

PART 1 GENERAL

1.01 SUMMARY OF WORK

- A. The extent and location of “Electrical Ground Service Equipment Charging Systems” Work is shown in the Contract Documents. This section includes requirements for design, installation and delivery of Electrical Ground Service Equipment Charging Systems and associated equipment.

1.02 NOTES TO DESIGNER

- A. Where existing EGSE chargers are removed and re-installed the following requirements must be met:
 - 1. Equipment must be stored in a clean, dry space with temperature and humidity controls to prevent condensation. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
 - 2. Handle in accordance with manufacturer’s written instructions. Handle carefully to avoid damage to components, enclosure and finish.
 - 3. Store equipment and material in suitable facilities until delivery, installation, and acceptance by the Port Resident Engineer.
 - 4. Equipment must be acceptance tested upon reinstallation before being put into general use.

1.03 SYSTEM DESCRIPTION

- A. System Parameters:
 - 1. Power Source: 480Y/277V, 3-Phase, 3-wire, 60Hz.
 - 2. Output and Distribution Voltage: 40kW or 80kW, 24-96V DC.
 - 3. Total Harmonic Distortion (THD) < 10%.
- B. System Major Components: The complete Electrical Ground Service Equipment Charging Systems shall include, but not be limited to, the following components:
 - 1. Power Servers: 40kW or 80kW rectifier-based power supply.
 - 2. Dual Output Power Charging Stations.
 - 3. 40kW Dual Vehicle stand-alone charging stations.
 - 4. Fast charge cables on swivel mounts, with rain shield to prevent water infiltration into connector. Cable shall be terminated in Burton 6-Pin connector.
 - 5. 6’ or 7’ stinger cable with factory-installed shrink wrap and strain relief where connected to the charging station.
 - 6. Battery monitor and identifiers.
- C. Charging corrals shall be 80kW with up to 12 ports or 40kW with up to four ports.
- D. Charging corrals shall consist of the following:
 - 1. Power Server with User Interface.

2. Power Master/Slave Charging stations, capable of being field configured as master or slave.
 3. Power slave charging stations.
 4. Fast charge cables on swivel mounts, with rain shield to prevent water infiltration into connector. Cable shall be terminated in Burton 6-Pin connector.
 5. Stinger charge cable with factory-installed shrink wrap and strain relief where connected to the charging station.
 6. Battery monitor and identifiers.
 7. Galvanized steel stands for charging equipment.
 8. Enclosed circuit breaker/disconnect with shunt trip and metering in NEMA 3R enclosure.
 9. Emergency Power Off button within line of sight of Power Server.
- E. Each circuit feeding a charging corral shall be metered and shall be connected to the Port Power Monitoring system. Refer to Section 26 27 13 – Electrical Power Metering and Relaying.

1.04 GOVERNING CODES, STANDARDS AND REFERENCES

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Sections:
 1. Section 26 05 19 – 600 Volt or Less Wire and Cable
 2. Section 26 05 23 – Control Signal Transmission Media for control systems communications cables and Classes 1, 2, and 3 control cables.
 3. Section 26 05 53 – Electrical Identification.
 4. Section 26 08 00 – Commissioning Electrical Systems
 5. Section 26 24 13 – Low Voltage Switchboards
 6. Section 27 15 00 – Communications Horizontal Cabling for cabling used for voice and data circuits
- C. MIL-STD-461d Electromagnetic Emission and Susceptibility Requirement for the Control of Electromagnetic Interference.
- D. NFPA 70 National Electrical Code (NEC), version as adopted by the State of Washington.
- E. ANSI C2 National Electrical Safety Code.
- F. IEEE 127 and 519.
- G. ICS 6-78 (NEMA) enclosures for Industrial Control Devices and Systems.
- H. ST 20 (NEMA) Dry Type Transformers for General Applications.
- I. ANSI C84.1-1977 Voltage Ratings for Electrical Power Systems and Equipment.
- J. ATA-101 Rev. 4 Ground Equipment Technical Data.

