Specifications for

Shade net structure for Ndabakazi community project

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1 Scope of work

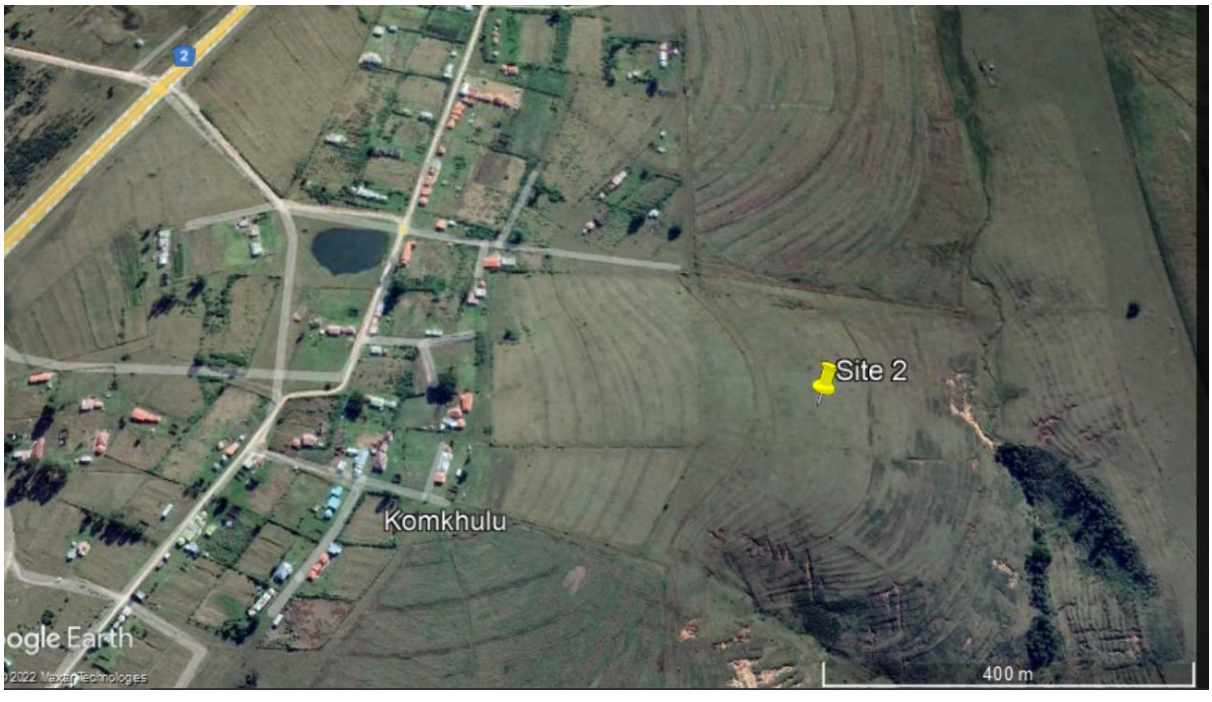
1. To erect a flat roof shade net structure of 30 x 30m
2. Cultivate land
3. Fence
4. Ablution facility in container
5. Irrigation and water reticulation
6. Container conversion
7. Assist in Eskom connection in paying all fees to Eskom
8. GB 1 and above

2 Location of site where the structure will be erected

Coordinates: -32. 388407° 27. 95721842°

3 Photo of site

4 Google earth photo of site



5 Specification of shade net structure

- 30m X 30m ShareNet structure
- The sides of the structure must be covered with the same net as the roof.
- Sides must be at an angle of 45 degrees
- The minimum cover area of the structure must be 900m^2,

5.1. Poles

- Gum or Saligna poles (CCA) treated)
- Poles length: 3 m x 100 - 125mm diameter
- Plant at a depth of 500 mm
- Configuration is as shown in Figure 3
- The soil around the poles must be properly compacted

