ATTACHMENT 3
DRAFT PPA SUPPLEMENTAL CONDITIONS

ENERGY SERVICES AGREEMENT – SOLAR

Wastewater Treatment Facility - Las Gallinas Valley Sanitary District

This Energy Services Agreement ("Agreement") is made and entered into as of this ____ day of _____, 2022 (the "Effective Date"), between FFP BTM SOLAR, LLC, a Delaware limited liability company ("Provider"), and *Las Gallinas Valley Sanitary District* ("Purchaser"; and, together with Provider, each, a "Party" and together, the "Parties").

RECITALS

2.1 Purchaser desires that Provider install and operate a solar photovoltaic system at the Premises (as hereafter defined) for the purpose of providing Energy Services (as hereafter defined), and Provider is willing to have the Installation Work performed by using one or more qualified contractors holding the appropriate licenses required in the jurisdiction where the System will be installed;

2.2 Provider and Purchaser acknowledged those certain General Terms and Conditions of Energy Services Agreement between FFP BTM SOLAR, LLC and Purchaser dated as of _____, 2022 ("General Terms and Conditions"), which are incorporated by reference as set forth herein; and

2.3 The terms and conditions of this Energy Services Agreement, excluding the General Terms and Conditions incorporated herein, constitute the "Special Conditions" referred to in the General Terms and Conditions.

In consideration of the mutual promises set forth below, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1. Incorporation of General Terms and Conditions. The General Terms and Conditions are incorporated herein as if set forth in their entirety.

2. Initial Term. The initial term of this Agreement shall commence on the Effective Date and shall continue for Twenty (20) years from the Commercial Operation Date (as defined in the General Terms and Conditions), unless and until extended or terminated earlier pursuant to the provisions of this Agreement (the "Initial Term"). After the Initial Term, this Agreement may be renewed for an additional five (5) year term (a "Renewal Term"). At least one hundred and eighty (180) days, but no more than three hundred and sixty-five (365) days, prior to the expiration of the Initial Term, Provider shall give written notice to Purchaser of the availability of the Renewal Term. Purchaser shall have ninety (90) days to agree to continuation of this Agreement for the Renewal Term. Absent agreement to the Renewal Term this Agreement shall expire on the Expiration Date. The Initial Term and the subsequent Renewal Term, if any, are referred to collectively as the "Term".

3. Schedules. The following Schedules hereto are hereby incorporated into this Agreement:

Schedule 1	Description of the Premises, System and Subsidy
Schedule 2	Energy Services Payment
Schedule 3	Early Termination Fee
Schedule 4	Estimated Annual Production
Schedule 5	Notice Information
Schedule 6	Site-Specific Information and Requirements
Schedule 7	Specific Items for Scope of Work
Schedule 8	Site Diagram
Schedule 9	Upgrades, Scope and/or Schedule Change Acknowledgment

4. Privacy. Purchaser acknowledges that the System may collect certain information about Purchaser's electricity usage and the System performance. Such information may be stored and processed in the United States or any other country in which Provider or its third-party service providers, or its or their respective affiliates, subsidiaries, or service providers, maintain facilities. Purchaser consents to any such transfer of information outside of Purchaser's country.

5. Purchase Requirement; Energy Services Payment. "Energy Services" means the supply of electrical energy output from the System and any associated reductions in Purchaser's peak demand from its Local Electric Utility. After the Commercial Operation Date, Purchaser agrees to purchase one hundred percent (100%) of the Energy Services generated by the System during each relevant month of the Term, up to 110% of the system designed output per Schedule 4. All output above 110% of projection shall accrue to Purchaser free of charge for Purchaser's use. While the Energy Services are calculated and billed on a per kWh basis as set forth in Schedule 2 of these Special Conditions, they represent a package of services and benefits.

6. Estimated Annual Production. The annual estimate of electricity generated by the system for each year of the initial term is set as forth in Schedule 4 of the Special Conditions ("Estimated Annual Production").

7. Minimum Guaranteed Output. If the System fails to generate at least ninety percent (90%) of the Estimated Annual Production for a full 12-month period commencing on the Commercial Operation Date (and each anniversary thereof) (such amount, the "Minimum Guaranteed Output"), other than as a result of the acts or omissions of Purchaser or the Local Electric Utility (including a Disruption Period), or an Event of Force Majeure, Provider shall credit Purchaser an amount equal to Purchaser's Lost Savings on the next invoice or invoices during the following Term Year. The formula for calculating Lost Savings for the applicable Term Year is as follows:

   Lost Savings = (MGO *WPR – AE) x RV

   MGO = Minimum Guaranteed Output, as measured in total kWh, for System for the applicable Term Year.

   WPR = Weather Performance Ratio, measured as the ratio of the actual insolation over typical (pro-forma) insolation as indicated in Schedule 10. Such Weather Performance Ratio shall only apply if the ratio is less than 1.00.

   AE = Actual Electricity, as measured in total kWh, delivered by the System for the Term Year.

   RV = (ATP – kWh Rate)

   ATP = Average tariff price, measured in $/kWh, for the applicable Term Year paid by Purchaser with respect to the Premises. This price is determined by dividing the total cost for delivered electricity, including all charges associated with such electricity howsoever named, including, without limitation, charges for distribution, transmission, demand, and systems benefits, paid to the Local Electric Utility during the applicable Term Year by the total amount of delivered electricity by the Local Electric Utility during such Term Year.

   kWh Rate = the kWh Rate in effect for the applicable Term year, measured in $/kWh.

   Lost Savings Cap = System size (DC) as installed in megawatts, multiplied by $20,000. For the avoidance of doubt, the Lost Savings Cap is applicable to each Term Year.

If the RV is zero or less, then no Lost Savings payment shall be due to Purchaser. Such payment for any Lost Savings shall be made by Provider no later than sixty (60) days after the end of the Term Year during which such Lost Savings occurred (or following the date of termination, in the event of an early termination of this Agreement).

8. Sunlight Easements. Purchaser will take all reasonable actions as necessary to prevent other buildings, structures or flora from overshadowing or otherwise blocking access of sunlight to the System.

9. Use of System. Purchaser will not use electrical energy generated by the System for the purposes of heating a swimming pool within the meaning of Section 48 of the Internal Revenue Code.

