London's Go Ultra Low City Scheme (GULCS)

Residential Electric Vehicle Charging Infrastructure

Electrical Guidance for London Boroughs

version 1 March 2019

GREATER LONDON AUTHORITY

Transport for London

LONDON COUNCILS

Go Ultra Low

Contents

1. Table of Abbreviations and Definitions

Term	Description
CPP	**Charge Point Provider**
Competent Person	Someone who has sufficient training and experience or knowledge to carry out specified tasks safely, avoiding danger and injury
CSA	**Cross Sectional Area**
Dedicated Power Supply Charge Point	A charge point which is comprised of an on-street charging cabinet that draws electricity from an electricity feeder pillar together with the electricity feeder pillar
DNO	**Distribution Network Operator** A person who owns or operates a network, except for a network situated entirely offshore or where that person is an operator of a network within the meaning of Part I of the Railways Act 1993*
EV	**Electric Vehicle** Any vehicle propelled by an electric motor drawing current from a rechargeable storage battery or from other portable energy storage devices (rechargeable, using energy from a source off the vehicle such as a residential or public electricity service), which is manufactured primarily for use on public streets, roads or highways**
EVCP	**Electric Vehicle Charge Point**
ENA	**Energy Network Association**
ICP	**Independent Connection Provider**
LA	**Local Authority**
LV	**Low Voltage** Voltages up to 1000V - typically used to describe 230/400V distribution systems.
MET	**Main Earthing Terminal**
MOP	**Meter Operator**
MPR	**Maximum Power Rating**
PFI	**Private Finance Initiative**
PME	**Protective Multiple Earthing** Protective Multiple Earthing system uses a single conductor to provide earthing and neutral functions with an earth terminal provided at the customer's installation. The earthing of the customers electrical installation may then be connected to this terminal so long as the relevant requirements set out by BS 7671 are met
RCD	**Residual Current Device** Mechanical switching device designed to make, carry and break currents under normal service conditions and to cause the opening of the contacts when the residual current attains a given value under specified conditions**
Shared Power Supply Charge Point	A charge point which draws electricity from a shared electricity source, for example, a lighting column.
Skilled Person (electrically)	A person who possesses, as appropriate to the nature of the electrical work to be undertaken, adequate education, training and practical skills, and who is able to perceive risks and avoid hazards which electricity can create

TT	**Terre Terre Earthing** A system having one point of the source of energy directly earthed, the exposed-conductive parts of the installation being connected to earth electrodes electrically independent of the earth electrodes of the source**
UKPN	**UK Power Networks** UK Power Networks (Operations) Ltd which consists of three electricity distribution networks: ▪ Eastern Power Networks plc (EPN) ▪ London Power Networks plc (LPN) ▪ South Eastern Power Networks plc (SPN)
UMC	**Unmetered Connection**

* Definition taken from the Electricity Safety, Quality and Continuity Regulations 2002
** Definition taken from BS 7671

2. Introduction

This guidance has been produced to assist London boroughs in the delivery of electric vehicle charge points (EVCPs) as part of London's Go Ultra Low City Scheme (GULCS) programme. London's GULCS is a joint programme between London Councils and the boroughs, Transport for London (TfL) and the Greater London Authority (GLA). The project's vision, funded by £13.2m from the Office for Low Emission Vehicles (OLEV), is to make London the ultra-low emission capital of Europe.

The purpose of this guidance is to clarify roles and responsibilities between EVCP operators and London boroughs (or PFI contractors). This guidance is optional for use and can be adapted to suit borough needs. Although written for the GULCS London boroughs, the principles in this guidance are applicable to other authorities responsible for the delivery of EVCPs.

This document identifies owners and stakeholders responsible for each part of the installation of an EVCP and provides brief descriptions of their roles and responsibilities. This is provided for the following four installation scenarios:

- Shared lamp column supply
- Shared lamp column supply (satellite charge point)
- Dedicated power supply (feeder pillar)
- Existing power supply (feeder pillar)

This document is by no means exhaustive for all the possible charge point installation scenarios that may be encountered. As this guidance has been produced for London boroughs procuring charge points under the GULCS EV Charging Framework, it has been written specifically for shared power supply charge points with a rated output of up to 7kW and dedicated power supply charge points with a rated output from 7 to 22kW.

All roles and responsibilities should be agreed between the Awarding Authority, the supplier of the charge point and any nominated third party(s) as per the Statement of Requirement 4.1 Mobilisation and Inception. Any ambiguity relating to the ownership of specific assets, and/or the responsibilities of specific stakeholders, throughout the lifecycle of the site should be clarified with the Awarding Authority prior to undertaking installation of any charging infrastructure or equipment.

Any risks, hazards or other notable complications and/or considerations posed by each charge point installation should be assessed on an individual site basis by a competent person(s). Similar considerations should also be taken into account with regards to charge point (and/or mains) disconnection (temporary or permanent) and site decommissioning.

All EVCP installations, and subsequent decommissioning's, must comply with current standards and regulations, including the IET Wiring Regulations BS7671. It is recommended that all EVCP installations follow best practice set out by the IET in the latest '*Code of Practice for Electric Vehicle Charging Equipment*' document.

The electric vehicle charging landscape is constantly evolving as new technologies and innovations in vehicle charging are realised. As such this guidance should be regarded as a live document and is subject to change to reflect wider changes in both industry and national standards and guidelines governing electric vehicle charging.

3. General Considerations for all Electric Vehicle Charge Point Installations

3.1. Exclusion Zones between Electrical Street Furniture

EVCPs installed on the highway are required to have a TT earthing system in accordance with ENA Engineering Recommendation G12, Issue 4, Amendment 1 (2015) and UKPN Engineering Design Standard EDS 06-0017 'Customer LV Installation Earthing Design'. This earthing system is different from that used on most other electrical street furniture (street lights, traffics signals, etc.). In line with IET code of practice for Electric Vehicle Charging Equipment Installations, any EVCP installations (including earth electrode(s)) must be situated at least 2.5 metres 'arms reach' away from any point of any other type of electrical earthing system. This is to prevent the risk of dangerous touch voltages between adjacent electrical street furniture on different earthing systems. This earthing exclusion zone must also consider the area where the electric vehicle will reside for the duration of a charging session. An illustration of this exclusion zone can be found in Figure 1.

3.2. Notification Requirement

The Energy Networks Association (ENA) requires that the local authority (or nominated charge point provider) notifies the applicable Distribution Network Operator (DNO) of any EVCP installations within 30 days of commissioning. This is to help track the roll out of electric vehicle charging infrastructure and allows the DNO to measure the impact of the charging infrastructure on the electrical grid. More information about the notification process can be found at: http://www.energynetworks.org/electricity/futures/electric-vehicle-infrastructure.html and a copy of the notification form can be found in Appendix A.

3.3. Shared Lamp Column Supply with Satellite Charge Points

UKPN have confirmed that a satellite charge point sharing an unmetered connection housed within a lamp a column is acceptable under their Engineering Design Standards. Satellite charge point installations derived from the unmetered connection of a lamp column must comply with section 5.1 "Unmetered Connections" of UKPN Engineering Design Standard EDS 08-5050 'Electric Vehicle Connections'. A visual representation of acceptable installation types for satellite charge points is shown in Figure 4.

3.4. Site Design

Before any installation work can commence all charge point site designs, whether they use new or existing electrical supplies, must be agreed with and approved by a competent person from or on behalf of the Awarding Authority. This includes but is not limited to; any site layout drawings, electrical designs or traffic management plans.

3.5. Site Testing, Commissioning and Future Maintenance

All charge point installation testing and commissioning activities are to be undertaken as per the GULCS Framework, with all relevant documents submitted as part of the Final Build Documentation pack. The Charge Point Provider will record details of the charge point installation in their asset register as per the GULCS Framework. Following successful commissioning of the charge point, unless agreed otherwise by the Awarding Authority, the Charge Point Provider will assume responsibility for future planned and reactive maintenance of the charge point installation as set out in the GULCS Framework.

