

**CAMEROON DEVELOPMENT CORPORATION  
GROUP BANANA**

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## **I - SCOPE OF WORK**

The works comprise construction of a re-enforced concrete tank for the re-cycling of Pack house water, waste chemical tank and Reject tank.

## **II - TECHNICAL SPECIFICATION**

### **A- EXCAVATION**

- The site of the works shall be cleared off vegetable soil and filled to the level given on the drawings or as shall be decided by the Engineer.
- Excavations shall be of the length, width and dept for the construction.
- Any obstacle encountered during the excavation shall be reported to the Engineer and shall be dealt with as then instructed.
- The contractor shall be pumping or other approved means maintain the excavation free from water and immediately before concreting and other works constructed therein, the bottom shall be cleaned and if in loose or disturbed ground shall be well rammed and the whole shall be approved.

### **B- DEPOSITING FILLING**

- Natural hollows or pockets where soft ground has been taken out bellow the level of the foundations or similar shall be filled with earth as instructed.
- Earth filling shall be in layers not exceeding 15cm thick, each layer being well rammed to the same degree of consolidation as the surrounding ground.
- Filling behind or at the side of the structures under the ground shall consist entirely of earth surplus from the excavations and shall be deposited at the works proceeds in layers not exceeding 20cm thick, each lay being well rammed.

### **C- PREPARATION OF GROUND BEHIND PERMANENT CONSTRUCTION**

- Plain concrete in foundations shall be placed in direct contact with the bottom of the excavation, the concrete being deposited in such a manner as not to be mixed with the earth.
- The bottom of excavation for reinforced concrete work shall be covered with a "blinding" layer of lean concrete dosed 150kg/m<sup>3</sup>, not less than 5cm thick finished to a smooth surface. The required cover of concrete under reinforcement shall be entirely above the blinding layer.

#### **D- FIXING REINFORCEMENT**

- Reinforcement shall be accurately fixed in the position described on the drawing. Bars intended to be in contact at passing points shall be securely wired together at all such points by binding wires which shall tightly embrace the bars with which they are intended to be in contact.
- Immediately before concreting, the reinforcement shall be examined for accuracy of placing and cleanliness and corrected if necessary.
- The concrete cover of reinforcement shall be as described on the drawings and shall be provided and maintained by means of distant pieces of cement mortar of 2.5cm thickness (sugar block).

#### **E- SHUTTERING**

- Shuttering for concrete shall be rigidly constructed of approved material and shall be true to the shape and dimensions described on the working drawings.
- Timber or plywood shall be well seasoned, free from loose knots, and faces in contact with concrete shall be free from adhering grouts, projecting nails, splits or other defects. Joints shall be sufficiently tight to prevent the leakage of cement grouts and to avoid the formation of blemished or fins.
- An approved mould, oil or other material shall be applied to faces in contact with concrete to prevent adherence of the concrete. Such coatings shall be insoluble in water, on staining, and not injurious to the concrete.

#### **F- COMPACTION**

- Fill materials as indicated in the specifications shall be compacted and well rammed with static compactor to attained at least 85% degree of modified proctor compaction.
- Compaction equipment shall be approved by the Engineer.

#### **G- CEMENT**

- The cement shall be ordinary setting Portland cement: 50kg/bag. All cement shall be fresh when delivered and consignments shall be used in order of delivery.

#### **H- AGGREGATES**

- Materials used as aggregates shall be obtained from a source known to produce aggregates satisfaction for concrete and shall be chemically inert, strong, hard, durable, or limited porosity and free from adhering coating, clay lumps and organic or other impurities that may cause corrosion of the concrete.
- Fine aggregate shall be clean, natural sand and shall be free from coagulated lumps.

- Coarse aggregate shall be crushed stones and shall be angular. After twenty four hours immersion in water, a previously dried sample of the coarse aggregate shall not have gained in weight more than 10%. The grading shall be size 15/25mm.

#### **I- STEEL BARS**

- Steel bars shall new twisted (ribbed) bars and of structural or intermediate grade edition.
- Steel bars shall be free from rust, oil, defects, grease or distortion.
- The space layout of the bars shall be as shown on the drawings.
- The steel bars shall be laid out evenly 25mm above the sub-base level.

#### **J- CONCRETE PROPORTION CONSISTENCY**

- Concrete for foundations shall be class "A" mixture of 350kg/m<sup>3</sup> and must attain a compressive strength of at least 220 bars at 28 days.
- The compressive strength shall be ascertained by crushing 15cm diameter concrete cylinders, the cylinders being made on the works and tested as instructed.
- Lean concrete for blinding shall be of 150kg/m<sup>3</sup> dosage.
- Water content shall in no case exceed 22.5 liters per bag of cement or 180 liters per cubic meter of concrete for 350kg/m<sup>3</sup> dosage or 82.5 liters per cubic meter for lean concrete.

