**TECHNICAL SPECIFICATIONS**

**Part 1: Lot 1, 2,3,4: Technical Specifications for Renovation and construction and infrastructure upgrade of selected health facilities.**

Please refer to the attached excel spreadsheet embedded below for District specific technical specifications for each of the two (2) lots:

**SUPERVISION OF WORKS**

The Contractor shall always keep a works diary on the site, which must be shown to the Employer’s Representative if he requests it. The following information shall be recorded in the works diary daily:

- Weather conditions

- Daily record of workers employed

- Deliveries of materials to the site

- Details of concrete mixes used and quantity of cement used

- Other occurrences, e.g., accidents, strikes, storms etc.

- Visitors to the site

Written instructions by the Employer’s Representative and minutes of site meetings will also be recorded in the works diary.

An A4 size duplicate book shall be provided by the contractor for use as the works diary.

At certain stages during the execution of the works the Contractor must have the approval of the Employer’s Representative before proceeding. In each case it is the responsibility of the contractor to inform the Employer’s Representative at least 48 hours in advance that his presence is required on the site.

### **SAFETY PRECAUTIONS**

The Contractor shall ensure that the following safety precautions are observed:

- Appropriate boots and safety helmets shall be worn by persons working on the project.

- A ladder shall be provided for workers use where necessary.

 Provision of a first aid box stocked with medications.

 Safety briefings of workers every Monday before work starts.

- At night or when work in the site has been suspended access to the site shall be closed off.

**ROOFING**

In Districts where replacement of the roofing is required, the roofing members shall be of odum treated with solignum and the roofing sheets are of aluminum running the whole length of the building and with an overlap of 600mm. 2x6” wood is to be used for the rafters at 1200c/c and 2x4” wood for the purlins at 1050 c/c. Roofing sheets shall be 0.35mm thick corrugated Aluzinc roofing sheets laid two corrugations side lap and 150mm end laps and fixed to timber purlins at maximum 1050mm centers with coupled diamond shape bituminous felt washers.

### **QUALITY OF MATERIALS**

**MATERIALS FOR CONCRETE**

**AGGREGATES**

Aggregates shall be hard, clean, and free of all organic material. They should conform to the appropriate Ghana standards. Samples of all aggregates to be used shall be brought to the Employer’s Representative for approval before use. Coarse aggregates shall be comprised of well-graded material of between 6mm and 15mm in size. Sand used for concrete shall consist of hard material of size not less than 4mm and shall contain no more than 5% silt. Sand used for cement mortar shall be fine grained and if required shall be screened through a 3mm sieve.

**CEMENT**

Cement shall be normal Portland cement delivered in 50kg bags. The bags shall be in perfect condition when delivered to the site and shall be not more than 3 months old at the time of use. All broken bags or bags showing evidence of dampness or caking shall be immediately removed from the site. Reuse of spilt cement is not permitted.

**STEEL REINFORCEMENT**

Plain mild steel bars shall be used for the reinforced beam and slabs. The Contractor shall remove any loose rust from the bars by brushing with a steel brush.

**WATER**

The Contractor shall provide all water needed on the site. Water used for mixing concrete shall be clean and of a quality suitable for drinking.

**CURING**

All concrete works, including beam and slabs shall be protected from rapid drying for 21 days by covering with either cocoa sacks white polythene sheets or any approved material and watered twice daily.

**FORMWORK**

Slab formwork shall have a maximum deviation from straightness of 5mm over the full length of the slab.

**TECHNICAL SPECIFICATIONS Part II (compliance with EMP)**

**SAFETY, SECURITY AND ENVIRONMENTAL MANAGEMENT**

**GENERAL**

1. Before the order to commence any works, the contractor is required to implement the Environment Plan (EMP) for the project as specified in the Environment & Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) prepared for this project. The plan shall spell out how the contractor will achieve environmental targets and objectives specified in the EMP (Excerpts available for reference). The plan shall include, to the extent practicable and reasonable, all steps to be taken by the Contractor to protect the environment in accordance with the current provisions of national environmental regulations and or the EMP established for this project.
2. Notwithstanding the contractors’ obligation under the above clause, the Contractor shall implement all measures necessary to restore the sites to acceptable standards and abide by environmental performance indicators specified under the EMP to measure progress towards achieving objectives during execution or upon completion of any works. These measures shall include but not limited to the following:
3. Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, dispersing coal ashes, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living downwind of dust producing activities!
4. Ensure that noise levels emanating from machinery, vehicles and noisy construction activities are kept at a minimum for the safety, health, and protection of workers within the vicinity of high noise levels and communities near rock – blasting areas.
5. Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to civil works being carried out.
6. Prevent bitumen, oils, lubricants, and wastewater used / produced during the execution of works from entering rivers, streams, irrigation channels and other natural water bodies/reservoirs and ensure that stagnant water in uncovered borrow pits is treated in the best way to avoid creating possible breeding grounds for mosquitoes. Regarding the adequacy or inadequacy of rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.
7. If the Contractor fails to implement the approval Environmental Management Plan after written instruction by the Engineer to fulfill his obligation within the requested time, the Client reserves the right to arrange through the Engineer for execution of missing action by third party on account of the Contractor.

