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PREFACE

The present Specifications comprise two parts:

- i. PART A: Gives a general description of the project, general requirements to be accomplished and general information to the bidders.
- ii. PART B: Gives the technical specifications for execution of the works.

GENERALITIES

These project specifications constitute an integral part of the contract documents and they alter or supplement the SATCC Regulations for Works in Roadways and Bridges - 1998, which are applicable to this project.

The SATCC Regulations for Works in Roadways and Bridges - 1998 are not supplied to the bidders with the Documents of this Project and they should be acquired from Administração Nacional de Estradas (ANE).

In case of some discrepancy among the Regulations, the bill of quantities or the drawings, the precedence order will be the following:

- a) Contractual Clauses.
- b) Specifications of the Project
- c) Drawings and Bill of Quantities
- d) SATCC Regulations for Works in Roadways and Bridges, September 1998
- e) Other mentioned specifications

These specifications were written to cover all aspects usually demanded in contracts of construction and consequently they can mention aspects not applicable for this contract in particular.

PART A: THE WORKS

1. Description of the Project

1.1. Location

The works regarding this project will be located in various parts of the Country.

1.2. Context of the Works


The context of the works to be undertaken consists in Execution of prototype design for a pharmaceutical intermediate warehouse, such as follow:

- i) Placement of new prefabricated kerbs and side channels.
- ii) Construction of covered pavement with 80 mm thickness in concrete paving block.
- iii) Construction of sidewalks and its surface using concrete.
- iv) Construction of a variable thickness rodbed pavement layer according to the specification of Table 7 from roads project description with CBR = 5 compacted to 93%-95% of the modified AASHTO density.
- v) Construction . Option 1
 - ✓ Construction of the pavement material as a granular sub-base of 150 mm thickness, type G8, compacted at 95%-98% of the modified AASHTO density.
 - ✓ Construction of the pavement material as a stabilized base of 240 mm thickness, C1, compacted at 98% of the modified AASHTO density.
- vi) Construction . Option 2
 - ✓ Construction of the pavement material as a granular sub-base of 150 mm thickness, type G8, compacted at 95%-98% of the modified AASHTO density.
 - ✓ Construction of the pavement material as a 600 mm thickness of granular base, type G4, compacted at 98% -102% of the modified AASHTO density.

The contract also includes the main following works:

1.2.1. Preliminary and General Works

- i) Establishment of a safe shipyard, including offices, sanitation, workshops and others, as requested.

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- ii) Establishment of all personnel, equipment and materials in the local, including the necessary spares parts.
- iii) Contact with affected parts and authorities on the works.
- iv) Orientation of traffic.
- v) Protection of the services where requested.
- vi) Supervision, quality control and measurement of the works

1.2.2. Drainage for Storm Waters

- i) Construction of side channels for pluvial waters.

1.2.3. Roadworks

- i) Cutting and blading to reduce the existing level to the new sub-base top.
- ii) Removal of inadequate material and replacement with imported material (or cutting soil) according to the specification of Table 7 from roads project description, compacted to 93%-95% of modified AASHTO density.
- iii) Construction . Option 1
 - ✓ Construction of the pavement material as a granular sub-base of 150 mm thickness, type G8, compacted at 95%-98% of the modified AASHTO density.
 - ✓ Construction of the pavement material as a stabilized base of 240 mm thickness, C1, compacted at 98% of the modified AASHTO density.
- iv) Construction . Option 2
 - ✓ Construction of the pavement material as a granular sub-base of 150 mm thickness, type G8, compacted at 95%-98% of the modified AASHTO density.
 - ✓ Construction of the pavement material as a 600 mm thickness of granular base, type G4, compacted at 98% -102% of the modified AASHTO density.
- v) Kerbing.
- vi) Paving of the roadway with concrete paving block of 80 mm thickness.
- vii) Construction of 100 mm thickness as subgrade layer for sidewalks type G8 of compacted to 93% Mod AASHTO density.
- viii) Paving of sidewalks with concrete class B25.

1.2.4. Additional works

- i) Assembly of road signs as mentioned.
- ii) Road marking.
- iii) Final finishing of the roadway, including road reserve and treatment of existing roads connecting to main road of this project.

2. Land Nature and Underground Conditions.

The bidders will confirm the site and underground conditions before submission of their proposals, because no protest will be accepted if those conditions differ of the real ones.

3. Aspects that Request Special Attention

3.1. Existent Services

- 3.1.1. No drawings or data have been provided for any other services.
- 3.1.2. Before beginning any part of the works which can affect contiguous services, the Contractor will verify with the several authorities of services if there is any service taking place on the local of works and he will obtain all information regarding the nature and location of such services. He will verify the location of all services which are near the works through handing excavations and shall have the maximum careful when working in its neighborhood.

