Annex I Scope of required works

Please note that these specifications should be taken into account in addition to those provided in the Bill of Quantities.

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PRELIMINARY SERVICES/TEMPORARY FACILITIES

Site Setup

The Contractor must define the amount and type of the temporary facilities to be necessary during construction works. The use of existing buildings is not envisaged. Structures to be built (e.g. guardhouse) can be considered to house administrative tasks after being built.

EARTHWORKS

Building platform to be compacted to clients Engineers approval.
Compaction tests will be taken by a soils laboratory and properly recorded.
General founding to be in natural ground and/or compacted fill and to the tender specification and satisfaction and client representatives satisfaction.
On completion of the works the site will be cleared of all rubble.
Please consider the potential for existing underground structure. No plans are available for reference.

STRUCTURE

All concreting work is to be carried out in accordance with the relevant Codes of Practice for the particular type of work and with the design of a competent Structural Engineer with placing of reinforcement in accordance with details supplied. Strengths of concrete are specified for the various applications and all work is to be carried out under the supervision of the clients appointed Engineer. Surface beds are to be cast in panels or to have expansion/shrinkage saw cuts.

When premises are located on suspended slabs, then the use of post tensioned floors is not permitted.

For all sub- and superstructure, the following material specifications must be followed, unless stated otherwise:

- Blinding: 10 MPA
- Foundation Footings: 25 MPA
- Concrete Bases to Stub Columns: 25 MPA
- Concrete Columns to Slabs: 30 MPA
- Concrete Mezzanine Slabs: 25 MPA
- Concrete Staircases: 30 MPA
- Concrete Surface Beds: 30 MPA
- High-strength steel for beams, columns and foundations (Fe E 500).
- Welded mesh for flooring and paving.

Prices shall include formwork assembly and disassembly.

Please note that the structure dimensions provided are preliminary, and are subject to minor changes after validation with contractors.

Substructure

The foundations for the warehouse were redesigned and are included in the attached construction plans.

Preliminary estimates were made for the additional structures (i.e. annex building and guardhouse).

Superstructure (warehouse)

Floor

The warehouse floor level should be selected to suit a number of factors:

- Balancing or optimising of bulk earthwork operations.
- Avoiding the risk of flooding in major storms.
- The warehouse floor finish to be a mechanical powerfloat finish.

Generally speaking, the warehouse floor thickness should be designed to accommodate for pallet and racking loads over a 25-year design life.

Floor Hardness & Concrete Sealers

Hardened surface finished smooth and even. The specification is to be designed by a tenderer specialist with experience in warehouse flooring.

Concrete sealer:

- Type 1 (SL-1):
    - L & M Chemical or equal approved Seal Hard of equal approved penetrating silane, sealer/hardener.
- Type 2 (SL-2):
    - L & M Construction Chemicals, Fluohard or equal approve fluo-silicates sealer dust-proofer.

Floor Joints

The floor should consist of un-reinforced panels with joints at a pitch suitable for the racking layout (subject to final confirmation of racking layout design).

Joints should include construction joints; saw cut (contraction) joints and expansion joints to accommodate the various requirements that arise during the construction as well as the long term serviceability of the floor.

Joints shall be properly treated and filled with a suitable joint filling compound, capable of carrying the traffic of lift trucks with polyurethane wheels.

- Movement Joint Sealant:
    - Single-component, polyurethane sealant, meeting Fed. Spec TT-S-00230C, Type II Class A, or BS equivalent with minimum plus-and-minus 25 percent movement capabilities
    - Colour: Custom colours to be determined.

Floor Strength

The floor must be power floated and a specialist floor hardener must be applied to provide a dust free surface for increased durability. The floor surface hardener/sealer is to prevent discolouration of the floor from the spillage of petrochemical products.

Floor Flatness

The internal warehouse floor is to be constructed to a FM2 floor.

'Allowable values of the properties of flatness for free movement areas' Concrete Society Technical Report № 34 fourth edition.

Damp Proofing

All floors and walls are to be damp proofed and as required for good building practice in the particular local area.
Place surface bed directly in damp proof heavy duty polythene sheeting over compacted sub grade laterite fill.

Ant Poisoning & Termite Proofing

To be allowed for.

Internal columns

An optimal structural grid will be determined in conjunction with the structural and logistics engineers in order to optimise the benefits a cost effective yet functional warehouse layout.

Where required in open storage areas, internal columns should be painted 2m high (chevron style black and yellow) to improve their visibility to truck and forklift operations. Protective barriers need to be placed around columns to protect the structure from damage incurred by impact. Columns requiring protection will be specified by client and the appointed industrial consultants.

Warehouse Height

As per attached drawings and WIB Schedule.

It is recommended that a global maximum working height be used allowing forklift reach limitation, eliminating facility/forklift damage.

Roof Structure

As per attached drawings and WIB schedule.

As this is a pharmaceutical warehouse there should be no product exposure to UV light.

Roof Sheeting

As per attached drawings and WIB schedule.

All cavities etc., which might induce the nesting of birds or ingress of vermin must be closed. Anti-bird perch material should be fixed to all exposed trusses.

All roof sheeting to be coated with Radiant Barrier Paint as described below.