- K. ISO-6858 Aircraft Ground Support Electrical Supplies.
- L. ECC-201-1 Electrical Equipment of Industrial Machines.
- M. SAE J1772 – Electrical Vehicle Conductive Charge Coupler.
- N. NEMA AB 1 Molded Case Circuit Breakers.
- O. NEMA 250 Enclosures for Electrical Equipment (1000V maximum).
- P. NEMA WD 1 Wiring Devices.
- Q. NEMA WD 6 Wiring Devices – Dimensional Requirements.
- R. UL 467 Grounding and Bonding Equipment.
- S. UL 485 Molded-Case Circuit Breakers and Circuit Breaker Enclosures.

1.05 SUBMITTALS

- A. Submit materials data in accordance with of Section 01 33 00 - Submittals. Furnish manufacturers' technical literature, standard details, product specifications, and installation instructions for all products.
- B. Submittals shall include the following:
 - 1. Product Data: Provide manufacturer's data indicating, as a minimum, input/output voltages and amperages, power rating, physical characteristics, short circuit ratings, dimensions and enclosure details.
 - 2. Shop Drawings: Provide schematics and interconnection diagrams, indicated front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends. Differentiate between manufacturer-installed wiring and field-installed connections.
 - 3. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.
 - 4. Provide Seismic Qualification Certification in accordance with Section 26 05 48 - Seismic Controls for Electrical and Communication Work, if not available as a standard item from manufacturer, refer to structural engineer for seismic evaluation. Include the following:
 - a. Basis of Certification: Verify whether withstand certification is based on actual test of assembled components.
 - (1) The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - b. Dimensioned Outline Drawings of Equipment Unit: Indicate weight, identify center of gravity, and locate and describe mounting and anchorage provisions.
 - c. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

5. Commissioning Plan: Complete description of commissioning procedures with test forms, checklists, and other documentation as required.
6. Operation Data: Include instructions for starting and operating battery charger and describe operating limits that may result in hazardous or unsafe conditions.
7. Maintenance Data: Include routing preventative maintenance schedule, recommended spare parts list, and required special tools.
8. Operation and Maintenance Manuals: Include in ATA 101 format a general description, theory of operation and specification, schematics and wiring diagrams, start-up instructions, installation and maintenance procedures, part list, recommended spare parts list, troubleshooting guides, controls and accessories information.
 - a. Provide three (3) copies of the approved, comprehensive Operation and Maintenance Manual to the Architect fourteen (14) days prior to Final Acceptance date.
 - b. The manuals shall fully describe each product, system or subsystem numbered logically and separated into sections and contained in rigid plastic binders with identification inserted in clear plastic pockets on front and spine of each binder.
 - c. The content of the manuals shall be limited to information and data that specifically apply to products provided and shall include routing normal and special operating instructions and sequences. Also included shall be routine maintenance procedures and guides for troubleshooting, disassembly and reassembly instructions, and recommended spare parts list consisting of current prices and sources.
 - d. Include wiring diagrams and schematics to clearly show features such as controls, switches, instruments, and indicators by name and location.
9. Qualification Data: For firms and persons specified in “Quality Assurance” Article.
10. Field Test Reports: Submit written test reports and include the following:
 - a. Test procedures used.
 - b. Test results that comply with requirements.
 - c. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
11. Manufacturer’s field service report.

1.06 QUALITY ASSURANCE

- A. Manufacturer: Company shall demonstrate a minimum of three years’ experience specializing in manufacturing the products specified.
- B. The equipment and ancillary devices shall be installed by a certified contractor.
- C. Testing and commissioning shall be by the manufacturer and shall be coordinated by the installing contractor.

- D. Listing and Labeling: Provide products that are listed and labeled and classified by UL, ETL or CSA and marked for intended use for the location and environment in which they are installed.
- E. Comply with NFPA 70, as adopted and administered by the Authority Having Jurisdiction.