4. TT & PME Earthing Exclusion Zones Diagram

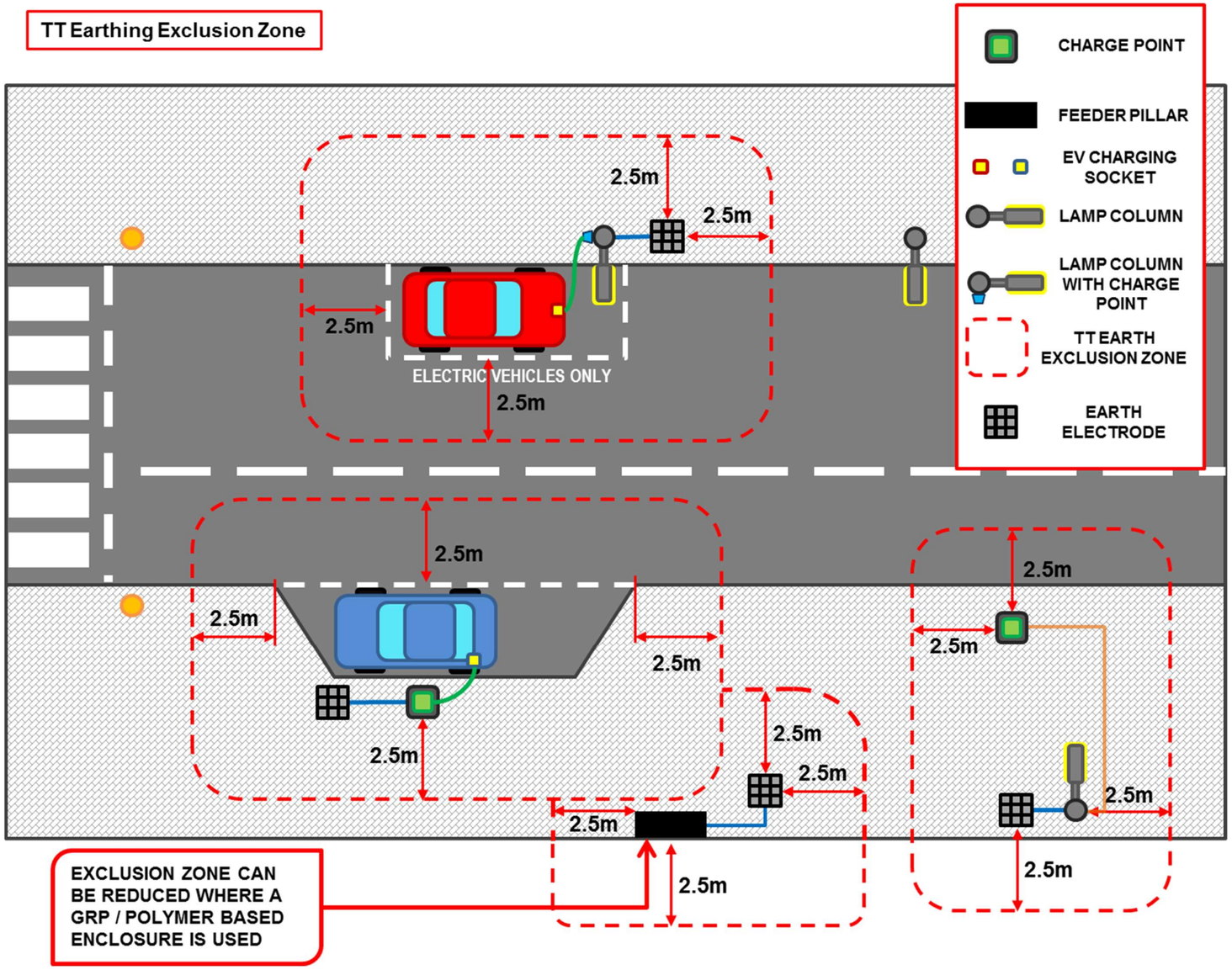


Figure 1*:* A visual representation of the 2.5 metre earthing exclusion zone required between (TT) EVCPs and other electrical (PME) street furniture, as per guidance from the IET 'Code of Practice for Electric Vehicle Charging Equipment Installations'.

NOTE: The position of any earth electrode(s) that make up part of the EVCP installation should be taken into consideration when calculating the TT earthing exclusion zone.

5. Shared Lamp Column Supply Installations

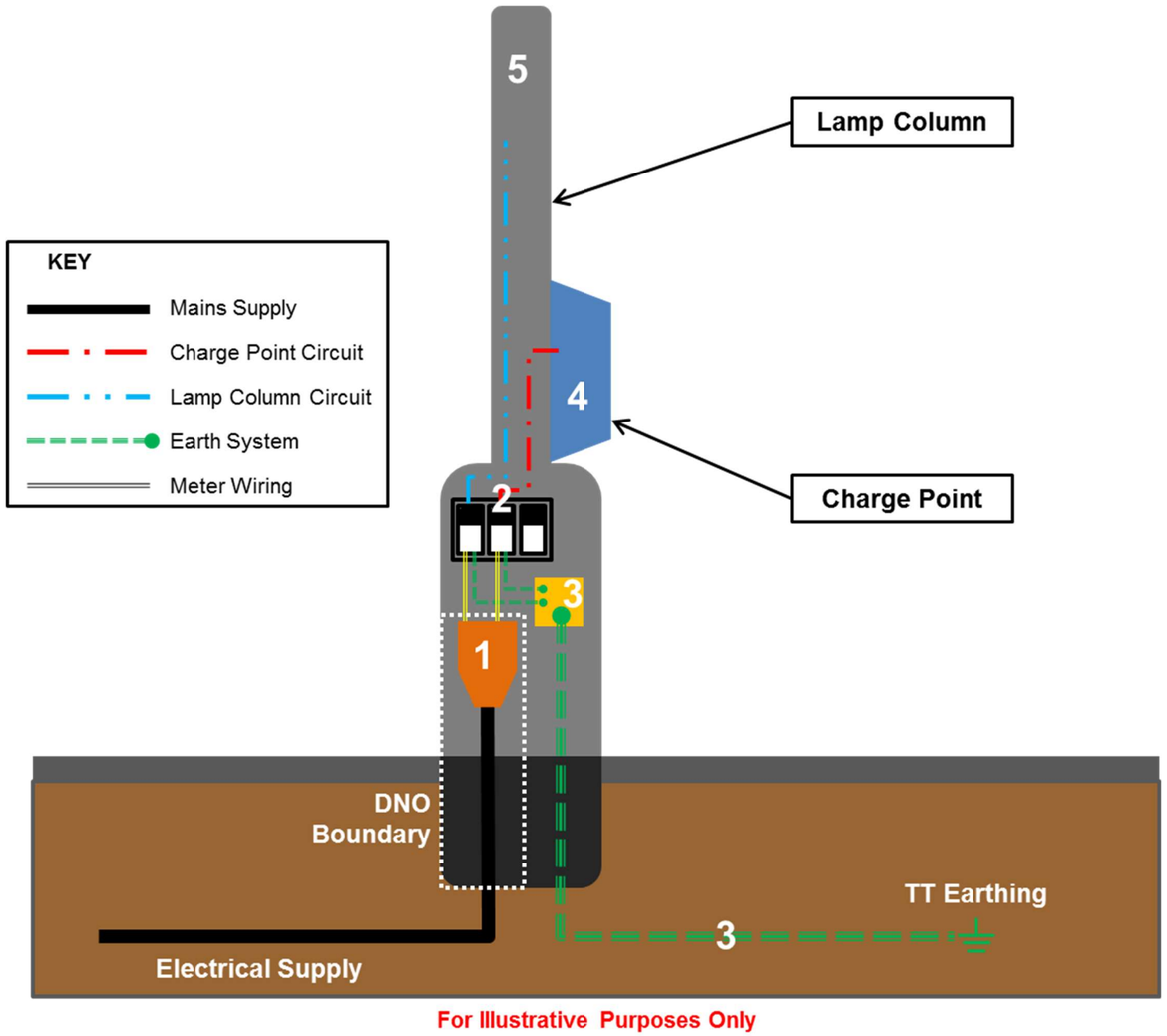


Figure 2: A visual representation of the components and earthing system that makes up a charge point installation utilising a shared lamp column supply.

