



## TERMS OF REFERENCE

Expansion of Hai Dinka PHCU, 1 block of 3 stance latrines with washroom, & Construction of 400m perimeter fence in Hai Bafra Primary school, 2 blocks of 4 stance latrine (for girls having washroom and boys with urinal) at Wau North Payam.

### 1. PROJECT INFORMATION

#### 1.1. Background

International Organization for Migration (IOM), South Sudan Mission, is implementing the Enhancing Community Resilience and Local Governance Project (ECRP). ECRP provides training to boma and Payam level development committees which have prioritized infrastructure for selected payams in eight Counties and two Administrative Areas.

IOM South Sudan therefore is seeking contractors to carry out the mobilizing and constructing of the various community infrastructure projects to the required standards of ECRP for construction, quality control, and health, safety, and environmental protection.

IOM requires prompt and immediate action in mobilization of a team for construction. As a result, the Contractor must provide a suitable and experienced team that can quickly and efficiently carry out the required construction work, as well as any required tools and transportation for the team to and from the sites. The Contractor shall furnish all the necessary materials, tools and equipment, labor supervision and other services for the satisfactory and timely completion of the works in accordance with this agreement.

#### 1.2. Project Details

**Table 1 Project Sites with Scope of Work**

<b>Project Name</b>	Expansion of Hai Dinka PHCU, 1 block of 3 stance latrines with washroom, & Construction of 400m perimeter fence in Hai Bafra Primary school, 2 blocks of 4 stance latrine (for girls having washroom and boys with urinal) at Wau North Payam.
<b>Project Site 1</b>	Hai Dinka PHCU Wau North payam, Wau County, Western Bahr El Gazal State. N 7.71475, E 27.99871995

	Scope of work: Expansion of Hai Dinka PHCU, 1 block of 3 stance <b>latrines</b> with washroom
<b>Project Site 2</b>	Hai Bafra Primary School, Wau North Payam, Wau County, Western Bahr El State  GPS: <b>N</b> 7.7030423, E 27.9795725
	Scope of Work: Construction of 400m perimeter fence in Hai Bafra Primary school, 2 blocks of 4 stance latrine (for girls having washroom and boys with urinal
<b>Schedule</b>	The project is expected to commence in February 2024 and be completed within 6 months with a twelve-month warranty period.

## 2. Supervision

The construction site and construction activities will be supervised by the IOM designated Site Engineer and Project Engineer. A Community Site Supervisor will support the team in monitoring the work daily.

The Lead Engineer is responsible for the overall project management of the contract work with oversight from the ECRP Programme Coordinator.

To avoid double reporting, the Contractor is not allowed to report externally to any other platform of coordination.

## 3. Role of the Contractor

The Contractor will have to provide for the construction and completion in every detail of the work described in the contract documents. All labor, materials, tools, equipment, transportation, supplies required to complete the work in accordance with the specifications and terms of the contract should be well furnished. The Contractor cannot deviate from the construction designs or specifications without seeking permission and approval from IOM.

IOM reserves the right to reject any materials, equipment, or resources and to delete or reduce any work item, whether in whole or in part and update Annexes, as necessary and a reduced contract price shall be agreed.

If the Contractor is not able to finish the construction works or must abandon the works due to loss of tools, accidents or any unforeseeable circumstances, the Contractor should remove all unused materials from the site. IOM will pay only for the work done as per rates in the filled Bill of Quantities in the contract document.

The ECRP IOM Project Health and Safety Management Plan (HSMP) outlines the Contractor's roles and responsibilities in the management of activities to prevent dangerous acts that could lead to injuries, illnesses or serious incidents in the workplace and damage or loss of assets.

The ECRP Quality Management Plan (QMP) outlines the Contractor's roles and responsibilities for meeting the quality standards expected of this program and the process and procedure for verifying each step.

