

Annex III

SCOPE OF REQUIRED WORKS

Table of Contents

KEY DATA.....	2
SECTION 1: SITE PREPARATION	2
1.1 SITE PLANNING	2
1.2 SITE PREPARATION.....	2
1.2.1 Compacted Base Instead of Concrete	2
1.2.2 Concrete Slab.....	3
SECTION 2. BUILDING STRUCTURE	5
2.1 BUILDING STRUCTURE.....	5
2.1.1 Salient Features.....	5
2.1.2 Steel Base Design	5
2.1.3 Floor Design	6
2.1.4 Wall and Ceiling Design.....	6
2.1.5 Roof Design	7
2.1.6 Doors.....	8
2.1.7 Security Doors & Grilles.....	9
2.1.8 Windows.....	9
2.1.9 Heating, Ventilation and Air Conditioning (HVAC).....	10
2.2 ELECTRICAL.....	10
2.3 FITOUT	11
2.3.1 Adjustable Steel Shelving	12
2.3.2 Office Fitout.....	12
2.3.3 Fire Extinguishers.....	13

KEY DATA

Summary of Areas

Office Area	=	9.6m ²
Storage Area	=	67m ²
Total Area	=	76.6m ²

SECTION 1: SITE PREPARATION

1.1 SITE PLANNING

The site shall be cleared of any undergrowth, buildings, hardstand areas, foundations, bases and other redundant installations as is reasonably required to construct the new structures.

Removal of existing buildings, if any, shall be undertaken by an approved demolition contractor and, where applicable, asbestos and other hazardous materials by a licensed contractor. The contractor shall ensure that, during the clearance works, all mains services and existing drainage systems etc. shall be disconnected/protected as appropriate.

The contractor shall remove or treat any contaminated ground encountered either prior to, or during, the progress of the works. Where possible, any suitable, re-usable topsoil shall be stripped and kept on site for re-use during landscaping works.

Excavation/filling shall be carried out over the site to achieve the required formation level. Where necessary additional imported materials shall be validated to ensure their geotechnical and chemical suitability for the works.

Please note that these preparations are a guideline only and a registered engineer should be consulted in-country to sign off on the correct site preparation procedures.

The site preparation drawings are for illustrative purposes only.

1.2 SITE PREPARATION

1.2.1 Compacted Base Instead of Concrete

- Begin by removing all organic material (weeds, grass, etc.) and anything that will eventually decay or decompose.
- Depending on the soil conditions in your area, bring in 50mm to 100mm of a compactable base (crushed stone and stone dust, granite chips, crushed limestone, paver base, recycled concrete, etc.)

- Level and compact as much as possible using a plate compactor, for those areas without access to equipment compacting with a hand stamp should be adequate.

1.2.2 Concrete Slab

There are two general specifications based on whether the soil conditions are poor/good in the area for installation of the units.

a) Good soil condition:

- 100mm thick 25 Mpa/ 19mm stone reinforced concrete slab with steel float finish. The reinforcing should be Mesh 395.
- The size of the slab should be 300mm wider than the building on all sides.

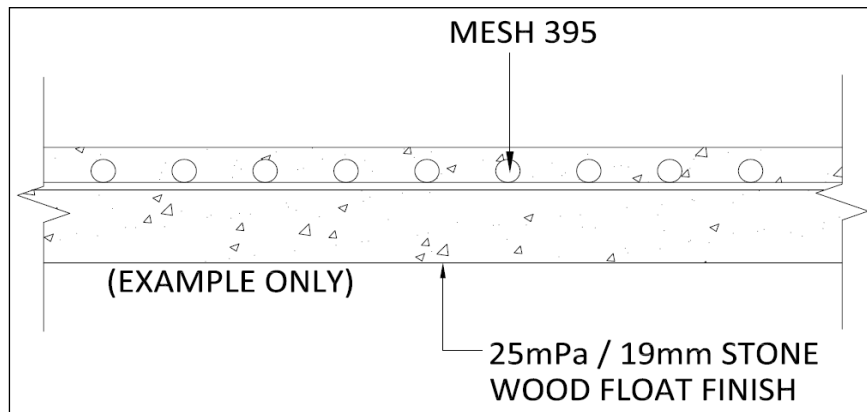


Figure 1: Sectional view slab preparation for good soil conditions

b) Poor soil condition:

- 100mm thick 30 Mpa/ 19mm stone reinforced concrete slab with steel float finish. The reinforcing should be Mesh 395. On the perimeter as well as in the middle of the slab there should be a 450mm x 250mm wide ground beam with 2 Y12 bars, top and bottom and R8 stirrups spaced 300mm c/c.

