THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL

DIPLOMA IN TECHNICAL EDUCATION EXAMINATION

783 **BUILDING CONSTRUCTION**

Time: 3 Hour. **ANSWERS** **Year: 2008**

Instructions

1. This paper consists of sections **five (5)** questions.
2. Answer all questions.
3. Each question carries **twenty (20)** marks.
4. Non-programmable calculators may be used.
5. Communication devices and any unauthorized materials are **not** allowed in the examination room
6. Write your **Examination Number** on every page of your answer booklet.

1. (a) Define the term "construction waste" and give two examples of common waste materials found on site.

Construction waste refers to **any unwanted material generated during building activities**, including materials left over, damaged, or removed. It includes items that are no longer useful for the ongoing work.

Examples include **broken bricks or blocks**, which often result from handling or cutting, and **off-cuts of timber or steel** that remain after shaping materials for their required size.

(b) (i) Explain two negative effects of poor construction waste management.

Poor waste management leads to **site congestion**, which reduces safety and efficiency, making it harder for workers and equipment to move around freely.

It can also cause **environmental pollution**, such as contamination of nearby soil and water sources due to uncontrolled disposal of hazardous materials like cement wash or chemicals.

(ii) State two methods of controlling construction waste on building sites.

One method is **sorting and separating waste at the source**, allowing for reuse or recycling of items like timber, steel, and concrete.

Another method is **careful material planning and handling**, such as ordering accurate quantities and training workers to avoid damage and waste during transport and storage.

(c) Describe three ways in which waste reduction can improve project efficiency.

Reducing waste saves **time**, as less effort is spent cleaning, disposing, or correcting mistakes due to cluttered and unsafe workspaces.

It also **lowers project costs**, since materials are used efficiently and the need for additional purchases is minimized.

Waste reduction leads to **better environmental compliance**, which helps avoid fines and improves the reputation of the contractor or company.

2. (a) Explain the importance of proper storage of construction materials.

Proper storage prevents **deterioration or damage** to materials caused by exposure to moisture, sunlight, pests, or mechanical stress.

It ensures **materials are easily accessible**, reducing time lost searching for supplies or clearing disorganized stockpiles.

Well-stored materials improve **inventory control**, helping contractors monitor usage, prevent theft, and manage costs.

(b) (i) Mention two effects of poor cement storage on site.

If cement is exposed to moisture, it may **harden inside the bag**, making it unusable and leading to material wastage.

Poorly stored cement can **lose its binding strength**, resulting in weak concrete or mortar that compromises structural integrity.

(ii) State two storage precautions for timber used in roofing.

Timber should be **stacked above ground level** on raised platforms or bearers to prevent absorption of ground moisture.

It must be **covered with waterproof sheeting**, but open at the sides to allow air circulation and prevent fungal growth or rotting.

(c) Give three reasons why material storage areas must be properly planned in advance.

Planned storage ensures **efficient site layout**, avoiding obstruction of work areas and smooth movement of personnel and machinery.

It allows for **easy supervision and security**, reducing the risk of theft, loss, or misuse of valuable materials.

Proper planning helps ensure **safety compliance**, avoiding hazards like fire risks or falling objects caused by haphazard stacking.

3. (a) What is site mobilization? Explain its importance at the beginning of a project.

Site mobilization is the **initial process of preparing a construction site for work**, including bringing in equipment, setting up temporary facilities, and arranging access.

It is important because it sets the stage for **orderly project execution**, ensures workers have facilities, and confirms that the site is safe and operational before construction begins.

(b) (i) List four components typically involved in site mobilization.

These include **transporting machinery and tools** to the site, **establishing site offices and stores**, **erecting fencing or hoarding** for safety and security, and **connecting temporary utilities** like water and electricity.

(ii) State two possible challenges during site mobilization.

Unexpected **site conditions** such as swampy ground or buried utilities may delay preparation and require adjustments.

Delays in equipment delivery or permits can stall mobilization, especially if regulatory approvals are not in place.

(c) Explain three benefits of proper mobilization for project success.

Proper mobilization ensures **smooth commencement of construction activities**, minimizing delays caused by missing tools or setups.

It enhances **worker morale and productivity**, as welfare facilities and clear site organization improve working conditions.

Well-managed mobilization promotes **early identification of risks**, allowing for mitigation strategies before full-scale work starts.

4. (a) (i) Define the term "setting out" in building construction.

Setting out is the process of **transferring the building dimensions from design drawings to the actual ground** using pegs, strings, and measuring tools, marking where foundations, walls, and structures will be located.

(ii) State three tools used during setting out.

Common tools include a **measuring tape** for determining lengths, a **spirit level** or **builder's level** for checking horizontality, and **pegs and string lines** for marking boundary and alignment lines.

(b) Explain three consequences of incorrect setting out in foundation work.

It can cause **misalignment of walls or columns**, which affects structural balance and design appearance.

Incorrect setting out may result in **foundation overlap with property boundaries**, leading to legal or regulatory issues.

It can also cause **structural failure or costly rework**, especially if key load-bearing elements are misplaced or misproportioned.

(c) Describe three measures to ensure accuracy during the setting out process.

Double-checking all dimensions using **diagonal or triangulation methods** ensures square corners and correct alignment.

Using **calibrated and accurate tools** prevents measurement errors caused by worn or damaged instruments.

Having **trained personnel supervise the process** ensures proper interpretation of drawings and reduces risk of oversight.

5. (a) (i) Define "contract variation" in construction.

A contract variation is a **change or alteration to the original contract agreement**, which may affect the scope of work, materials, design, timeline, or cost of a construction project.

(ii) State two common causes of variation in building projects.

Variations can be caused by **design changes requested by the client**, such as altering room sizes or finishes after the contract is signed.

They can also result from **unforeseen site conditions**, like discovering underground rocks or unstable soil that requires additional work.

(b) Explain three effects of contract variations on project cost and schedule.

Variations often lead to **increased project costs**, especially if the changes involve new materials or additional labor.

They can cause **delays in the construction schedule**, as work must stop or adjust to accommodate the changes.

Frequent variations may also result in **disputes or strained relationships** between the client and contractor, affecting collaboration and morale.

(c) (i) List three stakeholders involved in managing contract variations.

The **client or project owner**, who requests or approves the changes.

The **contractor**, who assesses the impact and executes the adjusted work.

The **consultant or architect**, who reviews and documents the technical aspects and confirms compliance with design.

(ii) Give two ways of minimizing unnecessary variations during construction.

Conducting **thorough planning and finalizing designs** before signing the contract helps prevent later changes.

Regular communication and site meetings allow early identification of issues and minimize last-minute alterations.