

United Nations Development Programme
Mozambique-Pemba



STABILIZATION AND RECOVERY CABO DELGADO
TECHNICAL SPECIFICATIONS

REHABILITATION OF ADMINISTRATIVE BUILDINGS IN QUISSANGA SEDE



PEMBA, 30th JUNE 2022

United Nations Development Programme
Mozambique-Pemba



TECHNICAL SPECIFICATION

Project : REHABILITATION OF ADMINISTRATIVE BUILDINGS IN QUISSANGA SEDE

Object : BUIDINGS

NB: All illustrative pictures shown below are only used as samples, UNDP has no affiliation or links with these brands.

ITEM	DESCRIPTION OF THE ACTIVITY / DESCRIPTION OF ACTIVITY	TECHNICAL SPECIFICATION	REFERENCE DRAWING NO.
1	MASONRY & STRUCTURES	<p>Masonry of Cement Blocks and Sand (if necessary)</p> <ul style="list-style-type: none"> a) Masonry walls will be made of cement and sand blocks measuring 150x200x400mm for interior walls and 200x200x400mm for exterior walls, which must be category A; b) The blocks will be cast for the exterior and interior walls and gables; c) The blocks must meet the applicable regulatory requirements, and also: <ul style="list-style-type: none"> - Have a uniform texture; - Present a resistance of at least 4.5Mpa to the 1:1:5 trace; - 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) The laying mortar to be used must have 320 kg of normal Portland cement per cubic meter of mortar (trace by volume of 1:4); e) The thickness of the mortar in the beds and joints shall not exceed 20mm. <p>joists</p> <ul style="list-style-type: none"> a) Ribbed rods, class A400 NR, Ø6 (0.222 kg/m) and Ø8 (0.395 kg/m) will be applied; b) The wire for making the meshes will be galvanized, 1.30mm in diameter; c) B25 concrete will be applied, at a ratio of 1:2:3, with a mixture of Portland cement with a strength of 42.5N, medium gravel and sand, with a formwork system based on marine sheet plywood. <p>The quantification of the work performed will be in square meters of the applied area.</p>	AT
two	FINISHES	<p>Splash, Plaster and Smooth plaster in cement and sand mortar (with chicken coop application if necessary)</p> <ul style="list-style-type: none"> a) The mortar that makes up the plastering will be made of limestone Portland cement, with a strength class of 32.5 N and sand in the trace of 1:4, for smooth plaster, and 1:3 for Tyrolean plaster; b) The plaster must have a thickness that allows to obtain well-regulated surfaces, without roughness and will never be less than 0.02 m thick; c) The plaster must be very smooth, even, without roughness, and tightened with the spoon, in the case of surfaces to be painted; 	AT

United Nations Development Programme

Mozambique-Pemba



- d) d) The reinforcement of the wall cladding with a chicken coop net will only be applied if it is necessary to perform plasters with high thickness, on walls prone to the appearance of cracks due to a phenomenon and junctions between structure and masonry, in which the net has to be galvanized.
- e) The interior walls shall be finished with a refined Sika Wall® -300 Ready acrylic putty or similar approved by the engineer. Plus, as the images below illustrate:



Figura 1. Plaster application process.



Figura 2. Sika Wall®-300 Ready Plus.

Fissure Filling

- a) Depending on the degree of the crack, they will be removed and filled with a new coating based on Portland cement limestone mortar with a strength of 32.5 N and sand to the line 1:4, for small cracks they will be filled with a putty. Hantek small defect repair ref: . 15950 of the CIN or similar approved by the engineer:



Figura 3. Illustrative photo of Hantek Plaster.



Painting on Walls
The painting work must include the preparation of surfaces to be painted, free from dirt, rust, scale, welding drips, oil stains, grease and, in general, all foreign matter will have to be removed. Subsequently, it will be applied under the following conditions:

