

Statement of Work

Electric Vehicle Charging Station Design Build Integrating Contractor for Knoxville and Nashville, TN

PART 1 - GENERAL

As part of the Regional Electric Vehicle Charging Station Project, the Oak Ridge National Laboratory (ORNL) is soliciting services of an Electric Vehicle Charging Station Integrating Contractor (EVIC) to provide design build integration services for the design, procurement and construction/installation of 30 solar-assisted charging stations for highway-ready electric vehicles (EVs). These stations will be located on the University of Tennessee (UT) campus, in downtown Knoxville, and in Nashville, Tennessee meeting all local codes, ordinances, and any relevant requirements specific to each location including ADA parking requirements.

The EV charging stations will consist of parking spaces with fully integrated Electric Vehicle Supply Equipment (EVSE) to charge one EV at a time, designed and installed according to industry standards and meeting all applicable codes. These grid connected stations will include solar power assistance, battery stationary storage, power conversion equipment, power management system, and data collection equipment in addition to the EVSE. All utility connections, including underground routings and connections, transformers, service drops, and other required equipment, will be provided and installed by the integrator. The site owner will be responsible for providing a clean, accessible site such as a garage parking deck or surface parking lot. The integrator will provide input to and manage site specific issues as they arise.

The stations will be compatible with, and installed on the following sites in downtown Knoxville and the UT Campus. See Attachment 1.

Downtown Knoxville:

Market Square Parking Garage – 4 spaces

Coliseum Parking Garage – 6 spaces

UT Campus:

Agriculture Campus – 6 spaces

Music Building Staff Parking Lot – 6 spaces

The stations will be compatible with, and installed on the following sites in downtown Nashville. See Attachment 2.

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LP Field – 8 spaces. Note: Construction activities at LP Field cannot begin until after the NFL season, including playoffs.

A representative approved design for ten typical charging stations will be provided by the ORNL to serve as overall baseline design recommendation. The EVIC will be responsible for working with each utility provider to determine site-specific design and installation requirements for each of the four stations. The exact locations have been agreed upon with the City of Knoxville, University of Tennessee Knoxville, and the City Nashville.

The stations will be permanent infrastructure (real property) at each location.

PART 2 - SCOPE REQUIREMENTS

The Seller will:

1. Provide specific design packages for each installation site and equipment specifications for solar assisted charging stations with electric vehicle charging and battery back-up. The design shall address all of the following sub-elements.
 - A. Communications and control capability: Each station will have internet access, wired and wireless, and controls to enable vehicle charging, battery charging cycles, battery discharge cycles and other pertinent charging activities to be controlled for effective operation of the systems.
 - B. Lighting: The design will include architecturally integrated low-energy exterior canopy lighting sufficient for compliance with all applicable codes and standards.
 - C. Solar: The design will include either a solid surface solar canopy structure over the parking spaces or an existing support structure in close proximity to the parking spaces to mount solar panels on. The solar modules will have at least 13.5% efficiency (unless otherwise dictated by site-specific conditions) and provide ~2.0 kW of solar capacity per charging station provided. Canopies will include guttering systems to manage rain water such that runoff will be diverted away from the parking spaces. The support structure for the canopies or the solar modules will be compliant with all applicable structural requirements and safety codes.

