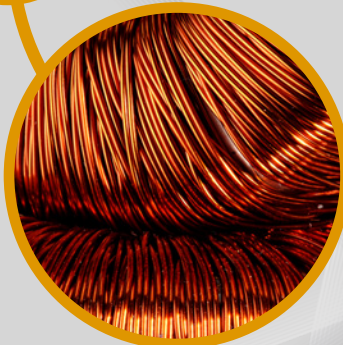


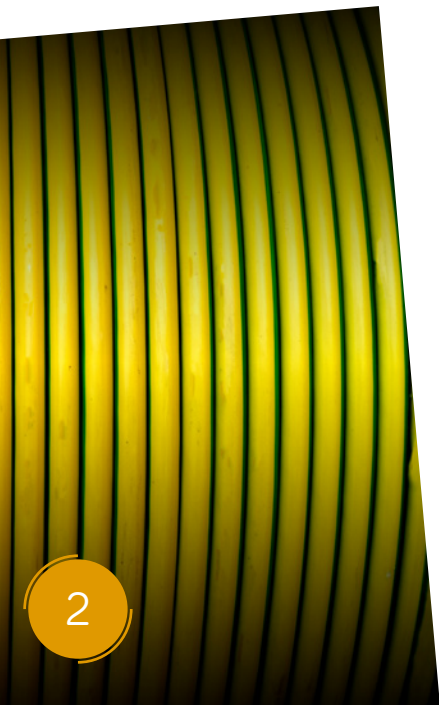


Electrical Services Ltd

POWER EARTHING (GROUNDING SYSTEMS)



PROTECTING PEOPLE,
PROPERTY AND PLACES



OVERVIEW

PTSG Electrical Services Ltd. is the largest of the four business divisions of Premier Technical Services Group – the UK's leading provider of specialist services for the construction and FM sectors.

We are the UK's market leader in the design, installation and testing of lightning protection systems. With a wide portfolio of assets across multiple industry sectors, we are also the natural choice for every kind of earthing system requirement, from design and installation to test, repair and upgrade.

Our range of services includes, but is not limited to:

-  Power Earthing System Design
-  Soil Resistivity Surveys
-  Soil Modelling and Analysis
-  Touch and Step Potential Calculations
-  Power Earthing System Testing



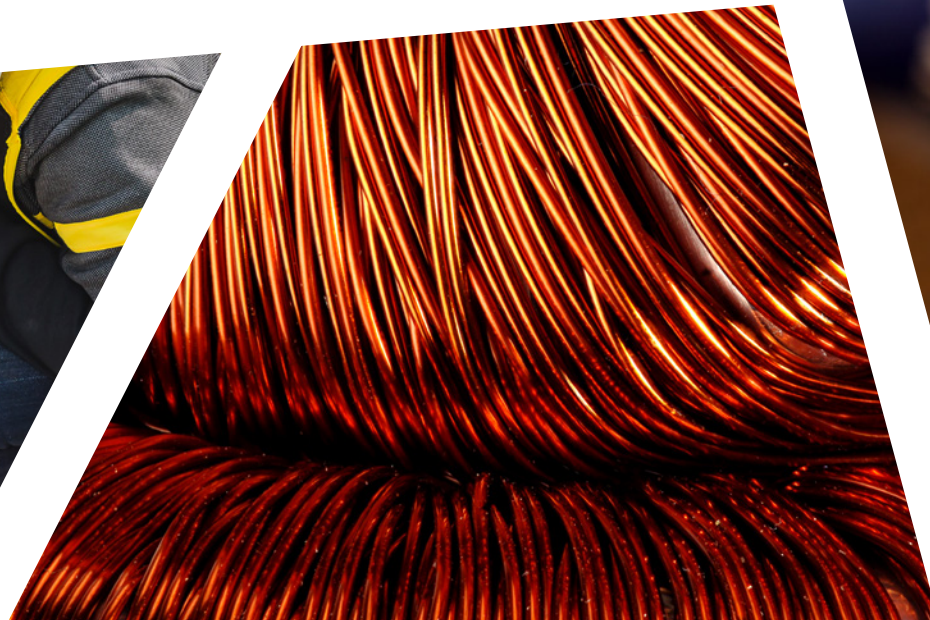
Sectors we routinely work in:



ACCREDITATIONS

All design work carried out by PTSG's skilled team is in accordance with **BS EN 50522** (earthing of power installations exceeding 1kV). TS 41-24 Issue 2, November 2018 (guidelines for the design, installation, testing and maintenance of main earthing systems in substations). Other design specifications can be provided. All designs are completed using CDEGS (Current, Distribution, Electromagnetic interference, Grounding and Soil Structure Analysis) design software. This is an extremely powerful software suite designed to accurately analyse a variety of electromagnetic related problems involving electric networks.