To complete the task timely and efficiently the Contractor should:

1. Deploy qualified and well experienced managers, site engineers and workers to complete the required tasks.
2. Prepare and submit staff deployment plan/organogram for the project implementation assigning the specific persons in charge of communication and coordination with the project supervisor.
3. Prepare and submit Work Plans, Emergency Preparedness and Response Plan, Waste Management Plan, Labour Management Plan and Environmental and Social Management Plan as per the HSMP
4. Preparation of "Resource Plan" (materials, machine/tools, manpower) in accordance with the submitted Work Plans.
5. Develop Risk Assessments using Form HS05 as per the HSMP
6. Based on the approved work plan, the Contractor shall execute multiple work activities simultaneously to save time.
7. The Contractor shall allow unlimited access to construction sites for the ECRP staff as required.
8. Follow Guideline GHS12 – Site Establishment in the HSMP,
  - A. The Contractor should arrange temporary office/accommodation at each site with necessary facilities for the staff and workers (water, toilets, first aid kits etc.)
  - B. The Contractor is responsible for maintaining pollution/contamination-free surrounding environment.
  - C. The contractor should display both work plan and resource plan at each site.
  - D. The debris from any demolition activity and garbage at the construction sites should be removed by the Contractor and disposed of in a safe area away from the site.
9. As per the Quality Management Plan (QMP),
  - A. Ensure that materials are properly packed and covered during transportation to ensure that the materials are not damaged.
  - B. Ensure that all materials in particular cement, timber, paints etc. are properly stored on sites to prevent any deterioration of strength by water, moisture, or heat.
  - C. All structural works such as foundation works, erection of columns, beams, support structures etc. shall be executed in the presence of IOM personnel.

## 4. Health, Safety and Environment

The Contractor is required to comply with the *ECRP IOM Project Health and Safety Management Plan (HSMP)* and the *Environmental and Social Management Plan (ESMP)*. The following information is provided to guide the Contractor in the key aspects of HSMP only.

The main health and safety legislation and other relevant compliance requirements in South Sudan are described in the [South Sudan Legal Register](#) (Form HSE03).

[Risk assessments](#) for hazard identification and activities are required for safety-critical activities prior to each stage of work commencing. These shall be documented using Form HS05. All IOM personnel have the authority to stop any activity that has the potential to cause injury or damage property until such times as the works are managed in a safe manner.

The Contractor's team leader shall take all reasonable precautions to prevent any death or injury to persons during said undertaken activities. These precautions shall include but not be limited to ensuring the crew wears the protective equipment such as safety helmets, hard-toed boots (safety boots) or gumboots, heavy-duty gloves and ensuring that all tools and equipment are in a safe condition and ensuring that their employees adopt safe working methods as instructed by IOM. No military-looking clothing will be accepted at any time. [Health, Safety, Social and Environmental inspection Site Reports](#) shall be carried out weekly on Form HSE05.

The project sites The Contractor's team leader has the obligation and responsibility to safeguard the safety and security of its personnel, the construction crew's equipment and other property, and personnel's personal effects and other property. The Contractor's team leader shall develop an [Emergency Preparedness and Response Plan](#) in consultation with IOM, including detailed procedures to cover evacuation, personnel, equipment, unlawful interference, and prevention of sabotage.

The Contractor is required to hire skilled and unskilled labour from the local project area to execute the contract. The Contractor shall submit their [Labour Management Plan](#) in accordance with the guidelines in Annex F on the ECRP [Labour Management Procedures](#). Justification must be submitted to IOM for approval before the Contractor can recruit non-local skilled labour.

All selected staff to work as part of the construction crew are to abide by the Code of Conduct in the Construction Contract on the prohibition and prevention of sexual exploitation and abuse (SEA). The crew shall undertake a [PSEA \(Prevention of Exploitation and Abuse\), 1-day training](#) with IOM prior to conducting any work.

The Contractor is to ensure that all materials, solid or liquid, are stored in a manner so as not to damage or contaminate any surface by spillage. Further guidance is provided in [Guidelines on Environmental Management](#): GEM02 Waste Management & Hazardous Substances, GEM03 Protection of Water, GEM05 Borrow Pit Management, and GEM06 Preservation of Historical, Archaeological and Cultural Remains.

## 5. Quality Management

The ECRP [Quality Management Plan \(QMP\)](#) outlines the Contractor's roles and responsibilities for meeting the quality standards expected of this program and the process and procedure for verifying each step. The following information is provided to guide the Contractor in the key aspects of the QMP only. A more detail guidance on quality of workmanship is provided in Annex B.

Section 5 of the QMP provides the framework for project staff responsibilities during Construction. From IOM, each site will be assigned a Site Engineer and Community Site Supervisor who are

supervised by a Project Engineer whose main task is to monitor and report on the performance of works being implemented. The Lead Engineer is responsible for the overall contract management.