#### **K- WATER**

- Water shall be clean, fresh and free from organic or inorganic matter in solution or suspension. Water shall be obtained from a public supply and shall be taken from any other source only if approved. No water from excavation shall be used.

#### **L- MIXING CONCRETE**

- The cement and aggregates shall be thoroughly mixed together in the proportions described in a batch-type mechanical mixer unless otherwise approved.
- The water shall not be admitted to the drum of the mixer until all the cement and aggregate constituting the batch are in the drum. Mixing shall continue until the concrete is uniform in colour and for not more than two minutes after all the materials and water are in the drum.
- No partly-set or re-tempered concrete shall be used. Partly-set or excessively wet concrete shall not be used on the works and shall be immediately removed there from.

## **M- PLACING CONCRETE**

- Before proceeding to place the concrete, the shuttering shall be re-aligned if necessary and water and rubbish therein removed by approved means.
- Immediately prior to placing the concrete, the shuttering shall be well wetted except in wet weather and all openings closed.
- Each layer of concrete while being placed shall be consolidated by approved methods of mechanical vibration to form a dense unit.
- Concrete shall be placed continuously until completion of the part of work between construction joints hereinafter. At the completion of a specified or approved part, a construction joint of the form and position hereinafter specified shall be made. If topping of concrete placing be in-avoidable elsewhere, a construction joint shall be made where the work is stopped.
- Construction joints shall be rebated and of an approved shape and shall be vertical or horizontal.
- Before placing new concrete against the old one already hardened, the face of the old concrete shall be roughened and scum and loose aggregate removed there from, and immediately before placing the new concrete the face shall be thoroughly wetted and a coating of neat cement grout applied thereto. The new concrete shall be well rammed against the prepared face before the grout sets.
- Newly placed concrete shall be protected by approved means from rain, sun and drying winds.
- Concrete placed below the ground shall be protected from failing earth during and after placing.

## **N- EQUIPMENT**

- The contractor shall use a mechanical batch concrete mixer (0.5m<sup>3</sup> minimum capacity) at least on the concreting works.
- A concrete pocker vibrator will also be used in consolidating concrete. A hydraulic hammer to crack concrete. A water pump machine to drain water in the basement. An excavator for earth work.

## **III- WORK SCHEDULE**

- Each lot should be completed within 12 weeks. If we find the Contractor
- failed to follow the specifications provided in carrying out the work, then

the contractor will be advised to stop the work and may only resume when he will agree to rectify the work in accordance to the specifications.

#### **IV - INTERPRETATION OF TECHNICAL SPECIFICATIONS**

- Should any ambiguity or difficulty be encountered with specifications, the bidder is advised to contact the Engineer of the project for clarification as to the intent or works involved.

#### **V. DISCREPANCIES**

- During the course of the work, should any ambiguities or discrepancies be found in the specifications and bill of quantities to which the Contractor has failed to call attention before submitting his tender, the Employer or his representative will interpret the intent of the specifications and the bill of quantities and the Contractor agrees to abide by the Employer's interpretation and agrees to carry out the work in accordance with the decision of the Employer. It is expressly stipulated that neither the bill of quantities nor the specifications should take precedence over the other, and it is further stipulated that the employer may interpret or construe the bill of quantities and specifications so as to secure in all cases the most substantial and complete performance of the work as is most consistent with his needs and requirements, and for this the employer should assumed full responsibility.

#### **VI. SITE VISIT**

- The contractor should be held to have examined the site and to have compared it with the specifications and Bill of Quantities and to have satisfied himself of the conditions existing at the site, as relating to the actual condition at the site at the time of estimate of the work, the storage and handling of materials and all other matters as may be incidental to the work under the contract, before the submission of his proposal. No allowance will subsequently be made or conceded by reason of any error, due to the contractor's neglect to comply with the requirements of this clause.

#### **VII - GENERAL**

- An extra works necessitated by site conditions or omission must first be discussed and approved by the supervising engineer in writing before execution. Such should be treated to the General Manager's approval for supplementary contract.
- The contractor must ensure his workers against all accidents, and subscribe to a third party liability insurance to cover him against any possible accident to third party in the course of executing this project.
- Each phase of work completed must be inspected and approved by the supervising Engineer before further works especially those that will bear upon the completed phase.

- The contractor should keep the surroundings clean of all equipments and debris at the end of works at no extra cost to the CDC (making good)
- Before the commencement of any works, material should be pre-inspected by the supervising Engineer before use.
- Failure to do so, all works done using such materials which are not pre-inspected should not be accepted.
- The contractor should also make provision for a site supervisory record.