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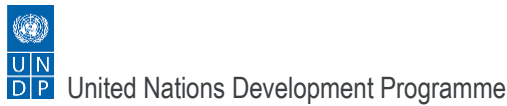
STABILIZATION AND RECOVERY OF CABO DELGADO

TECHNICAL SPECIFICATIONS

CONSTRUCTION OF CLASSROOMS

PEMBA, 25th APRIL 2022

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INTRODUCTION

The Technical Specifications are organized into articles that follow the order of the Items shown in the Bill of Quantities, except for the first chapter referring to the construction of the Construction Yard, which is not included in the Bill of Quantities. Therefore, they constitute a complement to the Bill of Quantities and provide details of the requirements that must be observed in the execution of the Project.

The prices to be presented by the competitors must be based on the Technical Conditions described for each Article in the respective annexes.

The price of each line item must include all the work and supplies necessary for its proper execution and application, highlighting those described and must follow the indications of the respective drawings.

In all that is omitted in these Technical Specifications, the Legal provisions or Regulations in force will be followed.

GENERALITIES

1 - Project, Parties and Consultants

Program: CONSTRUCTION OF 1 BLOCK OF 3 CLASSROOM IN XINAVANI - MACOMIA

Project: PROVINCIAL DELEGATION OF CABO DELGADO

Funds: UNDP

Client: UNDP

2 - Description of the place and works

Main Building – Removal of all vegetation on the perimeter of the work, such as bushes, grass, solid debris, rubble and others. Subsequently execution of the footings, foundation beam and pillars, placement of the masonry, execution of the crown beam, plastering the walls, supply of frames and window coverings, painting, supply and floor covering, installation and supply of all hydraulic devices and electrical.

3 - Nature of the soil

There is no geotechnical survey of the soil, which allows confirming the nature of the foundations, so this collection will have to be carried out by the Contractor, not accepting later price increases for the work, alleging lack of knowledge of the type of land.

4 – Construction Yard, accesses, and occupation



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The Construction Yard must be established close to the work site or in its space, in order to allow the reduction of trips, better use and control of the Work, being the Contractor's account in the execution of these, as well as accesses, fences and everything that necessary to carry out the work under desirable conditions.

CHAPTER 1 - GENERAL OBLIGATIONS AND ASSEMBLY OF THE SHIPYARD

Article 0 - General obligations of the Contractor

Art. 0.1 - Fixed obligations.

Art.º 0.1.1 - Construction of the shipyard; Labor; Equipment; Energy, Water and Communications

Generalities:

- a) The Contractor shall provide and maintain the necessary facilities to carry out the works in accordance with applicable standards and good engineering practice.
- b) It is assumed that the Contractor, in order to formulate his Proposal, has fully understood the local conditions, and everything that can be considered as production conditioning, but also the current state of the structure and the existing installations, so that no complaints will be accepted about any difficulties that may arise in the execution of the works due to alleged lack of knowledge and/or insufficient information.
- c) Likewise, the Contractor, for the preparation of his Proposal, must seek to find out, from the Owner of the Work, the best location for the construction site.
- d) The storage of materials, equipment and fixed installations of the contract must be located in the areas indicated for this purpose. During the work, only the presence of equipment in service and materials for immediate consumption will be allowed. The accumulation of excavation products or rubble will not be allowed.
- e) The civil construction works related to the assembly of electromechanical and electrical equipment will be carried out in accordance with the final details provided by the companies of the respective supplies and assembly.
- f) All work under the conditions indicated in the previous point must be carried out in perfect coordination with the equipment assembly work, in accordance with the indications provided by the Inspection, so that the work is carried out with minimal loss of work. time.
- g) The Contractor is responsible for installing temporary facilities, intended for the storage of perishable or non-perishable materials, and an office and shelter for the staff, who will demolish and remove them from the work site before their provisional reception.



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h) The material storage must guarantee that the materials contained therein are perfectly packaged and protected, and the Contractor shall be responsible for any compensation that may occur, due to the lack of safety conditions.

i) The Contractor is responsible for the adequate protection of the entire work against storms and thunderstorms, rain, frost, surface water or groundwater. He must also supply and operate all pumping systems necessary to keep the foundations free of water as well as protect the finished works. In the event of non-compliance with the provisions of this article, or due to the negligence of its workers or visitors, the contractor will carry out the necessary repairs at its expense.

Measurement methods: VG

Art.º 0.1.2 - Assembly and removal of the work plate

Generalities:

a) The Contractor will assemble a work plate in resistant material in a place to be agreed with the Inspection and remove it once the work is completed.

b) The sign must clearly contain the information regarding the Designation of Contract, reference number, Owner of the Work, designation and logo of the Financier, Designer, Inspection, Contractor and Subcontractors, construction permit number, and execution deadline.

c) The plaque must be approved by the Inspection.

Art. 0.1.3 - Temporary fence

Generalities:

a) The Contractor shall provide working label sign around the entire area affected by the works, limiting access to strangers by introducing a fence.

b) The type of fence must be approved by the Inspection.

Measuring methods: ml

Art. 0.2 - Variable obligations

Art.º 0.2.1 - Consumption of energy, water and communications

Generalities:



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Measurement methods: VG

Art. 0.3 - Value of obligations

Art. 0.3.1 - Works and Warranties Insurance

Generalities:

a) During the term of the Contract, the Contractor will maintain an Accidents at Work policy, covering accidents and occupational diseases of its personnel. The Contractor shall provide the Owner of the Work with a copy of the insurance policy and proof of payment of the respective policy.

b) The Contractor shall subscribe on behalf of the Owner, for himself and his Subcontractors, the following insurance policies:

The. All risks – Construction yard: Covering, from the beginning of the works until the date of Provisional Receipt, all losses and damages or destruction suffered by the Work during the construction period.