The QA process, in brief, starts with approval from the Lead Engineer for a construction activity to proceed (Form QM06). Once approval is obtained, the work can proceed. During the work phase and upon completion, the Contractor must allow testing of materials, inspection of construction activity and survey compliance checks to be performed. For *material testing*, relevant forms include QM07A Request for Inspection and Testing Results, QM07B Inspection of Materials on Site, and QM09 Inspection and testing plan. For inspection, the Contractor is responsible for submitting *QM10 Daily Logbook*, and *QM11 Weekly/Monthly Progress Report and Summary*.

Any materials or works that do not conform to the technical specifications, design drawings or BoQ shall be rejected with a *Non-Conformance Report (NCR)*. The Contractor will then be responsible for dismantling and removal of the rejected materials from the sites immediately. Rectification and reconstruction of works shall be carried out at the cost of the Contractor prior to continuing with the next phase of work. Refusal of this instruction will lead to immediate termination of the contract.

## 6. Scope of Work

These General Specifications are to be used with reference to the following documents:

Annex A.	Drawings and Site Specific Scope of Work for Rehabilitation
Annex B.	Guideline for Standards on Workmanship and Materials
Annex C.	ECRP IOM Project Health and Safety Management Plan (HSMP)
Annex D.	ECRP IOM Quality Management Plan (QMP)
Annex E.	ECRP Environmental and Social Management Plan (C-ESMP)
Annex F.	ECRP Labour Management Procedure (extract from ESMP)

The following detailed scope of work is supplementary to the site photos and descriptions in Annex A. Any discrepancies between Annex A and these specifications shall be brought to the attention of the Site Engineer for clarification.

Only IOM may approve any changes, modifications, deviations, and substitutions in the scope of work.

### 6.1. SPECIFICATIONS – PHCU BLOCKS AT HAI DINKA PHCU

#### 6.1.1.Site Layout

**Orientation of PHCU blocks:** The orientation of the PHCU blocks shall be as per the site assigned by the health facility administration. Confirmation of the orientation shall be part of the initial site inspection.

**Measurements:** During the setting out, the Contractor shall obtain the correct measurements from the drawings and cross check the diagonals to see if they are equal.

### 6.1.2.Site Clearance

The Contractor shall clear the site and debris for an area as specified in the BoQ and as shall be guided by the Site Engineer.

### 6.1.3.Excavation for foundation work

The contractor shall excavate the foundation trenches as per the cross sections specified on the design drawing. The Site Engineer reserves the right to increase the foundation size subject to the exposed soil conditions per the following guidance:

The Contractor shall excavate for Normal soil (hard and gravel soil) to a depth of *800 mm* and width of *600 mm* as per the footing and plinth wall layout. In case of sandy soil and water prone areas, the depth should be *1000 mm – 1500 mm* with a width of *800 mm*.

### 6.1.4.Concrete foundation work

The Contractor should provide a weak concrete blinding (1:8:12) of *50 mm thickness* after proper compaction of the soil. Concrete for the foundation shall be C10 (Ratio of 1:3:6) (Cement: Sand: Aggregate). The ratio must be measured properly with a gauge box of 300 mm by 300 mm by 400 mm. After the casting of the foundation the foundation must be cured for 5 days prior to plinth wall construction.

Provide column bases as per the layout drawings:

Columns C1 at *2000 mm x 800 mm x 250 mm* thick to receive columns of size *200mm x 200mm*. For all columns, 4 Y-12 bars shall be installed with stirrup R8 spaced at 175mm C/C with an overlap of 50mm. Y-12 bars shall be used for the footing spaced at 180 C/C in both directions. Refer to C-1 in the drawings for more details on the reinforcement.

CHS columns for the veranda at *400 mm x 400 mm x 400 mm thick*, to receive CHS  $\phi 100 \times 3$ mm Steel Columns to support the roof.

### 6.1.5.Plinth Wall and Ground Beam

A plinth wall should be constructed to a *height of 150 mm* above the ground level with solid concrete blocks to receive the *200mm x 300mm* thick ground beam. Mortar mix should be 1:3 (Cement: Sand) with wall thickness of *200 mm* for the plinth wall. For the ground beam, C-25 structural concrete shall be used (1:1:2 Cement: Sand: Aggregate). The ground beam shall have depth of 300mm and width of 200mm. For reinforcement details refer to the bar bending schedule for beams on different axes with their respective cross sections. All beams with stirrup R8 and reinforcement bars Y12 on all Axes (A, C, 1, 3 & 4).

