

# **RECOVERY MECHANISM**

# **CONSTRUCTION PROJECT OF EIGHT (8) SCHOOLS IN SOFALA PROVINCE**

# **SCOPE OF WORK**

# **BEIRA, 18 MAY 2020**

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# **I. INTRODUCTION**

The present descriptive and justification report refers to the executive project for the construction and rehabilitation of schools in conventional material in the Sofala Province under the Recovery Mechanism after Cyclone Idai and Kenneth in the province of Sofala and Cabo Delgado Province. This project is funded by UNDP and Partners.

The construction and/or rehabilitation of schools will be based on the model projected by the United Nations Program for Human Settlements in Mozambique (UN-HABITAT), as a result of the recommendations given by the project “Safe Schools”, an initiative supported by the World Bank - Global Service for Disaster Reduction and Recovery (GFDRR) and led by the Ministry of Education (MINEDH) in coordination with the Ministry of Public Works (MOPHRH) and the Ministry of State Administration and Public Service, through the National Institute for Disaster Management (INGC).

## **1.2. FRAMEWORK**

After the widespread devastation caused by cyclones ldai and Kenneth, the government and its international partners began the long and challenging emergency response and recovery response. The severity of the damage and loss (estimated at 3.2 billion), the underlying vulnerability and the limited capacity in the affected areas have made recovery efforts much more difficult. UNDP has supported the Government of Mozambique since the initial response. The International Commitment Conference yielded $ 1.3 billion in commitments from development partners. On that occasion, the government and development partners emphasized the importance of building resilience and accelerating the implementation process.

The Recovery Mechanism is being financed with the support of resources from the European Union, Canada, Finland, the Netherlands, India, China and Norway, together with UNDP. The program's total budget is $ 72.2 million over five years. Given the mandate of the program, the size of resources and the imperative of accelerated implementation, UNDP decided to establish a dedicated Program Management Unit based in Beira.

UNDP is implementing its RF through an integrated approach, balancing early recovery and building resilience. The Recovery Mechanism focuses mainly on enabling the restoration of livelihoods and, at the same time, strengthening the community's resilience against future disasters and ensuring that gender equality and equity is maintained in the process. The RF program includes the rehabilitation of agricultural and livestock production, the improvement of water resources for people and animals, the construction of schools, health and nutrition centers and the introduction of income-generating activities to support people.

### **II. DESCRIPTION OF THE PROJECT.**

The project for a school includes the construction of a block of 3 classrooms, a block of 2 classrooms and administration, 4 improved latrines (doubles). The latrines will be provided with a rainwater collection and storage system and a concrete washbasin will be built on the front facade. Each building will have a covered area of ​​244.62 m², and 10.55 m² for improved latrines, the level of the ground floor will be about 60 cm from the ground level, with access by means of steps and ramps with a maximum inclination of 11% for people with disabilities. The construction will be of the conventional type with reinforced concrete structure, masonry in cement and sand blocks and cover in IBR type sheets supported on a resilient structure of treated pine wood and affixes with all resilience accessories in the connections according to the details and details in the drawings. At this stage, the construction of 8 schools in Sofala Province is planned, namely:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **District** | **Schools Name** | **Classrooms** | **Administration** | **Double latrines** | **Risk Zone** |
| Chibabava | Chicuacha Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
| Madombatomba Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
| Muconja Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
| Heua Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
| Gerome Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
| Primary School Armando Guebuza | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
| Dondo | Mutua Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |
|  | Chipinde Primary School | 5 | 1 | 4 | Zone 1 (Winds up to 210Km/h) |

A- School building sites

## **III. CONSTRUCTION AND REHABILITATION**

### **3.1 NORMANS AND REGULATIONS**

The project took into account the General Regulation of Urban Buildings (REGEU). The design of reinforced concrete structures was based on the Prestressed Reinforced Concrete Regulation (REBAP), Action Request Regulation (RSA) and Steel Structure Regulation for Buildings. For hydraulic installations, he considered the provisions of the Regulation on Building Water Distribution and Wastewater Drainage Systems - Mozambique.

In general, the specific construction standards for construction, in particular those in the Bulletin of the Republic, were carefully followed.

### **3.2. GENERAL TECHNICAL CONDITIONS**

The Contractor must ensure that he has all the drawings on the list of drawings referred to in the Project Summary.

