

## **B. Technical Specifications**

### **SCOPE OF WORKS AND TECHNICAL SPECIFICATIONS**

This document shall be read and understood in conjunction with the BOQ and design drawings provided. The vendor shall consult the supervising Civil Engineer where clarification is required.

#### **1 GENERAL**

Together with Section 2 "Instructions to Bidders" this section directs the contractor to the relevant information necessary for pricing the Bills. It is therefore essential that the text contained therein be read in conjunction with the measured items which shall be priced accordingly.

It is assumed that the contractor's supervisory and estimating staff are fully conversant with the normal standards of good workmanship and relevant publications of trade and technical organisations.

#### **2 PROJECT LOCATION**

The project includes the Construction of perimeter fence, generator house, sand filling of the compound and other external works at the Health Clinic at Ngarannam. It is located at Ngarannam, Mafa LGA, Borno State (Lat: 11.916924°; Long: 13.573721°) on both sides of the main road between Maiduguri - Mafa as shown in Figure 1.

#### **3 SCOPE OF WORK**

The scope of work consists of construction of perimeter fence around the allocated beaconed area of the clinic, construction of generator house within the premise of the health clinic, sandfilling the depressed area within the compound, laying of kerbstone and providing gravel bed as stipulated in the BoQ. The fence is planned to span a total linear meter of about 240meters with 2 gates (exit and entrance). The structural drawing provides further details of the structural members as provided in the BoQ. The generator house is planned to house a 135 KVA generator. The generator shall be resting on a reinforced concrete plinth as provided in the structural detailed drawing. The entrance shall be metal grill material and 2 sides of the wall constructed with perforated decorative blocks to allow for ventilation. Further details are presented in the architectural and structural drawings attached as ANNEX.

##### **3.1 Provision of Preliminaries**

The contractor shall provide the health, safety and environmental gears, temporal hoardings, logistics for proper site construction management, records and reporting etc.

#### **4 DELIVERY PERIOD**

The delivery period for all the items mentioned in the scope of works, BOQs and drawings is six (8) Weeks as per the below schedule.

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*Table 1: Contract Duration*

| <b>Activity</b>  | <b>Duration /Time</b>                  | <b>Responsible Unit/Reporting</b>       |
|--|--|---|
| Signing the contract\ Handing over the site\Mobilization | Within 1-week of awarding the contract | Procurement/Vendor/ Engineering Team    |
| Work duration  | 6 weeks from site handover date        | Contractor/Supervising Engineers        |
| Substantial Completion of the project                    | 1 week after completion                | Contractor and the supervising engineer |

## **5 TECHNICAL SPECIFICATIONS**

### **5.1 Specifications**

- All works and processes shall be carried out using equipment, tools and methods that comply with applicable construction Health, Safety and Environmental regulations, standards, and policies. The use of PPE, safety caution tapes and symbols are mandatory. Safety first!!
- All excavations, demolition works, removal & arranged construction materials must be clearly encircled with safety caution tapes during works
- All excavations shall be done in accordance to the structural drawings provided
- Filling around foundations etc. is to be of selected earth obtained from the excavation and is to be filled in 150mm layers, each layer well rammed and consolidated
- All formation level must be compacted before concrete blinding as specified in the structural drawings
- All blockwork at substructure level shall be filled solid with concrete mix 1:3:6 while the use of broken blocks, laterite or mortar as a substitute shall not be accepted.
- Laterite shall be approved rock laterite or other suitable materials are to be free from dust or other foreign matter and broken to pass a 75mm ring and to be retained on a 50mm ring and deposited in layers not exceeding 150mm thick, each layer being well consolidated by rolling or ramming and well-watered.
- Hardcore is to be selected broken brick, concrete, sandcrete blocks or other clean hard and dry material.
- Provide damp-proof membrane not less than 0.3mm to cover the total surface of the foundation.
- Ordinary Portland cement shall be used for all masonry and concrete works and must be lump free
- Fine aggregates shall be sieved and free of organic matter and other impurities
- Well-graded crushed granite shall be used as coarse aggregate (20-25mm for reinforced concrete; 35-40mm for mass concrete)
- Water-Cement ratio by weight shall not exceed 0.55. The quantity of water used in the mixing of the concrete must be adequate to ensure proper hydration of the cement and to bring the mass to a proper consistency and to a workable mix.