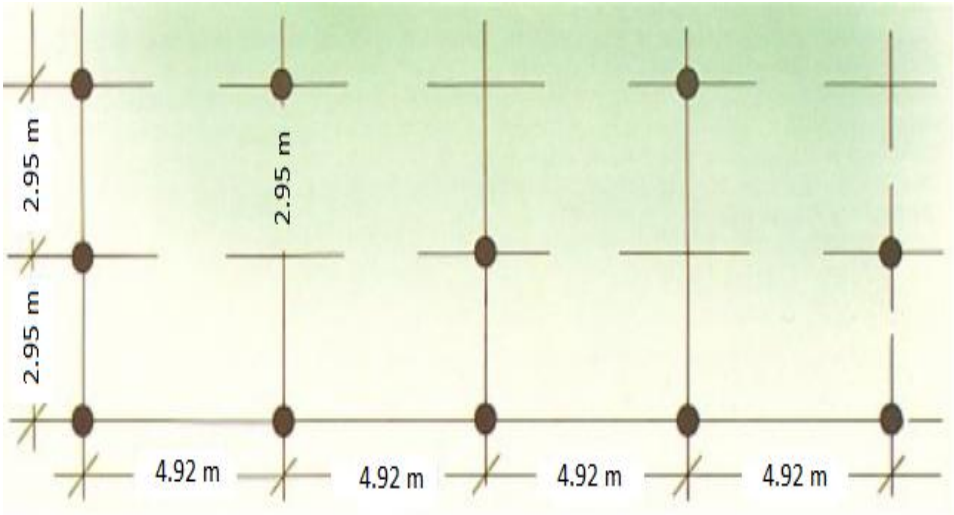


Fig 1: Orientation of poles

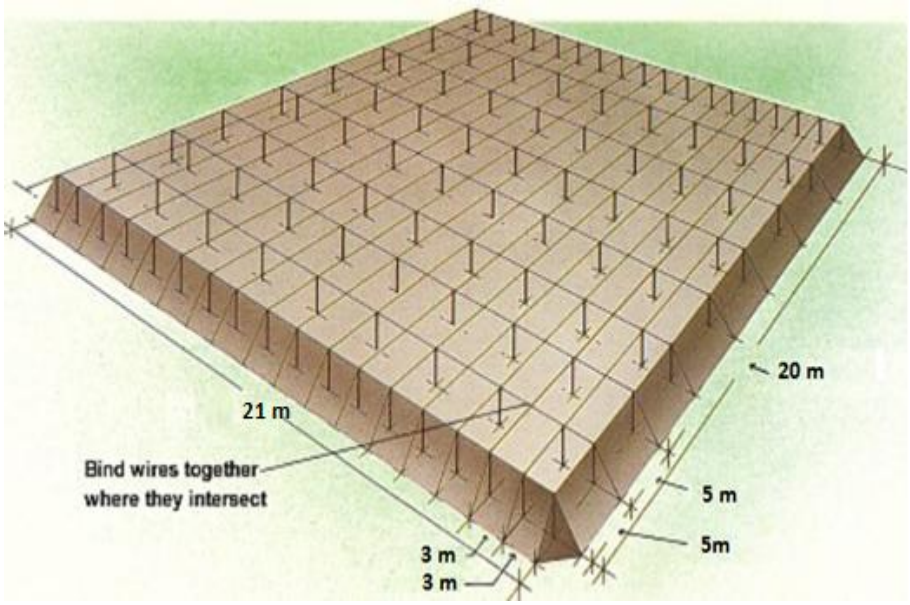


Fig 2: Overall dimensions of structure (should be adapted to the requested size)

5.2. Anchoring

Any one of the 2 methods can be used:

- Dig a hole about 1 metre from the corner pole, tie your support-wire (Double 2,5 mm galvanized wire) around a car-tire and refill the hole with soil. The car-tyre should not protrude above the ground.
- Tie your support-wire (Double 2,5 mm galvanized wire) around a Y standard – 1m long, then hammer the peg at an angle of 45 degrees until it is below ground level.