B. Civil Liability - Third parties covering, from the beginning of the works and the opening of the Construction yard until the date of the Provisional Receipt, any and all liability resulting from accidental death, bodily injury or material damage and/or damage involving third-party property, within the framework of the Work.

c) The Contractor undertakes to provide the Owner of the Work with all the necessary documents (reports, diagrams, photocopies, estimates of repair and/or replacement costs) to the presentation of claims participation to the Insurer.

Art. 0.4 - Relative time of obligations

Among the various conditions that must be met, the works indicated in this article are mentioned, as being of special reference, the following:

a) See Art. 0.3

Art.º 0.4.1 - Maintenance of the construction yard and technical direction of the contract

Generalities:

a) The contractor undertakes, subject to acceptance by the owner of the work, to entrust the technical management of the contract to a technician with the minimum qualification indicated in these specifications.



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b) After signing the contract and before consignment, the contractor will inform, in writing, the name of the technical director of the contract, indicating his legal technical qualification. This information will be accompanied by a declaration signed by the designated technician, assuming responsibility for the technical direction of the work and committing to perform this function with proficiency and assiduity.

Measurement methods: Month

Art. 0.5 - General cleaning of the land and removal of vegetation

Description:

a) Before starting the excavation and backfill work, the surface of the ground, coarse stones, debris and woody vegetation (bushes and trees) will be cleaned, while preserving the sub-shrub and herbaceous vegetation, to be removed by pickling.

b) Deforestation will comprise the cutting and uprooting of the trees indicated in the drawings, bushes and stumps, as well as the cleaning of the land of any debris, roots and products of the mentioned cutting and uprooting. Materials from deforestation will be burned or transported to a dump and buried.

c) In the areas to be cleaned, all trees, trunks, roots and other vegetation must be removed according to the drawings, except for the trees and vegetation that are expressly indicated in the drawings of the project in question. Trees that are not destroyed should be cleared of dead branches.

Reference standards: ---

Measurement method: m2

The unit price must include excavation, stacking, loading on site and unloading of the transport vehicle at a public dump, and transport on the round-trip route from the work to the dump.

Art.º 0.6 - Occupational Medicine, work accidents, and personnel safety

Generalities:

a) The Contractor shall build adequate sanitary facilities for its personnel and shall be responsible for their sanitary behaviour. The sanitary installations will be removed at the Contractor's expense at the end of the work and the land regularized and cleaned. This includes ensuring conditions for workers to have their meals in dignified conditions, on appropriate support and protected from the weather.



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- b) The Contractor must distribute condoms free of charge to construction and maintenance personnel within the scope of the AIDS prevention campaign
- c) The Contractor shall provide all safety measures at work for the personnel employed in the work, its Subcontractors, supervision as well as for the representatives of the Consultants and Owner of the Work when visiting the work.
- d) The Contractor is subject to compliance with the legal and regulatory provisions in force on work accidents and occupational medicine in relation to all personnel employed on the work, and the resulting costs will be borne by the Contractor.
- e) The Contractor shall inform, within a maximum period of 24 hours, the Owner of the Work of all damages and/or accidents occurred at the Work site.

Reference standards:

Measurement method: VG

Art.º 0.7 - Obtaining Municipal, Águas de Moçambique, EDM or (DNE) licenses

Generalities:

- a) All licenses, with the exception of Work licenses, which may be necessary for the execution of the work, will be the sole responsibility of the Contractor, who will be responsible for the necessary diligence for this purpose, as well as all expenses with the preparation and signature of the Works Contract.
- b) The Contractor shall carry out the necessary steps for the external connections of water, sewage, electricity and telephones and carry out the respective connection works, in the part in which these are not carried out by the Public Services.

Reference standards:

Measurement method: VG

Art.º 0.8 - Supply of final screens

Generalities:

- a) The Contractor is responsible for the execution of the final screens (as builds) of all the specialties of the contract and the delivery of manuals for all installed equipment.



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Measurement methods: VG

Art.º 0.9 – Removal of the shipyard facilities and cleaning of the work

Among the various conditions to which the work indicated in this article must comply, the following are mentioned as being of special reference:

a) See Art. 0.1

Reference standards:

Measurement method: VG

CHAPTER 2 - FOUNDATIONS / FLOOR / MASONRY / STRUCTURE (CONCRETE, FORMWORK AND STEEL)

In the present report, the type and system of structure adopted are indicated, clarification of some particularities of request on the structure and pointing out the requirements indicated in the project.

Art. 1.1 - Cargo and materials

The vertical loads of the structure applied in this project are the own weights, the weights of the different types of finishes and the corresponding overloads, as recommended by the regulation (R.S.A); in the calculation, increase coefficients of 50% were considered for permanent loads and overloads.

The materials proposed for the execution of the project are:

a) B15

b) B25

c) A400

d) Block masonry.

