



NETWORKS



Guide

**Overview of Public On-Street Electric Vehicle (EV) Charging
≤49 kVA (71 A)**

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i. Scope

The aim of this document is to provide information for charge point operators and Local Authority staff on the design and installation of standard three phase whole current metering solution for multiple on-street Electric Vehicle Supply Equipment (EVSE) or as they are commonly known as EV charge points in public spaces. (i.e., On-Street Charging Infrastructure, noted in Category 2, as per Table 1). This guide is primarily intended for the design and installation of EVSE in public spaces such as public roads, public footpaths, etc.

The maximum whole current metering capacity of ESB Networks' meter is currently 49kV A (c. 71 amps) and the solutions contained in this document takes cognisance of this.

There are two solutions detailed in this document:

- Figure 1: Solution A – Decentralised Metering Layout Drawing
- Figure 2: Solution B – Centralised Metering Layout Drawing

A separate, similar guide for loads greater than 49 kVA and up to 200 kVA will be produced in due course covering current transformer (CT) metering arrangements.

Table 1: Currently available electric vehicle charging technology

Category	Charge Point Type	Power Rating	Approximate time to charge
1	Residential (Home) Charging	3-7 kW	7- 16 hours
2	On-Street Charging	>7-49 kW	1-2 hours
3	Destination Charging	50 kW – 100 kW	30 minutes
4	Fast Charging	>50 kW	30 minutes or less

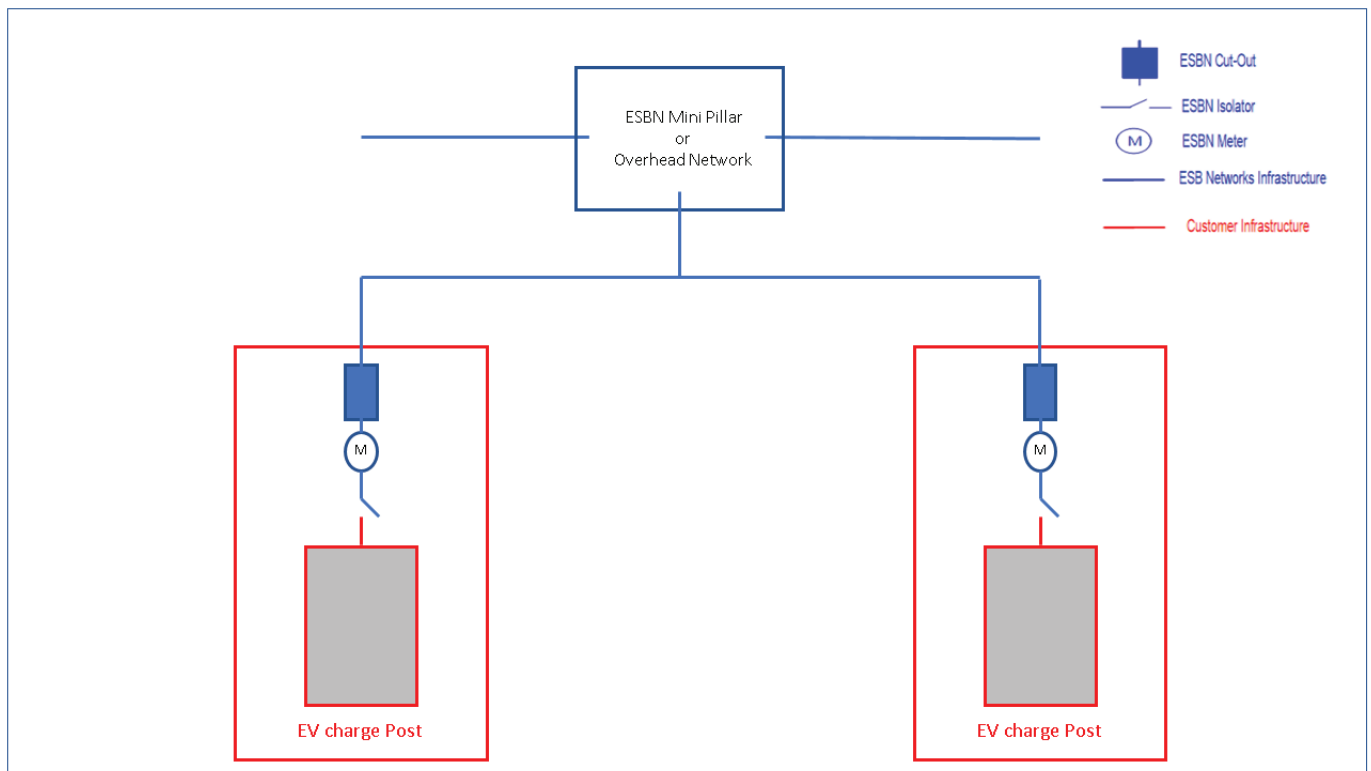
1. Solutions for connection of public On-Street Charging EV infrastructure

The DOC-30303-AEN: Company Standard - National Code of Practice for the Customer Interface provides electric vehicle (EV) On-Street Charging Solutions, with Annex I On-Street Charging (I.3.3) specifically referring to this issue.

