

NOTE

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Projectnr. : 66800
 Subject : Malaika Kids Tanzania



INSTALLATION INSTRUCTIONS

1. General information:

The electrical installations for Malaika Kids Village will mainly consist of three (3) completely different electrical systems.

- The main lighting system: this system will power most of the fittings in the village.
- The main power supply: this system will power all the fans as well as the power sockets etc.
- The emergency (and night) lighting system: this system will power a number of selected fittings in the village.

The "main" and the "main power supply" systems will only work when the generator is running.

In addition to this the following is applicable.

- In the general buildings (Kitchen /Garage, School buildings, Staff quarters) the fittings for emergency lighting can be switched on and of.
- Outside (covered walkways and underneath the veranda's) the fittings will be functional permanently.
- The basic lighting in the Shower block (D building) will be operated with a motion detector.
 In For every shower/toilet room one detector must be mounted.
 Fittings in the corridors in D building will be manually switched.
- For the living quarter the main switch will be mounted in the Shower block (D building), near the distribution board.

THIS IS IMPORTANT! It's not allowed to mix the different systems. Therefore each of the central cable boxes should be marked (e.g. with a "permanent" felt tip pen or paint) with either a "1" a "2" or a "3" for the systems or group there connected to.



2. **Installation.**

2.1. General.

- 2.1.1. For this installation the contractor should use a system of so called "central cable boxes".
- 2.1.2. Connections to all individual parts of the installations should only be made from those central cable boxes.
(Example: From one central box near the main door of a building one cable will go to the switch(es) on the door frame.
Then various cables will go from that central box to all the relevant fittings, fans wall sockets or next cable box.
For this next cable box the situation will repeat itself.
All cables should only enter the "central cable boxes" after fitting proper swivels.
The grey outside insulation should be at least 3 to 5 mm visible inside the cable boxes.
- 2.1.3. All connections between cables should be made using proper wire connectors. No more than 5 wire connectors are allowed in one cable box, with a maximum of 5 wires per connector.
- 2.1.4. All metal parts (from fittings and other parts to be grounded) need to be connected to an grounding wire (Yellow-Green).
- 2.1.5. Switches for lighting and switches for the ventilators should be fitted on the door frames at an height of 175 cm, measured from floor level.
All sockets should be fitted on the wall plate (the wooden beam on top of the layers of Hydraform blocks).
- 2.1.6. When installing a one phase power socket the active wire (Brown) should be on the left side of the socket; the neutral (blue) should be fitted on the right.
- 2.1.7. For security reasons it is important that both the live wire (Brown) as well as the neutral (Blue) will be switched on and off at the same time in the distribution board(s).

2.2. Cables in the ground.

- 2.2.1. Only cables which are mechanically protected by means of a metal braided shield can be used in the earth.
Such cables have to be laid at a depth of at least 60 cm.
- 2.2.2. Cables underneath a road need to be laid thru a PVC pipe.
With the cabling is pulled thru, a rope (three times the length of the pipe) need to be pulled thru as well.
Mentioned rope can be used for pulling thru future cabling.
The PVC pipe needs to be properly closed off (removable) on both sides.
- 2.2.3. The braided metal shield of the ground cables need to be connected with the grounding rail of the distribution board.



- 2.2.4. Connections in the earth need to be avoided.
However, if necessary, it is essential to ensure the connections are protected from moist and water.
For this a cable sleeve is used.
This unit is (after making the proper connections) filled up with a water resistant and isolating resin which hardens after it has been poured into the sleeve.
- 2.3. Cables; general.
- 2.3.1. When using cables, please use the following colour code:
- Green-Yellow : Protection (grounding).
 - Blue : Neutral.
 - Brown : Live or switched live.
 - Black : Live or switched live.
 - Grey : Live or switched live.
- 2.3.2. Minimal diameter of copper cores for lights and power sockets is 1,5 mm².
- 2.4. Cables: fitting
- 2.4.1. To ensure the cables will stay straight on the walls etc. it is important that cables are fitted to the surface as follows:
- Horizontal : every 30cm.
 - Vertical : every 40cm.
- 2.4.2. Never more then 30cm of the outside insulation layer of the cable should be taken off.
In other words, the maximum individual wire length visible inside a connection box, fitting etc. should never be more then 30cm.
- 2.4.3. Inside a fitting there should be enough length of cable to make it possible to make changes if and when needed at a later time.
It needs to be possible to fit a connection box at a later moment at the location of that fitting without having to install new cables.
- 2.5. Grounding:
- 2.5.1. For central grounding a duct needs to be laid down from the ground rail of the main switch board in G2/G3 building into the ground.
Grounding ducts need to be laid at a depth of at least 60cm, formed in a loop or ring(s).
Distance in between loop or ring(s) must be 100cm.
3. **Testing and commissioning.**
- 3.1. General.
- 3.1.1. All connections and connection boxes should be made in places where they can be approached and opened for inspection, testing and maintenance.
Cable connections in ground (sleeves) are excluded.
- 3.1.2. The installation needs to be tested before commissioning.
A report of this testing needs to be supplied to the principal and the commissioning officer.



- 3.1.3. The total of installations and cabling needs to be clearly drawn on a drawing by the contractor.
This drawing will be handed over to the principle and will stay on location near the central distribution board in the G2/G3 building.
- 3.2. Testing methods.
- 3.2.1. The herewith described testing methods are an example; other methods can be used as long as they will give test results with equal reliability.
- 3.2.2. The following tests need to be executed if and where relevant (and if possible) in the order described here:
- Visual inspection.
 - Measuring the "insulation value" of the electrical installation.
 - Checking the automatic switch off of the power supply in case of short circuit(s).
 - Determination of the correct polarity.
 - Checking the phases sequence.
 - Measuring the line to ground voltage.
 - Measuring the loss of voltage over the installation.
- 3.2.3. Measurements and tests which result in a defect or shortcoming need to be repeated until such moment that the defect or shortcoming has been overcome. Also all earlier measurements of which it is possible that they have been influenced by the defect or shortcoming, need to be repeated and the results recorded.

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