



## PROVO CITY UTILITIES NET METERING STANDARDS

### For Customer-Owned Electric Generating Systems

#### A. General

This “Net Metering Standard” for Customer-Owned Grid Connected Electric Generating Systems sets forth the requirements and conditions for interconnected non-utility-owned electric generation where such generation may be connected for parallel operation with the electrical system of the City of Provo’s electrical system (Provo City Power). Generating systems will be permitted to interconnect to Provo City Power’s electric distribution system at service level voltage only after a determination by Provo City Power that such interconnection will not interfere with the operation of the distribution circuit and ensures the safety of Provo City Power employees and customers.

#### B. Interconnection Requirements

1. Customer shall comply with all the latest applicable National Electric Code (NEC) requirements [NEC Articles 690 and 705], NESC requirements, State of Utah requirements, building codes, and shall obtain electrical permit(s) for the equipment installation.
2. Meter and transformer or transformer pole serving the Customer-Generator shall be labeled to indicate potential electric current back feed. Provo City Power will provide and install labels when Customer Generator’s electric system is approved for interconnection.
3. Customer shall provide space for metering equipment and meter base as per Provo City Power requirements.
4. Customer’s over-current device at the service panel shall be marked to indicate power source and connection to the Provo City Power’s distribution system.
5. The Customer shall assume the full responsibility for all maintenance of the generator and protective equipment and keeping of records for such maintenance. These records shall be available to the Provo City Power for inspection at all times.
6. Customer’s power production control system shall comply with NEC Articles 690 and 705; and applicable and current Institute of Electrical and Electronics Engineers (IEEE) Standards including Standard number 1547 “Interconnecting Distributed Resources with Electric Power Systems” for parallel operation with the Provo City Power; in particular the:
  - A. Power output control system shall automatically disconnect from the Provo City Power’s source upon loss of voltage and not reconnect until the Provo City Power’s voltage has been restored for at least five (5) minutes continuously. Net Metering Standards 8-13-09(clean) Page 2 4/13/2010
  - B. Power output control system shall automatically initiate a disconnect from the Provo City Power source within six (6) cycles if Customer’s voltage falls below 60 Volts rms to ground (nominal 120 V rms base) on any phase.
  - C. Power output control system shall automatically initiate a disconnect from the Provo City Power’s

system within two (2) seconds if the voltage rises above 13 Volts rms phase to ground or falls below 104 Volts rms phase to ground (nominal 120 V rms base) on any phase.

- D. Power output control system shall automatically initiate a disconnect from the Provo City Power's system within three (3) cycles for any reverse power flow condition.
7. Customer shall provide a written description of how the protection devices will achieve compliance with the requirements of this policy as part of the License Application.
8. Customer shall furnish and install on customer's side of the meter, a UL approved safety disconnect switch which shall be capable of fully disconnecting the Customer's generating facility from the Provo City Power's electric system. The disconnect switch shall be located adjacent to the Provo City Power's meters and shall be of the visible break type in a metal enclosure which can be secured by a padlock. The disconnect switch shall be accessible to Provo City Power personnel at all times.
9. Additional production meter base must be installed adjacent to the utility meter base and knives disconnect for the purpose of gathering research data. Provo Power to provide production meter.
10. Solar Photovoltaic Equipment shall be in compliance with Underwriters Laboratories (UL) 1741, Standard for Static Inverters and Charge Controllers for Use in Photovoltaic Systems; UL 1703, Standard for Safety: Flat-Plate Photovoltaic Modules and Panels; and IEEE 1262-1995, Recommended Practice for Qualification of Photovoltaic (PV) Modules; and the solar system shall be installed in compliance with IEEE Standard 929-2000, Recommended Practice for Utility Interface of Photovoltaic

### **C. Safety**

All Safety and operating procedures for joint use equipment shall be in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.269, the National Electrical Code (NEC), State of Utah rules, City standards, and equipment manufacturer's safety and operating manuals.

### **D. Guidelines For System Diagrams**

The required System Diagram is one of the most important parts of the application for interconnection. The system diagram is used by Provo City Power during the review and approval process, and again during field testing and meter installation. The diagram is a permanent record copy of the system and is filed at Provo City Power for reference. Net Metering Standards 8-13-09(clean) Page 3 4/13/2010

A good diagram can greatly shorten the Provo City Power review period and helps ensure Provo City Power's field testing and meter installation are straightforward. Incomplete diagrams are one of the largest sources of delays during the application process. Discrepancies between the diagram and the actual installation as built are cause for rejection at the final testing and net meter installation, which in turn means rescheduling and a significant delay in activating the system.