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- D. EV Charging Stations: Charging stations shall be equipped with EVSE compliant with the J1772 standard. The EVSEs will have both wired and wireless internet communications capability and be installed per all applicable codes and requirements including, but not limited to, NEC article 625. The charging stations will be constructed so that they are compliant with ADA access requirements and all applicable safety codes. System design shall be based on Ecotality North America Next Generation Level 2 EVSEs which will be supplied by Ecotality North America.
 - E. Battery storage: The design will include battery storage capacity for local grid support, with nominal energy storage of approximately 1.2 KWh/space. The battery storage will include an appropriate grid-connected battery management system with remote communications (capability) sufficient to permit the batteries to be charged from and discharged to the electric grid response to remote commands. The design will account for the charge/discharge cycle losses associated with the selected battery technology. The design will account for the degradation in service life that accrues from depth of discharge and provide for increasing the size of the battery system, where necessary, to ensure that the battery life is not prematurely sacrificed. The design will include a battery storage enclosure with ventilation, and cooling (as required) to ensure optimal protection and performance preservation. The battery storage enclosure will be of modular design that is architecturally compatible with and complimentary to the overall design of the pod and associated solar canopy. A nominal goal is a battery system with projected useful life of 5 years. All aspects of the battery storage system shall be compliant with all applicable safety and electrical codes and standards.
 - F. Security: Security cameras with integrated storage and remote communications capability will be provided with each of the charging stations to help protect the stations from vandalism.
2. Submit final designs of the installations to ORNL for review and to the City's engineering departments for approval.
 3. Perform the installation and commissioning of approximately 30 stations adhering to all federal, state, and local codes, standards, and safety requirements. Work with the utility providers at each site to ensure the utilities' specific equipment and termination requirements are met.

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4. Manage the full procurement, delivery, and vendor payment process of contracts awarded by the Seller.
5. Provide monthly reports to ORNL, including budget/cost status, outstanding commitments, project schedule, and other information as directed by ORNL. Costs are to be reported separately for each location at each city, i.e., six locations.
6. Provide training for the system operators.

PART 3 – ADDITIONAL TECHNICAL REQUIREMENTS

1. The solar, EVSEs and battery storage systems shall be three independent grid-connected systems.
 - A. The three independent grid-connected systems shall be provided on a “turn-key” basis. Complete documentation for the three independent systems shall be provided as individual packages and shall include all pertinent engineering drawings, warranty information and warranty pass-thru documentation, and all relevant calculations pertinent to the design of the individual systems.
 - B. All systems must be installed in accordance with all applicable requirements of local electrical codes and the National Electrical Code (NEC, 2008), including but not limited to Article 690, “Solar Photovoltaic Systems” and Article 705, “Interconnected Electrical Power Production Sources.”
 - C. Systems must be designed and installed using UL or ETL listed components, including mounting systems.
 - D. Modules must be certified to UL 1703, “Flat-Plate Photovoltaic Modules and Panels.
 - E. Inverters must comply with the following requirements:
 - 1) IEEE 929-2000 – “Recommended Practice for Utility Interface of Photovoltaic Systems”
 - 2) UL 1741 – “Standard for Static Inverters and Charge Controllers for use in Photovoltaic Systems”
 - 3) Listed on the CEC list of eligible inverters

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F. Other technical codes that will apply include:

- 1) AMSE PTC 50 (solar PV performance)
 - 2) ANSI Z21.83 (solar PV performance and safety)
 - 3) NFPA 853 (solar PVs near buildings)
 - 4) NEPA 70 (electrical components)
 - 5) IEEE 1547 (interconnections)
 - 6) National Electrical Safety Code – ANSI C2 – 1999
 - 7) All applicable state building codes and requirements
2. The successful bidder will be required to incorporate manufacturers and vendor's drawings into as-built drawings for the system and to provide these in an electronic format that may be imported into AutoCAD drafting software. Proper credit of the source of these drawings will be noted on the Company's drawings.
 3. The Contractor is responsible for providing three (3) complete copies of all parts lists and installation, operations, and maintenance manuals.
 4. The Project is an ARRA funded project and the proposed systems *must comply with all relevant requirements for ARRA funded projects. Refer to procurement requirements and reporting requirements.*
 5. An acceptance test to ensure that the system and subcomponents are all functioning within the manufacturers' rated performance specifications must be performed on the systems once the installations are complete. This includes measuring the short circuit currents and open-circuit voltages on all source circuits while measuring irradiance and module temperature. This also includes measuring the instantaneous DC input and AC output of the system to determine its efficiency. Test plan details will include definition of acceptable results for each test condition.
 6. An entire system level performance warranty for five (5) years or more shall be provided for each system. Transferable or assignable warranties of all components shall be provided. The system shall be warranted to produce at least 70% of total PV power rating of AC power at STC in the fifth year, as measured at the inverter AC output. An NABCEP-Certified individual shall prepare shop drawings showing components and interconnectivity, including mounting arrangements, DC wire and conduit sizing, voltage drop calculations, etc. between components. Shop Drawings shall include expected performance values based on the chosen component's manufacturer's specifications. Shop drawings shall be submitted and