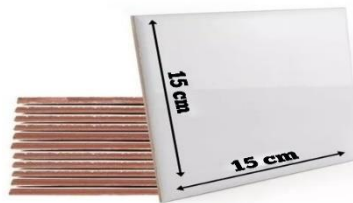
- a) All surfaces to be painted will be insulated with Cinolite primary paint (ref. 54-850) white, from CIN or MULTINEUCE (ref. 01.01) or similar approved by engineer, applied with a brush, anti-drip roller or airless spray gun, with two coats applied.
- b) After surface preparation, two coats of aqueous satin Vinylsilk (ref. 10220) or Neucebel (ref. 03. 03) or similar approved by engineer, will be applied to the interior walls and Novaqua HD 10-125, CIN or Neucegold (ref. 05.01) or similar approved by engineer, for external walls.) and emulsion paint (Supercryl) and the first coat must be diluted with 10% water and the next with 5%, in the case of applying with an airless spray gun , it is recommended to use nozzles between 0.38 to 0.43 mm (0.015 to 0.017 inches);
- c) On skirting boards and surrounding sidewalks, Cinacryl Mate Ref.:12230 or gray enamel paint will be applied, or similar approved by engineer,
- d) The inks must enter the work in original packaging and will be of colors and type chosen by the Owner of the Work.
- e) The paint must withstand washing with soap or normal detergent;
- f) The first coat will be applied by brush/brush and the rest by roller or according to the Inspection's instructions;



Figure 4. Illustrative images of recommended paints.

Ceramic tile
They will be applied on the walls of the toilets, kitchens and corridors and must comply with the following conditions:

- a) The tile to be used will be ceramic tile in white pavigrés porcelain and measuring 0.15 x 0.15 m of good quality, with a perfect glaze without defects:

		 <p>Figura 5. Demonstration of the required ceramic tile.</p> <p>b) The settlement will be with cement glue Construa/ Build it or similar of good quality, as per the manufacturer's instructions;</p> <p>c) In the event that the width of the cloth or wainscoting does not correspond to a certain number of tiles, the cuts will be made on a single side, choosing -, when possible, the most hidden side;</p> <p>d) The joints will be made with white grout, the use of plaster is not allowed and, in the laying of the pieces, without the use of spacers, crossheads of 1.5 mm;</p> <p>The measurement will be in square meters referring to the applied surface.</p>	
3	FLOOR	<p>ceramic tiles</p> <p>Ceramic tiles will be applied to the floor, which must comply with the following conditions:</p> <ol style="list-style-type: none"> The tiles to be used will be ceramic, in a color chosen by the developer and measuring 0.60 x 0.60 m, and 0.30 x 0.30, good quality non-slip tiles; The settlement will be with cement glue Construa/ Build it or similar of good quality as per the manufacturer's instructions. In case the floor width does not correspond to a certain number of tiles, the cuts will be made on a single side, choosing -, when possible, the most hidden side; The joints will be made with grout in the approximate color of the parts applied, not being allowed the laying of the parts with the use of spacers with 2 or 2.5 mm crossheads; The plinth will have a dimension of 0.10x0.60m and a thickness of 20mm, made of the same tiles applied to the floor and of chanfuta or umbila wood, based on glue cement, with joints in grout color chosen by the owner of the work. <p>burnt screed</p> <p>The pavement will be coated with Portland cement mortar, with a resistance of 32.25N and sand made in loco, followed by spraying by dry shake or manually with "Sikafloor-3 Quartz Top " or similar approved by engineer, hardener and coloring powder, one-component ready-to-use powder, evenly distributed over the freshly leveled and still wet mortar, terracotta or grey.</p> <p>The measurement will be in square meters referring to the applied surface.</p>	AT

United Nations Development Programme
Mozambique-Pemba



Figura 6. Illustration of Sikafloor-3
QuartzTop

4	FRAMEWORK	<p>Solid Wood Doors and Windows</p> <ul style="list-style-type: none"> a) The frame will be made of Chanfuta or Umbila wood, well dried, with straight and joined fibers, without knots, well dry, not burned, without cracks, free from woodworm and other diseases, of uniform color and veins of regular appearance and evenly distributed, and executed in accordance with the attached detail drawings; b) The leaves will be fixed to the frame by 3 1/2 4" balance sheets with washers, screwed in by screws; c) The paint to be applied will be CIN insulating acrylic, Cinacryl Satinado (ref.12-220) or similar approved by engineer, preceded by the CIN insulating acrylic primer (18-050) or similar approved by engineer, in two coats. d) The frames will be 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 5/16 screws. The screw-laying holes will be covered by wooden bushings identical to the one of the beads. The bead shall be connected to the concrete or masonry by means of an appropriate seal cord and a slow drying seal. e) Colorless translucent tempered glass will be mounted for 4mm thick stained-glass windows, transparent glass and mirror laminated glass with a thickness equal to 4mm, free of bubbles or voids, or scratches or other defects. Laying will be carried out with a suitable elastic bituminous putty; f) The mosquito net will be plastic, without holes or defects, with a mesh of 1.5mm. When placing the net, it must be perfectly straightened and stretched, with the terminals protected. The net is based on a wooden rim and will be bitten according to the detail; g) Regarding the hardware, all will be stainless steel, highlighting 4" hinges, bolts and robust chrome regulators. The locks will be Yale brand (ref. MF2666) or Elephant lock (ref. L275B93AB) with 3 levers or similar approved by engineer, h) The floor stops/door stoppers will be in stainless steel, fixed to the floor by chrome screws. 	AT