Minimum required Functional, Performance and Technical specifications for each item:

1 **2** **Item 1: Radiant Barrier Paint**
3 **Non-toxic**: Free from harmful chemicals such as Alkyl phenol ethoxylates (APEO), heavy metals and with low Volatile Organic Compound (VOC)
Fire resistant
Water resistant

4 Coverage for optimal Radiant Barrier result: Approximately 2-3 m^2 per litre per coat (Maximum 2 coats) applied by roller.
Material to be painted: Adequate for metal, timber and masonry surfaces.
Outside conditions: Adequate for outdoor surfaces of structures situated in tropical regions.
Maintenance: Able to withstand washing with soapy water
Colour: White*****
5 **Drying time** (touch dry): at 25 C dry conditions: Less than 3 hours
6 **Application Methods**: By brush, roller, spray
7 **Storage temperature**: Able to maintain its properties when stored up to 30 C°
8 **Shelf life:** Minimum 2 years
9 Compliance with International standards and or certifications. Please state which here and provide copies as annexes.
10 Warranty: at least 8 years performance warranty.
11 Minimum stock available during the duration of contract: sufficient paint to meet the needs of an average warehouse of 4,000 m2.
12 Maximum delivery time to FCA point: 2 Weeks
Item 2 Insulating Painting Additive
13 **Non-toxic**: Free from harmful chemicals such as Alkyl phenol ethoxylates (APEO), heavy metals and with low Volatile Organic Compound (VOC).
Fire resistant
Suitable for mixing with all kind of paints
Colour: White*****
14 **Storage temperature**: Able to maintain its properties when stored up to 30 C°
15 Shelf life: Minimum 2 years
16 Compliance with International standards and or certifications (please state which) and provide copies as annexes.
17 **Warranty:** at least 8 years performance warranty
18 Maximum delivery time to FCA point: 2 Weeks
Item 3 alternative Radiant Barrier Coating solution
19 Solutions other than items 1 and 2 may be considered in the future and not necessarily within the scope of this ITB, in the case that such alternative solutions result more beneficial in terms of value for money or any other added value.

Thermal Insulation (Sisalation) To Roofs And Side Walls

The tenderer is to make provision for all necessary thermal insulation to roofs and in accordance with the attached bill of quantities. All insulation materials to be fire rated.

Superstructure (mezzanine, annex building and guardhouse)

As per attached drawings.
For the warehouse mezzanine the project considers the provision and installation of steel deck slabs by the constructor. The mezzanine and the annex building consider the adaptation and installation of steel columns from the WIB that will not be used due to alterations from the original project (see Section 4).
For the guardhouse the project considers the use of reinforced concrete structure.

Protection

- Bollards
    - All doors and access ways are to be protected with steel bollards standing 1000 mm above ground. For additional strength, outside bollards are to be sunk into the ground and keyed into position.
- Building Column Protection
    - All exposed external/internal canopy columns are to be protected with a concrete or galvanised steel surround as advised by the Structural Engineer.

MASONRY AND PARTITIONING

Brickwork

No load-bearing brickwork is permitted within the premises without the written consent. Where consent for load-bearing brickwork is given the tenderer is to provide a sign clearly indicating the location and extent of load-bearing brickwork.

Mortars and design mixes for mortars are to be in accordance with the relevant Codes of Practice and shall be approved by the supervising Consultant.

Internal and external walls in the warehouse to be smooth plastered and painted with a high quality washable paint.

Generally, the external envelope is to consist of concrete masonry to a typical height as per the drawings and be suitably braced and stiffened. Warehouse and annex building to be clad with wall sheeting as per attached drawings.

Concrete Masonry Units (CMU):

- 200mm and 150mm thick hollow concrete blocks 3.5KN/mm minimum crushing strength, normal weight, plant cured concrete blocks, uniform in colour and texture and free of chips, cracks and imperfections. Mortar: Portland structural cement (Proportion Specification cement and sand 1:4).
- Use jamb-blocks at door and borrowed-light openings.
- Use prefabricated lintels and bond-beam blocks.
- Use solid-top block as the last (topmost) course.
- Reinforce assembly with mesh and ties where necessary at every third course.

Partitioning

Medium Density Fiberboard overlayed with melamine laminate Partitioning, with glass as per attached drawings, dividing reception, staircase area, warehouse area, narcotics area and offices.

CARPENTRY AND JOINERY

No additional requirements other than those stated in the drawings and BoQ.

METALLIC JOINERY

Doors and windows are to be epoxy powder coated aluminium framed with clear/frosted glass to NBR requirements and sealed with suitable sealant. Window sills externally are to be fibre cement sills, painted with a roadmaking/or similar paint finish.

Main entrance door to be double leaf epoxy powder coated aluminium framed with safety glazing and suitable handles and door closers.

Aluminium doors/ windows

- AAAMSA Architectural Grade Standards.
- Clear glass as per safety standards.
- Openable: Single hung
- Fixed pane
- Exposed Aluminium Finish Architectural Class 1 clear anodized finish (minimum thickness 18 microns).
- Concealed Metals:
    - Aluminium: chemically treated with alodine process.
    - Steel ASTM A123, G90, hot dip galvanised or AAASMA equivalent.

Mirror glass:

- (GL-91): ASTM C1036, Type I, Class 1 Quality q2, 17mm thick glass mirror or SABS equivalent with polished bevelled edges, furnish with brushed stainless steel mirror clips with concealed fasteners (above all wash hand basins).
- Size of mirrors: 900mm H x 600mm W

Obscure glass for all ablutions.

