

MEMORANDUM

TO: UTILITIES ADVISORY COMMISSION

FROM: UTILITIES DEPARTMENT

DATE: APRIL 9, 2019

SUBJECT: Utilities Advisory Commission Recommendation that the City Council Adopt a Resolution Amending Utility Rule and Regulation 20 to Allow Neighborhood Funding of Certain Subsurface Equipment

1

REQUEST

Staff recommends the Utilities Advisory Commission (UAC) recommend that the City Council adopt a resolution amending Utility Rule and Regulation 20 to allow Neighborhood Funding of Certain Subsurface Equipment.

EXECUTIVE SUMMARY

City of Palo Alto Utilities (“CPAU”) endeavors to build and maintain a safe, reliable, and cost-effective electric system that will minimize the risk of injuries and keep electric rates as low as possible. In service of this goal, Utility Rules and Regulations currently require that transformers and associated equipment (“equipment”) in underground utility districts be pad-mounted. While it is possible to install this equipment in underground vaults, such an installation is substantially more expensive than a standard pad-mounted installation, and—in the view of CPAU staff—is likely to be less reliable and more costly to maintain and operate.

CPAU needs to replace the 45-year old transformers and cables in Green Acres I because that equipment is at the end of its service life. CPAU would normally use electric funds to replace the existing equipment with a standard pad-mounted installation. However, the existing Green Acres I equipment is fully subsurface (i.e. mounted underground in subsurface vaults), and a number of residents have strongly opposed the installation of any new equipment that is not subsurface.

Existing Rules and Regulations do not provide the residents of an underground utility district with the option to have subsurface equipment that is at the end of its service life replaced with a new subsurface installation. In order to afford residents with an opportunity for such a replacement project while not burdening other system ratepayers with the added costs of the project, it has been suggested that Green Acres I property owners be given an opportunity to request a subsurface installation if they are able to self-fund the added costs. To make this option available in Green Acres I and other similar residential underground districts, staff

requests that the UAC recommend amendments to Utility Rule and Regulation 20 as described in Attachment A.

BACKGROUND

Underground Utility District 15 (“UUD 15”), the area bounded by Arastradero Road, Pomona Avenue, Glenbrook Drive, and Los Palos Avenue (also known as Green Acres I), was constructed and completed in 1973. To maintain reliability of the electric system, CPAU needs to replace the 45-year old transformers and cables and bring the system up to current design standards.

In 1973 UUD 15 was constructed using entirely subsurface equipment in concrete vaults. CPAU’s current standard for equipment in underground utility districts is to install pad-mounted equipment (above ground equipment sitting on a concrete pad) with only the cables installed below ground. This design aligns with CPAU’s responsibility to build a safe, reliable, and cost-effective electric system that will minimize the risk of injuries and outages and keep electric rates as low as possible. The proposed design using pad-mounted equipment met with opposition from a significant number of residents in Green Acres I, who expressed concerns over aesthetics, safety and property values. Staff presented a report at the August 1, 2018 UAC meeting ([report](#)) explaining the safety, reliability and cost justifications for CPAU’s standard for pad-mounted equipment. At that meeting the UAC also heard comments from Green Acres I community members. The UAC requested that CPAU staff work with residents on design alternatives to accommodate aesthetics and safety.

Subsequently, staff presented a design alternative to residents and attempted to answer residents’ questions. The feedback staff received from community representatives was that any pad-mount equipment was not an acceptable solution and they wanted to work with the Utility on a fully undergrounded system. At the December 5, 2018 UAC ([report](#)) meeting staff provided an update and sought the UAC’s opinion on preparation of a Utilities Rule and Regulation governing community-requested fully undergrounded systems

DISCUSSION

As equipment standards have evolved since 1996, current functional and safety requirements cannot be met by simply reusing existing vaults in the Green Acres I neighborhood. Putting aside the safety and reliability justification for pad-mounted equipment, CPAU’s current construction and safety standards require installing no more than one piece of equipment in a vault; multiple pieces of equipment in a single vault results in reduced clearances and increases the chances of disruption of the equipment. As a result, in the Green Acres I neighborhood, simply maintaining the existing load serving capacity would still require extensive subsurface construction to relocate transformers to separate vaults from secondary connections, hence the cost component for new vaults. CPAU has engineering estimates for Green Acres I based on recent quotes for equipment and labor costs shown in Attachment B. This is not the full project cost as it only compares the components that would change between the two designs; the replacement of electrical cables will be a similar scope under both designs. In the Fiscal Year 2019 budget, the estimated construction budget for the UUD 15 rebuild was just over \$500,000, with the cable replacement component comprising about \$180,000 of the total

budget. Staff's current estimate is that the additional costs associated with the non-standard installation in Green Acres I would be approximately \$475,000.

