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Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat*, *SectionFormat*, and *PageFormat*, as described in *The CSI Construction Specifications Practice Guide*.

This section must be carefully reviewed and edited by the Architect or Electrical Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" after editing this section.

Section numbers and titles are based on *MasterFormat 2014 Update*.

SECTION 11 11 36

VEHICLE CHARGING EQUIPMENT

Specifier Notes: This section covers SemaConnect, Inc. "Series 6" electric vehicle charging systems. Consult SemaConnect, Inc. for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electric vehicle charging systems.

1.2 RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

- A. Section 03 30 00 – Cast-in-Place Concrete: Concrete pad for pedestal-mount installation.

- B. Division 26 – Electrical: Circuit breaker, electrical conduit, and electrical supply wires.

1.3 REFERENCE STANDARDS

Specifier Notes: List reference standards used elsewhere in this section, complete with designations and titles.

- A. IEC 60529 – Degrees of Protection Provided by Enclosures (IP Code).
- B. ISO/IEC 15693 – Identification cards -- Contactless integrated circuit cards -- Vicinity cards.
- C. National Electrical Code (NEC) Article 625 – Electric Vehicle Charging System.
- D. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).
- E. NFPA 70 – National Electrical Code (NEC).
- F. SAE J1772 – Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler.
- G. UL 2231-1 – Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: General Requirements.
- H. UL 2231-2 – Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems.
- I. UL 2594 – Electric Vehicle Supply Equipment.

1.4 PREINSTALLATION MEETINGS

Specifier Notes: Edit preinstallation meetings as necessary. Delete if not required.

- A. Convene preinstallation meeting before start of installation of electric vehicle charging systems.
- B. Require attendance of parties directly affecting work of this section, including Contractor, Architect, installer, and manufacturer’s representative.
- C. Review materials, installation, adjusting, cleaning, demonstration, instruction and training, protection, maintenance, and coordination with other work.

1.5 SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

- A. Comply with Section 01 33 00 – Submittal Procedures.
- B. Product Data:
 - 1. Submit manufacturer’s product data, including installation instructions.

2. Submit manufacturer's project proposal describing electric vehicle charging subsystems:
 - a. Charging station.
 - b. Mounting device options.
 - c. Web-based software and network services.

- C. Shop Drawings: Submit project shop drawings, including plans, elevations, sections, and details, indicating dimensions, tolerances, materials, components, fabrication, fasteners, hardware, finish, electrical wiring diagrams, options, and accessories as required by Owner.
- D. Manufacturer's Project References: Submit manufacturer's list of successfully completed electric vehicle charging system projects, including project name and location, name of architect, and type and quantity of electric vehicle charging systems furnished.
- E. Operation and Maintenance Data: Provide detailed information required for Owner to properly operate and maintain equipment.
- F. Warranty Documentation: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 3 years, in the manufacturing of electric vehicle charging systems of similar type to that specified.
- B. Installer's Qualifications:
 1. Installer regularly engaged, for a minimum of 5 years, in installation of low-voltage distribution equipment.
 2. Employ persons trained for installation of low-voltage distribution equipment.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 1. Store and handle materials in accordance with manufacturer's instructions.
 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 3. Store materials in clean, dry area indoors.
 4. Protect materials and finish during storage, handling, and installation to prevent damage.

1.8 WARRANTY

Specifier Notes: Specify warranty period. One-year warranty period is standard, with options to extend total warranty period to three or five years. Consult SemaConnect, Inc. for information regarding extended warranty period options.

- A. Warranty Period: [1 year] [3 years] [5 years].

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: SemaConnect, Inc., 4961 Telsa Drive, Suite A, Bowie, Maryland 20715. Toll Free 800-663-5633. Phone 301-352-3730. Fax 301-352-4232. Website www.semaconnect.com. Email info@semaconnect.com.

Specifier Notes: Specify if substitutions will be permitted.

- B. Substitutions: [Not permitted] [In accordance with Division 1].
- C. Single Source: Provide materials from single manufacturer.

2.2 ELECTRIC VEHICLE CHARGING SYSTEMS

- A. Electric Vehicle Charging Systems:
1. Electric vehicle charging stations.
 2. Software and network services.
 3. Electric vehicle driver access.
 4. Maintenance and service.
 5. Installation and training.

2.3 ELECTRIC VEHICLE CHARGING STATIONS

- A. Electric Vehicle Charging Stations: "Series 6".

Specifier Notes: Specify mounting type. Delete mounting types not required.