ROOFING

REMAINING METALLIC PIECES FROM THE WIB WILL BE USED FOR THE STRUCTURE OF ROOFING OF THE GUARDHOUSE, ANNEX BUILDING, CANOPIES AND GENERATOR AREA.CEILING AND LINING

Administration area

- Suspended mineral fiber board line ceiling panels size 1200 x 600 to offices, toilets, server room and cleaning room
- Mineral fiber board line ceiling panels size 1200 x 600 with primer, putty and two coats of acrylic paint to battery charging
- Flush plastered ceilings in guardhouse

Battery charging room

Ceiling of battery charging room should be sealed to avoid escape of gases from the room towards the warehouse.

WALL COVERING

Administration Area

External Office Facade

Blockwork plastered and painted with a suitable finish to be maintenance free for the first 5 years and features to create a pleasing architectural aesthetic.

Wall Finish

- **Plaster:**

- One coat plaster – Portland cement plaster built-up to total thickness of 15mm with a fine-sand, wood float-texture over concrete masonry units. Plaster mix materials, and accessories shall be according to Standard Specifications for Materials of the Republic of Guinea Bissau, Interim Metric Edition (All exposed blockwork to be plastered).

- **Exterior Painting:**
  - To the extent practicable, materials with an exterior exposure will be pre-finished by the manufacture.
  - Paint System Dulux or Plascon: Semi-gloss, finish for hollow metal service doors and frames. Colour as selected by the Project Manager from the manufacturers full range of available colour.
  - Paint System Dulux or Plascon: High-performance, opaque urethane finish for structural steel with exterior exposure.

- **Materials Mix:**
  - Cement:
    - Portland cement
    - Aggregate: Well grade natural sand, clean, sharp and suitable of plastering.
    - Water: potable and free of substances that could damage plaster, lath of accessories.

- **Interior Painting:**
  - Painting System for CMU walls:
    - Paint System Dulux or Plascon: Semi-gloss, 100 percent acrylic-resin latex finish.
    - Base 1 coat block filler applied to achieve a smooth surface
    - Primer 1 coat concrete primer
    - Finish 2 coats, minimum, PPG, 6-50 Series, Speed hide Interior Latex Enamel finish

- Toilets – 2.1m high tiled with eggshell enamel paint finish above
- All internal window sills to be tiled

Doors and Ironmongery

- Internal doors to be semi-solid size 813 x 2032mm high in suitable frames
- External doors to be 'wrot meranti flbb' flush back external doors in suitable frames with galvanised steel sheet cladding on the external face
- All doors to be painted with eggshell enamel
- "Solid" door furniture with glass window or similar for visual check prior to opening door
- Rubber door stops
- Master keying is excluded
  - External door locks to be 4 lever and internal locks to be 3 lever
  - Overhead door closer on main warehouse entrance door (D7), staircase circulation door (2 x D4), manager office (D3), entrance to warehouse area (D4), toilets (2 x D1), server room (D1) and narcotics area (D3).

- **Acceptable Ironmongey:**
    - Hinges: Dorma or Cisa 114mm x 114 unless noted otherwise.
    - Lock-and latch-sets: Dorma or Cisa heavy duty commercial mortise sets.
    - Exit Devices: Dorma or Cisa approved.
    - Cylinders: Dorma or Cisa 7-pin, removable core.
    - Emergency strike: Dorma or Cisa approved.
    - Astragal: Dorma or Cisa approved.
    - Closers Manual: Dorma or Cisa series, universal closers with full covers.
    - Coordinator: Dorma or Cisa approved width or door opening.
    - Automatic flush bolts: Dorma or Cisa approved.
    - Push/Pull set: Domra or Cisa approved.
    - Stops/Holders:
        - Wall Stops: Dorma or Cisa approved.
        - Magnetic HO: Dorma or Cisa approved.
    - Protective Plates: Dorma or Cisa approved.
    - Smoke Gasket: Dorma or Cisa approved.
    - Vision Seals: Dorma or Cisa approved.
    - Base metal: Galvanised steel sheet
- Base metal: Galvanised steel sheet, (ASTM A653, A60) pre-treated for paint finish.
- Flush top channel.
- Fill seams with filler and grind smooth before finishing.

Doorframes

- Steel/Aluminium Doorframes – furnish in configuration for single doors with or without transom panels or sidelights as schedules.
    - **Steel doorframes:**
        - **Unitary frames:** One-piece with casing faces welded and ground smooth. Stops shall have hairline-tight butt joints.
        - **Fully welded frames:** one-piece with casing faces, rebates and stops welded from behind and ground smooth.
        - **Fabrication:**
            - Base metal: Cold-rolled, steel sheet, 16-gauge, minimum.
            - Sizes: As schedule by manufacturer with AAAMSA compliance.
            - Finish: Prime painted for scheduled paint finish.
            - Locations: Use unitary frames throughout the work unless fully welded frames are expressly indicated.
            - Use fully welded frames.
    - **Aluminium doorframes:**
        - Doorframes to be compatible to partition system specified.

<u>INTERNAL FLOORS</u>

Floor Finishes

Floor tiles laid on concrete floor to toilets and guardhouse
All other areas to receive polished concrete

WAREHOUSE MISCELLANEOUS

General Air-Conditioning Specifications: enough to keep temperature in warehouse from 20°C to 25°C.