IN WITNESS WHEREOF and in confirmation of their consent to the terms and conditions contained in this Agreement and intending to be legally bound hereby, Provider and Purchaser have executed this Agreement as of the Effective Date.

PROVIDER: **FFP BTM Solar, LLC**	**PURCHASER:** **Las Gallinas Valley Sanitary District**
By:_____ Name: Title:	By:_____ Name: Title:

SCHEDULES

I. Schedule 1 – Description of the Premises, System and Subsidy

A. Premises	**Las Gallinas Valley Sanitary District** **Wastewater Treatment Facility** **300 Smith Ranch Road** **San Rafael, CA 94903**
Site diagram attached:	X Yes ☐No
B. Description of Solar System	Behind the Meter, Net Energy Meter Aggregation (NEMA)
Solar System Size:	1085.76 kW (DC) (this is an estimate (and not a guarantee) of the System size; Provider may update the System Size prior to the Commercial Operation Date, however, Provider shall promptly inform Purchaser and obtain Purchaser's consent upon discovering or anticipating a downward deviation in the System size of more than 15% of the stated estimate.)
C. Anticipated Subsidy or Rebate	$0

II. Schedule 2 – Energy Services Payment

Purchaser shall pay to Provider a monthly payment (the "Energy Services Payment") for the Energy Services provided by the System during each calendar month of the Term equal to the product of (x) Actual Monthly Production for the System for the relevant month multiplied by (y) the kWh Rate.

The "Actual Monthly Production" means the amount of energy recorded by Provider's metering equipment during each calendar month of the Term.

The kWh Rate with respect to the System under this Agreement shall be in accordance with the following schedule:

Term Year	kWh Rate ($/kWh)	Term Year	$/kWh Rate ($/kWh)
1	$0.1295	11	$0.1295
2	$0.1295	12	$0.1295
3	$0.1295	13	$0.1295
4	$0.1295	14	$0.1295
5	$0.1295	15	$0.1295
6	$0.1295	16	$0.1295
7	$0.1295	17	$0.1295
8	$0.1295	18	$0.1295
9	$0.1295	19	$0.1295
10	$0.1295	20	$0.1295

If distribution upgrades are required by the Local Electric Utility, within 30 days of receipt of notice from the Local Electric Utility of the distribution upgrade costs, Purchaser will provide written notice to Provider of Purchaser's election of one of the following options:

A. Purchaser will pay the entire amount of such distribution upgrade costs, and the kWh rate as stated in PPA Rate Table will remain unchanged. Purchaser shall make payments directly to the Local Electric Utility in accordance with the requirements of the Local Electric Utility.
B. For every $0.01 per watt DC of such distribution upgrade costs, the kWh rate in PPA Rate Table will increase $0.0007 per kWh.

Scope Changes (ITC Eligible): If changes in project scope occur that are eligible for the Federal Investment Tax Credit (such as but not limited to adverse geotechnical conditions) and such additional scope and associated costs go beyond those contemplated as part of the development and implementation of the System in this Agreement, Provider will provide reasonable documentation demonstrating the direct and actual time and materials costs relating to such associated costs, and, within 30 days of receipt of notice from Provider reasonably substantiating the associated costs, Purchaser will provide written notice to Provider of Purchaser's election of one of the following options:

8.1 Purchaser will pay the entire amount of such associated costs, and the kWh rate as stated in PPA Rate Table will remain unchanged.
8.2 For every $0.01 per watt DC of such associated costs, the kWh rate in PPA Rate Table will increase $0.0005 per kWh.

Scope Changes (Non-ITC Eligible): If changes in project scope occur that are not eligible for the Federal Investment Tax Credit (such as but not limited to additional required ADA upgrades) and such additional scope and associated costs go beyond those contemplated as part of the development and implementation of the System in this Agreement, Provider will provide reasonable documentation demonstrating the direct and actual time and materials costs relating to such associated costs, and, within 30 days of receipt

of notice from Provider reasonably substantiating the associated costs, Purchaser will provide written notice to Provider of Purchaser's election of one of the following options:

8.3 Purchaser will pay the entire amount of such associated costs, and the kWh rate as stated in PPA Rate Table will remain unchanged.

8.4 For every $0.01 per watt DC of such associated costs, the kWh rate in PPA Rate Table will increase $0.0006 per kWh.

If the aggregate of costs set forth above for which Purchaser has elected to pay for via increased kWh Rate exceed the maximum total kWh Rate increase of $0.01174, the Provider has the option to terminate this Agreement and to remove the System pursuant to Section 2.4 of the General Conditions. In no event shall Purchaser be responsible for costs that exceed the stated kWh Rate increase.

III. Schedule 3 – Early Termination Fee

The Early Termination Fee with respect to the System under this Agreement shall be calculated in accordance with the following:

Early Termination Occurs in Year:	Column 1 Early Termination Fee where Purchaser does not take Title to the System ($/Wdc does not include costs of removal)	Purchase Date Occurs on the 91st day following: (Each "Anniversary" below shall refer to the anniversary of the Commercial Operation Date)	Column 2 Early Termination Fee where Purchaser takes Title to the System ($/Wdc, does not include costs of removal)
1*	$4.22		--
2	$3.66		--
3	$3.40		--
4	$3.16		--
5	$2.92		--
6	$2.69	5th Anniversary	$2.19
7	$2.65	6th Anniversary	$2.15
8	$2.63	7th Anniversary	$2.13
9	$2.60	8th Anniversary	$2.10
10	$2.57	9th Anniversary	$2.07
11	$2.54	10th Anniversary	$2.04
12	$2.51	11th Anniversary	$2.01
13	$2.47	12th Anniversary	$1.97
14	$2.44	13th Anniversary	$1.94
15	$2.41	14th Anniversary	$1.91
16	$2.37	15th Anniversary	$1.87
17	$2.33	16th Anniversary	$1.83
18	$2.30	17th Anniversary	$1.80
19	$2.26	18th Anniversary	$1.76
20	$2.22	19th Anniversary	$1.72

At Expiration (the end of the Initial Term), the amount in Column 1 shall be deemed to be zero (0).
*Includes Early Termination prior to the Commercial Operation Date.
If an early termination fee is due by Purchaser, and Purchaser is not taking title to the System, Purchaser shall reimburse Provider for the removal of the System at the actual cost, plus a 15% markup, with a maximum cost of $0.75/W dc. The removal costs shall be in addition to and not in lieu of the Early Termination Fee as listed in Column 1 in the table above.