Art. 1.2 - Regulations used:

a) Eurocode 2

b) RSA

c) Technical tables for civil engineering



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d) Reinforced concrete calculation tables

Art.º 1.3 - Elements contained in the project

a) Covering or locking beams

b) Masonry

c) pillars

d) Floor Beams (Baldrame) or Foundation

e) Insulated shoes

Art. 1.4 - Floor slab

In the building, a single floor slab with B25 concrete 150 mm thick is planned on a layer of 200 mm of rockfill and 50 mm of dirt-free sand. The slab will be reinforced with wire mesh, with reference AR30 100x300x3mm smooth over the rockfill, covering the area of the floor box, with a 300mm spacing. A waterproofing screen with a resistance of 250 microns must be applied on the rockfill with joints as indicated by the manufacturer.

An access ramp 2.0 m long, 1.5 m wide and 0.20 m high will be attached to the slab, ensuring a slope of 6%.

Art. 1.5 - Beams

The floor beams will be rectangular, with a geometry of 0.20x0.40m, being uniform according to the sections drawn according to the action of the loads acting on the structure.

The crowning or locking beams will be square, with a geometry of 0.20x0.20m applied over the openings of the windows and doors, performing a double function of locking the structure and lintel. For all cases the cover used is 50 mm for a B25, and A400 reinforcements:

- Floor beams will have 12mm diameter reinforcements at the five corners of the section and 6mm diameter stirrups spaced at 15cm each
- Crowning beams will have 12mm diameter reinforcements at the five corners of the section and 6mm diameter stirrups spaced at 15cm each.

Art. 1.6 - Masonry



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The masonry will be in building block, and executed with blocks of 15 for exterior and interior walls and, with blocks of 20 solid, based on the foundation. The blocks must be Category A. The trace for laying the blocks will be 1:5.

Art. 1.7 - Pillars

Pillars will be built in the building in question. In its design, pillars with cross-sections were considered according to the loads to which they are subjected; the determination of these sections considered the actions requested and the respective regulation in force. In all cases, B25, A400 concrete should be used. An analysis was also carried out in relation to the phenomenon of retailing according to the Eurocode.

Art. 1.8 Shoes

In the places where the pillars unload, insulated footings in reinforced concrete of class B25, A400 will be executed. During the execution of the footings, waiting reinforcements will be left indicating that the pillars will break from those points. For the admissible soil tension, the value of 150 Kpa was taken, considered for the type of foundation terrain. For the dimensioning, the most requested pillar was considered, and they will be reinforced according to the regulation in force in the country.

In places where the terrain is of poorer quality, the execution of 10% soil-cement bases is considered as the base of the footings.

CHAPTER 3 - COVERAGE AND FALSE ROOF

Art. 2.1 - Sloping Coverage - Structures

Generalities:

- a) The roof structure will be composed of legs, purlins, and modular struts bolted or welded together, in IPE, Lipped channels and tubes in the dimensions defined by the project.
- b) All elements must be clean and protected. as described in Art. 7.6.

Reference standards:

Measurement method: m2

Art. 2.2 - Sloping Roofing - Coatings

Generalities:

- a) The application process will be as established by the manufacturer.
- b) The execution of this work must be entrusted to an entity of recognized technical competence.
- c) The plates and accessories (tops, ridges, frechal ends, fixing parts, etc.) must be submitted for approval by the Inspection and must be from the same manufacturer.
- d) The assembly of the plates will be in the opposite direction to the prevailing winds and rains.



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- e) The use of parts that show signs of cracking, either in manufacturing or caused by the drilling operation or excessive tightening of fixing screws, is not allowed.
- f) Drilling and finishing operations will only be carried out by mechanical means.
- g) The plates and accessories must be accompanied by a certificate from the manufacturer, attesting to the origin and quality.

Art. 2.2.1 - Galvanized steel sheet metal

Materials: Type “inverted box rib” (IBR) 686 – Z275 galvanized sheet metal with 0.6mm thickness with “VER-SACOR” protection on both sides, in “lincoln green” color;

Reference standards: SABS 1022

Measurement method: m2

Application: The sheets will be laid, whenever possible, with the total length of two water, on wooden structure, through galvanized clamps with all accessories and fixing processes according to the manufacturer's specifications and recommendations.

Truss/Purlin- connection

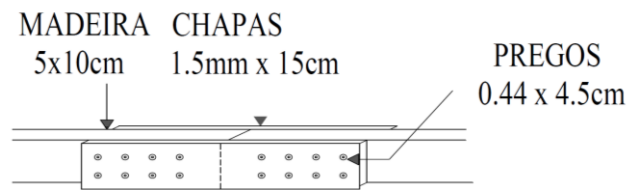
- Connections on both sides with min. 1.2 mm thick.
- 0.44x4.5 cm long nails for 5 cm thick pieces of wood.
- At least 6 nails (3 on each side of the plate)

Purlin-Purlin Link (Truss-Truss)

- Use sheet metal with a minimum thickness of 1.2 mm.
- For custom made boards, use 1.5 mm thick and 10x20 cm with 6-9 nails. 4.4mm x 4.5cm nails (so as not to penetrate 5cm thick wood)
- Joints can be made on the truss or 30 cm from the truss. Nails in both cases and on both sides of the joists.
- Move the plates 1 cm on both sides to ensure that the nails do not hit each other.
- 6. The "knots" in the trusses are connected by sheet metal (min. 1.2 millimeters thick) so that all connections can transfer shear loads between the wood and the sheet metal.

