SC22192 – Electric Bus Charging Solutions

Schedule 1: Scope, Part 1 – Specification

Contents

1. TECHINCAL DEFINITIONS 2

2. ELECTRIC BUS CHARGING SOLUTIONS 4

3. EV CHARGING SYSTEM DESIGN REQUIREMENTS 4

4. PRE-CONSTRUCTION REQUIREMENTS 5

4.2 Detailed Works Programme 5

4.4 Final Design for Acacia Hall Bus Hub 6

4.5 Review of Progress-to-date for Site Matters (Planning Permissions, POC Offers, and Property matters) 6

4.6 Management of Planning Permissions 7

4.7 Management of UKPN Process 7

4.8 Management of Network Rail Approval Processes 8

4.9 Facilitate and/or Engage in Land Agreement and Ownership Rights 8

4.10 Obtain Streetworks Approvals 9

4.11 Obtain Other Stakeholder Support 9

5. OPPORTUNTY CHARGER AND ASSOCIATED POWER CABINET REQUIREMENTS 9

6. SUBSTATION REQUIREMENTS 11

7. DUCTING AND ELECTRICAL CABLING REQUIREMENTS 12

8. INSTALLATION AND REMOVAL OF EQUIPMENT REQUIREMENTS 13

9. ELECTRICAL AND WIRING WORKS AND ENERGISATION REQUIREMENTS 13

10. ADDITIONAL CIVIL WORKS FOR ACACIA HALL BUS HUB 15

11. MANAGEMENT AND CDM COORINDATION OF INSTALLATION, COMMMISSIONING AND DEPLOYMENT REQUIREMENTS 16

12. STREETWORKS HEALTH AND SAFETY REQUIREMENTS 17

13. SOCIAL VALUE REQUIREMENTS 18

1. TECHINCAL DEFINITIONS

1.1	**AC**	means a form of electrical current. AC stands for 'Alternating Current' (mains electricity supply).
1.2	**ASPRO process**	means Network Rail's Asset Protection and Optimisation' process.
1.3	**BAPA**	means the Basic Asset Protection Agreement (BAPA) which sets out the process by which Network Rail ensures all design, engineering, and safety aspects are in place before any works can start on Network Rail land.
1.4	**Bus Shelter Provider**	means the third party provider(s) of bus shelter services for the Fastrack BRT Network appointed by the Client.
1.5	**CDM Plan**	means the Construction Design & Management Plan as defined by The Construction (Design and Management) Regulations 2015.
1.6	**Contract Award Date**	means [DD MM] 2023 – the actual date on which this contract is officially awarded to the Contractor.
1.7	**Electric Vehicle Charging System**	means the Opp Chargers, associated power cabinets, substation, ducting, and cabling from the DNO Point of Connection to the substation and ducting and cabling from the substation to the power cabinets and Opp Chargers required to energise EV chargers.
1.8	**DC**	means a form of electrical current. DC stands for 'direct current' which means the current only flows in one direction. Once an AC current enters a device its converted to DC.
1.9	**DNO**	Distribution Network Operator. The local DNO for the South East is UKPN.
1.10	**Easement Agreement**	means a wayleave or easement agreement provides the legal right for another party to lay and maintain facilities (pipes, cables etc) on Network Rail's land. This can stay in place for a fixed term or for as long as the facilities need to remain in place.
1.11	**Fastrack Bus Operator**	means the third party operator(s) of Fastrack BRT services for the Fastrack BRT Network appointed by the Client.
1.12	**Head of Terms**	Means a document which sets out the terms of a transaction agreed in principle between parties in the course of negotiations. In this case heads of terms for land matters and access rights.
1.13	**HV**	means High Voltage.
1.14	**KVA**	Kilo Volt Amperes is a unit of apparent power. 1KVA is equal to 1000VA.

1.15	**KW**	Kilowatt is a unit of power.
1.16	**Kwh**	Kilowatt hour.
1.17	**ICP**	means an Independent Connection Provider (ICP) is an accredited company that carries out works on behalf of clients on the electricity network.
1.18	**IDNO**	Independent Distribution Network Operator. From the Ofgem list of licensed IDNOs.
1.19	**Individual Contract SC22192**	means the Individual Contract entered separately between the Client and the Contractor for the ongoing management, maintenance, and support of EV Charging Systems (ref. SC22192), procured via the Framework Agreement for Electrical Vehicle Charging Points and Associated Services (ref. Y21002).
1.20	**LV**	Low Voltage.
1.21	**MVA**	Megavolt Amperes - this is showing the total load requirements for the new substation.
1.22	**NERS**	National Electricity registration scheme.
1.23	**Nominated Solicitor**	This refers to relevant Invicta Law Solicitor contracted by the Client.
1.24	**NR**	Network Rail.
1.25	**Opp Charger**	Opportunity Charging Electric Vehicle Charging infrastructure (pantograph arm and associated cabinets).
1.26	**Total Substation Output**	The total amount of the electricity the substation is able to dispatch.
1.27	**Pantograph Down**	Pantograph Charging arm that comes down to the top of the electric bus to charge the buses during operation.
1.28	**POC**	Point of Connection – where the electricity connects with the mains supply.
1.29	**POC**	means Point of Connection.
1.30	**EV**	means Electric Vehicle
1.31	**IEC**	International Electrotechnical Commission which sets international standards for electric road vehicles and Electric Charging Infrastructure.
1.32	**RTI Display Provider**	means the third party provider(s) of Real Time Information Displays for the Fastrack BRT Network appointed by the Client.

