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Earthing Assessments Training

February 2021

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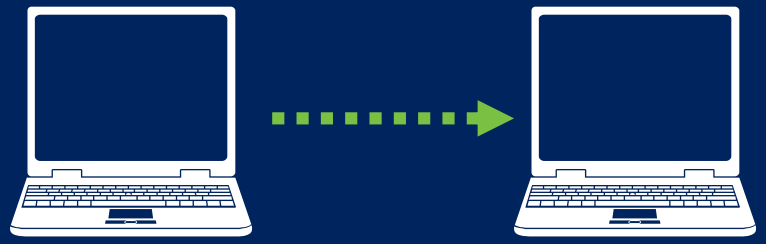
Webinar format

60 minute presentation

30 minutes
questions & answers



Please use the chat function or raise your hand for any questions

Agenda

Purpose of today

Overview	Earthing assessments	Submission Requirements	Next steps & any questions

Meet the Team

Garreth Freeman

Connections and Capital Manager

Chris Greenfield

Strategic Planning Engineer

Ami Mathieson

Incentive on Connections Engagement Manager

Mike Doward

Connections Charging Manager

Hannah Sharratt

Regulatory and Stakeholder Engagement Manager

Brian Hoy

Head of Market Regulation

Overview

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Overview

Provide an overview of the changes in CoP333 – 3 methods of assessment introduced

ENWL agreed to carry out earthing assessments for a short period of time to assist with the transition

From July 2021, ICPs will be required to undertake their own earthing assessment

The Network Asset Viewer was released in May 2020 – ICPs are now able to access cable data for earthing assessments

The PoC report will be updated to include the running routes that require assessment and the associated primary substation information

Overview - New Design Approval/Earthing Process

ICP

Electricity North West

Connection offer issued

Accepts connection offer.

