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## I. General Requirements

### I.1 Manual Purpose and Scope

The purpose of this manual is to aid customers in obtaining service from the Power Company. It is the customer’s responsibility to ensure compliance with this manual; the customer is liable for all work performed by, or on behalf of, the customer, and any resulting loss or damage. This manual applies to new services, relocated services, house relocations, rewired services, and upgraded services. If additional information is required, please contact the Power Company at 1-888-221-7070 or via the internet at [www.pacificpower.net](http://www.pacificpower.net) or [www.rockymountainpower.net](http://www.rockymountainpower.net).

This manual shall be distributed and interpreted in its entirety. Individual pages will not represent all the requirements necessary for an installation. Printed versions of this document may be out of date. Please consult our websites for the most recent version.

### I.2 Customer and Power Company Defined

The term *Power Company* in this book refers to PacifiCorp, doing business as Pacific Power or Rocky Mountain Power.

The term *customer* is the party (or their agent) requesting electrical service from the Power Company.



### **I.3 Consulting the Power Company**

The instruction “consult the Power Company” indicates that the customer shall initiate discussion with a Power Company representative and shall obtain written approval from the Power Company prior to installation for special situations, meter socket locations, metering equipment locations, and any deviations from the requirements set forth in this book. Failure to receive prior written approval may result in denial of service until the nonconforming installation is modified to meet Power Company requirements. The customer shall be solely liable for any damage caused by a nonconforming installation, regardless of whether the Power Company has inspected the same and/or connects service.

Prior written approval requires that the customer and a Power Company representative discuss the project details before or during construction. Construction shall be conducted in accordance with the Electric Service Requirements Agreement (ESRA).

### **I.4 Changes or Conflicts in Requirements**

This manual is written with the intent to comply with all applicable codes, ordinances, and tariffs, as well as to implement common practices throughout the Power Company’s service territory. Common practices are implemented to:

- meet or exceed minimum safety codes and municipal building ordinances
- ensure fair and impartial requirements for all customers
- use safe work procedures by following established Power Company standards
- facilitate the privacy and security of current and future customers and occupants

This manual cannot address every possible situation. Consult the Power Company for situations not addressed by this manual that require clarification to meet the intent of this manual.

Electric service requirements may change if governing codes, ordinances, or tariffs change. Power Company standards shall be used to design a solution that meets (or exceeds) the minimum requirements of the tariff, code, or ordinance

### **I.5 Maximum Available Fault Current**

The customer shall furnish equipment to withstand available fault current. Upon request, the Power Company will supply information on the maximum fault current available at the customer’s service entrance.

### **I.6 Customer’s Responsibility for Safety**

The customer shall comply with federal, state, and local laws and regulations concerning activities in the vicinity of the Power Company’s electrical lines and equipment. The customer shall comply with all laws and regulations to protect themselves, their family, their employees, the Power Company and its employees, contractors, and all third parties from injury, loss, or damage.



## I.7 Work Activity Near High-Voltage Overhead Power Lines (Over 600 V)

To protect those working near overhead power lines from accidental contact, states have enacted laws and rules addressing work around high voltage overhead lines.

Please refer to the states' statutes and Occupational Safety and Health Administration (OSHA) regulation that clearly identify the distance you must maintain while performing any work near overhead power lines.

If you or your contractor are going to be working near overhead lines, please contact the Power Company at 1-888-221-7070. The Power Company will work with you on appropriate precautions that may include the following:

- Coordinate work activity schedules
- Place temporary mechanical barriers
- Temporarily de-energize and ground the lines
- Temporarily raise or move the lines

The customer is responsible for the cost of implementing satisfactory precautions.

## I.8 Temporary Service Disconnect

Ensuring safe work practices on customer-owned equipment may require a temporary service disconnect from the Power Company's facilities; please contact the Power Company at 1-888-221-7070 to coordinate disconnection.

## I.9 Grounding and Bonding

Grounding and bonding are critical for safety and electrical reliability. The customer is responsible for ensuring electrical wiring and service equipment are grounded and bonded in accordance with applicable NEC requirements.