### 6.1.6.Back Filling the Soil

After completing the foundation work, the back-void spaces must be filled out with selected soil material. The selected material should be put in layers of up to 200 mm with each layer properly compacted. Min. 500mm thick Compacted selected fill to grade is required.

#### 6.1.7. Hardcore Placing

Contractor shall place a 200 mm thick crushed stone/hardcore and compact the layer properly. The void shall be filled with marram, smaller aggregates, or broken bricks.

#### 6.1.8. Concrete Slab

The floor slab will be resting on top of the hardcore stones, with a weak concrete blinding (1:8:12) and damp-proof membrane (i.e., plastic sheeting). It shall be casted monolithically with the ground beam.

A concrete slab must be casted (according to the drawing) with a thickness of 100 mm using concrete grade of C-25 (ratio of 1:1:2). reinforced with wire mesh reinforcement; BS 4483 A98 weighing 1.54 kgs per square meter, resting on spacers at least 50mm high. and should be resting on spacers at least 50mm high.

#### 6.1.9. Walling

The contractor should construct the wall a thickness not less than 200 mm by using good quality burnt clay bricks or concrete blocks, whichever is available, all round the classroom perimeter including partition walls. A damp-proof course must be laid on the floor slab prior to laying mortar for the walls. The length and height of the wall must be constructed according to the drawings. The mortar ratio should be 1:3 (Cement: Sand).

#### 6.1.10. Ring Beam

The contractor shall form the ring beams in situ and provide formwork at the soffits fitted to the door and window openings. The ring beams are **300 mm x 200 mm** C-25 concrete (ratio 1:1:2), reinforced with R8 stirrups spaced at 175mm c/c and 6-Y-12 bars, see reinforcement schedule for details on beam axes A, C, 1,3, &4 while use lintels at axis B and 2 over the window and door respectively.

#### 6.1.11. Roofing Work, Timber Elements

Contractor shall put complete roofing structure by using timber roof structure. The contractor may submit a proposal for using a steel frame structure on Form QM06 - Approval for work/materials (AFW/M). The price contains construction of bonding elements for roof timber supporting structure according to the rules of craft using hoop iron, roofing nails all according to the design. For details and dimensions of the timber structure elements, refer to the Roof, Beam and Truss Layout and Truss T-1 details in the drawings.

The gable end roof shall have a pitch of 20-degree slope in accordance with the drawings. The contractor should put pre-coated corrugated galvanized iron sheet (28G) as per the specification mentioned in BoQ. The CGI sheet should be joined with the purlin with appropriate roofing nails and other necessary accessories. A 25 x 225mm high timber valance board / barge board with approved wood preservative shall be nailed to 100 x 50mm rafter: The fascia board shall be nailed to the edges of the rafters; payment includes all joint and placement work to install the fascia board. A gutter shall be installed on the lower side of the roof and connected to the 10,000L water tank using the appropriate accessories and fittings.

All timber parts of the roof construction shall be protected with 2 coating against termite attack using wood preservative.

#### **6.1.12. Doors and Windows**

The contractor should provide all the ironmongery work of good quality, two coats of red oxide primer shall be applied at point of fabrication before delivery.

Steel doors and windows to fit structural opening as per the doors and window schedule. One coat of enamel paint to be applied on site. The finish shall be clean and uniform in color with no blemishes. All surfaces shall be covered uniformly. Adjacent surfaces that have not been painted shall be protected from splashing. Any paint splashes shall be cleaned off at the contractor's expense.

#### **6.1.13. Ramps**

The Contractor shall construct ramps for ease of accessibility with 5% slope or ratio of 1:20 for the pedestrian access. The ramps should be equipped with handrails on either side of the ramp as per the drawings and specifications. The ramp shall be constructed with C-20 concrete (ration 1:1.5:3) with BRC mesh A98 with a minimum thickness of 100 mm at all points.