The two solutions laid out in sections 1.1 and 1.2 of this guide ensure compliance with the Electrification Act of 1999.

1.1 Solution A – Decentralised ESB Networks Metering

Figure 1: Solution A – Decentralised Metering Layout Drawing

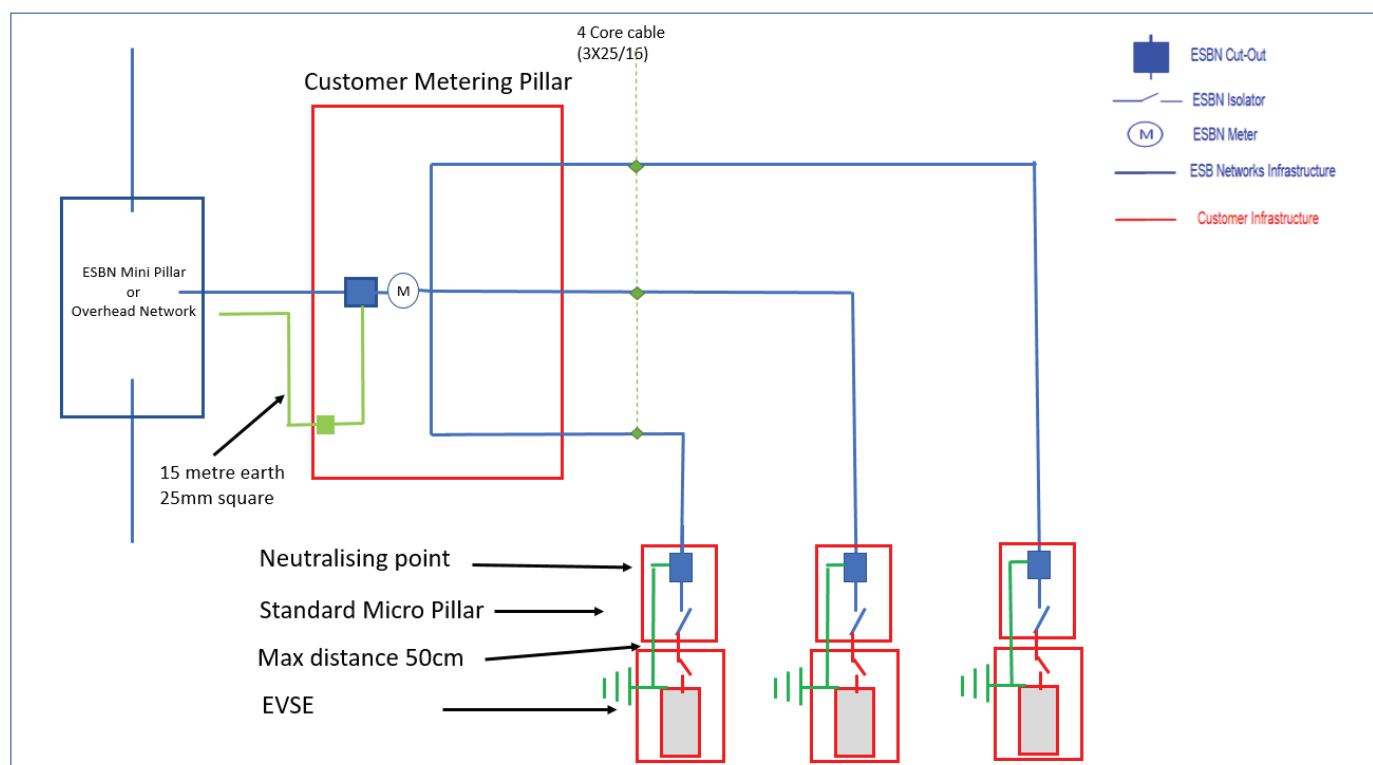


- This solution should be utilised on public streets and public spaces.
- ESB Networks to install cable from mini pillar or overhead line to EVSE as per DOC-240205-AJC: Company Standard - MV LV Cable Installation Standards and Practices Manual.
- EVSE is to be fed from the local low voltage (LV) network via a standard ESB Networks mini pillar on overhead network.
- Each individual EVSE can accommodate a Maximum Import Capacity (MIC) of up to 49 kVA (Three Phase, 71 A).
- The MIC of combined EVSE fed from a single ESB Networks mini pillar or overhead network is limited by the LV capacity and voltage drop of the feeding network.
- ESB Networks cabling, cut out and meter are contained in a separate compartment at the EVSE as per Annex I 3.3. of DOC-30303-AEN: Company Standard - National Code of Practice for the Customer Interface.
- Customer owned EVSE can be a stand-alone EVSE or an EVSE with public lighting column on top.
- The EVSE point installation should have suitable protective measures on the customer's side of the charge point to detect any faults or broken conductors and disconnect the EV load (i.e., compliance with safe procedures on the customer's side will help mitigate the risk).
- As each EVSE is metered separately, different suppliers/owners can operate individual charge points on the same street.
- The earth rod(s) at the EVSE is installed by the customer like any other LV installation.
- All civil works are to be carried out in line with current ESB Networks standards between the mini pillar/overhead line and the EVSE i.e., DOC-240205-AJC: Company Standard - MV LV Cable

Installation standards and Practices Manual. The customer should make all necessary arrangements for the civil works to the customer interface point at their own expense as per above document and DOC-101209-AXQ: Guide - Basis of Charges for Connection to the Distribution System.

1.2 Solution B – Centralised ESB Networks Metering

Figure 2: Solution B–Centralised Metering Layout Drawing



- This solution may be utilised on public streets and public spaces.
- The customer metering pillar is an enclosure supplied by the customer which complies with DOC-30303-AEN: Company Standard - National Code of Practice for the Customer Interface. In Figure 2 above, the 15-metre earth at the customer metering pillar is owned and installed by ESB Networks.
- The earth rod(s) at the EVSE is installed by the customer like any other LV installation.
- ESB Networks to install cable from mini pillar or overhead line to customer metering pillar and from customer metering pillar to micro pillar as per DOC-240205-AJC: Company Standard - MV LV Cable Installation Standards and Practices Manual. The customer metering pillar and micro pillar are supplied by the customer.
- Total MIC up to 49 kVA (71 A).