5.3. Steel wire

- High-tensile, minimum 2,25mm cross wire through the pre-drilled holes, 100mm from the top of the pole, at tops of each row of the poles

- All wires must be heavy galvanized
- Bind all edge wires and cross wires together wherever they intersect.
- Stay cables or wires must be stronger than the horizontal wires or cables used in the structure.
- The load-bearing surface of the anchor must be at 90 degrees to the stay.
- The stay must not be more than 45 degrees to the horizontal.
- Metal connections in contact with the ground must be at least 12mm in diameter and galvanized or well-treated for rust prevention.
- If eyebolts are used, they must be twice the diameter of the cable, and the eyes must be welded.
- When twisting up 4mm diameter wire for stays, the final twist must be permanently locked in order to retain tension.

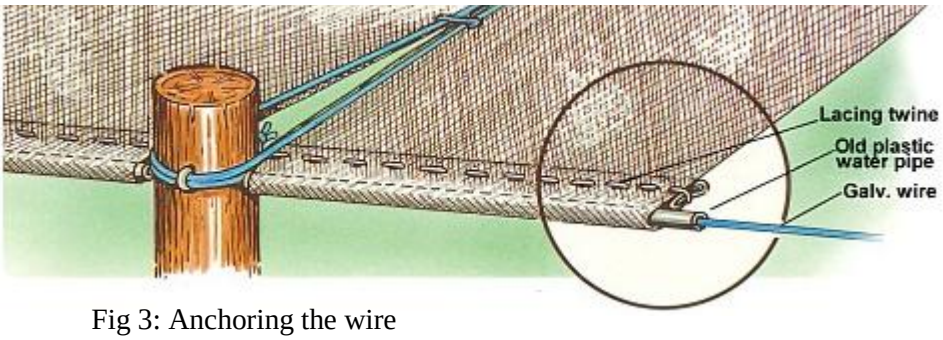


Fig 3: Anchoring the wire

5.4. Wrap netting

Fig 4: Wrapping of net arround the poles

- Where a pole come in contact with the tight horizontal shade net, a extra pieze of shade net must be wrap at a minimum of 2 layers around the pole.
- The Net around the pole must be minimum 200 high with the horizontal tight net in the middle.
- The wrap Net around the pole must be staple to the pole.

5.5. Shade Net

- Colour: White
- Percentage shade: 40%
- Minimum standard: Similar or equal to Alnet's monofilament twine to stitch pieces of shade cloth together.
- All sides at ground level must be buried minimum depth 250 mm with a 250x250 soil on top of the net

5.6. Nursery Entrance/Gate

- One gate for entrance is needed, Minimum width of 1 m.
- Gate pole Gum or Saligna poles (CCA) treated) hole and pole minimum depth 1 m. Pole diameter minimum 100 – 125 mm wood.
- Steel gate frame (hot dipped galvanised after welding), wrap with shade cloth and stitch with similar or equals to Alnet's monofilament twine (or equivalent quality).
- Gate must have proper lock mechanism.
- 50mm pad lock

5.7. Netting specification

- Height of fence & gate netting: 1,8 meter above ground
- Aperture size of the mesh must not be more than 50mm
- Minimum diameter of netting wire: 3.15 mm
- All wires and steel must be hot dipped galvanizing, SABS 935 for coastal areas
- Mesh must be supported by minimum 5 straining wires of diameter 4 mm
- The mesh must be attached to the top straining wire at each aperture
- The mesh must be attached to the bottom straining wire at 150mm intervals

5.8. Brick plants beds

- 60 (Quantity), Brick beds (4m length, 0.5m high and 1m width),
- with a 1m pathway spacing between
- Foundations for walls, 0.5 x 0.2m with 10Mpa Concrete
- 120 m3 Soil to fill plant beds

6 Land preparation 0.5ha (±70m x 70m)

- Cut in all grasses and other plants on the soil surface with a disc harrow. In a second operation use a disk harrow again and cut in the crass 90° with the first operation.
- The soil must be ripped and cross ripped, at a 45-degree angle to a minimum depth of 600 mm,
- Ploughed to a minimum depth of 450 mm.
- 5 Tons Kraal manure must be broadcasted to the entire area, and ploughed back in the soil, with the use of a mouldboard plough.
- Once the weeds are approximately 150 mm in height, the area must be disced to cut in the weeds. The discing activity must be repeated at least 3 times.
- Once the occurrence of weeds is minimal, the area must be ridged.
- Ridges must be formed with a row spacing of 1.6 meters centre to centre
- Ridges must have a flat area of 300 - 350 mm wide, for single row planting

- If necessary, roads of approximately 4 meters wide in between blocks must be made to allow movement and turning of tractors and farm machinery.