All inspection and testing provided by PTSG is carried out in accordance with **BS7430:2011 +A1:2015**, the code of practice for protective earthing of electrical installations.



WHY SPECIALIST EARTHING IS SO IMPORTANT

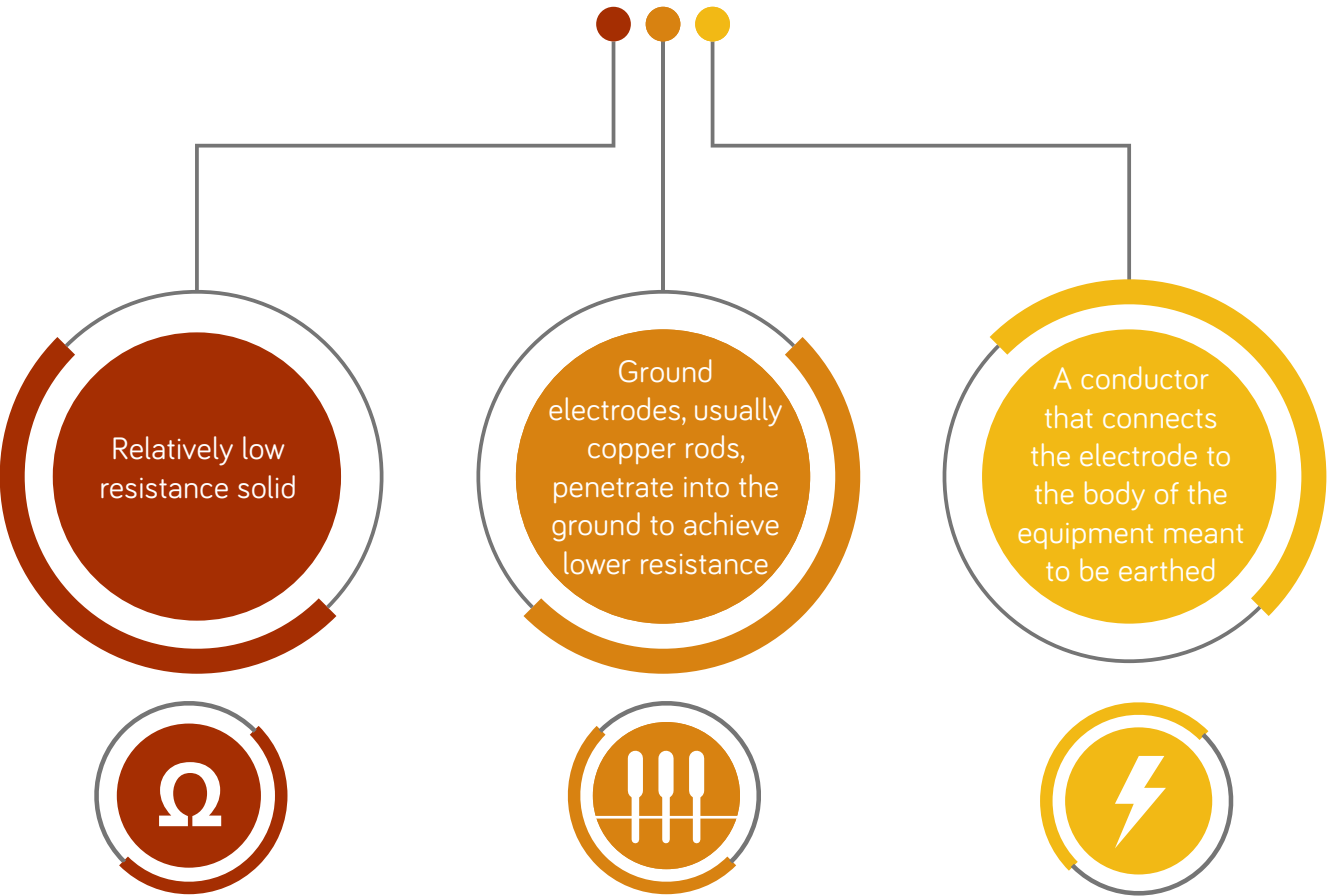
All of PTSG's services make buildings, systems and equipment safer and more efficient for their users. Earthing is the creation of an alternative path for the flow of fault or excessive currents safely to ground. It is an integral part of any electrical system and essential in keeping both people and equipment safe.