Install two lines of grip friendly handrails using CHS 50 diameter and 2.5 mm thickness on both sides of the ramp. The height of the rails shall be at 30, 60 and 90 cm from the ramp level with vertical support @ 100cm C/C. Horizontal rails shall be parallel to the slope. The edges of the handrails shall have a smooth finish. All iron parts to be painted with two coats of antirust paint and one coat of enamel paint.

#### **6.1.14. Finishing work**

For the floor finishing, a 50 mm floor screed should be applied on top of the slab. The ratio of cement to sharp sand should be 1:3.

The contractor shall provide 15 mm thick as plastering and rendering on internal and external sides of the walls. The plastering and rendering mortar ratio should be 1:3 (cement: plaster sand).

All the walls to be painted shall be clean and dry. Any dirt shall be removed through scrubbing. Specified color coats on the BoQ shall be applied to the satisfaction of the IOM Site Engineer. Spills on the floors, walls and roof shall be avoided and any accidental spillage should be thoroughly cleaned to a state that can't be seen. The walls shall be painted with 1 coat of emulsion under coat and finished with 3 coats of matte vinyl paint in soft white for internal walls and emulsion weather guard paint in smoked grey for external walls. The wooden fascia board shall be painted with 1 coat of emulsion under coat and finished with 3 coats of an oil-based gloss paint in white. Paint color and where to apply to be coordinated with the IOM Site Engineer.

#### **6.1.15. Drainage and Plumbing works**

The contractor shall construct a 600x200mm storm water drainage ditch around the building to drain storm water to an appropriate discharge site. This shall be determined by the Site Engineer based on the site layout. The contractor will also put in place one water tank as per the water tank stand details



in the drawing including the compacted earth base, brick walling (min. 225 mm thick, cement mortar 1:3) to hold compacted murram, top slab and 10,000L water tank with all fittings.

The contractor shall install 250x350mmx2mm galvanized metal sheet gutter with all the fittings and accessories (hoppers, delivery pipe, clips, washout pipe and overflow pipe).

## 7. SPECIFICATIONS -2 STANCE LATRINE CONSTRUCTION

### 7.1.1.Site Layout

**Orientation of latrine block:** The orientation of the latrine block shall be as per the site assigned by the facility administration. Confirmation of the orientation shall be part of the initial site inspection.

**Measurements:** During the setting out, the Contractor shall obtain the correct measurements from the drawings and cross check the diagonals to see if they are equal.

### 7.1.2.Site Clearance

The Contractor shall clear the site and debris for an area as specified in the BoQ and as guided by the Site Engineer.

### 7.1.3.Pit Excavation and Lining

The contractor shall excavate the pit for the block of latrine as per the dimension in the drawing and BoQ. The contractor must ensure that proper shoring of the excavation walls is installed. After the excavation is completed, place a 50mm plain concrete blinding with C-10 concrete (Ratio 1:3:6). The pit wall foundation beams should be formed according to the beam details, *200 mm thick C-25 concrete (ratio 1:1:2) with reinforcement bars* as per the beam schedule. A *100mm thick concrete (C-20 Ratio 1:1.5:3) with BRC mesh* shall be laid as the bottom pit slab.

The 400mm pit walls to be formed with concrete blocks, in filled with  $\phi 10 @ 100$  mm steel mesh and cement mortar (ratio 1:3). The contractor shall plaster the lined pit internally to a thickness not exceeding 15mm with mortar ratio of 1:3. At the top of the wall, a RC ground beam with a dimension of 200 mm X 300 mm (breadth and height) should be monolithically casted with the suspended slab using C-25 concrete (ratio of 1:1:2). The concrete cover shall be 25 mm for beams and 20 mm for floor slabs. Refer to bar bending schedule for details of reinforcement.

### 7.1.4.Excavation for foundation work

Excavate as per the cross sections specified on the design drawing, *a rectangular C-shaped foundation strip on Axis B & C between 1 & 2 and on Axis 1&2 between B&C*. The Site Engineer reserves the right to increase the foundation size subject to the exposed soil conditions based on the following guidance:

The Contractor shall excavate for Normal soil (hard and gravel soil) to a depth of 600 - 1000mm and width of 600mm as per the footing and plinth wall layout.

In case of sandy soil and water prone areas, the depth should be 1000 – 1500 mm with a width of 600 mm.