### **3.2.1 Deployment and Guidance**

The list of drawings, which constitute a standard project, does not include the implantation plan, being dependent on the available land. The implantation plan must be prepared taking into account the conditions of the land and then delivered to the Contractor for the construction of the work. The implantation scheme will become a contractual document, just like the other plans and will give rise to a mention signed in the Work Book, or to an official correspondence.

In order to eliminate or minimize the harmful effects of the climate and contain costs, buildings should be oriented according to 3 factors:

**Sun:** In order to avoid the longitudinal entry of the sun inside the classrooms and the subsequent discomfort of the students sitting in the sun and heating of the interior environment, the windows and doors should not be exposed to direct sunlight. Therefore, the longitudinal axis, that is, of the building's gables, should be aligned, as far as possible, in the East-West direction.

**Wind:** In relation to the prevailing strong winds: The building must be installed in such a way that the main openings are protected. Otherwise, the cover could be lifted by strong winds. The latrines should only be installed after the dominant wind direction has been evaluated, in order to remove odors.

**Slope:** If the land presents significant slopes, the long buildings should be installed as far as possible parallel to the level levels. The contractor and the Inspection must take these factors into account. As a general measure, the construction should be located at a distance from the top and bottom of the slope, at least ½ the height of the same slope, and in all cases not less than 2m. The building must not be located on top or at the base of slopes with a pendency greater than 40%.

**Proximities to arboreal elements:** Trees are a fundamental element for the protection of buildings against winds, but if they are too close they can cause destruction to the building, therefore the building must be deployed away from the trees at a distance equal to or greater than the height of the building.

**Distances between buildings:** This measure must also be taken into account when implementing the building next to another one already built or to be built, therefore, the distance between buildings must be equal to or greater than the height of the building.

**3.2.2 Several**

Even when not clearly defined in the respective Specification, it is mandatory to apply certified and/or approved materials. Whenever the Inspection requires, the Contractor undertakes to present - within the period established by that entity - documents proving that it will be applied in the work, certified and/or approved materials; as well as, the works are being carried out by personnel or applicators qualified for this.

Regardless of the existence of these documents, the Inspection may - whenever it sees fit to carry out inspections and tests of a general or other nature.

The Contractor is responsible for the adequate protection of the entire work against storms and thunderstorms, rain, surface or groundwater. In addition, you must have a valid professional insurance policy, according to the contractual terms. It must also supply and operate all the pumping systems necessary for the maintenance, of water-free foundations, as well as any protection of finished works.

In the event of damage caused by any of those causes or the negligence of its workers or visitors, the contractor must carry out the necessary repairs at his expense.

The contractor is responsible for setting up temporary facilities for the storage of perishable or non-perishable materials, and an office and shelter for personnel, who will demolish and remove it from the construction site prior to its provisional reception.

The contractor will maintain a general supervisor of the work, of proven competence, at the shipyard during normal working hours, who will be authorized to receive and comply with orders from the work owner or his representative.

The contractor must place all orders for materials necessary for the work in a timely manner and will be entirely responsible for any delay in the delivery of any material.

The contractor shall provide, as soon as possible, all samples required by the developer or his representative, who may reject any material or work that does not correspond to the approved samples.

The contractor is responsible for delivering the work to its provisional reception in perfect clean condition, with all moving parts and equipment lubricated and operational, clean glass, unobstructed pipes and without sand or residue, paint dripping from surfaces, etc.

## **4. LAND MOVEMENT**

### **4.1 Classification of materials**

The classification of the materials to be excavated should be taken as a guide for establishing its degree of hardness. The contractor must certify, by direct examination, the nature of the materials to be excavated. Any extra payments that result from a lack of consideration for this point will not be satisfied.

### **4.2 Measurements and excavations**

Excavations were measured considering the finished dimensions of the concrete foundations and any other buried element. When measuring the excavations, this rule will be strictly considered and there will be no payment of any extra cost if the excavations or depths are of greater width or depth, whatever the material in which it was carried out.