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- Batching of concrete shall be by volume and Tilting Mixer shall be employed for mixing of fresh concrete
- Concrete shall be placed gently and not tipped or dropped from a height, it shall then be thoroughly rammed into positions to fill the forms and surround the reinforcement without displacing it and without the formation of voids or cavities.
- Compaction of fresh concrete shall be done with a poker vibrator for adequate compaction.
- The use of BRC wire-mesh for ground floor slab is mandatory in new construction works and photographs are to be shared with Supervising Civil Engineer as evidence of same
- Curing of concrete shall be in accordance with the recommendation set out in the B.S. Code of Practice and all surfaces shall be kept continually wet after concreting and protected from the sun and drying winds by covering with wet sacking, etc. for not less than one week.
- Concrete cover of 50mm shall be provided to reinforcement in foundation.
- Hollow sandcrete blocks (225mm X 225mm X 450mm) shall be machine-molded and not hand molded
- Minimum crushing strength of sandcrete blockwork shall not be less than 2.5N/mm<sup>2</sup> (cement-sand ratio of 1:6 by volume; no of blocks must not exceed 25 per 50kg bag of cement during fabrication).
- Formwork shall be removed without damage to the concrete.
- A schedule of suggested minimum striking times is given below:
  - Walls, sides of R.C beams sides of columns - 2days after concreting
  - Soffits to R.C beam - 14days after concreting
- The mortar used shall be composed of cement and sand and approved to give a strength equal to the strength of the blocks
- All reinforcement shall comply with BS4449 and associated codes with regards to bending, lapping, binding, and cranking
- Reinforcement shall be kept free of oil, mud, rust prior to use
- Concrete cover of 25mm shall be provided to reinforcement in beams and column
- High yield steel (tensile strength of 410N/mm<sup>2</sup>) of specified size shall be used for both main reinforcements and links/stirrups.
- The sand for plastering/rendering shall comply with B.S 1199.
- The internal and external renderings shall be carried out in accordance to the specification provided in the architectural drawings.
- All concrete surfaces which are to be rendered are to be carefully and thoroughly hacked with a suitable tool to provide an adequate and suitable keyed surface. All block walling which is to be rendered shall have the joints raked out to provide an adequate and suitable keyed surface.
- Plaster work and paintings which does not thoroughly adhere to any surface shall be removed and re-executed in a proper manner. Such hollowness, cracks, blisters, and any other defects will be considered a defect under the Defects Liability Clause of the Contract.
- The roofing sheet shall be 0.55mm long span aluminum sheet, colour as specified by Architect's instruction.

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- Evidence of compliance with specified roof gauge must be provided
- All roofing sheets must be lapped with 2 corrugation at both ends
- Timber Specifications for roof rafter, struts, purlins, and fascia board as provided in BOQ and Architectural drawings.
- Defective or poorly seasoned timber shall not be used for roof carcass or fascia
- All roof timber structure members including fascia shall be treated with approved chemicals.
- Materials and specifications for windows and doors shall be according to BOQ and Architectural drawings
- Door-post labelling and designation shall be made with plastic plague as directed by the supervising Engineer.
- Floor finishes as provided in architectural drawings for different rooms. 50mm screed to concrete slab installed to a shine for rooms and veranda.
- All electrical installations must be earthed, and fittings must be tested and commissioned using a power generator prior to handover of project.
- All Paint materials shall be the best quality of their respective kinds and in accordance with their latest British Standards and obtained from an approved manufacturer. No dilution of painting materials will be allowed, except strictly in accordance with the manufacturer's directions, or as described in their literature.
- 12mm cement screed finish with average gauge Tyrolean finish with two coats of weatherproof paint to Architect's further specification for external walls at the back and sides of building. 12mm cement screed finish with weatherproof paint to Architect's further specification and artistic mural. Internal walls shall be 12mm cement screed finish with two coats of sheen finish paint, color to Architect's further instruction.
- Painting on exterior work shall not be done in wet weather or upon any surface which are not thoroughly dry and free from rust or dust.
- Gloss paint of similarly approved colours shall be on woodwork or metal work after necessary preparations.
- Land survey and mapping services shall be carried out to ensure that the siting of the perimeter fence and generator house matches with the global layout of Ngarannam.

### 5.2 Alternative Materials, Components and Goods Specified

- Wherever materials, components, and goods, whether basic or proprietary, are specified the Contractor may, subject to approval in writing, use materials, components and goods from an alternative source providing the quality, properties and design are similar. All materials, components and goods shall be used and fixed in an approved manner and, where applicable, in accordance with the manufacturer's instructions.