#### 7.1.5. Concrete foundation work

The Contractor should provide a weak concrete blinding (1:3:6) of 50 mm thickness after proper compaction of the soil. Concrete for the foundation shall be C-20 (Ratio of 1:1.5:3) (Cement: Sand: Aggregate). The ratio must be measured properly with a gauge box of 300 mm by 300 mm by 400 mm. After the casting of the foundation the foundation has be cured for 5 days prior to plinth wall construction.

Provide column bases as per the layout drawings: The column footing shall have 3-Y12 bars, L=600mm with 50 mm cover in both directions. Stirrup R8 shall be used spaced at 175mm c/c with an overlap of 50mm and 4-Y12 for all columns. Refer to C-1 to C-3 for more details on the reinforcement.

#### 7.1.6. Plinth Wall and Ground Beam

A plinth wall should be constructed to a height of 150 mm above the ground level with 200 mm solid concrete blocks to receive the 200mm x 300mm ground beam. Mortar mix should be 1:3 (Cement: Sand) with wall thickness of 200 mm for the plinth wall. For the ground beam, C-25 structural concrete shall be used (1:1:2 Cement: Sand: Aggregate). For reinforcement details refer to the bar bending schedule for beams on different axes with their respective cross sections. All beams with stirrup R8 and for beams on *Axes 1, 2, A', B and C using Y-12* while the beam on *Axis A using Y-16*.

#### 7.1.7. Back Filling the Soil

After completing the foundation work, the back-void spaces must be filled out with selected soil material. The selected material should be put in layers of up to 200 mm with each layer properly compacted. Minimum 500mm thick compacted selected fill to grade is required.

#### 7.1.8. Hardcore Placing

Contractor shall place a 200 mm thick crushed stone/hardcore and compact the layer properly. The void shall be filled with marram, smaller aggregates, or broken bricks. Place a layer of 50 mm weak concrete blinding (ratio 1:3:6) to receive the damp proof membrane layer.

#### 7.1.9. Concrete Slab

A reinforced concrete slab over the latrine pit (Y-10 mm @ 100 mm c/c both directions) must be casted according to the drawing with a thickness of 150 mm and concrete grade of C-25 (ratio of 1:1:2).

The floor slab of the lobby will be resting on top of the hardcore stones, with a weak concrete blinding and damp-proof membrane (i.e., plastic sheeting). It shall be casted monolithically with the ground beam over the excavated pit. The floor slab for the lobby is reinforced with wire mesh; BS 4483 A98 weighing 1.54 kgs per square meter, resting on spacers at least 50mm high.

The slab over the latrine pit should have openings for 2 squat holes (see drawing detail), 1 manhole of a size 600 mm x 600 mm and one ventilation pipe (PVC 4" diameter).

#### **7.1.10. Walling**

The contractor should construct the walls to a thickness of 150 mm by using good quality burnt clay bricks or concrete blocks, whichever is available, for all internal and external walls. A damp-proof course must be laid on the floor slab prior to laying mortar for the walls. The length and height of the wall must be constructed according to the drawings. The mortar ratio should be 1:3 (Cement: Sand).

#### **7.1.11. Ring Beams**

The contractor shall form the ring beams in situ with soffits fitted to the door and window openings. The ring beams are 150 mm x 300 mm C-25 concrete (ratio 1:1:2), reinforced with R8 stirrups spaced at 200mm c/c and 4-12Y bars, see reinforcement schedule for details.

#### **7.1.12. Roofing Work, Metallic Elements**

Contractor shall put complete roofing structure by using Timber roof structure. The contractor may submit a proposal for using a Metallic frame structure on Form QM06 - Approval for work/materials (AFW/M). The price contains construction of bonding elements for roof timber supporting structure according to the rules of craft using hoop iron, nails/roofing nails, and all according to the design. For details and dimensions of the timber structure elements, refer to the Roof, Beam and Truss Layout and Truss R-1 Detail in the drawings.

The lean-to roof shall be at 6-degree slope in accordance with the drawings. The contractor should put pre-coated corrugated galvanized iron sheet (28G) as per the specification mentioned in BoQ. The CGI sheet should be joined with the purlin with appropriate roofing nails and other necessary accessories. A wooden fascia board, 25mm x 225mm, shall be fixed to the rafters and purlins. A gutter shall be installed on the lower side of the roof and connected to the hand washing tank.

