

**Regional Renewable Energy Procurement
REQUEST FOR PROPOSALS**

Exhibit D.3: Fuel Cell Specifications and Requirements

September 18, 2013

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THROUGHOUT THIS DOCUMENT THE TERMS DESIGN-BUILDER SHALL MEAN SELLER UNDER A PPA FINANCING, AND PURCHASER-OWNER SHALL MEAN BUYER.

1. SITE ACCESS

Design-Builder shall conform to all Purchaser-Owner rules and requirements for accessing sites. Road usage, road closures, number of vehicles, access points, etc., may be regulated by the Purchaser-Owner. Site visits shall be approved and proper check-in requirements must be followed. Design-Builder shall provide signage and/or electronic notification of possible operational impacts upon request by Purchaser-Owner. Unless otherwise determined by Purchaser-Owner, Design-Builder shall be responsible for providing bathroom and storage facilities for all workers on-site, and shall be responsible for procuring, installing, securing, and removing temporary security fencing and scaffolding.

2. PROJECT MANAGEMENT

2.1 PROJECT MANAGER

Design-Builder shall assign a Project Manager from their firm upon execution of any Agreement awarded as a result of this RFP and receipt of Notice to Proceed. The Project Manager shall manage all design, procurement, construction, and commissioning phases of the Project. The construction of fuel cell systems shall be accomplished by Design-Builder with an on-site construction management team. The Project Manager shall ensure that all contract, schedule, and reporting requirements of the Project are met and shall be the primary point of contact for the Purchaser-Owner.

2.2 PROJECT SCHEDULE

A Project Schedule is to be prepared and submitted to the Purchaser-Owner within 14 days of Agreement execution. The Purchaser-Owner will review and approve the Project Schedule prior to the initiation of work. Updates shall be submitted every other week, though the Purchaser-Owner may allow less frequent updates at their discretion. The submittal shall be a Critical Path Method (CPM) schedule describing all Project activities, dependencies, and sequencing of tasks. In particular, Design-Builder shall include Purchaser-Owner review of submittals on the Critical Path. The Project Schedule shall describe all elements of project design, equipment procurement, construction and commissioning, and shall be submitted in electronic format (MS Project, Primavera P6). Adobe Acrobat is not acceptable. The schedule shall also reflect the requirement that construction activities must be coordinated to minimize impacts on normal operations at each site, including ongoing construction activities.

Sufficient information shall be shown on the Project Schedule to enable proper control and monitoring of the Work. The Project Schedule shall show the intended time for starting and completing each activity; the duration of each activity; submittal and approval times; design; delivery of materials, equipment and software; all testing; and other significant items related to the progress of the Work. The Project Schedule shall include a CPM network diagram of sufficient detail to show how Mandatory Milestones are intended to be met. If a schedule submitted by Design-Builder includes changes affecting the achievement of Mandatory Milestones, Design-Builder should clearly identify and justify those changes.

Design-Builder is encouraged to phase the Work in a way that supports efficient and effective delivery of design and build services. The following Mandatory Milestones shall be reflected in the schedule and where applicable, represents the dates upon which each milestone is to be achieved for all sites in the Agreement.

Mandatory Milestones

Mandatory Milestone	Date
50% Schematic Design submittal	TBD
90% Design Development submittal	TBD
100% Construction Documents submittal for permitting	TBD
Approved Construction Documents – All Agency Sites	TBD
Notice to Proceed	TBD
Mobilization – All Agency Sites	TBD
Substantial Completion – All Agency Sites	TBD
Final Completion – All Agency Sites	TBD

2.3 SUBMITTALS

Design-Builder shall provide the following submittals as part of the performance of the Work. The cost of developing and providing submittals shall be included in the Project price.

Agreement Submittals

Submittal	Submittal Date	Exhibit D.1 Section
I. System Design		TBD
a. System Design Documentation	At each design milestone	TBD
b. Warranties	At Construction Documents milestone	TBD
c. Testing Plan	At Construction Documents milestone	TBD
d. Training Plan	At Construction Documents milestone	TBD
e. Power production modeling	At Construction Documents milestone	TBD
II. Procurements and Construction		TBD
a. Quality Assurance / Quality Control (QA/QC) Plan	30 days before commencement of construction	TBD
b. Safety Plan	30 days before commencement of construction	TBD
c. As-built Documentation	After completion of Proving Period	TBD
III. Testing		TBD
a. Acceptance Test Results	After Acceptance Test	TBD
b. Startup Test Results	After Startup Test	TBD
c. Monitoring Data (Proving Period)	Continually throughout Proving Period	TBD
d. Proving Period Report	30 days after System Startup	TBD
IV. Training		TBD
a. Training Materials	30 days before Training Session	TBD
b. Monitoring Manual	30 days before Training Session	TBD
c. Operations & Maintenance Manual	30 days before Training Session	TBD