The size of the slab should be 300mm wider than the building on all sides.

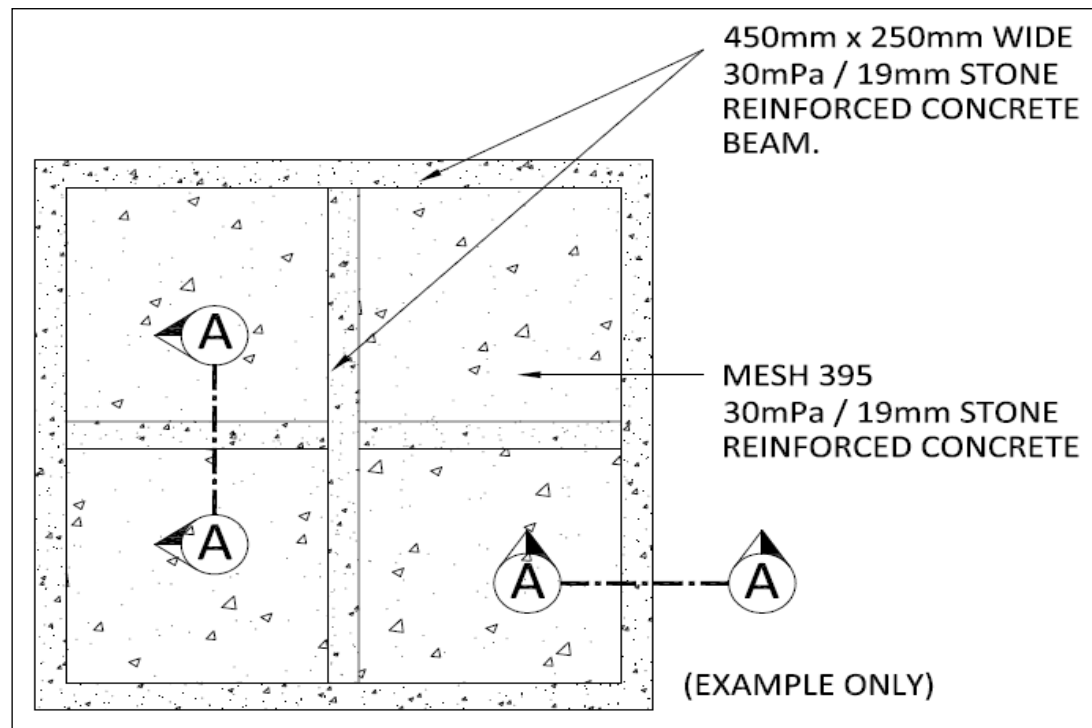


Figure 2. Plan view on slab preparation for poor soil conditions

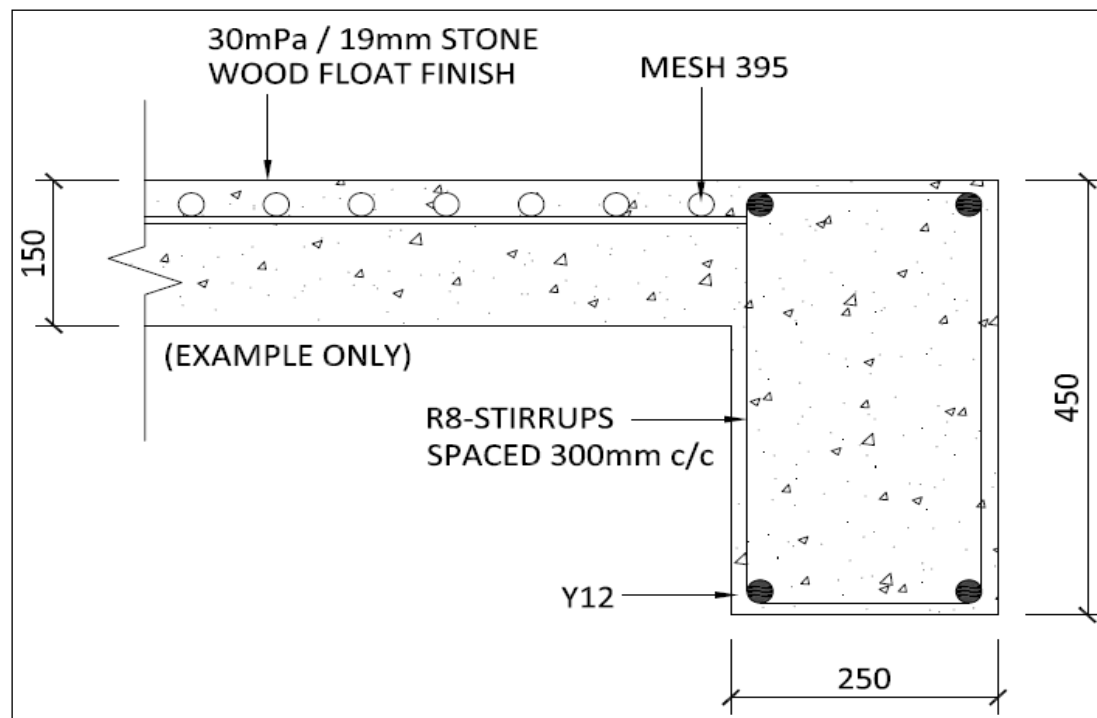


Figure 3. Sectional view A-A on slab preparation for poor soil conditions

SECTION 2. BUILDING STRUCTURE

2.1 BUILDING STRUCTURE

2.1.1 Salient Features

The prefabricated modular buildings shall be designed keeping in view to optimize the following factors:

- Energy efficiency
- Indoor temperature control
- Weather protection
- Termite resistant
- Operational and functional for purpose

Other features of the prefabricated modular buildings include, but are not limited to, the following:

- A buildings internal office configuration can vary to suit a desired architectural plan however must be pointed out in the Bidders offer.
- There shall be minimal work on-site to erect/assemble and disassemble the building using only basic hand tools and unskilled labours.
- The building materials shall have lowest feasible embodied energy, carbon emission and life cycle cost including final disposal/recycling cost.
- The building design and construction shall focus on sustainability aspects.
- The buildings shall be light but robust enough to cater for the design loads, effects of different weather and climatic conditions etc.
- The building shall have at least 10-years life expectancy.

2.1.2 Steel Base Design

The sub-base of the pre-fabricated structure shall consist of a steel framework to ensure the levelness and flatness of the structure and further permit separation of the finished floor from its concrete base structure. The steelwork material shall be prepared in such manner to avoid corrosion when the base is constructed on the concrete floor. In addition to the foundation bearing members, the prefabricated building shall be secured to the ground to deter horizontal movement.