IV. Schedule 4 – Estimated Annual Production

Estimated Annual Production commencing on the Commercial Operation Date with respect to System under this Agreement shall be as follows:

Term Year	Estimated Production (kWh)	Term Year	Estimated Production (kWh)
1	1,866,421	11	1,775,172
2	1,857,089	12	1,766,296
3	1,847,804	13	1,757,465
4	1,838,565	14	1,748,678
5	1,829,372	15	1,739,934
6	1,820,225	16	1,731,235
7	1,811,124	17	1,722,578
8	1,802,068	18	1,713,966
9	1,793,058	19	1,705,396
10	1,784,093	20	1,696,869

The values set forth in the table above are estimates (and not guarantees), of approximately how many kWhs are expected to be generated annually by the System assuming the System size indicated in Schedule 1 and based on initial System designs. Provider may deliver to Purchaser an updated table on or about the Commercial Operation Date based on the actual System size and design, however, Provider shall promptly inform Purchaser and obtain Purchaser's consent upon discovering or anticipating a downward deviation of more than fifteen percent (15%) of the stated estimate.

V. Schedule 5 – Notice Information

Purchaser:

Las Gallinas Valley Sanitary District
Attn: Engineering
101 Lucas Valley Rd
STE 300
San Rafael, California 94903

With a copy to

Provider:

FFP BTM Solar, LLC
c/o Forefront Power, LLC
Attn: Director, Energy Services
100 Montgomery St., Suite 725
San Francisco, CA 94104

With a copy to

FFP BTM Solar, LLC
c/o Forefront Power, LLC
Attn: Legal Department
100 Montgomery St., Suite 725
San Francisco, CA 94104
Email: FPLegal@forefrontpower.com

Financing Party:
[To be provided by Provider when known]

VI. Schedule 6 – Site Specific Information and Requirements

In accordance with Section 7.2(f) of the General Terms and Conditions, the following information references any known restrictions on the use of the Premises for the construction, ownership, use and operation of the System, including any land use restrictions, known underground structures or equipment, or limitations arising under permits or applicable law, as well as any additional Environmental Documents, reports or studies in the possession or control of the Purchaser, which shall each have been delivered to Provider as of the Effective Date:

Type of Information	Purchaser is not aware of any relevant information	Relevant Document Provided by Purchaser
Phase I environmental site assessment		Not Provided
Reports on site sampling (soil or groundwater)		Not Provided
Cleanup plan, corrective action plan or permits applicable to Premises		Not Provided
Open spill reports or unresolved release reports		Not Provided
Known underground storage tanks, foundations, utilities		Not Provided
Utility easements or public rights of way		Not Provided
Completed closure or "cap" on buried waste or other materials		Not Provided
Systems in place for extracting and collecting methane, groundwater or leachate		Not Provided
Subject to the control of a trustee, group of entities or entities other than landlord and/or Purchaser		Not Provided
As-built drawings and engineering reports of existing PV systems to be removed from site		Not Provided

VII. Schedule 7 – Specific Items for Scope of Work

- All System structures shall be permitted through the authority having jurisdiction as ground mounted structures, as applicable. Provider shall obtain permits on behalf of the project(s), including building department, structural, grading, and/or electrical permits as required.

- Provider and Purchaser are operating under the assumption that the premises will be eligible for a CEQA Notice of Exemption (NOE), and that a special use, conditional use, or zoning permit will not be required. Provider assumes that Purchaser, as lead agency, will issue a Notice of Exemption for CEQA. Upon request, Provider shall provide such limited support as necessary to Purchaser to obtain the NOE, including, if necessary, biological study and associated consultant statement and summary citing exemptions applicable. Provider shall not be responsible for costs or delays associated with any unforeseen required CEQA studies, special use, conditional use, or zoning permits, or mitigations that may result from a CEQA submittal and public comment. Additionally, Provider shall not be responsible for costs or delays associated with CEQA-related mitigations resulting from construction activities, including but not limited to Archaeological, Cultural or Biological discoveries.

- Purchaser shall be responsible for all costs associated with all efforts and expenses required to obtain CEQA approval beyond the securing of a CEQA Notice of Exemption. The Construction Start Date shall be extended on a day for day basis for delays associated with CEQA review.

- Fencing shall be 6' tall chain link, with barbed wire. Provider will determine the number of gates that are to be installed on the perimeter fencing, and such location(s) will be indicated on Provider's drawings and plan submittals to Purchaser. Provider assumes that the entirety of the existing fencing around the existing PV systems are in suitable condition to remain in place.

- Provider shall be responsible for all tree trimming and tree removal in order to facilitate the installation of the Systems. Provider will remove tree such that area is flush with grade. Purchaser shall acknowledge and approve removal of trees identified by Provider, in order to install the system and such approval shall not be unreasonably withheld. Purchaser shall be responsible for the costs associated with afforestation or reforestation for any trees removed. Purchaser can elect to address afforestation or reforestation itself, or require that Provider address it through the change order process described in Schedule 2. Irrigation re-routing shall not be the responsibility of the Provider.

- Provider intends to interconnect the System to Purchaser-owned 480V service at a mutually agreeable location. Provider assumes that the conductors and service equipment will be sufficiently capable of accepting the additional electrical load of the System. Provider shall be responsible for completing all required upgrades to the Purchaser's pre-existing electrical system and infrastructure in order to facilitate the installation of the Systems. Purchaser shall be responsible for the costs associated with required upgrades to the Purchaser's pre-existing electrical system and infrastructure. Provider shall work with Purchaser in good faith to determine a mutually-acceptable solution for Purchaser to pay such additional costs, if any, including potentially an increase in the kWh rate by exercising the Scope Changes (Non-ITC Eligible) rates in Schedule 2.

- Provider shall be responsible for all fees associated with the interconnection application, except that Provider shall not be responsible for any upgrades determined necessary by the Local Electric Utility.

- Provider assumes that existing grade is level and that no grading is required in support of System installation.

- Provider shall not be responsible for exporting soils. Any spoils that result from the installation of the System are assumed to be spread on site.

