured?

The site was secured to ensure safety of both workers and students. Alfa Belgore is located in the middle of the campus and even close to hostels where a large number of students walk past everyday to get to class. If the site was not secured to restrict indiscriminate access, some students may wander into the construction site unguarded and without any safety equipment. So, to avoid accidents, the construction site was demarcated.

BILL OF ENGINEERING MEASUREMENT AND EVALUATION (BEME)

TOTAL PROJECT COST: ₦ 19,091,200.00

	MATERIALS		COST
TASK	UNITS	₦/UNIT	TOTAL
GENERAL REQUIREMENTS			
Site Preparation & Clearing		5% TEC	₦ 628,000.00
Consultancy Fee		15% TEC	₦ 1,884,000.00
Building Materials			₦ 4,500,000.00
Transport Cost		12% TEC	₦ 1,507,200.00
Profit		20% TEC	₦ 2,512,000.00
Miscellaneous		10% TEC	₦ 1,256,000.00
			₦ 11,031,200.00
OTHER MASONRY/PAVING			
Exterior Stairs			₦ 300,000.00
Driveway			₦ 500,000.00
Walkways			₦ 420,000.00
Other			₦ 300,000.00
			₦ 1,520,000.00
EXTERIOR			
Paint Work			₦ 370,000.00
Wall Finishing (Pebble Dash)			₦ 90,000.00
Other			₦ 50,000.00
			₦ 510,000.00
WINDOWS/EXTERIOR DOORS			
Exterior doors	3	₦ 80,000.00	₦ 240,000.00
Exterior door frames, sills	3	₦ 20,000.00	₦ 60,000.00
Locksets, knobs, door hardware	3	₦ 7,000.00	₦ 21,000.00
Windows	8	₦ 80,000.00	₦ 640,000.00
Other			₦ 10,000.00
			₦ 971,000.00
PLUMBING			
Drain/Waste			₦ 70,000.00
Water Supply Piping			₦ 200,000.00
Fixtures: Toilets, Sinks, Hand Driers			₦ 140,000.00
Other			₦ 100,000.00
			₦ 510,000.00
ELECTRICAL			
Service, Panel, Sub-Panels			₦ 65,000.00
Rough Wiring			₦ 72,000.00
Lighting Fixtures	50	₦ 1,000.00	₦ 50,000.00
Exterior Lighting	10	₦ 10,000.00	₦ 100,000.00
Devices: outlets, switches, dimmers	45	₦ 400.00	₦ 18,000.00
Smoke, CO2 Alarms	5	₦ 5,000.00	₦ 37,000.00
Other			₦ 52,000.00
			₦ 394,000.00
HVAC			
Air Conditioning	8	₦ 150,000.00	₦ 1,200,000.00
Other			₦ 200,000.00
			₦ 1,400,000.00
PLASTER			
Walls			₦ 50,000.00
Ceilings			₦ 210,000.00
Decorative Plaster			₦ 200,000.00
Other			₦ 120,000.00
			₦ 580,000.00
INTERIOR FINISH			
Interior Doors	5	₦ 40,000.00	₦ 200,000.00
Interior Door frames, thresholds	5	₦ 20,000.00	₦ 100,000.00
Door knobs, hardware	5	₦ 5,000.00	₦ 25,000.00
Stairs, Railings, Newels			₦ 300,000.00
Interior Painting			₦ 200,000.00
Floor Tiles			₦ 330,000.00
Acoustical, Metal, Decorative Ceilings			₦ 600,000.00
Interior Carpentry Labor Only			₦ 420,000.00
			₦ 2,175,000.00
TOTAL ESTIMATED MATERIAL & LABOUR COST			**₦ 12,560,000.00**

Definition of Terms

1.) **BEME**: BEME is the 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 resources required for the success of any construction endeavour based on a pre-determined scope and specification.

Objectives of BEME:

- To facilitate the comparison of rates and prices between bidders
- To enable the clients to assemble actual tendered rates and prices to prepare for future estimating and budgeting.

2.) **PROJECT LIFE CYCLE**: A standard project typically has the following four major phases (each with its own agenda of tasks and issues) initiation, planning, implementation, and closure, taken together, these phases represent the path a project takes from the beginning to its end and are generally referred to as the project life cycle.

3.) **LEAD CONSULTANT**: The lead consultant is simply an entity (company or personnel) appointed by the client to manage and administer the services of all consultants on multi-disciplinary projects where more than one professional service provider is appointed on a project. In multi-

disciplinary engineering projects where these services are provided they are often called "Engineering Management Services". In other words, 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.

ROLES OF A LEAD CONSULTANT

- Arranging consultant team meetings and planning work stages
- Preparing programs and progress reports
- Advising the client on the choice of procurement route.

4.) **DEFECT LIABILITY**: Defects liability period (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. This period is sometimes referred to as rectification period or defects correction period. Typically, during this period, the contractor has the right to return to the site to rectify defects or complete unfinished work; the principal is entitled to continue holding security, to secure the contractor's obligations in respect of incomplete or defective work; and the superintendent continues to remain involved in the project.

5.) **ENVIRONMENTAL IMPACT ASSESSMENT:** Environmental Impact Assessment (EIA) is a systematic analysis tool used to identify and evaluate the likelihood of environmental impacts as a result of a proposed project or development, considering inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the environment and present the predictions and options to decision-makers.

Payment Schedule

S/N	ITEM	Percentage	DUE DATE	AMOUNT
1	Mobilisation	30%	01/01/2020	₦ 5,727,360.00
2	Payment at 50% Completion	30%	01/03/2020	₦ 5,727,360.00
3	Final Payment at Completion and Handover	40%	05/05/2020	₦ 7,636,480.00
4	**Total Estimated Cost:**			₦ 19,091,200.00
5	**Retained Capital for Defect Liability:**			₦ 1,909,120.00
6	**Total Amount in Words**	Nineteen Million Ninety-One Thousand Two Hundred Naira Only		