Initial indication of assessment category

Earthing design submission

Approve submitted design

Reject submitted design and ask for more information

Energisation Request

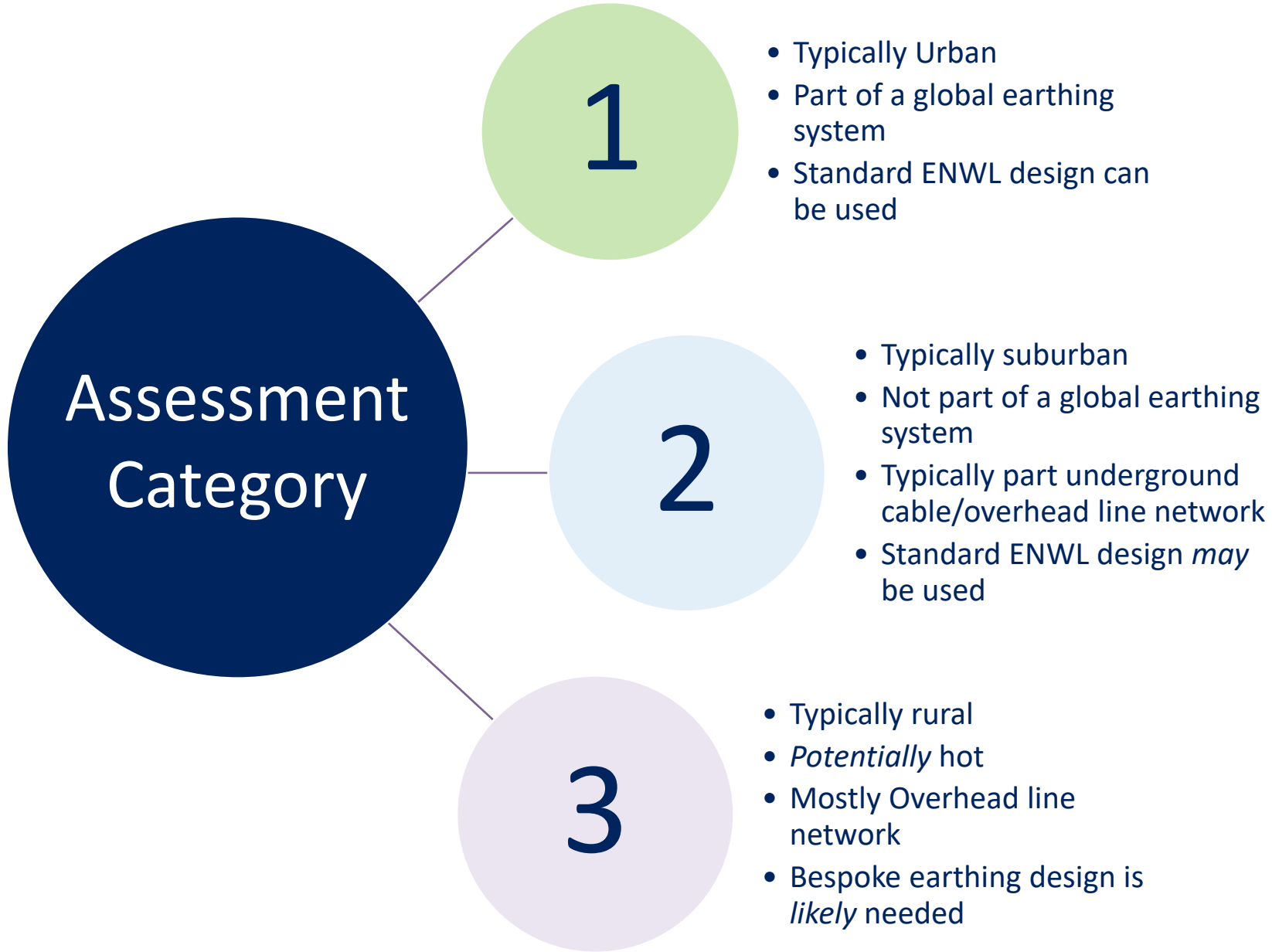
Complete construction and submit Earthing measurement

Reject Earthing measurement Delay Energisation & request resubmission

Approve Earthing measurement

Energisation

Overview - Assessment Categories



- Typically Urban
- Part of a global earthing system
- Standard ENWL design can be used

- Typically suburban
- Not part of a global earthing system
- Typically part underground cable/overhead line network
- Standard ENWL design *may* be used

- Typically rural
- *Potentially* hot
- Mostly Overhead line network
- Bespoke earthing design is *likely* needed

Type 1 Assessment

- Tick box exercise
- Simple, quick – no detailed design
- Global Earthing System concept
- Final site measurement after installation
- Expected use – cities, towns

Requirements for Type 1 Assessment:

- Surrounded by urban / built up area
- Cable fed
- New substation is a Standard ENWL Design in a GRP enclosure without any metallic fences/enclosures
- EPR at Primary substation is cold/low risk
- Primary transformers impedance earthed to give a maximum fault current of 2kA
- Local ground Resistivity is 300 ohm m or better (data may be from on-line sources such as BGS)
- Earth resistance of substation must measure 10Ω or less once installed and prior to energisation
- Ground Mounted substation