- Provider does not intend to use PVC coated rigid conduits, nor concrete encased conduits

- Provider intends to configure the System to be operated in parallel with electric distribution services from the Local Electric Utility. Provider and Purchaser agree that during Local Electric Utility power outages, public safety power shut offs or other instances when the Local Electric Utility ceases to provide electric distribution services to the Premises, the System shall cease providing Energy Services to the Premises until such time as the Local Electric Utility resumes electrical distribution services.

- Provider assumes free, unobstructed native soil, capable of providing structural support to the PV system and being suitable for trenching or directional boring. Provider shall not be responsible for such additional expenses related to underground conditions that are rocky, sandy, contaminated, contain ground water, result in caving, or otherwise have problematic construction limitations. Additional expenses related to these conditions include, but are not limited to, hard rock drilling, de-watering, installation of casings, spread footings, importing of backfill, or other abnormal installation methods. Provider shall work with Purchaser in good faith to determine a mutually-acceptable solution for Purchaser to pay such additional costs, including potentially an increase in the kWh rate in Schedule 2.

- Provider assumes Risk Level I BMPs as it relates to relevant SWPP assumptions for the installation of the System.

- Provider will execute a Phase I Environmental Site Assessment, in accordance with ASTM e1527. Provider assumes that there are no Recognized Environmental Conditions, Historical Recognized Environmental Conditions or de minimis concerns associated with the Project Site.

- Provider agrees to construct the System in no more than 1 construction phase, and that Provider will be allowed ample space to store material on site.

- Provider assumes that there is a potable water source on site, and available for Provider's use in constructing, cleaning and maintaining the system.

- Provider shall be responsible for all inspection and inspector costs associated with the installation of the system.

- Purchaser shall deliver to Provider all as-built drawings or design drawings in order to fully develop the solar plan sets and designs. Provider shall not be responsible for the accuracy of the as-built drawings.

- Provider excludes provision of temporary generators for any required facility power shutdowns.

- Purchaser shall be responsible for coordinating permanent disconnection of the two separately interconnected PV systems with the Local Electric Utility. Provider shall be responsible for physical disconnection, demolition, and removal of existing PV system equipment.

- Provider assumes that no additional flood protection measures are required due to the District's future plans to implement Sea Level Rise mitigation to protect District infrastructure (including the PV system area) in the Reclamation Area.

- Provider assumes that the existing medium voltage underground conduit and wires (between the two existing PV system medium voltage transformers) are suitable for reuse and in proper condition for the full duration of this Agreement. Provider also assumes that the pullboxes for this existing conduit can be opened to observe physical condition of the conductors. The provided as-built PV system plans do not indicate the material of the medium voltage conductors, and the Provider has assumed that they are copper conductors for the estimation of the new PV system's AC line losses due to voltage drop.

- Provider assumes no title and/or real estate risks, encumbrances or other limitations exist that would otherwise limit Provider's ability to access the site, install, own and operate the system. Provider assumes that all parcels encompassed by the site area recommended by Purchaser will be owned by Purchaser at time of development.

VIII. Schedule 8 – Site Diagram

IX. Schedule 9 – Upgrades, Scope and/or Schedule Change Acknowledgment

This Acknowledgment is made in accordance with Schedule 2 of the Special Conditions and/or Section 2.2(b) of Exhibit A, General Terms and Conditions of the Energy Service Agreement – [Solar], between Las Gallinas Valley Sanitary District ("Purchaser") and FFP BTM Solar, LLC ("Provider"), dated [_____, 20___] (the "Agreement"). Upon execution by both Purchaser and Provider, this Acknowledgment shall be effective as of [INSERT DATE] (the "Acknowledgment Effective Date").

1. Type of Change:

☐ Distribution Upgrades
☐ Scope Changes (ITC Eligible)
☐ Scope Changes (Non-ITC Eligible)
☐ Day for Day Extension
☐ Extension for Good Cause

2. Description of Change

[INSERT DESCRIPTION AND IF PROVIDER SEEKING EXTENSION FOR GOOD CAUSE, PROVIDER TO DETAIL CIRCUMSTANCES AND ACTIONS PROVIDER IS TAKING TO COMPLETE SYSTEM ON AGREED UPON SCHEDULE]

3. Change in kWh Rate and Early Termination Fee [IF NO IMPACT TO RATE OR ETF THEN DELETE]

[INSERT UPDATED KWH RATE AND EARLY TERMINATION FEE TABLE]

4. Updated Guaranteed Construction Start Date and Guaranteed Commercial Operation Date [IF NO IMPACT TO CLIFF DATES THEN DELETE]

The Parties hereby agree that the Guaranteed Construction Start Date and the Guaranteed Commercial Operation Date as defined in the Agreement are updated as follows:

Guaranteed Construction Start Date: [_____]
Guaranteed Commercial Operation Date: [_____]

The Parties hereby acknowledge and confirm the terms set forth herein as of the Acknowledgment Effective Date.

[PURCHASER]	FFP BTM Solar, LLC
By: _____	By: _____
Name: _____	Name: _____

X. Schedule 10 – Project Specifications

SPECIFICATIONS

Las Gallinas Valley Sanitary District

PART 1 OVERVIEW

1.1 The District's goals are to:

A Obtain pricing for the Capital purchase and for an optional power purchase agreement (PPA) for a new PV system.

B Remove and dispose of approximately 2,400 existing solar panels, and 3 central inverters.

C Reuse existing racking, conduit, transformers, pull boxes, electric panels, Data acquisition system, etc., as appropriate.

D Install a 1 MW PV system.

1.2 Introduction

A The District's main treatment facility is located at 300 Smith Ranch Road, San Rafael, CA. 94903

B The existing PV system is 588 kW and is installed approximately 3,200 feet to the northeast of the main plant. The PV system uses a step-up and step-down transformers to deliver the energy from the PV system to the plant.

C Plan Drawings for the existing system are included as Attachment 1.

D The existing system has had modifications over time, including:

1 The theft of ~90 panels in 2010 that were replaced with new Suntech panels. These panels should be disposed of and replaced.

2 The installation of 234 new Canadian Solar panels in 2021, as a warranty replacement of the original panels. The new Canadian Solar panels could be reused if there is a cost benefit. If not, the District will store those panels for future projects.

E The District is responsible for medium voltage underground between the step-down and step-up transformers.

F The District has completed an interconnection application for the new system to ensure qualification for NEM2. The draft single line diagram is included as Attachment 2.