The System Diagram can be anything from a One-Line, to a Schematic, to a complete Wiring Diagram that shows every wire and every connection throughout. Any of these are acceptable as long as the minimum key information is included. The diagram does not need to be overly complex, but accuracy and clarity are critical. The sample diagram on page 3 is for a typical PV System and is very simple, but it contains all technical information for Provo City Power. At a minimum, the System Diagram must show how the components of the customer generator system are connected electrically. Additional information, such as equipment part numbers and physical locations, should also be included on the diagram. Some of this additional information may be contained in the application forms as well, but documenting it on the System Diagram provides a single complete

reference for the project and speeds the engineering reviews and field work.

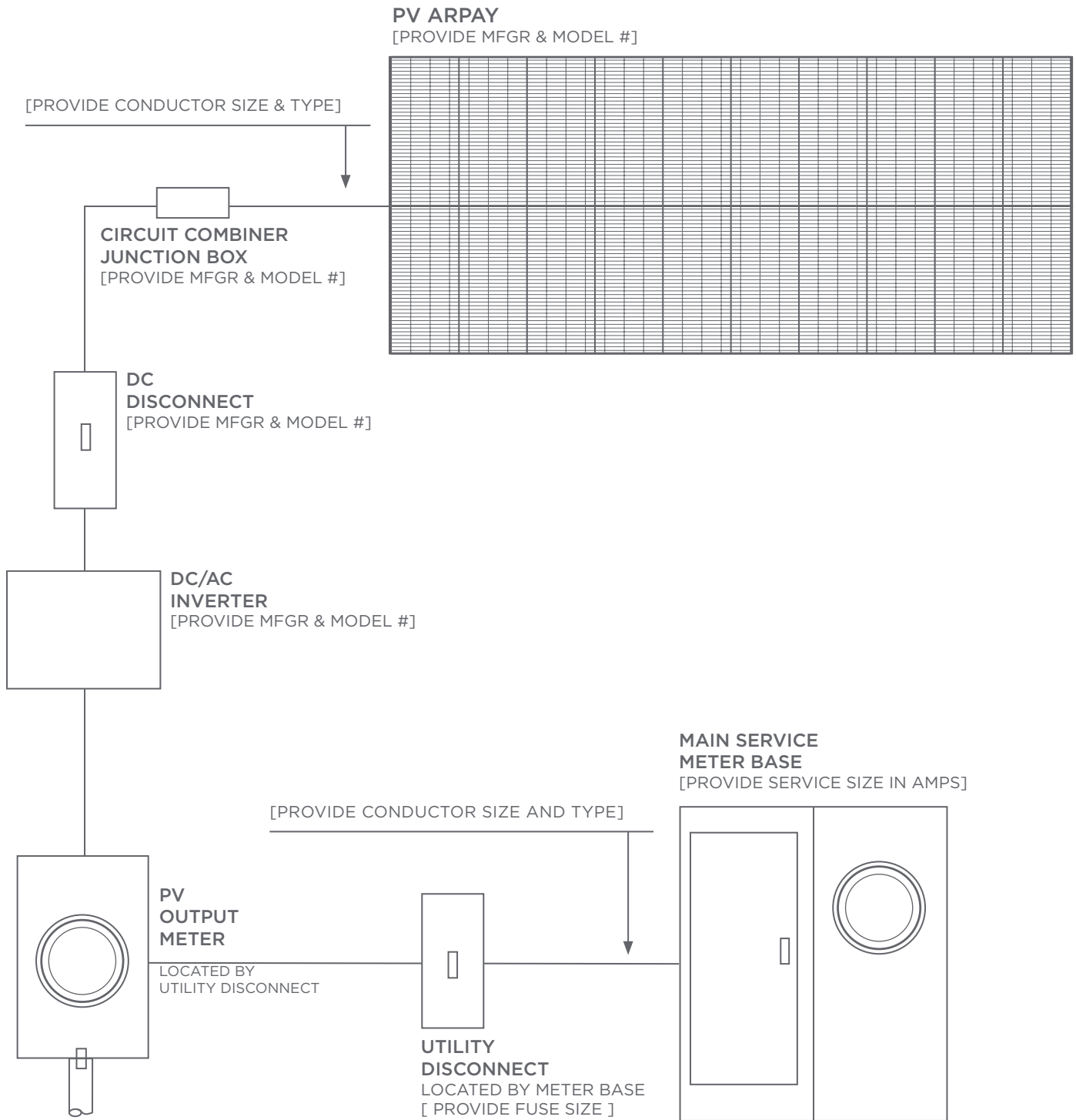
Note: These guidelines and the sample diagram are applicable for systems using a UL-1741 approved synchronous inverter. Systems not using a UL-1741 inverter have more complex requirements for interconnection and will require much more significant design drawings for review and approval.