7 Water & Irrigation

7.1. Borehole equipping

- Install single phase, 220V borehole pump, Minimum 800l/h, +/-2.2kW
- See: borehole test report, borehole is121m deep. Pump must be at 100m dept
- Electric cable from borehole pump & motor to the Ablution facility.
- Full protection: Overload protection, Pump stalled protection, Dry run protection, Under-voltage protection and Over-voltage protection

7.2. Irrigation for shade netting structure

- The aim is to irrigate 500mm per season
- The borehole pump must supply the irrigation and must be switch on by irrigation controller or Manual
- Shade net must be divided into 4 irrigation zones
- With irrigation controller, 24V solenoids, mesh filters etc. It must be housed in container
- Dripper line, 400mm spacing, 2.35L / hour per emitter
- 15 Dripper lines @ each 30m long

7.3. Irrigation for plough Land

- Supply x6 plastic 20mm bib taps in the land, anker to 50 – 75 mm poles (CCA) treated. Equally space at the edge of the land
- Two, 22mm x 50m hosepipe with connection to taps
- All connected with minimum 32mm pipe class 6, 500mm underneath the natural ground level

8 Fencing and Gate

8.1. Fence

- Cleaning of fence area, 2m on both sides (total 4m) of the fence of all grasses, trees, shrubs etc. (Mechanically, i.e. it must be bare ground)
- **Length of fence 460m**
- 1.8m Gate Corner Post Cap And Base plate 3mx101mm with Pad locks.
- 3000 x 150 x 2mm Galvanized gate posts
- 3000 x100 x 2mm Galvanized straining/corner posts
- 3000 x 60 x 2mm Galvanized intermediate posts
- Post is spaced not more than 30 m apart
- 60 x 2mm stays for Galvanized corner and straining posts
- 4 strands of 4mm Galvanized straining wire
- Post bases in 350X350X600mm deep concrete
- Concrete strength 20 MPa
- The concrete must be built up to a minimum height of 50 mm above ground level and sloped down.
- 1.8m height Razor Wire Mesh

8.2. Intermediate Y standards

- Y-standard must be bitumen coated
- Total length = 2,4 meter
- The Y standards are spaced at distances of not more than 3 meters apart.

8.3. Gate

- Supply and install 3000 x 1800mm x 1 sliding gates match fencing, lockable manually operated gates with rail and 60mm heavy duty wheels
- 40 x 40 x 5 angel iron rail for gate in 300x300 concrete.
- Gate must be lockable with pad lock
- 1 x 50mm Pad lock
- All steel must be hot dipped galvanize
- Frame of gate manufacture of 100 x 50 x 2 squire tubing

9 Ablution facility, Kitchen and storeroom

The unit should be built in a 12m refurbished container, with isolated walls and an isolated ceiling.

- Water reticulation, sewer and connections
- The tenderer is responsible for the refurbishment of the container.
- Apron of 1m must be cast around the facility. Use the same specs as above. Steel floating surface finish

9.1. Walls and ceilings (inside and division walls)

- 40mm polystyrene insulation with Chromadek cladding Two one-sided chromadek steel panels similar or equivalent to Isowall construction walls and double-sided on stand-alone walls
- 0,5 mm Chromadek,
- Chromadek Colour: Fish Eagle white

9.2. Windows

- The window light area shall be a min of 10% of the floor area per room.
- The window opening area shall be a min of 5% of the floor area per room.
- Glass panes shall be in accordance with the SANS/SABS 0137-2000 Code of Practice.
- All glass must be safety glass film so that broken glass cannot fell into products.
- Mentis grid must be welded in front of all windows within a 38 x 38 x3 sqeur tubing frame

9.3. Safety gates

- Install safety gates to all outside doors (3 x single door (NOT TOILETS)
- 38 x 38 x 3mm squer tubing frame with mentis grid inside frame