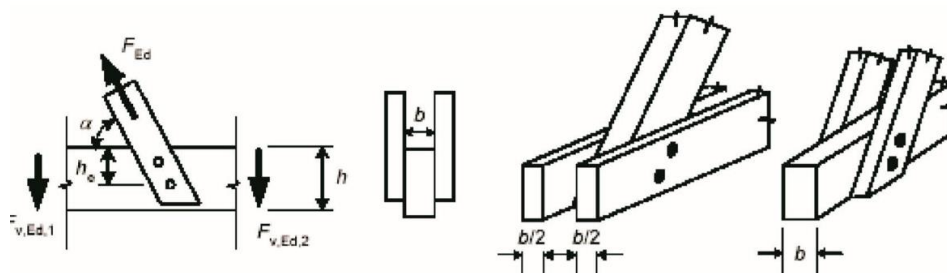


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Truss and its Connections

- Connections on both sides with metal sheets at least 1.2 mm thick:
- For 5 cm high beams use 5x12 cm sheets
- For beams of 7.5 cm or more in height, use 7x16 cm sheets
- 0.44x4.5 cm long nails for 5 cm thick pieces of wood. If the connection is between 3 pieces of wood the length of nails must be at least 10 cm.
- Offset 1 cm on both sides to ensure nails do not collide with each other.



Asna-Crowning Beam Connection

- Anchor the trusses to the crown beam with 5 mm thick metal sheets
- It is more advisable to place (2) pieces in "U" flat iron plate as shown in the following drawing:





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Art. 2.3 - Eaves and Gables

Materials: Flashings and flashings, tops, ridges, in 0.6mm thick galvanized sheet metal, with “VERSACOR” protection on both sides, in “Lincoln green”;

Reference standards: SABS 1022

Measuring method: ml

Application: In fixing the plates against the gables, these must not be recessed into the masonry, flashings and counter flashings will be used in smooth plate of the same thickness, color, quality, treatment and finish as the cover plate with all accessories and processes. fixing according to the manufacturer's specifications and recommendations.

Art. 2.4 - Drainage of Stormwater

Art. 2.4.1 - PVC Gutters

Generalities:

- a) The gutters will be in PVC tubes, 110mm in diameter.

Art. 2.4.2 - PVC downpipes

Generalities:

- a) The piping will have the diameters indicated in the quantity and color map approved by the Inspection.
- b) All fixings and connections, between the tubes and execution of the curves, will always be carried out using accessory parts of “standard” manufacture.
- c) Laying and fixing of the piping will be as established by the manufacturer.
- d) The system must be tested by an appropriate process to be submitted for approval by the Inspection.
- e) The piping must be connected to a tank for rainwater accumulation, where it will be necessary:
 - The execution of a simple concrete base with 2.0x2.0m.
 - Excavation of the foundation to a depth of 0.20m.
 - Irrigation and compaction of the excavated area 2.4x2.4m.
 - Application of a 19-8mm rockfill stone on the perimeter of the excavation with a width of 0.30m and a thickness of 0.10m and subsequent application of mortar for laying the ground blocks on the perimeter.
 - Filling the floor box with soil until reaching the desired height, leaving 0.10 cm below the block for the application of the rockfill;
 - With a formwork, delimit the perimeter of the concrete slab which will have a thickness of 8 cm and later screed and smoothed plaster of 1 cm thick;
 - Plastic tanks with 5000 Lts must be provided and applied on the bases.

Reference standards: SABS 1022

Measuring method: ml



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CHAPTER 4 - DOORS, WINDOWS, HARDWARE AND FACADE PANELS

Generalities:

- a) The wood to be applied will be Chanfuta (*Azelia Quanzensis*) or Umbila (*Pterocarpus Angolensis*) dry to the moisture content, without sapwood or loose knots, warps or other defects, well squared and in the necessary lengths to avoid joints; sawn and prepared in the correct dimensions to obtain finished pieces to the dimensions indicated in the drawings.
- b) Finished frames must have smooth and smooth surfaces, with slightly rounded edges, completely free of marks from machines or hand tools.
- c) All carpentry parts subject to damage during construction must be protected.
- d) All wooden pieces must be treated with linseed oil before applying enamel paint.
- e) All nails and screws shall be of the appropriate size, length and type for their respective uses.

Materials: Woods from Chanfuta (*Azelia Quanzensis*) or Umbila (*Pterocarpus Angolensis*).

Reference standards: SABS 1359, SABS 1099, SABS 1039

Materials: Pine

Reference standards: SABS 563, 1245, 1359

Application: If pine wood is used, it must be classified as structural according to SABS standards and must contain visible identification on each of the pieces, with a degree of resistance never higher than V4, with CCA pressure treatment in accordance with the standards SABS.

Materials: Glass

Reference Standards: Glass for windows and doors in accordance with SABS1263-2, Mirror laminated glass.

Application: The glass to be applied will be smooth without defects with a minimum thickness of 4mm.

Materials: Nets

Reference standards:

Application: The nets will be in stainless steel, uniform, properly stretched, and applied with steel tacks and coating bites.

Art.º 3.1 - Wooden windows (including glass).

Generalities:

- a) The frames are anchored to the concrete or masonry by means of screws with nuts, metallized in zinc. The spacing between fixings shall not exceed 0.60 m; in each fixing, place the 5/16" screws. The holes for the screws



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will be covered by wooden dowels identical to the ones used in the frames. The frame's connection to the concrete or masonry will be made by interposing an appropriate sealing cord and slow drying.

b) The window frames shall be of first quality chanfuta or umbila wood, with straight and joined fibers, without knots, well dried, not burnt, without cracks, free from woodworm and other diseases, of uniform placement and veins of regular and evenly distributed and executed.

c) The window frames must be laid so that they close hermetically and function perfectly.

d) Each of the elements of the hoops will be made in a single piece.

f) The mirrored laminated glass to be applied is smooth with a minimum thickness of 4mm and of good quality, free from "bubbles" or "voids" without any scratches or other defects.

g) The glass installation will be carried out with an appropriate elastic bituminous mass, with slow drying for better sealing of the glasses, and with the necessary clearance to prevent them from cracking.

h) The installation in wooden frames will be done by means of bits of the same material screwed together and executed in such a way as to allow the replacement of the glasses.

i) A prototype must be executed to be approved by the Inspection.