2.4 UTILITY INCENTIVES

Design-Builder shall submit applications for all available energy production incentives (e.g., SGIP, etc.) or, should the Purchaser-Owner already have submitted such applications, assume responsibility for all future requirements (agreements, submittals, etc.) related to these programs. This includes actions necessary to ensure compliance with the PG&E's net metering program and all

interconnection agreements and related documents for Purchaser-Owner participation and utilization of the benefits of each applicable program. Design-Builder shall attend all site verification visits conducted by the applicable public utility or Governmental Authority and shall assist the Purchaser-Owner in satisfying the requirements of the incentive program. Design-Builder shall be responsible for providing updated documentation to incentive program administrators throughout the project, as required by rules of the relevant incentive programs. Incentives shall be paid to the Purchaser-Owner if the system is to be purchased and to the Design-Builder should the system be owned by a third-party.

2.5 INTERCONNECTION APPLICATIONS

Design-Builder shall be responsible for preparing, submitting, and procuring interconnection application to appropriate utility and department. Design-Builder shall accept responsibility for payment for utility interconnection studies and/or project management that are not anticipated but may be required. All anticipated utility work (e.g. transformer installation, meter addition) shall be the responsibility of the Design-Builder. Sites on secondary networks or that feature more than 1 MW of renewable energy generating capacity are likely to require protective relays or other additional interconnection studies and equipment. Such work shall be the responsibility of the Design-Builder. At project completion, Design-Builder shall confirm Permission To Operate with the utility, and shall verify most financially-beneficial rate schedule and billing.

3. SYSTEM DESIGN

3.1 DESIGN REVIEW PROCESS/ PHASES

The Purchaser-Owner will review and approve design documentation based on the requirements in this RFP and as detailed in Section 3.3 of this document. Additional documents may be requested by the Purchaser-Owner as needed. The precise organization and format of the design submittals shall be agreed upon by Design-Builder and the Purchaser-Owner prior to the first design submission. The Purchaser-Owner will review all submittals, provide written comments, and conduct Design Review Meetings for each stage of the process. Design-Builder shall provide additional detail, as required, at each successive stage of the Design Review. Design-Builder shall not order equipment and materials until Schematic Design submittals have been approved. Design-Builder shall not begin construction until Construction Documents have been approved and all required permits have been obtained. The Purchaser-Owner will formally approve, in writing, each phase of the design and is the sole arbiter of whether each phase of the design has been completed. The Design-Builder shall not enter a subsequent design phase without the approval of the Purchaser-Owner.

Design-Builder shall be held solely responsible for obtaining approvals from the Purchaser-Owner, including revising designs as necessary until they are given approval by the Purchaser-Owner and all other required entities and organizations. A description of requirements for each design phase is provided below. System design shall comply with all applicable laws, statutes, ordinances, codes, rules, and regulations for construction projects of jurisdictions with authority over the Purchaser-Owner. Design-Builder is responsible for providing designs approved by the appropriate professional engineers registered in the State of California. Costs for engineering reviews and approvals shall be borne by the Design-Builder. System designs must take into account Purchaser-Owner aesthetic issues and not conflict with any current Purchaser-Owner operations.

3.1.1 Schematic Design

Design-Builder shall prepare Schematic Design documents consisting of drawings and other documents illustrating the scale and relationship of Project components, including but not limited to, schematic design studies, site utilization plans, equipment layouts and design information, electrical

single-line diagrams, wiring and conduit schedule, equipment lists and bills of material, and equipment cut sheets or specifications.

3.1.2 Design Development

Design Development documents shall consist of elevations, cross sections, and other drawings and documents necessary to depict the design of the Project. This submittal shall include architectural, structural, geotechnical, mechanical and electrical design documents and equipment specifications to illustrate the size, character, and quality of the Project and demonstrate that it meets the performance specifications defined in this RFP. The Design Development documents shall represent 100% of the intended scope for the Project.

3.1.3 Construction Documents

Design-Builder shall prepare Construction Documents (CDs) depicting the detailed construction requirements of the Project. CDs shall conform to all applicable governmental, regulatory, and code requirements, and all pertinent federal, state, and local permitting agencies. The CDs shall show the work to be done, as well as the materials, workmanship, finishes, and equipment required for the Project. CDs shall comply with and illustrate methods to achieve the performance specifications of this RFP. CDs shall be stamped by the engineer of record and any other required engineering disciplines.

3.2 DESIGN-BUILDERS' LICENSE CLASSIFICATION

In accordance with the provisions of California Public Contract Code §3300, the Purchaser-Owner requires that Respondents possess, at the time of submission of a Proposal, at the time of award of the Agreement and at all times during construction activities, a General Engineering Contractor License (A), a General Building Contractor License (B), or Electrical Contractor License (C-10). It shall be acceptable for a Respondent that does not possess a C-10 License to list a Subcontractor with a C-10 License.

