

SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

A. GENERAL

In addition to the general requirements outlined in Rule and Regulation 18 for Utility Services and Facilities on Customers' Premises, the following is required:

B. ELECTRIC SERVICE CONNECTION REQUIREMENTS

1. FACILITIES ON CUSTOMER PREMISES

- a. The Customer is responsible for the installation of all equipment from the facility to the designated Point-of-Service. For underground systems, this includes conduit and conductors. For overhead systems, because the Point-of-Service is the weatherhead or point of attachment to the facility, this includes the mast or riser and all conductors therein.
- b. The Customer is responsible for installing and maintaining all substructures (including, but not limited to, conduits, underground vaults or boxes, and covers) on the Customer's Premises that are reasonably required for CPAU to provide Electric Service, at the Customer's expense and in accordance with CPAU requirements, standards, and specifications. Substructures are owned and maintained by the Customer, for CPAU's exclusive use. The Customer is responsible for repairing or replacing the substructure for any reason deemed necessary by CPAU, including deterioration to the extent that the existing conductors/cables cannot be removed.
- c. The Customer is required to provide all substructure between the Customer's Service entrance equipment and the nearest available Point of Service connection, as determined by CPAU. This Point of Service is typically a splice box located near the street and may be in the Public Right-of-Way. In the case of rear easements, this point is typically at a splice box or at the base of a pole riser.
- d. Upon approval by CPAU of the substructure installed on the Customer's Premises, CPAU will install Primary Electric Service conductors and a transformer, if needed. The Applicant/Customer is responsible for the full cost of installation in accordance with the applicable sections of CPAU's Electric Service Connection Charges (Rate Schedule E-15), and/or any applicable Special Facilities Charges. CPAU will determine the type and size of the conductors required.
- e. CPAU will assume ownership and responsibility for maintenance of Customer-



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installed underground Electric Service lateral conductors, as defined in the National Electric Code Article 100, only if the Service meets CPAU specifications and it has been approved and accepted by the CPAU Electrical Engineering Manager or his or her designee. Where bus duct or extra flexible cable is required and used, CPAU's maintenance responsibility for conductors ends at the transformer secondary terminals. The bus duct or extra flexible cable is considered to be the Service entrance conductor for which CPAU assumes no responsibility.

- f. All Service switches, fuses, Meter sockets, Meter and instrument transformer housing and similar devices, irrespective of voltage, required in connection with Service and Meter installation on the Customer's Premises, will be furnished, installed, owned and maintained by the Customer in accordance with CPAU requirements.
- g. The Customer must provide a suitable means for CPAU to place its seal on covers of Service enclosures/troughs and instrument transformer enclosures which protect un-metered live circuits installed by the Customer. Such seals may be broken only by CPAU or its authorized agents.
- h. CPAU will furnish and install necessary instrument transformers, test facilities and Meters.

C. SERVICE CONFIGURATIONS

1. OVERHEAD OR UNDERGROUND

- a. The standard Service to single family Residential homes in existing overhead areas is overhead. The Director of Utilities or his/her designee can require an underground Service for single family Residential Service in areas where system design requires underground Service or would otherwise require the addition of poles to the system.
- b. All new Electric Utility Services to Commercial/ Industrial Customers and new subdivisions will be provided by underground facilities on the Customer's Premises. The on-site underground Electric Utility lines will be provided by the Customer at the Customer's expense and must meet CPAU specifications.

2. NUMBER OF SERVICES PER BUILDING



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Only one Electric Service line is allowed for a building or other Premises, except for commercial properties, under the following conditions:

- a. Two or more Electric Service Drops or laterals may be extended to a single building provided all wiring supplied for each Service, other than Metering conductors, has no common raceway, connection, or service area with wiring supplied by any other such Service. Approval by the Director of Utilities, or his/her designee, is required, and Special Facilities Charges may apply.
- b. Two or more sets of Electric Service entrance conductors may be extended to a single switch gear for the purpose of providing additional capacity or for backup protection. Special Facilities and/or reserve capacity Charges may apply.

3. SERVICES FOR TWO OR MORE COMMERCIAL BUILDINGS ON ONE PARCEL

Only one Electric Service line is allowed on a parcel with multiple commercial buildings except when the Applicant requests, and CPAU agrees, to install multiple Service Lines. The additional costs, as estimated by CPAU, will be borne by the Customer, including such continuing ownership costs as may be applicable. See Special Facilities (Section J) below.