1. Mounting: [Single-head pedestal mount] [Dual-head pedestal mount] [Wall mount] [Pole mount].
2. Head Unit:
 - a. Factory-assembled, 1-piece, sealed enclosure.
 - b. No field assembly required.
 - c. Dimensions: 20 inches high by 6 inches wide by 6 inches deep.
 - d. Enclosure Primary Material: Aluminum.
3. Access Panel: For installation and maintenance.
4. LED Lights: Indication of electric vehicle charging station status.
 - a. Steady Blue: Station available.
 - b. Flashing Green: Vehicle charging.
 - c. Steady Green: Vehicle fully charged.
 - d. Steady Red: Ground-fault detection.
5. LCD Messaging Screen:
 - a. Communicates charging instructions to electric vehicle drivers.
 - b. Backlit.

Specifier Notes: Specify either standard cable management or the optional cable management system. Delete the one not required.

6. Standard Cable Management: Looped cable on rack.
 - a. When charging session is complete, electric vehicle driver returns plug to head unit and manually loops cable on stainless steel cable rack.
 7. Optional Cable Management System: Retractable cable lanyard.
 - a. When charging session is complete, electric vehicle driver returns plug to head unit and cable automatically retracts to organized loop.
 - b. Lanyard: Mechanical pulley system to support cable and keep it above parking lot surface at all times.
 - c. Lanyard Housing Primary Material: Aluminum.
 8. Smart Card Authentication:
 - a. For open or restricted access control.
 - b. Manufacturer's "SemaCharge Passes" available for electric vehicle drivers.
 - c. For billing and payment for electric vehicle drivers.
 9. Plug: Able to charge all new electric and plug-in hybrid electric vehicles.
 10. Electricity Metering: Energy monitoring.
- B. Power:
1. AC Power Output, Maximum: Level 2. 7.2 kW (240 VAC at 30 A).
 2. AC Power Input: Level 2. 30 A; Line 1, Line 2, and Earth (no neutral).
 3. Vehicle-to-Charger Connection: SAE J1772 EV Connector, 18-foot cable.
 4. Energy Metering Accuracy: 1 percent at 5-minute interval (standard).
 5. Standby Power: 5 W typical.
 6. Service Panel Breaker: Dual-pole, 40-A, common-trip breaker, dedicated circuit.
- C. Safety:
1. Safety, Ground-Fault-Circuit Interrupt: 5 mA CCID with auto retry (15-minute delay, 3 tries).
 2. Automatic Plug-Out Detection: Power terminated, SAE J1772. SMS or email notification.
 3. General Safety Compliance: UL Certified; CCID, UL 2231-1 and UL 2231-2; Meets UL 2594; NEC Article 625 Compliant.
- D. Network:
1. Wide Area Network: Commercial CDMA or GPRS cellular network.
 2. Network Communication Protocol: TCP/IP.
 3. Network Security: HTTPS; 128-bit AES Encryption.
 4. Smart Card Reader: ISO 15693.
- E. Communications Device:
1. LED Array: 270-degree visibility, multi-color visual status indication.
 2. LCD Screen: 2 lines, 16 characters per line.
- F. Site Conditions:
1. Outdoor Rated:
 - a. NEMA 250: NEMA 3R.
 - b. IEC 60529: IP44.

2. Operating Relative Humidity: Maximum 95 percent, non-condensing.
3. Operating Temperature Range, Ambient: Minus 22 degrees F to 122 degrees F (minus 30 degrees C to 50 degrees C).

G. Surge Protection: 6 kV at 3,000 A.

H. EMI Compliance: FCC Part 15 Class A.

2.4 SOFTWARE AND NETWORK SERVICES

A. Station Management Software:

1. Provide Owner with web-based SemaConnect station management software.
2. Capable of configuring stations for pricing and access policies.
 - a. Pricing Policies Include: Time-of-use, duration-based, and kWh pricing.
 - b. Access Policies Include: Private-only, public-only, or combined private/public access.
3. Capable of generating operational reports, including:
 - a. Transaction Reports: Summary of individual session details (e.g. plug-in time, plug-out time, kWh delivered).
 - b. Usage Reports: Histogram summary of station usage by time-of-day in one-hour intervals.
 - c. Cost Reports: Summary of electricity cost generated by station usage.
 - d. Revenue Reports: Summary of Owner revenue generated from driver fees.
 - e. Sustainability Reports: Summary of carbon offset and fossil fuel consumption reduced due to usage of charging stations.

B. Driver Account Software:

1. Provide electric vehicle drivers with web-based SemaConnect driver account management software.
2. Drivers register with address contact and credit card payment information.
3. Drivers can specify SMS txt and email alert preferences (e.g. charge complete and plug-out).
4. Drivers can monitor charging session history, including fees incurred and kWh consumed.

C. Network Services:

1. Monitor state-of-health of charging station 24/7.
2. Automated driver billing and Owner payment.
3. Pricing and access policy configuration through web-based software.
4. Near real-time monitoring and reporting of charging session data.
5. Near real-time mapping of station location, availability, access, and pricing information.
6. Multiple portals for key stakeholders, including Owner, electric vehicle drivers, and customer service.