1.33	**Site**	means the site location for an Electric Vehicle Charging System. Sites shall include: (a) **Acacia Hall Car Park** (Lowfield Street, Dartford, Kent. DA1 1JB) (b) **Gravesend Bus Hub** (Garrick Street, Gravesend, Kent. DA11 0DW). (c) **Dover Priory Station Car Park** (Priory Station Approach Road, Dover, Kent. CT17 9SB).
1.34	**Substation**	A substation reduces electricity voltage so that it is easier and safer to deliver electricity.
1.35	**UKPN**	UK Power Networks, the DNO in Kent.

2. ELECTRIC BUS CHARGING SOLUTIONS

2.1 The Contractor must provide civil engineering and electrical works to install and energise Electric Vehicle Charging Systems, including the design, supply, and installation of:

(a) New **sub-station** including underground cabling and ducting, which connects to existing underground electricity cabling.

(b) New over**ground** kit including cabling and bus charging equipment, including on-street "opportunity" charging pantograph arms on posts, associated power cabinets (if solution required cabinets), and any other necessary equipment to support the Electric Vehicle Charging Systems with minimal on-street footprint.

2.2 The Contractor must also provide associated civil engineering works for:

(a) The installation of underground ducting, and installation of Opp Charger, power cabinets and substations and any other necessary equipment to support the Electric Vehicle Charging Systems.

(b) Acacia Hall Bus Hub building to house the substation and power cabinets or enclosure for the substation and power cabinets (depending on the substation and Opp Charger cabinets).

(c) Acacia Hall Bus Hub including a triangular island to install the Opp Chargers on, surfacing to bus hub area, surface treatment to island and bus shelter foundations (or liaise with Bus Shelter Provider who can provide bus shelter foundations).

2.3 **Lead Times for Manufacturing and Installation:** The Contractor must ensure that the electrical installation and the whole system is electrically energised a minimum of <u>one (1) month prior</u> to the service commencement for the electric Fastrack BRT services:

(i) Fastrack Dover – planned service commencement is 1 November 2023.

(ii) Fastrack Kent Thameside – planned service commencement is 31 March 2024.

3. EV CHARGING SYSTEM DESIGN REQUIREMENTS

3.1 Considering the specificity of each the Site locations, the Contractor must design EV Charging Systems which:

(a) Optimises the operational performance of the EV Charging System.

(b) Minimises overall cost across 15 years, ideally front-loaded in capital expenditure.

(c) Poses the least risk to delivery timescale (in terms of planning permissions, landowner permissions, Site clearance, construction, and testing).

(d) Provides the Client with control of the Total Substation electricity Output, regardless of land ownership.

(e) Considers Client preference to minimize system footprint and constraints at specific locations in accordance with paragraph 5.10 of this Schedule.

(f) Considers planning teams preference for reducing visual impact of the Opp Chargers in landscaping the system.

(g) Proposes the most suitable location for the substation and size considering existing specific constraints.

3.2 The Contractor must comply with all standards and requirements set out in the *Scope*. These must also be considered and reflected in landscape design.

3.3 If Gravesend Bus Hub Option 2 (adjacent to Clive Road) is selected, the Contractor design must avoid any extra loading to be added to the retaining wall to the car park by providing deep or piled sub-station foundations.

3.4 The design of EV Charging Systems should consider future opportunities to optimise and share electricity supply via the new sub-station kit with other electric vehicles (such as a potential new Multimodal Mobility Hub for third parties such as the Electric Car Club, EV charging for the public, and bike/ebike hire docking stations), all the while not encroaching on use by the Fastrack bus fleet.

3.5 The Final Design will be finalised during pre-construction period.

4. PRE-CONSTRUCTION REQUIREMENTS

4.1 Pre-construction activities shall include the following:

(a) Produce a detailed Works Programme.

(b) Produce Final Designs for each Electrical Vehicle Charging System.

(c) Produce a Final Design for Acacia Hall Bus Hub.

(d) Review of Progress-to-date for Site Matters (Planning Permissions, POC Offers, and Property matters).

(e) Manage Planning Permissions.

(f) Manage the UKPN Process.

(g) Manage the Network Rail Approval Processes.

(h) Facilitate and/or Engage in Land Agreement and Ownership Rights.

(i) Obtain Streetworks Approvals.

(j) Obtain other Stakeholders support as necessary.

For avoidance of doubt, the Contractor shall be responsible for initiating and delivering all relevant activities to deliver the Final Design, <u>including supply of hardware and software</u> required to comply with all requirements set out in this Schedule.

4.2 **Detailed Works Programme**

4.2.1 The Contractor must provide a detailed Works Programme within two (2) weeks of the Contract Award Date, including:

(a) Compliance with Clause 31 (The programme).

(b) Updated Risk Register.

(c) Stakeholder Engagement Plan including documenting planned engagement activities with the various key stakeholders involved.

(d) Construction Design & Management Plan **("CDM Plan")** as required of a Principal Contractor in compliance with The Construction (Design and Management) Regulations 2015, covering:

(i) the installation of the Opp Chargers (and associated cabinets if required);

(ii) the safe Construction of the Substation area; and

(iii) the safe Construction of the ducting civils works; and

(iv) Construction of Acacia Hall Bus Hub.

4.2.2 The Contractor must raise issues immediately with the Client if there are supply chain issues with the manufacture and delivery of equipment to Site which then delays the installation of an EV Charging System.