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Mozambique-Pemba



		  <p>Figura 7. Illustrative image of some hardware.</p> <p>Metal Doors and Railings</p> <ol style="list-style-type: none"> The tubes will be 50x50mm galvanized squares; The rods will be 8 mm in diameter; Galvanized iron sheets will be 6mm; The hinges will be stainless steel; Galvanized iron flat bars; The paint to be applied will be CIN smooth enamel, Cinofer (ref.38-200) or similar approved by engineer, applied in three coats directly on the metal surface. <p>The measurement will be in square meters referring to the applied surface.</p>	
5	ROOF	<p>wooden structure</p> <ol style="list-style-type: none"> The different parts that make up the structures (150x150mm trusses, 75x50mm plinths, braces and beams) will be made with sawed and treated "Pinho" wood or another of superior quality (with the sections indicated in the project 's detail drawings); Cuprinol should be applied clear, water -based, Wood with a brush, at least 3 coats, interspersed for 1h; The pieces will be carefully executed, according to the technical indications and detailed drawings, without amendments and with the dimensions indicated in the project; 	AT

- d) The metallic connection means will be in steel and according to the dimensions indicated in the project , treated with smooth enamel from CIN, Cinofer (ref.38-200).

Covering Coating

- The sheets will be coated Thermo-lacquered, type IBR 686, with a minimum thickness of 0.6mm;
- The laying will be carried out with clamps with nuts and metalized washers suitable for the support structure; metal washers should tighten over rubber washers. Under the clamp washer will be performed, before the final tightening.
- includes -all the necessary accessories for the assembly of the sheets and finishes such as ridges, lace for the eaves, all the edges of the gables, being protected with a suitable bituminous product in the areas to be embedded in the coverings;
- The ridges will be in 0.60m wide thermo-lacquered sheet; in its assembly, a covering element must **be** applied between the ridge and the covering plate in order to isolate the external and internal environment;
- The Rufo (if necessary) , **will** be of 0.4 mm thick thermo-lacquered sheet; its fixation must be in the beams of the roof structure; it can be affixed at the same time as the roofing sheets, using the same nails.

Rainwater Reservoir and Receivers

- 110mm Marley Gutter or equivalent must **be** applied on the rear elevation of the building with two slopes, one for each end of the building with a slope of 1%;



Figura 8. PVC gutter and discharge pipe.

- At the ends, downpipes with a diameter of 75 mm must be installed, duly affixed **to the wall** and with the routing of water to the water reservoir;
- The gutter will be **affixed** to a joist with supports and must be positioned every 1 m;
- All support and fastening elements must be from the same manufacturer as the gutters to be applied.
- The water tank will be of the PLASTEX brand or equivalent, rigid PVC, of **high quality**, with an external layer stabilized against UV rays, resistant to rust and corrosion, with a black internal coating capable of preventing the growth of algae; including