3.3 DESIGN SUBMITTALS

Design-Builder shall prepare a comprehensive submittal package for each phase of the Work that will be reviewed and approved by the Purchaser-Owner. At a minimum, each submittal package shall include the elements required to convey in sufficient detail the following for each phase of the design:

- Site Layout Drawings, equipment clearances, as applicable
- Construction Specifications (trenching, mounting, etc.)
- Equipment Layout Drawings
- Detailed Drawings
- Gas Piping
- Piping and Mechanical Diagrams and Details
- Electrical Single-Line and Three-Line Diagrams
- Electric Wire and Conduit Schedule
- Electrical Warning Labels & Placards Plans
- Network Connection Diagrams
- Architectural Drawings
- Structural Drawings
- Geotechnical Drawings

- Manufacturer's Cut Sheets with Equipment Specifications
- Data Acquisition System (DAS) Specifications, Cut Sheets, and Data Specifications

Design-Builder shall include adequate time for Purchaser-Owner review and approval of submittals, as well as re-submittals and re-reviews. Minimum Purchaser-Owner review time shall be ten (10) days from the date of receipt of each submittal package during each phase of the Design Review.

3.4 PERMITS AND APPROVALS

Construction Documents must be reviewed and approved by all authorities having jurisdiction (AHJs) over the work, which may include, but are not limited to: the Purchaser-Owner, the City or County in which the work is being done, the utility, the Office of Statewide Health Planning and Development (OSHPD), and the Self Generation Incentive Program. Design-Builder shall be responsible for obtaining all approvals and shall account for permitting requirements in their system designs, project pricing, and schedule. Design-Builder shall produce required documentation in sufficient detail to obtain all regulatory approvals requested for design, construction and operation of the system, including but not limited to all federal, state, and local permits. Design-Builder shall attend all site verification visits conducted by the applicable public utility or Governmental Authority and shall assist the Purchaser-Owner in satisfying the requirements of the incentive program. The Purchaser-Owner will not grant Design-Builder relief based on Design-Builder's incomplete or incorrect understanding of permitting and approval requirements.

3.5 TECHNICAL REQUIREMENTS

3.5.1 General Considerations

This specification addresses the installation of fuel cells to generate electricity for the host site using natural gas from PG&E or cleaner biogas input fuels, if available. Heat recovery for increased efficiency is an option but is not mandatory. All systems must meet the qualifications for obtaining an incentive from PG&E's Self Generation Incentive Program, whether or not incentives are available at the time of construction. The Design-Builder is responsible for pursuing all available utility incentives for the project.

All documentation and components furnished by Design-Builder shall be developed, designed, and/or fabricated using high quality design, materials, and workmanship meeting the requirements of the Purchaser-Owner and all applicable industry codes and standards. Reference is made in these specifications to various standards under which the Work is to be performed or tested. The installations shall comply with at least, but not limited to, the latest approved versions of the International Building Code (IBC), National Electrical Code (NEC), Pacific Gas and Electric (PG&E) Interconnection Requirements, California Building Code (CBC) and all other federal, state, and local jurisdictions having authority.

3.5.2 Design Standards

The design, products, and installation shall comply with at least, but not limited to, the following electrical industry standards, wherever applicable:

- Electronic Industries Association (EIA) Standard 569
- Illumination Engineering Society of North America (IESNA) Lighting Standards
- Institute of Electrical and Electronics Engineers (IEEE) Standards
- National Electrical Manufacturers Association (NEMA)

- National Electric Code (NEC)
- Insulated Power Cable Engineers Association (IPCEA)
- Certified Ballast Manufacturers Association (CBMA)
- Underwriters Laboratories, Inc. (UL)
- National Fire Protection Association (NFPA)
- Pacific Gas and Electric Utility Requirements
- American National Standards Institute (ANSI)
- Occupational Health and Safety Administration (OSHA)
- American Disabilities Act (ADA)
- American Society for Testing and Materials (ASTM)
- National Electrical Contractors Association (NECA)
- National Electrical Testing Association (NETA)
- International Building Code (IBC)
- California Building Code
- California Mechanical Code (CMC)
- California Plumbing Code (CPC)
- California Fire Code (CFC)
- All other Authorities Having Jurisdiction

3.5.3 Fuel Cells

In addition to the above, the fuel cells proposed by Design-Builder shall comply with at least, but not limited to, the following:

- ANSI/CSA America FC 1-2004, Stationary Fuel Cell Power Systems
- NFPA 55, Standards for the Installation of Stationary Fuel Cell Power Systems 2007
- ASME PTC 50, Performance Test Code for Fuel Cell Power System Performance 2009
- Fuel cells and all equipment shall be new, undamaged, fully warranted without defect.
- Fuel cell installations shall qualify for incentives under California Self Generation Incentive Program for electrical only or combined heat and power projects.
- Fuel Cells shall have minimum maintenance requirements and high reliability, have a minimum 15-year design life, and be designed for normal, unattended operation.