1.3 Scope of Work

A Remove and Palletize of the existing PV panels as appropriate for disposal by the District.

B Remove and Dispose of the existing inverters as appropriate.

C Design, install, and operate a new PV system.

1.4 Prevailing Wages are required.

1.5 The District will retain ownership of all environmental attributes of the energy systems (Renewable Energy Credits (RECs), Carbon Credits, etc.)

1.6 In the case of a PPA, the vendor will be responsible for all operations and maintenance

of the PV system for the life of the PPA. Operations and Maintenance will include system operation, repair, warranty replacement, weed control (Roundup is not allowed), security, system output, etc.

PART 2 CONSTRUCTION SUBMITTALS

2.1 SUBMITTALS DUE WITH EXECUTION OF THE AGREEMENT:

A General Liability insurance certificate with endorsement

B Automobile Liability insurance certificate with endorsement

C Executed Workers Compensation Certification

2.2 PRE-CONSTRUCTION SUBMITTALS

A 60% and 90% detailed drawings for review and comment by the District.

B Stamped permit set with Professional Engineer (registered in the State of California) verification that the systems and the mounting structures and details will meet all local applicable seismic and wind-load requirements per the Specification, for review and approval.

C Utility interconnection applications.

D Copies of permits.

E Fire jurisdiction approval for fire access.

2.3 POST CONSTRUCTION SUBMITTALS

A As-built drawings showing the final placement of all combiner boxes, connections, and conduit placement, electrical plans, including three-line diagrams, and elevation drawings showing the final placement of the electrical equipment.

B Copies of all start-up procedure measurements.

C Copies of all testing data and reports.

D Copies of Utility operation Approval.

E Lien releases from all subcontractors.

PART 3 WARRANTIES

3.1 VENDOR WARRANTY

A The vendor is responsible for ensuring that the systems operate as designed for the term of the agreements.

B All repairs shall be completed in a timely fashion, including, but not limited to, failed cells, inverter issues, damage to units, etc.

C As part of system monitoring, the Contractor will notify the District staff of performance issues within 15 days.

3.2 All materials used in the construction of the system shall be warranted against degradation for the life of the equipment.

3.3 QUALITY ASSURANCE

A All generating equipment shall be certified by Underwriter Laboratories

(UL). The system shall be comprised of UL listed components or in cases where a UL listed component is not available, the component shall be listed by another OSHA recognized National Recognized Testing Laboratory (NRTL).

B All installations shall meet or exceed Cal-OSHA requirements for equipment access.

C The installation shall not void the warranty or UL Listing of any existing equipment or electric panels

PART 4 CONTRACTOR EXPERIENCE

4.1 Installation Contractor must hold appropriate licenses, and be approved by the Manufacturer to install the system.

4.2 Subcontractors must hold licenses in the appropriate disciplines.

4.3 Electrical work will be completed by a licensed electrical contractor.

PART 5 MATERIALS SPECIFICATION

5.1 GENERAL

A The Work shall include all materials, labor, equipment, fencing, trenching, paving, electric panels, breakers, services, and incidentals necessary to install a complete PV system including, but not limited to, the work included in this Specification.

B At a minimum, the Project shall consist of the design, supply, and installation of equipment, mounting structures, terminal and combiner boxes, DC wiring, DC disconnect, grid-connected inverter, AC disconnect, AC wiring, and all utility grade metering equipment, all designed to interconnect with the buildings' electrical systems.

C It is the Contractor's responsibility to review all available drawings and visit the jobsite to collect and document existing conditions and determine conduit and wiring runs. The Contractor is also responsible for identifying all underground obstructions in the working area via a District approved Underground contractor. The District will support the Contractor by providing all available drawings and institutional knowledge that is available. No allowance shall be made for any additional costs incurred by the Contractor due to failure to properly understand site conditions.

D The Contractor must provide Civil and Structural engineering analysis and documentation, stamped and signed by a Civil or Structural Engineer registered in the State of California, certifying that the mounting structures can support any loads resulting from local applicable seismic and wind-load activity. A Professional Engineer in the appropriate discipline must stamp all relevant drawings. All mounting canopies shall have a safety factor of at least 1.5.

E Complete all required utility paperwork for the interconnection agreements.

F All current California Building Codes and all other applicable codes shall

apply.

G The systems shall be designed to meet all local applicable seismic and wind-load requirements.

H The Contractor is responsible for securing, and for compliance with, all permits (building, fire, etc), final sign off, and final utility sign off.

I Commission the system per manufacturer's requirements and provide documentation of proper operation.

J All components are to be new and direct from the manufacturer; no used or refurbished materials are permitted.

K All materials that are used outdoors shall be sunlight and UV resistant.

L Materials shall be designed to withstand the temperatures to which they are exposed.

M Dissimilar materials should be isolated from one another using non-conductive shims, washers, or other methods.

N Any materials, equipment, or workmanship that is found defective, based on the acceptance tests or for any other reason, shall be reported to the Engineer. Defective material, equipment, and workmanship shall be replaced.

O Metals shall be hot dipped galvanized steel, anodized aluminum, and stainless steel.

P Aluminum shall not be placed in direct contact with concrete materials.

Q Only grade 316 or better stainless steel fasteners shall be used.

R All external electrical conduits shall be rigid schedule 40, galvanized and unpainted, or schedule 40 PVC for riser conduits in contact with earth.

S All electrical equipment shall be rated for the current and voltage ratings necessary for the application.

T All required over-current protection devices will be included and accessible for maintenance. Each shall have trip ratings no greater than the de-rated amperage of the conductor it protects.

U Drainage – The construction shall not adversely affect water drainage.

5.2 PANEL MOUNTING SYSTEMS

A All systems shall meet the requirements of the all California Building Codes.

B PV module attachment must be four-point equally distributed over the frame

5.3 MODULES

A Only Bloomberg Tier 1 rated panels.

B If panels are manufactured in China, provide certification that the panels meet US "Withhold Release Order" requirements for imports from China.

C Photovoltaic modules shall be tested in the factory for design performance.

5.4 OPTIMIZERS

A Not required for ground mounted systems.

5.5 INVERTER

A PV Inverter shall be SMA Sunny Tri-power or equal.

B The array shall have a dedicated inverter(s) with optimized performance.