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approved by The Company prior to installation. All solar-related components shall be installed by a NABCEP-certified solar installer.

7. The SELLER shall provide proof of certification of the designer of the shop drawings and the installer of the equipment prior to procurement or installation of the equipment. The system shall be designed (in accordance with NABCEP guidelines and NEC requirements) to make optimum use of the provided canopy mounting surface in terms of maximum kW DC power output as well as maximum power output per installed cost for the proposed PV system(s). The PV module(s) shall contain crystalline silicon solar cells. The bidder is free to propose more than one design option for consideration.

PART 4 - PRODUCTS

1. Each PV module shall be warranted by the manufacturer for at least 80% of its rated power for a minimum of 20 years from the date of system acceptance. The solar PV system shall incorporate a single inverter that will be grid-connected to the supplied 3-phase 208V AC connection point. The inverter shall be designed specifically for utility grid interconnection of photovoltaic arrays and be capable of automatic, continuous, and stable operation over the range of voltages, currents, and power levels for the size and type of array used. The inverter shall be compliant with the most recent revisions of UL standard 1741 and IEEE standards 1547 and 1547.1. The inverter shall also comply with IEEE Std. 519 (Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems) and the latest applicable ANSI and FCC standards and addenda dated prior to the award of the purchase order for this procurement. The inverter(s) must have an automatic visual indicator showing whether the system is on-line and operating properly. The inverter shall have internet communication capability. Anti-islanding and automatic single phase shutdown shall be integral to the inverter. The inverter(s) must have at least a 5-year repair or replacement warranty from the manufacturer covering parts and labor.

Some sites might have shading issues from trees or power poles and may require the use of micro-inverters or other means to optimize maximum power point tracking at the sub-array level.

2. Solar PV systems that are mounted on solar canopy structures over the parking places shall be mounted to standing seam metal roofs without penetrating the roof surfaces, using standard mounting hardware. The canopies shall include guttering systems to manage rain water such that runoff will be diverted away from the parking spaces. The modules

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mounting system design will provide at least three to five inches of space beneath the modules to allow array ventilation to minimize excessive temperatures that decrease output and increase module degradation. Systems such as UNI-RAC or an approved equivalent with a combination of clips and rails shall be utilized.

3. The solar PV systems shall include a data monitoring system, such as FatSpaniel, SMA Sunny Portal, or an approved equivalent. The contractor is responsible for the communications wiring.
4. The PV systems design shall require shop drawings indicating proposed layout of the entire systems, including PV array, and location of BOS hardware and inverters with respect to the array. A complete one-line diagram of each system including wire and conduit sizes shall be included. The shop drawings shall also include information showing details of module/array mechanical support, including structural drawings and component photographs sufficient to enable the aesthetic compatibility of the proposed structure to be evaluated.
5. Parts lists, including replaceable parts (wear items), for all major electrical components, mechanical hardware and other equipment required for installing the systems are to be submitted. Include description and make for all the equipment provided, model/part number and source for the PV modules, inverter, batteries, charger/inverter, charging stations, and battery enclosures.
6. EVSE Vehicle Chargers
 - A. A total of 30 Level 2 EVSEs will be installed, one per designated parking space co-located under the solar canopy.
 - B. The EVSE product shall be the Ecotality North America Next Generation Level 2 EVSE, which will have both wired and wireless internet communications capability and will be supplied by Ecotality North America.
 - C. The EVSEs will be connected to a 208VAC single phase circuit that has a three phase power supply in accordance with all manufacturers' recommendations.
 - D. The EVSEs will be installed per all applicable codes and requirements including, but not limited to, NEC article 625.