The System Diagram should provide the information as described below. Refer to the sample diagram on the following page for an example.

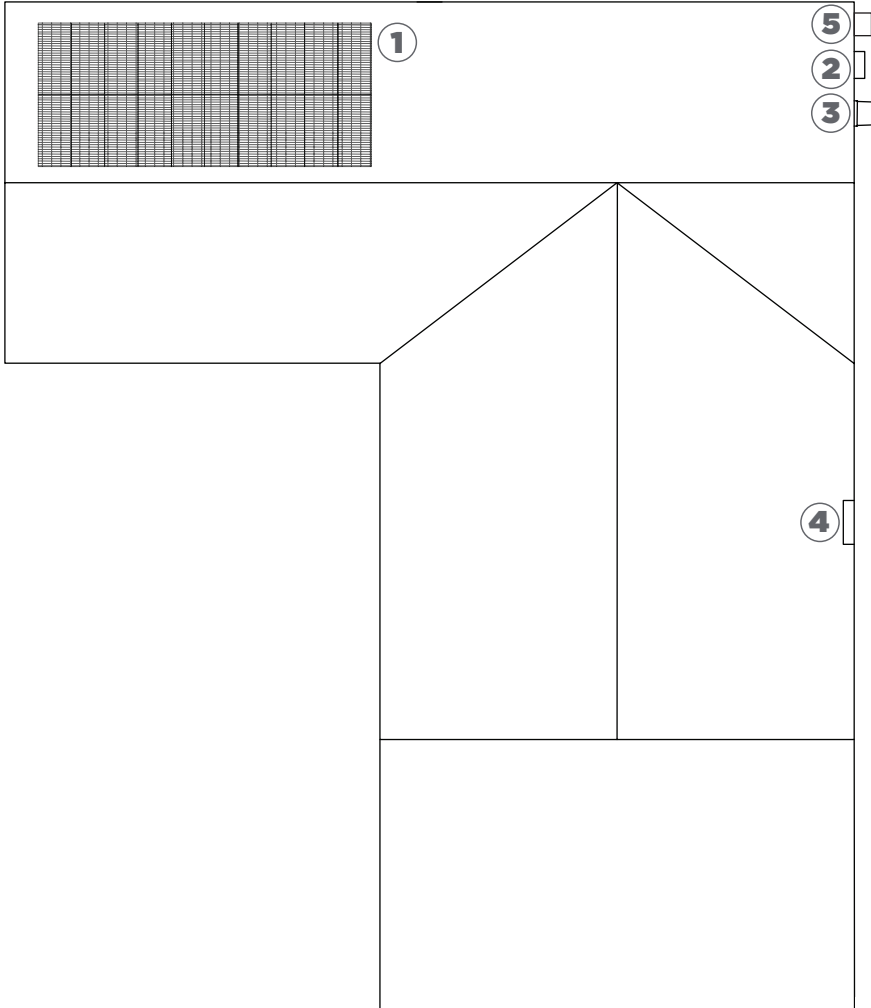
- Generator (PV Panels, Wind Turbine, Hydro Turbine, etc.) - Include manufacturer, part number, nameplate maximum capacity (kW), and physical location. For modular systems (e.g. pv panels), also include: number of modules, configuration, nameplate maximum capacity of each module, and total nameplate maximum capacity.
- Inverter - Include manufacturer, type or series, part number, serial number, nameplate maximum capacity (kW), output voltage, physical location.
- Disconnect Switch - Include the physical location relative to the Provo City Power Service Meter.
- Electrical Service Panel -Include the panel or main breaker size and the position at which the generation is connected. Show all panels (if there are multiple panels or subpanels) even if not directly connected into the generation system.
- Provo City Power Service Meter - Include existing meter serial number, meter form, and class
- Other Related Equipment (battery banks, transfer or bypass switches, backup generators, etc.)

These items are typically associated with more custom and complex systems. Providing accurate information and connection diagrams is especially important as these systems are not as “routine”.

# SAMPLE SYSTEM DIAGRAM



# SAMPLE SITE PLAN DIAGRAM



- ① **PV ARRAY**  
[ PROVIDE MFGR & MODEL # ]
- ② **UTILITY DISCONNECT**  
LOCATED BY METER BASE  
[ PROVIDE FUSE SIZE ]
- ③ **MAIN SERVICE METER BASE**  
[ PROVIDE SERVICE SIZE IN AMPS ]
- ④ **DC/AC INVERTER**  
[ PROVIDE MFGR & MODEL # ]
- ⑤ **PV METER BASE**  
LOCATED BY UTILITY DISCONNECT