4.2.3 The Contractor must all make all reasonable possible efforts with lead times to ensure that the Fastrack zero emission bus is not operationally delayed due to lead times.

4.2.4 The Contractor must manage the work with its own subcontractors plus the Contractor must also coordinate with third parties (such as the Bus Shelter Provider to coordinate bus shelter works for Acacia Hall Bus Hub and Fastrack Bus Operator for testing the Electric Vehicle Charging Systems with the electric buses) to ensure works are coordinated.

4.3 Final Designs for Electrical Vehicle Charging Systems

4.3.1 The Contractor must, within six (6) weeks of the Contract Award Date, finalise the design of the Electric Vehicle Charging Systems with the Client, in collaboration with key stakeholders such as the Fastrack Bus Operator and relevant district councils/landowners as appropriate in view to progress and obtain the various permissions to start construction.

4.3.2 The Final Design (i.e. revised Outline Design) of each EV Charing System must include detailed drawings, technical specifications, and supporting narrative for the electric network, on-street infrastructure including Opp Chargers (and associated cabinets if required), substation and electric metre, ducting and cabling, and the DNO Point of Connection.

4.3.3 The Final Designs must provide design submission information to level of detail required by UKPN to finalise the DNO POC to the mains electricity supply as set out in the Offer letter for each of the three Site locations as set out in Annex B (UKPN Offer Letters & UKPN Requirements) and the UKPN POC maps set out in Annex A (Site Maps for Electric Vehicle Charging Systems).

4.4 Final Design for Acacia Hall Bus Hub

4.4.1 The Contractor must, within six (6) weeks of the Contract Award Date, finalise the design of civil works for Acacia Hall Bus Hub.

4.5 **Review of Progress-to-date for Site Matters (Planning Permissions, POC Offers, and Property matters)**

4.5.1 The Client has initiated a number of workstreams to obtain the required planning permissions, UKPN POC offers, and property agreements and ownership rights. The Contractor must:

(a) Review and amend work program to finalise the work which has been started by the Client to obtain planning, construction and access permissions, POCs, resolve property related matters.

(b) Appoint suitable resources with relevant technical expertise to manage the planning, construction and access permissions, POCs, resolve property related matters on behalf of the Client. This is expected to include as a minimum a land solicitor and planning consultant and suitable architect

(c) Engage with the Client's Nominated Solicitor, Invicta Law.

(d) Ensure the works programme robustly considers timescales relating to permissions and property related matters.

(e) Comply with the UKPN requirements as stated in the UKPN offer letters as set out in Annex B (UKPN Offer Letters & UKPN Requirements).

4.6 **Management of Planning Permissions**

4.6.1 The Contractor must:

(a) Continue and finalise the Client's Planning Permissions process for the relevant parts of the EV Charging Systems started by the Client with consultation with The Client's Planning team, Dartford Borough Council, Gravesham Borough Council, Dover Borough Council.

(b) Appoint a suitable planning consultant to act as the Client agent, prepare and submit the required planning permission applications to Kent County Council Planning team, in compliance with Regulation 3 of the Town and Country Planning Act.

(c) Ensure the planning permissions are obtained in a timely manner and do not delay the delivery of the works programmes for each site.

(d) For Gravesend Bus Hub especially, review existing permission conditions [Planning Register: Kent County Council (kentplanningapplications.co.uk)], and apply for variation if required. The existing planning permission decision dated November 2020 for Gravesend Bus Hub that opened during Spring 2022 is provided in Annex G (Gravesend Bus Hub Planning Permission Decision).

4.7 **Management of UKPN Process**

4.7.1 The Contractor must:

(a) Continue the DNO Point of Connection process started by the Client with UKPN, including finalising location and size of POC, payment to secure suitable UKPN POC for the Sites in Dartford and Dover. [Please note the Client already paid UKPN for the POC for Gravesend Bus Hub only].

(b) Provide UKPN with necessary documents, designs, method statements as requested in the POC offer letters contained in Annex B (UKPN Offer Letters & UKPN Requirements).

(c) Confirm to UKPN the appointment of a Principal Designer if the Contractor is subcontracting as required by The Construction (Design and Management) Regulations 2015.

(d) Appoint an ICP that has the approved accreditation to undertake the connection closing joints.

(e) Engage and coordinate with the Client's Nominated Solicitor to resolve land properties matters as required.

(f) Comply with the UKPN requirements as stated in the UKPN offer letters as set out in Annex B (UKPN Offer Letters & UKPN Requirements).

4.8 **Management of Network Rail Approval Processes**

4.8.1 The Contractor must:

(a) Engage with Network Rail on land and access issues with the Client.

(b) Comply with the BAPA signed between the Client and Network Rail set out in Annex C (Network Rail Approval Processes).

(c) Provide Network Rail with a Construction Phase Plan, method statement(s) and Risk Assessment(s) and other relevant requirements stated in the BAPA in timely manner.

(d) Engage and coordinate with the Client's Nominated Solicitor, Network Rail, and UKPN to resolve property matters as required.

(e) Obtain required authorisation to use and install infrastructure on Network Rail in timely manner to not delay the service commencement for the electric Fastrack BRT services.

(f) Provide technical information on behalf of the Client as required by Network Rail's ASPRO team and land property matter.