Cold Storage Room

General Design Requirements

- Finish: White Chromadeck finish on outside and inside. Thickness of 0.5mm.
- Thermal Insulation chiller : Rockwool panelling 80mm.
- Box Roof: Depending on height and span of the box, the roof must be suspended from the warehouse structure with steel cable and tin buckle.
- Pedestrian Door:
    - Width of 1500mm x Height of 2000mm sliding door
    - Material same as per fridge.
    - Must be installed with a quality sliding mechanism.
    - Must be able to open from the inside even if locked form the outside.
    - Opening mechanism on the inside must be luminescent.
- Drains: Floor drain with a p-trap for evaporator condensate must be allowed for inside the box. Drain to be connected to this sewer system.
- Lights:
    - 400 LUX rating. (Cool light)
    - Fluorescent tubes with vapour proof light fittings.
    - Switchgear for lights must be designed for cold start conditions.
    - Light switch must be on the outside of the box next to the main service door.
    - Must have indication light on the switch to indicate status of the lights.

- Strip Curtains: To be installed at all external doors – clear type, industrial Grade

Refrigeration Requirements

- The Cold Room Airlock storage to be maintained between 2° and 8° Celsius
- Temperature probes for the control of the evaporator units to be placed at the return-air side.
- Defrost probes must be installed in the coil of the evaporator units.
- Compressor units to be installed in such way to suit the environmental and weather conditions of the facility.
- Product load has been allowed for when designing refrigeration equipment.
- Evaporator coils for redundancy reasons must be positioned for optimum air flow/temperature (e.g. staggering of coils).
- Stacking limit line to be fixed inside fridge 1 000mm lower than evaporator
- oils (to allow for air flow).
- Pipes, electrical wiring etc., must be installed in such a manner not to interfere with the movement of humans, computer equipment or product.
- Holes for pipes etc., must be properly sealed and made good.
- The Compressor unit to be installed in a separate temperature controlled environment to prevent over/under condensing - This area must be lockable.

Electrical

- Main power supply to chiller panel must be a dedicated supply from the generator panel.
- Complete air conditioned warehouse power supply to be supplied with an isolator rated according to tenderers Electrical Engineers specification.

- Individual compressor unit's circuit to be supplied with individual circuit breakers according to specification.
- Compressor to be fitted with an overload of correct value to indicate compressor trip. Compressor trip indicator light to be installed in same position as the Carel controller.
- Power for the chiller lights to be supplied form warehouse light circuit.
- Compressor unit must supply power to its own controlling Carel controller.

Controls

- Compressor unit must be controlled with a Carel controller model IRDRC (din mounted and contacts can be changed to normally open/closed to allow one to configure your own alarm system inputs/outputs).
- Controller to be mounted in control room (position to be specified by NatPharm).
- Controller to be mounted in a suitable DIN rail enclosure.

Offices, reception and server room Air Conditioning

The facility should provide fresh air at a rate of 8l/s per person* into these spaces to achieve comfortable conditions. The fresh air should be connected via individual space terminal air conditioning units, thus providing necessary pre-conditioning to the incoming air. Exhaust will be by natural ex-filtration into the warehouse space or via forced exhaust to toilet accommodation if as anticipated, it is adjacent to the offices, reception and server room spaces. Make-up air should be provided by the office air conditioning system via transfer where available.

It is envisaged that offices will either be in the form of split-packaged units, possibly multi-splits with suitable room side units in the office spaces and the condensing units at a suitable external position. Each unit should then be sized to cater for internal and external loads of the space served with allowance to treat incoming fresh air. The climate specifications within the dispatch offices are 23oC ± 2 oC*. Alternatively, an open plan office structure would require the same specifications.

- Ducting system to open plan office area to be considered. Correct BTU to be specified for each area volume.
- 380 Volt 3 phase 4 wire electrical supply to the switchboard on each of the air conditioning units.
- Water supply adjacent to the air conditioning units.
- Permanent drain points adjacent to each air conditioning unit.
- Provision for framed openings through the building fabric to accommodate the air conditioning equipment.
- Provision of concrete bases for the equipment.

PLUMBING

Plumbing codes and standards:

- International Building Code
- British Standard BS 6700
- Leadership in Effective Energy Design (LEED) principles
- Relevant Local Regulations

Building service piping:

- **Domestic water**
    - The system comprises an elevated water tank (40000L), pressure pump and bladder vessel for cold water supply, and equivalent equipment necessary

for acceptable operation and maintenance of the plumbing fixtures which includes taps, cocks, valves etc. Water would be sourced from the existing water supply piping and borehole into the newly adequately sized tank for use in the warehouse facilities. Domestic water tank are to be strategically positioned on the site for ease of distribution into the building. All domestic taps to be supplied from borehole water tanks.

- **Plumbing Fixtures**
    - All plumbing fixtures would be of standard quality with features of:
        - Durability
        - Water saving in line with LEED, for instance, water closet with 6 litres to 6.5 litres flush cisterns, aerators for minimal usage of water on taps, emergency shower and wash hand basin outside the battery changing room.