NOTE: The position of any earth electrode(s) that make up part of the EVCP installation should be taken into consideration when calculating the TT earthing exclusion zone.

5.1 Shared Lamp Column Supply – High Level Ownership & Responsibilities

Asset (Figure 2)	Owner	Stakeholders	Details
1 - Fuse Cut Out & Mains Supply	DNO	DNO / LA / PFI	▪Only the DNO or an ICP contractor holding the appropriate accreditation(s) are permitted to work on the cut out (area inside the dashed white line) ▪For UKPN sites, provided the site satisfies all criteria set out in UKPN's 'EDS 08-5050' document, a G39 accredited competent, skilled persons (contractor) can upgrade the supply fuse without UKPN involvement ▪The maximum fuse rating of an unmetered connection is dependent on the measured earth fault loop impedance value as per table 7.1 'Maximum Earth Fault Loop Impedance for Fuse Selection' found in UKPN/s EDS 08-2102 'LV Customer Unmetered Supplies' document ▪The maximum available power from an unmetered connection is constrained by this fuse rating. Total MPR values for each fuse rating can be found in Table 5.1 'Maximum Power Available per Fuse Rating' found in UKPN's EDS 08-5050 document ▪For all other sites the CPP/ LA / PFI (depending on arrangements set out by the Awarding Authority) is responsible for engaging with the DNO or ICP in situations where upgrades to the fuse cut out or mains supply are required. ▪Unless other arrangements are in place, the LA / PFI is responsible for engaging with the DNO to arrange temporary or permanent disconnection of the mains supply from the shared lamp column
2 - Distribution Board	LA / PFI	CPP / LA / PFI	▪LA / PFI is responsible for the maintenance of the distribution board ▪CPP is responsible for their electrical installation to the distribution board ▪CPP is responsible for ensuring that their electrical installation complies with the IET Wiring Regulations (BS7671) ▪CPP must ensure that their works do not impact the operation of the existing street lighting installation ▪Isolation and Switching – CPP is responsible for providing a means of isolating the charge point equipment in accordance with BS7671. The isolating device(s) should be positioned in a readily accessible location for maintenance and must be suitably marked or labelled. ▪Protective Devices – CPP is responsible for providing the appropriately sized, LA / PFI approved, protective devices as part of the charge point installation in line with BS7671. ▪When decommissioning the shared column charge point, the CPP is responsible for ensuring that all wiring and electrical equipment associated with the charge point installation is removed from the lamp column ▪At decommissioning, following the removal of charge point infrastructure, the responsible party must ensure that the remaining lighting electrical installation within the lamp column is left in a safe, functional state that complies with all applicable standards
3 - Earthing Arrangements	CPP / LA / PFI	CPP / LA / PFI	▪Lamp column must be converted to a TT earth system – for sites where the DNO is UKPN this activity can be carried out by a competent, skilled electrical contractor holding the appropriate G39 accreditation. For all other sites the CPP / LA / PFI will need to engage with the DNO. ▪Existing PME link between the fuse cut-out and the MET must be removed and not connected to outgoing TT circuits ▪LA / PFI is responsible for recording that the earth system has been converted to TT and notifying all relevant maintenance/engineering staff/contractors ▪Earth cable CSA must comply and be designed in accordance with BS7671 standards ▪Earth method to be specified by CPP – where practicable the resulting Ze (earth fault loop impedance) should be <20Ω, however a maximum resistance of up to 100Ω is considered a stable and acceptable earth resistance under the IET's 'Guide to Highway Electrical Street Furniture' ▪CPP / LA / PFI should agree on a suitable earthing arrangement for shared lamp column installations. Current ENA and UKPN guidance **does not permit the lamp column to be used as an earth electrode**. Where the LA wishes to adopt a risk-averse approach, it is recommended that an alternative earthing electrode is adopted.

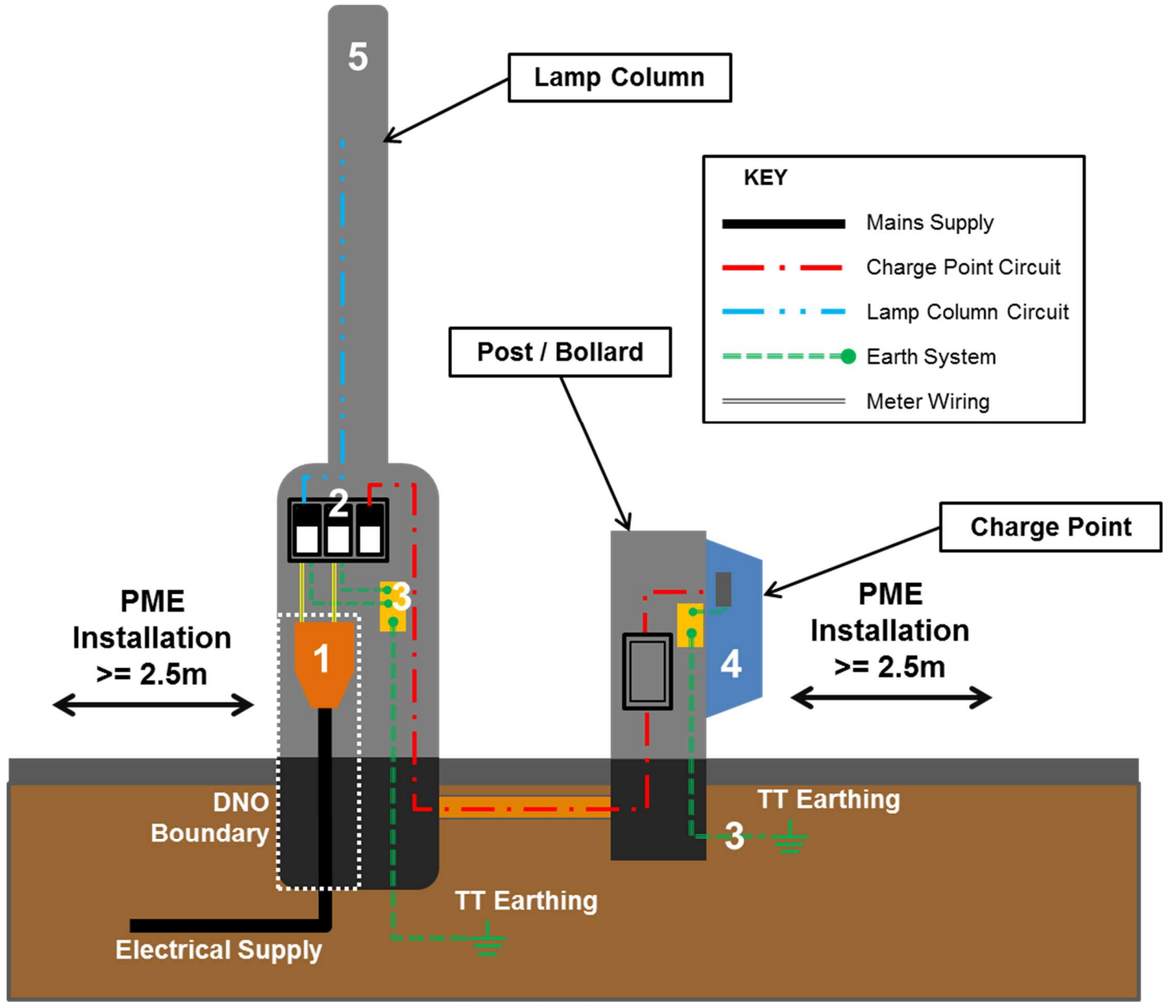
4 - Charge Point	CPP	CPP	▪CPP is responsible for installation / maintenance / decommissioning of charge point, unless other arrangements have been made with the LA or Awarding Authority ▪CPP should provide a small enclosure within the charge point to house the appropriate protective devices necessary to protect users from the risk of electric shock
5 - Lamp Column	LA / PFI	LA / PFI	▪Unless other arrangements are in place, the lamp column is owned and maintained by the LA / PFI ▪LA / PFI /CPP should conduct a structural risk assessment prior to making any holes or cut outs in the lamp column to assess the impact this may have on the structural integrity of the lamp column ▪CPP is responsible for ensuring that any holes or cut outs made in the lamp column for charge point installation do not expose the lamp column to an increased risk of corrosion ▪When decommissioning the charge point the CPP must permanently seal any holes or cut outs made in the lamp column.