4.9 Facilitate and/or Engage in Land Agreement and Ownership Rights

4.9.1 It is the Client intention to attain a legal interest in land required to procure the delivery of the Electric Vehicle Charging System. The Client is actively progressing discussions with relevant parties to use reasonable endeavours to ensure this can be delivered in timely manner alongside the work programme. However, there is a risk that the Client internal governance processes and negotiation with landowners may create a possible delay in securing some of the ownership or long term lease agreements in time for construction.

4.9.2 To support the Client in procuring such legal interests as are necessary on the relevant Sites in the long term but securing permission to construct and energise EV Charging Systems in the shorter term to match the work programme, the Contractor must:

(a) Recommend and set up short term agreements such as easements or wayleaves or other as required with relevant parties on behalf of the Client to ensure the construction can start on time and does not delay the works programme. The recommended short term agreements must ensure the Client controls the Total Substation electricity Output in the short term.

(b) <u>For Dover and Gravesend:</u> If short term agreements between the Client and landowner Network Rail create any significant risk to delivery timescales, the Contractor must be willing to enter into such legal documentation as is required in its own name in the short term which is capable of being transferred and/or assigned to the Client in the longer term while preserving the ability for the Client to control the Total Substation Output.

(a) Reflect the Client agreed short term agreements information in the Head of Terms, and longer term intention where appropriate

(b) Engage and coordinate with the Client's Nominated Solicitor, Network Rail, Southeastern Train Operating Company, Dartford Borough Council, Gravesend Borough Council, Dover District Council * relevant other parties and UKPN to resolve land/property matters as required.

(c) Provide technical information on behalf of the Client as required by Network Rail's easement and wayleaves team.

(d) Engage with Network Rail on land and access issues with the Client to speed up the finalisation of longer-term agreements to provide the Client with the ability to control the Total Substation electricity Output in the long term at each site.

(e) Upon the reasonable request of the Client, provide additional support for the Client for all land/property related matters affecting the delivery of the works.

4.10 Obtain Streetworks Approvals

4.10.1 The Contractor must:

(a) Engage with the Client's Kent Permit Scheme and apply for the Kent Permit Scheme for each Site. https://www.kent.gov.uk/roads-and-travel/highway-permits-and-licences/kent-permit-scheme

(b) Engage with Kent Lane Rental Scheme - Certain Sites may also require Lane Rental works which will require the Contractor to apply for a Kent Lane Rental scheme permit. https://www.kent.gov.uk/roads-and-travel/highway-permits-and-licences/kent-lane-rental-scheme

4.11 Obtain Other Stakeholders Support

4.11.1 The Contractor must engage and coordinate with other affected stakeholders including:

(a) Southeastern trains for matters relating to the works at the Sites in Dover and Gravesend.

(b) Local district council representatives for matters relating to works at their local Sites: Dartford Borough Council for Acacia Hall Bus Hub; Gravesham Borough Council for Gravesend Bus Hub; and Dover District Council for Dover Priory Station.

(c) Consultation and collaboration with key stakeholders to ensure all Final Designs comply with the requirements set out in section 3 (EV Charging System Design Requirements) of this Schedule.

(d) Fastrack Bus Operator and bus manufacturers to optimise EV Charging systems for electric Fastrack BRT services.

5. OPPORTUNTY CHARGER AND ASSOCIATED POWER CABINET REQUIREMENTS

5.1 The Contractor must supply and install:

(a) **Up to three (a minimum of two)** min 450KW pantograph down Opp Chargers at Dartford Acacia Hall Car Park, (Lowfield Street, Dartford, Kent. DA1 1JB) [refer to Part 3 (Acacia Hall Bus Hub) of Annex A (Site Maps for Electric Vehicle Charging Systems) for proposed locations].

Note: *Outline Designs must assume the installation of three Opp Chargers at the Acacia Hall Car Park Site. For avoidance of doubt, the Client reserves the right to proceed with the install of just two (not three) Opp Chargers, but Opp Charger base, ducting (and empty cabinets if required) must be installed to allow for the install of a third Opp Charger at a later date.*

(b) **Two** min 450KW pantograph down Opp Chargers at Gravesend Bus Hub (Garrick Street, Gravesend, Kent. DA11 0DW) [refer to Part 4 (Gravesend Bus Hub) of Annex A (Site Maps for Electric Vehicle Charging Systems) for proposed locations].

(c) **One** min 450KW pantograph down Opp Charger at Dover Priory Station Car Park (Priory Station Approach Road, Dover, Kent. CT17 9SB) [refer to Part 5 (Dover Priory Station) of Annex A (Site Maps for Electric Vehicle Charging Systems) for proposed locations].

5.2 The Contractor must provide an Opp Charger solution that adheres to the standards and requirements set out in Annex F (OppCharge Standards).

5.3 The Contractor must provide an Opp Charger solution allowing high-power charging.

5.4 Opp Charger Power ratings min 450 kW required.

5.5 Charging current must be controlled according to IEC 61851 part 1 and part 23 (electric vehicle conductive charging system).

https://www.oppcharge.org/#:~:text=OppCharge%20is%20designed%20according%20to%20established%20standards%20for,ratings%20are%20currently%20150%2C%20300%20and%20450%20kW.

5.6 All EV charging equipment supplied must be Open Charge Point Protocol (OCPP) compliant and have open charging interfaces to be compatible with many bus manufacturers.

5.7 The pantograph arm height should be variable to allow single deck buses normally and potential for double deck buses in the future.