All timber parts of the roof construction shall be protected with 2 coating against termite attack using wood preservative.

#### **7.1.13. Doors and Louvers**

The contractor should provide all the ironmongery work of good quality, two coats of red oxide primer shall be applied at point of fabrication before delivery.

Steel doors and windows to fit structural opening as per the doors and window schedule. One coat of enamel paint to be applied on site. The finish shall be clean and uniform in color with no blemishes. All surfaces shall be covered uniformly. Adjacent surfaces that have not been painted shall be protected from splashing. Any paint splashes shall be cleaned off at the contractor's expense.

#### **7.1.14. Ramps**

The Contractor shall construct ramps for ease of accessibility with 5% slope or ratio of 1:20 for the pedestrian access. The ramps should be equipped with handrails on either side of the ramp as per the drawings and specifications. The ramp shall be constructed with C-20 concrete (ration 1:1.5:3) with BRC mesh A98 with a minimum thickness of 100 mm at all points.

Install two lines of grip friendly handrails using CHS 40 diameter and 2 mm thickness on both sides of the ramp. The height of the rails shall be at 70 and 90 cm from the ramp level with vertical support @ 100cm C/C. Horizontal rails shall be parallel to the slope. The edges of the handrails shall have a smooth finish. All iron parts to be painted with two coats of antirust paint and one coat of enamel paint.

#### **7.1.15. Finishing work**

For the floor finishing, a 50 mm floor screed should be applied on top of the slab. The ratio of cement to sharp sand should be 1:3.

The contractor shall provide 15 mm thick as plastering and rendering on internal and external sides of the walls. The plastering and rendering mortar ratio should be 1:3 (cement: plaster sand).

All the walls to be painted shall be clean and dry. Any dirt shall be removed through scrubbing. Specified color coats on the BoQ shall be applied to the satisfaction of the IOM Site Engineer. Spills on the floors, walls and roof shall be avoided and any accidental spillage should be thoroughly cleaned to a state that can't be seen. The walls shall be painted with 1 coat of emulsion under coat and finished with 3 coats of matte vinyl paint in soft white for internal walls and emulsion weather guard paint in smoked grey for external walls. The wooden fascia board shall be painted with 1 coat of emulsion under coat and finished with 3 coats of an oil-based gloss paint in white. Paint color and where to apply to be coordinated with the IOM Site Engineer.

#### **7.1.16. Drainage and Plumbing works**

The contractor should cast a latrine seat that is 400mm high from the floor as per the PSN seat detail. The top and sides of the seat should be finished with tiles. Furthermore, the contractor shall install footrests reinforced with wire mesh for the two standard stances as per the drawing detail.

The contractor shall construct a perimeter drain around the building to collect and convey storm water to an appropriate discharge site. This shall be determined by the Site Engineer based on the site layout.

The contractor will also put in place one hand washing station as per the hand wash tank stand details in the drawing including the foundation, plinth wall, concrete slab, brick wall, compacted murram, top slab and 500L water tank with all fittings.

A 75mm diameter PVC pipe shall be connected from the hand wash station to the soak away pit. In locations where the soil conditions do not allow for effective infiltration, the grey water shall be directed to an appropriate discharge site located away from the facility.

A vent pipe should be installed with a vent cap and fly screen. The height of the vent opening shall be at least 30 cm above the roof height.

## 8. SPECIFICATIONS FOR PERIMETER WALL

### 8.1.1. Site Layout

**Orientation of Perimeter Wall:** The orientation of the perimeter fence shall be as per the site assigned by the school administration. Confirmation of the orientation shall be part of the initial site inspection.

**Measurements:** During the setting out, the Contractor shall obtain the correct measurements from the drawings and cross check the diagonals to see if they are equal.

### 8.1.2. Site Clearance

The Contractor shall clear the site and debris for a 2.0 m wide strip from the centerline of the wall.

### 8.1.3. Excavation for Foundation work

Excavate as per the cross sections specified on the design drawing, the Site Engineer reserves the right to increase the foundation size subject to the exposed soil conditions per the following guidance:

The Contractor shall excavate for Normal soil (hard and gravel soil) to a depth of *700 mm* and width of *400mm, 600 mm or 1200 mm* as per the footing and plinth wall layout.

In case of sandy soil and water prone areas, the depth should be 1000 mm – 1500 mm with a width of 900 mm.