Measurement method: m²

Art. 3.2 - Doors

Art. 3.2.1 - Solid Wood Doors

Generalities:

a) The frames will be in chanfuta or umbila wood, well dried, anchored to the masonry by means of screws with nuts, metallized in zinc. The spacing between fixings will not exceed 0.60 m and the holes for the screws will be covered by wooden dowels identical to those used in the frames.

b) The doors will be made of chanfuta or umbila wood, very dry, free from cracks or cracks, with a homogeneous texture and color, to be approved by the Inspection, and to be carried out in accordance with the detail drawings and map of spans.

c) Each of the elements of the hoops will be made in a single piece.

d) The leaves will be fixed to the frame by 3 plugs of 1/2 balance of 100x75mm or 4" in solid brass, with double washers, screwed by screws.

e) The doors and frames must be fitted so that they close hermetically and function perfectly.

g) A rubber must be fitted to limit the opening of the door, which will be fixed to the floor by an oxidized brass screw.



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h) The lock will be identified with a number, to be indicated by the Inspection, engraved with a brass plate fixed on the door (external face); each of the 3 keys will carry a brass plate with the same number.

i) A prototype must be executed to be approved by the Inspection.

Measurement method: m²

Art. 3.3 Hardware

Generalities:

a) All locks will be supplied with 3 keys.

b) All keys and all locks will be engraved with their corresponding numbers and numbered consecutively, a wooden key ring will be provided to store all the necessary keys and to fix them on the wall, in a position to be defined by the Inspection and the Owner of the Work

The.

c) The application of any of the locks must follow the technical conditions defined in the respective catalogues.

Reference standards: SABS 1510, SABS 1533, SABS 4

Measurement method: unit

Art. 3.3.1 - Lock and Handles

Locks for double doors:

a. D037D with rosette or cylinder mirror DCE-002 and respective barrel + DPH 301C handles on each side of the doors, all in brushed stainless steel from the "DORMA" Catalog

b. D036S with rosette or cylinder mirror DCE-002 and respective barrel + DPH 301C handles on each side of the doors, all in brushed stainless steel from the "DORMA" Catalog

WC cabin door locks:

c. DWC-005 indicator set, with lock on the inner side of the door, all in brushed stainless steel from the "DORMA" Catalogue.

Art. 3.3.2 - Door and Window Hinges

Door hinges:

a. DBB-SS_009 102x75x3mm stainless steel, with 2 ball bearings from the "DORMA" Catalog (3 per sheet)

b. DRR-SS_012 (RH) 102x75x3mm or DRR-SS_013 (LH) 102x75x3mm stainless steel, from the "DORMA" Catalog

c. For Bitcon Industries doors, bronze hinges with 100mm and 4.2mm thick high strength flanges.

Window hinges:



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d. In Solid Brass, type B2412, 75 x 41 x 1.6mm, 2 per opening frame (glass and mesh) and 2 in tilting glass frame from the "DH - Design Hardware" catalog

Art.º 3.3.3 – Closures, Stoppers and Hooks

a) Door stop:

The. DDS-SS-017 in stainless steel from "DORMA"

B. DORMA BTS 75V Floor Spring complete with all fittings, 90° open action, cover plates, cement box and axles from the "DORMA" Catalog

b) Closures:

The. DORMA DFB SS 027&160 160mm with stainless screws on the secondary door and finished with the floor and top plate on the door frame.

c) Clothes hooks:

a. The. DORMA DHC-SS-030-A without rubber

b. DHC-SS-031-B with stainless steel cap and cover hook with rubber bumper.

Art.º 3.3.4 – Trays, Regulators

a) Locks: Both from the catalog " DH - Design Hardware

a. In Solid Brass, type B2757, 1 per opening frame (glass and mesh)

b) Regulators: Both from the "DH - Design Hardware" catalog

The. Solid Brass type B2764, (200mm) 1 per opening glass frame

Art. 3.3.5 - Signage

a) Signaling plates in anodized and thermo-lacquered aluminum will be installed in all compartments.

b) The colors of the RAL/NCS system will be defined by the developer and the nomenclature will be defined by the Quissanga District Planning and Infrastructure Services.

Reference standards:

Measurement method: Units

CHAPTER 5 – WALLS, FLOORS AND PAINTING

Art. 4.1 - Proposed Materials

The materials proposed for the execution of the project are:



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- a) Block masonry.
- b) Laying Mortar
- c) plasters
- d) wood
- e) tiles

Art. 4.2 - Regulations Used

- a) SABS
- b) Technical tables for civil engineering
- c) Reinforced concrete calculation tables

Art.º 4.3 – Elements Contained in the Project

- a) Masonry
- b) Wooden Roofing Structures
- c) Coverage in Thermo lacquered IBR Sheets with a thickness of 0.6mm

Art. 4.4 - Block Masonry

Generalities:

- a) Cement will be normal Portland
- b) The walls will consist of solid blocks with a simple concrete filling or hollow blocks with a thickness of 150 and 200mm, according to the situation of the place.
- c) The blocks must meet the applicable regulatory requirements, and also:
 - ☐ Have a uniform texture;
 - ☐ Present compressive breaking stresses equal to or greater than 45kg/cm²;
 - ☐ Be free from any foreign bodies;
 - ☐ Have regular and uniform shape and dimensions;
 - ☐ Have a uniform color;
 - ☐ Have water absorption in 24 hours less than 1/5 of their full volume.
- d) For each supply of 500 blocks, 5 blocks will be removed from the work by the Inspection.