1.07 WARRANTY

- A. Provide a two-year manufacturer warranty for the battery charger inclusive of parts and labor from the date of beneficial use. Date of beneficial use is defined as the date that the equipment is turned over for normal operation.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space with temperature and humidity controls to prevent condensation. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle in accordance with manufacturer's written instructions. Handle carefully to avoid damage to components, enclosure and finish.
- C. Provide units which do not require disassembly and reassembly because of movement into the final location and follow manufacturer's written instructions.
- D. Deliver equipment as a factory-assembled unit with protective crating and covering.
- E. Store equipment and material in suitable facilities until delivery, installation, and acceptance by the Port Resident Engineer.

1.09 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Port or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify the Engineer not less than seven days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without the Engineer's written permission.
 - 3. Coordinate with requirements specified in Section 01 50 00 - Temporary Facilities and Controls for temporary utilities.

1.10 EXTRA MATERIALS

- A. Comply with Section 01 78 23.13 – Operations and Maintenance Data for spare parts and maintenance products.
- B. Provide the following spare parts:
 - 1. Four (4) 25 foot – Fast charging cables.
 - 2. Two (2) BMID Battery Monitors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AeroVironment.
 - 2. Posi-Charge.
 - 3. Or approved equal.

2.02 POWER SERVER CHARGER

- A. 80kW OR 40kW rectifier changing 480V AC 60Hz power into DC power.
- B. Characteristics:
 - 1. Ambient Temperature Range -40 to 140 degrees F, suitable for fully rated operation in direct sunlight.
 - 2. Input power factor: 0.96 or greater.
 - 3. Line filtering: EMI filtering shall limit rectifier noise from being conducted onto the incoming AC circuit.
 - 4. AC Current Surge Protection device. Meet the requirements of ANSI/UL Standard 1449 3rd Edition Surge Voltage Ratings and high energy impulse let-through rating (IEEE C1:6kV, 3kA surge). This device shall be serviceable/replaceable.
 - 5. 95% efficiency while under load, charging batteries.
 - 6. 90% efficient under no-load conditions.
 - 7. High efficiency IGBT power electronics.
 - 8. Total harmonic distortion: less than 3%.
 - 9. Real-time clock.
- C. User Interface LED Control Panel:
 - 1. Front Panel Manual start/stop/equalize.
 - 2. 3 LED Quick Status Indicators.
 - 3. High contrast display for:
 - a. State of Charge.
 - b. Change of Status.
 - c. Real time record of events (date, day, time).
 - d. Battery and fault history display of last 100 faults, last 200 charge events.
 - e. Programmable charger and battery characteristics.
 - f. RS-232 Diagnostic Serial Port
 - 4. Non-volatile memory or 90 minute battery backup. This component shall be modular to allow future removal or replacement.
 - 5. Underwriters Laboratories (UL) Certification on complete fast charging system. UL certification for use of single connectors with fast charger.

6. Output Voltage range: 24-96 Volts DC.

2.03 POWER STATIONS

- A. 40kW rated, two charging ports per unit.
- B. Characteristics:
 1. Input and Output Voltage: 24-96V DC.
 2. Ambient Temperature Range -40 to 140 degrees F, suitable for fully rated operation in direct sunlight.
 3. All charging ports capable of charging simultaneously, load sharing and prioritization based on battery state of charge.
 4. Configurable as master or slave unit.
 5. Slave communication with master unit, RS 232.
 6. 120 VAC control signal input to wake up charger from sleep mode. Sleep mode energy consumption shall be minimized to controls.