3.2. Property Protection

- 3.2.1. The Contractor shall ensure that whole private and public property is protected against damages during execution of the works.

3.3. Security

- 3.3.1. The Contractor will be responsible for his personnel's safety and construction plants around the place of the works and for his shipyard's safety and no claim on this will be taken into account by the Employer.

4. Ditch

- 4.1.** The Contractor shall make his own arrangements for the disposal of material to be disposed at the nearest municipal deposit or other deposit that may be approved. The unit prices established for work items involving material disposal shall be estimated to include all costs or fees payable to cover the disposal of material in the approved deposit, including the loading, unloading and transport costs.

5. Local Labour

- 5.1.** The Contractor must use to the maximum the local labour wherever the nature of the works allows.

6. Quality Assurance/Quality Control

- 6.1.** The Contractor shall adopt a high degree of attention and supervision for all aspects of the work aspects. The Contractor will keep up an effective quality monitoring system to assure that the quality of the works is on agreement with the Employer's demands.
- 6.2.** The Contractor will ensure that even the sub-contractors maintain equivalent systems proportional to their particular scope of works.

7. Legal Requirements

- 7.1.** Construction work will also be carried out in accordance with Law 48/73 of July 5, 1973 and the Mozambican Labor Law of July 20, 1998.

PART B: GENERAL TECHNICAL SPECIFICATIONS

The standard specifications (Regulations) allow that certain clauses being specified on the project among material alternatives or construction methods and in cases of additional requirements, being specified in order that they are suitable to a private contract. The details of these alternatives or applicable additional requirements to this contract are contained in this part. This also contains some additional specifications required for this private contract.

In this part of the project specifications, each activity consists of a number of each clause and the payment item in the standard specifications. The number of a clause or payment item that is not part of the clauses or payment items of the standard specifications and which is included in this agreement is indicated by a new number.

1. GENERAL REQUIREMENTS.

1.1. Capacity and Quality Control

1.1.1. The Contractor shall make sure that:

- a) The results of the samples of all the materials are provided to the Supervision for analysis, at least 3 weeks before their request for use in the works.
- b) The written approval of the borrow pits and quarry is obtained before the starting of a construction.
- c) The quality and consistency of the materials are verified regularly, in agreement with the specifications, and the results of the tests are submitted to the Supervision within 24 hours after their conclusion.

1.1.2. Any materials out of the specifications incorporated on the execution of the works will be removed and substituted or modified under the Contractor's responsibility and cost, in accordance with the Supervision's instructions. The Contractor will also support the costs of tests which involve these materials.

1.1.3. In the way to get hold of products acceptance and their quality, the Contractor should evaluate the test results and works measurements.

1.1.4. A signed copy of all tests results will be submitted to the Supervision's representative in the following period, after conclusion of the issued layer:

- i) Relative compaction: 24 Hours
- ii) Indicative Tests: 48 hours
- iii) CBR/UCS: 8 calendar days

1.2. Works Implantation and Landmark Protection

1.2.1. If there are no landmarks, or have been destroyed or displaced, the Contractor shall, on written instruction by the Inspection, install such signs as may be required for the exact adjustment of the works and the monitoring of levels and classes. In this case, a separate payment will be made for the installation of the landmarks.

1.3. Traffic on the Finished Pavement Layers


1.3.1. The traffic on the finished pavement layers of incomplete road will be restricted to the machinery and equipment requested for its construction. Whole remaining traffic, including transport vehicles should be deviated around the works through adjacent roads using temporary road signs

1.3.2. In spite of described sub-item above no traffic on finished stabilized layers will be allowed at least 24 hours after their conclusion, except different agreement by the Supervision.

1.3.3. The Contractor will be responsible for the protection and maintenance of the finished pavement layers opened to traffic and will repair all defects or damages of the layer before covering with subsequent layer, in accordance with the Supervision. No separate payment shall be made for this requirement and full compensation for all costs related to the protection and maintenance of pavements open to traffic shall be included in the unit prices established for the construction of the pavement layers.

1.4. Application rates and composition of dosages

1.4.1. These specifications show the nominal unit prices for the application and for the dosages of the composition. However, actual application prices, sealing and composition mix will be determined by the contractor and submitted to the Inspection at least four (4) weeks prior to its application in construction.

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1.4.2. The prices of application and compaction mix will include the following:

- a) Price of Application of the stabilizing agents (Cement).
- b) Composition of the concrete.

1.4.3. In case of b), it will also include all specified testing materials and demanded materials for these projects

2. SECTION 15.00: ACCOMMODATION OF TRAFFIC

2.1. Item 15.02: General Requirements

2.1.1. (b) Forecast of deviations

Need for details concerning to devices for orientation of traffic will be approved by the Supervision before their setting. The Contractor shall be certified, before competing, that he fulfils all the requirements to do any arrangement for any necessary preventive measures for safety and convenient traffic circulation.