C Installation shall meet all applicable UL 1741, IEEE Standard 929-2000 and standard 519, California electric code, and the latest applicable ANSI and FCC standards and addenda dated prior to the award of the purchase order for this procurement.

5.6 ELECTRICAL ENCLOSURES AND BOXES

A Exterior enclosures and boxes shall be minimum 14 gauge type 316 stainless steel with seams continuously welded and ground smooth, and fast access door latches.

B Interior enclosures and boxes shall be minimum 14 gauge NEMA 3R.

C Outer doors shall have provisions for locking enclosure with standard padlocks.

D A copper ground bus shall be provided in each enclosure or cabinet. It shall have provisions for connecting a minimum of ten grounding conductors.

E Provide thermoplastic data pockets mounted on inside door. The As-Built drawings for the electrical enclosure shall be placed in a watertight plastic wrap and shipped with the enclosure to the jobsite.

5.7 CONDUIT

A All exposed conduit shall be unpainted, schedule 40 Rigid galvanized, or schedule 40 PVC where used for riser conduits in contact with earth, meeting NEMA/ANSI C80.3 and UL 797 standards.

5.8 WIRE

A All conductors shall be copper, with a minimum conductivity of 98%. This does not apply to existing premises conductors through which inverter output current will flow.

B Wire shall be Class B stranded.

C Insulation of all conductors and cables shall be rated for the voltage of the system.

D Insulation type shall be moisture and heat resistant thermoplastic THWN, rated 90°C in dry locations and 75°C in wet locations, for #8 AWG and smaller. For #6 AWG and larger insulation shall be type XHHW.

E Wire identification - all wires, field and interior (non-field) to equipment, shall be identified with machine permanent ink printed sleeve markers or clip-on markers covered with clear plastic heat shrinkable tubing. Hand lettered wire labels are not acceptable and shall be replaced at the Contractor's expense. All wires that are electrically the same (connected to common termination points) and do not pass through a contact or other switching device shall have the same wire identification. The wire labeling code for each end of the same wire shall be

identical. Tubing shall be sized for the wire and shrunk into place with the properly sized heat gun.

5.9 CIRCUIT BREAKERS

A Circuit Breakers shall be of the indicated type, providing ON, OFF and TRIPPED positions. Circuit breakers shall be quick make, quick break with thermal magnetic action and shall be compatible with existing breaker panel at the power feed facility. The use of tandem or dual circuit breakers in normal single pole space to provide the number of poles or spaces specified are not acceptable. All multiple-pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. Circuit breakers shall be manufactured by Square D or approved equivalent. Breakers shall be sized and have the minimum interrupting capacity as required.

5.10 CONCRETE

A Concrete shall conform to Caltrans standard specification for class 2 concrete.

B Concrete mix must exceed the compressive strength requirements of ASTM C387.

C Type I Portland cement must be used.

D Aggregate shall be hard, durable, selected, graded, and free from foreign materials.

E Water shall be potable and free from foreign materials in amounts harmful to the concrete and embedded steel.

F Utilize standard designs incorporating mixtures that facilitate the workability, curing, and strength.

G Forms shall be sized to minimize air pockets and maximize strength.

PART 6 INSTALLATION SPECIFICATION

6.1 GENERAL INSTALLATION REQUIREMENTS

A All safety, electric, building, and labor code requirements at the national, state, and local levels shall be met.

B The installations shall be completed in a “workman like manner.” The areas shall be kept clean and free of obstructions at all times.

C The installations shall be completed per each manufacturer’s installation manual.

D All electrical connections and terminations shall be fully tightened, secured, and strain relieved as appropriate.

E All mounting equipment shall be installed to the manufacturer’s specifications.

F All cables, conduit, exposed conductors, and electrical boxes should be secured and supported according to code requirements.

G All applicable environmental regulations shall be met.

H System switching and metering equipment shall have convenient access for resetting or repair during electrical outages, and regular monitoring for data retrieval.

I The Contractor shall employ personnel that are skilled and experienced in the installation and connection of all elements, equipment, devices, instruments, accessories, and assemblies. All installation labor shall be performed by qualified personnel who have had experience on similar projects. The Contractor must provide first class workmanship for all installations.

J Ensure that all equipment and materials fit properly in their installations.

K Perform any required work to correct improper installations at no additional expense to the Customer.

L The Customer's Engineer reserves the right to halt any work that is found to be substandard or being installed by unqualified personnel.

6.2 INSTALLATION STANDARDS

A System Installations shall conform to Manufacturers' Installation Manuals and approved project drawings and specifications.

B Mounting hardware shall be compatible with the site considerations and environment. Special attention shall be paid to minimizing the risk from exposed fasteners, sharp edges, and potential damage to the units or support canopies. Corrosion resistance and durability of the mechanical hardware shall be emphasized – the use of stainless steel fasteners and aluminum support canopies are required. The use of ferrous metals, wood, or plastic components is not acceptable.

C The installations shall be completed with minimal impact on the environment.

6.3 WASTE DISPOSAL

A All waste will be disposed of offsite.

B Panels shall be disconnected, removed from existing racking, and palletized on project site for removal and disposal by the District.

C Vendor must provide R2 and ISO 14001 certificates to the District.

D All concrete, steel, aluminum, and wire waste will be recycled.

6.4 COORDINATION

A The contractor shall provide a daily update via email and shall participate in a weekly onsite meeting with District staff.

B The Contractor shall coordinate the electrical work with the other trades, code authorities and Engineer (District's engineer or representative); with due regard to their work, towards promotion of a rapid completion of the Project. If any cooperative work must be altered due to lack of proper supervision of such, or failure to make proper provisions, then the Contractor shall bear expense of such changes as necessary to be made in work of others.

C The Contractor shall cease work at any particular point, temporarily, and transfer operations to such portions of work as directed, when in the judgment of the Engineer it is necessary to do so.

D The Contractor shall schedule all the required work with the Engineer, including each shutdown period. Each shutdown shall be implemented to minimize disruption of the existing operations. The Work to be provided under this Contract shall not disrupt any of the existing operations without prior approval.

1 The Contractor shall not have any unscheduled shutdowns.

2 Carry out scheduled shutdowns only after the time, date, and sequence of work proposed to be accomplished during shutdown has been favorably reviewed by the Engineer. Submit shutdown plans at least 2 days in advance of when the scheduled shutdown is to occur.