The three main reasons for specialist earthing are

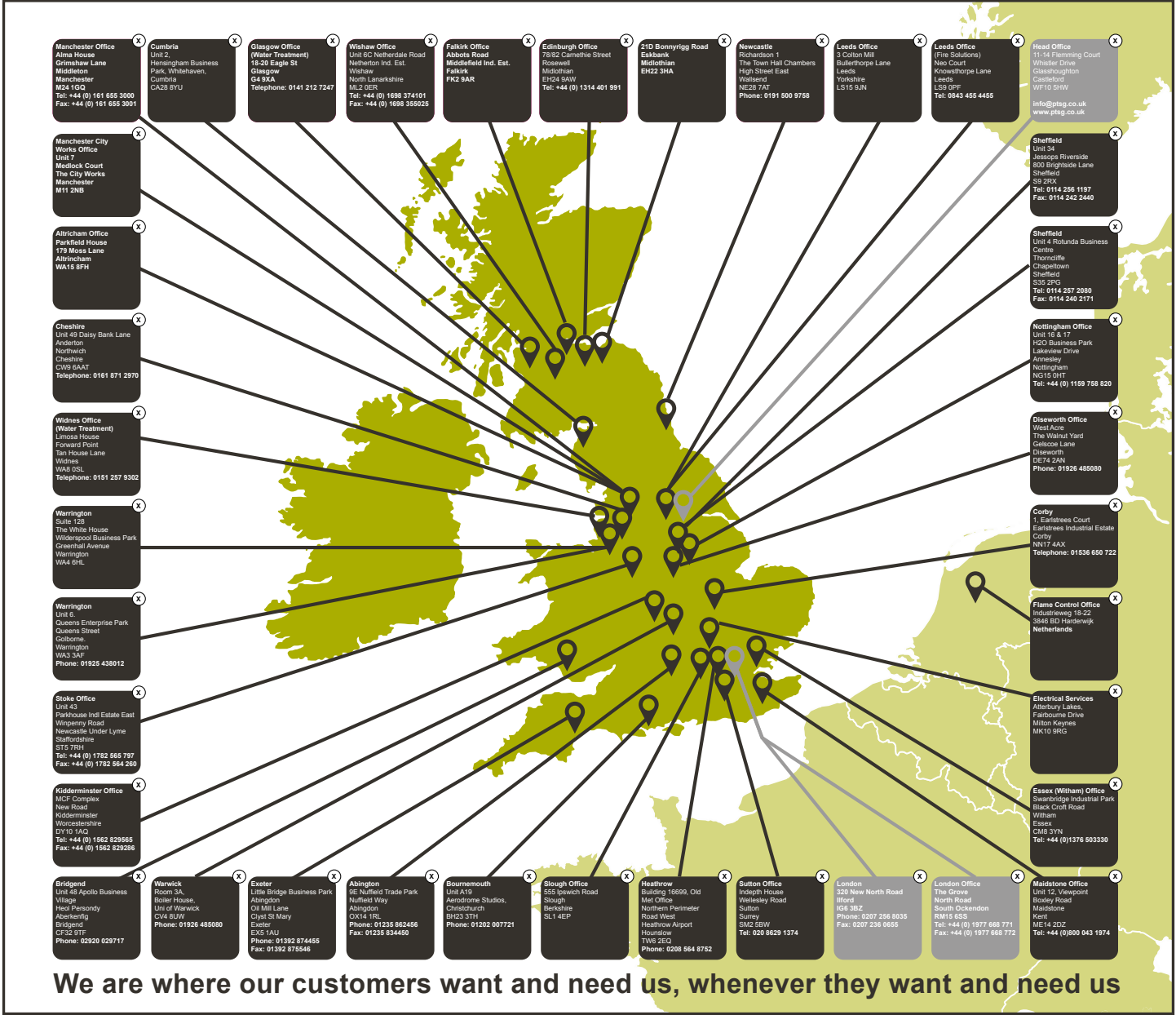
-  To protect people from the danger of electrical shock, which can cause death
-  To provide voltage stabilisation – earthing removes the guesswork, helping to ensure no circuits overload or blow up
-  To provide overload protection – in instances of excessive power surges, earthing can prevent devices and appliances from getting fried, saving data and equipment

An earthing system consists of three main parts:



Before installing an earthing system, the first design step is to measure the resistance of the earth. Many different things need to be consideration, such as the resistivity of the soil, the level of moisture in soil, the number of rods connected in parallel and the depth of electrodes under the ground.