3.5.4 Electrical Balance of System Components

- All system wiring and conduit must comply with NEC stipulations, and all indoor and outdoor wiring, outdoor-rated or otherwise, must be enclosed in EMT or RIGID conduit or covered raceway.

3.5.5 Mounting Systems

The Design-Builder's design shall sufficiently respond to the design requirements imposed by Federal, State, and local jurisdictions in effect at the time of Agreement execution and any pending code decisions affecting the design shall be identified during Schematic Design. Design-Builder shall conduct an analysis, and submit evidence thereof, including calculations, of each structure affected by

the performance of the scope described herein, and all attachments and amendments. The analysis shall demonstrate that existing structures are not compromised or adversely impacted by the installation of the Fuel Cell, equipment, or other activity related to this scope. Mounting systems must also meet the following requirements at a minimum:

- All structural components shall be designed in a manner commensurate with attaining a minimum 25-year design life. Particular attention shall be given to the prevention of corrosion at the connections between dissimilar metals.
- Thermal loads caused by fluctuations of component and ambient temperatures shall be accounted for in the design and selection of mounting systems such that neither the mounting system nor the surface on which it is mounted shall degrade or be damaged over time.

3.5.6 Corrosion Control

In addition to the above, Corrosion Control proposed by Design-Builder must comply with at least, but not limited to the following requirements:

- Fasteners and hardware throughout system shall be stainless steel or material of equivalent corrosion resistance
- Unprotected steel not to be used in any components
- Each system and associated components must be designed and selected to withstand the environmental conditions of the site (e.g., temperatures, winds, rain, flooding, etc.) to which they will be exposed.

3.5.7 Ancillary Equipment Enclosures

Design-Builder will be responsible for incorporating the following elements in the design and construction of the System:

- Fencing: all ancillary equipment be grouped to a single location per site and shall be surrounded by a fence to prevent access by unauthorized personnel. The fence shall be a six (6) foot high chain link fence with vinyl privacy slats. This requirement may be waived at the Purchaser-Owner's sole discretion.
- Location: all ancillary equipment shall be located in a manner that minimizes its impact to normal Purchaser-Owner operations and minimizes the visual impacts to the site.

3.5.8 Placards and Signage

- Placards and signs shall correspond with requirements in the National Electric Code and the interconnecting utility in terms of appearance, wording, and placement.
- Permanent labels shall be affixed to all electrical enclosures, with nomenclature matching that found in As-Built Electrical Documents.

3.5.9 Lightning and Surge Protection

- Design-Builder shall utilize lightning arrestors to protect appropriate equipment from lightning strikes.
- Design-Builder shall utilize surge suppressors to protect the appropriate equipment from electrical surges.

3.5.10 Short Circuit Coordination

- As part of their design submittals, Design-Builder shall identify overcurrent protective devices installed on the project. Design submittals shall include calculations and demonstrate that the devices installed as part of the project are coordinated with the rest of each site's distribution, preventing an unintentional outage due to an isolated system fault.

3.5.11 Wiring and Cabling Runs

- Design-Builder shall install all AC conductors in conduit.
- Direct burial wire will not be acceptable. Conduit buried underground shall be suitable for the application and compliant with all applicable codes. PVC shall be constructed of a virgin homopolymer PVC compound and be manufactured according to NEMA and UL specifications. All PVC conduit feeders shall contain a copper grounding conductor sized per NEC requirements and continuity shall be maintained throughout conduit runs and pullboxes. Minimum conduit size shall be $\frac{3}{4}$ ". A tracing/caution tape must be installed in the trench over all buried conduit.
- Conduit installed using horizontal directional boring (HDB), shall include tracer tape or traceable conduit. The minimum depth of the conduit shall be per NEC 2011 Article 300.5. The Design-Builder is responsible for demonstrating that all conduits installed utilizing horizontal boring meets the minimum depth requirement and is solely responsible for any remediation costs and schedule impacts if the specification is not met. The HDB contractor must provide documentation of final depth and routes of all conduit installed in horizontal bores.
- Conduit installed on building roofs shall not be installed near roof edges or parapets to reduce visibility. Any conduit penetrations through roof surfaces shall not be made within five (5) feet of the roof edge to reduce visibility. If conduit is installed on the exterior face of any building, it shall be painted to match the existing building color. In all cases, the visible impact of conduit runs shall be minimized and the design and placement of conduit shall be reviewed and approved by the Purchaser-Owner as part of Design Review.
- Electro-metallic tubing (EMT) shall be used in indoor, above grade locations and where conduit needs to be protected from damage. EMT shall not be installed underground, outdoors, or embedded in concrete. EMT shall be cold-rolled zinc coated steel and be manufactured to UL and ANSI standards. Fittings shall be watertight and malleable gripping ring compression type. Pressure cast material for nuts of compression ring type fittings and set-screw type connections are not acceptable.
- Unless specified otherwise by Purchaser-Owner, Galvanized Rigid Conduit (GRC) shall be used where exposed to weather or where subject to physical damage in exposed areas. GRC shall be continuous hot-dipped galvanized manufactured per UL and ANSI requirements. Rigid aluminum conduit is not acceptable. Conduit bodies for use with steel conduit, rigid or flexible, shall be manufactured per UL requirements and shall be cast metal with gasketed closures. Fittings for GRC conduit shall be malleable iron or forged steel with cadmium or zinc coating. Union couplings for joining rigid conduit at intermediate runs shall be of the same material as the conduit. Couplings shall be threaded concrete-tight to permit completing conduit runs when neither conduit can be turned and to permit breaking the conduit run at the union. Set screw connectors are not acceptable.
- All conduits, boxes, enclosures, etc. shall be secured per NEC 690 requirements.
- All conductors shall be insulated copper rated for 600V, minimum.
- All items shall be U.L. listed and shall bear the U.L. label.
- All spare conduits shall be cleaned, mandrelled, and provided with a pullwire.