- **Sanitary Waste and Vent System**
    - A complete sanitary drainage and vent system to be provided in accordance with SABS 1200 and SABS 0400. Sanitary drainage and vent system would consist of a network of piping connected to fixtures, drains, and equipment that drains by gravity to the septic tank. The sanitary drainage and vent system would be sized using the drainage fixture unit method. Sanitary waste pipes would have minimum slopes of 1:60 and 1:100 in 40mm diameter and 100mm diameter waste pipes, respectively. Vent pipes and vent valves shall be considered for every zone of waste pipes. Floor drains would be provided in all rest rooms and emergency shower. Inspection bend in waste pipes and inspection chambers in the sewer system shall be included in the installations for ease of maintenance.

- **Storm Water System**
    - A storm water system would be provided and designed to accommodate a rainfall rate as required by Code of Geographic Area. The Building storm water drainage system would consist of gutters. The gutters could be drained by exterior rain down pipes

The number, size and type of sinks, basins and other sanitary fittings are all to be in accordance with the requirements of the Local Health and Licensing Authorities.

Cold water is to be supplied to all wash hand basins and sinks and suitably sized geysers positioned locally to avoid long pipe lengths.

- Under slung basins to vanities
- Wall hung vitreous china wash hand basins to ablutions
- Vitreous china wall hung WC pans with flush masters and heavy duty double flap seats
- Office block to have paraplegic toilet
- Building and toilet accessories:
    - Will be commercial quality units fabricated from Type 304 stainless steel with brushed (satin) finish
    - Acceptable manufacturers of Regional equivalent:
        - Franke
        - Kimberley-Clarke Professional
        - Bidvest Steiner

        - TCS Hygiene Products and Services
        - Cobra Standard fixtures
        - Cobra Electronic Faucets (Fixtures)
    - Toilet Paper Holders: Franke no CHRX 672
    - Combination paper towel dispenser/waste receptacle: Franke no RODX 602
    - Liquid soap dispenser: Franke no RODX 619
    - Grab bars (paraplegic toilet): Franke no CNTX 300, CNTX 700A, CNTX 70B

Integrity testing

All plumbing installations should be tested for integrity accordingly.

ELECTRICAL

It should be noted that the specification shall be in accordance with Local and International Standards as noted within the local by laws pertaining to Electrical Installations of premises.

Main Service Provisions

Mains Power:

A plant room in the annex building will connect to the provision of a suitable power to the site.

Client requires a main consumption KWH/KVA meter positioned with ease of reading for the checking of the supply authority metering values.

The installation of a transformer shall be protected by a Circuit Breaker having the following protection: -

- Earth fault.
- Over Load.
- Bucholz protection.
- Over temperature protection.

The protection is to be installed and witnessed by client.

Main Building Earth and Clean Earth

Normal and clean electrical supply earthing certificates are to be issued for both of these, the appropriate cable will be specified by the electrical engineers. (Computer earth to link to Telecommunication Provider earth).

Lightning Protection

The Developer is to provide sufficient lightning protection in accordance with the recommendations of Local and International Standards.

Main LT Distribution Board

The main distribution board shall be installed within the general warehouse area to suit the areas of largest electrical consumption to be determined by the tenderers electrical engineer and the logistics

consultant. It is of paramount importance that the board be rated and certified to the correct fault level as required by the transformer power supply.

The construction of all distribution boards is to be of sound structure, with the following

- Hinged Panels.
- Metal square key catches.
- Engraved Labels
- Legend cards to be fitted onto panels /doors as required.
- All feeds over 200 amps to be coppered.
- No welding cables to be used under any conditions.
- No reverse circuit breaker feed will be accepted.
- The main distribution board is to have a KWH meter or similar to confirm configuration, this is the same as noted above as the check meter.

All distribution boards are to be white, with colour panels being: -

a) Normal – Orange
b) Emergency – Red
c) UPS- Blue.

The main board is to be supplied with power factor correction. This is to be included in the submission as the ventilation and battery bay loadings forms significant part of the connected Load.

A standby generator is included in the bill of quantities and the tenderer to allow for the following:
- Cables from and to the generator.
- All room requirements.
- Fire approval for the diesel tank.
- Handling, Off Loading, Positioning and Commissioning of the Unit, should this be required.

It should be noted that besides lighting, the standby plant will feed the office and the battery bay.

There is a need for a energy transfer switch to allow changing from energy sources (EAGB, generator).

Main Feeders

It should be noted that besides the standard power provisions to the warehouse and offices the following would be required to be allowed for as the base submission: -

- Ventilation/Cooling – Warehouse Main Plant
- Battery Bay Distribution Board and Reticulation

Other power requirements are to be provided for inclusive of the distribution boards and the associated requirements.

Ancillary Buildings and Guardhouse

Power and Services: (to be assessed on final design)

- All wall mounted plug points in the warehouse to be 1.5m from floor to avoid damage from pallet handling.

Note: All dedicated SSO to be on emergency power

Battery Charger Area (for information only): -

- 1 x 400 volt SSO (32 amp units) at 2100 affl
- (Provision in DB / cabling for 10 % expansion)

Note: Lighting and the general installation to this area to be vapour proof unless rationalized alternatively.

All units to be of type welding plug, male and female components to be provided.

Power for air conditioning and ventilation system is to be provided for as per the nominated air-conditioning contractor.

Lighting

All gear to be electronic.

Important: Light fittings/globes should be of very low or preferably zero UV radiation type.