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- e) All control tests on the blocks will be the responsibility of the Contractor.
- f) Before their application on site, the blocks must be extensively watered or submerged in water during the first seven days of their existence; the Inspection will previously determine which blocks, due to their visual appearance and characteristics, can be used in the works.
- g) The mortar to be used must have 320 kilos of normal Portland cement per cubic meter of mortar (trace by volume of 1:4).
- h) In the construction of the panels, no visible holes will be left.
- i) The Contractor shall submit the detailed drawings of the connection between the panels to the side pillars for approval by the Inspection.
- j) The junctions of normal walls with each other must be locked in "toothed".
- k) The thickness of the mortar in the beds and joints shall not exceed 10mm.
- l) The masonry must be well straightened and upright.
- m) The foundation walls of the buildings, in the horizontal direction, will be reinforced in each row with a "Brick force" type sun mesh, which will be placed on the mortar for laying the blocks, in order to guarantee the strength of the masonry.
- n) The sun mesh to be used will be the one indicated for the purpose and of good quality.

Reference standards: cement according to SABS 471; lime application in accordance with SABS 523; sand in accordance with SABS 1090; cement blocks in accordance with SABS 1215; concrete blocks according to SABS 1215;

Measurement method: m²

Art.º 4.5 – Splash, plaster and plaster on external vertical surfaces

Generalities:

- a) The cement will be normal Portland
- b) Embeddings, when necessary, will be carried out with the mortar used for laying the masonry.
- c) The masonry must be well wetted immediately before spraying.
- d) The mortar that makes up the plaster will be made of cement and sand in a ratio of 1:4, in the case of smooth plaster, the plaster must have a thickness of 2 cm, which allows for well-regulated surfaces, without roughness.
- e) The finishing will be done with a slatted ruler, on masters, slid in all directions to obtain a perfectly flat and straightened surface.



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- f) The plaster must be very smooth, even, without roughness, and tightened with the spoon, when dealing with surfaces to be painted.
- g) The finishing or decoration fins will be as indicated in the drawings or as indicated by the Inspection.
- h) No gaps will be allowed in surfaces already plastered and, when this happens, all the parameter in which it was necessary to open a gap must be replaced.
- i) All renders must be kept moist for seven days after application.
- j) The Contractor is entirely responsible for the correction of any defect such as cracks, blisters, hollow layers, even if they are caused by the execution of any subcontract work that must be coordinated by him.

Reference standards: cement according to SABS 471; lime application in accordance with SABS 523; sand in accordance with SABS 1090;

Measurement method: m2

Art.º 4.6 – Splash, plaster and plaster on vertical walls Interiors

Generalities:

- a) The plaster must have a thickness of 1.5 cm, which allows for well-regulated surfaces, without roughness.

Reference standards: cement according to SABS 471; lime application in accordance with SABS 523; sand in accordance with SABS 1090;

Measurement method: m2

Art.º 4.7 – Plastic Ink Painting on Exterior Walls

Generalities:

- a) All paints to be applied will be from a factory of recognized quality.
- b) For the exterior walls, the paint to be applied will be water-based, suitable for application on rough-finished cement plaster, and resistant to weathering and waterproofing. The paint to be applied will be CIN Nováqua with refª “ 10-122 or PERMOGLAZE Permtop MS3 or similar in RAL colors to be defined by the Owner of the Work.
- c) Any other brand that may be approved and applied must always be of the best quality from the respective manufacturer and accompanied by a Certificate of Quality and Product Warranty of at least 5 years, issued by the manufacturer.
- d) The paints must enter the work in sealed original packaging and will be of colors and type to be chosen by the Inspection and the Owner of the Work. No tampering will be allowed.
- e) The Inspection may order the necessary tests to be carried out, at the contractor's expense, before approving the paints.



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- f) The insulation and paint application scheme will be submitted to the Inspection before the start of work.
- g) All surfaces to be painted will be insulated with a product appropriate to the nature of the wall, of the same brand as the paint to be applied and according to the manufacturer's instructions. This insulator must be CIN with ref. Cinolite 54-850 or PERMOGLAZE Primer for cement or aqueous primer for walls or similar.
- h) The number of coats indicated by the manufacturer will be applied on the insulation, at least two; however, the necessary coats will be applied to obtain a uniform color and a perfect covering of the painted surfaces.
- i) The paint must withstand washing with soap or normal detergent and water.
- j) The first coat will be applied with a brush and the rest will be applied by roller or in accordance with the instructions of the manufacturer and the Inspection.
- k) The percentage of water to be applied to the paints must be minimal or almost zero, except for a written guarantee from the supplier, or the Contractor must, at its own expense, apply more coats until the surfaces are perfectly covered.
- l) In the event of a change in the defined brand, the Contractor shall indicate in a timely manner which brands and types of paints he intends to apply, for approval by the Inspection.
- m) All surfaces to be painted must be perfectly dry and clean, with no residue of oil or grease, dust or sand and preparations for painting.
- n) Each coat of paint will be allowed to dry completely, sanded until a perfectly smooth, homogeneous and clean surface is obtained, before applying the next coat.
- o) The last coat of paint or finish will be applied only after all other works are completed and the work is perfectly and clean of dust debris
- p) The prices to be presented by the competitors must be based on the Technical Conditions of plastic, at least two hands, in order to obtain a uniform color and a perfect covering of the painted surfaces.