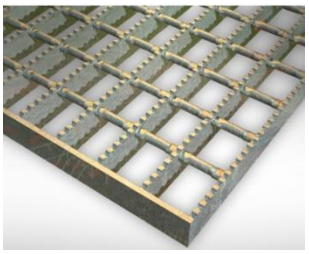
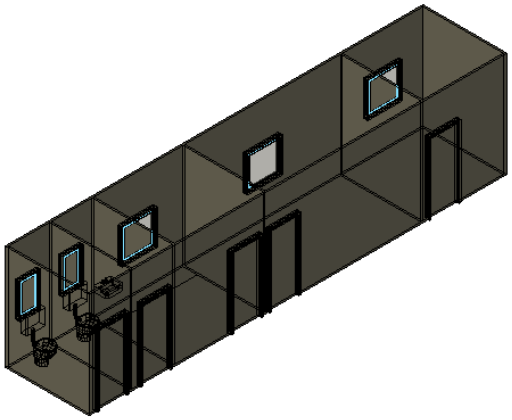
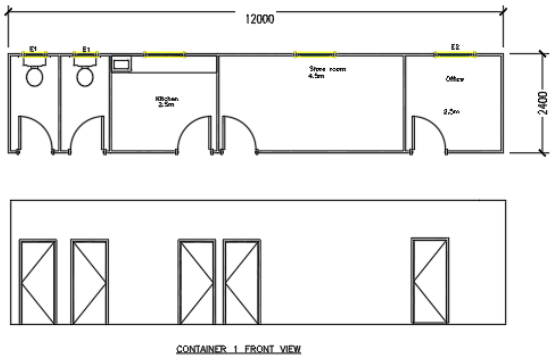


Photo of mentis grid

- Ultra lock
- 2 x Bullet hinges 100x50
- Remove all welding splatters.
- All metal to be clean, dry and dust-free, painted with one coat red oxide base etching primer and apply two coats of enamel black. Paint to manufacturer's specification.
- Ablution part of the container must have SABS approved toilets





9.4. Doors

- 4x external Chromadek doors (840 x 2040).

9.5. Flooring

- Marley industrial flooring on existing container floor

10 Electrical reticulation

There is a lot of theft and vandalism in the area. All wires must be hide away.

All cable from transformer to Container and pump

500mm under neath the natural ground level (Prevent theft)

Distribution board, earth leakage, 1x 15 amp plug points, 15 amp for borehole pump

- 1 x plug in each room
- 1 x flood lights
- CoC for the installation

11 Eskom application

- Assist ARC/beneficiary by applying for the 20A pre paid metering point at the Eskom office on behalf of beneficiary.
- Pay all application fees and deposits need by Eskom for the application on behalf of ARC/beneficiary
- Load an amount of R1000-00 on the pre-paid account on the day you give the site back to the ARC (Snag list is completed)

12 Contingency

- An amount of R50 000 will be approved for variations and contingency.
- No variations or contingency will be valid, unless approved by the Research Team Manager: Crop Science in writing.
- The ARC has the right not to spend this contingency or only part of it.
- The R50 000 must be clearly stated in the quotation as Contingency

13 Price breakdown

There is a limited budget for this project. The ARC has the right to choose only certain aspects of the quotation as set out in the detail's specification document. One contractor will do the selected work. The remaining work will be re-advertised in the new financial year.

Items	Quantity requires	Price/Unit	Price (Exc VAT)
1. Shade netting structure	900 m²		R
2. Brick beds	60	R /bed	R
3. Soil to fill plant beds	120 m³	R / m³	R
4. Land preparation	5 000 m²	R /m²	R
5. Borehole equipping			R
6. Irrigation for shade netting structure			R
7. Irrigation for plough Land			R
8. Fencing and Gate			R
9. Container, Ablution facility, Kitchen and storeroom			R
10. Electrical reticulation			R
11. Eskom application			R
12. Pre paid Electricity			R 1 000
13. Contingency			R50 000
		Total	**R**
		15% VAT	**R**
		Grand Total	**R**