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SYSTEM COMPONENTS:

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Earth conductors

Strike Terminals

Connector clamps

Earth inspection pits

Distribution earth bars

Exothermic weld

Company profile

Egyptian for Electrical Earthing co. EERECO is an engineering company specialized in the field of Earthing and Lightning Protection systems.

The scope of services provided by EERECO includes consulting, engineering, execution and testing as well as offering professional support to our client in a broad range from low voltage to high voltage.

With our business philosophy "high quality, inexpensive, quality service", we obtain a vast customer base and become the top service provider of many famous enterprises.

EERECO offers a wide range of products belonging to well-known manufacturers such as earth rods, earth conductors, ESE lightning rods, connectors and clamps, distribution bars, exothermic welding, and manholes as integrated solutions at a very competitive cost.

These products have been widely used in the earthing works (protective earthing, functional earthing and anti-static earthing) of petrochemicals, communications, data centers, airports, railways, commercial and residential facilities.

EERECO Engineering services include:

1) Soil resistivity surveys:

- Key to creating effective earthing system
- Multiple readings taken to ensure safe and accurate designs

2) Analysis & earthing design

- Engineered designs to meet client specifications
- Range of detailed reports

3) Lightning protection Solutions:

- Team of experienced engineers
- Risk assessment complying to latest standards

4) Earth resistance testing

- Verification of earthing design through measurement
- Experienced team of engineers with full understanding of electrode testing

1) Soil resistivity surveys

A comprehensive soil resistivity survey is the key to creating an effective earthing system, as inadequate or erroneous soil resistivity readings are likely to result in a flawed design.

EERECO site surveys take multiple accurate soil resistivity readings at various depths across the site. As these results form the basis of the whole earthing design, the experience of our engineers is critical in ensuring correct implementation of the test data.

2) Analysis & earthing design

We prepare detailed earth electrode and lightning protection system computer aided designs, in compliance with recognized standards, whatever the complexity of system required.

3) Lightning protection solutions

There are many benefits of coming to EERECO for lightning protection solutions:

- Specialist advice from our fully qualified technical team, which focuses on protection and safety
- Designs that comply with all relevant standards - national and international
- Experience to provide an 'optimum' design - one that doesn't use more material than is necessary.

4) Earth resistance measurement

Earth resistance measurement is essential to accurately determine that the installed earthing system meets the anticipated criteria laid out in the initial design.

Our technicians ensure all measurements are correctly taken and interpreted, so that the true resistance of the earthing system can be accurately determined and verified.

Compliance . . .

EERECO designs comply with all recognized standards - national and international such as:

- BS 7430 Code of practice for protective earthing of electrical installations
- IEEE Std 80 IEEE Guide for safety in AC substation grounding
- NFPA 780 Standard for the installation of lightning protection systems
- NF C 17-102 Early streamer emission Lightning protection systems
- BS EN 50522 - Earthing of power installations exceeding 1.k V ac
- BS EN/IEC 62305 Protection against lightning

TYPICAL CUSTOMERS & PREVIOUS WORKS

Petroleum Sector

Khalda Petroleum Company
Petroleum Complex - Alexandria
Pharaonic Petroleum Company
Qarun Petroleum Company

Airports & rail ways

Abu Simbel Airport - Satellite Station
Luxor International Airport - Satellite Station
Marsa Matruh International Airport - Satellite Station
Cairo International Airport - Satellite Station
Ramses Railway Station

Telecommunications & Data centers

Ministry of Communication & Information Technology
National Bank of Egypt , Cairo Plaza Tower
I SCORE , Smart Village
Mokattam Data Center – Etisalat Misr
Alexandria Bank , Smart Village
Agricultural Bank of Egypt DC , Dokki
Mobinil - El Hosary , 6th of October
Telecom Egypt, 6th of October
Telecom Egypt, Sidi Gaber, Alexandria
Abou Talat Telecom Central, Alexandria
Etisalat misr , Ramses Post Building
Etisalat misr , El Omraniya
Chevrolet Egypt

Government & public sector

Ministry of Local Development , Dokki
Export Development bank of egypt
Egypt Post , Smart Village
Helwan Post Office , Helwan
Coinage Authority, El Darassa
Animal Production Complex, Elwadi
Shalateen Slaughterhouse
Robiki Leather City
Ain El Sira lake

Media sector

MBC Maser , Egyptian Media Production City
Maspero Television Building

Medical sector & hospitals

Abu El Reesh Hospital
Police Hospital, Dokki
Gamma Knife Center - Nasser Institute
Alexandria Urology Hospital
El-Hayat Scan

High tech & industrial

Hi Food (Ülker Egypt)
Farm Frites Egypt
Chloride Egypt
Bridgestone Egypt
Coca Cola Atlantic Industries
White Point Elabd
Universal Egypt
Gulsan Egypt
National Poultry Co.

Administrative & Commercial buildings

PGESCO , new cairo
Agriculture Bank of Egypt (ABE)
Raya Holding , 6th of October City
Suez Canal Bank - Gleem Branch
Egyptian Gulf Bank EGB , Port said
Banque Du Caire - Sidi Beshr Branch
Barclays Bank - Saint Fatima Branch
DORRA office building - Smart Village
Crédit Agricole Bank, Maadi Branch
Crédit Agricole Bank, mansoura branch
Housing & Development Bank – Helwan

Water and wastewater

El-Abadla water station
Helwan Wastewater Treatment Plant
ALHabeel Waste Water Treatment Plant, Luxor
Kom abo rady wastewater plant
Al Jeelani wastewater plant
Senhour wastewater plant
Sewage pumping stations (Zefta - Samanoud - Qotour)

Tourism sector

Hilton Hurghada Plaza, Hurghada
Amwaj Oyouun Hotel & Resort , Sharm El Sheikh
Le Meridien Dahab Resort , Dahab
Porto Sharm Resort , Sharm El Sheikh
Porto Matrouh Resort , Marsa Matruh
Mountain View, North Coast
Jaz Grand Marsa, Marsa Alam

About earthing

"Earthing" is connecting the power system or electrical devices or building facilities to the earth. earthing and bonding are an integral part of any modern electrical protection system design. An effective, low-impedance earthing system is a key element of this system. It is crucial to help provide personnel safety, as well as reliable protection for vital equipments and to minimize interruptions of service and costly downtime.