7. Battery Storage Equipment Specifications

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- A. The battery storage systems shall consist of approximately 1.2 kWh/space of (VRLA) sealed lead-acid batteries capable of being regularly cycled to 50% depth of discharge with at least 2000 such cycles of useful operation.
- B. The batteries used in these energy storage systems shall be contained in a compact, air-conditioned, thermostatically controlled enclosure to ensure that the battery operating temperature remains below 80°F at all times. The enclosure shall include appropriate standard measures to detect and or prevent hydrogen build up so that it cannot exceed 2% concentration (4% being the combustible limit) in any portion of the containment enclosure. Battery enclosure shall have at least a NEMA 3R rating for outdoor installation. The enclosures must provide sufficient work space for inspection and maintenance. Provisions must be made for adequate ventilation to prevent an accumulation of explosive gasses. Wiring and insulation must be of a type that withstands corrosive action. Special precautions must be taken to ensure that all metal work is designed and treated to be corrosion resistant.
- C. The battery management systems inverter/charger products shall be the SMA Sunny Island SI 5048U Inverter or approved equivalent and shall include communications interface hardware.

PART 5 – EXECUTION

1. PV SYSTEM ELECTRICAL DESIGN

- A. The electrical design and installation instructions for the PV systems shall conform to the 2008 National Electric Code (NFPA 70). Article 690 of the NEC applies specifically to photovoltaic system safety, protection, control and interface with other sources. Other articles of the NEC also apply.
- B. All electrical components, including overcurrent protection, disconnect, surge suppression devices, conduit, wiring and terminals must have UL or equivalent listing and have appropriate voltage, current and temperature ratings for the application. Special attention should be given to appropriate ratings for components used in DC circuits.
- C. All wiring shall be listed for a minimum operation of 600 volts and temperature where required.

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- D. Ampacity calculations must take into account appropriate de-ratings as required. All conductors in the systems are subject to a 125% NEC de-rate, and all DC source circuit conductors and overcurrent devices must include an additional 125% de-rate for solar radiation enhancement. Appropriate temperature de-ratings for conductors used in module junction boxes must be considered for peak module operating temperatures, as well as de-ratings for instances where more than three current-carrying conductors are enclosed in a conduit. Electrical enclosures (including the inverter) shall be shaded from direct sunlight wherever possible.
- E. Total voltage drop in the system (including DC and AC) shall be no more than three percent (3%), including losses in conductors and through all fuses blocking diodes, and termination points.
- F. Interconnection shall be made via a load-side connection per NEC 690.64(B), connecting to the electrical distribution system in accordance with each city's requirements.
- G. All overcurrent devices shall have trip ratings no greater than the de-rated ampacity of the conductors being protected.
- H. Each series-connected string of modules (also known as source circuits) shall include a series fuse as required by UL and NEC to prevent damage to wiring or other system components. Parallel connections of modules within individual source circuits are not permitted.
- I. The inverters shall include array ground-fault protection devices, which must be capable of detecting array ground faults, shunting the fault current to ground, and disabling the array until the fault has been cleared.
- J. All terminations must be listed multi-contact, box terminal, or compression type connections. Twist on wire splices, crimped, soldered, or taped connections are not permitted for the required field installed wiring. Proper torque specifications should be provided for all of the required field connections.
- K. All module frames, panel/array support structures, metal enclosures, panel boards and the inverter cabinet(s) should be provided with connections for bonding to a common equipment grounding conductor, terminating at the utility service ground. Modules shall be grounded with tin-plated copper lay-in lugs rated for outdoor use (typically labeled as suitable for direct burial).