The prefabricated building's galvanized steel chassis shall be designed to take the full dead and imposed loadings according to the span expected between ground supports.

The recommended chassis design for the base to be

considered:

- Galvanized steel ladder frame chassis with a C-profile channel main runner beams and lipped-channel joists fastened on to concrete the concrete platform described earlier.
- Typically measures 150mm above platform level.
- Loading capability of 230Mpa (2mm) commercial grade steel.
- Material protection Z200 galvanised.

2.1.3 Floor Design

The floor of the prefabricated building structure is to be designed and manufactured with a non-permeable floor ensuring a smooth and hygienic finish suitable for good pharmaceutical storage practice.

Floors shall be constructed with a framed structure, load bearing flooring panel spanning over the structural members as described in this document with an internal floor finish layer. The underside of the framed structure will be enclosed with a lining panel. The overall floor thickness shall be proposed by bidder keeping in view the required level of thermal insulation, acoustic and other requirements.

The floor layer shall be made from durable material with emphasis on tear resistant and easy to clean features.

The recommended floor design shall consider the following:

- Preferably sheet vinyl floor, with coved corners in the joints between floor and walls to form integral skirting to facilitate cleaning.
- Welded joints to minimise potential areas for contamination.
- Surface finish to be non-slip to likely wet areas, anti-bacterial, anti-fungal and water resistant wall and ceiling lining to facilitate cleaning
- The floors must be fabricated with termite resistant materials.