United Nations Development Programme
Mozambique-Pemba



		a 1HP BP1000 electric pump to supply water to the building.	
		The measurement will be in square meters referring to the applied surface.	
6	INSTALLATION OF WATER, SEWAGE NETWORK, SANITARY WARE	<p>PVC piping</p> <ul style="list-style-type: none"> a) The piping to be used will be rigid PVC, for a normal minimum pressure class of 0.60 MPa (~ 6 Kgf /cm2); b) End-to-end pipe joints in derivation using accessory parts must always be carried out after immersion in hot water, -tightening between the parts by means of metallic zinc-plated clamps; c) Before covering the pipe, it must be tested by an appropriate process to be submitted for approval by the Inspection. <p>Inspection and connection boxes and septic tank</p> <ul style="list-style-type: none"> a) Repair of the lining of the walls of the pits and the manholes with Portland cement plaster, with a resistance of 35.2N and sand, with a ratio of 1:3; b) Replacement of the lids of boxes and pits without a lid or that are damaged, supported by properly finished walls with a thickness of 0.08m, in B20 reinforced concrete (#Ø8@15). The cover must have a Ø10 armor holder for inspection. <p>370x600x790) mm</p> <ul style="list-style-type: none"> a)The toilet and the cistern will be white in vitrified ceramic tableware of the Roca, VAAL type or equivalent quality upon approval by the Inspection; b) The toilet will have a built-in tubular siphon with bottom discharge; c) The cistern will be low and its connection to the toilet will be made by a rigid PVC pipe with a diameter of 1 1/4"; d) The cistern will be connected to the water network by a flexible pipe with a diameter of 3/4". <p>ceramic washbasin</p> <ul style="list-style-type: none"> a) The washbasin will be ceramic (560x460)mm with pedestal, white, with single lever faucet in chrome finish, with drainage element ; b) The siphon will be a 1"1/4 chrome-plated bottle type. The connection joints must be perfectly watertight and the siphon will be seated so that it is strictly vertical. <p>Stainless steel sink bench</p> <ul style="list-style-type: none"> a) The sink will be in stainless steel (400x405x280)mm , with a single-lever faucet with a drain element; c) The siphon will be a 1"1/4 chrome-plated bottle type. The connection joints must be perfectly watertight and the siphon will be seated so that it is strictly vertical. 	AT

United Nations Development Programme
Mozambique-Pemba



		 <p>Figura 9. Illustrative image of sanitary devices.</p>	
7	ELECTRICAL & PHOTOVOLTAIC INSTALLATION	<p>Normative General Conditions</p> <p>The installations must follow the regulations in force in the country, namely:</p> <ul style="list-style-type: none"> - RSIUEE-Safety Regulation of Installations for the Use of Electric Energy and Collective Installation of Buildings and Entrance. <p>The materials must be of the JSL/Manufacture Portuguese or Equivalent type upon approval by the Inspection; All devices in sight must have a single color to be approved by the Owner of Work; Every installation must be built-in. Except when there is a need to run a cable after finishing the masonry, but with authorization from the inspection.</p> <p>Branch boxes</p> <ol style="list-style-type: none"> The boxes will be for flush mounting; They will be in cream-colored molded Bakelite, with lids of the same color, fixed by chrome screws tightening in chrome-plated bushings threaded or nailed into the boxes; They will have the minimum dimensions of 80x80x40mm for up to six entries and 120x80x40mm for more than six entries; The inlets and outlets of the Isogríz tubes must ensure perfect watertightness, and will be made of the same material as the tubes; No more than one circuit will be accepted in each box; Only one terminal board will be allowed in each box, allowing the passage of -entire conductors from the same circuit inside it ; The terminal boards will be in porcelain, with dimensions suitable for the section of the conductors to be connected, and these connections must comply with the provisions of Articles No. 121, 122 and 123 of the RSIUE E.; will be fixed to the bottom of the boxes by two screws or quick connectors approved by the inspection. <p>Electrical Panels</p>	AT