4. NUMBER OF ELECTRIC SERVICE PERISCOPES PER SERVICE DROP

Not more than two service periscopes may be served from a single overhead Service Drop. Overhead Service connections will not be installed where the Customer's main switchboard is larger than 400 amps.

D. PROTECTIVE DEVICES

1. The Customer is responsible for furnishing, installing, inspecting and keeping in good and safe condition at Customer's own risk and expense, all appropriate protective devices of any kind or character, which may be required to properly protect the Customer's facility. CPAU is not responsible for any loss or damage occasioned or caused by the negligence or wrongful act of the Customer, or any of the agents, employees or licensees of the property owner, in omitting, installing, maintaining, using, operating or interfering with any such protective devices.
2. The Customer is responsible for locating, installing, and maintaining approved protective



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devices as may be necessary to coordinate properly with CPAU's protective devices to avoid exposing other Customers to unnecessary Service interruptions.

3. Applicants or Customers who request Primary voltage Service must install, at a minimum, circuit breakers with over-current and ground fault relays. Applicants must submit their planned protection scheme to the City's Building and Utilities Departments for approval prior to installing any equipment.
4. The Customer is responsible for equipping three-phase motor installations with appropriate protective devices, or for using motors with inherent protective features, to completely disconnect each motor from its power supply. Appropriate protective devices must include the following:
 - a. Protection in each set of phase conductors to prevent damage due to overheating in the event of overload.
 - b. Protection to prevent automatic restarting of motors or motor-driven machinery which has been subject to a Service interruption and, because of the nature of the machinery itself or the product it handles, cannot safely resume operation automatically.
 - c. Open-phase protection to prevent damage in the event of loss of voltage on one phase.
 - d. Reverse-phase protection to prevent uncontrolled reversal of motor rotation in the event of accidental phase reversal. Appropriate installations include, but are not limited to, motors driving elevators, hoists, tramways, cranes, pumps, and conveyors.
5. The Applicant is responsible for installing and maintaining Service equipment rated for the available short-circuit current at the Point-of-Delivery. This value varies from one location to another, and can change over time. The Applicant must consult CPAU for the short-circuit current at each Point-of-Delivery.
6. Any non-CPAU-owned Emergency standby generation equipment must be installed by the Applicant with suitable protective devices to prevent parallel operation with CPAU's system. The design must be fail-safe, such as with the use of a double-throw switch to disconnect all conductors. Any exception must include a written agreement or Service contract with CPAU permitting such parallel operation.



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7. Unprotected Service entrance conductors within a building must terminate at a disconnect switch immediately after entering the building. Installation must comply with the National Electrical Code section 230-70, concerning the location of the disconnect switch, and section 230-6, defining conductors considered outside a building.

E. INTERFERENCE WITH SERVICE

1. GENERAL

CPAU reserves the right to refuse to serve new Loads or refuse to continue to supply existing Loads of a size or character that may be detrimental to CPAU's operation or to the Service of its Customers. Any Customer who operates or plans to operate any equipment such as, but not limited to pumps, welders, saw mill apparatus, furnaces, compressors or other equipment where the use of Electricity is intermittent, causes intolerable voltage fluctuations, or may otherwise cause intolerable Service interference, must reasonably limit such interference or restrict the use of such equipment upon request by CPAU. The Customer is required to provide and pay for whatever corrective measures are necessary to limit the interference to a level established by CPAU as reasonable, or avoid the use of such equipment, whether or not the equipment has previously caused interference.

2. HARMFUL WAVEFORM

Customers may not operate equipment that superimposes a current of any frequency or waveform onto CPAU's system or draws current from CPAU's system of a harmful waveform, which causes interference with CPAU's operations, Service to other Customers, or inductive interference to communication facilities. Examples of harmful waveform include, but are not limited to:

- a. Current drawn with high harmonic currents causing transformer or conductor overheating, even if root-mean-square (RMS) loading is within normal limits.
- b. Current drawn causing voltage distortion adversely affecting CPAU or other CPAU Customers.
- c. Harmonic currents which exceed the harmonic current distortion limits set in the most recent IEEE Standard 519. In most cases, this equates to a maximum limit of 4% harmonic current on any individual odd harmonic or 5% total harmonic current.



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3. CUSTOMER'S RESPONSIBILITY

Any Customer causing Service interference to others must take timely corrective action. Otherwise, CPAU, without liability and after giving five (5) days written notice to Customer, will take corrective action. Corrective action could include discontinuing Electric Service until a CPAU-approved permanent and operational solution is provided by the Customer, at Customer's expense.