All grounding is per NEC Article 250 and is represented by the following symbol in the figures in this manual:



## I.10 Vegetation and Accessibility

The customer shall prepare and maintain the premises such that trees, shrubs, or other vegetation do not interfere with Power Company access to all facilities, including poles, pad-mounted equipment, overhead equipment, underground conduit or cable, or metering equipment. (See Section 4, *Clearances*.)



### I.1.1 Barrier Posts

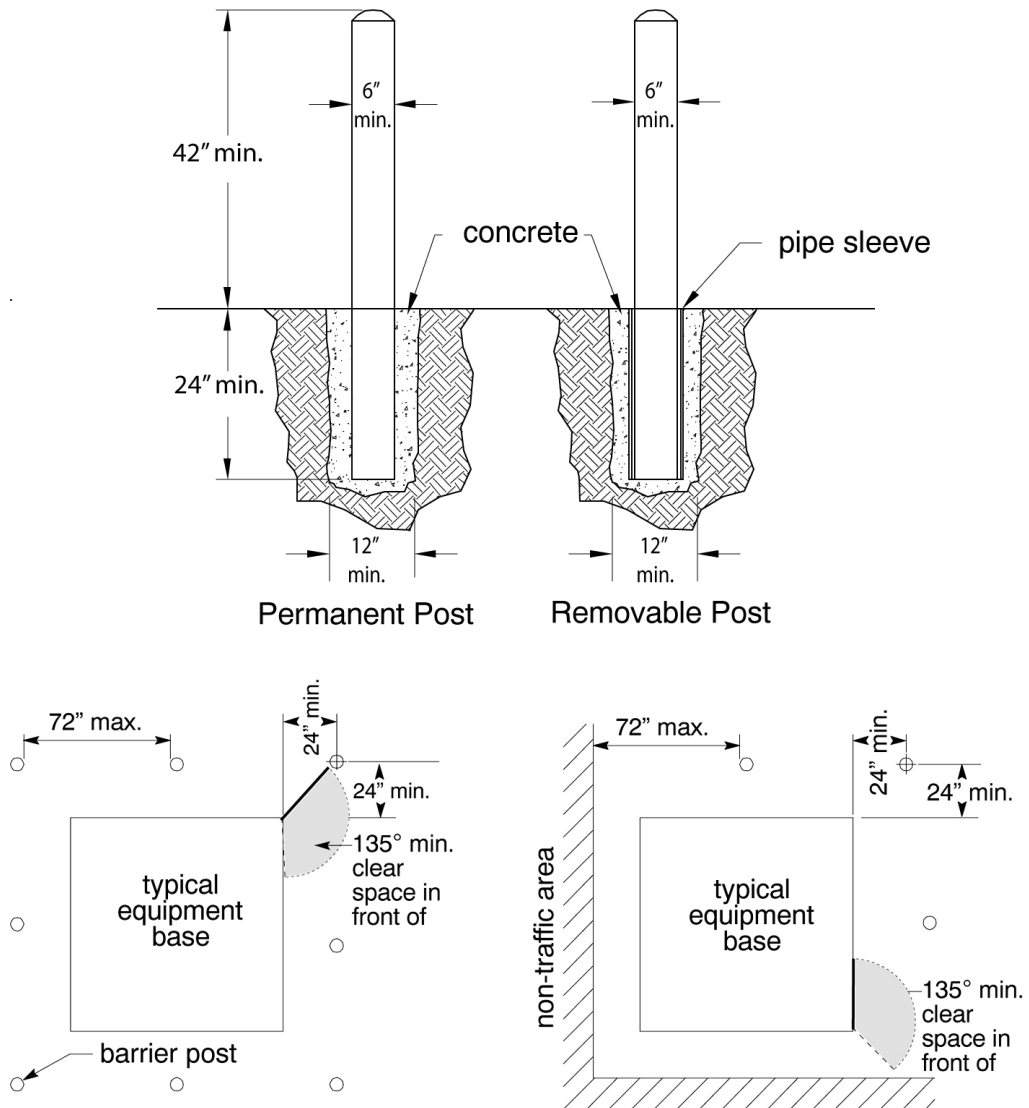
Barrier posts shall be provided by the customer in locations where vehicular traffic may pose a threat to utility equipment.

See Figure 1 for details on barrier posts. Consult the Power Company regarding barrier post location prior to installation.

#### Requirements:

1. Barrier posts shall be six-inch-diameter steel or concrete suitable for local environmental conditions.
2. Steel posts may be filled with concrete.
3. Posts shall have a domed top, free of burrs and sharp edges.
4. Barrier posts shall be placed so as not to obstruct the opening of the equipment doors (doors shall open at least 135 degrees), nor to impede the operation of the equipment. If such positioning is not possible, removable posts shall be used in the obstructive location(s).
5. Each barrier post shall be set in a concrete foundation at least 12 inches (12") in diameter and 24 inches (24") in depth below grade. See Figure 1 for additional space and dimension requirements.
6. Enough barrier posts shall be installed to adequately protect utility equipment from damage.
7. Temporary barrier posts may be required during construction.

**Figure I—Barrier Post Details**



## I.12 Customer Equipment on Power Company Poles

Customer-owned metering equipment, switching devices, conduits, conductors, luminaires, etc., shall not be mounted on a Power Company pole.

## I.13 Call Before You Dig

State laws require the customer/excavator call 8-1-1 for underground utility cable locations at least 48 hours prior to any excavation. Excavation shall not start until facilities have been marked by an underground locator service, or until the service confirms that no facilities exist in the area.



## I.14 Power Quality

### I.14.1 General

The characteristics of the customer's electrical equipment and devices must allow the Power Company distribution system to operate efficiently without undue interference to the Power Company's service or to other customers. When a customer's equipment has characteristics that cause undue interference with Power Company service to other customers, the customer shall make equipment changes or provide, at customer expense, additional equipment to eliminate the interference.

To eliminate the possibility of equipment interference, the customer should submit to the Power Company prior to installation all information regarding equipment that might cause power quality problems.

The Power Company's power quality, voltage, and harmonics standards are located online at: [www.pacificpower.net/con/pqs.html](http://www.pacificpower.net/con/pqs.html) and [www.rockymountainpower.net/con/pqs.html](http://www.rockymountainpower.net/con/pqs.html).

### I.14.2 Voltage Performance

Electric service supplied by the Power Company may be subject to voltage disturbances that may, but do not normally, affect the performance of typical electrical equipment. These disturbances may cause voltage-sensitive equipment, such as computers or microprocessors to shut down. The customer shall provide any power-conditioning devices needed to obtain the quality of power necessary for optimum performance of voltage-sensitive equipment.

### I.14.3 Harmonics

The effects of the design and operation of high-frequency equipment such as electronic heating systems, spark discharge devices, radio transmitting equipment, etc., and equipment that generates harmonics, such as an induction furnace, shall not create



disturbances on the Power Company's electrical system that interfere with any other customer's proper operation of communication, radio, television, remote control, or other equipment.

Devices that can produce harmonic distortion (such as adjustable speed drives, electronic ballasts for fluorescent lighting, and switching power supplies for computers and electric vehicles) shall be filtered such that the harmonic distortion caused by these devices is kept within the limits specified in the Institute of Electrical and Electronics Engineers (IEEE) Standard 519, Section 10. Compliance with this requirement is judged by the Power Company's measurement at the service point, otherwise known as "the point of common coupling."

The customer can more easily stay within harmonic distortion limits by requiring their supplier to provide "low harmonic current distortion" equipment.

### **I.15 Power Factor**

The Power Company's currently-filed tariffs charge for "low power factor" for certain commercial, agricultural and industrial customers. Low power factor may cause inferior performance of the customer's electrical system. The Power Company recommends that the customer install corrective devices to make the most effective use of the electrical system. If the customer would like to determine potential savings during design, the tariff can be obtained online at [www.pacificpower.net/about/rr.html](http://www.pacificpower.net/about/rr.html) or [www.rockymountainpower.net/about/rar.html](http://www.rockymountainpower.net/about/rar.html), or contact the Power Company at 1-888-221-7070.

### **I.16 Motors**

#### **I.16.1 Protection**

To ensure adequate safety and protection, the customer is responsible for providing and maintaining code-approved protective devices to protect motors against overloading, short circuits, ground faults, low voltage, and single-phasing of three-phase motors.

#### **I.16.2 Starting**

Motor starts may cause unacceptable voltage dips to other customers or on the customer's premises. Frequently-started motors, or large motors on certain systems, may require reduced-voltage or soft-start motor controls.

Upon the customer's request, the Power Company will furnish permitted starting currents that are dependent upon motor size, starting amperage, frequency of starts, and impedance of the distribution system.

When the customer's motor creates unacceptable voltage dips, the customer is responsible for correcting the issue. This may include modifications to the Power Company's facilities at the customer's expense, in compliance with current local laws and ordinances and state tariffs.



## I.17 Customer Generation

The Power Company will work with customers to interconnect local distributed generation according to the Federal Energy Regulatory Commission (FERC) and state rules. Interconnections will be evaluated on a case-by-case basis. Consult the Power Company before making any type of interconnection with any type of generating device.

Types of interconnects and their requirements are described here for convenience only.

### I.17.1 Emergency or Standby Generators

An emergency, or standby, generator is permanently connected to the customer's wiring system and provides energy when the normal source is lost. This type of generator typically has a transfer switch ("break-before-make") or a code-approved, secure inter-lock scheme that disconnects ungrounded conductors from the Power Company's system prior to connection to the generator.

The transfer switch prevents connection of the generator to the Power Company's system during any mode of operation. The customer shall comply with the following requirements and all applicable electrical codes:

#### Requirements:

1. The Power Company shall be notified before an emergency or standby generator is installed.
2. The customer shall not connect portable generators to a permanent wiring system unless the interconnection uses a permanently installed transfer switch ("break-before-make") or a code-approved secure inter-lock scheme. Failure to use this type of switch could create a hazardous situation.
3. A closed transition switch ("make-before-break") may be approved by the Power Company for this type of installation, but the requirements for parallel generation shall be met. Written approval and operating agreements from the Power Company shall be obtained prior to installation.
4. Government electrical inspectors must approve all transfer switches and/or transfer operating schemes.





### **I.17.2 Parallel Generation and Cogeneration**

Parallel generation is defined as customer-owned production of electric energy connected to the Power Company's system for distribution. Cogeneration is defined as the joint production of electric energy and useful thermal energy in a combined process.

Power Company approval shall be obtained prior to operation of the customer's parallel generation or cogeneration system. The Power Company will also designate the metering type and location, and the method of interconnection between the customer's system and the Power Company's system. Please consult the Power Company for additional information on this topic.

### **I.17.3 Net Metering**

Net metering is a debit and credit metering process for an account in which the customer owns and operates a qualified generating device that interconnects with the Power Company's electrical facilities. Interconnection requirements vary from system to system; consult the Power Company to determine the requirements for interconnection prior to acquiring equipment. For general requirements described by state, see the appropriate website listed below.

Customers requesting net metering service shall submit an application for a net metering agreement, available at [www.pacificpower.net/ESR](http://www.pacificpower.net/ESR) and [www.rockymountainpower.net/ESR](http://www.rockymountainpower.net/ESR). Lists of state-approved types of generators and other requirements are also available at these websites.

The customer must obtain Power Company approval for the interconnection before construction. Inspection from the authority having jurisdiction is required before operation.

Generation shall not be connected to the Power Company's electrical distribution system until written notification authorizing net metering system activation is given by the Power Company.



## I.18 Supporting Documentation

The Power Company has published “ESR white papers” to provide more information on certain topics in this manual. These white papers are posted online at [www.pacificpower.net/con/esr.html](http://www.pacificpower.net/con/esr.html) and [www.rockymountainpower.net/con/esr.html](http://www.rockymountainpower.net/con/esr.html). When a white paper is available on a topic in this manual, it is noted with the following symbol:



The white papers are provided as additional helpful information and commentary. In the event of any inconsistencies between this manual and the white papers, the information and requirements in this manual supersede the white papers.

In addition to the white papers, customers may reference the Power Company’s tariffs, located on the “Rates and Regulations” web pages at [www.pacificpower.net/bus/rr.html](http://www.pacificpower.net/bus/rr.html) and [www.rockymountainpower.net/bus/rr.html](http://www.rockymountainpower.net/bus/rr.html).