- All feeders and branch circuits shall be sized to minimize voltage drop and losses and shall be in compliance with NEC requirements.
- All systems, conduit, boxes, components, etc. shall be grounded and bonded per NEC requirements.
- All exposed conduit runs over 100-feet in length or passing over building connection points shall have expansion joints to allow for thermal expansion and building shift.
- Design-Builder will be responsible for locating, identifying and protecting existing underground utilities conduits, piping, substructures, etc. and ensuring that no damage is inflicted upon existing infrastructure.

3.5.12 Grounding and Bonding

- Ground wiring splices shall be made with irreversible crimp connectors.
- All exposed ground wiring must be routed above the lower surface of any structural framing.

3.5.13 Monitoring System, DAS, and Reporting

Design-Builder shall at a minimum meet the requirements of the SGIP Fuel Cell installations for metering, DAS and reporting.

Design-Builder shall design, build, activate and ensure proper functioning of Data Acquisition Systems (DAS) that enable the Purchaser-Owner to track the performance of the Fuel Cell Systems as well as environmental conditions through an online web-enabled graphical user interface and information displays. Design-Builder shall provide equipment to connect the DAS via Ethernet cable, existing Wi-Fi network or cellular data network at all locations. The means of data connection will be determined during design. The Purchaser-Owner will pay for the cost of cellular data service if needed, but not for the modem or other equipment needed to connect to the cellular network.

The DAS(s) shall provide access to at least the following data:

- Instantaneous AC system output (kW)
- Fuel Cell System production (kWh) over pre-defined intervals that may be user configured
- Natural gas or other input fuel use
- Recovered heat (if applicable)
- System availability
- Site Load information. Available load data for the meter the system is connected to shall be collected by the monitoring solution as part of the DAS.

Data collected by the DAS shall be presented in an online web interface, accessible from any computer through the Internet with appropriate security (e.g., password controlled access). The user interface shall allow visualization of the data at least in the following increments: 15 minutes, hour, day, week, month, and year. The interface shall access data recorded in a server that may be stored on-site or remotely with unfettered access by the Purchaser-Owner for the life of the Project. The online interface shall enable users to export all available data in Excel or ASCII comma-separated format for further analysis and data shall be downloadable in at least 15 minute intervals for daily, weekly, monthly and annual production.

The Monitoring system shall enable Purchaser-Owner staff to diagnose potential problems and perform remediating action. The monitoring system shall provide alerts when the system is not functioning within acceptable operating parameters. These parameters shall be defined during the design phase of the Project and specified in the DAS design document.

Additionally, Design-Builder shall make available, at no additional cost, the following reports for a term of 5 years after Final Completion of the project:

- Monthly Production report shall be available online to the Purchaser-Owner personnel.
- System performance data shall be made available electronically to the Purchaser-Owner in a format and at a frequency to be determined during the Design Review process.
- Additional reports shall be made available to the Purchaser-Owner to assist the Purchaser-Owner in reconciling system output with utility bills and the production guarantee, as determined in the Design Review process.

A Monitoring Manual shall be provided to the Purchaser-Owner in printed or on-line form that describes how to use the monitoring system, including the export of data and the creation of custom reports.

3.5.14 Interconnection

Design-Builder is responsible for obtaining all necessary PG&E interconnection approvals for each Fuel Cell system being installed. Design-Builder must comply with all interconnection requirements, such as CPUC Rule 21 for the PG&E service territory. Design-Builder is responsible for the proper planning and scheduling of interconnection approvals and any potential interconnection study. Systems installed as part of this project will take advantage of Net Energy Metering (NEM), unless specified otherwise by Purchaser-Owner or its agents. Design-Builder shall be responsible for ensuring the system design and interconnection qualifies for NEM, as applicable.