5.2 Shared Lamp Column Supply – Key Stage Activities

Stage	Stakeholders	Details
Site Selection and Design	CPP / LA / PFI	▪When selecting an existing lamp column to convert into an EV charge point or choosing the location of a new dedicated lamp column charge point, consideration should be given to any other equipment mounted to the lamp column (both permanently or seasonally) as well as the presence of other electrical street furniture in the vicinity ▪Where an existing lamp column will be utilised for a charge point installation records should be obtained from the LA or PFI to confirm, amongst others; date of column installation, column manufacturer, lamp column material, whether a column sleeve or socket has been used. These factors should be considered when assessing the suitability of the lamp column for a charge point installation
Installation	DNO / CPP / LA / PFI	▪Unless otherwise stated, or excluded from the list of services required, by the Awarding Authority (AA), the **CPP is responsible for all civils works relating to the installation of the charge point**. This includes (where applicable): **foundations for the feeder pillar(s), foundation for the charge point(s), any ducting between the point of connection and the charge point(s) and the reinstatement of any carriageway/footway impacted by any of these works** ▪LA / PFI / CPP should conduct a structural risk assessment prior to making any holes or cut outs in the lamp column to assess the impact this may have on the structural integrity of the lamp column ▪The CPP is responsible for ensuring that any holes or cut outs made in the lamp column structure to facilitate the installation of the charge point infrastructure do not introduce and/or accelerate corrosion of the lamp column ▪The CPP must ensure that any seal between the lamp column and charge point should be weatherproof and any exposed metal work following the installation of the charge point should be protected with paint or an anti-corrosion coating. ▪For sites where the DNO is UKPN, the supply fuse can be upgraded by a competent, skilled ICP holding an appropriate G39 accreditation, without the involvement of UKPN, provided that the site satisfies all criteria set out in UKPN's 'EDS 08 5050' document ▪For all other sites, upgrades to the supply fuse will need to involve the relevant DNO, though an ICP may be able to carry out the works. In the absence of an agreement between the CPP and the LA / PFI stating otherwise, it is the responsibility of the LA / PFI to engage with the relevant DNO ▪The CPP is responsible for providing a reliable TT earthing method (in compliance with IET Wiring Regulations BS7671 and IET 'Guide to Highway Electrical Street Furniture') for the charge point equipment ▪The LA / PFI is responsible for recording that the earth system has been converted to TT and notifying all relevant maintenance/engineering staff/contractors
Disconnection (of charge point)	DNO / CPP / LA / PFI	▪Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from the shared lamp column, it is the responsibility of the LA (unless otherwise stated) to engage with the DNO ▪The CPP is responsible for the safe disconnection of the charge point equipment, and ensuring that the disconnection of the charge point equipment does not affect the normal operation of the lighting column ▪In cases where the charge point will remain in place following disconnection, the CPP is responsible for clearly indicating that the charge point is out of service
Decommissioning (of charge point)	DNO / CPP / LA / PFI	▪LA / PFI /CPP should conduct a structural risk assessment prior to decommissioning the charge point to ensure that methods proposed to seal holes or cut outs left by the charge point and make good the lamp column do not impact on the structural integrity of the lamp column ▪CPP is responsible for ensuring any holes or cut outs made to facilitate the installation of charge point infrastructure are permanently sealed following the removal of the charge point ▪When removing the charge point from the lamp column the CPP must ensure that any exposed metal work on the lamp column is protected with paint or an anti-corrosion coating ▪When decommissioning the shared column charge point, the CPP is responsible for ensuring that all wiring and electrical equipment associated with the charge point installation is removed from the lamp column ▪At decommissioning, following the removal of charge point infrastructure, the responsible party must ensure that any remaining electrical

		installation(s) within the lamp column is left in a safe, functional state that complies with all applicable standards ▪ Unless otherwise stated by the Awarding Authority or the LA / PFI, it is not necessary to excavate the TT earthing method following removal of all charge point equipment ▪ Following the decommissioning of the charge point, it is the responsibility of the LA / PFI to decide whether the lamp column is returned to a PME earthing system or if the installation will remain part of a TT earthing system

6. Shared Lamp Column Supply Satellite Charge Point Installations



For Illustrative Purposes Only

Figure 3: A visual representation of the components and earthing system that makes up a 'satellite' charge point installation utilising a shared lamp column supply.

NOTE: The position of any earth electrode(s) that make up part of the EVCP installation should be taken into consideration when calculating the TT earthing exclusion zone.

