**NAME;** Ogundare Emmanuel Jesuferanmi

**MATRIC NUMBER:** 18/ENG06/055

**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 siZte 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)

**PROJECT TITLE;** The Alfa Belgore Rehabilitation project is ongoing

**PROJECT SCOPE;** Scope of work in construction projects clearly defines what is expected from each party involved in a contract, and this makes it an essential document in project management. Scope of work in construction tells the project manager handling the project where his work begins and where it ends. This rather very essential document clearly defines what will be done, how it will be done, and is designed to have a timeline which indicates the timeframe within which each milestone, deliverables are expected to be due.

Without scope of work in construction projects, it becomes difficult to understand what needs to happen on that project as well as when. If there is no proper documentation for this, contractors or subcontractors could easily become overwhelmed by the intricacies of the project, and their work could change, and may lead to scope creep. This is why scope of work in construction project management is considered very important, and Sinnaps, as a project management software can come in handy in this regard.

These problems are very much likely to occur in large projects that are not properly planned. We’ve seen [scope creep examples](https://www.sinnaps.com/en/project-management-blog/scope-creep-example) in which some details are overlooked, which turns out to affect the entire project in massive ways.

There are two types of civil engineering roles: consultants who focus on design work and generally spend more time in the office or working with clients, and contractors who are more involved with keeping an eye on the physical construction and are usually based on-site. Both are challenging environments, and all civil engineers are required to be innovative and logical individuals. Other essential attributes civil engineers need include: creativity, versatility, a problem-solving mind, and the ability to understand the bigger picture and to collaborate with a number of other professionals.

Civil engineers design, build, supervise, [operate, and maintain](https://www.wbdg.org/facilities-operations-maintenance) construction projects and systems in the public and private sector, including roads, buildings, airports, tunnels, dams, bridges, and systems for water supply and sewage treatment. Many civil engineers work in design, construction, research, and education.

The duties of a civil engineer may typically include any or all of the following:

* Analyze long-range plans; survey reports, maps, and other data in order to plan projects.
* Consider construction costs, government regulations, potential environmental hazards, and other factors in planning the stages of, and risk analysis for a project.
* Compile and submit permit applications to local, state, and federal agencies, verifying that projects comply with various regulations.
* Test building materials, such as concrete or asphalt for use in particular projects.
* Provide cost estimates for materials, equipment, or labor to determine a project's economic feasibility.
* Use design software to plan and design transportation systems, hydraulic systems, and structures in line with industry and government standards.
* Perform or oversee surveying operations in order to establish reference points, grades, and elevations to guide construction or design.
* Present their findings to the public on topics such as bid proposals, environmental impact statements, or descriptions of projects.
* Manage the repair, maintenance, and replacement of public and private infrastructure.

Civil engineers inspect projects to insure regulatory compliance. In addition, they are tasked with ensuring that safe work practices are followed at construction sites.

Many civil engineers hold supervisory or administrative positions ranging from supervisor of a construction site to city engineer, public works director, or city manager. Others work in design, construction, research, and education. Civil engineers work with other professionals on projects and may be assisted by civil engineering technicians.

Civil engineers design, build, and maintain the foundation for modern society – from roads and bridges, drinking water and energy systems, to seaports and airports, and the infrastructure for a cleaner environment, to name just a few. Civil engineering touches people throughout their day. Think of a civil engineer when:

* Turning on the tap to take a shower or drink clean water.
* Flicking on the lights and opening the refrigerator.
* Driving to work on roads and bridges through synchronized traffic lights.
* Taking mass transit or taking a flight for a vacation.

*Civil Engineers make mass transit feasible.*

Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master planners, designers, constructors, and operators of society's economic and social engine - the built environment. They are stewards of the natural environment and its resources; innovators and integrators of ideas and technology across the public, private, and academic sectors; managers of risk and uncertainty caused by natural events, accidents, and other threats. They also serve as leaders in discussions and decisions shaping public environmental and infrastructure policy.

Every person, family, and business needs infrastructure to thrive - from the roads travelled to work, to the pipes that deliver clean drinking water, to the inland waterways, and rails that move goods from coast to coast. The American Society of Civil Engineers' 2013 Report Card for America's Infrastructure depicts the condition and performance of the nation's infrastructure in the familiar form of a school report card-assigning letter grades based on the physical condition and needed investments for improvement. The report card is available for public viewing at [ASCE.org](http://www.asce.org/).