4. MOTOR STARTING CURRENT LIMITATIONS

- a.** The starting of motors must be controlled by the Customer as necessary to avoid causing voltage fluctuations that will be detrimental to the operation of CPAU's Distribution or Transmission System, or to the Service of any of CPAU Customers.
- b.** If motor starting causes or is expected to cause detrimental Service to others, a suitable means must be employed, at the Customer's expense, to limit voltage fluctuations to a tolerable level.

F. PHASE BALANCING

It is the Customer's responsibility to maintain a balanced Load, as nearly as practical, between supplied circuit phases. In no case can the Load on one side of a three-wire single-phase service be greater than twice that on the other. In no case can the Load on any one phase of a polyphase service be greater than twice that of any other.

G. POWER FACTOR CORRECTION

The Customer is required to provide, at Customer's own expense, Power Factor correction equipment. This equipment must be sized to improve the average Power Factor to at least the level set forth in the applicable Rate Schedule with respect to avoiding a Power Factor penalty.

H. SERVICE DISCONNECT AND METER TEST DEVICES

- 1.** All Service disconnects and similar devices, irrespective of voltage, required by Law in connection with a Service and Meter installation on Customer's Premises, must be furnished, installed and maintained by the Customer. A "Service-disconnecting means", as defined in the National Electrical Code (NEC), must be installed adjacent to the CPAU Electric Meter(s). Metering equipment must be located on the exterior of the building, unless approved by the CPAU Electric Engineering Manager.



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2. When instrument transformers are required by CPAU as part of the Meter installation, CPAU will install a Meter test bypass block on a mounting plate that must be furnished by the Customer. When instrument transformers are not required by CPAU, the Customer is responsible for providing the Meter test bypass block. Meter test bypass blocks furnished by the Customer must be approved by CPAU in conjunction with Applicant's plan submittal.

I. SPECIAL POWER SERVICE REQUIREMENTS

1. GENERAL

Where a Customer requests voltage control with less variance than what is specified in Rule and Regulation 3 (Description of Utility Services), the Customer must reimburse CPAU for its cost to provide, at CPAU's sole option and discretion, any special or additional equipment to meet the Customer's special needs.

2. NONSTANDARD OR EXCESSIVE CUSTOMER REQUIREMENTS

- a. In order to prevent damage to CPAU's equipment and impairment of its Service, the Customer must give CPAU notice before making any additions to the connected Load so that CPAU, at its option, may provide such facilities as may be necessary for furnishing the increased Service.
- b. If a Customer's Load is of sufficient magnitude that it exceeds the capacity of CPAU's Distribution System, the Customer may be required by CPAU to shift peak loading to off-peak periods and/or receive service from CPAU's 60 kilovolt sub-Transmission System.

J. SPECIAL FACILITIES

1. Special Facilities are facilities requested by an Applicant in addition to or in substitution for standard facilities which CPAU would normally provide. Standard facilities are for delivery of Service at one point, through one Meter, at one voltage class under CPAU Rate Schedules.
2. CPAU normally installs only those standard facilities which it deems are necessary to provide regular Service in accordance with applicable CPAU Rules and Utility Standards. Where the Applicant requests that CPAU install Special Facilities and CPAU agrees to make such an installation, the additional costs thereof, as estimated by CPAU, will be



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- borne by the Applicant, including such continuing ownership costs as may be applicable. These costs will be calculated by CPAU based on the net present value, and must be paid by the Applicant in advance of installation unless alternative payment arrangements are approved by the Director of Utilities.
3. Unless otherwise provided by CPAU's applicable Rules and Utility Standards, Special Facilities will be installed, owned and maintained by CPAU as an accommodation to the Applicant only if acceptable for operation by CPAU and if the reliability of Service to CPAU's other Customers is not impaired.
 4. Installation of Special Facilities will require a contract between the Applicant and the City of Palo Alto.