3.6 WARRANTIES

Design-Builder shall provide a comprehensive fifteen (15) year warranty on all system components against defects in materials and workmanship under normal application, installation, and use and service conditions. Design-Builder shall be responsible for all maintenance, stack replacement and operations to deliver the guaranteed output over the life of the contract.

All work performed by Design-Builder must not render void, violate, or otherwise jeopardize any preexisting Purchaser-Owner facility or building warranties or the warranties of system components.

4. PROCUREMENT/CONSTRUCTION

4.1 SCOPE OF SUPPLY

Design-Builder shall provide all necessary labor, materials, equipment, and services required to install complete integrated turnkey Fuel Cell systems. Design-Builder shall supply all Fuel Cells, mounting equipment, metering, related wiring, monitoring equipment, heat recovery equipment, and all ancillary equipment necessary to install the Fuel Cell system and interconnect it to the Purchaser-Owner electrical distribution system. The Fuel Cell system installations shall comply with all contract requirements, technical specifications, approved design documents, and applicable regulatory codes and requirements. Design-Builder shall submit As-Built Construction Drawings in hard copy with two (2) sets and an electronic copy in DWG format on compact disc to the Purchaser-Owner after completion of the Proving Period for each system at each site.

4.2 MATERIALS AND EQUIPMENT

Materials and equipment incorporated in the Work shall be new and suitable for the use intended. No material or equipment shall be used for any purpose other than that for which it is designed, specified or indicated.

Design-Builder shall use means necessary to protect the materials and equipment before, during and after installation. Design-Builder shall promptly replace lost or damaged materials and equipment with equal, or Purchaser-Owner-approved, replacements, or repair them, at no additional cost to the Purchaser-Owner.

4.3 LINE LOCATION

Design-Builder will be responsible for locating, identifying and protecting existing underground utilities conduits, piping, substructures, etc. and ensuring that no damage is inflicted upon existing infrastructure. In addition to USA Dig and utility line-locating, a private line-locator must be used for any project requiring underground work.

4.4 QUALITY ASSURANCE AND QUALITY CONTROL

Design-Builder shall implement a Quality Assurance / Quality Control (QA/QC) plan for construction activities on Purchaser-Owner sites. At least 30 days prior to the planned commencement of construction, Design-Builder shall submit a copy of the QA/QC Plan for review and approval by the Purchaser-Owner.

To ensure the highest quality of the installation, Design-Builder shall:

- Implement policies and procedures to ensure proper oversight of construction work, verification of adherence to construction documents and contractual requirements, and rapid identification and mitigation of issues and risks.
- Utilize best practice methods for communicating progress, performing work according to the approved Project schedule, and completing the Project on-time.
- Keep the Site clean and orderly throughout the duration of construction. All trash and rubbish shall be disposed of off-site by licensed waste disposal companies and in accordance with applicable Law.
- Provide equipment marking, as well as labeling and signage for the Project that shall be removed after Project completion.
- Fully comply with all applicable notification, safety and Work rules (including Purchaser-Owner safety standards) when working on or near Purchaser-Owner facilities.
- Provide Special Inspection for trenching, rebar, concrete, and welding work, according to AHJ requirements.
- Route all electrical collection system wiring and conduits in a neat and orderly fashion and in accordance with all applicable code requirements. All cable terminations shall be permanently labeled.
- Torque all mechanical and electrical connections and terminations according to manufacturer specifications, with marking/sealing of all electrical terminations at appropriate torque point.
- Provide all temporary road and warning signs, flagmen or equipment as required to safely execute the Work. Street sweeping services shall also be provided as required to keep any

dirt, soil, mud, etc. off of roads. Comply with all state and local storm water pollution prevention (SWPP) ordinances.

4.5 REMOVAL AND REMEDIATION

Design-Builder shall remove all construction spoils, abandoned footings, utilities, construction equipment and other byproducts of construction. All disturbed areas including landscaping, asphalt, and concrete shall be remediated to be in equal or better condition than found. Parking lots shall be re-striped if affected by construction operations.

The site shall be left clean and free of debris or dirt that has accumulated as a result of construction operations.

5. TESTING

Following completion of construction, Design-Builder shall provide the following services related to startup and performance testing of the Fuel Cell systems:

- Acceptance Testing
- System Startup
- Proving Period

A detailed Testing Plan covering each of the phases above shall be submitted and approved by the Purchaser-Owner prior to substantial completion of construction. A detailed description of each phase is provided below.