FLOW AND GRANNT CHART:

Flow chart:

QUALITY CONTROL

GENERAL ASSEMBLY

BODY SHOP

DESIGN

RAW MATERIALS

COMPONENTS

HISTORY

BACKGROUND

4. Explain why the site was secured

To deter such theft and vandalism, lower risk and keep projects on time and within budget, clients can take these seven risk mitigation measures:

1. Use appropriate lighting.

Well-lit construction sites will help to discourage criminal activity by eliminating hiding places and raising the risk of discovery. Motion-activated lighting can be a very effective deterrent.

2. Install fencing.

Perimeter fencing should enclose the job site, including storage areas and trailers. Fencing has two jobs: first, to prevent unauthorized access to the site and second, should someone gain unauthorized access, limit their ability to remove property from the site. To that end, barbed wire or fencing that triggers an alarm will add a layer of protection to site security.

3. Post signage.

After fencing is set up, post conspicuous no trespassing signs as warnings for would-be intruders.

4. Consider surveillance.

Surveillance measures at job sites might include video surveillance, a private security guard, or both — which can help deter criminal activity. Should an act of vandalism or theft occur, having surveillance in place can help with identification and recovery.

5. Secure equipment.

Clients should plan ahead for the placement and nature of equipment and material storage during off-hours at the job site. Lock machinery and secure keys. Contractors or mobile equipment owners may also want to install tracking devices on machinery to facilitate location and recovery of any stolen equipment.

6. Plan deliveries ahead of time.

Knowing in advance when a delivery will be made, and planning deliveries for times when someone will be onsite to secure the packages, will help prevent theft of unattended materials. Planning for deliveries will also decrease the risk of any unauthorized personnel accessing the site.

7. Purchase adequate insurance coverage.

Builders risk and contractors equipment insurance can provide coverage for theft or vandalism of construction site materials, equipment and tools, and are an important risk-mitigation tools for any individual or entity with an insurable interest in a construction project. Builders risk and contractors equipment insurance coverage are not a substitute for the other measures on this list, but can be an important safety net if, in spite of taking appropriate security measures, a loss occurs.

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 siZte preparations and clearing after completion, 12% of tec for transport cost. 20% tec as profit



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7. What is BEME, Defect Liability Period, Lead Consultant, Project Life cycle, Environmental Impact Assessment (EIA)

* What is 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, labor, equipment and all/any other resource(s) required for the success of any construction endeavor based on a pre-determined scope and specification.

2.0 OBJECTIVES OF A BILL

The objectives of a BEME are: (i) To provide sufficient information during construction planning, for tendering and contracting purposes or for the purpose of knowing the estimated cost of the proposed project (If the estimated cost is greater than the available funds to execute the project, then attempts are made to reduce the estimated cost by reviewing the scope and/or specification). (ii) To Facilitate the comparison of rates and prices between bidders. (iii) To provide priced Bill of quantities for use in the periodic evaluation of Works executed; for the purpose of payments and project control, during and on-completion of a project for disputes and compensation or to determine if the project was completed on-budget or otherwise. (iv) To provide rates and prices which can be used in the variation of additional works instructed by the Clients. (v) To enable the Clients to assemble actual tendered rates and prices to prepare for future estimating and budgeting. In order to attain these objectives, the bill is often itemized such that the proposed work are broken down into classes of work with sufficient details for distinguishing between the classes of work, and between works of the same nature carried out at different locations or in any circumstances. The BEME is usually presented in a tabular form and prepared in work packages or categories by a process of

b. what is Defect Liability Period?

A defects 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 which become apparent. Depending on the form of contract you are reading, it may also be referred to as a rectification period or defects correction period.

A defects liability period is usually a period of around six or 12 months but it can vary depending on the contract used. Any defects or faults which arise during this period (for example - due to defective materials or workmanship) must be put right by the contractor at its own expense.

For example, under a JCT traditional building defects are notified to a contractor by the Contract Administrator, not later than 14 days after the end of the defects liability period. A contractor is then provided a reasonable amount of time to correct those notified defects. Provided that it does so, the Contract Administrator will then issue a ‘Certificate of Making Good’ which triggers a contractor’s entitlement to the remainder of any retention money which has been withheld by the employer. The situation is similar in other standard forms of contract, although the terminology may differ and the time periods can vary (especially the NEC ECC).

The inclusion of a defects liability period in a contract arguably benefits both the contractor and the employer. For the employer, it provides an opportunity to request that the contractor return to site and remedy a defect, while for the contractor it is usually cheaper to return and remedy a defect itself than to be asked to pay for the employer's losses in arranging for someone else to remedy that defect. Having a practical contractual remedy can therefore save the parties' time and cost compared to adjudication or litigation.