5.8 The Fastrack Bus Operator will provide these zero emission buses. The buses themselves have been specified with Opp Charger equipment to the top of the buses to be compatible with pantograph down Opp Chargers. The specification of the vehicle will be made available when the vehicle order is placed by the Fastrack Bus Operator. This is expected to be April 23 for Fastrack Thameside and early 2023 for Fastrack Dover.

5.9 The Opp Chargers must comply with international standards and British Standards designed to the highest international electrical, quality and safety standards, guaranteeing safe and reliable operation in public areas including:

IEC61851 – 1	Electric Vehicle Conductive Charging System standards – general Requirements – Charging processes.
IEC 61851-23	Electric Vehicle Conductive Charging System standards – DC electric vehicle charging station CD charging with an automatic connection.
IEC61851-21-2	Electric Vehicle Conductive Charging System – Electric vehicle requirements for Conductive connection an AC/DC supply / EMC requirements for off board electric vehicle charging system.
IEC 61851 – 24	Digital Communication between a DC EV charging station and an electric vehicle for control of DC charging.
IEC 61508	Functional Safety of electrical/ electronic / programmable electronic safety related systems.
BS EN 50696	Contact Interfaces for Automated Connection Device.
ISO 15118	Vehicle to Grid Communication interface.
ISO 17409	Electrically propelled road vehicles – Conductive Power transfer Safety Requirements.
EN 1090	Execution of Steel structures and aluminium structures (for Pantograph arm)

CE certified	Conformite European which means European Conformity standards.

5.10 The make, model, and location of the Opportunity Chargers should offer a cost efficient solution across the whole EV Charging System.

5.11 The Contractor should provide Opportunity Chargers, power cabinets & substations that have as low as possible Lifecycle Environmental footprints

5.12 The Contractor should provide the component parts of the Electric Charging Solution for the 3 sites that have Sustainable Lifecycles in terms of sourcing, manufacture, construction, reuse and end-of-life disposal, as well as any sustainable methods used during delivery and installation.

5.13 The Opp Charger solution should minimises the space footprint of the on street EV charging equipment and considers each location specific constraints including planning teams feedback to reduce the visual impact of the Opp Charger units.

5.14 The Contractor should provide power cabinets to house the associated power equipment for the Opp Chargers where required.

5.15 The Opp Chargers should be bi-directional which makes G2V and V2G energy flow.

5.16 The Contractor must provide Software to manage and maintain the Opp Chargers remotely and provide access for the Client to view the data and analysis in accordance with the software requirements set out in Individual Contract SC22192.

5.17 OppCharge Communications Protocol

5.14.1 The Contractor must provide an OppCharge system that is automatic with a standardised communication protocol securing reliability and interoperability.

5.14.2 Fully automated EV charging is fully automatic and secured by a two-way WiFi communication sequence. The driver starts the charging sequence by activating the parking brake, and can interrupt it at any time.

5.14.3 Guiding the driver: The driver gets a clear indication in order to stop within the specified ± 200 mm from the reference point. Ease of use is proven in commercial operation.

5.14.4 The Contractor must coordinate with the Fastrack Bus Operator as required to ensure communication between the electric buses and the EV Charging Systems is optimised.

5.14.5 Based on established standards, A standardised protocol, ISO 15118, the Contractor must make safe connections and reliable charging. Directional antennas are used for communication and association.

6. SUBSTATION REQUIREMENTS

6.1 The Contractor must work with an Independent Distribution Network Operator (IDNO), ICP, or DNO to install the substation so that the substation connects to the DNO Point of Connection to the mains electricity supply. The Contractor may be an IDNOs in their own right.

6.2 The Contractor must produce a CDM Plan for the safe Construction of the Substation area according to The Construction (Design and Management) Regulations 2015.

6.3 The Contractor must ensure that the EV Charging Systems are designed and installed to comply with the requirements set out in Annex B (UKPN Offer Letters & UKPN Requirements) to UKPN requirements.

6.4 The Client has applied for the below High Voltage Point of Connection (HV POC) electricity supply size from UKPN:

	Dartford	Gravesend	Dover
POC size:	1.5 MVA	1 MVA	450 KVA

6.5 The Contractor must install substation to match the POC size, or otherwise obtain approval from the Client of any adjustment to the POC size if they see a significant opportunity to optimise the financial or operational efficiency of the EV Charging System(s).

6.6 The design of the EV Charging Systems must be optimised according to UKPN specification in Annex B (UKPN offer letters & UKPN requirements)

6.7 The Contractor with the OEM must chose the most suited substation for each Site location taking into account the requirements set out in section 3 (EV Charging System Design Requirements) of this Schedule.

6.8 The Contractor must provide an electricity meter at each substation for the Client to own, control, and manage the Total Substation Output.

6.9 LV supply will be required for the bus shelter lighting at each bus hub Site, Real Time Information displays, Bus hub street lighting, and future supply of electricity to future driver welfare building(s), particularly for the EV Charging Systems at Dartford and Dover.

7. DUCTING AND ELECTRICAL CABLING REQUIREMENTS

7.1 The Contractor must provide a CDM Plan for the safe Construction of the ducting civils works according to The Construction (Design and Management) Regulations 2015.

7.2 ***From DNO POC to Substation:*** The Contractor must:

(a) Be responsible for the safe supply and installation of ducting and cabling for the EV Charging Systems.

(b) Either use an approved IDNO, or approved ICP, or DNO, or be an IDNO themselves to the excavation and reinstatement of all trenches and making good the Sites and cable routes on-site from the Site boundary at DNO POC as indicated in the IDNO Proposal Plans set out in Annex A (Site Maps for Electric Vehicle Charging Systems).