**SPECIFIC ENVIRONMENTAL ISSUES TO BE CONSIDERED**

**WORKSITE/CAMP SITE WASTE MANAGEMENT**

* All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous chemicals must be bunded to contain spillage. All waste containers, litter and any other Waste shall meet the Management Regulations of the Environmental Protection Agency of Ghana
* All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with the Water Pollution Control Regulations of the Environmental Protection agency of Ghana.
* Used oil from maintenance shall be collected and disposed of appropriately at designated sites or be re-used or sold for re-use locally.
* Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.
* Construction waste shall not be left in stockpiles along the road. Waste and other excess material shall be used for rehabilitating borrow areas and landscaping around the road.
* If other spoil disposal sites are necessary, they shall be in areas, approved by the engineer, of low land use value and where they will not result in material being easily washed into drainage channels. Whenever possible, spoiled materials should be placed in low-lying areas and should be compacted and planted with species indigenous to the locality.
* Stockpile areas shall be in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exist from workings.

**MATERIAL DEPOSIT**

* The Contractor shall deposit any excess material in accordance with the principles of the EMP at areas approved by local authorities and/or the engineer.
* The Contractor shall in advance of the commencement of work clarify with the local authorities’ dumpsites or areas for hazardous deposits for contaminated liquid and solid materials, that cannot be used any longer as backfill.

**REHABILITATION AND SOIL EROSION PREVENTION**

* To the extent practicable rehabilitate the site progressively so that the rate of rehabilitation is like the rate of construction.
* Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.
* Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.
* Re-vegetate the stockpile to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.
* Locate stockpiles where they will not be disturbed by future construction activities.
* To the extent practicable reinstate natural drainage patterns where they have been altered or impaired.
* Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute ground water and soil.

**TRAFFIC MANAGEMENT**

* Location of access roads/detours shall be done in consultation with the local community especially where access road shall traverse important ecosystem component. Access roads shall not traverse wetland areas.
* Access roads shall be sprinkled with water at least five times a day in settled areas and three times in unsettled areas to suppress dust emissions.

**BLASTING**

* Blasting activities ie blasting of rocks during pit excavation shall be done during working hours and local communities shall be consulted on the proposed blasting times.
* Noise levels reaching the communities from blasting activities shall not exceed 90 decibels.

**DISPOSAL OF RELOCATED ELEMENTS**

* In some areas, no longer usable materials and construction elements will have to be disposed of, such as pipes and demolished structures.
* The Contractor must agree with the local administration of the Client, which of these elements to be surrendered to the Clients premises, or in which way they could be recycled best.
* Unsuitable and demolished elements shall be dismantled to size fitting on ordinary trucks to be transported for the purpose of recycling to an official scrapyard.

**HEALTH AND SAFETY**

* The contractor in advance of the construction work shall mount an awareness and hygiene campaign. Workers and residents shall be sensitized on health risks particularly of AIDS.
* Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.
* Construction vehicles shall not exceed maximum speed limit of 40km per hour.

**REPAIR OF PRIVATE PROPERTY**

Wherever the Contractor, whether deliberately or incidentally damages private property it must be repaired. For each repair the contractor must obtain from the owner the certificate, that the damage has been made good satisfactorily to indemnify the Client from subsequent claims.

In case where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client must be informed by the Contractor through the Engineer. This compensation is in general to be settled under the responsibility of the Client along with the EMP or even before signing the Contract. In unforeseeable cases the respective administrative entities of the Client will take care of compensation.

**COST OF COMPLIANCE WITH THE EMP**

It is anticipated that the compliance with the EMP is already part of standard good workmanship and state of art as generally required under this Contract. However, the awareness has to be conveyed to the Contractors staff. In addition, some costs are arising from establishing an individual EMP for each subproject or site respectively, as well as the related monitoring and reporting. The item “Compliance with the EMP” of the BOQ covers these costs. No other payments will be made to Contractors for compliance with any request to avoid and/or mitigate an avoidable negative environmental impact.