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## 5.3 Measurement and Valuation

This contract will be Fixed Sum or Lump Sum Contract such that payments will be based on agreed milestones. Measurement and valuation process will involve checking and verifying that the milestone against which payment claim is made, is indeed complete and in accordance with the requirements of the specifications.

## 5.4 Tests on Completion

The contractor shall submit to UNDP designated engineer, not less than 7 days before the date the contractor intends to commence the Tests on Completion a detailed programme showing the intended timing and resources required for these tests.

As soon as the Works have started, in the Contractor's opinion, passed the tests on Completion, the contractor shall submit a certified report of the results of these tests to the Engineer. The Engineer shall review such a report and may give a Notice to the contractor stating the extent to which the results of the tests do not comply with the contract.

In considering the results of the tests on completion, the engineer, shall make allowance for the effect of any use of the Works by the beneficiaries on the performance of other characteristics of the Works.

## 5.5 Taking Over

Upon completion of the works, the contractor will request for a joint final inspection of the completed works. The Engineer will prepare a punch list where necessary upon conduction the final inspection for the contractor to rectify. Once the punch list has been attended to and works are certified complete then the contractor will hand-over the works to the communities through the district council.

## 5.6 Defects and Defect Notification Period

A defect in this context is defined as any observance of a physical problem that may cause structural weakness or failure hence less effective for the intended purpose. The defects can either be patent (obvious, easy to fix and often merely aesthetic) or latent (not easy to find and tend to be somehow problematic). Construction defects may arise from the materials used or workmanship during construction.

The works will have a defects liability period of 24 weeks within which any defects arising will be documented and the contractor will be instructed to make good of the same unless the defect is due to a force majeure.

Failure to attend to the defects without giving any proper reason will result in forfeiture of the retention money withheld by the UNDP Nigeria.

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**5.7 Closure**

Project closure will be upon completion and certification of the works by the engineer designated by UNDP Nigeria who will review and sign off on the deliverables. The completed works will be subject to defects liability period as may be determined in the contract document.

**5.8 Insurance**

The contractor shall have a “Contractor’s All Risks (CAR)” insurance during the execution period for the contract to cover the works, equipment, personnel, other people’s lives, and property.

**5.9 Liability**

The Contractor shall not be liable for the defects arising from the design or specifications. However, the Contractor shall be liable for the defects arising from the materials and workmanship.

**5.10 Requirements**

UNDP Nigeria through their representative will require certifying any completed works in accordance with the milestones before processing any payment for the completed milestone.

**6 CONTRACT PRICE AND PAYMENT**

The Contract Price will be fixed in Nigeria Naira (NGN) and the currency of payment is Nigerian Naira. UNDP Nigeria will pay the Contractor upon completing a milestone as outlined in section 6.1 below. The amounts payable for each completed milestone will be determined at the time of drafting a contract. UNDP Nigeria may pay the Contractor, upon its request, an Advance for up to 20% of the Contract Sum upon satisfying the requirements in form of Advance Payment Guarantee.

**6.1 Conditions for Release of Payment**

*Table 2: Contract Milestone Payments Schedule*

| <b>Milestone No.</b> | <b>Milestone’s Description and Required Activities &amp; Documentations</b>   | <b>Payment Amount (NGN)</b> | <b>Completion Date</b> |
|----------------------|---|-----------------------------|------------------------|
|                      | <p><b>20% progress payment upon completion of the below activities</b></p> <ul style="list-style-type: none"> <li>• Signing and Submission of Contract.</li> <li>• Submission of Performance Bond.</li> <li>• Attend entrance meeting in UNDP Sub-Office via Zoom, upon presenting signed contract.</li> <li>• Submit updated project work plan/schedule and</li> </ul> | 20%                         |                        |