6.1 Shared Lamp Column Supply (Satellite Charge Point) Installation Layouts

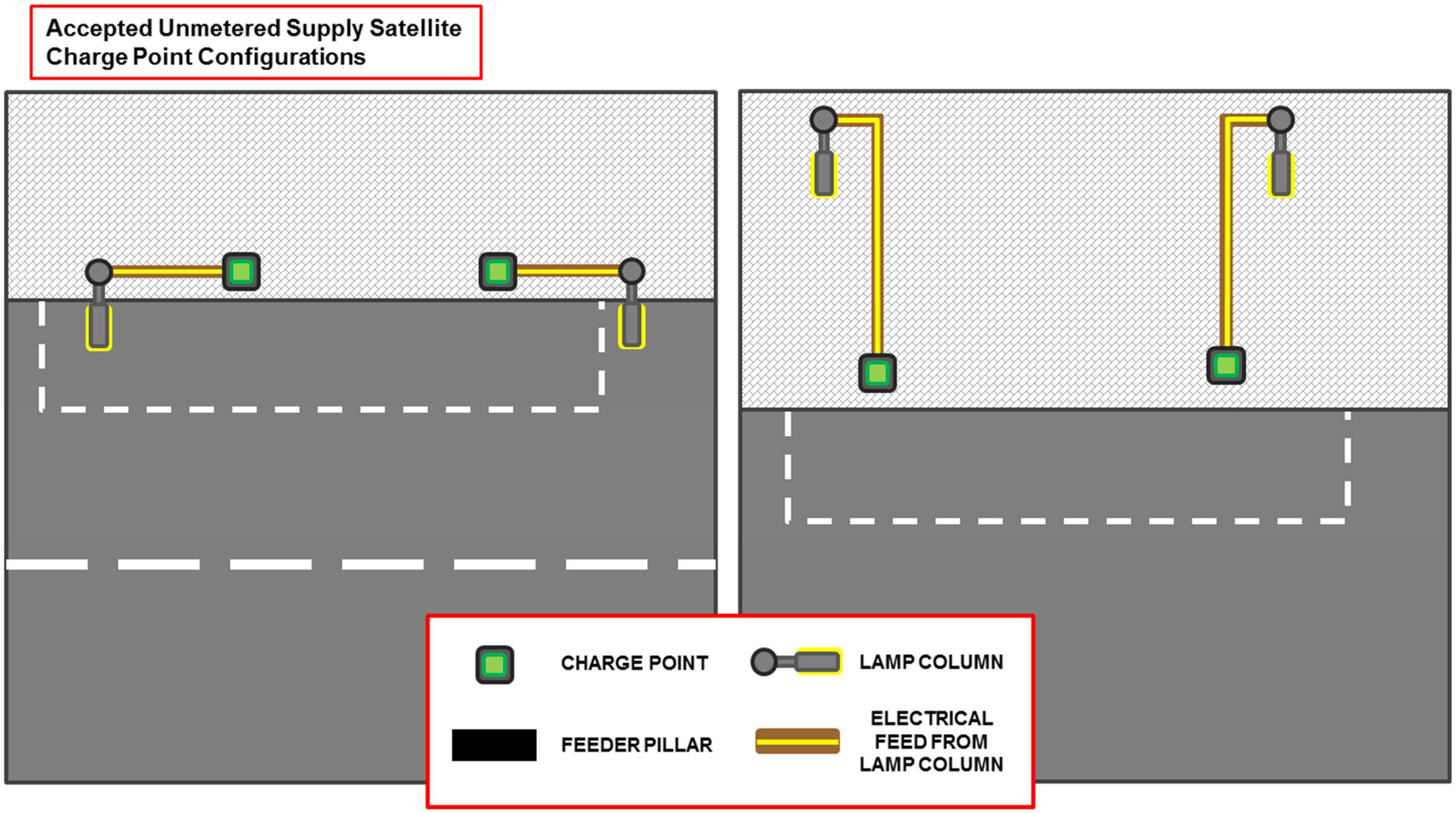


Figure 4: A visual representation of acceptable satellite charge point installations utilising an unmetered supply from a nearby lamp column.

6.2 Shared Lamp Column Supply (Satellite Charge Point) – High Level Ownership & Responsibilities

Note: The installation of an unmetered supply within a dedicated feeder pillar to provide power to a satellite charge point is not permitted.

Asset (Figure 3)	Owner	Stakeholders	Details
1 - Fuse Cut Out & Mains Supply	DNO	DNO / LA / PFI	▪Only the DNO or an ICP contractor holding the appropriate accreditation(s) are permitted to work on the cut out (area inside the dashed white line) ▪For UKPN sites, provided the site satisfies all criteria set out in UKPN's 'EDS 08-5050' document, a G39 accredited competent, skilled persons (contractor) can upgrade the supply fuse without UKPN involvement – size of fuse rating to comply with table 5.1 'Maximum Power Available per Fuse Rating' found in UKPN's EDS 08-5050 document ▪For all other sites the CPP/ LA / PFI (depending on arrangements set out by the Awarding Authority) is responsible for engaging with the DNO or ICP in situations where upgrades to, and/or replacement of, the fuse cut out or mains supply are required to facilitate the installation electric vehicle charge point. ▪Unless other arrangements are in place, the LA is responsible for engaging with the DNO to arrange temporary or permanent disconnection of the mains supply from the shared lamp column
2 - Distribution Board	LA / PFI	CPP / LA / PFI	▪LA / PFI is responsible for the maintenance of the distribution board ▪CPP is responsible for the charge point electrical installation to the distribution board ▪CPP is responsible for ensuring that their electrical installation complies with the IET Wiring Regulations (BS7671) ▪CPP must ensure that their works do not impact the operation of the existing street lighting installation ▪Isolation and Switching – CPP is responsible for providing a means of isolating the charge point equipment in accordance with BS7671. The isolating device(s) should be positioned in a readily accessible location for maintenance and must be suitably marked or labelled. ▪Protective Devices – CPP is responsible for providing the appropriately sized, LA/PFI approved, protective devices as part of the charge point installation in line with BS7671. ▪When decommissioning the satellite charge point, the CPP is responsible for ensuring that all wiring and electrical equipment associated with the charge point installation is removed from the lamp column ▪At decommissioning, following the removal of charge point infrastructure, the responsible party must ensure that the remaining lighting electrical installation within the lamp column is left in a safe, functional state that complies with all applicable standards
3 - Earthing Arrangements	CPP / LA / PFI	CPP / LA / PFI	▪Lamp column must be converted to a TT earth system – for sites where the DNO is UKPN this activity can be carried out by a competent, skilled electrical contractor holding the appropriate G39 accreditation. For all other sites the CPP / LA / PFI will need to engage with the DNO. ▪Existing PME link between the fuse cut-out and the MET must be removed and not connected to outgoing TT circuits ▪The satellite charge point unit will require a separate, dedicated TT earth system ▪Earth cable CSA must comply and be designed in accordance with BS7671 standards ▪Careful consideration must be given to the location of the satellite charge point with regards to any other powered street furniture in the vicinity. No PME systems can exist within 2.5m of the entire EV charging installation (supply lamp column and satellite charge point), this exclusion zone should also account for the presence of any earth electrodes installed as part of the EVCP installation. ▪Earth electrode to be specified by CPP – where practicable the resulting Ze (earth fault loop impedance) should be <20Ω, however a maximum resistance of up to 100Ω is considered a stable and acceptable earth resistance under the IET's 'Guide to Highway Electrical Street Furniture'
4 - Charge Point	CPP	CPP	▪CPP is responsible for installation / maintenance / decommissioning of charge point ▪CPP should provide a small enclosure within the charge point to house the appropriate protective devices necessary to protect users from the risk of electric shock

5 - Lamp Column	LA / PFI	LA / PFI	▪Unless other arrangements are in place, lamp column is owned and maintained by the LA / PFI ▪CPP is responsible for clearly labelling the charge point circuit to help differentiate it from the rest of the lamp column circuit/wiring.

6.3 Shared Lamp Column Supply (Satellite Charge Point) – Key Stage Activities

Stage	Stakeholders	Details
Site Selection and Design	CPP / LA / PFI	▪When selecting an existing lamp column to power a satellite charge point and selecting a location for the satellite charge point itself, consideration should be given to the presence of other electrical street furniture in the vicinity of the existing lamp column and/or the proposed satellite charge point location. This is to ensure sufficient electrical separation between TT and PME earthing arrangements.
Installation	DNO / CPP / LA / PFI	▪Unless otherwise stated, or excluded from the list of services required, by the Awarding Authority (AA), the **CPP is responsible for all civils works relating to the installation of the charge point**. This includes (where applicable): **foundations for the feeder pillar(s), foundation for the charge point(s), any ducting between the point of connection and the charge point(s) and the reinstatement of any carriageway/footway impacted by any of these works** ▪For unmetered sites where the DNO is UKPN, the supply fuse can be upgraded by a competent ICP with a G39 accreditation, without the involvement of UKPN, provided that the site satisfies all criteria set out in UKPN's 'EDS 08 5050' document ▪For all other sites, upgrades to the supply fuse may require involvement of the relevant DNO, though an ICP may be able to carry out the works. In the absence of an agreement between the CPP and the LA / PFI stating otherwise, it is the responsibility of the LA / PFI to engage with the relevant DNO ▪The LA / PFI is responsible for recording that the earth system has been converted to TT and notifying all relevant maintenance/engineering staff/contractors ▪The CPP is responsible for providing a reliable TT earthing method (in compliance with IET Wiring Regulations BS7671 and IET 'Guide to Highway Electrical Street Furniture') for the charge point equipment
Disconnection (of charge point)	DNO / CPP / LA / PFI	▪Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from the shared lamp column, it is the responsibility of the LA / PFI (unless otherwise stated) to engage with the DNO ▪The CPP is responsible for the safe disconnection of the charge point equipment ▪The CPP is responsible for ensuring that the disconnection of the charge point equipment does not affect the normal operation of the lighting column ▪In cases where the charge point will remain in place following disconnection, the CPP is responsible for clearly indicating that the charge point is out of service
Decommissioning (of charge point)	DNO / CPP / LA / PFI	▪Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from the shared lamp column, it is the responsibility of the LA / PFI (unless otherwise stated) to engage with the DNO ▪When decommissioning the shared column charge point, the CPP is responsible for ensuring that all wiring and electrical equipment associated with the charge point installation is removed from the lamp column ▪At decommissioning, following the removal of charge point infrastructure, the responsible party must ensure that any remaining electrical installation(s) within the lamp column is left in a safe, functional state that complies with all applicable standards ▪Unless otherwise stated by the Awarding Authority or the LA / PFI, it is not necessary to excavate the TT earthing method following removal of all charge point equipment ▪The CPP is to agree with the LA / PFI whether it is necessary to remove any of the ducting, and/or backfill any access chambers, associated with the charge point installation ▪Following removal of the satellite charge point(s), the CPP is responsible for reinstatement of the footway and/or carriageway to the specifications of the LA / PFI