It is a fundamental fact that electricity always flows to the point of lowest potential. The task is to help ensure that electricity, including faults, lightning and electronic noise flows to this point with maximum safety to people, while maintaining the reliability of equipment. Therefore we must help ensure the safe, controlled flow of electricity with minimum voltage drop to earth in all cases.

The importance of reliable earthing

Reliable protection of personnel and structures demands a systematic and comprehensive approach to minimizing threats caused by transients and other system disturbances. For instance, no air terminal can safely capture and arrest the lightning energy without a dependable route to earth.

Equally, even the most expensive surge protection device (SPD) will not provide optimum protection if a low-impedance electrical connection to the earth is not present.

There are important reasons why earthing system should be installed.

1. The most important reason is to help protect people.
2. To help provide protection of structures and equipment from unintentional contact with live conductors.
3. To help support maximum safety from electrical system faults and lightning.
 - A. Protect personal safety
 - B. Ensure the electrical system working properly
 - C. Prevent the hazards of lightning and over voltage

Earthing system classification

The possible hazards of unqualified earthing system

1. Personal injuries
2. Buildings or devices destroyed by the direct lightning
3. The devices destroyed caused by the earthing potential difference
4. Data disorder and loss
5. Stopped working of the equipments

6. Static electricity protection became invalid
7. The inflammable goods may be burned or exploded

Characteristics of a Good Earthing System

- Good electrical conductivity
- Conductors capable of withstanding available electrical fault currents
- Long life - at least 25 years
- Low earth resistance and impedance

The basic philosophy of any earthing installation should be an attempt to maximize the surface area of electrodes or conductors with the surrounding soil. Not only does this help to lower the earth resistance of earthing system, but it also greatly improves the impedance of earthing system under lightning surge conditions.

The key factors that impact earthing system

1. **Conductivity:**

When current flows from earth electrode into the surrounding soil, it is often described as flowing through a series of concentric shells of increasing diameter.

Each successive shell has a greater area for current flow and consequently, lower resistance. At some point distant from the earth conductor the current dissipation becomes so large and current density so small, that the resistance is negligible

There are two factors: first, the conductivity of the earthing materials should be as high as possible, to facilitate the high current going through; second, the soil around earth electrodes should have good conductivity.

2. **Electrical connection:**

The reliability of the electrical connection between earthing system and the devices or between earthing system components determines whether earthing system effective and safe or not. The connection breakoff of the key parts will cause failure to the entire earthing system.

The voltage generated by a lightning discharge depends primarily on the rise-time of the current and the impedance (primarily inductance) of the path to earth. Exothermic welding connections provide excellent low impedance, long life electrical connections with excellent corrosion resistance.

3. **Life span of the earthing materials**

As earthing electrode is buried in the soil, in the most cases it is often inconvenient to inspect and do maintenance. In this case, the earth electrode system should be corrosion resistant, and compatible with other conductors that are buried and bonded to the earthing system. Copper is by far the most common material used for earthing conductors. In general, some form of maintenance or inspection procedure should be adopted to ensure the long-term effectiveness of earthing system.

4. Thermo-stability:

When the maximum short circuit current is getting through the conductor, the mechanical strength of the conductor should not lower down or blow out.

5. Earthing system structure

Earthing system structure is designed based on the fully investigated of the actual application environment, soil resistivity and requirement analysis, and then under the premise of scientific analysis and calculations, with the least amount of work to achieve the best results. Reasonable design will be effective, while saving money; conversely, unreasonable design is not only a waste of money, but also results in unqualified earthing system which cannot remedy or amend.

The efficiency of earthing system is dependent on a number of factors, including the geometry of the earthing electrode system, the shape of the conductors and the Equipotential bonding.

bonding helps ensure that hazardous potential differences do not occur between different incoming conductors such as metallic water services, power systems, telecommunication systems and the local earth, and also minimizes step and touch potentials.

Lightning protection system

The transient nature of lightning with its associated fast rise times and large magnitude currents mean that special consideration needs to be given to earthing, for lightning protection to be effective. The primary aim of a direct strike earthing system is to:

- Efficiently dissipate lightning energy into the earth
- Help protect equipment and personnel

Low impedance is the key to lightning protection. All earthing connections should be as short and direct as possible to minimize inductance and reduce peak voltages induced in the connections. The resistance of the earth itself to lightning currents must also be minimized. Only when all these factors are taken into account will maximum lightning protection be achieved

Major concepts of an integrated lightning protection strategy

1. Capture the lightning strike
2. Convey this energy to the earth
3. Dissipate energy into the earthing system
4. Bond all earthing points together
5. Protect incoming AC power feeders
6. Protect low voltage data/telecommunications circuits

Exothermic welding

Exothermic welding is a simple, economical of making permanent, very high quality electrical connections. The process uses high temperature reaction of copper oxide and aluminum, within a semi-permanent graphite mold, to form electrical connections mainly between copper to copper or copper to steel. Now, exothermic welding has replaced the traditional method of physical connection between the metal. Exothermic welding is recommended to use in earthing system by many international standards.

Reaction principle:

