

Note: This section will be superseded by Section 8 of the Electric Service Requirements Manual 2022 or later.

**CONTENTS**

	<b><u>PAGE</u></b>
A. Introduction .....	8-2i
B. Data Required for Design .....	8-2i
C. Electric Rates .....	8-3i
D. Interconnection Agreements .....	8-3i
E. Interconnection Costs .....	8-3i
F. Transformer Requirements .....	8-3i
G. Operating Requirements .....	8-4i
H. Metering .....	8-4i
Performance .....	8-4i
Feed in Tariff .....	8-5i
Switchboard Approval .....	8-5i
I. Inspections .....	8-5i
J. Liability .....	8-5i
K. Disconnection of the Customer's Energy Sources .....	8-5i
General .....	8-5i
Notification .....	8-5i
L. Utility Disconnecting Means .....	8-6i
General .....	8-6i
Access .....	8-7i
M. Signs and Labels .....	8-7i
N. Protective Schemes .....	8-7i
O. Telemetry .....	8-9i
P. Maintenance .....	8-9i
Q. Records .....	8-9i
R. Specifications .....	8-10i
S. Testing and Evaluation .....	8-10i
T. Generators and Generating Systems .....	8-10i
U. Inverters .....	8-11i
V. Battery Backup Systems .....	8-12i
W. Battery Peak Shaving Systems .....	8-13i
X. Battery Energy Storage Systems (BESS) .....	8-13i
Illustrations:	
Typical Interconnection Arrangements .....	8-15i
Notes .....	8-40i

## A. INTRODUCTION

1. This section is intended to assist Los Angeles Department of Water and Power (Department) customers in the design and evaluation of utility interconnections for customer-owned parallel-generation, backup and energy storage systems.
2. The Solar Incentive process has been separated from the solar interconnection process. For more information regarding available solar programs visit [www.ladwp.com/solar](http://www.ladwp.com/solar).
3. The interconnection of customer-owned parallel-generation requires the following before any construction may begin:
  - a. **An Interconnection Agreement (IA):** See **TYPICAL TIME-LINES FOR PARALLEL-GENERATION INSTALLATIONS**, pages 1-16 and 1-17 for contact information and **INTERCONNECTION AGREEMENTS**, page 8-3i for details.
  - b. **A Generation Interconnection Study:** For aggregate parallel energy source capacities greater than 30kW, depending on available electric system (grid) capacity and line loading, a generation interconnection study shall be required to determine if the Department will need to install additional protective equipment, perform system modifications or upgrades at the customer's expense. The typical timeline for the generation interconnection study is 2-4 weeks. If the proposed aggregate parallel energy source is greater than the 15% of the peak line loading or 100% of the minimum line loading, dependent on generation system topology, a supplemental study shall be performed. The typical timeline for the supplemental study is 2-4 weeks. If the proposed generation system fails the supplemental study a detailed study shall be required. The typical timeline for the detailed study is 4-6 weeks.

**Note:** An interconnection study may result in lower capacity limitations than the maximum limits established in **PROTECTIVE SCHEMES**, page 8-7i. Regardless of the number of supply points, these capacity limitations apply to the entire customer premises, see Glossary for definition of *Premises*.
  - c. **A Service Commitment:** The Department will determine the method of interconnection and transmit requirements to the customer in writing after appropriate engineering deposits and customer submittals have been received by the Department. See **DATA REQUIRED FOR DESIGN**, page 8-2i.

## B. DATA REQUIRED FOR DESIGN

1. When considering the installation of a parallel-generation and/or storage facility, customers must contact the Department as soon as possible so that:
  - a. The Department's Service Planners can work with the customer to establish an acceptable interconnection scheme for the customer's facility.
  - b. Customers may avoid unnecessary expenses and delays in service caused by assuming deficient interconnection schemes and equipment requirements.
2. At the time of initial contact, or as soon as possible, customers should provide the Department with the following information so that the Department may assist the customer in finalizing the customer's plans:
  - a. Electrical plans including load schedules, single-line diagrams, *Service Planning Information form* (see pages 1-19 and 1-20), and *Supplemental Battery Energy Storage System Data sheet* (if applicable).
  - b. Plot and site development plans showing generator, AC disconnect, metering equipment locations and Department access to generator, AC disconnect and meter equipment locations.
  - c. Energy source information:
    - (1) Maximum kilowatt rating
    - (2) Nominal voltage output
    - (3) Voltage regulation
    - (4) Maximum fault current contribution

**B. DATA REQUIRED FOR DESIGN (Cont.)**

d. Protective system information:

- (1) Protective system plan
- (2) Manufacturer's data sheets and maintenance requirements for protective equipment
- (3) Any additional information required by the Department

3. Upon receiving the requested information and engineering fees, the Department will provide customer requirements drawings and Department construction drawings as needed. Customer requirement drawings provide the customer with the information necessary to construct the interconnection facilities for the transformers, protective devices, meters and other necessary equipment that will be installed by the Department.

**C. ELECTRIC RATES**

Rates for the sale or exchange of electrical energy between the Department and the customer shall be in accordance with the established rates as specified in the effective Rate Ordinance(s) of the Department or by contract.

**D. INTERCONNECTION AGREEMENTS (IA)**

1. Customers are required to complete a Standard Offer Interconnection Agreement (Agreement) with the Department before the generating and/or storage facility may be interconnected to the Department's electric system.
2. Customers seeking to interconnect a new Electrical Generation Facility associated with service according to a Customer Generation (CG) rate shall be required to complete the *Declaration of Ownership of Electrical Generation Facility under a CG Rate* form.
3. The Department normally uses a Standard Offer contract for Agreements. However, if the Standard Offer is not suitable for the needs of the generating and/or storage facility, the customer may request the Department to consider a separate nonstandard Agreement.

**E. INTERCONNECTION COSTS**

Customers are required to reimburse the Department for all expenses associated with completing the interconnection of the customer's parallel-generation facilities including, but not limited to, extensions or modifications to the Department's electric system and related facilities and construction costs.

**F. TRANSFORMER REQUIREMENTS**

1. Energy sources rated less than 500kW may be connected on the secondary side of Department-owned transformers supplied from the 4800-volt electric system.
2. Energy sources rated 500-750kW may be required to be connected on the secondary side of dedicated Department-owned transformers supplied from the 34,500-volt electric system.
3. Energy sources rated over 750kW shall be required to be connected on the secondary side of dedicated Department-owned transformers supplied from the 34,500-volt electric system. Transformers shall be sized to supply the complete installation and will serve no other customer. Secondary distribution may be provided at the most convenient serving voltage for the customer.
4. Feed-In-Tariff (FiT) solar energy source(s) rated 1,000kW and above may be connected to the secondary side of Customer-owned transformers supplied from the 34,500-volt electric system. In these cases, the generation meter shall be located between the Customer-owned transformer and Department-owned system protection equipment. The metering equipment shall have a service class of 34,500-volts, Three-Phase, Three-Wire. For additional information, see pages 4-21 through 4-36.
5. The Department may require that the Department-owned transformers used to supply the customer's electric system be sized (i.e., kVA rating) equal to, or greater than, the customer's total generator capacity.
6. See **TRANSFORMER INSTALLATIONS ON THE CUSTOMER'S PREMISES** on page 1-33 for additional information.

## G. OPERATING REQUIREMENTS

1. Customers are required to operate customer owned generating and storage facilities, whether permanent or temporary, in accordance with the Agreement, The Department's *Electric Service Requirements*, Rules, Rate Schedules and all other applicable Codes and Ordinances.
2. Customers shall not:
  - a. Energize an un-energized electric line or transformer.
  - b. Reconnect the energy source after a protective device trip unless the customer's electric system is energized by the Department's electric system by the Department, or unless the customer's electric system is isolated from the Department's electric system by the Department.

**Note:** Synchronous generators are capable of maintaining a distribution system energized even after the line protective device has opened and separated (relayed) the line from the Department's electric system. Since the Department uses automatic reclosing schemes to energize relayed lines after a short time delay, customer-owned equipment or Department-owned equipment may be damaged if power is restored to a line that is already energized by the customer's generator(s).

These operating and protective requirements have been established to protect the health and well-being of the public and utility workers from malfunctions in Department or customer equipment.

## H. METERING

1. Customers shall provide Department approved metering arrangements for the installation of Department-owned generation and generation performance (performance) meters to measure the energy into, or out of, the installation at the interconnection point and at the energy source(s) output, respectively.

**Exception:** Provisions for a Department owned performance meter are no longer required for solar or wind generating systems with an aggregate capacity of 30kW or less.

2. All metering equipment drawings must be submitted to, and approved by, the Department service planner before the customer installs any equipment.
3. The performance meter as specified in these requirements is intended to measure the total output of the customer's generating system. No customer load is permitted on the generating system side of the meter.

**Exception:** Optional customer installed device(s) used to monitor system performance are permitted and are subject to the following conditions:

- (1) Device(s) shall be co-located on the same side of the AC disconnect switch as its source of power.
- (2) A device(s) power source wiring shall not bypass or defeat any AC disconnect switch.
- (3) A device(s) power source and low voltage data circuits shall not enter or pass through any utility sealed section.
- (4) Total device load shall not exceed 100 Watts.

4. Whether the service connection is overhead or underground:
  - a. The **line side** (top of meter) of the Department Revenue meter used for billing shall be connected to **Department side**, and the **load side** (bottom of meter) shall be connected to the **customer side (the generation contribution side)**.
  - b. The connections of the performance meter are opposite to those of the revenue meter. The **generation contribution side** is connected to the **line side** (top of meter) and the **Department side** is connected to the **load side** (bottom of meter). Refer to drawings on pages 8-16i to 8-34i.

**H. METERING (Cont.)**

- c. The service class of the performance meter shall match the output of the generation source as measured by one of the Department's standard metering configurations. See page 2-5 for standard meter configurations.
5. **Feed in Tariff (FiT) Generation** - Use of current transformers applies to transformer rated meter installations. In this case, the current transformer polarities shall be facing the **Department** grid. For a self-contained FiT meter, the delivery direction for purpose of metering shall be from the **Department** grid to the **line side** (top of meter), and the customer's FiT from the **load side** (bottom of meter). The Department shall specify the class of service available for interconnection. See pages 8-17i (figure 3) and 8-18i (figure 4) for additional information.  
**Note:** FiT generation taps shall not be made in any utility sealed section or compartment unless approved by the Department.
6. **Performance Meter Switchboard Review** – Manufacturer's switchboard drawings shall be submitted to the Department when the performance meter (regardless of ampacity) and the utility disconnect are integrated into a single switchgear unit, see pages 3-3 and 4-2, **Manufacturer's Drawings for Approval**.

**I. INSPECTIONS**

The Department requires that all conditions specified by these requirements be met and verified by the Department. In addition, an approval from the permitting agency for portions of the wiring and electrical equipment under their jurisdiction is required before the Department will establish the interconnection.

**J. LIABILITY**

1. Customers are responsible for damage caused to Department-owned equipment or other customers served from the Department's electric lines as a result of mis-operation or malfunction of the customer's energy source system.
2. The Department does not assume any responsibility for the protection of the customer's energy source(s) or any other portion of the customer's electrical system. The customer is fully responsible for protecting the customer's system so that faults or other disturbances on the Department's system do not cause damage to the customer's equipment.

**K. DISCONNECTION OF CUSTOMER'S ENERGY SOURCES****1. GENERAL**

In compliance with the Department's *Rules Governing Water and Electric Service*, the Department reserves the right to disconnect the customer's energy source(s) from the Department's electric system:

- a. When the customer's energy source is adversely affecting the Department's electric system or other customer's supplied from the Department's electric system.
- b. When the customer-installed protective system has been defeated or not properly maintained, (lack of proper records is considered to be non-maintenance).
- c. If the customer denies access to the Department to the generating facility or to required maintenance and operating records.
- d. Under emergency conditions as determined by the Department.

**2. NOTIFICATION**

- a. **Under non-emergency conditions**, generally a notice of disconnection will be provided in writing as follows:
  - (1) For energy sources with an aggregate capacity of less than 500kW, the Department will endeavor to provide notification 72 hours in advance of the scheduled disconnection.
  - (2) For energy sources with an aggregate capacity of 500kW or greater, the Department will provide notification 72 hours in advance of the scheduled disconnection.

**K. DISCONNECTION OF CUSTOMER'S ENERGY SOURCES (Cont.)**

- b. **Under emergency conditions**, the Department reserves the right to disconnect the customer's energy source(s) without notification.
- c. If the customer-installed protective system becomes inoperative, the customer shall disconnect the energy source(s) from the Department's electric system and immediately notify the Department. When the protective system problems have been corrected, the customer shall request the Department for permission to reconnect the customer generation system.

**L. UTILITY DISCONNECTING MEANS****1. GENERAL**

- a. Customers shall furnish, install and maintain circuit disconnect switches as required by State or National Electric Code and the Department to isolate the customer's parallel generator, generating and/or energy storage system from the Department's electric system. In general, a parallel generator AC disconnect switch and a generator circuit disconnect switch will be required for all synchronous generating systems, while only a parallel generator AC disconnect switch will be required for induction and inverter-based parallel generating systems. In general, an additional AC disconnect switch shall be required for energy storage.

**Note:** A parallel energy source AC disconnect switch shall not isolate a customer's load panel.

- b. The Department AC Disconnect Switch shall be a safety switch with a readily verifiable visual air gap to assure positive circuit disconnect and shall be lockable in the open (off) position with a Department standard padlock having a 5/16-inch lock shaft and a 1-inch locking clearance.

**Note:** A disconnect or circuit breaker with rack-out capability **shall not** be used to provide a readily verifiable visual air gap.

- c. AC disconnect switches shall have the line side of the disconnect switch, that is the fixed portion of the switch connected to the Department's power system. The load side of the switch, that is the movable portion of the switch (the blades) shall be connected to the side of the customer's parallel-generation contribution. The blade side of the switch shall contain the fuse, and the fuse shall be "cold sequence" so the fuse shall be de-energized from the utility source for safety.

**Note:** Safety switches shall have a viewing window to allow verification of the open switch condition without exposing the Department's personnel to energized bus. The viewing window shall be located on center no higher than 68 inches above the level standing and working space. Removing customer-owned fuses shall not be permitted as a means of providing an air gap.

**Exception:** Unless otherwise requested by the Department, a viewing window is not required for wall mounted safety switches if a visual air gap may be verified by way of a hinged cover, the potential is less than 600 volts, and where the maximum short-circuit at the AC disconnect is 22,000 amperes or less.

- d. Six or more AC disconnect switches connected to any single service point shall be approved by a Department engineer and may be limited by the City of Los Angeles Department of Building and Safety, or other Authority Having Jurisdiction (AHJ).
- e. A dedicated AC utility disconnect may not be required for inverter-based PV systems with total combined aggregate capacities up to and including 30 kW AC per premises. A dedicated AC utility disconnect may not be required for inverter-based Battery Energy Storage Systems with total combined capacities up to and including 30 kW AC per premises. This includes single-phase and three-phase systems. For example, a 30kW photovoltaic system could be installed without a utility disconnect switch at the same premises as a 30kW battery energy storage system without a utility disconnect switch, provided:
  - (1) The service supply voltage is less than 600 Volts and,
  - (2) The service main disconnect controls all power flow registered by the meter and,
  - (3) Energy sources are not connected to the meter panel through a line side tap and,

**L. UTILITY DISCONNECTING MEANS (Cont.)**

- (4) The combination meter panel is of the 'self-contained type' commercial safety socket, residential class 320 or less and,
- (5) The service consists of no more than six self-contained type meters per premises and,
- (6) The service is not fed from the Department's 34.5kV sub-transmission system.

**Note:** Services that are converted to the Department's 34.5kV sub-transmission system or exceed the limits given above in the future shall require AC utility disconnects be installed for all existing energy sources at the customer's expense.

**Note:** The Department may need to remove the revenue meter to disconnect the customer's energy sources when required under section page 8-5i(K).

**2. ACCESS**

Switches used to disconnect the energy source shall be accessible under all conditions and at all times to Department personnel. This may require disconnect switches to be located in a publicly accessible area or be provided with an interlock system to gain access to an installation in a security-controlled area.

**Exception:** Parallel generating systems with an aggregated output capacity of 100kW or less per property or premises as determined by the Department. In these cases, performance meters and AC disconnect switches must be readily accessible and located on the exterior wall of a building or other approved permanent structure, in an approved meter room on the ground floor or first basement parking level or such other locations as the Department may designate.

**M. SIGNS AND LABELS**

1. **The customer shall provide and install the following signs** as directed by the Department:
  - a. A sign at the main service (meter) panel location identifying each energy source AC disconnect location.
  - b. A sign at each Department specified energy source AC disconnect identifying the main service location.
  - c. A sign on each personnel entrance door for Customer Stations.
  - d. Any other signs deemed necessary by the Department to provide energy source AC disconnect location information.
2. **The customer shall provide a sign to be installed by the Department** for each Department-owned pad-mount transformer and Customer Station connected to the customer's parallel-generation system.
3. **The customer shall provide and install the following diagrams** when required by the Department:
  - a. A single-line diagram located at the main service panel location. The diagram shall be approved by the Department and installed by the customer as directed by the Department.
  - b. A plot plan located at the main service panel showing the location of the energy source AC disconnect(s). The plot plan shall be approved by the Department and installed by the customer as directed by the Department.

**N. PROTECTIVE SCHEMES**

1. Customer generating facilities shall be provided with protective schemes in order to ensure the security of the Department's electric system, security of other customers supplied from the Department's electric system and the safety of Department operating personnel.
2. In general, the Department will provide and install, at the customer's cost, required protective equipment. However, where mutually agreeable between the Department and the customer, the customer may provide and install, at the customer's cost, protective equipment as specified by the Department for:
  - a. Synchronous generation with an aggregate capacity of less than 300kVA (240kW) and induction generation less than 400kVA (320kW) when supplied from the Department's 4800-volt electric system.

**N. PROTECTIVE SCHEMES (Cont.)**

- b. Synchronous generation with an aggregate capacity of less than 400kVA (320kW) and induction generation less than 600 kVA (480 kW) when supplied from the Department's 34,500-volt electric system.
- c. Inverter-based generation and/or export capable storage with an aggregate capacity of less than 1,000kW when supplied from any Department electric system.

**Note:** The values given above are the absolute limits for each individual type of generation or export capable storage per customer premises. Aggregation of different types may reduce the limits above and require the installation of additional protective equipment. The specific protective scheme required is subject to the Department's available distribution system capacity, see page 8-2i note A.3.b. for generation integration study requirements.

3. The Department will install ground fault protection (GFP) equipment, at the customer's cost, for customer generating and/or storage facilities with an aggregate capacity of 1,000kW or greater and interconnected with the Department's 34,500-volt electric system.

**Note:** The Department may require GFP for customer generation and/or storage facilities with an aggregate capacity of less than 1,000kW and interconnected with the Department's 34,500-volt electric system when the facilities are located in remote areas or whenever such protection, in the Department's judgment, is necessary.

4. The electrical rating (kW) of the customer's generating and/or storage facility will determine, in part, the configuration in operating characteristics and protection requirements for a customer's interconnection installation. Typical protection equipment requirements include, but are not limited to:
  - a. Under-voltage (Device 27) protection
  - b. Over-voltage (Device 59) protection
  - c. Under-frequency (Device 81U) protection
  - d. Over-frequency (Device 81O) protection
  - e. Tripping batteries, circuit breakers and battery chargers

**Note:** See **SPECIFICATIONS** on page 8-9i for additional information.

5. Customer's energy source circuit breakers must positively disconnect under all conditions. In most instances this will require the installation of a charger assisted, uninterruptible DC power source.
6. The Department reserves the right to review and approve any interconnection scheme involving customer initiation of the customer interconnecting breaker controls.
7. Protective equipment shall comply with IEEE1547-2018 and be tested by the customer per IEEE1547.1-2020 prior to commissioning. Test reports shall be provided to the Department upon request.
8. Protective equipment shall be readily accessible to the Department for periodic inspection.
9. For inverter-based (1,000kW to 10,000kW), synchronous (greater than 320kW), or induction (greater than 480kW) aggregate capacity parallel generating and/or storage systems, the Department will provide additional protective equipment, at the customer's expense, including switchgear with a vacuum interrupter, all necessary remote control, communication and protective devices (relays), batteries, and battery charger. The customer shall provide and maintain a dedicated communication equipment, see **TELEMETRY**. The customer shall also provide 120 volt single-phase control power to the protection equipment, as specified by the Department.
10. For parallel generating installations with an aggregate capacity greater than 10,000kW, consult the Department for requirements.



**O. TELEMETRY**

1. When required by the Department (see **PROTECTIVE SCHEMES**), the customer shall provide all communications cabinets, network equipment, cables, connectors and house power as specified by the Department, see the Department's *Standard Telecom Requirements* guide. For projects located in the Owens Valley, consult the Department for specific requirements.
2. For installations with an aggregate capacity greater than 30kW, but less than 1,000kW, the Department may utilize the performance meter to provide continuous output information at the Department's Energy Control Center. This information shall include, but not be limited to:
  - a. Energy source voltage, current, watts, vars, and watt-hours.
3. When required by the Department (see **PROTECTIVE SCHEMES**), the customer shall pay for equipment with relay protection, real time metering, and SCADA at the generating facilities interconnection point to provide SCADA information, and remote control to the Department's Energy Control Center. This equipment will be specified and installed by the Department. The information shall include, but not be limited to:
  - a. Real time analog reads for the energy source: watts, vars, voltage, current, and watt-hours.
  - b. Status and alarm indication of each energy source synchronizing disconnect information (i.e., open or closed).
  - c. Control capability of the interconnection circuit breaker(s) (i.e. trip or close)

**P. MAINTENANCE**

1. Where the Department installs the protective equipment, the Department is responsible for maintaining such equipment. Where the customer installs the required protective equipment, the customer shall maintain such equipment and provide monthly maintenance of the tripping battery and the battery charger.
2. For customer parallel-generation installations with an aggregate capacity of 500kW or more, maintenance of the customer's energy source must be scheduled in advance to be compatible with the Department's electric system load requirements.

**Q. RECORDS**

1. Customers shall provide, upon request, accurate records of the customer's generating facility. Such records shall include but not be limited to:
  - a. Tripping batteries and battery chargers, where protective equipment is installed by the customer:
    - (1) Date and time of maintenance
    - (2) Description of maintenance performed
  - b. Each energy source:
    - (1) On-line and off-line times
    - (2) Generation output (kW)
    - (3) Maintenance outages
    - (4) Trip operations
    - (5) Any unusual events
2. The Department reserves the right to periodically review the customer's maintenance records for system analysis and to evaluate system disturbances.

## R. SPECIFICATIONS

1. Customer generating facilities shall be constructed to meet the following specifications:
  - a. System frequency shall be 60 cycles per second (Hz).
  - b. Signal distortion shall be limited to 5-percent of the RMS value of the Department's serving voltage and 25-percent of the waveform.
  - c. Power factor of the customer's electric system shall be limited as follows:
    - (1) For parallel generating systems with an aggregate capacity of less than 1,000kW, the average monthly on-peak power factor shall not be less than 85-percent lagging.
    - (2) For generating systems with an aggregate capacity of 1,000kW or greater, the power factor shall not be less than 99.5-percent lagging or more than 99.5-percent leading.

**Note:** The Department will measure these specifications at the metering facility.
2. Protective equipment relays used to open and close generator circuit breakers shall operate with the following specifications:
  - a. Under-voltage (Device 27), 92 volts or lower with a maximum time delay of 2.0 seconds
  - b. Over-voltage (Device 59), 138 volts or more with a maximum time delay of 2.0 seconds
  - c. Under-frequency (Device 81U), 57 Hz or lower with a maximum time delay of 2.5 seconds
  - d. Over-frequency (Device 81O), 61 HZ or more with a maximum time delay of 2.5 seconds

## S. TESTING AND EVALUATION

1. Customers shall test the generating facility before interconnecting with the Department's electric system and provide written certification to the Department that the generating facility meets the Department's specifications.
2. The Department reserves the right to test the customer's equipment before approving the connection to the Department's electric system and the right to monitor onsite operations of the equipment.
3. If the generating facility does not meet the Department's specifications, the Department may require the customer to disconnect the facility and make corrections or reimburse the Department for corrections as specified in the Agreement.
4. After the Department determines that the operation of an energy source will not be hazardous or impair the reliability of the Department's electric system, the Department will provide written permission to complete the interconnection
5. Periodic Interconnection Tests - Where the customer installs protective equipment, the customer shall have the equipment tested at two-year intervals by a Department approved testing agency at the customer's cost. It is the customer's responsibility to arrange for contracts and payments to the approved testing agency and to complete testing within the two-year interval (see **PROTECTIVE SCHEMES**).

## T. GENERATORS AND GENERATING SYSTEMS

1. Parallel generating systems operated by customers shall be connected to the customer's electric system on the load side of the revenue meter at a permanent Department approved location.

**Note:** Parallel generators or generating systems **shall not be installed within any mobile home park** unless residential structures are individually metered, mounted to a permanent foundation system and given preliminary approval by the Department's Tract Design group, see page 1-4. Each proposed installation shall require Department engineering review and may be approved on a case-by-case basis only if the above conditions are met and the Department determines that there are adequate facilities to support the proposed generation.

## T. GENERATORS AND GENERATING SYSTEMS (Cont.)

2. Parallel generating systems may be connected on either the line side or load side of the customer's service disconnecting means as allowed by the permitting agency or other Authority Having Jurisdiction (AHJ) but are subject to the following restrictions:
  - a. Parallel-generation circuit connections may not be made in, or accessed through, any sealed utility compartment.

**Exception:** Where metering equipment has been specifically designed and manufactured with a line side tap terminating in a section that is accessible to the customer, and has been labeled and certified by the manufacturer for the sole purpose of connecting parallel generating systems.
  - b. Generation circuit conduits and conductors shall not be routed through any sealed utility compartment.

**Note:** sealed utility compartments include terminating pull boxes and pull sections, metering compartments, and test-bypass compartments.

**Caution:** Existing service equipment may not have a suitable parallel-generation connection point on the line side of the customer's service over-current device and may require third party certification of any proposed connection location. Consult with LADBS or other applicable permitting agency regarding third party certification requirements.
3. Single-phase generation sources are limited to 30kW total capacity per premises unless dedicated on-site transformation is provided. Installations with individual single-phase inverters greater than 30kW shall use a three-phase interconnection system and balance the sources between the phases.
4. For synchronous generators, automatic synchronization is preferred. However, manual synchronization with relay supervision is acceptable.
5. Synchronous generators designed to be started as induction motors may not require synchronizing relays, but will not be permitted to start up if it results in detrimental effects to the Department's electric system.
6. Voltage regulation equipment must be provided on the customer's generator to maintain generation voltage to within normal Department limits.
7. Induction generator installations may require capacitors to correct the power factor. Protection schemes must be coordinated to ensure that the capacitors will always be disconnected before the induction generator is disconnected.
8. Generator installations rated 750kW or less may be required by the Department to meet conditions and specifications normally required for installations rated over 750kW. Safeguards that will be required and the degree of sophistication will depend on the type of equipment and the interconnection scheme.

## U. INVERTERS

Inverters may be used in customer generation systems that are interconnected with the Department's Electric system (grid). An inverter shall:

1. Be permanently utility interactive at the point of interconnection to the grid.

**Exception:** Inverters may function in "off-grid" mode during a utility outage under the following circumstances:

  - a. The inverter supplies power to an outlet on the inverter unit that is accessible only to qualified service personnel per UL1741SA standards. Warning: Outlet circuit shall not be integrated with the buildings internal wiring system.
  - b. The inverter supplies power to charge a battery backup system to feed critical loads (See section V).

Hybrid inverters may be used, provided that any additional "off-grid" AC outputs are never connected in parallel with the Department's grid.

## U. INVERTERS (Cont.)

Systems with battery storage may require additional testing to confirm that the battery system, with the utility side de-energized, provides power to the designated customer circuits only, and does not back feed into the main panel (into the Department's grid).

2. Be certified by a Nationally Recognized Testing Laboratory to fully comply with UL1741SA performance and grid safety standards. The Certificate of Compliance should state that this utility interactive inverter met all applicable requirements of current editions of UL1741SA and IEEE1547-2018, including testing conformance to IEEE1547.1-2020. Also, refer to sections R and S (pages 8-9i & 8-10i) for specification, testing and evaluation requirements. All inverters shall be included in the California Energy Commission's (CEC) list.
3. Be accepted by the Department of Building and Safety, City of Los Angeles, or other Authority Having Jurisdiction (AHJ).
4. Have safeguards to prevent power flow into un-energized Department's electric system.
5. Have the voltage output match the electrical characteristics of the service provided by the Department. For example, a single-phase inverter shall not be connected to a three-phase service, and an inverter of one voltage class shall not be connected to a service of a different voltage class. See page 1-25 for available service classes.  
**Exception 1:** Customer provides, at their expense, transformation between the performance meter and NET energy or generation meter to match the electrical characteristics of the service provided by the Department.  
**Exception 2:** When connected to a three-phase service, three single-phase inverters may be used in lieu of a three-phase inverter, provided that the customer maintains IEEE1547-2018 compliance by installing additional certified equipment to shut down all inverters in the event of a "loss of phase" event and maintain a balanced condition when connected to a three-phase system.
6. Have an output that may be measured by a performance meter (see section H) conforming to one of the Department's standard meter configurations. See page 2-5 for standard meter configurations.
7. Operate as a current source rather than a voltage source; so that open-circuited inverter shall have an output of zero volts. It shall only produce power output when it is connected to an energized Electric Power System (EPS). The inverter's voltage output will not be independent from the Department's service supply voltage, but it will be synchronized with it in such a way as to produce a current and power flow from the Customer's parallel-generation into the Department's power system (grid).
8. Operate within the Department's acceptable service supply voltage ranges. See Acceptable Voltage Ranges, page 1-26 for additional information.
9. For the purposes of these requirements, be defined by its maximum continuous output power at unity power factor.
10. Include a Utility Settings Compliance report indicating conformance with the Department's UL1741SA *Smart Inverter Technical Requirements*. This report shall be submitted to the Department upon request.

## V. Battery Backup Systems

Battery backup systems are used to provide emergency standby power to essential loads during a disturbance on the Department's electric system (grid), see pages 8-20i (figure 6) and 8-22i (figure 8). A battery backup system shall:

1. Be used to serve essential loads on the customer's premises, only.  
Have safeguards to prevent a parallel connection with the Department's electric system such as an external automatic transfer switch (ATS), manual transfer switch, or double throw safety switch that is listed by a Nationally Recognized Testing Laboratory for this application (example: *UL1008 standard for transfer switches*). See **EMERGENCY OR STAND-BY GENERATORS**, page 1-32 for additional information.

**V. Battery Backup Systems (Cont.)**

2. Be reviewed and approved by the Department before construction begins. Customer shall provide copies of the one-line diagrams and documentation describing modes of operation to the Department prior to start of construction. Review by the Department of Customer's specifications shall not be construed as confirming or endorsing the design, or as implying any warranty of safety or durability of the Customer facility. The Department shall not, by reason of review or failure to review, be responsible for strength, details of design, adequacy or capacity of the Customer facility or said equipment, nor shall the Department's acceptance be deemed to be an endorsement of the Customer facility.

**NOTE: Batteries shall not be located in the meter room.** See pages 5-9 and 5-10 for more information. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**W. Battery Peak Demand Shaving Systems**

Battery peak demand shaving systems are used for energy demand management and are typically operated in parallel with the Department's electric system (grid), see page 8-21i (figure 7). A battery peak demand shaving system shall:

1. Be used to monitor and control the customer's peak energy usage, only.
2. Not have customer owned CT's, monitoring devices or wiring located in any Department sealed section.
3. Be utility interactive and certified by a Nationally Recognized Testing Laboratory to fully comply with IEEE1547-2018 and UL1741SA or UL9540 for grid safety, see page 8-11i.
4. Not be used with Department Generation or NET energy metering or allow for the export of energy to the Department's grid, see page 8-21i (figure 7).
5. Only be operated in parallel with the Department's transmission and distribution system for more than one second if Customer has on file with the Department the latest version of the Customer Interconnection Agreement provided by the Department to address safe parallel operation of customer-owned battery energy storage systems.
6. Be reviewed and approved by the Department before construction begins. Customer shall provide copies of the one-line diagrams and documentation describing modes of operation to the Department prior to start of construction. Review by the Department of Customer's specifications shall not be construed as confirming or endorsing the design, or as implying any warranty of safety or durability of the Customer facility. The Department shall not, by reason of review or failure to review, be responsible for strength, details of design, adequacy or capacity of the Customer facility or said equipment, nor shall the Department's acceptance be deemed to be an endorsement of the Customer facility.

**NOTE: Batteries shall not be located in the meter room.** See pages 5-9 and 5-10 for more information. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**X. Battery Energy Storage Systems (BESS)**

Other battery energy storage systems are typically used to store energy for self-consumption and to provide emergency standby power to essential loads during a disturbance on the Department's electric grid, see pages 8-23i (figure 9) to 8-36i (figure 22) and 8-38i (figure 24). Storage systems of this type are operated in parallel with the Department's electric system (grid) and shall:

1. Not have customer owned CT's, monitoring devices or wiring located in any Department sealed section.
2. Be utility interactive and certified by a Nationally Recognized Testing Laboratory to fully comply with IEEE1547-2018 and UL1741SA or UL9540 for grid safety, see page 8-11i.

**X. Battery Energy Storage Systems (Cont.)**

3. Comply with the requirements for **BATTERY BACKUP SYSTEMS** when functioning in backup mode, see page 8-12i.
4. Not export to the grid though Department NET energy metering unless exclusively charged by eligible renewable parallel-generation. See pages 8-29i (figure 15) and 8-30i (figure 16) for additional information.
5. Include power controls that prevent the inadvertent export of energy when required under note 4 of this section. Power control settings shall be securely adjustable by the manufacturer or other qualified electrical worker as designated by the manufacturer. The customer shall not have direct access to power control settings. A settings compliance report shall be provided to the Department upon request.
6. Be operated parallel with the Department's transmission and distribution system for more than one second if Customer has on file with the Department the latest version of the Customer Interconnection Agreement provided by the Department to address safe parallel operation of customer-owned battery energy storage systems.
7. Be programmed to operate only in a manner which is consistent with the Department's Electric Service Requirements, and may require distribution system upgrades as determined after Department review to accommodate the total size of the electrical generating facility and the maximum capacity of all battery energy storage systems.
8. Be reviewed and approved by the Department before construction begins. Customer shall provide copies of the one-line diagrams and documentation describing modes of operation to the Department prior to start of construction. Review by the Department of Customer's specifications shall not be construed as confirming or endorsing the design, or as implying any warranty of safety or durability of the Customer facility. The Department shall not, by reason of review or failure to review, be responsible for strength, details of design, adequacy or capacity of the Customer facility or said equipment, nor shall the Department's acceptance be deemed to be an endorsement of the Customer facility.
9. Not be operated if Customer fails to provide any information requested by the Department regarding the solar electrical generating facility that includes such battery energy storage system.

**NOTE: Batteries shall not be located in the meter room.** See pages 5-9 and 5-10 for more information. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements

10. Comply with the following codes/standards or its successors, if applicable:
  - a. UL 1741/1741SA, UL 1793, UL 1973, UL 9540, UL 9540A
  - b. IEEE 1547-2018, IEEE 1547.1-2020, IEEE P2686, IEEE 519, IEEE 693
  - c. NFPA 1, NFPA 70, NFPA 70B, NFPA 855, NFPA 72
  - d. NEC 480, NEC 705, NEC 706
  - e. ANSI C84. 2006
  - f. CFC 1206, IFC-2018/2021
  - g. IEC 62933-5-2

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING (30KW OR LESS)

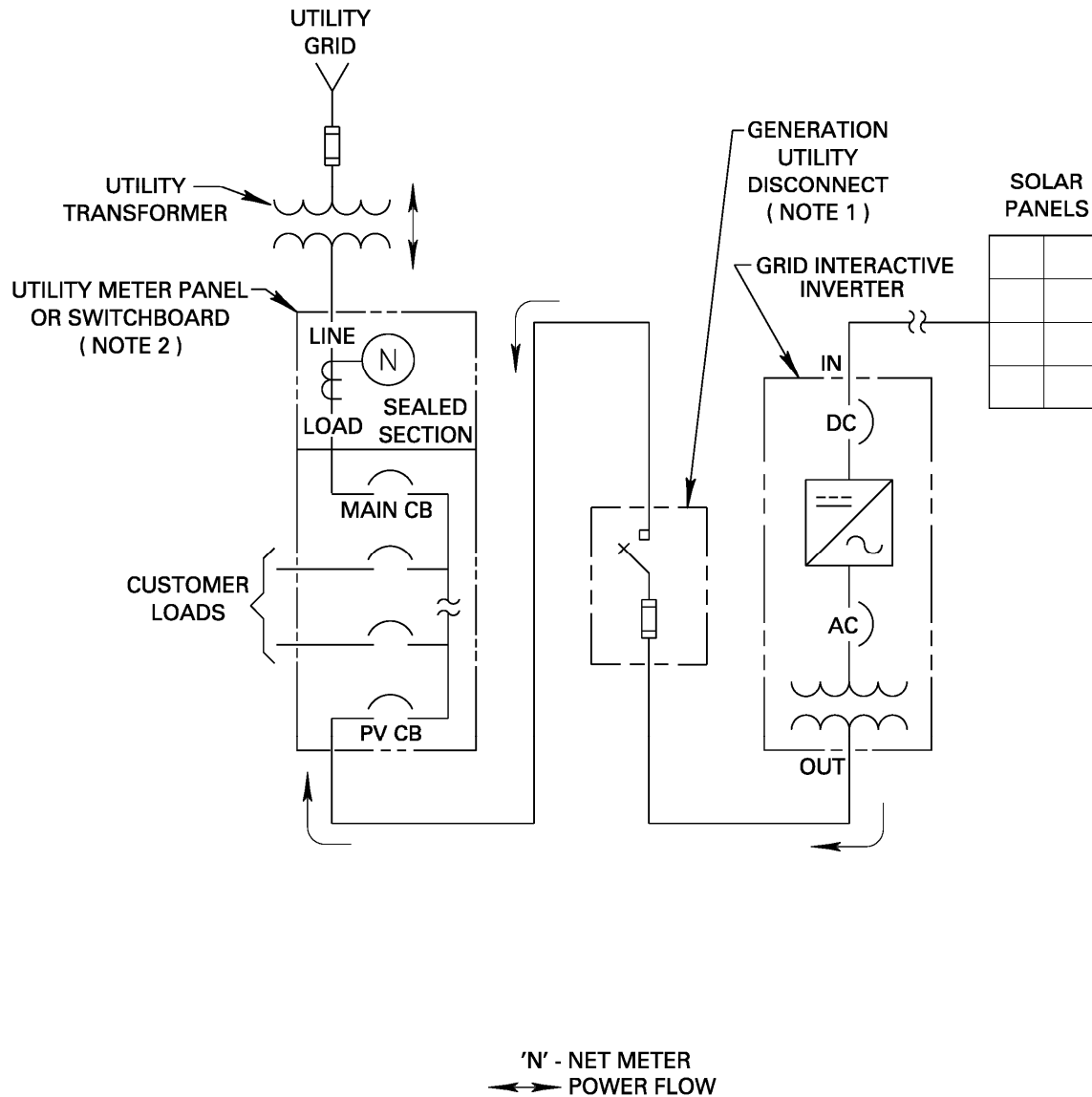
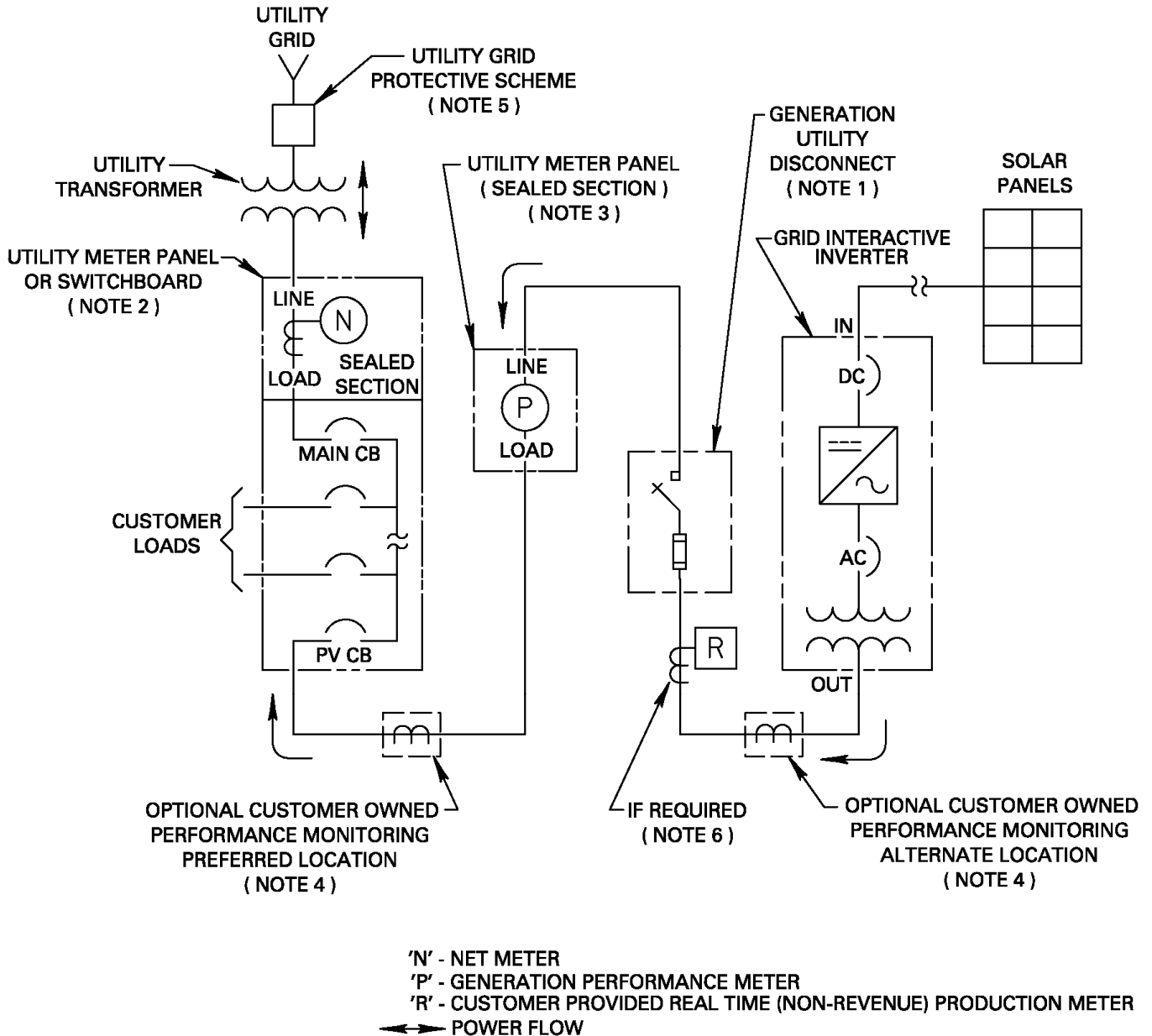


FIGURE 1

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING (GREATER THAN 30kW)**



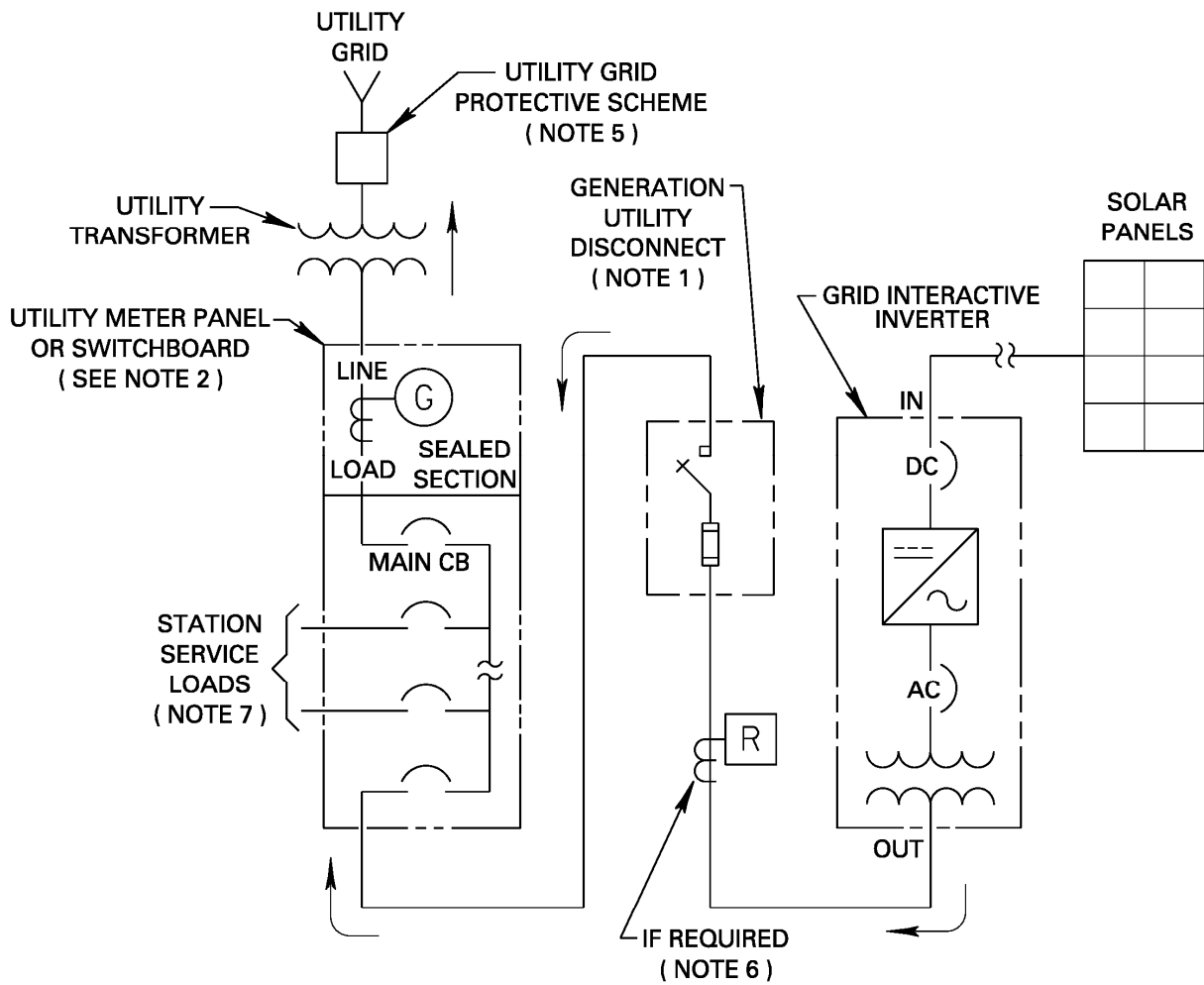
\*Solar NET energy metering is not available for total system capacities of 1MW and above.

**FIGURE 2**

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.



**TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR FEED IN TARIFF ( FIT ) GENERATION METERING  
( UTILITY-OWNED TRANSFORMER )**



'G' - GENERATION INTERCHANGE METER  
'R' - CUSTOMER PROVIDED REAL TIME (NON-REVENUE) PRODUCTION METER  
↔ POWER FLOW

**FIGURE 3**

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR FEED IN TARIFF ( FIT ) GENERATION METERING  
( CUSTOMER-OWNED TRANSFORMER )

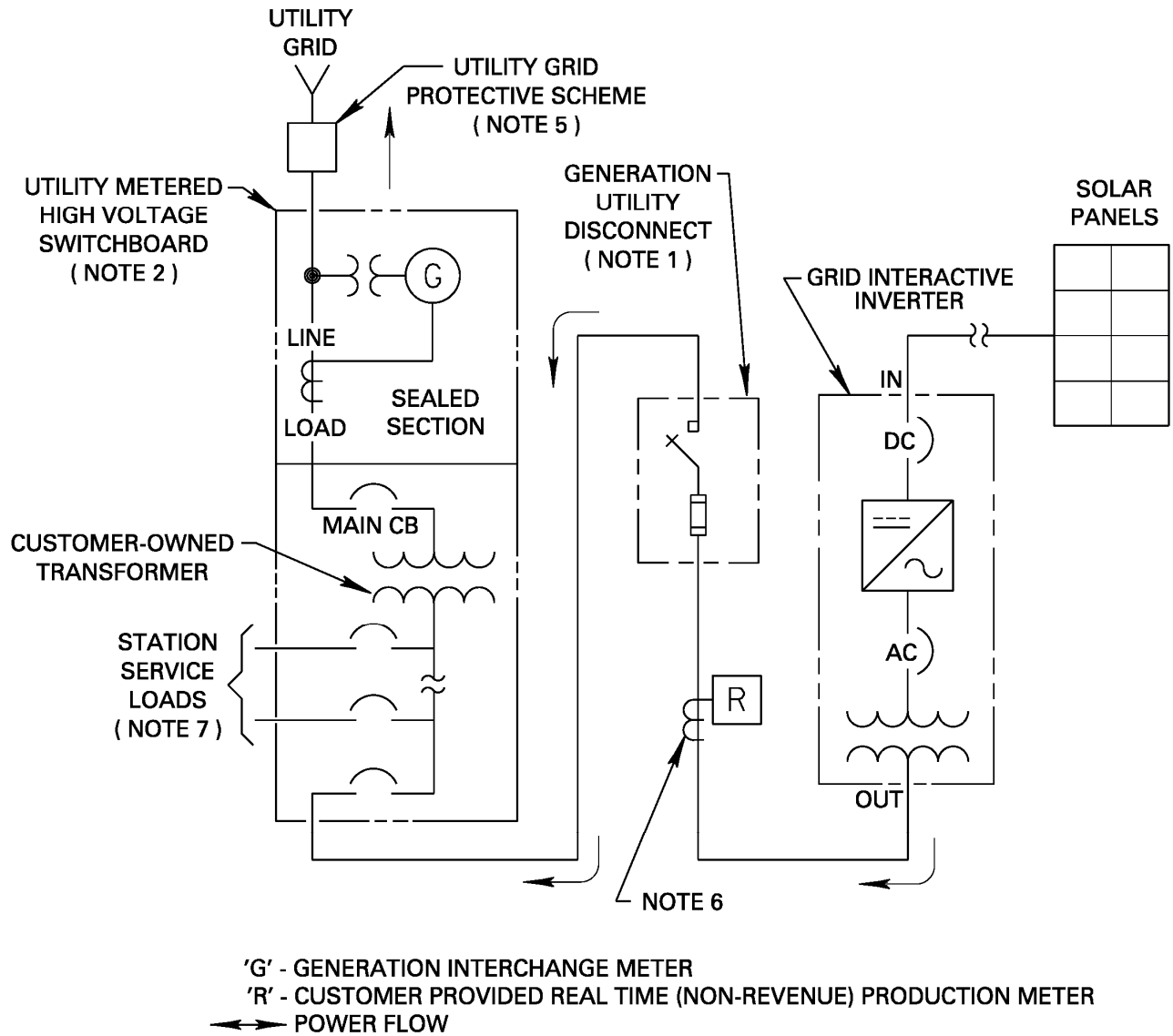


FIGURE 4

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SYNCHRONOUS GENERATION METERING

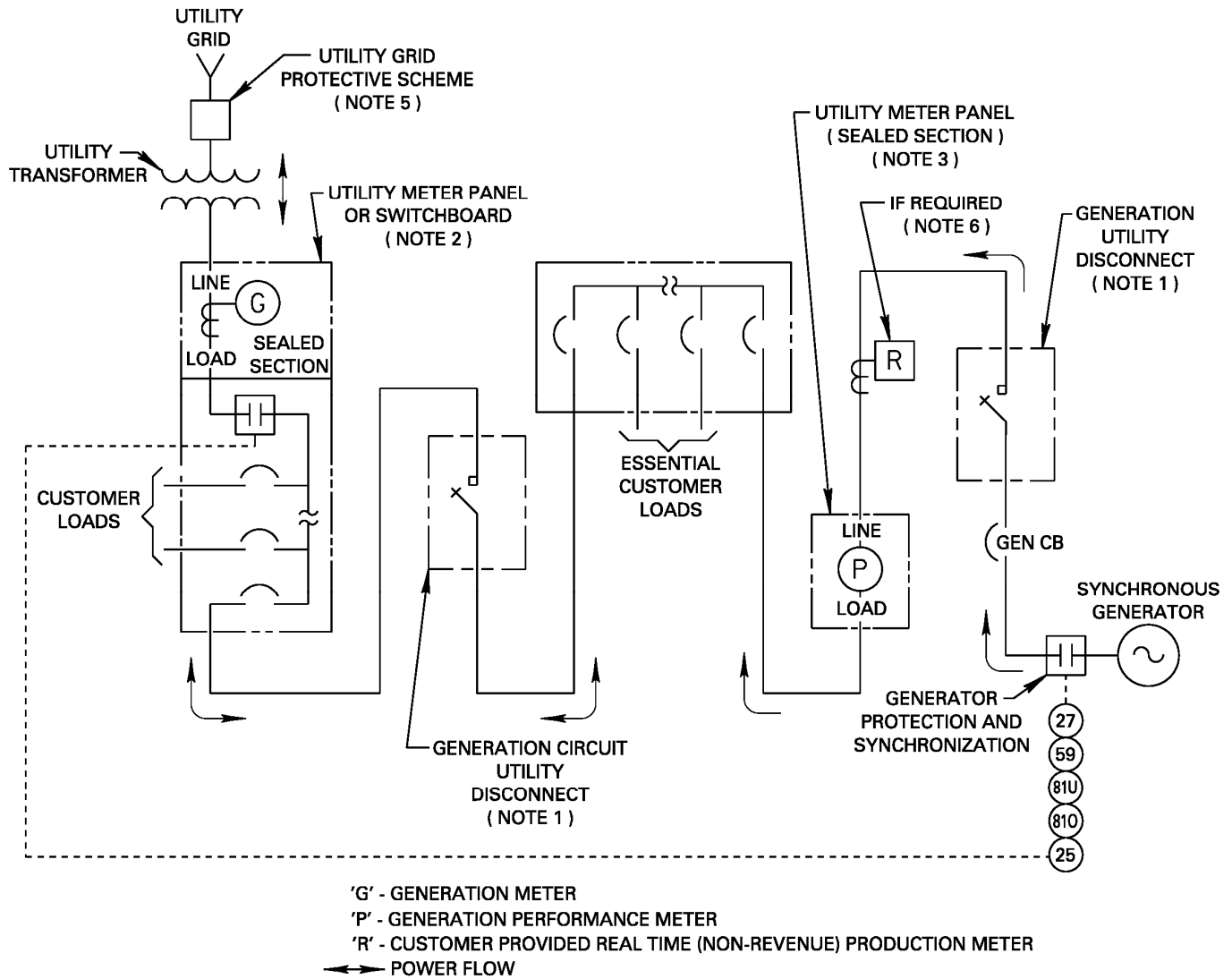


FIGURE 5

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
BATTERY BACKUP

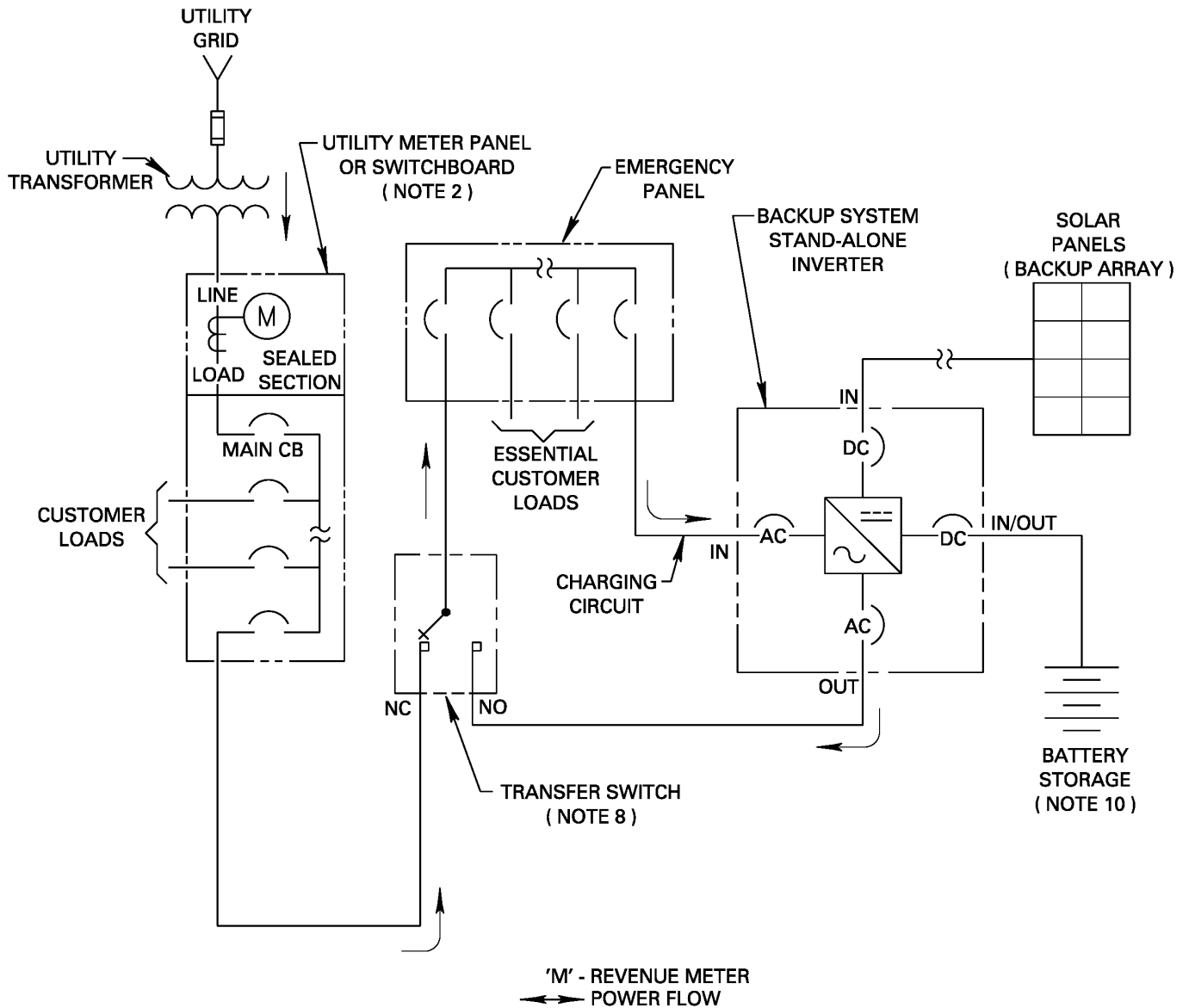


FIGURE 6

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
DEDICATED PEAK DEMAND SHAVING SYSTEM

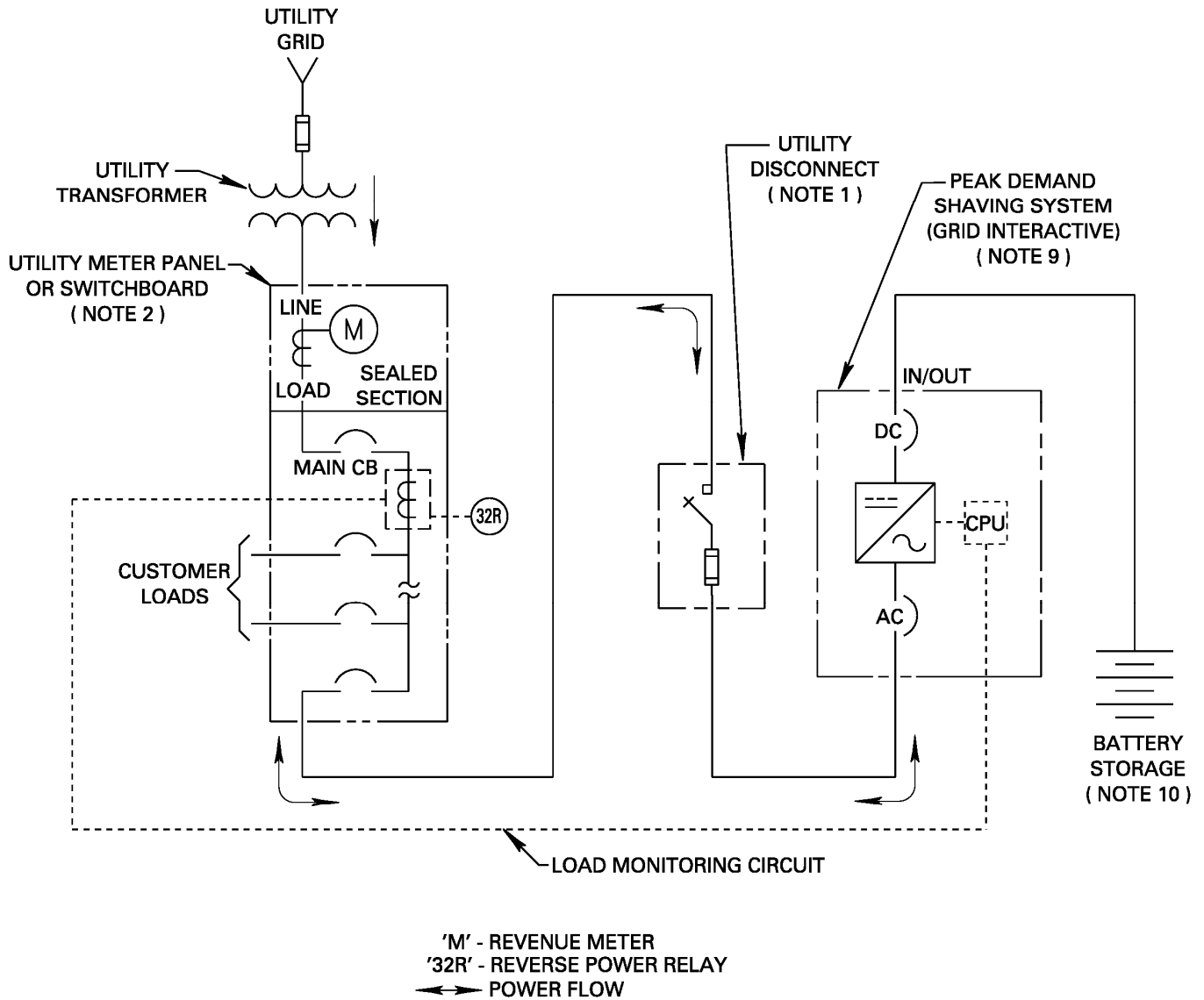
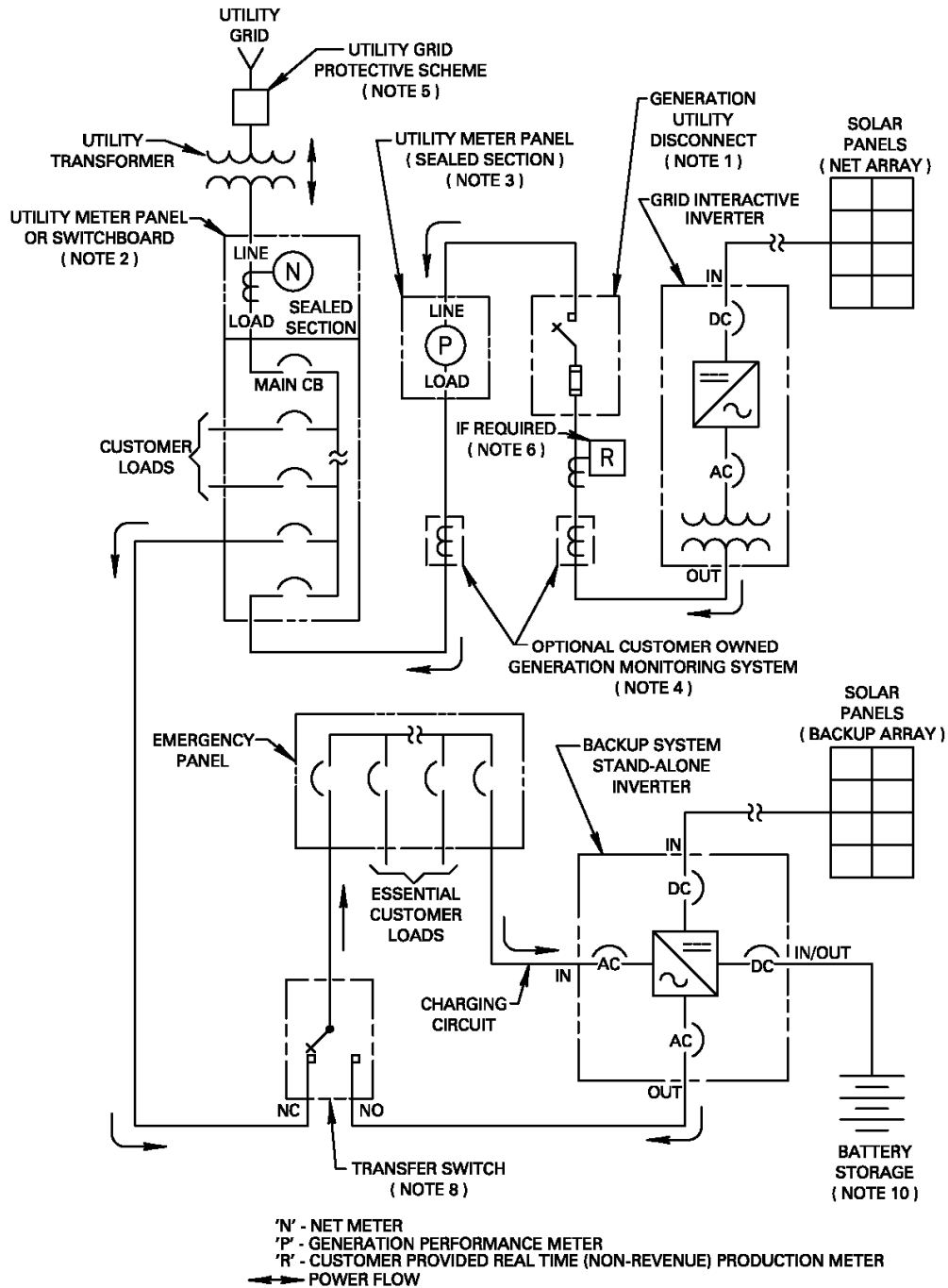


FIGURE 7

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING + BATTERY BACKUP  
AC-Coupled (GREATER THAN 30kW)**



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

**FIGURE 8**

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
DC-Coupled or AC-Back Coupled (30kW OR LESS)

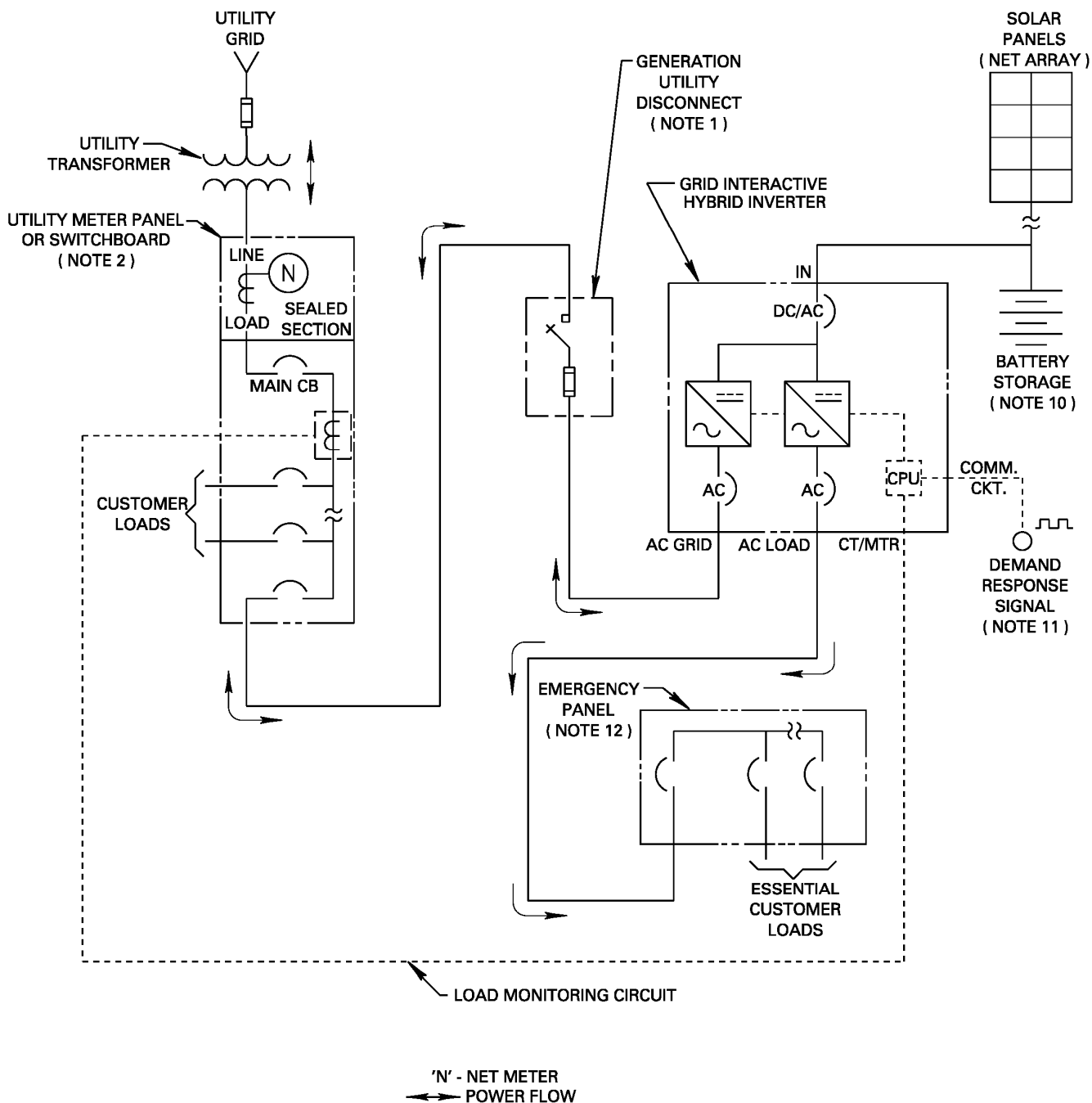
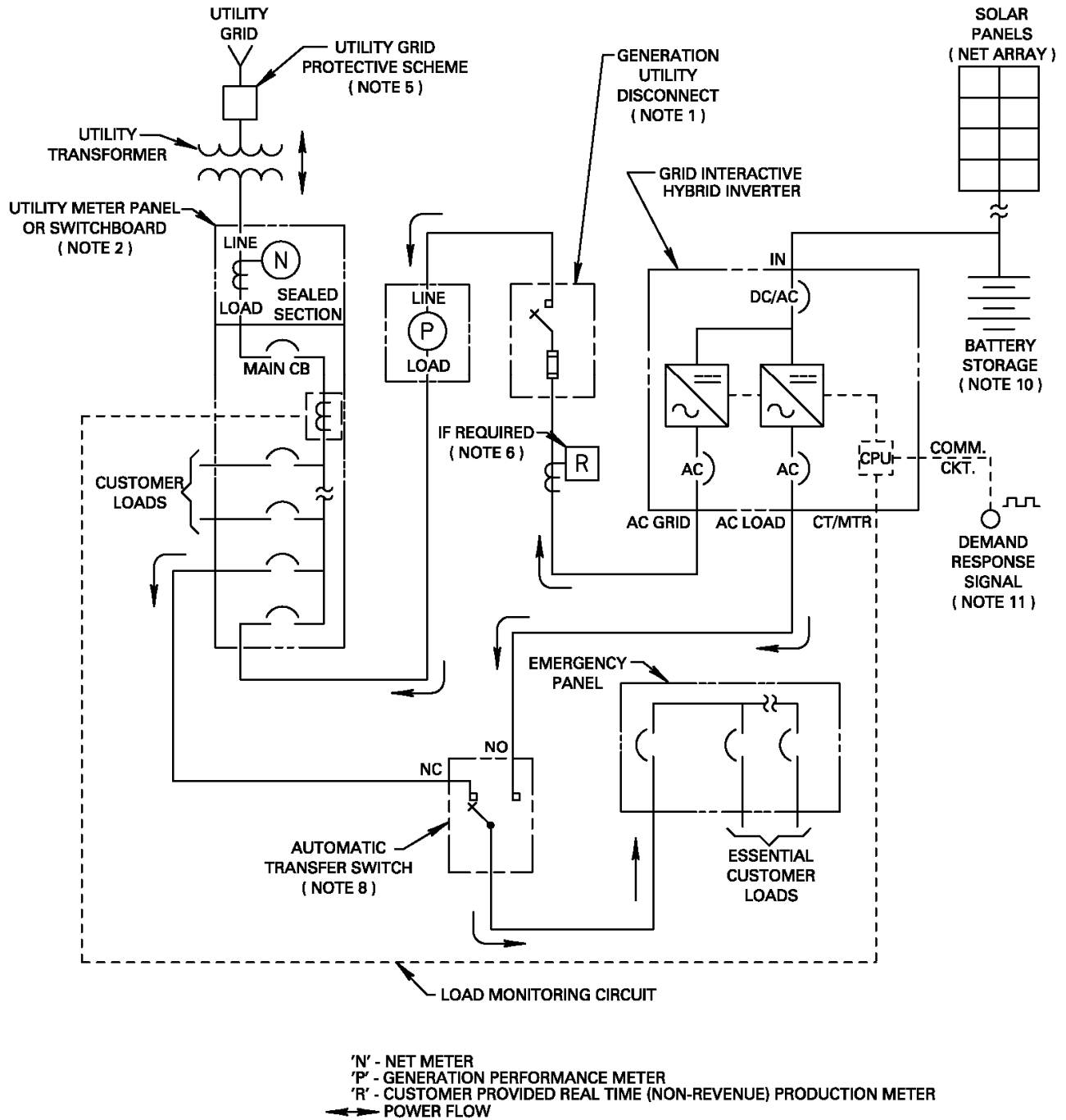


FIGURE 9

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
DC-Coupled or AC-Back Coupled (GREATER THAN 30kW)



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

FIGURE 10

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.



TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
AC-Coupled (30kW OR LESS)

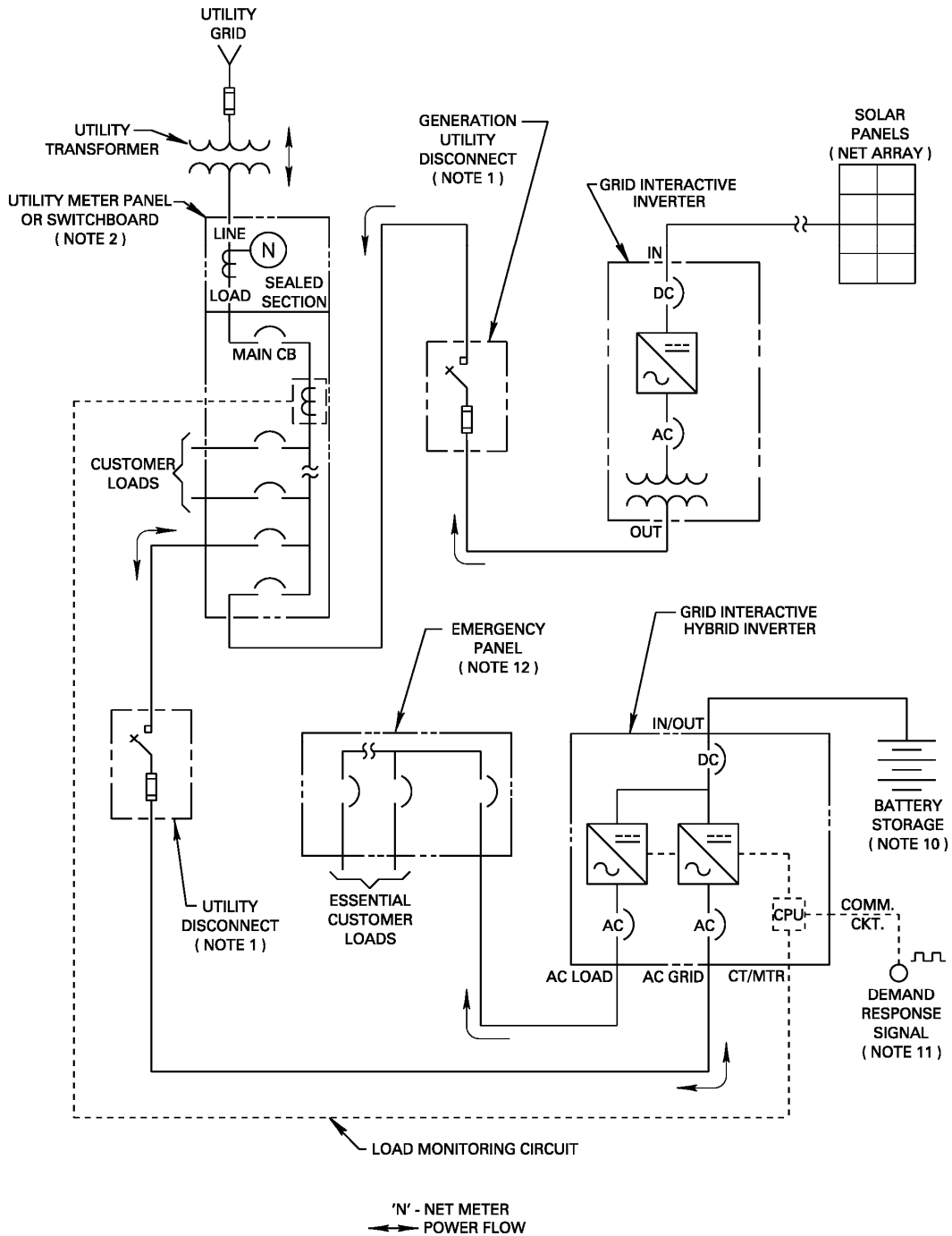
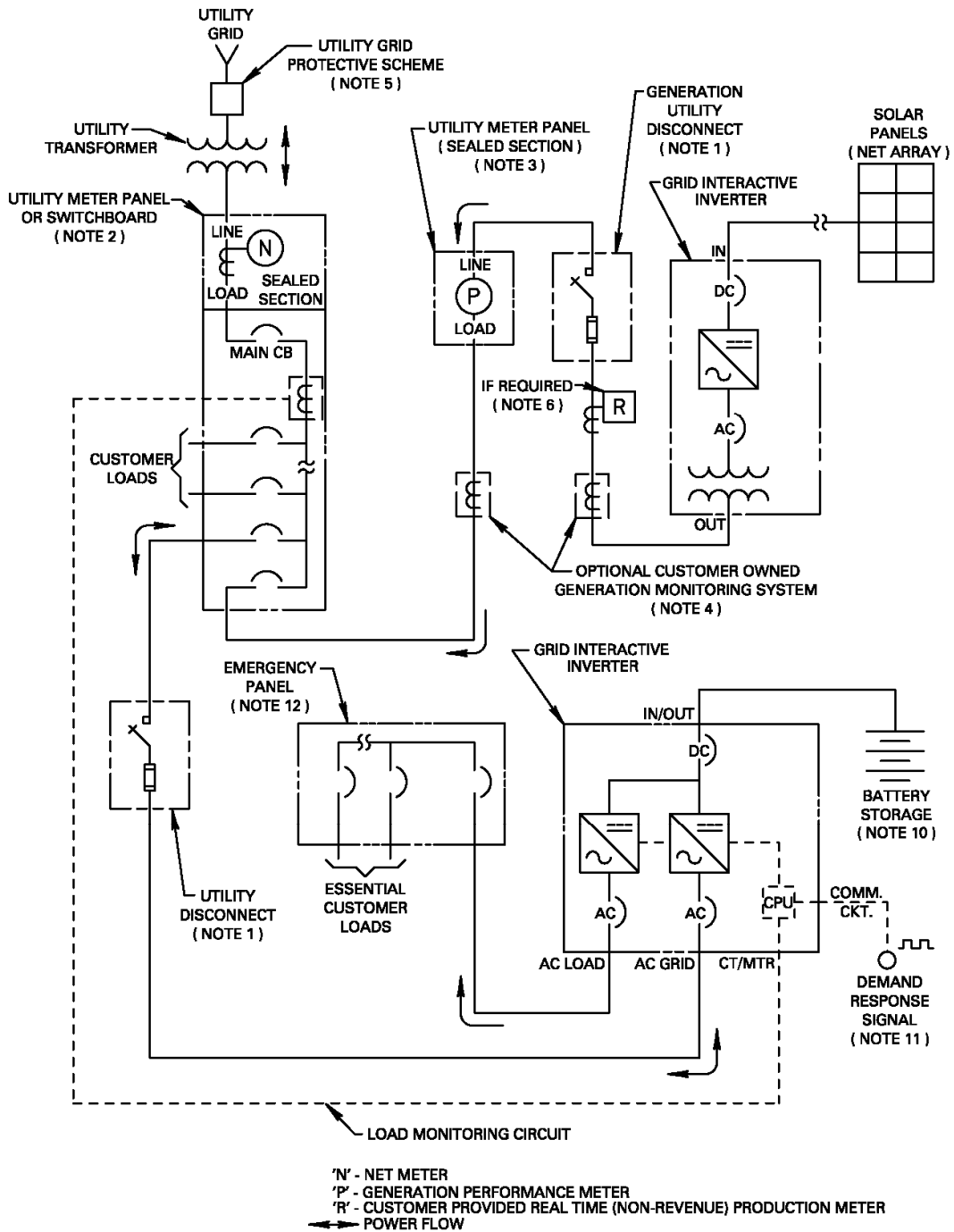


FIGURE 11

**Note:** This single line diagram has been simplified to illustrate the Department’s interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
AC-Coupled (GREATER THAN 30kW)**



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

**FIGURE 12**

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
MICROGRID - SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS)  
AC-Coupled with ISOLATION RELAY (30kW OR LESS)

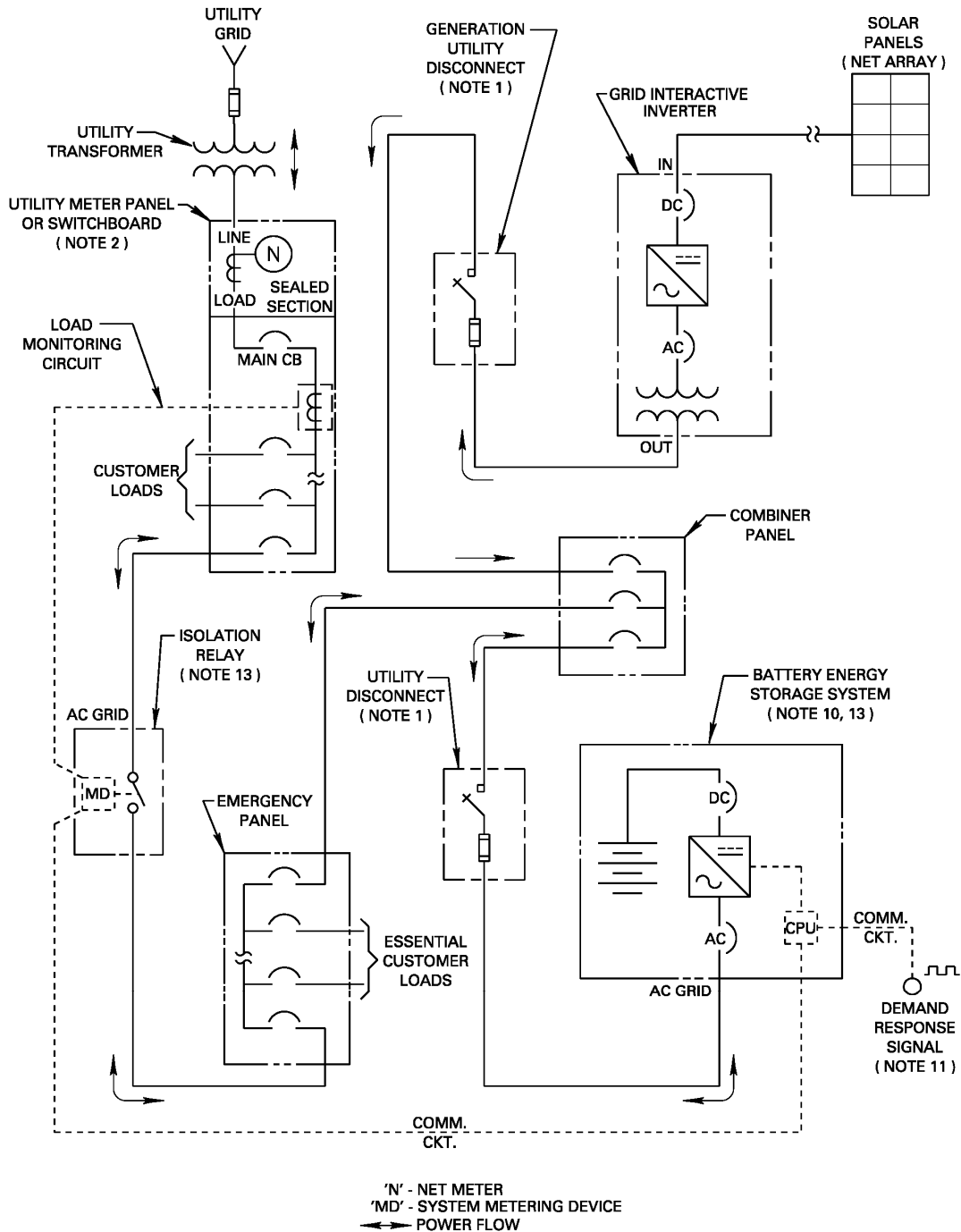
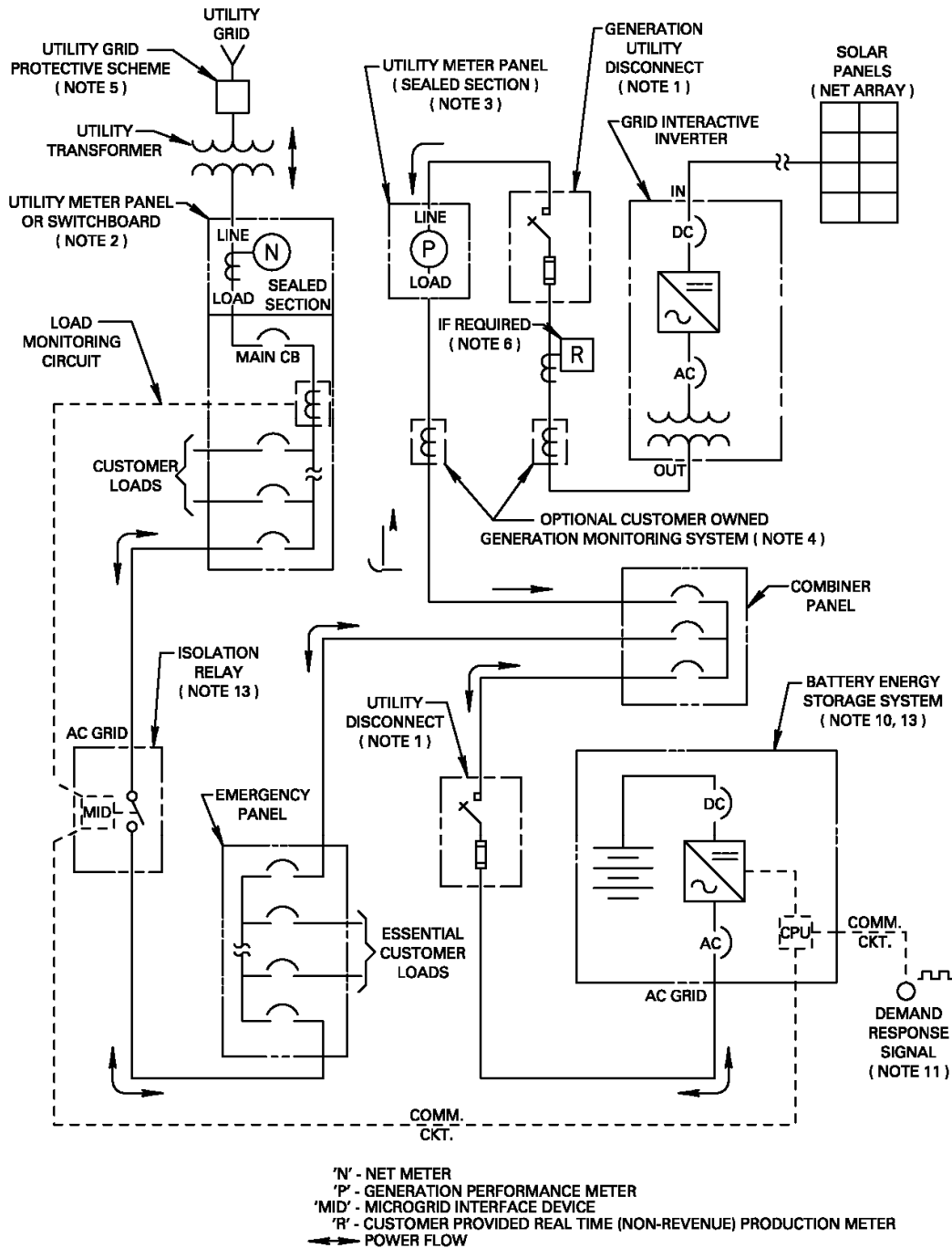


FIGURE 13

**Note:** This single line diagram has been simplified to illustrate the Department’s interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
MICROGRID - SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS)  
AC-Coupled with ISOLATION RELAY (GREATER THAN 30kW)



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

FIGURE 14

**Note:** This single line diagram has been simplified to illustrate the Department’s interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP

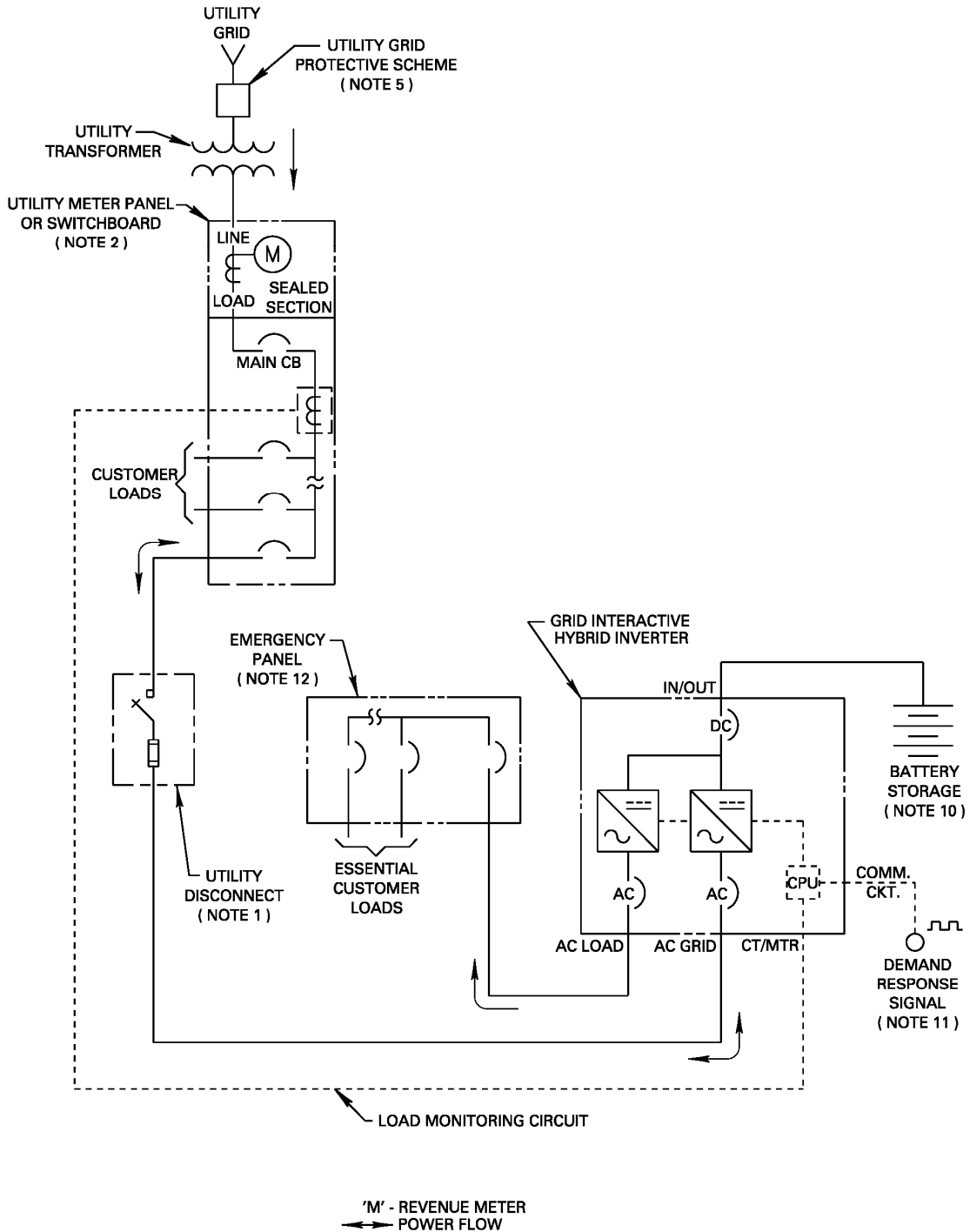
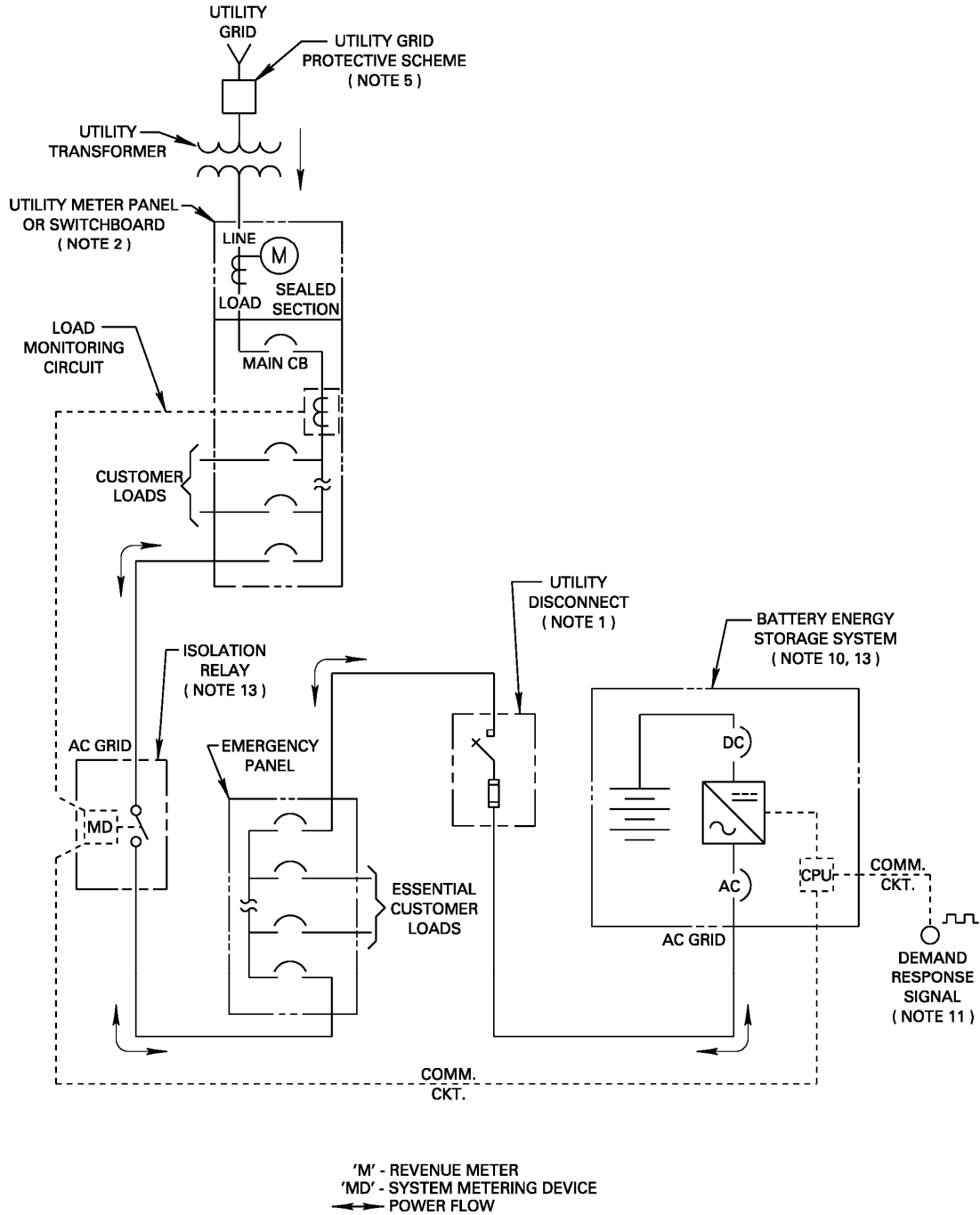


FIGURE 15

**Note:** This single line diagram has been simplified to illustrate the Department’s interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**TYPICAL INTERCONNECTION ARRANGEMENT  
MICROGRID - BATTERY ENERGY STORAGE SYSTEM (BESS)  
with ISOLATION RELAY**



**FIGURE 16**

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
AC-Back Coupled with load panel (30kW OR LESS)

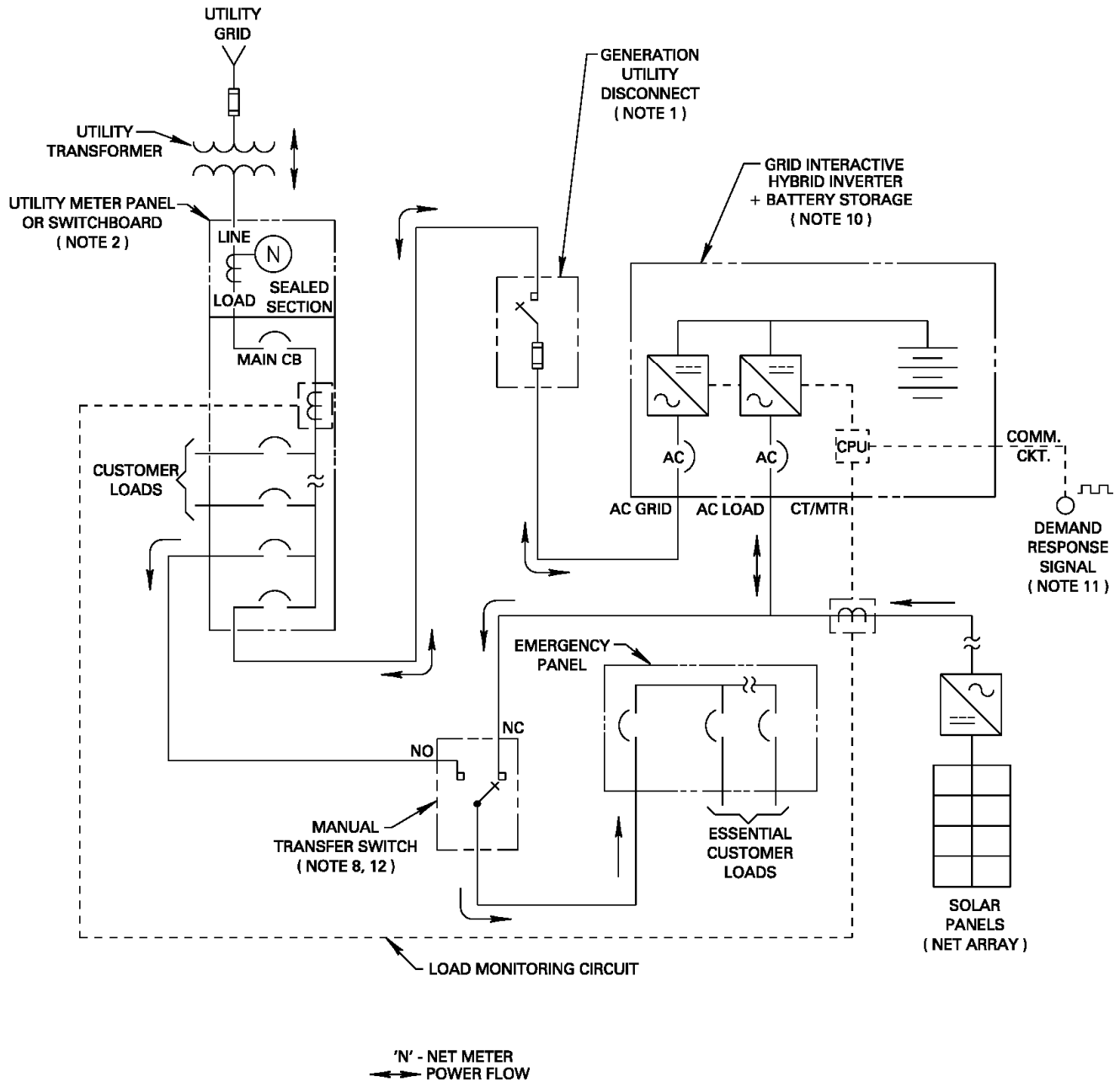
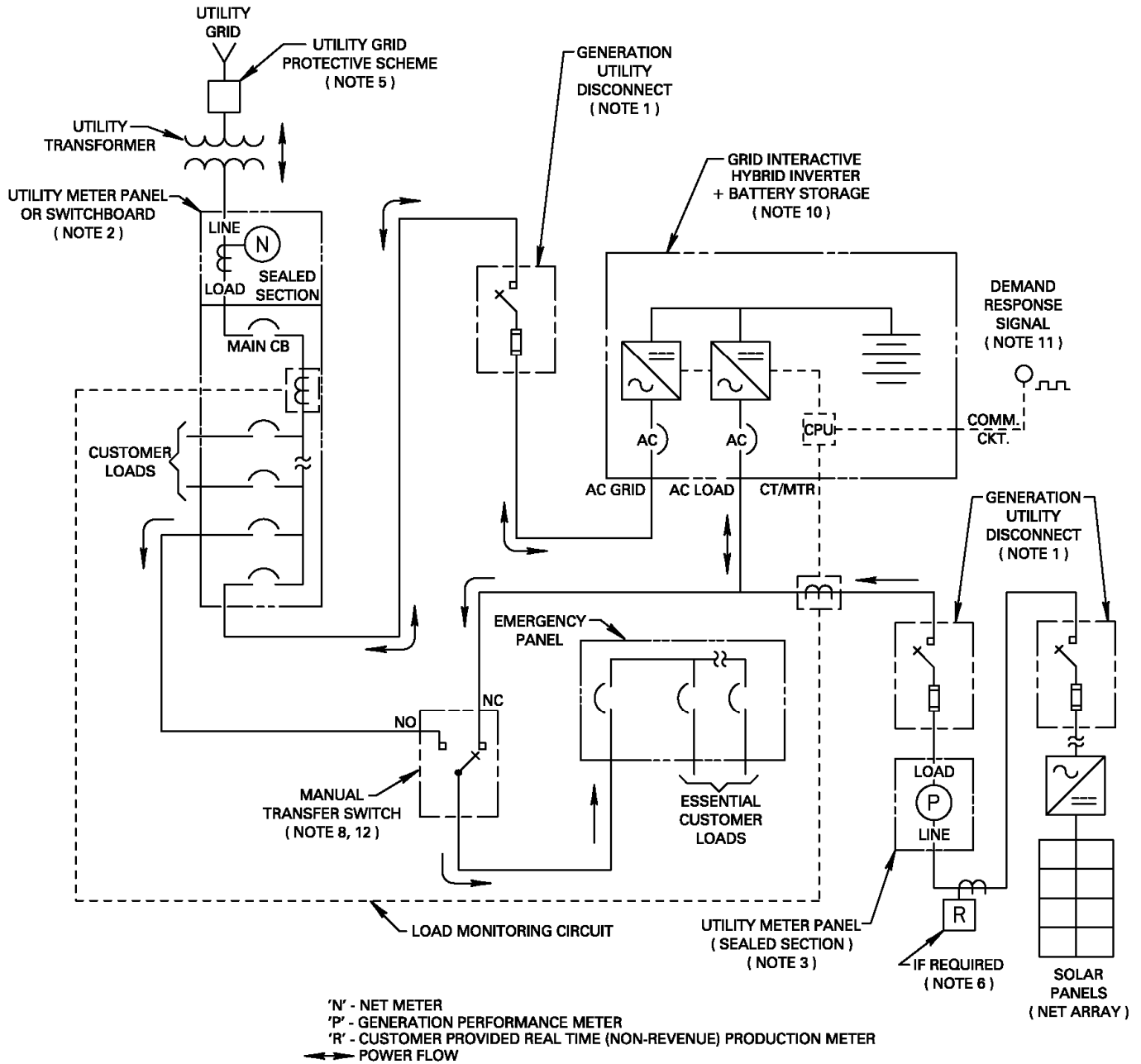


FIGURE 17

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
AC-Back Coupled with load panel (GREATER THAN 30kW)



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

FIGURE 18

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.



TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
*Alternate Design - AC-Back Coupled with load panel (30kW OR LESS)*

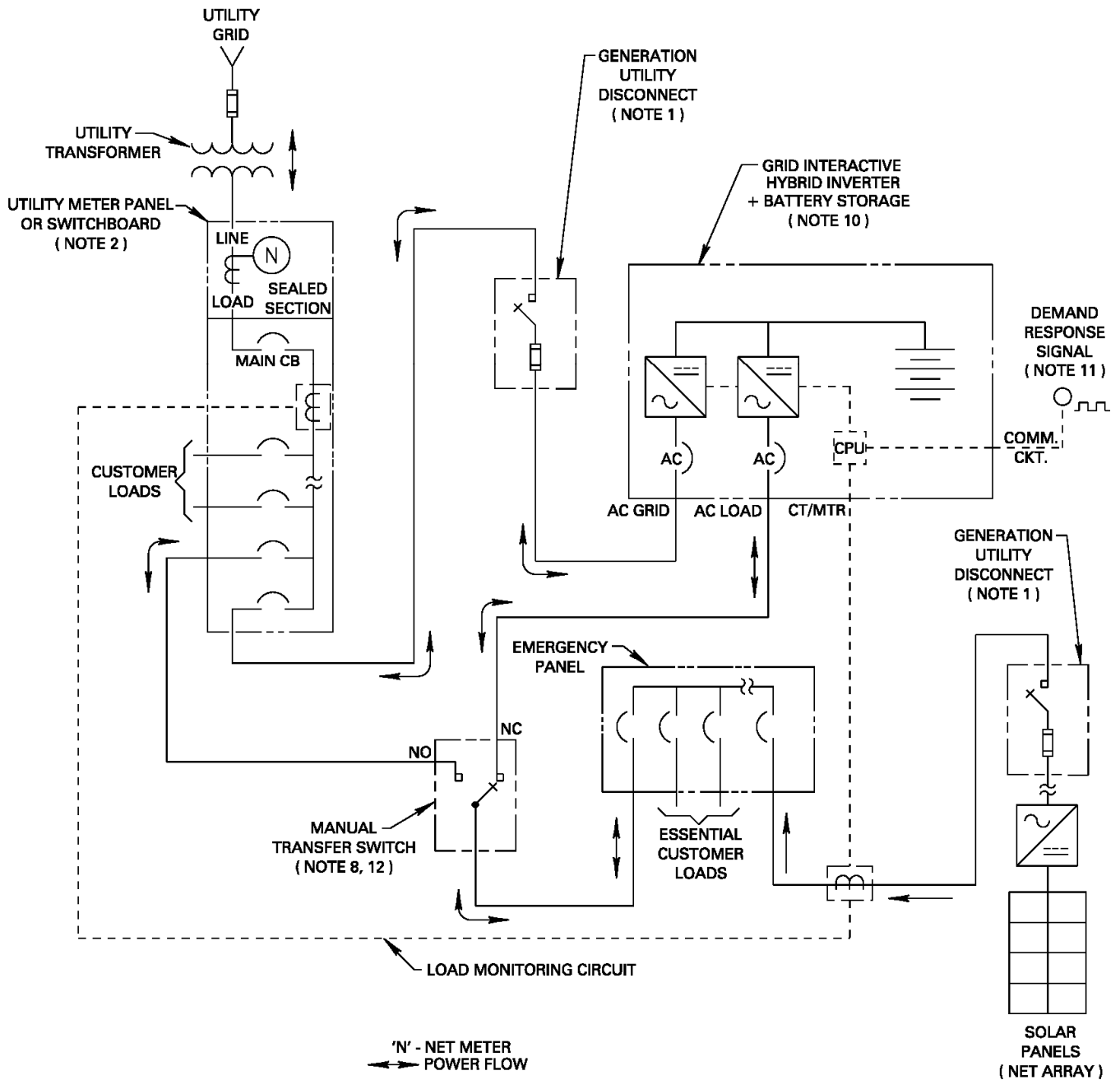
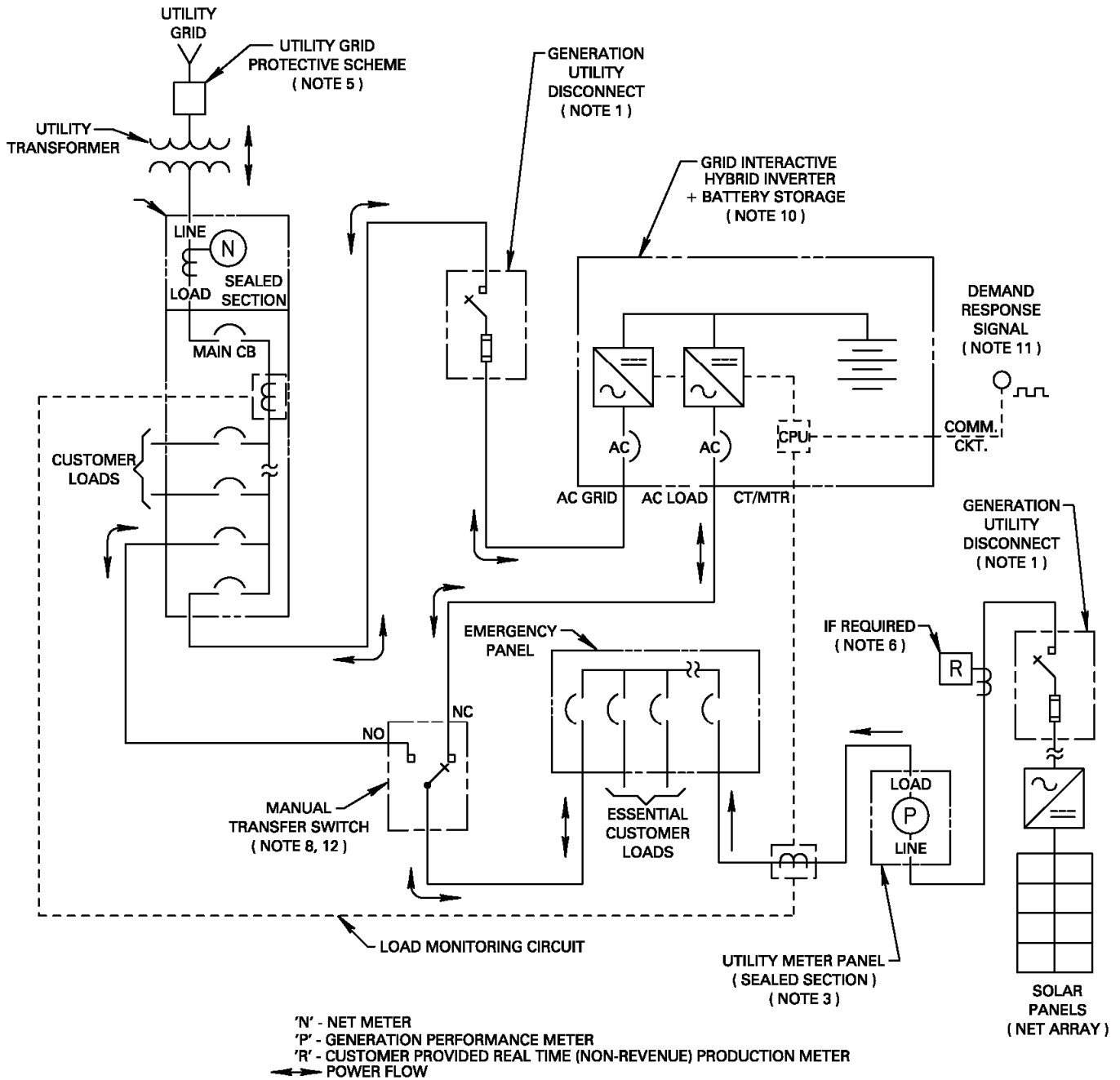


FIGURE 19

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS) + BACKUP  
*Alternate Design* - AC-Back Coupled with load panel (GREATER THAN 30kW)



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

FIGURE 20

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
ENERGY STORAGE INTERCHANGE METERING (DER Locational Capacity Services Only)  
( UTILITY-OWNED TRANSFORMER )

