EARTHING & BONDING SYSTEM

SOLUTIONS FOR RAILWAYS, METROS, AIRPORTS, SUBSTATION, SOLAR, SMART CITIES, MODERN INFRASTRUCTURE, TUNNELS etc...

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MAKE IN INDIA

EARTHING SYSTEM

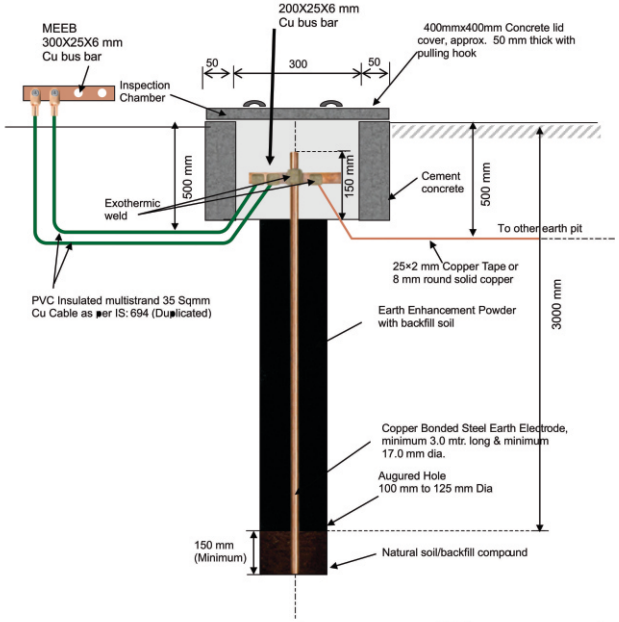
The earthing system protects electrical equipment by conducting unwanted charges, transients, and surges into the ground. It provides a low impedance path for fault currents, diverting them away from the equipment. Inadequate grounding leads to equipment failures. Proper, equipment-specific earthing systems are crucial for preventing damage from voltage spikes and electrical disturbances.

EARTHING AND BONDING SYSTEM-UNIT EARTH

As per RDSO specification RDSO/SPN/197, Ver 1.0.

The earthing and bonding system is a critical component of electrical installations that ensures safety and prevents electrical hazards. Earthing involves connecting electrical equipment and structures to the ground, providing a path for fault currents to flow safely.

Bonding involves interconnecting metallic components to eliminate potential voltage differences and create a common reference point.



RDSO	
Typical installation of earth for S&T Installations	
Drg. No. SDO / RDSO/ E&B/001	Sheet No. 1 of 1

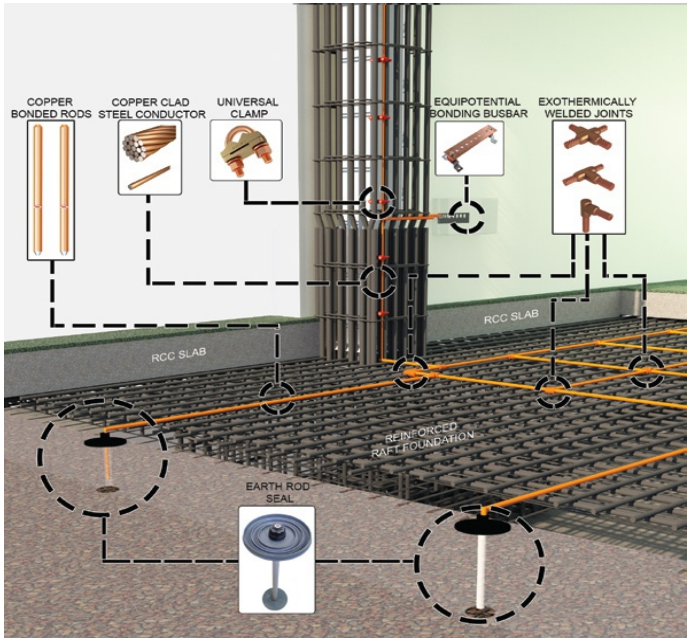
RING & GRID EARTH

The earthing and bonding system is a critical component of electrical installations that ensures safety and prevents electrical hazards. Earthing involves connecting electrical equipment and structures to the ground, providing a path for fault currents to flow safely.

STRUCTURAL EARTHING - LATEST SOLUTION

FOR EARTHING AND BONDING

The primary purpose of structural earth is to create a large-volume shield or a Faraday cage around a building. This involves utilizing conductive materials in the building's structure to block the entry or exit of electromagnetic fields. By creating a Faraday cage, structural earth disperses lightning or fault currents through multiple parallel paths, reducing the concentration of current in any one area. This technique helps to ensure the safety of the structure and its occupants by minimizing voltage drops and potential risks associated with excessive electrical energy. Installation area like, Building, Tunnel and Modern Infrastructure.