It should be noted, however, that defects liability periods will only arise if they are included in the contract. Contractors therefore need to be aware that they do not have an automatic right to return to site to rectify a defect. Employers, on the other hand, need to carefully consider the wording and requirements of defects rectification provisions if they are considering hiring another contractor to fix the original contractor's mistakes, or else they risk being found to have failed in their duty to mitigate their losses.

It is also worth noting that a defect which is not discovered until after the defects liability period has expired is still a breach of contract for which the contractor is liable (subject to limitation arguments). In this circumstance, the contractor has no right to return to the site to repair the defect but is liable to the employer for damages.

c. who is a 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.

The [lead consultant's](https://www.designingbuildings.co.uk/wiki/Lead_consultant) role might include:

* Co-ordinating, monitoring and reviewing the [work](https://www.designingbuildings.co.uk/wiki/Works) of the [consultant team](https://www.designingbuildings.co.uk/wiki/Consultant_team) (and others, such as [specialist designers](https://www.designingbuildings.co.uk/wiki/Specialist_designers) and [specialist contractors](https://www.designingbuildings.co.uk/wiki/Specialist_contractors)).
* Arranging [consultant team](https://www.designingbuildings.co.uk/wiki/Consultant_team) meetings and [planning](https://www.designingbuildings.co.uk/wiki/Planning) [work stages](https://www.designingbuildings.co.uk/wiki/Work_stages).
* Preparing [programmes](https://www.designingbuildings.co.uk/wiki/Programme%22%20%5Co%20%22Programme) and [progress](https://www.designingbuildings.co.uk/wiki/Progress) [reports](https://www.designingbuildings.co.uk/wiki/Report).
* Seeking [instructions](https://www.designingbuildings.co.uk/wiki/Instruction) from the [client](https://www.designingbuildings.co.uk/wiki/Clients).
* Advising the [client](https://www.designingbuildings.co.uk/wiki/Clients) on the choice of [procurement route](https://www.designingbuildings.co.uk/wiki/Procurement_route).
* Advising the [client](https://www.designingbuildings.co.uk/wiki/Clients) on the need to [appoint](https://www.designingbuildings.co.uk/wiki/Appoint) additional advisers, [consultants](https://www.designingbuildings.co.uk/wiki/Consultants) or [specialist designers](https://www.designingbuildings.co.uk/wiki/Specialist_designers).
* Establishing [change control procedures](https://www.designingbuildings.co.uk/wiki/Change_control_procedures) at key stages, for example when the [project brief](https://www.designingbuildings.co.uk/wiki/Project_brief) is frozen or when [detailed design](https://www.designingbuildings.co.uk/wiki/Detailed_design) is frozen.
* Arranging [value management](https://www.designingbuildings.co.uk/wiki/Value_management) exercises.
* Advising the [client](https://www.designingbuildings.co.uk/wiki/Clients) on the choice of [contract](https://www.designingbuildings.co.uk/wiki/Contract) and [contract conditions](https://www.designingbuildings.co.uk/wiki/Contract_conditions).
* Assist the [client](https://www.designingbuildings.co.uk/wiki/Clients) in defining [selection criteria](https://www.designingbuildings.co.uk/wiki/Selection_criteria) for [contractors](https://www.designingbuildings.co.uk/wiki/Contractors) and preparing [pre-qualification questionnaires](https://www.designingbuildings.co.uk/wiki/Pre-qualification_questionnaire).
* Co-ordinating the [review](https://www.designingbuildings.co.uk/wiki/Review) of [tenders](https://www.designingbuildings.co.uk/wiki/Tenders).

Some of these roles may appear to duplicate tasks undertaken by the [project manager](https://www.designingbuildings.co.uk/wiki/Project_manager), however the [project manager](https://www.designingbuildings.co.uk/wiki/Project_manager) is acting as if they were the [client](https://www.designingbuildings.co.uk/wiki/Clients), whereas the [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant) is co-ordinating the [activities](https://www.designingbuildings.co.uk/wiki/Activities) of the [consultant team](https://www.designingbuildings.co.uk/wiki/Consultant_team).

As the role of [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant) involves additional [services](https://www.designingbuildings.co.uk/wiki/Services), beyond those that might be expected from a [consultant](https://www.designingbuildings.co.uk/wiki/Consultants) that is not [appointed](https://www.designingbuildings.co.uk/wiki/Appointed) as [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant), it is important that it is discussed with [consultants](https://www.designingbuildings.co.uk/wiki/Consultants) before they are [appointed](https://www.designingbuildings.co.uk/wiki/Appointed) and their [scope of services](https://www.designingbuildings.co.uk/wiki/Scope_of_services) and [fee](https://www.designingbuildings.co.uk/wiki/Fees%22%20%5Co%20%22Fees)agreed. The [client](https://www.designingbuildings.co.uk/wiki/Clients) cannot assume that these [services](https://www.designingbuildings.co.uk/wiki/Services) will be carried out within the agreed [fee](https://www.designingbuildings.co.uk/wiki/Fees%22%20%5Co%20%22Fees)unless the role of [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant) has been allocated.