2.5 DRIVER ACCESS

A. Account-Based Access Methods for Repeat Users:

1. SemaConnect Smart Card: Drivers can access and pay for sessions.
2. SemaConnect Smart Phone App: Drivers can locate, check real-time availability, start and pay for sessions.

3. PlugShare Smart Phone App: Drivers can locate, check real-time availability, start and pay for sessions.
- B. Non-Account-Based Access Methods for First-Time Users:
1. SemaConnect 1-800 Number: Drivers can start and pay for sessions using 1-800-663-5633.
 2. SemaConnect Mobile Web Site: Drivers can start and pay for sessions via Smart Phone via semacharge.com home page.
 3. PlugShare Smart Phone App: Drivers can locate, check real-time availability, start and pay for sessions.

2.6 ACCESSORIES

Specifier Notes: Specify anchor plates for pedestal-mount installations. Delete anchor plates for wall- or pole-mount installations.

- A. Anchors Plates:
1. For pedestal-mount installations.
 2. Steel.
 3. Top Plate: 3/8 inch by 8 inches by 8 inches.
 4. Tube: 18 inches by 2.5-inch diameter.
 5. Stabilizing Rods: 8 inches long.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive electric vehicle charging stations.
- B. Verify surfaces to support electric vehicle charging stations are clean, dry, flat, plumb, level, square, stable, rigid, and capable of supporting the weight.
- C. Notify Architect of conditions that would adversely affect installation or subsequent use.
- D. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install electric vehicle charging stations in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install electric vehicle charging stations in accordance with NFPA 70.

Specifier Notes: Specify installation for pedestal, wall, or pole mount. Delete mounting types not required. Pedestal-mount installation applies to both single-pedestal and dual-pedestal mounting configurations.

- C. Pedestal Mount:
 - 1. Install concrete pad to dimensions indicated on the Drawings.
 - 2. Imbed anchor plate into concrete pad plumb, level, and square.
 - 3. Place concrete for pad as specified in Section 03 30 00.
 - 4. Bolt pedestal to anchor plate.
 - a. Adjust for plumb, level, and square with 4 set screws included in base.
 - 5. Attach head unit to pedestal.
- D. Wall Mount:
 - 1. Attach wall-mount bracket to wall in accordance with manufacturer's instructions plumb, level, and square.
 - 2. Attach head unit to wall-mount bracket.
- E. Pole Mount:
 - 1. Attach pole-mount bracket to pole in accordance with manufacturer's instructions plumb, level, and square.
 - 2. Attach head unit to pole-mount bracket.
- F. Electrical: Install circuit breaker, run electrical conduit, and connect electrical supply wires as specified in Division 26.
- G. Install electric vehicle charging stations weathertight.

Specifier Notes: Edit the following sentence as necessary.

- H. Install top of electric vehicle charging stations [56 inches] [as indicated on the Drawings] above grade.

Specifier Notes: Edit the following sentence as necessary.

- I. Cable Management: Install [standard cable management] [optional cable management system] in accordance with manufacturer's instructions plumb, level, and square.
- J. Manufacturer:
 - 1. Provide advisory assistance and guidance to installer for electrical preparation work and installation of electric vehicle charging stations.
 - 2. Perform testing and monitoring of electric vehicle charging stations for full operational performance.

3.3 CLEANING

- A. Clean electric vehicle charging stations promptly after installation in accordance with manufacturer's instructions.

- B. Do not use harsh cleaning materials or methods that could damage finish.

3.4 DEMONSTRATION

- A. Demonstrate for Owner's personnel that electric vehicle charging systems function properly in every respect.

3.5 INSTRUCTION AND TRAINING

- A. Provide instruction and training of Owner's personnel in the operation and maintenance of electric vehicle charging systems.
- B. Include Instruction and Training for:
 1. Electric vehicle charging stations.
 2. Station management software.
 3. Electric vehicle driver software.
 4. Establishing access and pricing policies for Owner's electric vehicle charging station program.
- C. Provide instruction and training by factory-trained and certified representative of manufacturer.

3.6 PROTECTION

- A. Protect installed electric vehicle charging stations to ensure that, except for normal weathering, stations will be without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE

- A. Provide operational service by manufacturer to minimize system downtime and to minimize maintenance costs incurred by Owner.
 1. Service shall include full replacement of universal charging station head unit.
 2. Manufacturer shall ship replacement unit to Owner.
 3. Failed unit shall be returned to manufacturer in same box as used to ship replacement unit.
 4. Owner's electric vehicle charging system shall be immediately operational with installation of replacement unit.
- B. Include in Network Service Fee:
 1. Real-time monitoring of operational performance of electric vehicle charging stations.
 2. Automatic upgrade to latest version of system software packages, including electric vehicle charging stations, station management software, and driver account software.
 3. Access to manufacturer's 24/7 customer support.
 4. System machine-to-machine communication fees.
 5. Integration into manufacturer's network operation center.

END OF SECTION