- The MIC of combined EVSE fed from a single ESB Networks mini pillar or overhead network is limited by the LV capacity and voltage drop of the feeding network. The maximum distance between customer metering pillar and standard micro pillar is 20 metres. It is advised to locate the customer metering pillar and micro pillars on the same side of the street as per current ESB Networks' practices contained in DOC-240205-AJC: Company Standard - MV LV Cable Installation Standards and Practices Manual.
- To allow multiple EVSE, a busbar arrangement is required in the customer metering pillar as per Figure 2 above. This busbar allows for the connection of up to three outgoing 3-phase cables. 3 X 25/16 cables are used to connect the EVSE to the busbar. 16 mm PVC/PVC cables are used to connect the meter to the busbar.
- Customer owned EVSE can be a stand-alone EVSE or an EVSE with public lighting column on top.
- The EVSE installation should have suitable protective measures on the customer's side of the EVSE to detect any faults, or broken conductors and disconnect the EV load (i.e., compliance with safe procedures on the customer's side will help mitigate the risk).
- Neutralising is undertaken at the micro pillar located immediately adjacent to EVSE and not in the main metering cubicle.

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- Micro pillars should be located max. 50cm from the EVSE.
 - Customer to provide the cross-bonding earth wire (via 16mm² earth wire) between micro pillar and EVSE as enclosures are within 2m of each other. Customer is responsible for the earthing arrangement of EVSE.
 - Standard current ESB Networks stocked equipment is installed in the micro pillar i.e., 100 A, 3-phase cut out and isolator.
 - Above provides for the continuation of separation between ESB Networks and the customer via the ESB Networks owned, but customer operable, isolator (customer interface point) as per the latest DOC-30303-AEN: Company Standard - National Code of Practice for the Customer Interface.
 - All civil works carried out in line with current ESB Networks standards between the mini-pillar/overhead line and the EVSE i.e., DOC-240205-AJC: Company Standard - MV LV Cable Installation Standards and Practices Manual. The customer should make all necessary arrangements for the civil works to the customer interface point at their own expense as per above document and the Basis of Charges for Connection to the Distribution System DOC-101209-AXQ.



The metering cubicle contains ESB Networks equipment only. The cut-out, meter and the distribution busbar are located in a single door Customer Metering Cubicle.

Derogations

No derogations are recorded against the requirements of this document.

Terms, Definitions & Symbols Used

For the purposes of this document, the following terms and definitions apply.

Table 3: Terms & Definitions

Term / Symbol	Definition
Shall	Designates a Company Requirement, hence conformance is mandatory.
Should	Designates a Company Recommendation where conformance is not mandatory but is recognised as best practice.
May	Designates a Permissive Statement - an option that is neither mandatory nor specifically recommended.
AC	Alternating Current
C&R	Commercial and Regulation
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
LV	Low Voltage
MIC	Maximum Import Capacity
PL	Public Lighting
CT	Current Transformer
EO	Engineering Officer



Used to give the end user specific, important information to help complete the task or procedure correctly.