### **4.3 Collapse or landslides over excavations or hollows**

If there are landslides or landslides on the ground next to the excavation beyond what is necessary to open it, the displaced material will not be paid for as an excavation and must be removed and deposited on site, removed or reused and compacted as indicated by the Inspection. Where there are landslides or where the excavation exceeds the expected and necessary depths, in positions where the ground should structurally support the construction, the Contractor must proceed with filling and correcting solid concrete levels (“E” class) at his expense. In the measurement of the excavation, it is assumed that the land will be leveled to the level required for the concreting of floors, shoes, bases, cleaning concrete, etc., before filling. This measurement method will be suggested for all excavation adjustments or new measurements regardless of any method that has been used by the Contractor.

The excavation for the foundations will have a minimum depth of 80 cm, and a width of 50 cm, according to the projects. The materials removed below the project dimensions, should be replaced by properly compacted soils. Attention should be paid to the convenience of reducing to a minimum, the time between the opening of the hollows or ditches and their filling, in order to avoid the collapse or disintegration of the trench walls and their prolonged flooding. The excavation bottoms will be smoothed, leveled and well compacted. In case of doubt about the proper compactness of the foundation bed, the inspection may recommend tests for its verification. Excavated material not applied to landfills will be transported to the dump.

### **4.4 Inspection Notice**

The Contractor will notify the Inspection when the excavations or hollows are ready to receive the foundations and will not fill any excavation until it has been inspected and approved by the Inspection to do so.

### **4.5 Landfills**

Landfill materials must be free of organic debris or waste and must come from soil selected from the excavation. The soils to be used in the landfill layers will, when necessary, be watered, and one should seek whenever possible to provide the soil with the necessary moisture and degree of compaction. Whenever it is found that the soil moisture exceeds the optimum values ​​for good compaction, according to the Inspection, the necessary steps will be taken to correct it. Landfills will be carefully executed in layers.

The thickness of the layers must be in accordance with the compaction means. When the means used are not mechanical, the thickness of the layer should not exceed 0.20m. A layer should not be spread without the previous one having the required degree of compaction 95%. The execution of landfill on buried parts should only be carried out after the inspection has been approved. The measurement of the landfill quantities will be carried out according to the foundation level approved by the inspection and taking into account that the excavations were carried out as previously specified. Any damage caused by settlement resulting from defective consolidation and compaction will be corrected by the contractor and at his expense.

### **4.6 Blistering**

In elements such as filling or removing excess material, only the consolidated volume will be measured. The contractor should count on the blistering in his prices.

### **4.7 Pricing**

The prices for all excavations include the leveling and formation of the external levels of the terrain, curves, etc., adjustments of curbs and sidewalks, leveling, irrigation and compacting of the bottom of the caboucos for approval of the Inspection; and also consider all phasing and removal, loading and transport at a distance of up to 100m from the perimeter of the work and deposit in piles for reuse and spreading and leveling as necessary. Prices for maneuvering and working space must include what is necessary for the further excavation, for the risk of collapse or subsidence and for the refilling and compacting of the excavated material. The prices for all types of filling under floors, around the work, etc., must also include the loading of the material over or under as described in the Measurements. If the contractor follows any other method not foreseen, this in itself should be considered extra in relation to the method considered in the Measurements.

## **5. Foundations**

The choice of the land on which the foundations will be based should be such that it offers the necessary resistance capacity to allow the stabilization of the properties. The drills will be executed according to the dimensions indicated in the project, for sandy and loose soils, the excavation depth should never be less than 80cm taking as a base, the lowest level of the terrain if it is sloping. If deemed necessary depending on the conditions of each type of soil, a layer of soil-cement of 20cm thickness should be applied in order to guarantee greater soil resistance capacity. If the soil is potentially clayey, borrowing soils will be mandatory.

The running shoes will be made of B25 concrete in the line of 1: 2.5: 3 in volume of cement, sand, stone, respectively, with a thickness of 20 cm and a width of 60 cm. Before the execution of the shoes, it is necessary to ensure the compaction of the bottom of the excavation and the execution of a 10cm thick rockfill with a "2” median stone.

Landfills will be carried out with land from excavations and on loan in accordance with the soil conditions and the final levels defined in the executive project, the land to be used will be clean and free of organic substances or any other impurities.

## **6. GROUND FLOOR**

The pavement will be carried out on the landfill well regularized with land from the excavations and / or loan chambers, watered and well compacted in successive 20 cm layers. A rockfill will be made in medium stone, with a thickness of 10 cm, on which the concrete slab B20 simple with a line of 1: 2.5: 5 (cement, sand, stone) with a thickness of 10 cm will be concreted.