2.04 DUAL VEHICLE STAND-ALONE CHARGING STATION

- A. 30kW or 40KW, 480VAC, 60Hz rectifier to 24-96V DC.
- B. Power Factor: 0.98.
- C. Capable of automatically charging upon battery connection. Connection to or from battery shall utilize instant anti-arcing disconnect.
- D. Automatic system restart upon loss of input power.
- E. Programmable equalization schedules.
- F. Programmable maximum charge current.
- G. Incorporate automatic charge algorithm that prevents overheating by adapting to the internal temperature of battery. Charger must be able to actively measure electrolyte temperature during the charge event. Charger must be able to measure internal electrolyte temperature on flooded batteries.
- H. Shall automatically adapt equalization profile for sealed and unsealed batteries.
- I. Each charger output independently controlled through continuous monitoring of battery state of charge, temperature, voltage and charge current in real time.
- J. Battery mounted record of battery type, identification, last charge and equalization information.
- K. Pilot interlock (SAE J1772) shall remove power from charge port within 20 ms of loss of pilot signal.
- L. User interface LED Control Panel
 1. High contrast, two lines by 20 characters, displaying:
 - a. State of Charge.
 - b. Status of Charge.
 - c. Real time record of charge events (date, day, time).

- d. Battery and fault history (last 100 fault/warning events, last 200 charging events).

2.05 SYSTEM FUNCTIONAL REQUIREMENTS

- A. Battery charger shall incorporate fast charging to intelligently and quickly charge batteries commonly used in aircraft ground support equipment (GSE).
- B. Charger shall be capable of automatically charging upon battery connection. Connection to or from battery shall utilize instant anti-arcing disconnect.
- C. Automatic system restart upon loss of input power.
- D. Programmable equalization schedules.
- E. Programmable maximum charge current.
- F. Capable of parallel charging up to 10 charge ports simultaneously with load sharing and prioritization based on battery state of charge.
- G. Incorporate automatic charge algorithm that prevents overheating by adapting to the internal temperature of battery. Charger must be able to actively measure electrolyte temperature during the charge event. Charger must be able to measure internal electrolyte temperature on flooded batteries.
- H. Shall automatically adapt equalization profile for sealed and unsealed batteries.
- I. Each charger output independently controlled through continuous monitoring of battery state of charge, temperature, voltage and charge current in real time.
- J. Battery mounted record of battery type, identification, last charge and equalization information.
- K. Pilot interlock (SAE J1772) shall remove power from charge port within 30 ms of loss of pilot signal.
- L. Multiple-port systems must allow for any vehicle equipped with the appropriate battery monitor to charge at any port with the same connector configuration, regardless of battery size and voltage.
- M. Multiple-port systems must allow for every vehicle to receive a charge specific to that battery type, voltage and size regardless of which port (with the same connector configuration as the vehicle) it charges from.
- N. Vehicles must be able to charge automatically on both multiple and dual port systems with the same connector configuration without the need for programming or reconfiguring the charger or vehicle.
- O. Auto start/stop upon connection/disconnection.
- P. Field configurable from a laptop computer.
- Q. Communication module in unit control panel provides capability for remote monitoring of status, parameters, alarms and remote control. Include the following features:
 - 1. Fiber optic port and/or CAT6/TCP/IP connection port.
 - 2. IP addressable communication.
 - 3. kW demand by hourly peak and average for each charge point.

4. kWh reported by 15 minute or 1 hour adjustable window.
 5. Time tag for all data.
 6. Battery status and capacity. Charger shall be capable of receiving, at a minimum, the following information from the battery monitor:
 - a. User ID code, battery type, size and status.
 - b. Battery high and low temperature.
 - c. Battery high and low voltage.
 - d. Battery state of charge.
 - e. Days since equalization.
 - f. Date and time of last charge.
 - g. Charge current.
 - h. Water level.
 - i. Number of equivalent cycles.
 7. Charge unit maintenance codes.
 8. Enable/Disable control.
 9. Control of peak output demand. Ability to select incremental output capacity levels (i.e., 100%, 75%, 50%, and 25%).
 10. Non-volatile memory; all information shall be kept for a period of no less than seven (7) days in the event of a power loss.
 11. Self-resetting. All programmable settings shall be kept and the charger shall be fully operational within one minute of power restoration to the charger.
 12. Software designed for control and monitoring of charger functions and to provide on-screen explanations, interpretations, diagnosis, action guidance and instructions for use of monitoring indications and development of meaningful reports. Permit storage and analysis of power-line transient records.
 13. Maintain control of the vehicle (vehicle will not be able to move) until the physical charging cable connection is broken and therefore the communications connection is broken, preventing the GSE vehicle from driving away unless the cable has been disconnected.
- R. Once the communication between the vehicle onboard battery monitor and the battery charger, via the charging cable, has been established, the charge rate will be determined by the charger and the charge process will start until completed as determined by the battery charger. The charger shall maintain control of the vehicle (vehicle will not be able to move) until the physical charging cable connection is broken (i.e. communications connection is broken).