K. NEIGHBORHOOD FUNDING OF SUBSURFACE EQUIPMENT

1. REPLACEMENT OF SUBSURFACE EQUIPMENT

- a. Notwithstanding the provisions of Rule and Regulation 3(B)(3), in Underground Utility Districts in which the existing equipment required to provide Electric Service to Customers is subsurface, the Utilities Director, or his/her designee, may, at the end of the service life of such equipment vaults or equipment, authorize their replacement with new subsurface equipment if the following conditions are met:
 - (i) The Utilities Director, or his/her designee, determines that the installation of subsurface equipment is practicable; and
 - (ii) Such installation has been requested by property owners in the manner set forth in this subdivision K; and
 - (iii) The City receives funding for the subsurface installation as set forth in this subdivision K.
- b. For purposes of this subdivision K, "Neighborhood-Funded Subsurface Installation" means all vaults and equipment the installation of which has been funded pursuant to this subdivision K.
- c. CPAU operates its utilities in accordance with Prudent Utility Practice. As is always the case with CPAU's Electric Distribution System and any CPAU-operated equipment, CPAU reserves the right to operate, maintain, rehabilitate, and replace equipment at such time and in such manner as it determines is necessary or useful for the safe and effective operation of the Electric Distribution System. Consequently, nothing in this subdivision K should be interpreted to:



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- (i) Require that CPAU, at the end of the useful life of a Neighborhood-Funded Subsurface Installation, replace that equipment with a subsurface installation; or
- (ii) Prohibit CPAU, subsequent to the installation of a Neighborhood-Funded Subsurface Installation, from installing pad-mounted equipment in the territory served by that Neighborhood-Funded Subsurface Installation if the Utilities Director determines that such installation is necessary or prudent; or
- (iii) At any time prohibit CPAU from replacing all or part of a Neighborhood-Funded Subsurface Installation with pad-mounted equipment if CPAU is required to do so by Law or if the Utilities Director determines that the continued operation of all or part of the Neighborhood-Funded Subsurface Installation presents an unacceptable hazard to public safety, employee safety, or system reliability, or is contrary to Prudent Utility Practice.

2. REQUEST FOR PETITION FORM

- a. Upon receiving a timely written request signed by owners of at least five parcels of real property in an area served by a subsurface installation, CPAU will prepare the petition form described in subdivision (3)(c) of this subdivision (K).
- b. A request will be considered timely only if (i) it is submitted to the Utilities Director, or his/her designee no later than 30 days following the distribution of the first courtesy notice regarding the planned replacement of a subsurface installation or (ii) the Utilities Director determines that the work schedule for such replacement will permit the time necessary for the process described in subdivisions (3) and (4) of this subdivision (K).
- c. Nothing in this subdivision (K) will be interpreted to require the preparation of a petition form or the provision of time for circulation of a petition if the Utilities Director determines that either the work schedule for a project or operational requirements will not make it practicable to allow time for preparation and circulation of the petition and collection of funding by proponents.

3. REQUEST FOR SUBSURFACE EQUIPMENT

- a. The owners of real property located in a Underground Utility District may request the replacement of existing vaults and equipment with new subsurface equipment by submitting a petition to the Utilities Director, or his/her designee.
- b. The petition must be signed by the owners of not less than 60% of the parcels in the Underground Utility District.



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- c. The petition must be on the form prepared by CPAU pursuant to subdivision (2) of this subdivision (K). The form must include a map or description of the area to be served by the Neighborhood-Funded Subsurface Installation; a summary of this procedure for Neighborhood Funding of Subsurface Equipment; as well as any additional information deemed necessary or useful by the Utilities Director, or his/her designee.
- d. The form must indicate the name and contact information of one property owner who will serve as proponent for the project and must indicate the date on which the form was issued to that proponent and the amount of the payment required by subdivision (f) of this subdivision (3).
- e. To be valid, the signed petition must be returned to the Utilities Director, or his/her designee, no later than 45 days after the form is issued to the proponent.
- f. The signed petition must be accompanied by a payment to cover the cost of developing a cost-estimate for the proposed subsurface replacement. The amount of this payment, as determined by the Utilities Director or his/her designee, will be indicated on the form.

4. FUNDING OF SUBSURFACE EQUIPMENT

- a. Upon receipt of a valid petition, the Utilities Director, or his/her designee, will provide the proponent with either (i) a written estimate of the cost of a subsurface installation (including the net present value of any unusual continuing ownership costs associated with such installation) or (ii) a finding that such installation is not practicable. The proponent will also be provided with an estimate of the cost of a standard installation.
- b. The City will proceed with the subsurface installation if and only if within 90 days of the date upon which the Utilities Director, or his/her designee, provides a written estimate pursuant to subdivision (a) of this subdivision (4), the City receives payment in full for the estimated cost difference between the subsurface and the standard installation.
- c. It is the responsibility of the proponent to raise the funding required by this Section and the entire cost must be paid to the City at one time. The City will not collect funds from property owners or community members nor will it require any person or property owner to pay any portion of the costs.
- d. The Utilities Director, or his/her designee, may extend the payment deadline set forth in this subdivision.



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(END)