(c) Comply with the requirements set out in Annex B (UKPN Offer Letters & UKPN Requirements). Please note the UKPN offer letter in Annex B excludes the connection closing joints.

(d) Undertake the connection closing joints.

7.3 ***From Substation to Opp Charger Pantograph arm and cabinet:*** The Contractor must:

(a) Be responsible for the safe supply and installation of ducting and cabling for the EV Charging Systems.

(b) Either use an approved IDNO, or approved ICP, or DNO, or be an IDNO themselves to the excavation and reinstatement of all trenches and making good the Site and cable routes on-site from the new substation electricity meter (to be owned by the Client) to the proposed locations for the Opp Charger equipment as indicated in Annex A (Site Maps for Electric Vehicle Charging Systems).

7.4 ***Other requirements in ducting & electrical cabling:*** Where relevant, the ducting shall be wide enough able to accommodate additional LV connection electricity cables required for bus shelters and/or canopy lighting, real time information displays, and any future driver welfare building for Acacia Hall Bus Hub.

7.5 **For Acacia Hal Bus Hub,** The LV cabling from the substation to the new bus shelter/canopy must be provided by the Contractor in liaison with the new bus shelter provider who will confirm size and type of electricity cable required for the bus shelter & RTI displays to be installed on the new Acacia Hall bus hub waiting area. Room for LV cables in this ducting for a future driver welfare building will need to be accommodated for but the cables do not need to provided at this stage.

8. INSTALLATION AND REMOVAL OF EQUIPMENT REQUIREMENTS

8.1 The Contractor must supply and install the appropriately sized substation, Opp Chargers, associated power cabinets, and ducting connecting each undertaking all excavation, foundation, and reinstatement works, the provision of appropriate traffic management if necessary.

8.2 Installers must be qualified to Operative Level of the New Roads and Street Works Act 1991.

8.3 The Contractor (and its subcontractor(s)) must follow the process set out in the NRSWA Street works code of practice for the coordination of Street Works and works for Road Purposes and Related Matters.

8.4 NRSWA 1991 Utilities Enquiries and Works Opening Notice (N notice): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/43578/street-works-code-of-practice.pdf

8.5 The Contractor must arrange utility enquiries and appropriate notices prior to any installation works.

8.6 When components of the electrical system are removed, the Contractor must dispose of existing units in an environmentally friendly manner to ISO14001 or equivalent Environmental Management policy which promotes reuse, upcycling, recycling & the circular economy and avoiding landfill

8.7 During any civils works, any subsoil or any waste products must be disposed of in an environmentally friendly manner complying with ISO14001 or equivalent Environmental Management policy which promotes reuse, upcycling, recycling & the circular economy and avoiding landfill.

8.8 All EV Charging Systems installations must comply with the Equalities Act 2010 specification and be safe, secure, and fit for use on the public highway.

8.9 The Contractor must have the written approval of the Client prior to the installation or removal of any of the components of EV Charging Systems.

8.10 During installation, the Contractor must maintain safe public access to Acacia Hall Car Park and Acacia Hall facilities, Gravesend Station and Gravesend station car park, Dover Priory Station and Dover Priory Car Park.

8.11 During installation, the Contractor must minimise the impact on Fastrack bus services and other local bus services allowing these bus services to continue to operate at Gravesend Bus Hub and the surrounding area, Acacia Hall Car Park, and Fastrack Busway.

9. ELECTRICAL AND WIRING WORKS AND ENERGISATION REQUIREMENTS

9.1 All electrical and wiring works must comply with to the following regulations:

(a) The Electricity Supply Regulations 1988. The Contractor shall provide the necessary documentation and certification after electrical inspection and testing.

(b) Electricity at Work Regulations 1989.

(c) BS 7671 IEE Wiring Regulations – 18th Edition.

(d) Members of NICEIC, ECA or similar standards sector.

(e) HERS Registration in support of National Highway Sector Scheme 8 (NHSS 8).

(f) The Health and Safety at Work Act 1974.

9.2 The Contractor must adhere to the IET Code of Practice and produce evidence that demonstrates compliance with this.

9.3 The Contractor (or appointed Subcontractor for electrical and wiring works) must comply with ISO 17409 (Power Supply Safety Requirements).

9.4 The Contractor shall be responsible for arranging the electricity connection from the mains supply Point of Connection to the substation and from the substation to the Opp Chargers and power cabinets, including applying for the connection to the DNO or IDNO.

9.5 The Contractor must be responsible for paying the DNO charges as set out in Annex B UKPN offer letters and any IDNO connection charge.

9.6 The Contractor must:

(a) be a NERS accredited organisation and/or use NERS subcontractors.

(b) Either the Contractor must be an NICEIC Approved Electrical Contractor or use a NICEIC Approved electrical Subcontractor.

(c) Either the Contractor must be HERS registered dealing with highway electrical matters (Highways Electrical Registration Scheme), or use a HERS registered electrical Subcontractor.

(d) Provide Materials, equipment, and workmanship under the Contract shall comply with BS 7671 Regulations for Electrical Installations (IEE Wiring Regulations) and the rules and regulations of the Electricity Provider who will provide the supply.

(e) Employ only competent personnel with appropriate electrical qualifications to undertake the work.

(f) Provide Independent third party certification, showing the complete test results must be produced upon request.