General:

Warehouse lighting refer to bill of quantities

LOCATION	AREA OF ACTIVITY	MIN. LX LEVEL
Outdoor Areas	• Bulk loading / unloading areas where manual operations are performed • Storage areas (e.g. waste skip yard) • Marshalling yards • Main entrance & exit	50 50 20 200
Warehouses & Marshalling Areas	• Shelf & flow rack packing area • Manifesting counters • Receiving & despatch • Bulk racking area	400 500 400 200

The light fittings are to be so positioned that they provide for the racking and bulk storage area layout, ensuring that the light level design is consistent within the racking area and the open storage area.

Switching is to be provided for in a 30 / 30 / 40 percentage split throughout the warehouse to allow for the control of light levels. The first 30 percentage must be on emergency power. (Lighting to be controlled from security control room)

External Lighting

External lighting will be individually powered solar lights 40W with 6m poles which will provide lighting to the compound and exterior fence. Lighting to be inclusive of all solar requirements and individual foundations. The positions of the solar lighting poles are shown on drawing number CHO-2-001 Site Plan.

Minimum lux levels measured at boundary fence to be 20 lux.

Emergency Lighting

Emergency/escape lighting system shall conform to the requirements of the Local Authority's Fire Officer.

The emergency lighting systems shall comprise a 1-hour self-contained non-maintained system converting designated general purpose luminaries within office areas or utilising devoted fittings.

Emergency lighting shall be provided as a minimum to each external exit door, each internal emergency exit door, changes in direction or level along emergency access routes and as appropriate to open plan and other areas.

Emergency lighting is to be provided to all essential rooms and areas on a 50 % basis.

Emergency lighting is to be provided at all electrical panels.

External Special Requirements

Connections to the following gate house provisions required: -

Guardhouse

Lighting as required.

Power, 1 Off Normal SSO and 1 Off Telephone outlet on power skirting at 1200 affl.

Special Notes

No surface wiring will be allowed, all wiring to be either cast in, in ceiling voids or in galvanized conduit. All distribution boards are to be manufactured by an approved manufacturer; client must approve size of the distribution boards, general arrangement drawings prior to manufacture. (All boards should be fault level cascaded)

All plant rooms and areas must be provided with small power and lighting as per the industry norm should it not be detailed specifically above.

Lighting is to be provided under any loading canopy as indicated on the clients drawings.

Lighting circuits are to be provided for the cold room lighting, lighting to these areas by others.

FIRE PROTECTION

As a generalization it is anticipated that hose reels and portable fire extinguishers will be required as a norm. An external hydrant is also a requirement. The compatibility of the hydrant with local requirements needs to be checked accordingly with competent authorities.
An 800mm border should be left as fire access around the internal perimeter of the warehouse.

Fire Extinguishers

It is envisaged that hand held fire extinguishers will be required within the warehouse. The size, type

and final locations should be determined based on the appropriate fire code and internal warehouse layout. (Halon extinguishers are not to be used.)

Fire Extinguisher Cabinet (FE-1): Steel unit constructed with rolled edges for semi-recessed installation. Steel tub shall have inside dimensions of 267mm wide x 601mm high x 152mm deep with welded joints grind smooth.

- Use rated tub construction where applicable
- Trim type: Radiused
- Door: Solid door with break glass insert and key lock.
- Acceptable Product: J.L. Industries: Ambassador Model 1015B20

  Fire Extinguisher Bracket (FE-2): Wall mounted bracket sized for each extinguisher. Manufacturer's standard bracket with strap to secure fire extinguisher.
- Provide bracket at each mechanical and electrical room
- Acceptable product: J.L. Industries: Model MB846, for ABC Dry Chemical
  Fire Extinguishers: Provide hand held fire extinguishers as per approved fire plan/design.

Smoke Detection

Sufficient Smoke detection connected to the alarm throughout buildings required.

Fire Water Supply and Pressure

Appropriate tanks, pumps and standby pumps for the total fire system (hydrants and fire hose reels) must be installed with pump house and all peripherals.

Fire Detection and Fire Alarm System

A conventional fire alarm system needs to be provided with a central control panel. The position of the panel needs to be discussed further; a good position would be close to the main entrance. The system should allow for smoke detectors or beams mounted at high level within the warehouse (to be installed by another party). A detection grid should be provided for in the office area, which has a high fire risk. Small bells should be placed in the office environment to maintain maximum noise levels to acceptable levels. Flashing xenon beacons should be provided in areas with high ambient noise levels.

Break glass units should be provided on the final escape doors from the office. Wiring should be in red flexible fire resistant cable, which should be installed on cable trays within trunking.

General

An emergency assembly area needs to be allocated and demarcated with signage. It must be away from product and buildings.

WATERPROOFING

Waterproofing of the warehouse and surrounding structures is particularly important as there is a need to keep the supplies to be stored away from humidity. The availability of waterproofing materials and techniques in Guinea-Bissau is limited, therefore it is expected that the Contractor provides detailed information on their recommended approach to this item.

Roofing

Cover insulation (from the bottom up) including vertical, horizontal, embouchure, pinwheel or similar system trim:

- Application of a layer of lightweight concrete or screed with slope formation on the roof with 2-5%

slope, free of irregularities and dust.
- Application of bituminous emulsion type "IMPERKOTE" or equivalent.
- Application of bituminous membrane type "POLYPLAS 30" or equivalent.
- Application of bituminous membrane type "POLYSTER 40 T" or equivalent.
- Coating of building eaves with zync plates.