5.1 ACCEPTANCE TESTING

Design-Builder shall perform a complete acceptance test for each Fuel Cell System. The acceptance test procedures include component tests as well as other standard tests, inspections, safety and quality checks. All testing and commissioning shall be conducted in accordance with the manufacturer's specifications.

The section of the Testing Plan that covers Acceptance Testing shall cover at least the following:

- Detailed test methods, including sample calculations and reference to standards as required or applicable, and list of tested equipment.
- Pre-test checklist to ensure readiness and any safety measures are in-place.
- Detailed list of all items to be inspected and tests to be conducted.
- Acceptance Criteria: For each test phase, specifically indicate what is considered an acceptable test result.

After Design-Builder conducts all Acceptance Testing based on the Testing Plan approved by the Purchaser-Owner prior to substantial completion, Design-Builder shall submit a detailed Acceptance Test Report to the Purchaser-Owner for review.

The Acceptance Test Report shall document the results of the tests conducted following the Testing Plan, and include additional information such as the date and time each test was performed. It shall also make reference to any problem and deficiencies found during testing. If there was troubleshooting done, the Report shall describe the troubleshooting methods and strategy. Design-

Builder shall be responsible for providing the labor and equipment necessary to troubleshoot the System.

5.2 SYSTEM STARTUP

Following Purchaser-Owner approval of the Acceptance Test Report, Design-Builder shall conduct tests over twenty-four (24) hours and at a time resolution of fifteen (15) minutes, recording the following data:

- Average AC output (kW)
- Hourly Fuel Cell system production (kWh)
- Natural gas or other input fuel use
- Heat recovered
- Ambient temperature
- General system status information

These data points shall be presented in a manner that best depicts the actual performance of the system for Purchaser-Owner review and approval and shall be submitted as part of the Startup Test Report.

5.3 PROVING PERIOD (30 DAYS)

Upon completion of Acceptance Testing and System Startup, and approval by the Purchaser-Owner, Design-Builder shall monitor the system during a thirty (30) day Proving Period and submit a report for Purchaser-Owner review and approval prior to final acceptance by the Purchaser-Owner. This includes monitoring system output and ensuring the correct functioning of system components over this time. The values for the following data shall be acquired every fifteen (15) minutes over thirty (30) days:

- AC system output (kW)
- Ambient temperature
- General system status information
- System availability

Design-Builder shall utilize calibrated test instruments and the DAS and monitoring system to collect the test data described above, which shall be made available to the Purchaser-Owner for access throughout the Proving Period. Design-Builder shall determine through analysis of data from the Proving Period whether the Fuel Cell system delivers the expected production as determined by the final approved design (i.e., Construction Documents). The production figures for all meters, whether existing or installed by or on behalf of the IOU or by or on behalf of the Respondent, shall be correlated during this test to verify their accuracy in measuring system production.

All data and reports required in Section 3.5.13 shall be fully functional and available to the Purchaser-Owner at the commencement of the Proving Period. Data and reporting requirements are included in the testing scope of the Proving Period and deficiencies in these areas (including missing data, inaccurate reports, and other issues that make validation of system performance inconclusive) shall be grounds for denying approval of the Proving Period Report.

If the Fuel Cell system does not perform to design specifications, diagnostic testing shall be performed by Design-Builder, deficiencies shall be identified with proposed corrective actions submitted to the Purchaser-Owner, and the Proving Period test repeated. Design-Builder shall be

responsible for providing the labor and equipment necessary to troubleshoot the system. The Proving Period Report shall be submitted after the successful completion of this phase and submitted to the Purchaser-Owner for review and approval. The report shall contain, but not be limited to, the following information; calculations shall be provided in Excel format with formulas visible to allow for peer review:

- System description
- Test period
- Test results
- Anomalies identified during test
- Corrective action performed
- Actual measured performance
- Calculations detailing expected performance under TMY conditions

5.4 CLOSE-OUT DOCUMENTATION REQUIREMENTS

Close-Out documents prepared by Design-Builder must include at minimum, but not limited to, the following items:

- Final As-Built Drawing Set
- Component warranties
- Signed inspections cards from AHJ and required Special Inspections
- Interconnection agreements and Permission To Operate
- Owner's Manual

6. **OPERATIONS AND MAINTENANCE**

Design-Builder shall offer Operations and Maintenance services for fifteen (15) years with their Proposal. These services shall include

The Purchaser-Owner reserves the right to not execute the Operations and Maintenance services agreement. In offering such services, Design-Builder shall perform all necessary preventive and corrective maintenance, which includes routine maintenance adjustments, replacements, and electrical panel/transformer/fuel cell cleaning (interior and exterior) with supporting documentation delivered to the Purchaser-Owner after the Work has been performed. Maintenance by Design-Builder shall ensure that all warranties, particularly fuel cell warranties, are preserved. Environmental sensors shall be tested and recalibrated at least once every three (3) years.