EARTH ENHANCEMENT COMPOUND

The IEEE 80 and NBC-2016 guidelines highlight the need for artificial soil treatment when multiple rods fail to achieve low earth resistance. RoHS compliant Earth Enhancement Compound, containing 95% carbon, improves grounding systems in high resistivity soil. JMV's product adheres to IEC 62561-7 standard, ensuring quality through rigorous tests.

Features:

- Offers an effective earth resistance in areas of high soil resistivity
- Does not leaches out with time offering corrosion free system
- No scheduled or routine maintenance
- Retains moisture for undoubtedly long span
- Easy to handle as it comes in 10kg and 25 kg bags
- Chemically inert and pollution free

COPPER CLAD STEEL CONDUCTOR

Complying IS 3043, IEEE 80, IEC 62561-2, NBC 2016

Copper Clad Steel (CCS) wire is a composite conductor that blends the strength of a steel core with the electrical conductivity of copper on the outer layer. Its low carbon steel core makes it ideal for grounding applications, providing both strength and conductivity. CCS offers excellent fault current carrying capacity and is a cost-effective alternative to solid copper conductors, with lower scrap value.

The electrical conductivity of the conductor determines its ease of formation, malleability, and durability, with values of 21%, 30%, and 40% IACS.

The CCS conductor are available in **8 mm, 10 mm, single core and 150 and 170 sq mm stranded wires.**

FEATURES

- Easy to install
- Theft proof and cost effective
- Reduces the number of joints

Fig.1 CCS Stranded Wire

Fig.2 CCS Conductor

COPPER BONDED ROD/ COPPER RODS

Copper Bonded Steel Rods are most appreciable and highly preferable product known for its ultimate performance with significance of no hidden factor. These low carbon, molecularly bonded mild steel rods are manufactured, inheriting 99.99% pure electrolytic copper coating of minimum 250 microns.

JMV manufactures UL listed copper bonded rods of sizes **12.8 mm, 14 mm, 17 mm, 19 mm, 21 mm, 23 mm, 24 mm, 25 mm, 32 mm, 38 mm diameter.**

Length:1.2m, 1.8m, 2m, 2.4m, 3m, 3.5m, 4m, 6m.

These copper bonded rods are tested by CPRI at various fault currents and also tested by NABL accredited labs as per IEC-62561.

EXOTHERMIC WELDING

An exothermic welding system is used for making electrical connections of copper to copper, copper to steel or copper to cast iron for grounding and cathodic applications. An exothermic welded connection shall be suitable for exposure to the elements of direct burial in earth or concrete without degradation over the lifetime of the grounding system."

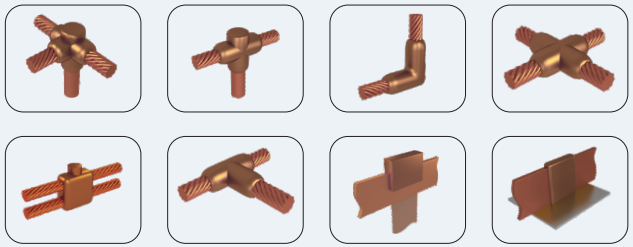
An exothermic welding system complying **IEEE 837,** has come up as a robust solution for these problems. Today, Exothermic Welding is a globally accepted method to make reliable and safe connections between two or more conductors. This technology is highly portable and does not require any external source of heat to make a joint offering in permanent molecular bonding among metallic conductors.

Features:

- Exothermic weld connections form a solid bond around the conductors assuring continuity.
- Superior electrical conductivity.
- Easy installation due to absence of external source. Can be installed at any remote location.
- Exothermic bonds have a higher mechanical strength as compared to other forms of welding.

JMV EXOTHERMIC KIT

Types of Exothermic Joints



EARTH PIT CHAMBER

Lightweight, Heavy duty Inspection Pit

In conventional earthing systems, heavy and hard to-maintain RCC pit covers are used, but they often get broken due to mishandling. The latest solution is lightweight plastic pit covers, which are easy to maintain and have a high load-bearing capacity (tested at 8 tons by a government NABL accredited lab).

These plastic pit covers are more economical than concrete covers and are already successfully used in NCRTC & Metro projects.

FEATURES

- Light weight
- Durable
- Strong (8 TONS)
- Cost-Effective
- Easy to Installation
- Lock & key

INSTALLATIONS

EARTHING ACESSORIES

Our comprehensive range of Earthing Accessories, such as Earth Bars with **multiple connection studs, Earth Rods, Sleeving, Clamps, and more,** offers diverse configurations to meet your needs and safeguard electrical devices from potential damage.

CDEGS

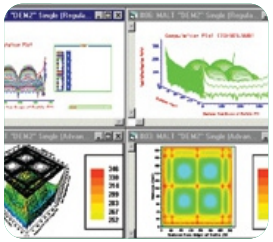
(CURRENT DISTRIBUTION, ELECTROMAGNETIC FIELDS, GROUNDING AND SOIL STRUCTURE ANALYSIS)

As a **"Make in India"** organization, **JMV LPS LIMITED** has taken the initiative to enhance the method of earthing calculation in India. We provide accurate design solutions using international software to simplify the earthing design process and assist you in achieving the desired values.