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|                        |   |     |   |
|------------------------|---|-----|---|
| <b>Milestone No. 1</b> | <p>proposed list of staffs and get the approval of the engineer</p> <ul style="list-style-type: none"> <li>• Handing over of site/Taking over of site Mobilization of equipment and staff to site.</li> <li>• Completion of not less than 20% rate of the total scope of work, duly certified by the UNDP authorized Civil Engineer to qualify for Submit progress report including a summary of activity progress with photographs showing works completed.</li> </ul>   |     | (2 weeks from the commencement of contract)     |
| <b>Milestone No. 2</b> | <p><b>40% payment of the total contract amount, upon completion of the below activities</b></p> <ul style="list-style-type: none"> <li>• Complete not less than 60% rate of the total scope of work to include work activities as per the approved project work schedule which is to be valued and certified by UNDP Engineer to qualify for payment</li> <li>• Submit progress report including a summary of activity progress with photographs showing works completed.</li> <li>• Submit list of workers (Cash for Work – CfW) not less than 20 with 10-15% being women who MUST have worked minimum of 5days on the project</li> <li>• Submit hardcopy of invoice</li> <li>• Site walk along with UNDP Engineer to inspect and certify completed milestone item of works</li> </ul> | 40% | (Within Week 2-5 of Contract commencement date) |
| <b>Milestone No. 3</b> | <p><b>35% payment upon completion of the outstanding items thus completing 100% works in the BoQ, duly certified by the UNDP Civil Engineer.</b></p> <ul style="list-style-type: none"> <li>• Complete 100% of all outstanding items of work in the SoW as detailed in the BoQ/checklist.</li> <li>• General paintings, finishes, clearing of site, washing &amp; cleaning of the buildings and installation of visibilities with artistic works for gender segregation</li> <li>• General testing of electrical fittings, plumbing and associated works</li> <li>• Submit list of workers (not less than 20 with 10-15% being women) who MUST have worked minimum of 10days on the project</li> <li>• Submit 35% invoice and project completion report</li> </ul>                      | 35% | (Within 5- 8 weeks after the commencement date) |

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|                 |   |    |   |
|-----------------|---|----|---|
| Millstone No. 4 | Final payment. Retention of 5% shall be paid after post-completion inspection and certification report by the authorized UNDP nominated engineer that defects which occurred within 6 months of practical completion have been satisfactorily repaired. | 5% | 24 weeks after the substantial completion date. |
|-----------------|---|----|---|

**7 CONTRACTOR KEY PERSONNEL**

The following personnel shall be provided for this project ONLY without duplication of personnel in other ongoing projects with UNDP.

**One (1) Project Manager (Full time available in the site):**

A minimum of 5 years work experience in the construction works & must have handled at least 3 projects of similar nature and complexity equivalent to this assignment. Minimum a B.Sc/B.Eng in Civil Engineering. Furthermore, project manager MUST be readily available on site when required within the shortest notice. CV and certificates should be provided in the attached UNDP format attached in the ITB document.

**One (01) Resident Qualified Civil/Site Engineer (Full Time available in the site):**

A minimum of 3 years work experience in the rehabilitation/construction works & must have handled at least 3 projects of similar nature and complexity equivalent to this assignment. Minimum of a B.Tech/B.Eng Degree in Civil Engineering and MUST be ready to reside in Project Location. COREN Registered with CV and certificates provided in the attached UNDP format attached in the ITB document.

**One (1) HSE Officer (Full time available in the site):**

A minimum of 3 years' relevant work experience in the rehabilitation/Renovation/construction works. Must have handled at least two (02) similar project in nature and complexity. Minimum a B.Sc/B.Tech Degree in Natural/Environmental Engineering or equivalent). Professional certification in Health Safety Security & Environment. CV and certificates provided in the attached UNDP format attached in the ITB document.

**One (01) Foremen (Full time available in the site):**

A Qualified Foremen with 5 years of experience in civil works (construction/rehabilitation), should have minimum of National Diploma in Civil Engineering/Building. CV and certificates provided in the attached UNDP format attached in the ITB document.

**8 CONSTRUCTION EQUIPMENT/MACHINERY PROPOSED IS AS FOLLOWS**

| S/N | EQUIPMENT                        | QUANTITY |
|-----|----------------------------------|----------|
| 1   | Concrete mixer 10 m <sup>3</sup> | 1        |



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| S/N | EQUIPMENT                        | QUANTITY |
|-----|----------------------------------|----------|
| 2   | Levelling Equipment/Survey tools | 1 set    |

## 9 Previous Experience & Financial Standing

Minimum 3 years of relevant experience (Renovation /Construction/Rehabilitation works).

Evidence of Minimum 3 contracts of similar value, nature and complexity implemented over the last 3 years. One of the contracts must exceed NGN 30,000,000.

Statement of Satisfactory Performance from the Top three (3) Clients in terms of Contract Value for similar assignments over the last 5 years.

Please submit Latest Audited Financial Statement (Income Statement and Balance Sheet) including Auditor's Report for the past three years **[2018-2019-2020]**.