7. Dedicated Power Supply (Feeder Pillar) Installations

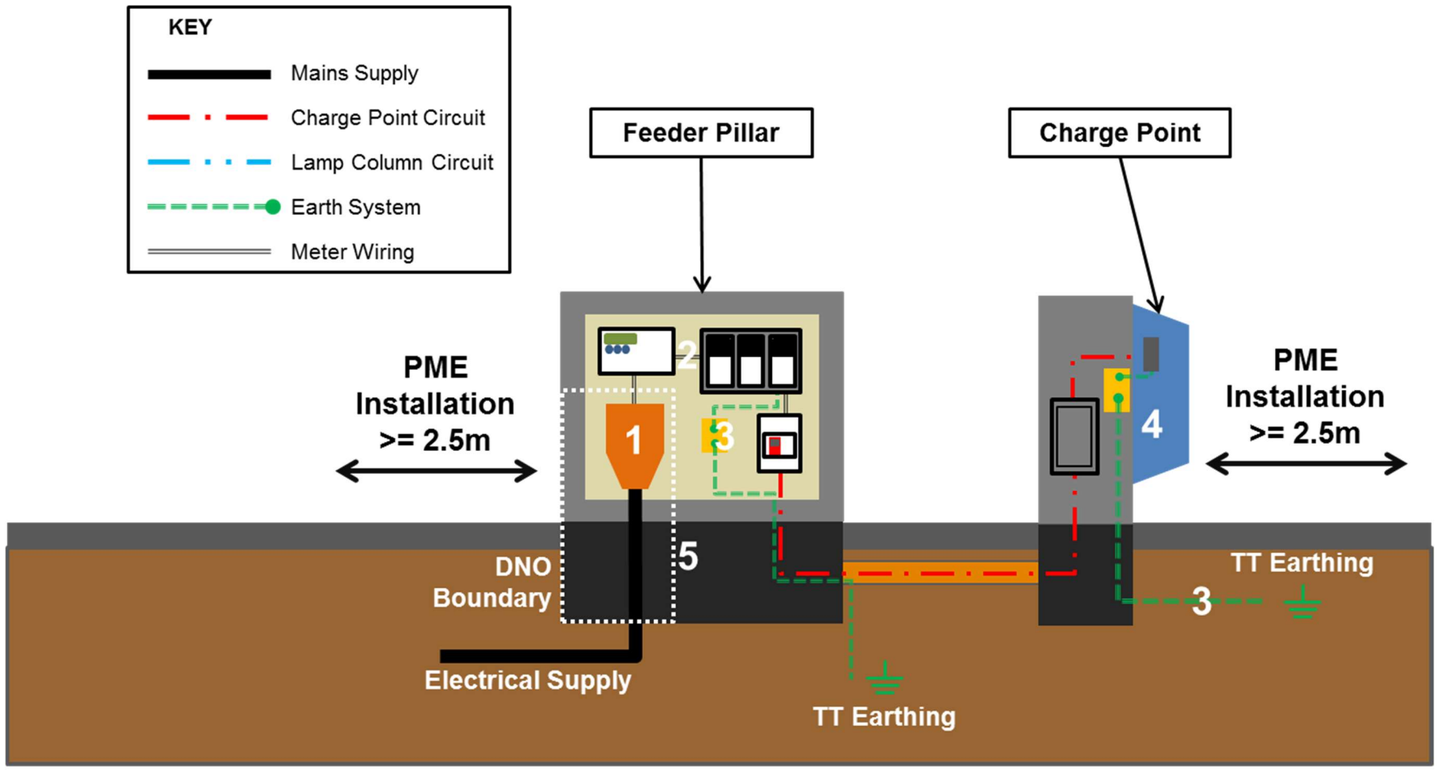


Figure 5*:* A visual representation of the components and earthing system that makes up a charge point installation utilising a dedicated power supply (new feeder pillar).

NOTE: The position of any earth electrode(s) that make up part of the EVCP installation should be taken into consideration when calculating the TT earthing exclusion zone.

7.1 Dedicated Power Supply (Feeder Pillar) – High Level Ownership & Responsibilities

Asset (Figure 5)	Owner	Stakeholders	Details
1 - Fuse Cut Out & Mains Supply	DNO	DNO / LA / PFI	▪Only the DNO, the MOP, or an ICP contractor holding the appropriate accreditation(s) are permitted to work on the cut out (area inside the dashed white line) ▪CPP is responsible for engaging with the DNO or ICP for installation of the cut out ▪Unless other arrangements are in place, the LA is responsible for engaging with the DNO to arrange temporary or permanent disconnection of the mains supply from the feeder pillar
2 - Distribution Board & Meter	LA / PFI	CPP / LA / PFI	▪CPP is responsible for the installation of the meter and distribution board (via energy supplier and electrical contractor) ▪CPP is responsible for ensuring that their electrical installation complies with the IET Wiring Regulations (BS7671) ▪Isolation and Switching – CPP is responsible for providing a means of isolating the charge point equipment in accordance with BS7671. The isolating device(s) should be positioned in a readily accessible location for maintenance and must be suitably marked or labelled. ▪Protective Devices – CPP is responsible for providing the appropriately sized, LA/PFI approved, protective devices as part of the charge point installation in line with BS7671 ▪Unless otherwise stated, the CPP is responsible for engaging with the DNO for changes and maintenance
3 - Earthing Arrangements	CPP / LA / PFI	CPP / LA / PFI	▪Both the feeder pillar and the charge point must have a TT earth bonding system – this can be undertaken by a competent person from an ICP or DNO, CPP is responsible for engaging with the ICP or DNO ▪Existing PME link between the fuse cut-out and the MET must be removed and not connected to outgoing TT circuits ▪Charge point and feeder pillar should have TT earth systems independent of each other ▪CPP is responsible for specifying the earth method used for charge point and feeder pillar ▪Earth cable CSA must comply and be designed in accordance with BS7671 standards ▪Earth method to be specified by CPP – where practicable the resulting Ze (earth fault loop impedance) should be <20Ω, however a maximum resistance of up to 100Ω is considered a stable and acceptable earth resistance under the IET's 'Guide to Highway Electrical Street Furniture'
4 - Charge Point	CPP	CPP	▪CPP is responsible for installation / maintenance / decommissioning of charge point ▪CPP should provide a small enclosure within the charge point or feeder pillar to house the circuits protective device(s) and means isolation
5 - Feeder Pillar	LA / PFI	CPP / LA / PFI	▪CPP is responsible for ensuring that equipment and circuits within the feeder pillar are labelled correctly and appropriate warning labels are displayed ▪Unless otherwise stated, the CPP is responsible for engaging with the DNO for changes and maintenance ▪When decommissioning the charge point, the CPP is responsible for ensuring that all wiring and electrical equipment associated with the charge point installation is removed from the feeder pillar ▪At decommissioning, unless stated otherwise, the CPP is responsible for engaging with the DNO to arrange permanent disconnection of the mains supply from the feeder pillar