Type 1 Assessment - Maps

Assess where the substation sites within a 1km urban network

Check if rivers or railways have bridges with cable routes across

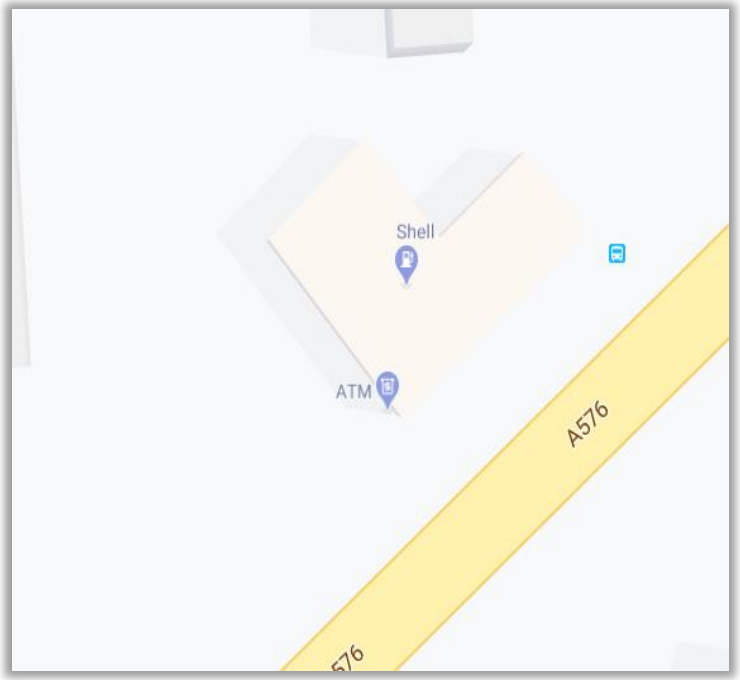
Some green space acceptable depending on circumstance

Mapping tools available free to use online

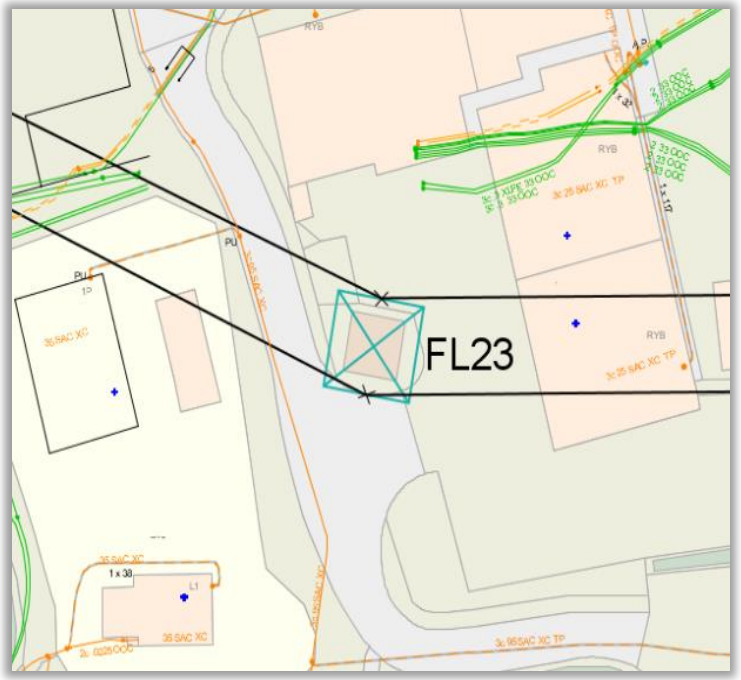
Type 1 Assessment - Maps

Things to be aware of – All of the below will require a type 3 study

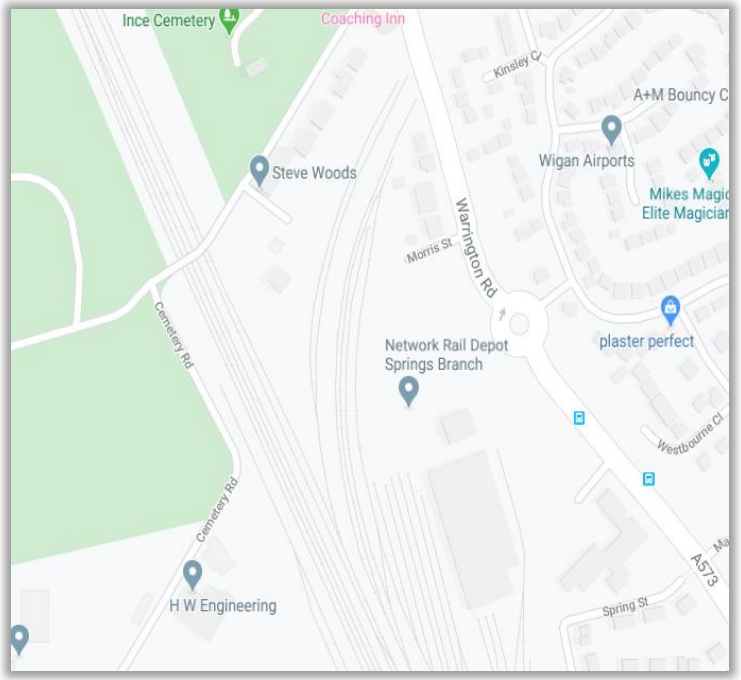
Fuel filling stations within 20m of your substation