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- L. In addition, provisions for grounding the neutral of the inverter output shall be provided. The DC ground conductor may be common to the AC neutral in the inverter design and under no circumstances should multiple connections to ground be specified for current-carrying conductors in the system.
- M. Appropriate surge suppression devices should be installed on both the DC and AC sides of the system.
- N. Loss of Line: The inverter(s) shall not operate without the line voltage present. The inverter(s) restart shall occur automatically after restoration of line voltage and frequency for at least five (5) minutes.

2. PV ARRAY MECHANICAL DESIGN

- A. The Contractor shall provide the mechanical hardware for mounting the photovoltaic arrays. The Contractor shall provide all other hardware required for assembling the photovoltaic modules and panels and structurally attaching them to the roof supports.
- A. The PV array, including modules, hardware and attachments shall be designed to withstand the required design wind loads and comply with all existing local and national codes. Verifying documentation shall be provided to the Company.
- B. Array mounting hardware supplied by the bidder should be compatible with the site considerations and environment. Construction will be in accordance with the design drawings and will meet workmanship standards that ensure a high-quality appearance under both close and distant inspection. Special attention should be paid to minimizing the risk from exposed fasteners, sharp edges, and potential damage to the modules or support structure. Corrosion resistance and durability of the mechanical hardware is required – the use of stainless steel fasteners and an aluminum support structure is preferred. Galvanic corrosion should be avoided.
- C. As these are high profile, publicly visible installations, the aesthetics of the overall installation is extremely important. To create a uniform appearance of the array, spacing between individual modules and panels should be kept to a minimum. As much as possible, all mechanical hardware, conduit, junction boxes and other equipment should be concealed.

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- D. The array layouts should be consistent with the ordering (and labeling) of source circuits in the array combiner boxes. Ease of access for array troubleshooting and maintenance is desired by allowing access to the back of the array for module junction box servicing (as required), and removal/replacement of individual source circuits and modules if necessary.

PART 6 - ENVIRONMENT, SAFETY AND HEALTH REQUIREMENTS

The seller will comply with the following health and safety requirements including ORNL specific ES&H requirements which are set forth in the governing subcontract.

1. Compliance: Seller shall comply with all applicable federal, state and local laws, regulations and ordinances relating to occupational health and safety and the protection of public health or the environment.
2. Worker Safety and Health Plans.
 - A. All work shall be performed in accordance with the State of Tennessee Occupational Safety and Health Act (TOSHA) standards and requirements, including any requirements to develop supplemental substance/activity compliance plans and training. All plans developed by the Seller shall be made available to the Company for review, upon request.
 - B. During periods of active construction, Seller's designated representative shall be present on the construction site. Seller's designated representative must make frequent and regular inspections of the construction worksite to identify instances of noncompliance with ES&H requirements.
 - C. Seller shall have a disciplinary process for employees failing to utilize appropriate protective measures.
3. Activity Hazard Analysis: Seller shall submit a written activity hazard analysis (HA) to the Company prior to beginning work. The HA shall identify all work tasks anticipated, any potential health, safety and environmental hazards that could reasonably be expected during

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these work activities, and list specific actions or precautions that will be taken to minimize the risk of such hazards that could cause an accident, injury, illness, or environmental insult. The HA shall be revised when activities and/or hazards change. The HA and all changes to it shall be communicated to the appropriate workers.

4. Integrated Safety Management.

Seller shall perform this Agreement in a manner that ensures adequate protection for workers, the public, and the environment, and shall be accountable for the safe performance of work. The Seller shall exercise a degree of care commensurate with the work and the associated hazards. Seller shall ensure that management of ES&H functions and activities is an integral and visible part of Seller's work planning and execution processes. The Seller shall, in the performance of this work, ensure that:

- A. Seller is responsible for the protection of employees, the public, and the environment.
- B. Clear and unambiguous lines of authority and responsibility for ES&H matters are established and maintained at all organizational levels.
- C. Personnel possess the experience, the knowledge, skills, and abilities that are necessary to discharge their responsibilities.
- D. Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.
- E. Before work is performed, the associated hazards are evaluated and ES&H standards and requirements are established which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences.