7.2 Dedicated Power Supply (Feeder Pillar) – Key Stage Activities

Stage	Stakeholders	Details
Site Selection and Design	CPP / LA / PFI	▪ When selecting the location for the charge point and associated feeder pillar, consideration should be given to the presence of other electrical street furniture in the vicinity of the proposed locations of either the charge point and/or the feeder pillar. This is to ensure sufficient electrical separation between TT and PME earthing arrangements. ▪ Feeder pillars should be positioned such that the risk of vehicular impact is minimised
Installation	DNO / CPP / LA / PFI	▪ Unless otherwise stated, or excluded from the list of services required, by the Awarding Authority (AA), the **CPP is responsible for all civils works relating to the installation of the charge point.** This includes (where applicable): **foundations for the feeder pillar(s), foundation for the charge point(s), any ducting between the point of connection and the charge point(s) and the reinstatement of any carriageway/footway impacted by any of these works** ▪ The CPP is responsible for procuring and installing the feeder pillar ▪ The CPP is responsible for engaging with the DNO or ICP to provide a connection to the electricity grid ▪ The CPP is responsible for engaging with the DNO or ICP for changes to the fuse cut out and earthing system to facilitate the installation of the charge point ▪ The CPP is responsible for ordering MPANS for the charge point installation and undertaking all works associated with installing the electricity meter and distribution board inside the feeder pillar ▪ The CPP is responsible for providing a reliable TT earthing method (compliant with IET Wiring Regulations BS7671 and IET 'Guide to Highway Electrical Street Furniture') for the charge point equipment
Disconnection (of charge point)	DNO / CPP / LA / PFI	▪ Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from feeder pillar, it is the responsibility of the CPP (unless otherwise stated) to engage with the DNO ▪ The CPP is responsible for the safe disconnection of the charge point equipment ▪ In cases where the charge point will remain in place following disconnection, the CPP is responsible for clearly indicating that the charge point is out of service
Decommissioning (of charge point)	DNO / CPP / LA / PFI	▪ Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from the feeder pillar, it is the responsibility of the CPP (unless otherwise stated) to engage with the DNO ▪ Unless otherwise stated by the Awarding Authority or the LA / PFI, it is not necessary to excavate the TT earthing method following removal of all charge point equipment ▪ The CPP is to agree with the LA whether it is necessary to remove the feeder pillar and fuse cut out ▪ The CPP is to agree with the LA whether it is necessary to remove any of the ducting, and/or backfill any access chambers, associated with the charge point installation ▪ Following removal of the charge point(s) and/or feeder pillar, the CPP is responsible for reinstatement of footway and/or carriageway to the specifications of the LA

8. Existing Power Supply (Feeder Pillar) Installations

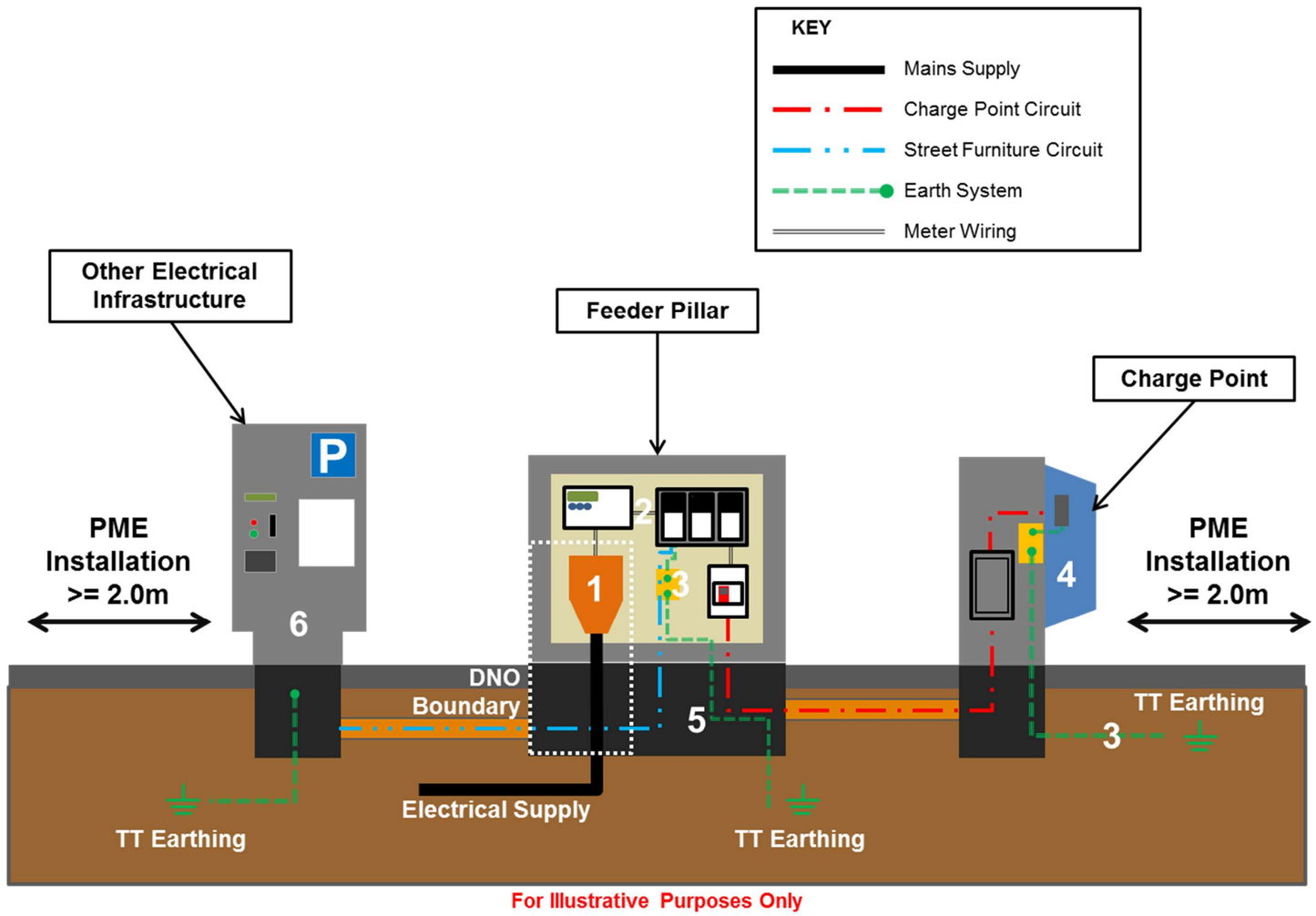


Figure 6: A visual representation of the components and earthing system that makes up a charge point installation utilising an existing power supply (feeder pillar).

NOTE: The position of any earth electrode(s) that make up part of the EVCP installation should be taken into consideration when calculating the TT earthing exclusion zone.

