

## SECTION 262653 - ELECTRIC VEHICLE CHARGING EQUIPMENT - LEVEL 2

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes EV charging equipment that provides Level 2 EV charging.

## 1.3 DEFINITIONS

- A. EV: Electric vehicle.
- B. EV Cable: The off-board cable containing the conductor(s) to connect the EV power controller to the EV that provides both power and communications during energy transfer.
- C. EV Capable: Parking spaces that include nearby termination of raceway (conduit) to a power source with sufficient electrical panel capacity designed for simultaneous charging of electric vehicles in all planned EV parking spaces. Electrical wiring need not be pulled through raceway (conduit) until charging station is installed.
- D. EV Charger or EV Charging Equipment: See "EVSE".
- E. EV Connector: A conductive device that, when electrically coupled to an EV inlet, establishes an electrical connection to the EV for the purpose of power transfer and information exchange. This device is part of the EV coupler.
- F. EV Coupler: A mating EV inlet and connector set.
- G. EV Inlet: The device in the vehicle into which the EV connector is inserted, and a conductive connection is made for the transfer of power and communication. This device is part of the EV coupler.
- H. EV Make Ready: Parking spaces that include nearby termination of raceway (conduit) and electrical wiring pulled to a power source with sufficient electrical panel capacity for simultaneous charging of electric vehicles in all EV parking spaces.
- I. EVSE: Electric Vehicle Supply Equipment. It includes the EV charging equipment and conductors, including the ungrounded, grounded, and equipment grounding conductors and EV cables, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for transferring energy between the premise wiring and the EV.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **[Project site]** <**Insert location**>.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for EV charging equipment.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

- B. Sustainable Design Submittals:

1. Plan showing location and number of EV charging units, and distance from building.
2. Plan showing "reasonable accessibility" to EV charging units.
3. Plan showing location and number of EV charging units, charging levels and connectors, and ability of EV charging units to participate in a demand-response or time-of-use pricing program, as well as a power load management system that allows for an increased number of charging stations than would otherwise be feasible without power load management.

- C. Shop Drawings: For EV charging equipment.

1. Include plans, elevations, sections, and **[mounting]** **[attachment]** details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Detail fabrication and assembly of mounting assemblies for EV charging equipment.
4. Include diagrams for power, signal, and control wiring.
5. Include verification of wireless communications service at each location of EV charging equipment.

- D. Product Schedule: For EV charging equipment. **[ Use same designations indicated on Drawings.]**

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Area plans and details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Structural members to which equipment will be attached.
2. Electrical service.
3. Communications service, **[including wireless communications equipment]**.
4. Items penetrating finished **[floor]** **[ceiling]**.

- B. Qualification Data: For **[Installer]** **[factory-authorized service representative]**.

- C. Seismic Qualification Certificates: For <Insert equipment,> accessories, and components, from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Field quality-control reports.
- E. Sample Warranty: For manufacturer's warranty.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For EV charging equipment to include in operation and maintenance manuals.
- B. Software and Firmware Operational Documentation:
  - 1. Online training and help documentation.
  - 2. Station activation sticker.

#### 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- C. Comply with UL 2231-1, UL 2231-2, UL 2594, and NEC Article 625.
- D. Comply with SAE J1772.
- E. Comply with FCC Part 15 Class A.

#### 1.9 FIELD CONDITIONS

- A. Wireless Survey: Complete wireless survey to determine if wireless provider signals meet or exceed manufacturer's recommended minimum values.
- B. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
  - 1. Ambient Temperature: Not exceeding **minus 22 to plus 122 deg F (minus 30 to plus 50 deg C)**.

2. Altitude: Not exceeding 6600 feet (2000 m).
- C. Rate Equipment for non-operation under the following conditions:
1. Ambient Temperature: Not exceeding minus 40 to plus 140 deg F (minus 40 to plus 60 deg C).
  2. Altitude: Not exceeding 6600 feet (2000 m).
- D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
1. Notify [Architect] [Construction Manager] [Owner] no fewer than [two] <Insert number> days in advance of proposed interruption of electric service.
  2. Do not proceed with interruption of electric service without [Architect's] [Construction Manager's] [Owner's] written permission.
- 1.10 WARRANTY
- A. Manufacturer's Warranty: Manufacturer agrees to replace EV charging units that fail(s) in materials or workmanship within specified warranty period.
1. Standard Warranty Period: Two years from date of Substantial Completion.
  2. Extended Warranty Period: [One] [Two] [Three] years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Provide CyberSwitching CSE family of electric vehicle charging stations for commercial applications, for dedicated fleet charging and multifamily charging applications.
- B. Source Limitations: Obtain EV charging equipment from single manufacturer.

### 2.2 EV CHARGING EQUIPMENT DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. ADA compliant.
- D. Metering: +/- 2 percent from 2 percent to full scale of output (30 A).