Reference standards:

Measurement method: m2

Art.º 4.8 – Floor in burnt screed and ceramic stoneware

The floor will be covered with two different materials, and for the classrooms it will be in screed with cement mortar and sand at a ratio of 1:3. While for the Administrative Block, the floor will be in 300x300mm porcelain stoneware.

Before laying, the surface must be plumb and level so that the pieces can be seated correctly. You must also certify that the surface is homogeneous. It is necessary to make a Settlement Plan for the material. The cuts should be in



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the most hidden areas so that they are not noticeable so much. Mosaic laying should be done in such a way that it is not necessary to cut too much to fill in the remaining spaces.

Measurement method: m2

Art.º 4.9 – Plastic Ink Painting on Interior Walls

Generalities:

- a) For interiors, the paint to be applied will be a satin plastic paint by CIN Vinylsik ref. 10-220 or PERMOGLAZE VIP Sheen over primer by CIN ref. Cinolite 54-850 or PERMOGLAZE Water-based primer for walls or similar in RAL colors to be defined by the Construction owner.
- b) The prices to be presented by the competitors must be based on the Technical Conditions of plastic, at least two hands, in order to obtain a uniform color and a perfect covering of the painted surfaces.
- c) The paint to be applied will be CIN ref^a Cinacryl aqueous 12-200 or similar in RAL system colors to be defined by the Owner of the Work.
- d) The paint must enter the work in original packaging, and will be of a color and type chosen by the Inspection and the Owner of the Work.
- e) The Inspection may order the necessary tests to be carried out, at the Contractor's expense, before proceeding with the approval of the paint.
- f) The surfaces to be painted must be previously insulated with a CIN primer ref^a Cinolite 54-850 and, if necessary, grouted.
- g) Instructions for applying the insulation and paint will be provided to the Inspection before the start of the respective work.
- h) The number of coats indicated by the manufacturer will be applied on the insulation, at least two. The necessary coats will be applied to obtain a uniform color and a good covering of the coatings.
- i) The paint must withstand washing with soap or normal detergent.
- j) The prices to be presented by the competitors must be based on the Technical Conditions of enamel, at least two hands, in order to obtain a uniform color and a perfect covering of the painted surfaces.
- k) Any brand that may be approved and applied must always be of the best quality from the respective manufacturer and accompanied by a Certificate of Quality and Product Warranty of at least 5 years, issued by the manufacturer.

Reference standards:

Measurement method: m2



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Art.º 4.10 – Painting with Enamel Paint on wooden elements (doors, windows, shelves)

Generalities:

- a) The paint to be used will be CIN ref. “Satin Enamel 48220” or PERMOGLAZE ref. Eggshell Enamel or similar and of recognized quality, weather resistant in RAL colors to be defined by the Owner of the Work.
- a) The paint must enter the work in original packaging, and will be of a color and type chosen by the Inspection.
- b) The application scheme of the base products and paint will be submitted to the Inspection before the start of work.
- l) The wooden surfaces will be perfectly finished, sanded and sanded until smooth faces are obtained before painting or oil application; between each coat you should also pass the fine sandpaper.
- m) At least one coat of primer or suitable undercoat with refª Synthetic wood primer 40920” or “Undercoat 36400”, or Wood primer or universal undercoat PERMOGLAZE in order to obtain a uniform color and a perfect covering painted surfaces.
- n) The necessary coats will be applied, at least two, in order to obtain a uniform color and shine, as well as a perfect covering of the painted surfaces.
- o) All coats must be applied by brush.
- p) The prices to be presented by the competitors must be based on the Technical Conditions of enamel, at least two hands, in order to obtain a uniform color and a perfect covering of the painted surfaces.
- q) Any brand that may be approved and applied must always be of the best quality from the respective manufacturer and accompanied by a Certificate of Quality and Product Warranty of at least 5 years, issued by the manufacturer.

Reference standards:

Measurement method: m2

CHAPTER 6 - ELECTRICITY

Art. 5.1 Distribution and load forecast

In order to facilitate the definition of the installation, as well as the loads taken into account for the execution of this project, a general QGD distribution board was established which, in addition to supplying the partial electrical panels, will include all the electrical installation protection equipment and other auxiliary services.

Art.º 5.2 Electrical panels

All electrical panels will be of the cabinet type, including all the recommended protection devices in accordance with the drawings.



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All input and output conductors in the electrical panels will be signaled by color tapes recommended by the DNE and will be obligatorily labeled.

All electrical panel inputs and outputs must be provided with plastic mouthpieces of measurements corresponding to the plastic tube used.

The electrical panels will be made up of three-phase buses, produced in electrolytic copper and painted in conventional colors and sized for a density that supports the short-circuit current foreseen for each panel.

All screws, washers and nuts or any other connecting parts of the conductors shall be nickel plated brass.

All screws, nuts and washers to be used in the frame of the Frames will be made of iron.

The connections to the bus will be made by appropriate clamping terminals, fixed by screws and the use of eyebolts is not allowed for any connection.

The outputs of the circuits must be made from terminal strips, tightened by screws, to be established inside the boards, based on suitable profiles.