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- F. Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards.
- G. In accordance with the SOW and this Agreement, Seller shall demonstrate through documentation and work practices that its performance of the work under this Agreement:
 - (1) Fulfills the scope of work as outlined in the SOW and this Agreement;
 - (2) Identifies and analyzes hazards associated with the work;
 - (3) Develops and continuously implements hazard controls related to this work;
 - (4) Allows the performance of work within the hazard controls; and,
 - (5) Provides feedback to the Company and Seller's employees on adequacy of hazard controls and opportunities for continuous improvement.
- 5. Seller shall ensure workers are aware of foreseeable hazards and the protective measures described within the HA prior to beginning work.
- 6. Seller shall require that workers acknowledge being informed of the hazards and protective measures associated with assigned work activities.
- 7. Reports. Seller shall make the following reports to the Company:
 - A. Seller shall report to the Company within two (2) working days of learning of an occupational injury or illness that is recordable under 29C.F.R. § 1904.12(c).
 - B. Seller shall forward reports from lower-tier subcontractors to the Company consistent with the requirements above.
- 8. Noncompliance's. The Seller shall promptly evaluate and resolve any noncompliance or potential noncompliance with ES&H requirements. If the Seller fails to resolve the noncompliance or if, at any time, the Seller's acts or failures to act cause substantial harm or an imminent danger to the environment or health and safety of employees or the public, the Company may:
 - A. Issue an order stopping work in whole or in part. Any stop work order issued by the Subcontract Administrator under this clause (or issued by the Seller to a subcontractor) shall be without prejudice to any other legal or contractual rights of the Company. If the Subcontract

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Administrator issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of the Subcontract Administrator. The Seller shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.

- B. Require, in writing, that the Seller remove from the work site any employee the Company deems unsafe, incompetent, careless, or otherwise objectionable. Replacement of the removed employee shall be at the Seller's expense and not chargeable to the Company.
 - C. Require the Seller's participation, at the Seller's expense, in the Company's fact-finding investigations of accidents, injuries, occurrences, and near-misses.
 - D. Terminate the Agreement for default and pursue any other remedies provided by law or this Agreement.
 - E. Remove the Seller from consideration for future subcontract awards.
9. Observation by Company. Representatives of the Company may conduct periodic observations of the Seller's on-site activities for compliance with ES&H requirements. The Company's Subcontract Administrator will notify the Seller in writing of observed noncompliance's with applicable ES&H requirements that cannot be immediately resolved. Seller shall immediately take appropriate corrective action. Seller shall advise the Company's Subcontract Administrator, in writing, within five (5) working days of the corrective action taken on any written noncompliance. Repeated or willful noncompliance with applicable ES&H requirements by the Seller shall constitute a default under other provisions of this Agreement and Company may terminate the Agreement in accordance with those provisions.
10. Special ES&H Requirements:
- A. HAZCOM training is required each year.
 - B. Seller is encouraged to have a Health and Safety program that meets the requirements of OSHA. According to OSHA, an effective Safety and Health Program includes four main elements. Those elements are management commitment and employee involvement, worksite analysis, hard prevention and control, and safety and health training. Nashville is proposing to adopt NEC

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National Electric Code 2011 while Knoxville is still requiring NEC 2008.

- C. Seller is required to have a competent person for activities such as hoisting, trenching and electrical work.
- D. Seller is required to have a full time, on-site Site Safety Health Officer (SSHO) with qualifying training and familiarity with local codes and requirements of the construction sites. The designated person may have concurrent additional jobsite duties only to the extent those additional duties do not interfere with the ability to perform S&H responsibilities. The S&H shall be the first priority and any other duties shall be immediately suspended if they interfere.
- E. Seller must have satisfactory performance record with no recent seriously deficient contract performance. Past Failure to apply sufficient tenacity and perseverance to perform acceptably is a significant factor in determining satisfactory performance.
- F. Personal Protective Equipment: Seller is responsible for providing the appropriate personal protective equipment in all operations/tasks where there is an actual or potential exposure to hazardous conditions or where there is otherwise a need for using such equipment to reduce actual or potential hazards to employees.
- G. Material Management: Seller shall keep the worksite in a clean and orderly condition Materials brought to the worksite by Seller shall be managed appropriately (protected from weather, labeled, stored in accordance with applicable standards, etc.) and utilized in accordance with manufacturer instructions. Unused or reusable material brought to the worksite by Seller shall be removed by Seller at the completion of work.
- H. Waste Disposal: Seller shall comply with applicable federal, state and local liquid, sanitary/industrial, solid and hazardous waste management laws, regulations, ordinances, codes and standards. It is the responsibility of Seller to properly characterize, manage

