

Technical Specifications in General for Wild Elephants

SALIENT FEATURES OF THE SOLAR FENCING SYSTEM

- The system will be a non-lethal Solar Powered system to ward off wild animals and Elephants in particular.
- The system will operate as a psychological and physical barrier for the wild animals.
- The system will alert any kind of intrusion through an audio alarm that can be in the vicinity of more than 350meters, within 2 seconds.
- The Solar Powered fence system will produce a high voltage at an energy output of 3.5 Joules (Variable & set at factory to meet site requirement), which will act as an active deterrent, a physical barrier and a reliable protection system for the villagers.
- The fence system produces a high voltage in the range of 6.0 kV to 7.9 kV to deter, detect and deny physical intrusion by giving the Animal a short, sharp and painful shock.
- The Energizer will be able to check the fence around 50 times a minute and the instant the pulsated wires are tampered, a built-in-alarm will immediately alert the monitoring personnel.
- External Alarm will be activated within two seconds. As a precautionary means an internal alarm is provided as a substitute in case of failure of external alarm.
- 12V / 90 AH Battery (Reputed Make) along with electronic system will be kept in a protected place, preferably in a house near the fence.
- 12V / 74Wp Solar PV Module of reputed make will be supplied, which can generate the required power at 25 deg. C, along with Battery. Battery shall provide a backup of more than 48 Hrs. in the event of complete darkness or solar power input failure.
- Auxiliary supply of 230V AC shall be provided by User, optional.

Critical Component details:

1. Energizer:

Crown Solar - Model No.: CS 250 confirming to BIS 302-2-76 (1999) and IEC 335-2-76 (1997) stands for safety.

- a. Input voltage : 12 V DC
- b. Input current : <500 mA
- c. Output voltage : 6.0 KV on 500 Ohm load
- d. Pulse interval : 1.2 second
- e. Pulse duration : 3 m second
- f. Output energy : 3.5 Joules

2. Solar Powered Energizer shall be installed over a reach of specified length with 5 strands with Energizer installed at every 2 to 3 KM. Any tamper / intrusion / unwanted activation of the fence will be suitably annunciated with audio alarm system.
3. Warning signboards will be placed at every pathway along the fence and also at every 50 meters.
4. Sections will be maintained at every 250 to 350m, based on the site conditions, of fence length for easy troubleshooting.
5. Battery: 12V 90/100AH rechargeable Maintenance-free Lead Acid Battery of reputed make will be used for storing the energy and the same shall be utilized to power the Fence system.
6. Charger: Solar PV module of rating 12V / 74W from a reputed company will be used as a battery charger.
7. Lighting Diverter: Lighting Diverter kit will be provided to protect the Solar fence system from Lighting. The details of the same are:

Lightning can cause serious damage to the energizer. When Lightning strikes close to or directly on electric fence, it causes a massive surge in voltage which flows back to the energizer to find the quickest path to earth.

The Lightning Diverter kit (LDK) consists of a choke, which creates a blocking effect for the extremely high voltages caused by Lightning. The high voltage is blocked by the choke and diverted across the arrestor to earth. The Earthing system shall be installed separately for Lightning kit.

It will be always safe to install the Lightning Diverter kit as close as possible to the Energizer. We have incorporated the LDK in the Energizer itself.

Other Components:

The components will be of reputed make and of high quality confirming to the safety standards for each item. Specific details of some of the components are:

a. **Insulator:**

Strain Insulators for End or Corner Posts: Made of High quality Industrial Plastic – Virgin Nylon rated for 15KV UV Stabilized.

Reel Insulators: Made of virgin Polypropylene plastic rated for 15KV UV stabilized.

b. **Permanent Wire tightner:** Mode of special aluminum alloy designed for 15 KV UV stabilized.

c. **Earth System:** 8 mm stainless steel rods or 1” dia GI pipe with Galvanized clamps along with Bentonite mixture shall be used for creating more conducive conditions for Electron flow.

d. **Fence wire:** 2.59mm diameter, High tensile wire with minimum of 230 gms/sq.m zinc coating thickness. Make - TATA.

Earthing mechanism: The performance of the Solar fence system will totally depend on the specification of Earthing system. Hence, we recommend 3 Earth pits (Based on the ground conditions) for every energizer and additional earth pit at every 300 of fence length. Depending on the dampness of the soil an additional Earth pit(s) shall be installed for effective usage of the system.

e. **Fence Posts:** The prefabricated posts are used to carry the fence wires along the boundary to protect the premises from any type of intrusion. The posts used are MS Pre-fabricated duly galvanized to ensure protection against rusting and long life. The details of posts are as under:

Option - 1:

a. Pre-fabricated Corner posts: 50 NB Class B post duly galvanized of 8.5 feet length of which 2 feet will be grouted into the ground.

b. Intermediate posts: 25x25x3mm T angular duly galvanized of 8.5 feet length.

- c. Support posts: 32 NB Class 'B' post for every corner post of 8.5 feet length of which 2 feet will be grouted into the ground.

Option - 2:

Precast-RCC post of 7.5 feet length and 100 x 150mm in dimension can also be used as Posts to erect Solar fence system.

Distance between posts shall be about 15 meters and same post will also be used for support post.

General design particulars for Solar Power Electric Fencing:

The designing of the Solar power electric fencing is prepared based on our practical experience and exposure achieved during the installations at various forest regions in the country.

i. **Number of wires:**

Solar power electric fencing with 5 strands (Wires) shall be installed as under:

Distance between ground and wire No. 1 300 mm

Distance between wire No. 1 to wire No. 2 300 mm

Distance between wire No. 2 to wire No. 3 300 mm

Distance between wire No. 3 to wire No. 4 400 mm

Distance between wire No. 4 to wire No. 5 500 mm

Total distance from ground to wire No. 5 shall be 1,800 mm.

ii. **Posts:**

Corner Post and Pull through posts shall depend on the site conditions and fence line. The corner posts shall be installed at places where there is a deviation in the fence line and also at undulations on the ground other than starting and ending posts.

The Intermediate poles shall be installed at every 15 meters of length.

iii. **Permanent wire tightners:**

These components shall be installed on every section to maintain the tension on the wires and also to withstand the loads and pressures impended on the fence wires.

iv. **Flashlights (Optional):**

Flashlights shall be installed beside every Gate and also at places where the Flashlight is mandatory.

v. **Gate (Optional):**

Spring rope gate kit shall be installed at suitable entry or exit paths. The number of Gates shall be decided based on the site conditions and approval from Forest department.

The Specifications are for Animal Fencing especially to ward off Wild elephants. This proposal does not mention about Elephant Toupees or capping, it is optional.

For **Crown Solar Power Fencing Systems,**

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