A waterproofing tarpaulin with a thickness of 250 microns will be laid on the floor, before concreting in order to prevent and or reduce the humidification of walls and floors by means of capillarity.

The final floor level will be defined in the execution drawings if the entrances will always be provided with access ramps with a slope not exceeding 11 degrees.

The ground floor will be in simple concrete, cast with a thickness of 10 cm over the leveled and compacted rockfill of 10 cm with median stone 2 ”. The concrete will be applied on continuous surfaces that will not exceed 30m2, separated by construction joints finished with 1: 5 mortar, 7 days after the initial concreting.

The floor will be finished with simple screed and smoothed according to the recommendations.

## **7. BUILDING STRUCTURE**

The building will be provided with pillars and beams in reinforced concrete of class B25 in volume of cement, sand, stone, respectively at the points indicated in the project, they will have a section according to the designed parts and reinforced with steel of class A400 according to the details in the drawings. The connection between the bars and stirrups will be made by annealed wire.

**8. BUILDING WALLS AND PLASTERING**

The masonry on the running shoes will consist of softened blocks of 200x200x400mm, the outer walls with blocks of 20x200x400cm, all according to the project drawings. The blocks will be made of cement and sand based on cement mortar and sand with a 1: 4 line.

The concrete to soften the foundation blocks will be 1: 4: 7 in volume of cement, sand, stone, respectively.

The elevation walls of the latrines will be made of hollow blocks in cement and sand 10 cm thick, they will be laid in cement and sand mortar to the trace 1: 4 of volume of cement and sand, respectively.

The base walls must be properly prepared to receive the plaster. The surface to be covered must be completely clear of particles that are not adherent or any other bodies that may affect the plaster mortar, as well as free of dust, grease or fire soot.

The surface to be covered must have the necessary stiffness and be perfectly performed so that plaster thickness greater than 1.5 cm does not have to be used.

Immediately before applying the plaster, the wall must be abundantly wet in order to be totally moist at the time of applying the mortar, without, however, presenting any cavity with trapped water.

When it has not been possible to avoid irregularities in the performance of the base wall, greater than the tolerances, all the depressions must be filled in advance, with mortars identical to the plaster, as a base for the plaster to be placed later. The thickness of each layer should not exceed 2.0 cm.

## **9. CARPENTRY - WINDOWS AND DOORS**

All doors and windows will be made of solid earth wood (chamfer or umbila), very dry and free of knots and whiteness. All frames and finished joinery should have very smooth and smooth surfaces, with slightly rounded edges completely free of machine marks or hand tools. The roundness of the edges will be of the order of 2 mm in radius according to the inspection indication for each case.

All joineries will be protected after being installed to avoid damage to the edges and surfaces, cement or paint stains, etc.

Joinery parts must be prepared immediately after ordering. They will be stored in a dry place in order to be approved by the Inspection. In the event that any joints are opened by warping or shrinkage before the work is finished, these parts must be removed and replaced at the contractor's expense. Unless otherwise indicated, all joineries will be built according to the best practices, armed with joists and joints, pegged and with glued, bolted dovetail joints, etc., as best required for each case. The longest possible lengths for all elements will be used throughout the work. When necessary, any joint will be made of half wood by overlapping and pegged and the tops always the best possible match.

These will be executed according to a detailed drawing, most of which will be treated as described.

### **9.1 Hardware**

All the fittings to be used in the work will be of the types, dimensions, finishes as described in the technical specifications drawings. All parts will be assembled, with suitable screws, either in size, in material or in the shape of the head. All parts must be perfectly clean and lubricated for the delivery of the work.

## **10. LOCKSMITHS**

All doors and windows will be made of solid earth wood (chamfer or umbila), very dry and free of knots and whiteness. All frames and finished joinery should have very smooth and smooth surfaces, with slightly rounded edges completely free of machine marks or hand tools. The roundness of the edges will be of the order of 2 mm in radius according to the inspection indication for each case.

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These will be executed according to a detailed drawing, most of which will be treated as described.

## **11. STRUCTURE OF THE COVERAGE**

All the wood to be used in the roof structure will be of good quality, very dry, without knots, warps, or other defects and will be sawn according to the good rules of the art, well squared, in the necessary lengths, and in the dimensions that allow the finishing according to the specifications of the details. They may be earth woods or pine wood. The sections used in the project are 15x5 cm (asses) and 7.5x5 cm (madres).