Design-Builder shall perform the following maintenance services, at a minimum, as described in the following sections:

6.1 PREVENTIVE MAINTENANCE

Preventive Maintenance shall be performed at least annually and include:

- System testing (voltage/amperage)
- System visual inspection and necessary corrections:
 - Inspect wiring for loose connections and wire condition. Resolve issues as needed or report larger issues to the Purchaser-Owner.
 - Inspect all metallic parts for corrosion and resolve issue as needed.

- Inspect all wiring connections for signs of poor contact at terminals (burning, discoloration, etc) and resolve issue as needed.
- Inspect disconnects for proper operation and resolve issues as needed.
- Survey entire jobsite for debris or obstructions and resolve issues as needed.
- Inspect fasteners for proper torque and corrosion and resolve issues as needed.
- Inspect electrical hardware for proper warning and rating labeling and resolve issues as needed.
- Review as built documentation as needed.
- Check for proper operation and reporting of monitoring hardware and resolve issues as needed.
- Inspect sealed electrical components for condensation buildup and resolve issues as needed.
- Inspect wiring and hardware for signs of damage from vandalism or animal damage and resolve issues as needed.
- Routine system maintenance to include correction of loose electrical connections, ground connections, replacement of defective equipment found during testing, other minor maintenance repair work.
- Routine DAS maintenance to include sensor calibration and data integrity check.

6.2 Troubleshooting, Inspection and Additional Repairs

- Dispatch of field service resources within two business days of notification (via automated or manual means) for repairs as necessary to maintain system performance.
- Any corrective action required to restore the system to fully operational status shall be completed within 24 hours of the service resources arriving on-site.
- Major system repairs, not to include mid-voltage switchgear or transformers.

6.3 CUSTOMER SERVICE SUPPORT

- Support telephone line made available to Purchaser-Owner staff to answer questions or report issues.
- Support line shall be staffed during operational hours from 8 am – 6 pm California Standard Time. During times outside of this operational period, an urgent call shall be able to be routed to a supervisor for immediate action.

6.4 MAJOR COMPONENT MAINTENANCE AND REPAIR

- Fuel Cell repair and component replacement and refurbishment as required in the event of Fuel Cell failure.
- Fuel Cell stack replacement is required at no extra cost.
- Fuel Cell inspection and regular servicing as required under manufacturer's warranty specifications. Those include but are not limited to the following annually:
 - Check appearance/cleanliness of the cabinet, ventilation system and all exposed surfaces.
 - Inspect, clean/replace air filter elements
 - Check for corrosion on all terminals, cables and enclosure.
 - Check all fuses.
 - Perform a complete visual inspection of all internally mounted equipment including subassemblies, wiring harnesses, contactors, power supplies and all major components.

- Torque terminals and all fasteners in electrical power connections.
- Check the operation of all safety devices (E-stop, door switches).
- Record all operating voltages and current readings via the front display panel.
- Record all inspections completed.
- Inform Fuel Cell manufacturer of all deficiencies identified.
- Oversee manufacturer performance of In-Warranty replacement of failed components.
- Customer advocacy with vendors.

6.5 OTHER SYSTEM SERVICES

- O&M Manuals – Design-Builder shall provide three (3) copies of O&M Manuals. Updated editions of O&M Manuals shall be sent electronically to the Purchaser-Owner as they become available.
- Management of long term service and warranty agreements, ongoing.
- Design-Builder shall log all maintenance calls and document all maintenance activities. These activities shall be presented in a report, which is to be submitted to the Purchaser-Owner on a minimum monthly basis.

O&M services shall be priced separately from the design and construction of the Fuel Cell system. Design-Builder shall submit a detailed description of their O&M services, detailing the activities and the intervals at which they will be performed, with their Proposal.

7. PRODUCTION GUARANTEE

Design-Builder shall offer a Production Guarantee as part of their Proposal. The Production Guarantee shall reflect downtime due to anticipated maintenance activities, including stack replacement, and comply with the PPA Terms and Conditions and Design-Build Terms and Conditions included as Exhibits E.1 and E.2 of the RFP.

8. TRAINING

The Respondent shall provide four (4) hours of on-site training for Purchaser-Owner personnel in all aspects of operation, routine maintenance, and safety of the Fuel Cell systems, DAS, and monitoring solution.

At a minimum, training topics shall include the following:

- Fuel Cell system safety, including shut-down procedures
- Fuel Cell maintenance and troubleshooting
- DAS and monitoring solution, including standard and custom reporting

Design-Builder shall submit a proposed Training Plan during the design process for approval and provide all training materials and manuals to support on-site training in advance of scheduled training sessions (see schedule of submittals in Section 2.3, "Submittals"). The on-site portion of the training program shall be scheduled to take place at the jobsite at a time agreeable to both the Purchaser-Owner and Design-Builder.