(g) Provide products that shall be labelled with the electrical rating as stated in BS EN 60947-3 (1999 + A1 2001).

(h) Provide the following Electrical Installation Certificate documentation and accessories for each EV Charging System at the three Site locations:

(i) General characteristics of the installation as in BS7671 part 3;

(ii) Cable design calculations;

(iii) Wiring diagrams;

(iv) Schematic diagrams;

(v) Standard drawings for shelters showing plan views and front side and rear elevations equipment used including manufacturing product reference numbers;

(vi) Completed Electrical testing and Inspection sheet after the installation of the Opp Chargers and power cabinets;

(vii) Two keys for the access compartment; and

(viii) Ideally, the Electrical Installation Certificate documentation should be electronic.

9.7 **Electrical Inspection and Testing** must be carried out at the following two stages:

(a) **Stage 1** – Each EV Charging System on completion and before being energised shall be inspected and tested to verify that the requirements of BS7671 and the electricity supply regulations 1988 have been met. The certification shall be given to the local authority to confirm the Contractor has arranged for the DNO and IDNO to install and energise the installation. The method of testing shall be such that no danger to persons or property or damage to equipment can occur even if the circuit is defective.

(b) **Stage 2** – Each EV Charging System shall, on completion and after being energised, be inspected and tested to verify that the requirements of BS7671 have been met. The certification shall be given to The Client for their information. The method of testing shall be such that no danger to persons or property or damage to equipment can occur even if the circuit is defective.

9.8 Where items have been tested by the manufacturer prior to installation, the Contractor shall obtain copies of such tests and their results. The Contractor shall then take all the necessary steps to ensure that these conditions still appertain prior to the item being put into service. Copies of such test sheets shall be included with all other test certificates on completion.

9.9 The Contractor shall ensure that all test instruments have been calibrated and adjusted in accordance with BS EN ISO 9001 and come complete with calibration certificates to verify that BS EN ISO 9001 has been complied with.

9.10 The Contractor shall furnish the engineer with a test certificate verifying compliance with BS 7671 upon completion of the inspection and tests.

10. ADDITIONAL CIVIL WORKS FOR ACACIA HALL BUS HUB

10.1 The Contractor shall be responsible for designing, supplying, and installing and construction of:

(a) Formation of kerbed passenger waiting area using modular paving (triangular shaped island on concept drawing in Annex A (Site Maps for Electric Vehicle Charging Systems).

(b) Block paving finish to island using Tegula blocks or similar approved (leaving room for accommodate the bus shelter foundations).

(c) Kerbing in the bus hub area including DDA compliant pedestrian access.

(d) Reprofiling and resurfacing of the bus turning area for the bus hub to interface with the existing Fastrack busway including reconstruction of the existing grass verge.

(e) When reconstructing the existing grass verge this must be enhanced to become a wildflower verge compatible with Kent's Plan Bee to encourage pollinators.

(f) Review existing surface water drainage / street lighting and amend / extend as necessary.

(g) Roadmarkings for bus stopping area and pedestrian crossings.

(h) Reinstatement and make good the Site.

10.2 The Contractor must use Environmentally friendly materials to reduce the carbon footprint of the civils works which includes use of Eco concrete & materials used for resurfacing should have a low carbon footprint as possible.

10.3 General Consutrcution Stadnards are to follow the Kent Design Guide: https://www.kent.gov.uk/about-the-council/strategies-and-policies/regeneration-policies/kent-design-guide

10.4 Please note that once the kerbed triangular passenger waiting area is complete, the Bus Shelter Provider will install centre mounted living roof bus shelter waiting station or canopy/gullwing.

10.5 It is expected that additional trees should be required as part of the Acacia Hall planning permission to reduce the visual impact of Acacia Hall Bus Hub as explained in Annex H (Dartford Borough Council's Planning teams initial feedback)

10.6 The Contractor must coordinate with the Bus Shelter Provider and RTI Display Provider about the design, supply and installation of the Acacia Hall bus shelter/canopy/gullwing and any associated RTI display equipment for Acacia Hall bus hub. (Design, Supply and installation of the bus shelters and RTI displays are by separate KCC contracts)

10.7 The Contractor must work with the Client to go through the Technical Appraisal Process (TAP) for the Acacia Hall Bus Hub to be adopted by Kent County Council (i.e. the Highway adoption process) (as an alteration to the existing Fastrack busway next to Acacia Hall bus already adopted by Kent County Council).

11. MANAGEMENT AND CDM COORINDATION OF INSTALLATION, COMMMISSIONING AND DEPLOYMENT REQUIREMENTS

11.1 The Contractor must ensure that all the relevant licences and agreements are in place prior to carrying out the installation of any the EV Charging Systems.

11.2 The Contractor must provide a CDM Plan for the installation of the Opp Chargers and associated cabinets and Acacia Hall Bus Hub according to The Construction (Design and Management) Regulations 2015.

11.3 The Contractor must be responsible for ensuring that the necessary consents are obtained and evidenced to the Client.

11.4 The Contractor as CDM Principal Contractor must manage and coordinate all elements of the installation activity including, where relevant, Sub-Contractors, other Contractors, communication and liaison with various parties.

11.5 All Plant and materials should be delivered and installed in accordance with the installation programme agreed with The Client. The Client must be notified of any delays in delivery/installation.

11.6 The Contractor must communicate directly with the Client to obtain agreement for the anticipated delivery and installation date and times (if different to the Approved Programme).