The terminal strips must be identified in relation to the circuits they supply and shall have such an assembly arrangement that it is possible to easily disconnect any circuit for measuring insulation from them.

The inputs and outputs of the various conductors or cables, on the boards will always be done through suitable sockets or cable glands and their electrical connections will be made on the terminals mentioned above.

All electrical connections between equipment inside the switchboards will be carried out using a H7V-U/R type conductor wire.

The cutting and protection equipment will consist of:

- a) Multi-cell, tetra-polar, cut-off switches, operated by handle.
- b) Thermal magneto-type protection circuit breakers, with a breaking power of not less than 4.5 kA at 380V and 6KA at 230V, for the protection of lighting circuits and sockets and must be from Merlin Gerin.

The degree of protection of electrical panels must not be less than IP 41-IK08, where IP is the degree of protection against solids and water and IK is the degree of protection against mechanical impacts.

Art. 5.3 Installation

The installation established inside the building will be considered in a place without special risks, except in the bathrooms, which are subject to humidity, so it will be considered in a temporarily damp place, being always advisable to use waterproof material of good quality. quality.

The entire installation to be installed on the ceiling will be in Isogriz 16 mm tube type for lighting. All socket circuits and other specials will be established on the floor and/or walls. If the conditions of the work force them to pass



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through the ceilings, the same tube will be used, being Isogriz 20mm and Isogriz 25mm for special circuits and for general and special use sockets.

The entire installation to be installed on the walls will be of the mixed type, opening trenches without first making cuts with an angle grinder in order to avoid accentuated vibrations in the building's structure is not allowed.

Art. 5.4 Lighting

A careful analysis of the locations and their functions was carried out, which served as a basis for the positioning of the luminaires. The choice of different lamps and fittings according to the utility of each space, specifications of the similar ones chosen are indicated, the types may be changed, after express authorization by the supervision of the work.

Art. 5.5 - Lighting Command

All interior lighting in the compartments will have a command located through recessed switches placed on the walls in the places indicated in the drawings.

The exterior lighting will be controlled through a time switch that will activate a contactor inserted in the respective panels or a 16A photocell or equivalent depending on the lighting circuit.

Art. 5.6 - Outlets

General purpose and specific purpose socket circuits will be established for the connection of movable loads and specific fixed loads and all must be of good quality.

These circuits will be established in masonry inside 20mm Isogriz tubes, in 1x2.5mm² pbt type conductor wires, respecting the distribution indicated in the drawings.

Art. 5.7 – Protective Land

The protective earth electrodes will be of the copper-plated steel rod type, approximately 2 m long and with a minimum diameter of 16 mm, installed in the locations indicated in the drawings.

The protective earth will be established through removable terminals and its contact resistance must be less than 10 Ω.

The conductors that connect the electrodes to the earth terminals must ensure, at all times, good electrical conductivity, even in conditions of mechanical stress caused by eventual movements of the ground during its installation.

All metallic parts of the installations that could accidentally be live must be connected directly to the protective earth.

The system will consist of electrodes of 2m each, joined 1 by 1, arranged in a triangular shape, with a separation of 3m, forming an equilateral triangle. Parallel mounting will be allowed in order to achieve that the earth value is less than or equal to 10 Ohm.



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Art. 5.8 - Photovoltaic System

Supply and Installation of a Small Photovoltaic System of the Ongrid 3KVA type, complete including all accessories for its proper functioning, namely (Note: The marks of the materials of the system must be equivalent or similar to the following proposals and approved by the UNDP engineer):

- a) Off-grid solar inverter with integrated controller with output power 3KVA, MPPT voltage 60-145V, battery voltage 48V-DC, AC voltage 220-230V ($\pm 5\%$, 50/60Hz)
- b) Pv Combiner BOX 5 Inputs and 1 Output (Switches, Circuit Breaker, SPD)
- c) 4mm² photovoltaic cable
- d) Gutters 30x25mm
- e) Earth electrodes
- f) 40A fuse
- g) Yellow green cable 1x6 mm²
- h) Mono solar panels with a power of 460W, Weight 22.5kg, Dimensions (1960x992x40)mm
- i) Structure for 6 panels (complete set for solar modules)
- j) Gel Battery with 12V-200AH
- k) Battery Seating Cabinet, with two compartments (top/bottom), separated with 50x50mm bars, based on 40x40x5mm angles, with a 4mm unitex movable iron plate to seat the batteries. The structure will be in 40x40x5mm angles, contoured horizontally with 50x50mm bars.

This activity includes the preparation of the surface to be painted, free from rust, welding drips and, in general, all foreign matter will have to be removed. Subsequently, a similar or equivalent CIN aqueous acrylic to metal primer will be applied (to be approved by the UNDP engineer), then two coats of high quality CIN aqueous acrylic enamel will be applied, with a roller, brush or spray gun, diluting the first coat. with 10% water and the second with 5%.

The construction and dimensioning details, in case of doubt, will be defined by the inspection.

RECOMMENDATIONS AND OMISSIONS

During the implementation of this project, attention is drawn in order to consider, whenever necessary, all the requirements of the manufacturer and suppliers of the materials to be used in the work.

Regarding reinforced concrete work, it is important to strictly follow the specifications contained in the technical specifications, giving special attention to **laboratory tests**, vibration, in order to reduce as much as possible the void index of the concrete in its final state.



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As for omissions, the regulations in force and the rules of good art will be followed, applying materials of recognized quality, effective methods and practices.

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