3 The Engineer reserves the right to delay, change, or modify any shutdown at any time, at no additional cost to the Customer, when the risk of such a shutdown would jeopardize the operation of the facility.

6.5 SUPERVISION

A The Contractor shall schedule all activities, manage all technical aspects of the project, coordinate submittals and drawings, and attend all project meetings.

B The Contractor shall supervise and coordinate all work to insure each phase of the project, submittal, delivery, installation, and acceptance testing, etc. is completed within the allowable scheduled time frames.

C The Contractor shall be responsible for obtaining, preparing, completing, and furnishing all paper work, which shall include transmittals, submittals, forms, documents, manuals, instructions, and procedures.

6.6 SPECIAL INSPECTIONS

A All work or materials covered by the Contract documents shall be subject to inspection at any and all times by the applicable Engineer. If any material does not conform to the Contract documents, or does not have a favorably reviewed submittal status; then the Contractor shall, within three days after being notified by the Engineer, remove said material from the premises; and if said material has been installed, the entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the Contractor.

B The Contractor shall give the Engineer 10 working days' notice of the dates and time for inspection. Date of inspection shall be as agreed upon by the Contractor, Operations Manager and Engineer.

C Work shall not be closed in or covered over before inspection and approval by the Engineer. All costs associated with uncovering and making repairs where non-inspected work has been performed shall be borne by the Contractor.

D The Contractor shall cooperate with the Engineer and provide assistance at all times for the inspection of the electrical system under this Contract. The Contractor shall remove covers, provide access, operate equipment, and perform other reasonable work that, in the opinion of the Engineer, will be necessary to determine the quality and adequacy of the work.

E The permitting authority shall be notified to perform required inspection either prior to or concurrent with Engineer's inspection in the close out process.

F Before request for final inspection is made, the Contractor shall submit to the Engineer in writing, a statement that the Contractor has made his own thorough

inspection of the entire project, enumerating punch list items not complete and that the installation and testing is complete and in conformance with the requirements of this Section.

G The Owner's Engineer may arrange for a facility inspection by Cal-OSHA Consultation Service at any time. The Contractor shall make the necessary corrections to bring all work in conformance with Cal-OSHA requirements, all at no additional cost to the Customer.

H Contractor will be Responsible for any Additional Cost for Overtime, Weekend Overtime or Differential Time, Expenses for Inspection of Defective Work that has to be re-inspected.

6.7 JOB CONDITIONS

A The Contractor shall make all arrangements and pay the costs thereof for temporary services required during construction of the project, such as temporary electrical power. Upon completion of the project, remove all temporary services, equipment, material and wiring from the site as the property of the Contractor.

B The normal outdoor, not in direct sunlight, ambient temperature range of the job site will vary between 5 to 115 degrees Fahrenheit. All equipment shall be rated to operate in these temperature ranges or provisions for adequate heating and cooling shall be installed, at no additional cost to Customer.

6.8 SAFETY

A Testing shall conform to the respective manufacturer's recommendations. All manufacturers' safety precautions shall be followed.

B The procedures stated herein are guidelines for the intended tests, the Contractor shall be responsible to modify these tests to fit the particular application and ensure personnel safety. Absolutely no tests shall be performed that endanger personal safety.

C The Electrical Contractor shall have two or more Electricians present at all electrical field tests.

D California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): The Contractor is cautioned that testing and equipment shall comply with ESO and OSHA as to safety, clearances, padlocks and barriers around electrical equipment energized during testing.

E Field inspections and pre-energization tests shall be completed prior to applying power to equipment.

PART 7 METERS, MONITORING, AND DATA AQUISITION

7.1 PV DATA ACQUISITION SYSTEM (DAS)

A The District shall have access to the DAS. The DAS shall include instrumentation (with a stability < 2% change over a one year period) that allows the measurement of`:

1 Ambient temperature - accuracy ± 2°C

2 PV module temperature - accuracy ± 2°C

3 Wind speed - starting threshold 2.98 mph & accuracy < 5%

4 Plane of array solar irradiation (accuracy ±5%)

5 A Net Energy package with the ability to monitor the energy used by the facility in all utility time-of-use periods.

6 Monitoring must provide string level output and alarms.

7 Inverter level monitoring.

B All measurement equipment must be "revenue" grade.

C The DAS shall capture and store data on 15-minute intervals.

D Real-Time display will provide the following information. This information can be viewed via the Internet for the entire term of the warrantee period. The Contractor will use a regression to establish the system rating at PV-USA Test Conditions as the basis for projecting system output.

1 Instantaneous system output in kW

2 Instantaneous irradiation in watts/square meter.

3 Instantaneous ambient temperature in degrees Fahrenheit

4 Instantaneous wind speed

5 Daily and year-to-date system output in kWh

6 Data shall be provided in a format that easily facilitates graphing and analysis in third party database or spreadsheet programs.

PART 8 PROJECT CLOSEOUT

8.1 CLEANING AND TOUCH-UP

A Clean all work areas and remove any debris.

B Prior to startup and completion of the work, and subsequent to final acceptance, all parts of the installation, including all equipment, exposed conduit, devices, and fittings shall be cleaned and given touch up by Contractor as follows:

1 Remove all grease and metal cuttings.

2 Any discoloration or other damage to parts of the building, the finish, or the furnishings shall be repaired. Thoroughly clean any exposed work requiring repairs.

3 Vacuum and clean the inside of all panel and electrical enclosures.

4 Clean all above and below ground pull boxes and junction boxes from all foreign debris prior to final acceptance.

5 Paint all scratched or blemished surfaces with the necessary coats of quick drying paint to match adjacent color, texture, and thickness. This shall include all primed painted electrical equipment, including enclosures, panels, poles, boxes, devices, etc.

6 Repair damage to factory finishes with repair products recommended by Manufacturer.

7 Repair damage to PVC or paint finishes with matching touchup coating recommended by Manufacturer.

8.2 FINAL ACCEPTANCE

A Final acceptance will be given by the District Engineer after the equipment has passed the final acceptance trial period of one month, each deficiency has been corrected, final documentation has been provided, and all the requirements of design documents have been fulfilled.

B Upon completion of the project, prior to final acceptance, remove all temporary services, equipment, material, and wiring from the site.