2.2. Measurement and Payment

Item	Unity
15.01: Accommodation of traffic and maintenance of deviations	Lump-Sum

2.2.1. The tendered price shall also include total compensation for whole equipment, material, labour and other unforeseen necessary for the movement and re-use of facilities.

2.2.2. The payment for the accommodation of traffic shall be done as a global value, payable in same monthly installments during the contract duration.

Item	Unity
15.04: Reallocation of traffic-control facilities	Lump-Sum

2.2.3. The mentioned global sum shall include compensations for dismantling, storage, if necessary, transport, raising and inspection of traffic-control facilities, and for all

works, equipment, the respective machinery and incidents, necessary for execution of total work, as specified.

SECTION 23.00: CONCRETE KERBING AND CONCRETE CHANNELING INCLUDING COMPLEMENTARY WORK

2.3. Material

2.3.1. Concrete Kerbing

The prefabricated concrete kerbing (type Fig.7) shall comply with the requirements of SABS 927.

2.3.2. Side Channels

The channels shall be in simple concrete class B25.

2.3.3. Bedding Material

The concrete kerbing and drainage channeling shall be bedded in concrete 13,2/15 of low cone lowering (slump) to prevent differential settlements after its placement.

3. SECTION 25.00: CONCRETE PAVING BLOCKS, STONWORK AND PROTECTION AGAINST EROSION

3.1. Material

3.1.1. Item 25.04 (i): Concrete Paving Blocks


The concrete paving blocks for pavement shall be of class 25 to 35 Mpa, Zig-Zag, type A (S-A) with 80 mm thickness.

3.1.2. Item 25.04 (ii): Concrete for Sidewalks

The concrete to be applied on sidewalks shall be of class 25, with 100 mm thickness.

3.1.3. Placement

The paving block shall be placed with herringbone pattern.

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3.2. Measurement and Payment

3.2.1. Placement of paving blocks

The unit of measurement shall be the square meter (m²) of placed paving blocks.

The tendered price include full compensation to supply, transport and bedding sand as specified and supply the paving block from applicable source, placement as specified, including the machinery, equipment, transport, materials, labour and other unforeseen works.

The tendered price, however, will exclude the preparation and compaction of the foundation soil and sub-base, which will be paid in separate on applicable payment Item of section 33.00 or section 34.00.

3.2.2. Concrete for Sidewalks

The unit of measurement will be the cubic meter (m³) of concrete to be placed in the sidewalks.


The tendered value for this work shall include full compensation to supply, transport and placement, as specified, labour and other unforeseen works.

4. SECTION 33.00: EARTHWORKS

4.1. Cut and Borrow

4.1.1. Use of Cut Material

- a) All suitable excavated and approved materials from the road prism shall, in so far as it is practicable, be used as sub-base (minimum type G8). This material shall be temporarily stored in a previously prepared and approved area to compensate any deficiency material in the sub-base or platform and/or for use as embankment soil in the areas where no appropriate material for foundation layer was removed.
- b) The materials with quality for sub-base shall be temporarily stored in separate deposits, in which each one of them will be clearly marked in accordance with their characteristics.
- c) After conclusion of the works, whole temporary stored material remaining in excess will be removed and deposited in a close and approved windrow, and the storage place shall be cleaned on Supervision's satisfaction.

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4.2. Measurement and Payment

4.2.1. Item 33.07: Removal of Inadequate Material

The tendered price shall also include full compensation for costs of loading, transport and deposit of material.

The following new payment items are added:

Item	Unity
33.14 Backfill of areas where inadequate material is replaced with material at least type G8 compacted to 93% of modified AASHTO density.....cubic meter (m3).	


4.2.2. The unit of measurement will be the cubic meter (m3) of the material with specified quality placed on the excavations where undesirable material was removed and compacted to the specified density.

4.2.3. The tendered price shall include full compensation for obtaining the material with specified quality, either being obtained from cut, borrow, temporary storage or commercial sources, loading, transport, unloading, spreading and compaction of the material to 93% of AASHTO modified density in 200 mm thickness layers or less, such as whole machinery, equipment, labour, materials and other unforeseen necessary to completion the works, as specified.

Item	Unity
33.15: Extra over 33.04 for temporary storage of material ò ò òcubic meter (m3).	

4.2.4. The unit of measurement shall be the cubic meter (m3) of the cut and temporarily stored material on Supervisor's instruction.

4.2.5. The tendered price shall include full compensation for all additional payment costs for Item 33.04 relative to cleaning and preparation of the storage sites, storage and loading of the material in excess, leveling and re-establishment of the sites after the conclusion of the works.