All wood used in the roof structure must be previously approved by the inspection, properly treated against the attack of insects and fungi, in particular termites, through approved methods, such as pressure treatment or other similar method, of proven quality. They will always be protected with products of organic solvent, having as preservative or active substance Chlorinated Naphthalins, specially indicated as preventive and curative against Fungi of the Rot and Insects Xilófagos: Woodworms and termites.

In all cases, the assembly of said trusses will be done based on the details shown in the drawings. All trusses must be supported by reinforced concrete beams according to the designed parts. The connection of the wooden parts will be made using connection plates as detailed in the drawings. The trusses must be approved by the inspection before placement.

## **12. COVERAGE**

The covering material will be the safintra type IBR cover plate made of 0.6mm thick galvanized iron. The lateral and front projections will be as expressed in the drawings. The plates will be handled, transported and stored in such a way that they will not be damaged by shock, perforations, or arrows caused by permanent deformations. The plates will preferably be stored under covered areas. When protected from water, the plates will be placed in piles not too high on wooden blocks, in sufficient numbers for the load to be transmitted as evenly as possible. The handling of plates with a length greater than 3.0 m will be carried out by more than 2 men in order to avoid deformations or even breakage.

The settlement will start on the opposite side to the prevailing winds and rains and from the bottom up. The lateral and longitudinal overlays of the sheets and the finishing pieces will obey the indications provided for that purpose by the manufacturer.

The plates are fixed to the structure using threaded nails (screw type) and sealing washer. The number of fixings will be 3 per wedge on each plate and 1 on each wave in the eaves of the eaves and the ridge. The fastening of the fastening elements will be firm without, however, causing any part of the fastening elements to be deformed.

The cuts and perforations to be made in the sheets, will be carried out carefully and will be carried out by appropriate mechanical means. These operations will never be carried out on areas already covered.

The ridges, gable ends, slope, etc., will be executed in molded parts and supplied by the same manufacturer of the sheets and their specifications will correspond to those of the sheets that finish. All plates, trim pieces and accessories will be conveniently placed, in order to observe a convenient sealing of the parts and their set.

## **13. PAINTING**

All materials used in the painting will be of the best quality and must be approved by the inspection. The coating of carpentry pieces, when required by the project, will be cellulosic varnishes. The contractor must indicate in a timely manner which brands and types of paints and other finishing materials for approval by the inspection, while obeying, however, the guidelines defined by the inspection.

All materials to be used in the painting work must be brought to the work in sealed and sealed cans or drums and no tampering will be allowed. All painting work will be carried out according to the color schemes defined by the Inspection or the developer.

In all cases the preparation of the surfaces and the application of paints, varnishes, oils, etc., will be carried out strictly according to the manufacturer's instructions for each type of surface and for each type of finish specified. All surfaces to be painted must be perfectly dry and clean, without residues of oils or grease, dust or sand and prepared for painting.

The plastered surfaces will be well brushed, and all cracks will be redone and dented. The wooden surfaces will be perfectly finished, sanded and sanded until smooth faces are obtained before painting or varnishing; between each coat, fine sandpaper should also be applied.

## **14. EXTERIOR ARRANGEMENTS**

### **14.1 TREES AND BUSHES**

All trees and shrubs on the ground and outside the boundary of the foundations will be preserved and protected against any damage they may suffer during construction. The Inspection will determine which trees and shrubs to be felled outside those limits. The resulting woody material must be removed at the contractor's expense, after agreement with the local Education Directorate.

**14.2 Leveling**

The land will be leveled to the quotas in the project, both in paved areas and in non-paved areas. The contractor will take the utmost care to ensure that the final quotas are obtained on the surface of the land ready for planting.

### **14.3 Soil removal and conservation**

The organic soil will be removed from the surface of any area and level, stacked in a convenient place and spread again after the general leveling of the base is complete.

### **14.4 Final land preparation**

When preparing the leveling of the land, utmost care will be taken to ensure that there will be no burial or scattering of debris from the work, organic or inorganic, and that the coverage and protection of pipes is complete before closing it from the ditches.

# **IV. OMISSIONS**

For all cases omitted in this report, the basic principles prescribed by current legislation will be observed.

# **V. ANEXES**