- E. EV Charging Equipment Mounting: [**Pedestal mount**] [**or**] [**Wall mount**].
- F. Enclosures:
  - 1. Rated for environmental conditions at installed location.
    - a. Indoor Locations: IK08, Type 3.
    - b. Outdoor Locations: IK08, Type 3.
    - c. Galvanize Steel and UV-resistant plastic.
    - d. Paint and Anodized.
    - e. Meter, modem, and CPU, tamper resistant.
- G. EV Cable and Connectors:
  - 1. SAE J1772 connector.
  - 2. [**One**] [**Two**] connectors
  - 3. **18-foot (5.5 m)** [**25-foot (7.5-m)**] cable with and without cable management system options
- H. Status Indicators:
  - 1. LEDs to indicate power, vehicle charging, charging complete, system status, faults, and service, as well as authorization.
- I. Networking:
  - 1. WAN Communications: Cellular or 2.4 GHz Wi-Fi 802.11b/g/n.
  - 2. LAN Communications
  - 3. Capable of remote configuration, diagnostics and reporting.
  - 4. Capable of remote software updates (future proof).
- J. Payment System:
  - 1. RFID (ISO 14443)
  - 2. PCI (Payment Card Industry) compliant.
  - 3. Capable of remote control and authorization including mobile phone application
- K. Charging Network: Compatible with the **EPIC Charging, AmpUp, WEVO, Chargelab, Evoke, Ampeco, Driivz** EV charging networks (and any other OCPP1.6 platforms)
  - 1. Multiple units shall independently connect to charging network.
  - 2. Individual units shall be capable of indicating station status and availability providing or connecting user to customer support and remote control.

## 2.3 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
- B. Input Power:

1. [20A] [40A] [50 A] [60A] [Two 20A] [Two 40A] [Two 50 A], [Two 60 A] 208/240-V ac, 50-60 Hz, single phase per charger.

C. EV Charging Levels:

1. Single vehicle: AC Level 2 at up to 11.5 kW per vehicle.
2. Dual vehicles, AC Level 2 at up to 11.5 per vehicle.
3. Multiple vehicles simultaneously charging using Advanced Load Management via the software may be charged up to 11.5 kW per vehicle.

## 2.4 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for EV charging equipment electrical conduit to verify actual locations of conduit connections before equipment installation.
- C. Examine walls, floors, and pavement for suitable conditions where EV charging equipment will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 413.
- B. Concrete Base Mounting:
  1. Install EV charging equipment on 12-inch (300-mm) nominal-thickness concrete base. Base should be square (minimum 12-inch (300 mm) from the center located conduit stub-up). Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete".

- a. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on **18-inch (450-mm)** centers around the full perimeter of concrete base.
  - b. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
  - c. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - d. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - e. Secure EV charging equipment to concrete base according to manufacturer's written instructions.
2. Install EV charging equipment on **18-inch (450-mm)** nominal-diameter and **18-inch (450-mm)** concrete base. Comply with requirements for concrete base specified in **[Section 033000 "Cast-in-Place Concrete. "] [Section 033053 "Miscellaneous Cast-in-Place Concrete. "]**
    - a. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    - b. Install anchor bolts to elevations required for proper attachment to supported equipment.
    - c. Secure EV charging equipment to concrete base according to manufacturer's written instructions.
- C. Wall Mounting:
1. This device shall be mounted at a sufficient height from grade such that the height of the storage means for the coupling device is located between 600mm (24 inches) and 1.2m (4 feet) from grade
  2. Set the positions of the 4 screw holes and drill them, with a diameter of 8mm and a depth of 52mm. Use 4 sets expansion screw and M6 screw to fix the wall-mounted bracket on the wall.
  3. Align the rear notch of charger into the wall-mounted bracket and fit the screw holes of the right and left side.
  4. Fix two M5 screws to complete the installation.
- D. Pedestal Mounting:
1. Mount the charging stations on the pedestal using 2pcs of M5\*12mm screws on two sides of the charger. (Repeat one more time on the back for Back-to-back version.)
  2. Thread the connection cables from the bottom through the pedestal upwards through the wiring window.
  3. Perform the electrical connection and commissioning in accordance with the instructions in the "User manual" of charging station.
  4. Fix the 4pcs M5\*12mm screws to finish the installation.
- E. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."

- F. Wiring Method: Install cables in raceways and cable trays. Conceal raceway and cables except in unfinished spaces.
  - 1. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
  - 2. Comply with requirements for underground raceways and enclosures specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems."
- G. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- H. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- I. Circuit Breakers: Comply with Section 262816 "Enclosed Switches and Circuit Breakers."
- J. Secure covers to enclosure.

### 3.3 CONNECTIONS

- A. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Comply with grounding requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Comply with requirements for installation of conduit in Section 260533 "Raceways and Boxes for Electrical Systems." Drawings indicate general arrangement of conduit, fittings, and specialties.
- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

### 3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

### 3.5 ONGOING MANAGEMENT SERVICES

- A. Engage a station manufacturer that offers a service to manage the administration and policies of the electric vehicle charging stations on an ongoing basis.

### 3.6 SOFTWARE SERVICE AGREEMENT



- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for the duration of an active Network Service Plan.

END OF SECTION 262653