United Nations Development Programme
Mozambique-Pemba



		<p>a) 16-module metallic electrical boards will be installed, or another Quiterro brand fire extinguisher ;</p> <p>b) Between the door and the switchgear there will be a removable panel in 2mm steel sheet, which will protect the set of equipment under tension from the switchgear. The control and signaling organs will be visible on the face of the panel. All panels will be equipped with locks;</p> <p>c) All busbars will be in electrolytic copper, sized for a maximum current density of 2A/mm2 and rigidly supported on "permali" type insulators or equivalent, conveniently sized;</p> <p>d) All internal wiring will have a minimum cross-section of 1.5mm2 for the Lighting, signaling or control control circuits, and a minimum cross-section of 2.5mm2 for the remaining general-purpose and special-purpose socket circuits; all interior cables will be identified at their ends, with clamps numbered according to the terminals to which they are connected;</p> <p>Switches, Indicators and Circuit Breakers</p> <p>a) Tetra polar switches for cutting under load Legrand or Equivalent, sudden break and frontal command.</p> <p>b) Bipolar and tetrapolar Differential Switches of the Legrand brand or equivalent, sudden rupture and frontal command, with differential relays of 300 m[^] and 30 m[^];</p> <p>c) Signals for the presence of voltage in EVA colors, square or circular, with incandescent filament lamps and for undervoltage operation, with a minimum duration of 20,000 hours;</p> <p>d) Legrands or equivalent -bipolar or tetrapolar circuit breakers , always with neutral cut, equipped with thermal and electromagnetic relays;</p> <p>e) Legrands or equivalent Circuit Breakers : Single 16A circuit for Normal and Special Use Sockets;</p> <p>f) Legrands or equivalent Circuit Breakers : Single 10A for indoor and outdoor lighting circuit;</p> <p>g) holder -disconnectors, for cutting under load, opening distance sufficient to extinguish the arc, normal protection treatment, according to IEC 408 standards;</p> <p>h) Fusible circuit -breakers : they will be of the cartridge or knife type, with high cutting power, with striker and fusion indicator system;</p> <p>i) Conductors will be type V.</p> <p>Isogriz 16mm tubing with guide</p> <p>The tubing will be of the isogriz type with a diameter of 16mm with guide, made in Portugal or equivalent.</p> <p>Single-Phase Sockets with Earth</p> <p>a) Legrand brand or equivalent approved by inspection, with a ground pole, for 16A/250V, with protected sockets, with mechanical tightening of the conductors to the terminals;</p> <p>c) They will be mounted 0.30 cm from the finished floor (level of the center of the switchgear box).</p> <p>Single and Dual Switches</p> <p>a) The switches must be of the Legrand brand or Equivalent to that proved by the inspection;</p> <p>c) The switches will be of the tilting type, for 10A -250V, silent and with sudden rupture regardless of the control organ, long-lasting contacts and mechanical tightening of the conductors to the terminals;</p> <p>d) They will be mounted 1.20 meters from the finished floor (level of the center of the switchgear box).</p> <p>LED Armor</p> <p>a) All the led's armatures will be of the industrial ruler type with LED reflective tabs;</p>	
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Mozambique-Pemba



		<p>b) The reinforcement bodies as well as the reflective flanges must have been treated against corrosion, painted in white color and dried in an oven.</p> <p>d) All armatures must have a high-power factor, greater than 0.9, and the lighting circuits must have a minimum power factor of 0.85 after compensation for the stroboscopic effect;</p> <p>e) The lamps to be applied will be designated new generation, of the LED'S type with a diameter of 26mm and from 18W to 36W, all modules, except in the sanitary installations, where the assembly of color 33 lamps is allowed;</p> <p>f) In sanitary installations, the reinforcements must be watertight and the watertightness in the cable entry or exit glands must be perfect, in order to avoid internal condensation.</p> <p>Protective Land</p> <p>a) The protective earth will be constructed on the basis of two square plates 1m² and 1mm thick as minimum values for the dissipation surfaces, with a contact resistance of less than 10 Ω.</p> <p>e) The electrodes will be buried so that their upper part is at least 0.80 m from the floor, after replacement.</p> <p>photovoltaic system</p> <p>The small photovoltaic system will be of the Off grid type with a power of 3KVA, complete including all accessories for its proper functioning, namely:</p> <ul style="list-style-type: none"> a) 460w Mono Solar Boards; b) Metallic Structure for fixing the Plates; c) 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); d) PCN Solar Cable 1X6mm Black color; e) Gel Battery 12v 220AH ; f) MC4 Male and Female Connectors; g) Solar Cable Type Pcn 1x6mm Red color; h) Bipolar Circuit Breaker System 40A; i) 40A fuse; j) Fuse Holder; k) PV Turn-Off and Turn-On Box with 5 Inputs and 1 Output (SPD); l) Battery Seating Cabinet, with two compartments (top/bottom), separated with 50x50mm bars, based on 40x40x5mm angle brackets, with a 4mm UNITEX mobile iron plate to seat the bacteria. The structure will be in 40x40x5mm angles, horizontally contoured with 50x50mm bars, according to the illustrative images below: 	
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Figura 10. Armário das baterias.

This activity includes the preparation of the surface to be painted, free from rust, welding splatters and, in general, all foreign matter will have to be removed. Afterwards, a CIN aqueous acrylic primer for metal will be applied, then two coats of CIN's high quality 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%.