2.06 BATTERY MONITOR AND IDENTIFIER

- A. Identifies battery type, capacity, voltage, manufacturer and identification number which communicates directly with fast charge unit.

- B. Sends real-time temperature and charging information to charging station.
- C. Records charge event data.
- D. Smart Battery Monitor and Identification Device (BMID).
 - 1. BMID creates a charge log. During a battery charge, the BMID data is sent from the vehicle to the charger, continuously updating the charger at one time per minute until the charge is complete.
 - 2. BMID data is sent from Slave to Master upon completion of charge.
- E. Battery monitor shall be field configurable with a laptop computer.
- F. Battery monitor shall send, at a minimum, the following information to the charger:
 - 1. User ID code, battery type, size and status.
 - 2. Battery high and low temperature.
 - 3. Battery high and low voltage.
 - 4. Battery state of charge.
 - 5. Days since equalization.
 - 6. Date and time of last charge.
 - 7. Charge current.
 - 8. Water level.
 - 9. Number of equivalent cycles.

2.07 CHARGING CABLES

- A. Stinger Charge Cable
 - 1. Length: 6' or 7' cable.
 - 2. Cable contains three (3) #1/0 stranded copper wires power and three control cables with two (2) #12 conductors in each cable. Factory installed heat-shrink sleeve. Sleeve shall extend minimum 1" inside charger enclosure and 1" beyond wire mesh strain relief.
 - 3. Provide factory installed cold shrink band.
 - 4. Provide 2-1/2" cable connector with stainless steel wire mesh strain relief, connected to 2-1/2" hub mounted on charger.
 - 5. Cable Connector: Neoprene bushing and compression nut
- B. Fast Charging Cable
 - 1. Length: 20' or 25' cable.
 - 2. Cable to contain three (3) #1/0 stranded copper wires for power and three (3) control cables with two (2) twisted shielded tinned copper 18 gauge wire with PE-polyethylene jacket for communication.
 - 3. Terminations:
 - a. Euro-connector to connect to Fast Charge Cable.
 - (1) Amperage Rating: 320A

- (2) Voltage Rating: 600V
 - (3) Wire range (power): #1/0 to #4/0
 - (4) Wire range (communications): #18 to #10
 - (5) Dielectric Withstand Voltage: 2,200
 - (6) Average constant resistance: 30 micro-ohms.
 - (7) Housing: Nylon glass filled
 - (8) Contacts: silver plated copper
 - (9) Hardware: galvanized steel.
- b. 6-Pin connector compatible with airline electric vehicle fleet.
- 2.08 POWER SERVER DISCONNECT SWITCH
- A. Comply with Section 26 28 16 Enclosed Switches and Circuit Breakers.
 - B. Molded Case Circuit breaker
 - 1. Instantaneous trip adjustable and able to accommodate Power Server inrush current.
 - 2. 120VAC Shunt Trip
 - C. Metering:
 - 1. PEM series meter compliant with Section 26 27 13 - Electrical Power Metering.
 - 2. Integral current transformers, fused power taps.
 - 3. External communication entry port.
- 2.09 8-Port RS232 Ethernet Hub
- A. NEMA TS2 Certified.
 - B. 8 Female 9 pin D shell Serial ports with enhanced 25KV surge protection.
 - C. Supports native COM, TTY, or TCP/IP Socket communication modes.
 - D. Stainless steel housing to enable DIN rail or panel mounting.
 - E. Temperature rated for extreme conditions (-40° to 75°C).
 - F. Built-in two-port 10/100 Ethernet switch.
 - G. 90 to 260 VAC at 60Hz input power.
- 2.10 MISCELLANEOUS EQUIPMENT
- A. Provide floor stands and anchoring compliant with Section 26 05 48 Seismic Controls for Electrical and Communication Work.
 - B. All enclosures and cabinets to be NEMA 3R.
- 2.11 SOURCE QUALITY CONTROL
- A. Perform factory testing of all components to demonstrate suitability for operation.
 - B. Make provision for Port personnel to witness factory testing prior to packaging for shipment. Notify Port at least fourteen (14) days before testing is scheduled.