2.1.4 Wall and Ceiling Design

The materials for walls shall be of panellised construction. The outer surface material shall be a washable, durable material, in a white or light colour. The core of the panel may be a solid material such as foam or a framed construction with added insulation. The inner surface material shall be a durable smooth surfaced material. It may have either an integral colour or a painted finish. The joints between panels and between panels and frames shall be tongue and groove type or other interlocking type. The overall wall thickness shall be proposed by Bidder keeping in view the

required level of thermal insulation, weathering and other requirements.

The recommended wall and ceiling design shall consider the following:

- All external and internal walls are to have a minimum thickness of 50mm and to be of composite material containing a middle insulation layer of high quality foam core, (such as extruded polystyrene or polyurethane or equivalent).
- External walls are to be weather resistant and coated with an anti-rust material.
- Internal walls and ceilings are to consist of flush panels with a smooth finish, not requiring painting for maintenance, with an “easy clean” antiseptic finish suitable for pharmaceutical storage practice.
- No asbestos is acceptable in any material or composite form.
- All walls internal and external are to be coloured White.

2.1.5 Roof Design

The materials for roofs shall be of panellised 75mm 15DV Chromodek IBR construction. The outer surface material shall be a IBR profiled steel sheet, with integral surface coating of zinc/aluminium or similar corrosion resistant coating in a Beige colour. The core of the panel may be a solid material such as foam or a framed construction with added insulation. The inner surface material shall be a durable smooth surfaced material. It shall have a Beige colour finish. The roof joints between panels must be waterproof and shall be tongue and groove type or other interlocking type.

The overall roof thickness shall be proposed by Bidder keeping in view the required level of thermal insulation, acoustic and other requirements. Eaves shall be designed in such a manner that direct sunlight penetration into windows is reduced where feasible to do so.

The roof shall allow easy installation of a rainwater harvesting system subject to confirmation by the User. The Bidder may propose a basic system for rainwater harvesting in the modular building mainly considering rain water collection from the roof and possible storage and outlet arrangements next to the building. However, the installation of complete rain water harvesting system is outside the scope of this works.

The slope of the roof shall be sufficient enough for the rainwater to drain easily. The Bidder may also propose simple truss for the roof but the vertical load shall be transmitted via the wall only. All

design parameters and details must be included in the Bidders technical proposal along with assembly/dis-assembly details.

The recommended roof design shall consider the following:

- The roof structure will comprise of insulated composite panels with galvanized IBR roof sheets. Roof structure to be self-supporting and attached to both walls. The mono pitch roof must have sufficient slope to allow for drainage. The roof must have gable ends vertical or sloping to prevent rain water entering the roof space.
- Ceiling panels will be designed out of pre-fabricated composite panels (min 100mm thick panels).
- uPVC gutters manufactured of approved material of 75mm or 100mm nominal size are to be installed, complete with end caps, downpipes, and splash blocks to direct rainfall away from building. If the ground is not a hard surface, then the ground immediately below the splash blocks is to be covered with stone to deter soil erosion.
- Should the location of prefabricated structure be positioned remotely for any existing stormwater channel or drain, then soakaway pits are to be considered for the dispersion of rainwater existing the downwater pipe. Soakaways for areas less than 100m² have traditionally been built as square or circular pits, either filled with rubble or lined with dry jointed brickwork or pre-cast perforated concrete ring units surrounded by suitable granular backfill.
- The fall of the roof is min.5 degrees from back to front of building. Roof pitch is indicated on the side elevation on the drawing.

2.1.6 Doors

All external doors shall be of sandwich type (coated aluminium sheets with Polyurethane foam core or similar). The exact thickness of the door panels shall be determined and proposed by the Bidder based on the energy efficiency and compatibility with wall of the building.

Door frames shall be made from either aluminium extruded sections with thermal break features with powder coat finish, or a combination material to match the door panels, and be of similar colour as the building.

Exterior doors will be lockable with three sets of keys for each lock. Elements of the door, such as hinges, locks and handles will be robust and highly resistant to rough use.

Internal doors and frames shall be compatible systems. Elements of the door, such as hinges, locks and handles will be robust and highly resistant to rough use.