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and dispose of any waste generated during performance of the work, and to exercise good waste minimization practices. All wastes generated during installation must be properly removed from the site at the completion of work activities.

- I. Hoisting and Rigging. Seller may not bring to or use on-site any hoisting and rigging equipment that contains any SAE Grades 5, 8, or 8.2 fasteners or ASTM Grade A325 fasteners identified on the "DOE Suspect Bolt Headmark List" which is available under the title *Special Articles and Forms* at <http://www.ornl.gov/adm/contracts/documents.shtml>.

For purposes of this paragraph, "hoisting and rigging equipment" means:

- (A) Overhead and gantry cranes as defined in 29 C.F.R. § 1910.179;
- (B) Crawler, locomotive, and truck cranes as defined in 29 C.F.R. § 1910.180;
- (C) Derricks, as defined in 29 C.F.R. § 1910.181; and
- (D) Associated lifting devices such as slings, lifting fixtures, and lifting attachments.

11. Working on or near energized parts. For purposes of this paragraph, "energized parts" means:

- A. Energized parts mean parts that operate at 50 or more volts to ground or contain 10 or more Joules of stored electrical energy.
- B. Seller shall comply with National Fire Protection Association (NFPA) 70E when working on or near energized parts.
- C. Prior to working on or near any energized parts, Seller shall obtain, through the Technical Project Officer, or if there is none, the Subcontract Administrator, the advance approval of the responsible Company Level II Manager, of Seller's plans and proposed activities. Seller must allow in its scheduling for a reasonable amount of time to obtain said approval and Company shall not be responsible for any resulting delay, so long as Company's actions were reasonable. Seller is responsible, at no additional cost to the Company, to provide qualified personnel and compliant personal protective equipment.

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12. Lower-tier Subcontractors. Seller shall include this clause in all of its subcontracts, at any tier, involving performance of this Agreement. However, such provision in the subcontracts shall not relieve Seller of its obligation to assure compliance with the provisions of this clause for all aspects of the work. Seller shall be responsible for identifying all potential hazards to their lower-tier subcontractors.

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PART 7 - GENERAL WORK REQUIREMENTS

1. SUMMARY OF WORK

Work is located at Knoxville, TN and Nashville, TN.

Perform work in accordance with 29 CFR 1926 and applicable portions of 29 CFR 1910.

Work shall be completed in strict accordance with the subcontract documents.

2. COMPANY INTERFACE

Technical communication between the Seller and the Company shall be through the Company's Project Manager, or designee. The Seller shall communicate issues affecting the contract with a Request for Information (RFI). An RFI form is posted on the Procurement website.

3. SUBMITTAL REQUIREMENTS

- A. Coordinate submittal information through the Company's Project Manager, or his designee, and Procurement representative.
- B. Provide the submittal information as stated in the subcontract documents. A preferred submittal form is included on the Procurement website.
- C. Identify submittal information with contract number, project title, Seller's name, and date submitted.
- D. Number of submittal copies: Three, except as noted otherwise within the specification.
- E. Items submitted for review and comment will be returned to the Seller within five business days.
- F. Items submitted for approval will be returned within five business days with one of the following comments:
 - 1. Approved As Is.
 - 2. Approved with comments, revise and resubmit.
 - 3. Approved with comments, resubmittal not required.
 - 4. Not approved, revise and resubmit.