The [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant) will often be the [architect](https://www.designingbuildings.co.uk/wiki/Architects), however this is not necessarily the case and [appointment documents](https://www.designingbuildings.co.uk/wiki/Appointment_document) for other [consultants](https://www.designingbuildings.co.uk/wiki/Consultants) will generally offer provision for them the be [nominated](https://www.designingbuildings.co.uk/wiki/Nominated) [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant).

d. what is Project Life cycle?

A 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.

Project life cycles can range from predictive or plan-driven approaches to adaptive or change-driven approaches. In a predictive life cycle, the specifics are defined at the start of the project, and any alterations to scope are carefully addressed. In an adaptive life cycle, the product is developed over multiple iterations, and detailed scope is defined for iteration only as the iteration begins.

Characteristics of the Project Life Cycle

Although projects are unique and highly unpredictable, their standard framework consists of same generic lifecycle structure, consisting of following phases:

1. The Initiation Phase: Starting of the project
2. The Planning Phase: Organizing and Preparing
3. The Execution Phase: Carrying out the project
4. The Termination Phase: Closing the project



1. The Initiation Phase: The initiation phase aims to define and authorize the project. The project manager takes the given information and creates a Project Charter. The Project Charter authorizes the project and documents the primary requirements for the project. It includes information such as:
	* Project’s purpose, vision, and mission
	* Measurable objectives and success criteria
	* Elaborated project description, conditions, and risks
	* Name and authority of the project sponsor
	* Concerned stakeholders
2. The Planning Phase: The purpose of this phase is to lay down a detailed strategy of how the project has to be performed and how to make it a success.

Project Planning consists of two parts:

* + Strategic Planning
	+ Implementation Planning

In strategic planning, the overall approach to the project is developed. In implementation planning, the ways to apply those decisions are sought.

1. The Execution Phase: In this phase, the decisions and activities defined during the planning phase are implemented. During this phase, the project manager has to supervise the project and prevent any errors from taking place. This process is also termed as monitoring and controlling. After satisfaction from the customer, sponsor, and stakeholder’s end, he takes the process to the next step.
2. The Termination Phase: This is the last phase of any project, and it marks the official closure of the project.

This general lifecycle structure is used when dealing with upper management or other people less familiar with the project. Some people might confuse it with the [project management process groups](https://www.invensislearning.com/resources/pmp/project-management-process-groups-explained), but the latter contains activities specific to the project. The project lifecycle, on the other hand, is independent of the life cycle of the particular outcome of the project. However, it is beneficial to take the current life-cycle phase of the product into account. It can provide a common frame of reference for comparing different projects

D. what is Environmental Impact Assessment ?

Environmental assessment (EA) is the assessment of the [environmental consequences](https://en.wikipedia.org/wiki/Environmental_impact) (positive negative) of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action. In this context, the term "environmental impact assessment" (EIA) is usually used when applied to actual projects by individuals or companies and the term "[strategic environmental assessment](https://en.wikipedia.org/wiki/Strategic_environmental_assessment)" (SEA) applies to policies, plans and programmes most often proposed by organs of state.[[1]](https://en.wikipedia.org/wiki/Environmental_impact_assessment#cite_note-1)[[2]](https://en.wikipedia.org/wiki/Environmental_impact_assessment#cite_note-2) It is a tool of environmental management forming a part of project approval and decision-making.[[3]](https://en.wikipedia.org/wiki/Environmental_impact_assessment#cite_note-3) Environmental assessments may be governed by rules of [administrative procedure](https://en.wikipedia.org/wiki/Administrative_law) regarding public participation and documentation of decision making, and may be subject to judicial review.

The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. The [International Association for Impact Assessment](https://en.wikipedia.org/wiki/International_Association_for_Impact_Assessment) (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the [biophysical](https://en.wikipedia.org/wiki/Biophysics), social, and other relevant effects of development proposals prior to major decisions being taken and commitments made".[[4]](https://en.wikipedia.org/wiki/Environmental_impact_assessment#cite_note-4) EIAs are unique in that they do not require adherence to a predetermined environmental outcome, but rather they require decision makers to [account for environmental values](https://en.wikipedia.org/wiki/Environmental_full-cost_accounting) in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts.[[5]](https://en.wikipedia.org/wiki/Environmental_impact_assessment#cite_note-5)