Groundfloor pavement and foundations

- Well-compacted soil around foundations, including cleaning of all foundation elements;
- Waterproofing of buried elements in contact with the ground based on pasty products of "FLINTKOTE" type asphalt resins, applied in two to three coats, including all preparatory work and application accessories, primary, or similar products available (to be confirmed based on availability);
    - Including walls that are in contact with the ground (up to 40 cm).
- Application of 250 g/m2 geotextile on well compacted soil, including overlays and all necessary work;
- Well-compacted rock-stone layer;
- Application of PVC Film including all necessary works;
- Installation of electro-welded net of class A500, type Malhasol CQ30, including folds, overlaps, breaks, labor and according to the project;
- Application of concrete C20/25 (B25) with a thickness of 0.15 m, including all necessary work.

Expansion joints

- External expansion joint sealing on the facades, with a 25 mm round polyethylene foam cord of the type "ROUNDEX" from BETTOR or equivalent, sealing with two component mastic and permanent elasticity, type "CAUCHOMASTIC 2C" of BETTOR or equivalent, including gasket filling with compressible material (polyethylene or expanded polystyrene strands) and support preparation;
- Sealing of internal expansion joints in walls, ceilings and floors of the upper floor, with polyethylene foam cord of circular cross-section of 25 mm, type "ROUDEX" from BETTOR or equivalent and sealing with mastic, type "MASTERFLEX 472 "of BETTOR or equivalent, including filling the joint with compressible material and support preparation;
- Expansion joint sealing on the floor of the lower floor, with PVC inner joint system, type "BETTOR DI-24" or equivalent, polyethylene foam cord of circular cross-section of 25 mm, type "ROUNDEX" from BETTOR or equivalent and final sealing with type mastic "MASTERFLEX" from BETTOR or equivalent.

Integrity Testing

A flood-test must be conducted on the roofing of all waterproofed installations as to ensure water tightness. Recommended water depth is 100 mm.

EXTERNAL AREAS

New Guardhouse and Gate Access Control

- In Lane and out lane with electronic booms
- One automatically operated 7 500mm wide x 2 100mm high sliding gate to entrance. Gate to match fence profile.
- Small kiosk for security with toilet facility
- Counter tops as required
- Air-conditioning is required
- Internal finishes similar to those in the general office and ablution areas

The Guardhouse is to be designed to house 2 security guards who perform search and access control

functions.

The Guardhouse design is to suit general aesthetic of the office building with adequate visibility to monitor all movements at the entrance.

Guardhouse

A guardhouse constructed from 150mm block work with plaster and paint finish on internal and external walling over a 450mm concrete foundations strip, 150mm thick solid block wall foundation, 75mm thick reinforced slab complete with mild steel door and aluminium window frames with glazed sliding window and solid timber door leafs, roofed with white IBR Chromadek roof sheeting on steel frames including 4mm Alucusion insulation, electrical fittings and plumbing fittings as shown on Architects & Engineers drawings. All to comply with the Standard Specification for Materials and Workmanship for Building Works for the Government of Guinea Bissau.

Plant Room

Electrical room constructed from 150mm block work with plaster and paint finish on external walling over a 450mm concrete foundation strip, 150mm thick solid block wall foundation, 75mm thick reinforced slab.

The Electrical Room and Battery Charging Stores, all as required by the Electricity Department and the Electrical Consultant are to be provided by the Professional Team in accordance with the relevant Supply Authority's requirements. Everything necessary to conform with the proper Codes of Practice in this regard is to be provided.

Electrical boards need to be lockable

Roads, Staging and Hardstand Areas

Pending a detailed logistics report, the Professional Team should assume the need of new paved roads serving the medical storage hub facility.

This allowance will need to include feeder roads from municipal roads, loading and unloading areas & truck turning areas and staging area. Roads and hard standings will generally consist of 80mm thick interlock paving blocks. Pavement thickness should be selected to suit anticipated axle loads and design life (*25 years**) as well as subsoil conditions. The paving blocks and sub-base is to be properly engineered and designed.

Paving must be designed to take cognisance of all vehicle turning movements and incorporate flexibility with respect to vehicle sizes, etc.

Road markings and safety signage should be provided for. Side walks should be landscaped. Road positioning should be inline with the relevant legislation regarding distances from building, rail lines and site boundaries.

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Parking Areas

Construction

The construction of the Parking Areas shall be carried out in accordance with the design specification.

Parking Areas Generally

The drawings are to show all parking areas and driveways, properly demarcated, and showing kerbs, drive-

ins, parking bays and general circulation. Minimum size of internal parking bays to be 2,5 x 5m. Minimum width of internal roadways to be 6 500 and main roadways to be 9 000.

a) Proper illumination of Parking Areas.

Walls and Gates

Clearvu Fence will be installed on the gateways as per the logistics study recommendation.

Gates should consist of sliding steelwork gates, suitably painted. – **Height: 2.1m.** Provision is to be made for automation and access control.

CCTV Surveillances

Closed circuit TV needs to be considered as an option. The feasibility of installing cable ducts and draw chambers within the medical storage hub site for future installation of CCTV in operational sensitive areas needs to be evaluated. Suitable sleeves and conduits are to be provided and chased into brickwork.

Access Control

Access control is divided into personnel access and vehicle access.

