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SOLAR PV SYSTEM SPECIFICATIONS

PART 1  GENERAL

1.1 The design of the on-site solar PV system will be the responsibility of the Supplier, however, the system must be compliant with the applicable University design guidelines. This guide delineates the minimum technical and installation specifications required by the University.

1.2 Applicable Codes and Standards:

- UL 1703 – “Flat-Plate Photovoltaic Modules and Panels”
- AMSE PTC 50 (solar PV performance)
- ANSI Z21.83 (solar PV performance and safety)
- NFPA 853 (solar PVs near buildings)
- NFPA 70 (electrical components)
- IEEE 1262 “Recommended Practice for Qualifications of Photovoltaic Modules”
- IEEE 1547 (interconnections)
- All applicable State Building Codes and requirements
- Cal OSHA § 2588 (Title 8, Subchapter 5, Group 1, Article 88) Solar Photovoltaic Systems

PART 2  PRODUCTS

2.1 General Requirements:

A. Power provided must be compatible with the onsite distribution system, typically 480 or 208 VAC.

B. Power capacity should be measured at the inverter AC output using the PVUSA Test Conditions (PTC), i.e. 1,000 Watts/m at 220º C ambient temperature and wind speed of 1 m/s.

C. The system must include all the hardware needed for the solar PV.

D. All systems must be installed in accordance with all applicable requirements of local electrical codes and the National Electrical Code (NEC), including but not limited to Article 690, “Solar Photovoltaic Systems” and Article 705 – “Interconnected Electrical Power Production Sources”.

E. Systems must be designed and installed using UL or ETL listed components, including mounting systems.

F. All Balance of Systems (wiring, component, wiring, conduits, and connections) must be suited for conditions for which they are to be installed.

G. Interconnection must comply with “Rule 21” affecting the IOUs in California. Interconnection must be acceptable to the distribution utility. Supplier will assist the University in preparing and submitting appropriate interconnection agreements with the local utility company. This shall be done at no cost or liability to the University.

H. System shall be supplied with lockable DC and AC disconnect switches.

I. The AC panel connected to the PV system, as well as the main switchboard and all branch circuits feed from the same circuit breaker as the PV system shall be clearly labeled with NEC compliant labels indicating the possible danger from alternate power sources.

J. Modules, inverters, balance of system equipment, and metering and measurement equipment all must comply with the California Solar Initiative (CSI) or applicable rebate program.

2.2 PV Modules:

A. System must comply with IEEE 1262 “Recommended Practice for Qualifications of Photovoltaic Modules”

B. Modules must be certified to UL 1703 – “Flat-Plate Photovoltaic Modules and Panels”.

2.3 Inverters:

A. Inverters must comply with the following requirements:
   3. Listed on the CEC list of eligible inverters

B. Inverters shall be Non-Islanding type designed to shut down on loss of utility power.

C. Inverters shall be installed in all-weather enclosures (NEMA 4 or 3R) suitable for exterior location.
D. Inverters shall be located in an easily accessible, weather-protected area, and not be subject to direct rain or sun, preferably located in-doors.

E. As far as practical, the AC output of all inverters located in one building shall be connected to the same distribution panel.

2.4 Meters:

A. Each branch feeder dedicated to an inverter, or groups of inverters shall have revenue class metering per FDG 33 71 73.33.

B. Meters shall be Schneider Electric ION 7330 or Stanford Utilities approved equal.

C. A conduit for SCADA circuits shall be installed from the PV Meter to the building main switchboard, near the main utility meter.

2.5 Structural Requirements:

A. All structures, including array structures, shall be designed to resist dead load, live load, plus wind and seismic loads to the geographic area.

B. PV systems must be able to withstand wind speeds of at least 95 mph, exposure 4.

C. Thermal loads caused by fluctuations of component and ambient temperatures must be combined with all the above load combinations.

D. All structural components, including array structures, shall be designed in a manner commensurate with attaining a minimum 30 year design life. Particular attention shall be given to the prevention of corrosion at the connections between dissimilar metals.

E. The structural design should provide for easy and cost effective repair or replacement of the roof.

PART 3 EXECUTION

3.1 Installation:

A. Prior to installation, all design drawings and specifications shall be submitted and approved by the University.

B. Installer shall coordinate work with general building contractor or building manager to minimize effect on building construction or operations.

C. All shutdowns and clearances of building electrical system shall follow University policies.
D. Installer is responsible for properly sealing all roof and wall penetrations associated with PV system.

E. Installer is responsible for removing all unused material and restoring the location to acceptable condition.

3.2 Acceptance Testing:

A. A performance test shall be used to verify system operation. Supplier shall submit an acceptance test procedure for University approval prior to test performance.

B. Acceptance testing shall be done near mid-day in sunny conditions.

C. Acceptance testing shall verify that all components are functioning correctly, and the system will produce at least 90% of the expected output for solar conditions at the time of the test.

3.3 Operation and Maintenance (Leased Systems):

A. The Licensee will be responsible for the operation and all maintenance of the solar PV system at the Licensee’s own cost and will assure that there will be no disruption to the University.

B. The Licensee shall provide notification to the University as early as practical, but in no event less than five days, prior to any planned maintenance and repairs.

C. The Licensee will provide a minimum of ten days notification to the University if any planned repairs or maintenance that will result in any disruption to campus electrical load.

D. Because the solar PV system will be privately-owned, the University will not provide any maintenance. All system warranties and workmanship guarantees will be in effect during the Solar License Agreement period and the Solar Power Purchase Agreement period.

END OF SECTION