Best practice at Farringdon –
Earthing & Bonding Systems

Overview

Electricity is a source of energy which is essential to modern life. It can be extremely dangerous as it cannot be seen or smelt.

Earthing is the process whereby the conductive parts of equipment which do not normally conduct electricity are prevented from becoming live during any faults.

Bonding is the process making a connection between equipment to ensure there is no potential difference (in volts) between adjacent structures.

During the construction of the Farringdon project which includes activities to undertake installation of Mechanical & Electrical systems, there was an identified trend of close calls related to earthing bonds being removed or tampered with via unauthorised and unsafe methods, which posed a risk of electric shock.

The team undertook a number of actions to remind the whole team about the safety systems and the need to adhere to these to maintain an electrically safe environment.

Symbol used to indicate an Earth Bond (note: shown as a green symbol on tags – see photograph below)

Innovation

- All Earthing bonds have their own individual numbers and the locations across the site are known
- A one-number, one-use method has been implemented which tracks each tag's individual history
- In addition a one-tag, one-photo system is in place which is held in a central register
- All new tags receive a new number and tag numbers are not reused as the history of that tag will be lost.
- Tags are inspected weekly as a minimum
- All tags locations are recorded on a master site drawing

Example of Earthing wire

Benefits

- Provides safe and effective method of isolating electricity to reduce the potential of accidents occurring
- Prevents damage to London Underground or Network Rail Assets
- Visible system to increase awareness and understanding of working in and around electricity

Earthing Bond with tag in place

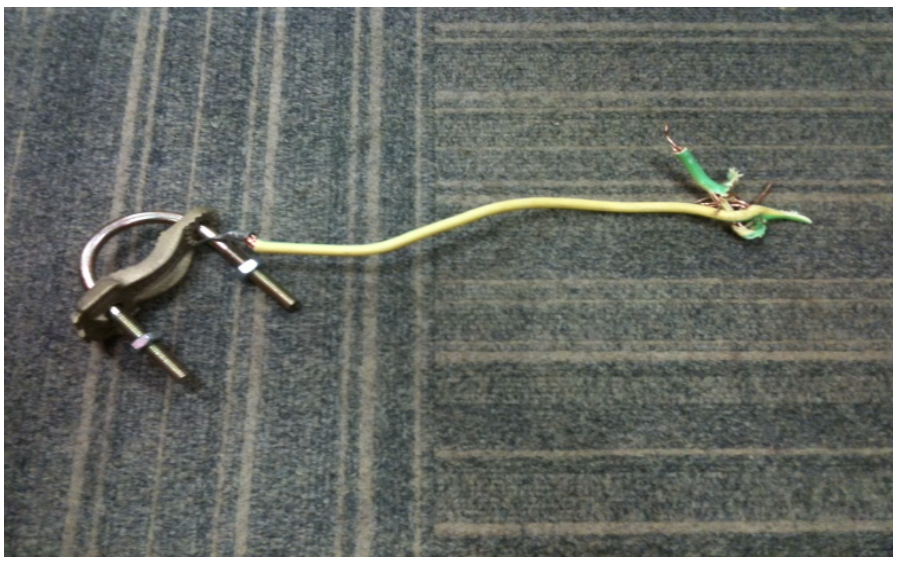
Targets and objectives

Utilisation of this Earthing system at Farringdon has helped us meet our targets and objectives in the following areas:

- Network Rail's Control Period 4 outputs in relation to a reduction of 3% of safety risk to the workforce and travelling public

- Farringdon Sustainable Design and Construction Strategy (SDC) – Implement industry best practice in overall construction performance; Improve SHE culture and Compliance

- Farringdon Targets and Objectives – Increased safety; Reinforcement of Safety Culture and Best Practice; Increased Close Call reporting culture



Example of broken bond / unauthorized removal of Bond

Sources of Additional Information

Earthing and bonding of electrical systems relevant to the Farringdon project is governed by a number of British Standards and Codes of Practice which are:

- BS7430:1998 Code of Practice for Earthing
- BS7375:2010 Distribution of electricity on construction and demolition sites
- BS7671:2008 Requirements for Electrical Installations (the *IEE Wiring Regulations*).

There is also some other helpful Guidance Notes e.g. the NASC (National Access & Scaffolding Confederation) Guidance note SG3:08 which outlines best practice for earthing of scaffolding structures.

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