8.1 Existing Power Supply (Feeder Pillar) – High Level Ownership & Responsibilities

Asset (Figure 6)	Owner	Stakeholders	Details
1 - Fuse Cut Out & Mains Supply	DNO	DNO / LA / PFI	▪Only the DNO, the MOP, or an ICP contractor holding the appropriate accreditation(s) are permitted to work on the cut out (area inside the dashed white line) ▪The LA / PFI are responsible for engaging with the DNO or ICP in situations where changes to, and/or maintenance of, the fuse cut out or mains supply are required to facilitate the installation of an electric vehicle charge point ▪Unless other arrangements are in place, the LA is responsible for engaging with the DNO to arrange temporary or permanent disconnection of the mains supply from the feeder pillar
2 - Distribution Board	LA / PFI	CPP / LA / PFI	▪Local Authority is responsible for the maintenance of the existing meter and distribution board (via energy supplier and electrical contractor) ▪CPP is responsible for installation / maintenance / disconnection of charge point electrical circuit ▪CPP is responsible for ensuring that their electrical installation complies with the IET Wiring Regulations (BS7671) ▪Isolation and Switching – CPP is responsible for providing a means of isolating the charge point equipment in accordance with BS7671. The isolating device(s) should be positioned in a readily accessible location for maintenance and must be suitably marked or labelled. ▪Protective Devices – CPP is responsible for providing the appropriately sized, LA/PFI approved, protective devices as part of the charge point installation in line with BS7671.
3 - Earthing Arrangements	CPP / LA / PFI	CPP / LA / PFI	▪In circumstances where an existing feeder pillar will be used to supply a charge point, this feeder pillar and the associated electrical installation will need to be converted to a TT earthing system ▪Existing PME link between the fuse cut-out and the MET must be removed and not connected to outgoing TT circuits ▪If it is not feasible to convert the existing electrical installation to a TT earthing system a new dedicated electrical supply and feeder pillar should be provided in line with guidance on **Dedicated Power Supply (Feeder Pillar)** installations found in this document ▪The electric vehicle charge point unit will need a separate, dedicated TT earth system ▪LA is responsible for recording that the earth system has been converted to TT and notifying all relevant maintenance/engineering staff/contractors ▪Earth cable CSA must comply and be designed in accordance with BS7671 standards ▪Earth method to be specified by CPP – where practicable the resulting Ze (earth fault loop impedance) should be <20Ω, however a maximum resistance of up to 100Ω is considered a stable and acceptable earth resistance under the IET's 'Guide to Highway Electrical Street Furniture'
4 - Charge Point	CPP	CPP	▪CPP is responsible for installation / maintenance / decommissioning of charge point ▪CPP should provide a small enclosure within the charge point or feeder pillar to house the circuits protective device(s) and means of isolation
5 - Feeder Pillar	LA / PFI	LA / PFI	▪CPP is responsible for ensuring that equipment and circuits within the feeder pillar are labelled correctly and appropriate warning labels are displayed ▪Unless other arrangements are in place, the LA / PFI is responsible for engaging with the DNO for changes and maintenance ▪When decommissioning the charge point, the CPP is responsible for ensuring that all wiring and electrical equipment associated with the charge point installation is removed from the shared feeder pillar ▪At decommissioning, the responsible party must ensure that the remaining powered street furniture electrical installation within the feeder pillar is left in its original state prior to the addition of charge point infrastructure
6 - Street Furniture	LA / PFI	LA / PFI	▪The LA / PFI is responsible for the operation / maintenance of powered street furniture (and associated electrical circuits)

8.2 Existing Power Supply (Feeder Pillar) – Key Stage Activities

Stage	Stakeholders	Details
Site Selection and Design	CPP / LA / PFI	▪ When selecting the location for the charge point, consideration should be given to the presence of other electrical street furniture in the vicinity of the proposed locations of either the charge point and/or the existing feeder pillar. This is to ensure sufficient electrical separation between TT and PME earthing arrangements. ▪ The feasibility of converting an existing feeder pillar installation to power a charge point installation should be carefully considered, especially where multiple stakeholders may be involved
Installation	DNO / CPP / LA / PFI	▪ Unless otherwise stated, or excluded from the list of services required, by the Awarding Authority (AA), the CPP is responsible for all civils works relating to the installation of the charge point. This includes (where applicable): foundations for the feeder pillar(s), foundation for the charge point(s), any ducting between the point of connection and the charge point(s) and the reinstatement of any carriageway/footway impacted by any of these works ▪ In the absence of an agreement between the CPP and the LA / PFI stating otherwise, it is the responsibility of the LA / PFI to engage with the DNO or ICP for changes to the fuse cut out and earthing system to facilitate the installation of the charge point ▪ The CPP is responsible for providing a reliable TT earthing method (compliant with IET Wiring Regulations BS7671 and IET 'Guide to Highway Electrical Street Furniture') for the charge point equipment
Disconnection (of charge point)	DNO / CPP / LA / PFI	▪ Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from feeder pillar, it is the responsibility of the LA / PFI (unless otherwise stated) to engage with the DNO ▪ The CPP is responsible for the safe disconnection of the charge point equipment ▪ The CPP is responsible for ensuring that the disconnection of the charge point equipment does not affect the normal operation of any other street furniture powered from the feeder pillar ▪ In cases where the charge point will remain in place following disconnection, the CPP is responsible for clearly indicating that the charge point is out of service
Decommissioning (of charge point)	DNO / CPP / LA / PFI	▪ Where it is necessary to arrange for temporary or permanent disconnection of the mains supply from the feeder pillar, it is the responsibility of the LA / PFI (unless otherwise stated) to engage with the DNO ▪ Unless otherwise stated by the Awarding Authority or the LA / PFI, it is not necessary to excavate the TT earthing method following removal of all charge point equipment ▪ The CPP is to agree with the LA / PFI whether it is necessary to remove the feeder pillar and fuse cut out ▪ The CPP is to agree with the LA / PFI whether it is necessary to remove any of the ducting, and/or backfill any access chambers, associated with the charge point installation ▪ Following removal of the charge point(s), the CPP is responsible for reinstatement of footway and/or carriageway to the specifications of the LA / PFI

9. Appendices

Appendix A: ENA Notification Form

Notification

Notification to DNO of installation of dedicated electric vehicle charging equipment

This form must be sent by the installer to notify the DNO directly. For help identifying the correct DNO and their contact details please visit http://www.energynetworks.org/electricity/futures/electric-vehicle-infrastructure.html

Please note that an 'adequacy of the supply' assessment, highlighted in the IET Code of Practice, is required prior to any EV charge point installation. This requires a load survey to calculate the new post-diversity **Maximum Demand (MD),** including the new electric vehicle charging equipment at the property.

DNO should be contacted **prior to installation** to establish the property's supply capacity in the following instances:

- Where there is an identified issue with adequacy or safety concern with the property's existing service equipment
- Where the property's MD (post-installation) will be **greater than** 60A (13.8kVA).

Date of installation		DD/MM/YYYY
Full address of installation	Address line 1	
	Address line 2	
	Town	
	Postcode (if known)	
Compulsory 21-digit Meter Point Administration Number (MPAN) or the 11-digit Meter Point Reference Number (MPRN) in Northern Ireland for the meter to which the electric vehicle charging equipment is connected. Digits 9 and 10 identify the Distribution Network Operator		xx – xxx – xxx- xx –xxxx –xxxx –xxx
Maximum Demand (MD) Maximum demand (load) of property including EV installation, concluded from a Load Survey		Amps
Property's Service Capacity		Amps
Has this service capacity been verified by the DNO? You must verify the service capacity with the relevant DNO prior to installation if MD > 60 Amps		Yes / No If yes, give DNO reference:
Details of New Installation Maximum demand from all electric vehicle charging equipment connected to the above meter, including any previously connected charging equipment that is available for use or where multiple charge points have been installed		Amps
Earthing arrangements installed – Detail the final earthing arrangements that have been applied for the installation of the charging point as per BS 7671 e.g. protective multiple earthing (PME).		
Installer	Name	
	Telephone / email	
Charging point owner	Name	
	Telephone / email	
	Address (if different from installation address)	

For the following questions, please choose from the options given

Type of installation	- Private – Domestic - Private – Non-domestic - Public access e.g. car park, on street, please attach location map to email submission
Is the property on a looped service?	Yes / No / Don't know
Has DNO been contacted prior to installation for any other reason? e.g. new connection, concerns worth adequacy of service equipment.	Yes / No If Yes, give DNO reference:

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