Descriptions of all door types shall be proposed and described by the Bidder in their tender proposal.

The recommended doors for the building shall consider the following:

- One weatherproof external double door including frame measuring 1600mm wide.
- One semi-solid hardwood door including frame measuring 815mm wide.
- Where double doors are to be installed, the left hand leaf should be fitted with top and bottom stainless steel flush bolts. Mortice locks should be fitted unless otherwise specified.
- Door heights should not exceed 2.1m.
- Doors, sills and thresholds to incorporate sufficient sealing and weather strips made consisting of either rubber or neoprene. The proposed sealing methodology by the Bidder must cognisance of frequent door use and longevity for the lifetime of the building.
- A single door is to be fitted with automatic closers of the appropriate specification for the door size / weight. The closer will ensure that opening doors limit the loss of cold air from within the building.
- Locks should be oval profile to accommodate a typical Mortice Deadlock type cylinder.
- All ironmongery to be stainless steel, high quality, robust and suitable for a frequent number of operations. Additional door protection should be considered for the double doors where trolleys are used.

2.1.7 Security Doors & Grilles

The building shall require a security door to the outside of the double doors and single door (specified above) and security grilles over windows. The security doors shall be robust doors mounted in compatible frames securely fixed to the structure. These must be inclusive of deadbolts, strike plate reinforcement, fixed pin hinges and other strengthening/ intrusion protection devices able to withstand basic aggressive intruder activity. The security grilles to windows shall be made of galvanized or powder-coated steel rods in angle frames securely fixed to the structure and similar in colour with the windows.

As mandatory extra component, the Bidder shall design and propose the security doors and security grilles and include all details in their tender proposal.

2.1.8 Windows

The frames and window sashes shall be made from either aluminium extruded sections with thermal break features with powder coat finish, PVC or a combination of those or other materials and be of similar colour as the building.

Window sashes shall be the awning type within the frame. The awning window will be lockable from the inside of the building. Elements of the window such as frame, hinges, locks and handles will be robust and highly resistant to rough use.

The recommended window for the building shall consider the following:

- Aluminium window measuring 900mm X 1200mm.
- Opening to be top-hung fitted with security grilles to all panes.
- Preferably Silver tinted glass (reflecting) including venetian blinds to limit solar ingress.

2.1.9 Heating, Ventilation and Air Conditioning (HVAC)

All modules are insulated reducing the need for significant heating and cooling equipment to a minimum. The operational context in which this building may be deployed will determine the type of heating, ventilation and air-conditioning equipment to be provided.

The indoor temperature shall be maintained between 15°C to 25°C.

The environment of the modular building installation will require an energy efficient window-wall air-conditioning system. These systems shall take into account design criteria such as simplicity, durability and economic operational characteristics, as well as the requirements listed below:

- All refrigerants used must be free of ozone depleting substances.
- Air Conditioners shall be quantified and sized accordingly to volumetrically cool 200m³.
- Air Conditioners with the automatic climate control capacity only for cooling modes between 2.5 to 3.5Kw.
- The Air Conditioners to be supplied with sufficient protection and security brackets to prevent theft from the exterior of the building.
- The Air Conditioners to be fitted with a “trickle” drain to direct the flow of condensation away from the façade of the building.

The Bidder shall provide a detailed summary of all the proposed HVAC systems in their Technical Proposal, demonstrating that these criteria are met along with Technical Brochures and other relevant documents.

2.2 ELECTRICAL

The electrical system shall be designed to meet the following minimum requirements:

- Standards: Zambia Bureau of Standards & Regulation or international equivalent.
- Voltage: 220-240 Volts AC.