Bidders having completed and certified Audited Financial Statements for 2020 can also submit to be considered for evaluation.

Minimum annual average turnover of **NGN 30,000,000** in any single year in the last 3 years.

## 10 General Requirements

### 10.1 Reports, Meetings and Work-Plan (Time-schedule)

The contractor shall submit weekly progress report, mentioning in the report the following:

- The activities which have been done during that week,
- The materials provided to the site.
- The weather conditions
- The challenges and delay in the project.
- The number of labors for each day of the week.
- Progress of work related to the quantities.
- Photographs showing progress of works.

There will weekly meeting between UNDP engineer and the contractor.

The contractor is expected to follow submitted and approved work schedule (work-plan) and changes should be communicated and approved by Supervising Engineer before proceeding.

The contractor must submit the milestone progress report with each request for milestone payment.

The As-built drawings should be submitted with the progress report of milestone No. 3.

## 11 Health and Safety

The contractor is fully responsible for the safety of operations in the site. Contractor must follow the below:

- Provide his staff with PPE, helmet, vest and safety shoes.

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- Provide the project site and the holes with safety tape.
- Provide first Aid kit to the site.

**12. COVID 19**

Complying with Covid-19 protection measures on site is mandatory and the Contractor will have to their work in such a way that workflow is not disrupted in the process of adhering to the measures. The contractor must provide his staff with face masks and keep the social distance at work.

The Contractor will observe and follow safety guidelines on the construction site as instructed by the engineer or any party designated by UNDP Nigeria.

**13. SITE MAP & OTHER ASSOCIATED LAYOUTS**

Fig 1



Figure 1: Google Earth Map showing location of proposed Ngarannam project site

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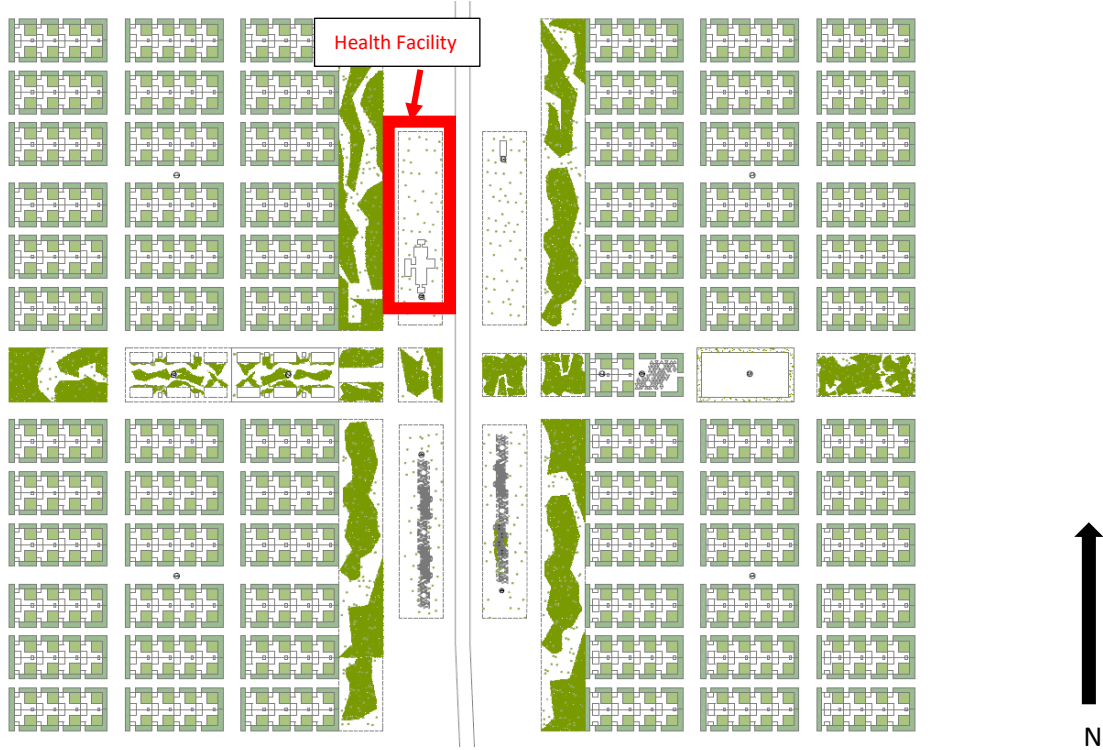


Figure 2: Global layout of Ngarannam showing location of Health Facility