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5. Review not required.

4. DRAWINGS

1. Work shall conform to the drawings.
2. Reference drawings are furnished for information only.

5. PROJECT WORK AND PAYMENT SCHEDULE

Within 30 days of award, the subcontractor shall submit a cost-loaded, baseline project schedule with activities and related costs that match the schedule of values.

The baseline schedule shall consist of a precedence network diagram using the critical path method (CPM) to show each individual essential activity in sequence to meet the contract milestones. The schedule shall also show durations and dependencies, including off-jobsite activities such as design, fabrication of equipment, and procurement and delivery of material, as well as total float and free float times. A rolling four-week schedule showing one week actual progress and a three-week look-ahead forecast shall be reviewed and maintained weekly in Company review meetings. The baseline schedule shall be used for critical path and total float analysis.

Submit for approval, within 30 calendar days after the award of subcontract, a schedule of values (payment schedule) allocated to the two locations in Knoxville and to the two locations in Nashville. The schedule of values shall be in enough detail to verify applications for payment and be traceable to the activities and progress on the schedule. Activities with substantial material values shall be listed separately.

6. PROJECT COORDINATION

A pre-construction meeting will be held at the sites five calendar days before starting field work. The Seller's superintendent and key personnel shall attend. The date and time will be mutually agreed upon by the Company and the Seller.

A progress status and coordination meeting will be held bi-weekly with input from the contractor's subs (location TBD). This meeting will be chaired by the Company's Project Manager. The Seller's superintendent shall attend this

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meeting and have authority to resolve field problems and make changes in cost and schedule.

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REFERENCES

1. City of Knoxville **BUILDING CODES, PERMITS, & INSPECTIONS**
<http://www.ci.knoxville.tn.us/plansreview/building.asp>
2. City of Knoxville **PLANS REVIEW & INSPECTIONS DIVISION**
<http://www.ci.knoxville.tn.us/plansreview/currentcodes.asp>
3. City of Nashville **Department of Codes & Building Safety**
<http://www.nashville.gov/codes/kiva.asp>
4. City of Nashville **List of Adopted Code Editions**
http://www.nashville.gov/codes/adopted_codes.asp
5. Knoxville Utilities Board **Distributed Generation Interconnection Procedures Under The TVA/KUB Generation Partners Program**
<http://www.kub.org/wps/wcm/connect/44b0df0041380759a3f9ef0d4b016aa6/KUBGP+InterconnectionProcedures.pdf?MOD=AJPERES&CACHEID=44b0df0041380759a3f9ef0d4b016aa6>
6. Knoxville utilities **Board Generation Partners**
http://www.kub.org/wps/portal/!ut/p/c1/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gPC1OnYE8TIwMDlwAnAyMfl1BLU1c3D1cjl_1wkA68KvDLG-CVDzQzhMgb4ACOBvp-Hvm5qfoF2dlBHuWOigCrPjmR/dl2/d1/L3dJMjJZZyEhL0lCakFBQVFnQUIEQ0FBZ0NJQUNBb2dBSUJ1d0FDR0EhL1lCcDNwSnchLzZfSDglQINJNDIwR0dBMjAyVDdMVfJFUTlwRzE/
7. NES **Electrical Service Builders and Contractors**
<http://www.nespower.com/guidelines.html>
8. UT Knoxville Facilities Services
<http://www.pp.utk.edu/policies/Electrical/index.htm>

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ATTACHMENTS:

Attachment 1.



UTK EV Charging
Locations 8.12.11.pp

Attachment 2. The following sketch is revised in Amendment 2 to delete the optional State of Tennessee site in Nashville.



Nashville EV
Charging Locations 8.

Attachments for listed References:



knoxbuildingpermits.
pdf



NASHbuilding
permits.pdf



Nashvilleadopted_co
des.pdf



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0800-01-09.pdf



Knoxcurrentcodes.pdf