11.7 The Contractor must give sufficient notice for delivery and installations as agreed within the Work Programme, unless urgent delivery is required, or the Client has specified otherwise.

11.8 The Contractor must plan and manage installation and issues post installation. This includes areas such as planning, crisis management, removal and disposal of any old equipment in line with the most current WEEE Regulations, ensuring correct behaviour on-site, timing of installations and minimising disruption to the Client and members of the public and ensuring health and safety of the public at all times.

11.9 The Contractor must dispose of any materials or equipment in an environmentally friendly manner which encourages a circular economy and complies with ISO14001 Environmental Management standards or similar which promotes reuse, upcycling, recycling, the circular economy and avoiding landfill.

11.10 The Contractor must engage and coordinate UKPN, Network Rail, the Client's Nominated Solicitor, and the Client's planning department to obtain the necessary authorisations to install the EV Charging Systems. This includes necessary authorisations Network Rail land regarding access matters (see Annex C (Network Rail Approval Processes)), as well as planning permissions and UKPN POC requirements set out in Annex B (UKPN Offer Letters & UKPN Requirements).

11.11 Client Requirements for NEC Contract Change Management System

(a) The Contractor will be expected to use the CEMAR **NEC Contract Change Management System ("NEC CCMS")** in conjunction with the Client.

(b) The Client will set the project up on the NEC CCMS immediately after award of contract. The NEC CCMS shall be available for use from the Contract start date and maintained for use until 4 months post Completion Date when hard disc storage of all documentation shall be provided from the Contractor to the Project Manager.

(c) This is a collaborative and workflow IT business support system to manage the rigorous contract change processes defined by the NEC contract in the Construction market sector. At award of the Contract, the Contractor shall provide details of all users they require set up on the NEC CCMS and login details will be provided by the Client. If appropriate the Client will provide MS Teams on-line training for the Contractor's nominated staff.

12. STREETWORKS HEALTH AND SAFETY REQUIREMENTS

12.1 Before the *starting date*, the Contractor will supply the Client with a copy of their Statement of Health and Safety policy, and that of any subcontractors together with their method statements for the operation of this contract. This should include for how the provision of welfare facilities will be dealt with in a mobile environment.

12.2 The Contractor is responsible for ensuring compliance with the Health and Safety at Work Act 1974, and in particular the requirements of the CDM Regulations 2015. This applies to the Contractor any and Subcontractors carrying out the works.

12.3 A bespoke Health and Safety risk assessment and method statement must be provided by the Contractor for each work activity and location, and all works shall be carried out in accordance with the requirements set out in this document

12.4 The Contractor must have a qualified and competent health and safety advisor. This advisor must work closely with the Contractor's staff and management team in order to resolve any health, safety and environment issues to the satisfaction of the Client.

12.5 The Contractor shall cooperate with anyone else having health and safety responsibilities on or adjacent to the Highways Network, and Electrical Network for the effective discharge of those responsibilities.

12.6 The Contractor, to the extent that they are in control of the site as covered under section 4 of the Health and Safety at Work etc Act 1974, must keep the site, its access and egress, safe and without risk to the health of the persons using it.

12.7 The Contractor reports to the Client details of any incident, near miss, unsafe situation or dangerous occurrence that arises from providing the service at the monthly progress

meetings. The Contractor's report includes details of any proposed actions required, by whom and by when, to prevent a recurrence of the incident. The Contractor is to have process for reporting immediately any major issues to the Client.

12.8 Temporary Carriageway Traffic Management will be required for safe access and working space when installing or removing the Fastrack bus charging electrical solution.

12.9 Use of the "Safety at Street Works and Road Works – a code of practice" Manual to create the most suitable Traffic Management Plan for the safe installation or removal of the EV Charging Systems.

12.10 All staff due to undertake any Traffic Management works should have undertaken the NRSWA course be accredited for ""Signage, Lighting and Guarding"" with experience and knowledge to create the correct and most suitable Traffic Management plan.

12.11 If required, the Contractor may hire a specialist traffic management company to design and implement the best and safest traffic management configuration.

12.12 Temporary fencing shall be at least 2.0m high and 3.5m wide clad with 38 x 253 mesh panels. The fencing shall be self supporting from the ground level.

12.13 A Contractor who fails to ensure that installations are carried out in accordance with the appropriate regulations and legislation shall be removed from the Framework Agreement with immediate effect.

13. SOCIAL VALUE REQUIREMENTS

13.1 The Client requires a proactive approach to managing the use of local employment and supporting the local economy, as well as a proactive approach to delivering the works in a green and sustainable way that minimises greenhouse gas emissions and minimises any negative impact of these works on the environment.

13.2 As part of the DfT's ZEBRA Scheme funding obligations, the Contractor must provide at least 3 zero emission Apprenticeships split between this Contract & the Individual Contract for long term maintenance & support. This will contribute towards the overall ZEBRA scheme obligation of creating 9 zero emission Apprenticeships across the Fastrack Electrification Programme with other FUMEs members.

13.3 Where reasonably possible, the Contractor shall:

(a) Create of local employment and training opportunities to reduce unemployment and raise local skills.

(b) Buy locally to support local business growth.

(c) Offer green and sustainable solutions which minimises greenhouse gas emissions and minimises any negative impact of these Works on the environment, including reducing air pollution, reducing carbon footprint, and/or promoting better places to live and an improved public realm (e.g. renewable energy consumption).

(d) Use Eco concrete & alternatives to asphalt or similar products to reduce the environmental impact of the Civils Works.