C Acceptance by Engineer shall be based on:

1 All operational tests performed to the satisfaction of Engineer.

2 Receipt of all final documentations listed above.

PART 9 SYSTEM START-UP

9.1 START-UP FORMS

A Complete start-up and testing forms included Attachment 3.

B Bill of Materials: Include modules, inverters, disconnects, DAS, and combiner boxes.

C Power conductor test form: Contractor shall complete a megger test on all wiring at 500 volts for 10 seconds. Each reading shall be a minimum of 100 Meg-Ohms.

D Grounding system test form

1 Visual and Mechanical Inspection.

a. Verify ground system is in compliance with drawings and specifications.

2 Electrical Tests

a. Before making connections to the ground electrodes, and before placement of sidewalks, landscape and paving, measure the resistance of each electrode to ground using a ground resistance tester.

b. After all individual ground electrode readings have been made, interconnect as required and measure the system's ground resistance.

c. Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.

d. The grounding test shall be in conformance with IEEE Standard 81.

e. Plots of ground resistance shall be made and submitted to the District Engineer for approval.

f. The current reference rod shall be driven at least 100 feet from the system under test.

g. Measurements shall be made at 10 feet intervals beginning 25 feet from the test electrode and ending 75 feet from it in a direct line between the

system being tested and the test electrode.

3 Test Values

a. The resistance between the main grounding electrode and ground shall be no greater than five ohms for commercial or industrial systems per IEEE Standard 142.

b. Investigate point-to-point resistance values that exceed 0.5 ohms.

E System Visual and Mechanical Inspection Form: Complete Forms for all equipment listed below.

1 PV System: complete a form for the inspection of the PV system. Include inspection of all DC connections, conduit, modules, etc.

2 Combiner Box: Complete a form for each combiner box.

3 Inverter: Complete a Form for each Inverter.

4 Disconnects: Complete a form for each AC Disconnect

5 Main Panel

F System Output Measurement Form: The Contractor will establish the initial system output to demonstrate that the system is performing as designed, and to establish a baseline to be used for warranty.

1 The system output will be verified after construction of the system has been completed, on a clear, sunny day, with a minimum insolation of 700 watts per square meter.

2 Data to be collected will include:

a. Volts open circuit

b. Volts maximum power (use max of instantaneous reading)

c. Current at maximum power (use the min of instantaneous reading)

3 Voltages and currents shall be measured for each string, combiner box circuit, and the entire array.

4 Irradiance measurements shall be in the plane of the array.

5 Time, irradiance, and temperature measurements must be taken at a minimum of 15 minute intervals

9.2 Start-up shall be per all manufacturers' instruction.

9.3 System start-up procedure will be as outlined by the Manufacturer's installation manual and the inverter manual.

9.4 Commission inverters per factory instructions.

Attachment 1
Start Up Sheets

POWER CONDUCTOR TEST FORM						
EQUIPMENT NAME:				LOCATION		
CONDUCTOR NUMBER	INSULATION TESTS					
	PHASE TO GROUND			PHASE TO PHASE		
	A	B	C	AB	BC	CA
NOTES: RECORD INSULATION TEST VALUES IN MEG-OHMS						
TESTED BY:				DATE:		
WITNESS:						

GROUNDING SYSTEM TEST FORM TEST FORM (TF3)					
FALL IN POTENTIAL TEST					
MAIN GROUND LOCATION	APPLIED VOLTAGE V	MEASURED POINT VOLTAGE	MEASURED POINT 2 VOLTAGE	MEASURED POINT 3 VOLTAGE	CALCULATED RESISTANCE OHMS

TWO POINT TESTS					
EQUIPMENT NAME	EQUIPMENT #	CIRCUIT NUMBER	APPLIED CURRENT	MEASURED VOLTAGE	CALCULATED RESISTANCE
NOTES:					
TESTED BY:				DATE:	
WITNESSED BY:					

VISUAL AND MECHANICAL INSPECTION FORM	
EQUIPMENT NAME:	LOCATION:
NAMEPLATE DATA	
MFG:	SERIES #:
MODEL #:	U.L.#:
VOLTAGE:	PHASE:
AMPERAGE:	SERVICE:
GRD. BUS:	NEU. BUS:

INSPECTION CHECK LIST ENTER: A-ACCEPTABLE, R-NEEDS REPAIR OR REPLACEMENT, NA-NOT APPLICABLE	
TIGHTEN ALL BOLTS AND SCREWS	
TIGHTEN ALL CONDUCTOR AND BUS CONNECTIONS	
CHECK BUS BRACING AND CLEARANCE	
CHECK MAIN GROUNDING AND CONNECTION SIZE	
INSPECT GROUND BUS BONDING	
CHECK EQUIPMENT GROUNDS	
CHECK CONDUIT GROUNDS AND BUSHINGS	
INSPECT NEUTRAL BUS AND CONNECTIONS	
CHECK VENTILATION AND FILTERS	
CHECK FOR BROKEN/DAMAGED DEVICES	
CHECK DOOR AND PANEL ALIGNMENT	
INSPECT ANCHORAGE	
CHECK FOR PROPER CLEARANCES	
REMOVE ALL DIRT AND DUST ACCUMULATION	
INSPECT ALL PAINTED SURFACES	
CHECK FOR PROPER WIRE COLOR CODES	
INSPECT ALL WIRING FOR WIRE LABELS	
CHECK FOR PROPER TERMINATIONS	
CHECK FOR PROPER WIRE SIZES	
INSPECT ALL DEVICES FOR NAMEPLATES	
CHECK IF DRAWINGS MATCH EQUIPMENT	
CHECK ACCURACY OF OPERATION & MAINTENANCE	

TESTED BY:	DATE:
WITNESSED BY:	

SYSTEM OUTPUT FORM							
DATE: Panel Make and Model:							
STRING #	PANELS PER STRING	TIME	PANEL TEMP	INSOLATION – W/SF POA	VOLTS OPEN CIRCUIT	VOLTS CLOSED CIRCUIT	AMPS CLOSED CIRCUIT
TESTED BY:					DATE:		
WITNESSED BY:					DATE:		

BILL OF MATERIALS

PROJECT:_____ DATE:_____

LOCATION:_____ PAGE:_____

SPECIFICATION SECTION	QTY	DESCRIPTION	MFG	PART #	TAG #