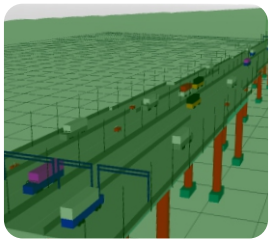
CDEGS (Current Distribution, Electromagnetic Interface, Grounding and Soil Structure Analysis)

CDEGS is a robust software developed by **SES (Software Engineering Services Ltd.)**, is a powerful software package for electrical engineering professionals. It provides accurate and efficient solutions for electrical earthing design in railways, including substation earthing, lightning protection system (LPS) designing, and S&T earthing for crossing and junction station buildings.

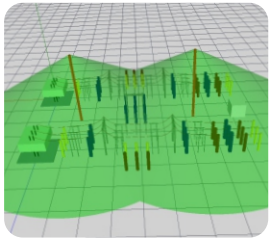
SIMULATION FROM CDEGS



3D GRAPHS FOR TOUCH, STEP & GPR



LIGHTNING PROTECTION OF BRIDGE



GROUND POTENTIAL RISE

EARTHING & LIGHTNING PROTECTION OF SUB STATION

KEY FEATURES

- Capable for 3D simulation of buildings
- Soil Resistivity Analysis & Soil Structure Interpretation
- Potential, Touch Potential & Ground Potential Rise
- Design validation as per Real Time Simulation
- Graphical Representation for Step
- Optimized Design

ABOUT COMPANY

JMV is a RDSO approved manufacturer of Earthing & Bonding Solutions for signaling equipment as per RDSO specification RDSO/SPN/197, ver 1.0. The signaling equipments comprises of very sensitive electronic components which are more susceptible to damage due to surges, transients, and over-voltages being encountered in the system due to lightning, sub-station switching etc. These signaling equipment include Electronic Interlocking, Integrated Power Supply Equipment, Digital Axle Counter, Data Logger etc. The components of Earthing & Bonding System are Earth Electrode, Earth Enhancement Material, Exothermic welding, Equi-potential Earth Busbar, connecting cable & tape/strip and other associated accessories.

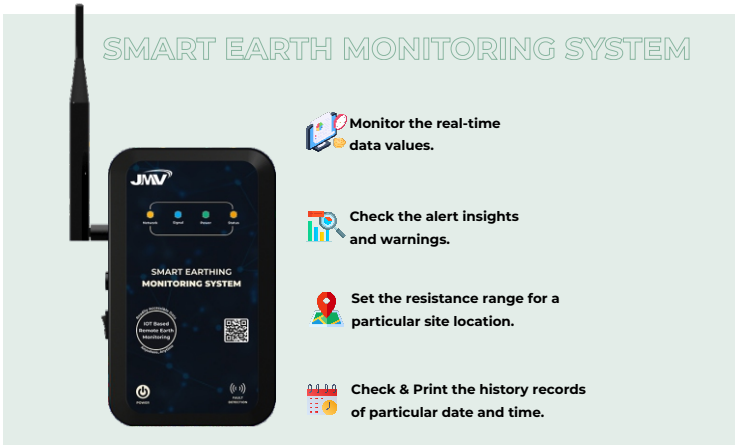
CLEINTEL

SMART EARTH MONITORING SYSTEM

Smart Earth Monitoring System (SEMS) is an advanced **IOT-based** device which is designed to remotely monitor and evaluate the earth resistance and continuity of the grounding conductor. With the help of SEMS, multiple grounding systems can be monitored simultaneously and the combined data collected from various sensors is sent to a Central **Cloudhub** for real-time data analysis. It provides online alert insights and warnings to the registered users whenever the resistance value goes beyond the registered resistance values. The user can access real-time data either through a web portal or through the mobile application. With its advanced features and real-time measurement capabilities, SEMS ensures the optimal functioning and safety of grounding systems in various applications and scenarios.

WEB PORTAL AND MOBILE APPLICATION

The real time data obtained from the site locations is processed and sent to a Central Cloudhub. This real-time data it is accessible to the users through the Web Portal and Mobile Application where the user can:



KEY BENEFITS OF THE DEVICE

- The real-time monitoring feature of SEMS enables early detection of failures which minimizes the downtime and reduces the repetitive repairing and replacement costs.
- The continuous remote monitoring and instant access to real-time data reduces the hurdles of repetitive manual inspections.
- Early warnings and alert insights sent by SEMS help in reducing electrical hazards and enhancing the overall electrical safety .
- Provides flexibility to edit and adjust the resistance ranges for particular locations at any time from any location from the user end.
- The remote accessibility of the system enables the maintenance team to make prompt decisions based on real-time data values.
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