Using PTSG's electrical experts is the best way to ensure an earthing solution that is appropriate to the installation.



We are where our customers want and need us, whenever they want and need us

SPECIALIST EARTHING FOR BUSINESS

Verification of an existing HV and Primary
LV Earthing arrangement at a well-known
chemical business



PTSG
PREMIER TECHNICAL
SERVICES GROUP
Electrical Services Ltd
CASE STUDY

📍 Wales

PTSG Electrical Services Ltd. was tasked with carrying out on-site testing and inspection of the HV and Primary LV earthing arrangements. This included ATEX hazardous areas to ensure that the functional and safety criteria within BS 7430 and BS EN 50522, i.e. permissible stress, touch and step potential limits were not exceeded.

The work involved the measurement of site-based equipment, along with soil resistivity surveys and the production of an overall design assessment including associated calculations, to ensure compliance with the above standards. Following completion of the testing, the development of a risk-based, time-bound action plan to resolve any non-compliances that were identified. After completion of the assessment/calculations, the relevant inspection, test and maintenance documentation was produced to reflect the calculated maximum allowable earth resistance values complete with recommended pass and fail criteria.

From the start, working through historic site data and site information to the completion of the ITM documentation, PTSG Electrical Services Specialist Earthing Division completed the work on budget and within the allotted time frame.

“The work involved the measurement of site-based equipment, along with soil resistivity surveys ”



SPECIALIST EARTHING FOR LOGISTICS

Installation of new HV distribution equipment site-wide for a large logistics company in the UK



📍 South East

The Specialist Earthing and Power division of PTSG Electrical Services Ltd. was contracted to produce an earthing study to assess the earth potential rise and associated touch and step potential values across a large site wide HV 11kV/LV distribution network. The original work scope was for a single location, which was expanded to include the existing site performance; this resulted in additional installation work and testing and the development of the site-wide works.

Soil resistivity surveys were undertaken across the site, along with the fall of potential measurements of existing substation locations. This information was used to finalise the earthing study with the production of design reports showing the Earth Potential Rise (EPR) along with detailed touch and step potential profiles for each of the substation locations.

Detailed earthing layout drawings, confirming conductor types, sizes and positions in addition to detailed technical drawings, showing how the earthing system was to be configured, were produced. The installation of the above earthing was undertaken by PTSG Electrical Services Ltd, with final verification and certification being produced.

“The project was undertaken to a very tight schedule and the works were completed ahead of programme and within budget”



SPECIALIST EARTHING FOR RAIL

Development of a detailed design and production of a buildable solution within Railway infrastructure



📍 London

PTSG Specialist Earthing was contracted to develop an outline earthing design for a railway substation and operating plant project, into a buildable, site-specific earthing design solution. The project contained multiple contractors working on differing items of plant and equipment, all of which required a common detailed earthing solution to be produced, delivering a safe and effective earthing system.

The project required the production of detailed design documents with supporting calculations, detailed installation drawings and supporting technical details. The production of risk assessments and industry-specific documentation were required to enable the client to approve the scheme.

The testing and commissioning of the installation and the production of industry specific documentation were provided. The detailed design was delivered within a short timescale, incorporating multiple contractor requirements all delivered to client requirements.

Simon Greenwood was the Company Responsible Engineer (CRE) on this project.

“The detailed design was delivered within a short timescale, incorporating multiple contractor requirements”



SPECIALIST EARTHING FOR CONSTRUCTION

Development of detailed design HV combined heating and power plant (food industry)



📍 Midlands

A detailed substation earthing study was previously completed on site, requiring close co-operation with a regional DNO (District Network Operator) – as a result of a unique connection configuration.

PTSG Specialist Earthing and Power was contracted to develop an earthing solution for the new build CHP plant. The installation work was undertaken by a third party, with the design development requiring co-operation with other professionals.

The design was completed ensuring that both industry- and client-specific requirements were adhered to. The final testing, commissioning and certification of a compliant installation were also undertaken by PTSG.

The design documentation was produced working in collaboration with others and enabled a safe, cost-effective and deliverable solution to be achieved.

“The design was completed ensuring that both industry- and client-specific requirements were adhered to”





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