- Frequency: 50-60Hz
- Power Distribution: to be determined on the country of delivery.
- Wiring: PVC insulated wire; size to be determined based on voltage and frequency.
- Circuit: Circuit breaker, Ampere to be determined based on voltage and frequency.
- Socket Outlets: Minimum of two double outlets per area of operation, plugs configured to suit the country requirements as below. In the case heating or air-conditioning is selected in the order extra sockets will be required for this provision. The electrical socket types for the Republic of Zambia are one of three types:
 - Adapter for "Type C" European CEE 7/16 Europlug
 - Adapter for "Type G" British BS-1363
 - Adapter for "Type D" Indian BS-546
- Lighting Fixtures: Energy Efficient CFLs or LEDs to be provided throughout. Bidders shall provide details of proposed fixtures in their technical proposal. Lighting to comprise of the following:
 - The office should have its own light switch that is controllable by the office occupant.
 - All internal area lighting shall be solar powered and linked to operate with motion detection sensors, so that only areas that are occupied are lit and areas that are not occupied will have their lights automatically turned off after a set time limit. An override switch with pilot light is to be located in the distribution board panel that may allow the normal light switching should the motion detection sensors fail.
- Required Illumination:
 - Storage area = 200 lux.
 - Office area = 500 lux.
- Main distribution boards with sufficient Earth Leakage capability shall be included in the supply of the building.
- Due to voltage fluctuations of the main electrical supply in Zambia, the Bidder should consider in their supply an Automatic Voltage Regulator (AVR) for the typical protection of the air conditioning systems. The function of an AVR is to ensure voltage generated from power inflow is running smooth to maintain the stable voltage in specified limit. It can stabilize the voltage value when suddenly change of load for power supply demand.
- Bidder shall provide a detailed summary of the proposed systems in the technical proposal, demonstrating that these criteria are met with technical brochures and other relevant documents as necessary.

2.3 FITOUT

The functional of the modular building will facilitate the operational

requirements for the secure, temperature control and storage of pharmaceutical products up to their point of use.

The building will be fitted out with the following items:

2.3.1 Adjustable Steel Shelving

The Bibber is to supply adjustable steel shelving with interchangeable steel components. Shelf loading capacity shall be an evenly distributed load of minimum 100kg Uniformly Distributed Load (UDL) with no deflection across the shelf front flange. Components shall be as follows:

- 2134mm high Posts for Open Shelving Units: Gauge and size of posts as necessary to support, without deformation, specified shelf loading; punched on 38mm centers to receive clips for vertical adjustment of shelves, and to receive angle or corner sway braces.
 - Rear End Posts: Single angle posts.
 - Front End Posts: Single angle posts.
 - Front and Rear Intermediate Posts: Two single posts forming T posts.
- Bays: 48-off Bays at 914mm centers. Note the configuration on drawing PFU-001 PRE-FABRICATED STORAGE UNIT Rev.B.
- Shelves: 5-off Shelf levels per bay measuring 914mm x 610mm Box formed shelves with face and return flange on at least front and rear edges; of strength to support specified loading without exceeding deflection limit; 0.8mm minimum; punched for shelf or bin dividers, label holders, and angle or corner sway braces; top shelf may be bolted to front posts.
- Shelf fastening: Manufacturer's standard galvanised bolts and nuts or boltless shelf clipping if deemed practical.
- Shelf stabilisation by means of gusset plates fastened to posts and to each shelf level as a minimum.
- Baseplate: Steel feet to underside of posts to protect floor finish.
- All components shall be free from sharp edges and protrusions and shall be galvanised or epoxy coated in a colour available from the manufacturer.

2.3.2 Office Fitout

Steel Desk: The desk shall comprise of preferably Black epoxy coated mild steelwork frame (Black)Framework Epoxy coated mild steel. The work surface shall measure typically 1200mm X 600mm X 32mm manufactured from post-formed laminated material (Formica) which has a scratch resistant finish and edged all round. Two lockable drawer units to be underslung from frame

and work surface approx. 450mm wide X 500mm deep X 140mm high.

Swivel Chair: The typical chair dimensions 450mm seat height, overall height 900mm, width around 600mm and depth around 550mm. Supplied in a Black durable material with swivel and tilt function. Chair to be gas height adjustable and moveable by means of swivel castors.

Steel Stationary Cupboard: The lockable double door cupboard is to comprise of epoxy coated mild steel material finish measuring 1200mm wide X 600mm deep X 1800mm high.

Waste Bin: Two waste bins with a 20L capacity each.

2.3.3 Fire Extinguishers.

A sufficient quantity of fire extinguishers with a minimum 4.5kg capacity and type configured to suit likely hazard classification must be fitted in the storage and office area. The extinguishers shall be fixed to a wall mounted bracket sized for each extinguisher in accordance to the manufacturer's standard. Bidders shall provide details of the proposed equipment in their technical proposal.