### 8.1.4. Concrete footing work

The Contractor inside the excavated trench should provide a concrete blinding of *50 mm thickness* after proper compaction of the soil. Concrete for the footings shall be M20 (Ratio of 1:2:4) (Cement: Sand: Aggregate). The ratio must be measured properly with a gauge box of 300 mm by 300 mm by 400 mm. After the casting of the footings, they shall be cured for 5 days prior to plinth wall construction.

Provide column bases as per the layout drawings: Columns C2 at *600mm x 600mm x 200mm* thick to receive columns of size *200mm x 200mm* and Columns C1 at *1200mm x 1200mm x 200mm thick* to receive columns of size *400mm x 400mm* for the gates and corners.

### 8.1.5. Plinth Wall and Ground Beam

A plinth wall should be constructed to a *height of 2000 mm* above the ground level with well burnt clay bricks, solid concrete blocks or crushed stone to receive the *200mm x 250mm* thick ground beam. Mortar mix should be 1:3 (Cement: Sand) with wall thickness of *400 mm x 400 mm for the plinth wall*. For the ground beam, C20 structural concrete shall be used (1:2:4 Cement: Sand: Aggregate).

#### **8.1.6. Back Filling the Soil**

After completing the foundation work, the back-void spaces must be filled out with selected soil material. The selected material should be put in layers of up to 200 mm with each layer properly compacted.

#### **8.1.7. Walling**

The contractor should construct the wall a thickness not less than 200 mm by using good quality burnt clay bricks or concrete blocks, whichever is available, for the full length of the perimeter wall leaving provisions for a 4m wide main gate and 1.1m single leaf access gate for pedestrians. The length and height of the wall must be constructed according to the drawings. The mortar ratio should be 1:4 (Cement: Sand).

Form Y-shaped steel holders for the razor wire installation by welding 50x50x3mm iron angle bars with 300mm lower part of Y embedded into the top of masonry wall and concreted. The V-shape part of the Y to extend 300mm either way, each 300mm apart and to have 2 holes drilled on each side to receive 400mm diameter razor wire. The Y-shaped bars to be installed at 2m intervals all-round the perimeter wall, painted with 2 coats of antirust paint and one coat of blue enamel paint.

#### **8.1.8. Ramps**

The Contractor shall construct ramps for ease of accessibility with 5% slope or ratio of 1:20 for the pedestrian access.

#### **8.1.9. Gate**

The Contractor should provide all the ironmongery work of good quality.

For the main gate, a single leaf shutter steel rolling gate with a built-in pedestrian gate (900mm x 2100mm) fitted for a gate opening size of 4000mm x 2200mm high. The Contractor shall supply a RHS steel shutter frame 100mm x 50mm x 2mm, fabricated and casted onto the concrete column with 50x50mm hollow section and 50x50mm angle bars fixed onto the ground beam and painted with 2 coats of antirust paint & one coat of blue enamel paint.

For the pedestrian gate, the Contractor should provide single leaf access for pedestrians fitted for a gate opening of 1100mm x 2200mm high. The Contractor shall supply a RHS steel shutter frame 100mm x 50mm x 2mm attached to the concrete column with heavy duty hinges, painted with 2 coats of antirust paint and one coat of blue enamel paint.

Weld 150mm long metal spikes on the top horizontal bar of each gate leaf (main and access gate) at interval 100mm. The spikes shall be used in lieu of installation of razor wire on the gates and paint with 2 coats of antirust paint and one coat of blue enamel paint.

#### **8.1.10. Plastering/Rendering works**

The contractor shall provide 15 mm thick plastering on Internal side of the wall and provide 15mm thick on top of walls and 150mm wide coping on either side. The plastering mortar ratio should be

1:3 (Cement: Plaster sand). Prepare surfaces and apply 2 coats of undercoat followed by three coats of weather guard emulsion paint (soft grey); For the coping, apply three coats vinyl silk soft white emulsion paint on steel troweled plaster.

Whereas on the external wall, apply rough cast slurry (black oxide), 9mm thick. rendering using a mortar ratio of 1:3 (Cement: Sand).

#### **8.1.11. Drainage and Plumbing works**

The Contractor shall provide weep holes install with 3" PVC pipe at 10m interval each considering the ground slope of the school compound.