C. ISO 9002 Certified

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine elements and surfaces to receive equipment for compliance with installation tolerances and other conditions affecting performance, including but not limited to ambient temperature, cooling air circulation, contaminants, and disassembly and maintenance space.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Examine existing EVCS equipment prior to relocation.
 - 1. Verify functionality of equipment prior to disconnection. Advise Port of any nonfunctional equipment.
 - 2. Store disconnected equipment in a condensation free environment. Protect from damage.

3.02 INSTALLATION

- A. Comply with mounting and anchoring requirements specified in Section 26 05 48 - Seismic Controls for Electrical and Communication Work.
- B. Verify integrity of equipment grounding conductor.
- C. Install per manufacturer's recommendations.

3.03 IDENTIFICATION

- A. Provide labels for enclosures, field-installed conductors, interconnecting wiring, and components as specified in Section 26 05 53 – Electrical Identification.
- B. Identify equipment designation, primary and secondary voltages, primary source and secondary loads and locations.

3.04 FIELD QUALITY CONTROL

- A. Coordinate all functional performance testing procedures and schedule with the Engineer and Commissioning Agent. Refer to Section 01810 – Commissioning. The Field Service and Commissioning Agent will document testing including test procedures, results, and initials of witnessing personnel. Tests will be witnessed by Commissioning Agent and Port representative and performed by the field Service Engineer.
- B. Manufacturer's Field Services: Provide the services of a factory authorized service representative with experience and capability to conduct the specialized testing of the battery charging systems and to assist in the installation and start-up of the equipment. The manufacturer's representative shall provide technical direction and assistance to the Contractor in general assembly of the equipment, connections and adjustments, and testing of the assembly and components contained therein.
- C. The tests that are performed and certified at the factory need not be duplicated in the field.
- D. Provide test equipment as follows:
 - 1. Certified digital multimeter.

- 2. Power station diagnostic cable (to be turned over to Port at project completion).
- E. Prior to energizing, test installed wire for continuity and faults.
- F. Assign internet protocol addresses as designated by the Port to the EVCS equipment. Demonstrate functional integration with the Port ICS system.
- G. Assign internet protocol addresses as designated by the Port to the PXM meters equipment. Demonstrate functional integration of PXM meters with the Port's Eaton power monitoring system.

3.05 DEMONSTRATION AND TRAINING

- A. Provide sixteen (16) hour of factory authorized service representative to train Port and Airline Maintenance personnel to adjust, operate and maintain Battery Charging Systems. Training will be located at Seattle Tacoma International Airport electric shop training center.
- B. Train Port maintenance personnel a minimum of four hours on procedures and schedules for energizing and de-energizing, troubleshooting, servicing, and maintaining equipment and schedules.
- C. Operator training shall be completed seven (7) days prior to beneficial use.
- D. The manufacturer shall provide maintenance training within 30 days of beneficial use.
- E. At least 60 days prior to beneficial use, a training program summary course syllabus, instructor qualifications and copy of the training manual should be forwarded to the Engineer for review.
- F. Training shall be conducted prior to final acceptance of respective equipment, products, and systems by the Port and shall be given at the installation site property.
- G. Review data in maintenance manuals. Refer to Section 01 78 23.13 - Operations and Maintenance Data.
- H. Schedule training with the Port with at least seven days' advance notice.

3.06 OPERATION AND MAINTENANCE MANUALS

- A. Comply with Section 01 78 23.13 - Operations and Maintenance Data and Part 1 of this specification.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

- A. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the Schedule of Unit Prices.

End of Section