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4.3. Negotiations with Owners and Authorities

4.3.1. No direct payments will be made for any activities that relate to obtaining and extracting material from borrow pits and full compensation for all costs that relate to the opening and operation of borrow pits. The transportation and extraction of the material will be considered as included in the proposed unit prices applicable to the earthworks and / or the pavement layer payment items.

5. SECTION 34.00: PAVEMENT LAYERS OF GRAVEL MATERIAL

5.1. Item 34.01: Material

5.1.1. The suitable material on both pavement and sidewalks shall be at least of type G8, as defined in TRH14, prior to stabilization and at least type C1 after stabilization (CEM I 32.5 - Normal Portland Cement) with a value of UCS after stabilization between 12MPa and 10Mpa and should have at least the following properties:


- i) GM not less than 0,75.
- ii) Plasticity Index (IP) not higher than 12 before stabilization and no higher than 6 after stabilization.
- iii) CBR before stabilization not less than 15% at 93% of modified AASHTO density
- iv) UCS after stabilization not less than 10000 kPa at 100% of modified AASHTO density.

5.2. Measurement and Payment

5.2.1. The unit of measurement shall be the cubic meter (m3) of the material from an existing pavement layer, temporarily levelled to ditch and measured in its original position before removal.

5.2.2. The tendered price shall include full compensation for all additional costs involved in temporary levelling the material to ditch and other previous one and also for cleaning-up work, which will be necessary after the material has been cut.

5.2.3. Only material cut to ditch under Supervisor's instructions, arranged in order to expose the underlying layer shall be measured and paid for. The Levelled or cut

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material from the restricted areas to the ditch and temporarily stacked material will not be paid through this item.

6. SECTION 35.00: STABILIZATION

6.1. Item 35.02: Material

6.1.1. (a) Chemical Stabilizing Agents

The stabilizing agents shall be CEM I 32,5 (Normal Portland Cement), applied at a rate defined by laboratory design by weight.

For this bidding purpose, a nominal application rate of the stabilizing agents shall be assumed as 10%.

6.2. Payment

The real price of application, however, will be stipulated by the Contractor, on the Supervisor's satisfaction, at least one month before beginning the construction of any sub-base, through detailed tests of UCS on application taxes scale.

7. SECTION 54.00: ROAD SIGNS

7.1. Material

7.1.1. Item 54.01: The requested material for signs shall be composed by boards (galvanized steel plates) with bottom painted or colored, symbols, signs and borders in retro-reflective material of Class 1, where the sign boards will be built.

7.1.2. Item 54.03: The requested road sign supports refer to the steel tubing of dimensions and appropriate quality, in agreement with the specified.

7.2. Measurement and Payment

7.2.1. Item 54.03: The unit of measurement of this item shall be in tons (ton) of steel tubing supplied to support the road signs. The tendered value shall include the transport and other necessary unexpected.

- 7.2.2. Item 54.09: For this item, the unit of measurement shall be the number of units of existing road signs, dismantled and stored on place under Supervision's instruction. The tendered payment value shall still compensate the transport to the storage site.

8. SECTION 55.00: ROAD MARKING

8.1. Item 55.02: Material

- 8.1.1. The paint shall be delivered at the site in sealed containers bearing the name of the manufacturer and the type of paint.

The viscosity of the paint shall be such that it can be applied without being thinned.

The colors to be used shall be bright white, red or yellow. The color of the yellow paint shall be as specified in the SADC Road traffic Signs Manual.


8.2. Item 55.05: Surface Preparation

- 8.2.1. Before the paint is applied, the surface shall be clean and dry and completely free from any soil, grease, oil, acid or any other material which will be detrimental to the bond between the paint and the surface. The surface where the paint is to be applied shall be properly cleaned by means of watering, brooming or compressed air if required.

8.3. Measurement and Payment

- 8.3.1. Item 55.02: The unit of measurement for painting lines shall be the kilometer of each specified width of line and the quantity paid for shall be the actual length of the line painted in accordance with the instructions of the Engineer, excluding the length of gaps in broken lines.

The unit of measurement for painting lettering, symbols or traffic-islands markings shall be the square meter, and the quantity to be paid for shall be the actual surface area of lettering, symbols or traffic-island markings completed.

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9. SECTION 58.00: FINISHING THE ROAD, ROAD RESERVE AND TREATING OLD ROADS

9.1. Item 58.01: Finishing the Road Including the Road Reserve

9.1.1. The finishing refers to the final finishing works of the road and their intersections along the reserve.

10. SECTION 71.00: TESTING MATERIALS AND WORKMANSHIP

10.1. Item 71.02: Other Special Testing Requested By the Supervision

10.1.1. This item refers to the testing materials which could be requested by the Supervision, to confirm certain characteristics of the materials to be applied in the work.

10.2. Item 71.02 (a): Measurement and Payment

10.2.1..The tendered value shall include not only the equipment, but also the necessary labour for its accomplishment.