Transmission towers within 50m of your substation



Your substation is supplying railway traction supplies



Introduction of spreadsheet
& Live demo of type 1 on spreadsheet

Any Type 1 questions?

CoP333 – Type 2 Assessment

Type 2 expected to be the usual method for suburban to rural mixed networks

- For sites failing the GES criteria
- Design effort minimised – can use an assumed 10Ω earth mat resistance for calculations
- Determine the fault current and percentage ground return current for each running arrangement
- Determine the available network contribution resistance
- Calculate the touch potentials within the sub and determine if the substation EPR is hot/cold
- Calculation methods available in ENA ER S34
- Desktop exercise where possible
- Look up tables provided in CP333
- Use on line sources – BGS providing the EPR remains below the 380V safety factor
- An earth resistance of 10Ω or less must be achieved prior to energisation

Live demo of type 2 on spreadsheet

Any Type 2 questions?

CoP333 – Type 3 Assessment

- Full design study and earthing report will be required
- On site soil resistivity tests will be needed
- Bespoke design tailored to achieve a SAFE and cold site where possible and to meet surface current density requirements
- Touch potentials must be within acceptable limits inside the substation
    - If a metallic fence/enclose is used it must be safe surrounding the fence/enclosure
- Step potential must be within acceptable limits
- Wherever possible a cold site will be achieved
- A hot site will be acceptable providing there are no hot EPR transfers onto the LV earth, PME electrodes/LV supplies, metallic fences, garden taps or other items that pose a high touch potential hazard

Live demo of type 3 on spreadsheet

Any Type 3 questions?

Submission Requirements

Submission Requirements – Study Guidance

Carry out an assessment to determine if your site is type 1, type 2 or type 3

Review the outcome from the assessment

Summarise the outcomes into our ICP Earthing Summary spreadsheet.

An alternative generic outcome table may be acceptable once altered to suit our needs

You will need to gather any required evidence/information and submit these separately

Send in your earthing assessment/report, the completed summary spreadsheet & any required evidence along with your design approval to CIC cic@enwl.co.uk

Submission Requirements – Construction Guidance

Install your earthing and carry out a Fall of Potential test

You must achieve a value of 10ohms or less for type 1 or type 2 assessment or for a type 3 assessment the value must be in line with that in your report

Send the results back to CIC cic@enwl.co.uk

Early submission ensures any site issues are picked up quickly

Earthing complications may delay energisation

Next steps
& questions

Next steps

You will be required to submit your earthing assessments and designs from **5th July 2021**

We will provide a refresher session in June before the go live date

If you require any further clarity or assistance, please email cic@enwl.co.uk

Finally, it is important to note that there is not much that has changed.

We are here to support. Earthing studies have always been undertaken by ICPs and we have only undertaken the assessments as an interim measure

Any questions?

ICP Earthing - Keep informed

	**Sign up to our distribution list here**
	**ICE@enwl.co.uk**
	**CIC@enwl.co.uk**
	**0800 195 4141**

Please contact us if you have any questions
Webinar slides will be circulated to all registered delegates

Thank you for your participation in today’s session