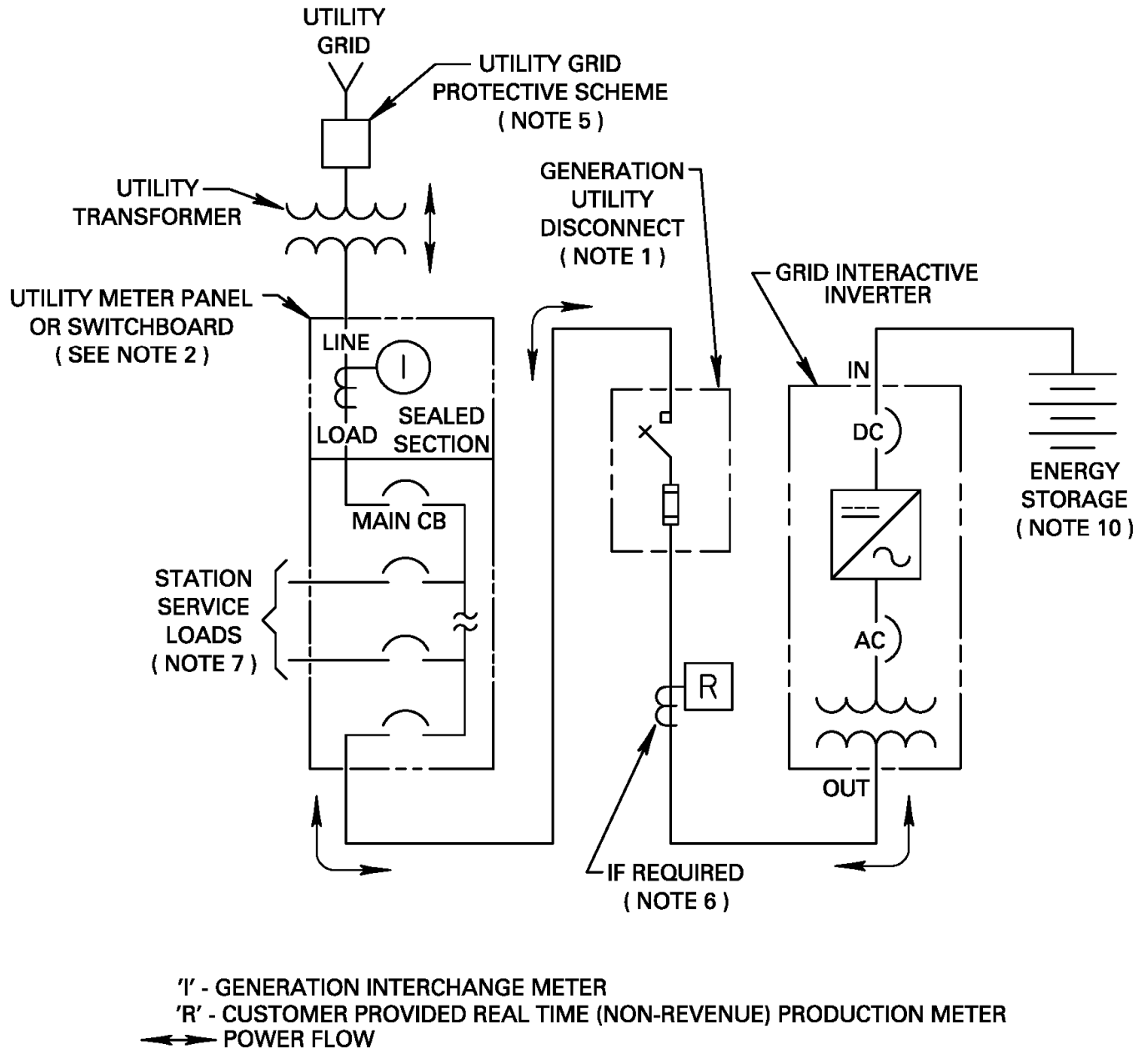
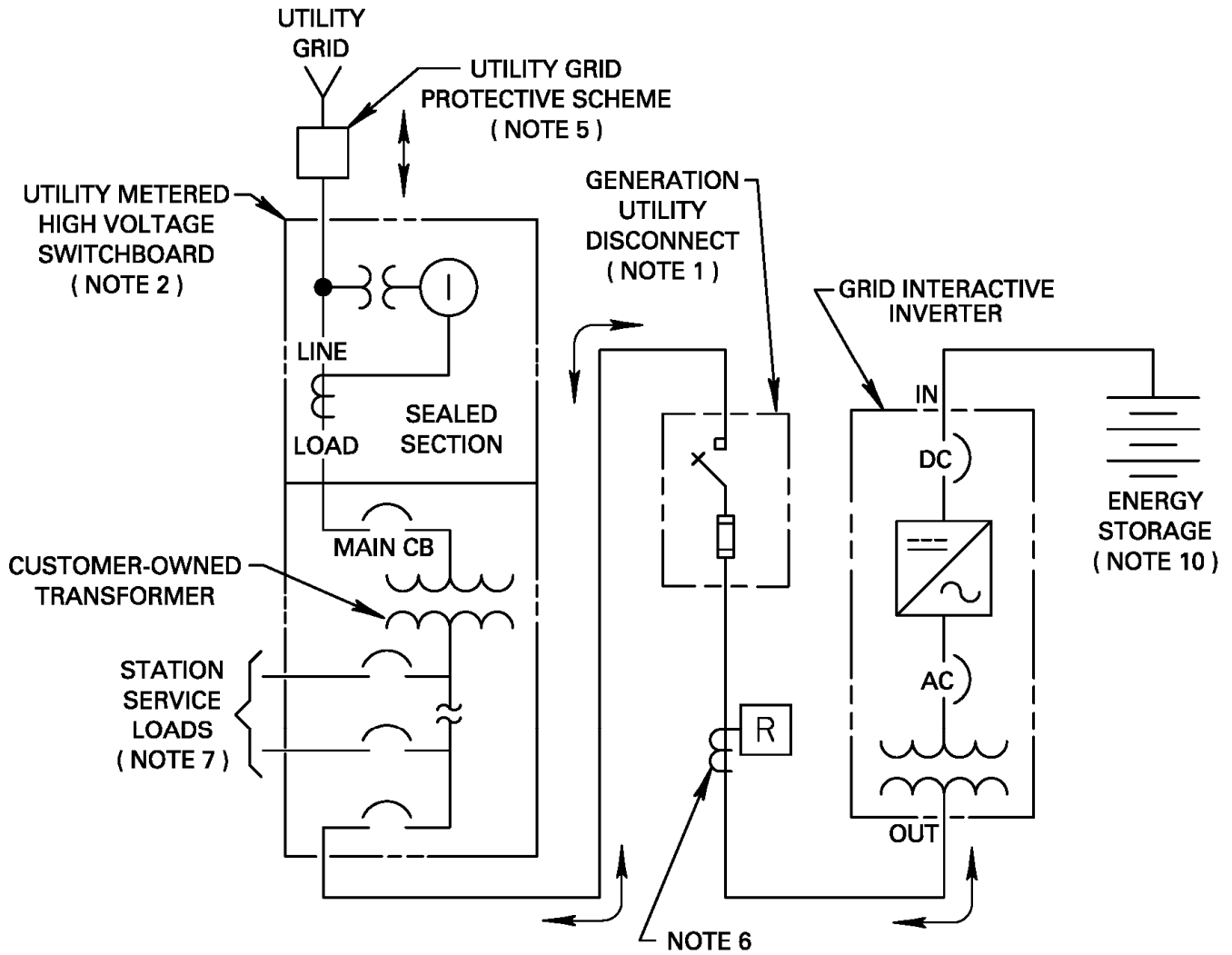


FIGURE 21

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
ENERGY STORAGE INTERCHANGE METERING (DER Locational Capacity Services Only)  
( CUSTOMER-OWNED TRANSFORMER )



'I' - GENERATION INTERCHANGE METER  
'R' - CUSTOMER PROVIDED REAL TIME (NON-REVENUE) PRODUCTION METER  
↔ POWER FLOW

FIGURE 22

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

TYPICAL INTERCONNECTION ARRANGEMENT  
INVERTER BASED MICRO-TURBINE AND FUEL CELL GENERATION METERING

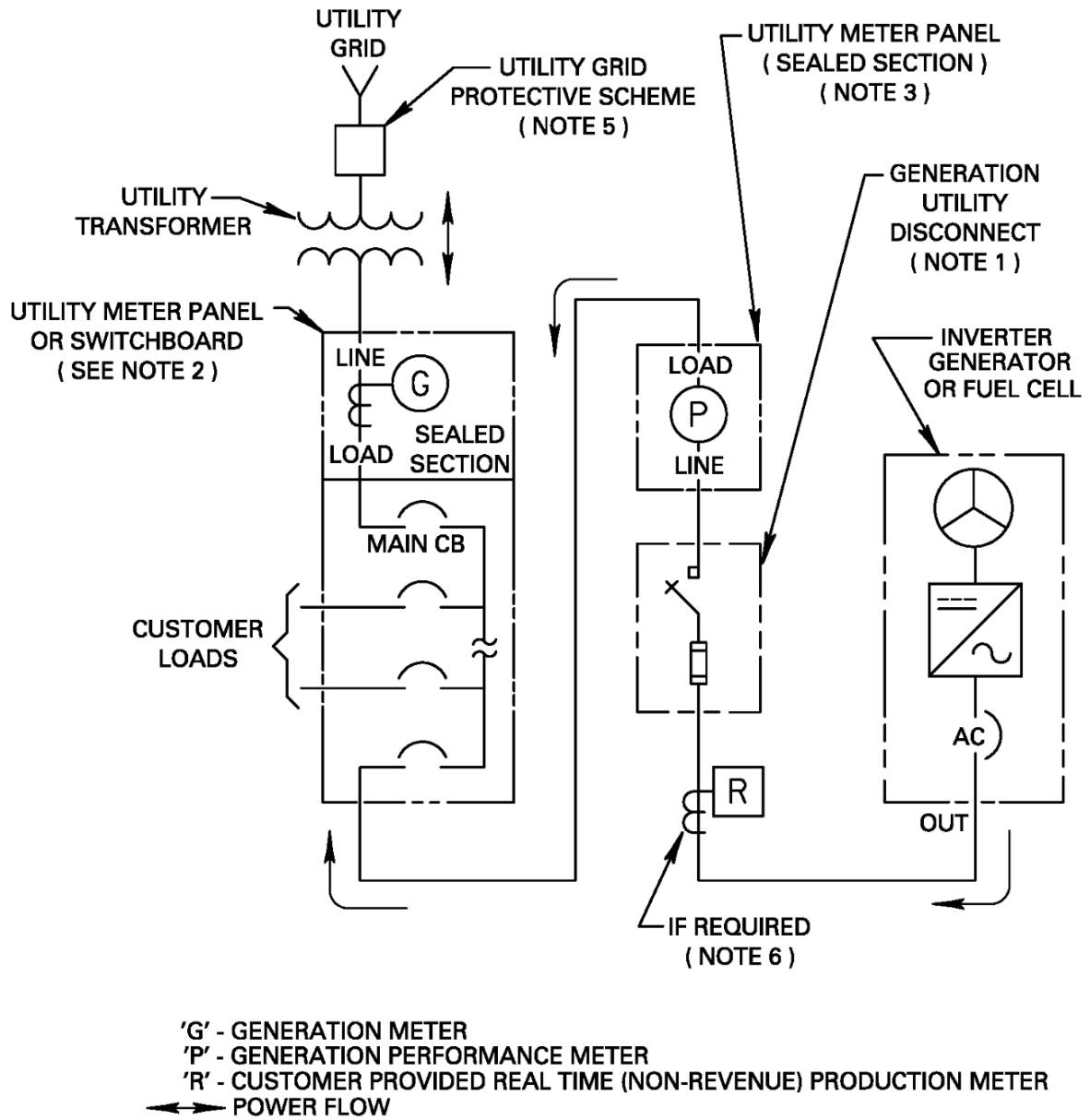
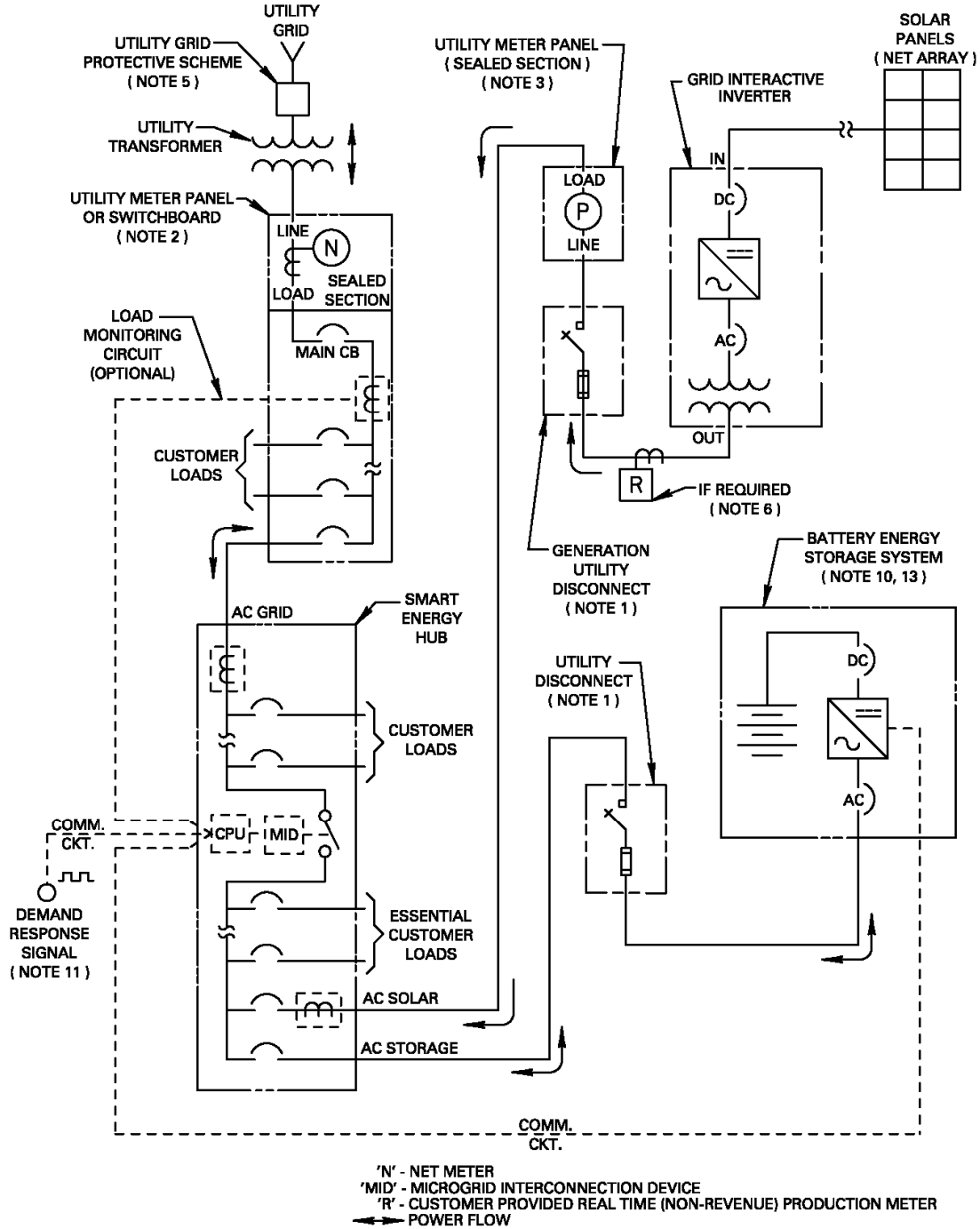


FIGURE 23

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

**TYPICAL INTERCONNECTION ARRANGEMENT**  
**MICROGRID - SOLAR NET ENERGY METERING WITH BATTERY ENERGY STORAGE SYSTEM (BESS)**  
**Energy Hub with ISOLATION RELAY (GREATER THAN 30kW)**



\*Solar NET energy metering is not available for total system capacities of 1MW and above.

**FIGURE 24**

**Note:** This single line diagram has been simplified to illustrate the Department's interconnection requirements and does not necessarily represent all possible equipment arrangements. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.

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Date: 07-20-23

## DESIGN GUIDE FOR CUSTOMER-OWNED PARALLEL GENERATING SYSTEMS

**NOTES:**

1. The customer shall furnish, install, and maintain all generation disconnect switches as required by the Department.
  - a. An AC disconnect switch shall be located on the customer's energy source side of the generation performance meter. Consult with the Department for mounting heights and clearances.
  - b. A single fusible disconnect may be used in place of a separate circuit fuse and AC disconnect. The fusible disconnect shall meet the same visual air gap and locking requirements as the AC disconnect and shall not be used to isolate the customer's load panel. See **UTILITY DISCONNECTING MEANS**, page 8-6i for additional information.
2. The customer's generating system circuit shall be connected on the load side of the customer's main service disconnecting means as shown in figures 1 to 5, and 7 to 24.

**Exception:** Parallel generating systems may be connected on the line side of the customer's disconnecting means as permitted by City, State or National Electric Codes. See **GENERATORS AND GENERATING SYSTEMS**, page 8-10i for additional information.
3. The customer shall provide a meter socket for the installation of a Department performance meter. A residential meter panel or a commercial safety-socket meter panel is required when the maximum output of the generating system does not exceed 200 amperes. When the system output exceeds 200 amperes, a current-transformer box or instrument-rated switchboard is required.

**Note:** The performance meter is intended to measure the total output of the customer's generating system. With the exception of monitoring equipment, no customer load is permitted on the generating system side of the performance meter. Under certain circumstances, and if required to measure total generation output, the Department may install additional performance meters at the customer's expense. See **METERING**, page 8-4i for additional information.
4. Optional customer installed performance monitoring equipment may be installed with restrictions, see **METERING** page 8-4i. Customers who wish to monitor their generations performance should consider consulting with their contractor for options when a Department supplied performance meter is not available.
5. The type of utility grid protection scheme required is dependent upon the size, type, and configuration of the customer's generation system, see **PROTECTIVE SCHEMES** page 8-7i.
6. Customer provided real time production monitoring equipment may be required as specified by the Department, see **PROTECTIVE SCHEMES** page 8-7i.
7. Currently, customer loads shall not be supplied from a feed in tariff (FIT) system. The customer must apply for a separate revenue meter and service from the Department.
8. An automatic transfer switch (ATS), manual transfer switch, or double throw safety switch shall be installed between the customer's backup system and the Department's revenue meter, see **BATTERY BACKUP SYSTEMS** page 8-12i and **EMERGENCY OR STAND-BY GENERATORS** page 1-32.
9. All systems that are designed to manage a customer's peak energy demand shall be grid interactive, see **INVERTERS** page 8-11i. Shall not be used with Department Generation or NET energy metering, and shall not allow for the export of energy to the Department's grid. All related devices shall be connected on the load side of the customer's main circuit breaker, see **BATTERY PEAK SHAVING SYSTEMS** page 8-13i.
10. **Batteries shall not be located in the meter room.** See pages 5-9 and 5-10 for more information. Contact the Los Angeles Department of Building and Safety (LADBS) or other Authority Having Jurisdiction (AHJ) for specific code requirements.



**NOTES (Cont.):**

11. Used for battery dispatch. No requirement at this time, standards are under development.
12. A normally open, maintenance bypass mechanical interlock shall be installed on an emergency panel provided it is affixed to the panel in a permanent, tamper-resistant fashion and is listed by a Nationally Recognized Testing Laboratory (NRTL) as an interlock device.  
**Note:** A double throw safety switch or ATS may also be used.
13. Battery energy storage system equipment that includes external isolation relays as part of an integral system shall be certified by a Nationally Recognized Testing Laboratory (NRTL) to comply with the UL 9540 standard.