All personnel access should be controlled using turnstiles (dual turnstiles at the gate, warehouse entrance as well as office area entrance. Only one access control point into the warehouse and office is required, however consideration needs to be taken of any emergency exit requirements

Access into the various areas will be controlled as per authorisation level of the individual affected. Furthermore, all turnstile access points need to incorporate a manual, lockable, pedestrian gate for access by disabled personnel and for managing exceptional situations.

The installation of an internal warehouse alarm system should be considered only once the internal equipping design has been finalised. The alarm installation will be under direct advice from Protection services upon the completion of the warehouse design.

Access control technology will be based on a access card throughout the warehouse.

- Security access
- Warehouse staff
- Office staff
- Visitors

Paving

The Contractor should specify the material for paving, based on the following assumptions:

- Paving entails both subsurface earthworks and placement of pavement material (e.g. asphalt, blocks or similar).
- Anticipated movement of trucks of up to 40 tons and forklifts in the areas surrounding the warehouse.
- Appropriate stormwater drainage capabilities (including subsurface and superficial structures) so as to avoid flooding, considering that original terrain has a slight slope down towards southeast, and potential flooding hotspots include docks area.

SITE CLEAN-UP

Includes cleaning of internal and external areas and disposition of debris and leftovers in adequate containers, which should then be disposed of according to local requirements.

CONSTRUCTION OVERSIGHT

This includes administrative-related materials and services that are strictly associated to the conduction of construction works for this project, as well as the technical oversight to be carried out by an engineer or architect, who should remain onsite full-time during working hours.

MISSING ITEMS

The contract should add here all items that it understands are not originally included in the scope of work and BoQ. Only materials and services that are essential to the completion of the construction works must be added.
Recommendations on better practices for any of the construction elements are also welcomed, but shall be discussed separately.

MODIFICATIONS FROM ORIGINAL WAREHOUSE-IN-A-BOX PROJECT

As stated previously, the warehouse to be built (item 1) is of the Warehouse-in-a-Box model. This model is comprised of a standardised design and associated construction guidelines in combination with the shipment of construction materials.

For the purpose of this project, the original design has been modified as follows:

- Axis 04, 05, 06, 07, 13, 14, 15 and 16 have been removed due to space limitations.
- Door openings have been modified in location and size. Original doors must be modified as follows:
    - Door 5 (3 units – fire escape): 1 unit as originally designed; 2 units with the same dimension, but different locations.
    - Remaining warehouse doors must be purchased and have their openings changed:
        - Door 7 (1 unit) 1,80 x 2,10 m (item 6.1.3)
        - Door 8 (3 units) 3,00 x 3,50 m (item 6.3.5)
- Roofing ridges should not be of ventilated type, as to reduce indoor humidity (item 7.7 of the BoQ).
- Original wall translucent tiles must be replaced by opaque ones as per attached drawing.
- Foundations have been redesigned as per attached construction plans.

Please note: all of these modifications are reflected in the construction plans provided in Attachment 1. Nevertheless, WIB-specific information in Attachment 2 does not include these changes.

TESTING

- Preconstruction Testing: Submit certified copies of test reports. If testing is more than 6-months old submit certification that products delivered will be identical in performance to tested products:
    - Mortar Tests: Test mortars for conformance to BS requirements for the indicated mortar types.
    - Concrete Masonry Units: Test each type of concrete masonry unit indicated, for strength, absorption and moisture content using ASTM C140

- Windows:
    - For structural performance use ASTM E 330 or AAAMSA equivalent.
    - For water resistance test use ASTM E 31 or AAAMSA equivalent.
    - For air infiltration testing use ASTM E 29 or AAAMSA equivalent.
    - For condensation resistance factor use AAMA 1503.1 or AAAMSA equivalent.

- Field Testing: Submit certified copies of test reports.
    - Masonry Test: Test prisms made with delivered materials using ASTM E447, method or BS equivalent.
    - Windows: Conduct at least two ASTM E 29 air leakage tests of installed windows including perimeter caulking. The Project Manager to select test sites. Conduct and additional test for each failed test at site selected by the Project Manager.

CONSULTANTS DESIGN

Tenderers to allow for the following consultants fees:

- design
- drawings
- details issue
- compliance certificate issue

Disciplines to be included:

- Civil Engineer
- Structural Engineer
- Electrical Engineer

EXCLUSIONS

Although specifically excluded from the above Project Specification, some of the following items could be undertaken as extensions to the construction contract once the necessary information becomes available, these items eventually attended to by Professional Team at the Lessee's request, these shall be at an extra cost to be agreed upon. Notwithstanding this, all necessary builder's work pertaining to this specialist work is to be carried by the Professional Team.

1. Telephone, PABX, intercom and Public Address System.
2. Loose furniture, fittings and lockers.
3. Office equipment and computers.
4. Canteen furniture and benches.
5. Any work directly related to the installation and functioning of any plant or production equipment or electrical reticulation for same or for liquid, solid or gas installation.
6. Any special provisions related to dealing with spillage or chemical containment, other than specified.
7. Security systems (burglar alarms / burglar proofing).
8. UPS
9. Racking.
10. Reach trucks & forklifts
11. Internal fencing
12. Battery charging equipment
13. Compressors & airlines
14. Computer and data cabling
15. Safes, Strong and record room doors, and shelving
16. Relocation costs

17. Consumer deposits
18. Diesel tanks and bowers
19. Stoves, fridges, microwaves and all other operational equipment
20. Client signage