Neighborhood Request for and Funding of Subsurface Equipment

Section B(3) of City of Palo Alto Rule and Regulation 3 (Attachment C) requires that "all new equipment in underground areas required to provide electric service to a Customer shall be pad-mounted."

However, Rule and Regulation 3 also provides that:

The Utilities Director, or his/her designee, may authorize...an exception to the above provisions when, in his/her opinion, a pad-mounted equipment installation in any particular instance would not be feasible or practical....

This sort of exceptional or non-standard installation is considered a "Special Facility" as defined in Rule and Regulation 20 (Attachment D). Pursuant to Regulation 5 (Attachment E), the applicant requesting service is responsible for costs associated with the non-standard installation of a Special Facility.

The typical application of this exception occurs, for example, when (as occurs in downtown University Avenue) a new development has zero lot line building construction and would require pad-mounted equipment to be installed in alleys, sidewalks or streets obstructing pedestrians and vehicles.

A full undergrounding in Green Acres I would not fall under the exception to Rule and Regulation 3 because it is feasible and practical to install pad-mounted equipment in Green Acres I. Furthermore, it is unlikely that 100% of the approximately 100 customers in Green Acres I will support the fully undergrounded installation. Rule and Regulation 3 is not typically used to impose a charge upon an existing customer to fund additional costs associated with a non-standard installation that the City does not consider infeasible or impractical.

Consequently, for Green Acres I property owners be able to request a fully subsurface installation of equipment it is necessary to amend the Rules and Regulations to provide a procedure governing such a request and a means for funding the additional costs. Staff is proposing the following procedure as described in Appendix A.

1. CPAU, per current practice, sends out "courtesy notice" to affected customers stating CPAU's intent to replace its installed equipment.
2. A request for a petition form, signed by owners of at least five parcels served by the installation, is filed with CPAU.
3. CPAU prepares a petition form that describes the proposed project and contains certain other information.

4. Proponents have a 45-day window after receiving the petition form to return the form to CPAU with the signature of the owners of at least 60% of affected parcels.
5. The form must be accompanied by a payment sufficient to fund CPAU's costs of developing a cost-estimate for a subsurface installation.
6. CPAU develops an estimate of the cost of a subsurface installation, including the net present value of any unusual continuing ownership costs associated with such installation.
7. Proponents have a 60-day window to pay CPAU the full estimated cost difference between the subsurface and standard installation.

If proponents are unable to collect sufficient signatures during the 45-day window, or make full payment during the 60-day window, CPAU will proceed with a standard installation.

The expectation here is that the proponents will collect the funding from interested neighbors. CPAU does not intend to assist in the collection of funds, nor will the City or CPAU impose any legal obligation upon any property owner or customer to pay a "fair share" of the cost.

Other Considerations

- This new policy will not preclude action the City may have to take in response to new safety rules and regulations promulgated at State or Federal level.
- Consideration is required for later capacity requirements in the Districts given the less flexible design and lower capacity of subsurface equipment.

NEXT STEPS

Staff will take the proposed amendments to Council, which could result in the adoption and implementation of a rule governing community requests for fully undergrounded systems. A revised schedule will be set once an approval process is determined.

RESOURCE IMPACT

The resource impact will depend on the allocation of the incremental installation and maintenance costs, and the costs of creating a system to administer and allocate the expense of proceeding with subsurface equipment in Green Acres I.

POLICY IMPLICATIONS

A Council decision to adopt a Rule governing community requests for fully undergrounded systems will require changes to Rule and Regulation 20.

ATTACHMENTS:

- A. Resolution of the Council of the City of Palo Alto Amending Utility Rule and Regulation 20 to Allow Neighborhood Funding of Certain Vault-Mounted Equipment
- B. Engineering Estimate for Green Acres I Rebuild
- C. Rule 03 effective 6-27-2016
- D. Rule 20 effective 6-27-2016
- E. Rule 05 effective 2016-06-27

PREPARED BY:

Debbie Lloyd, Assistant Director, Utilities Engineering

DEPARTMENT HEAD:


Dean Batchelor, Utilities Director

* NOT YET APPROVED *

Resolution No. _____

Resolution of the Council of the City of Palo Alto Amending Utility Rule and Regulation 20 to Allow Neighborhood Funding of Certain Subsurface Equipment

R E C I T A L S

A. Since 1965, Sections 12.16.020 and 12.16.040 of the Municipal Code have authorized the City Council to designate Underground Utility Districts (“UUD”) within the City.

B. The purpose of this designation is to require the replacement of existing poles, overhead lines and associated overhead structures within each designated UUD.

C. In areas served by underground lines, Utility Rule and Regulation 3 currently requires that, with few exceptions, all new transformers and other new equipment required to provide electric service to customers be pad-mounted.

D. Pad-mounted equipment is generally more reliable and substantially less expensive to install and maintain than subsurface (vault-mounted) equipment.

E. In some early UUD’s, equipment was installed subsurface, rather than pad-mounted. As these installations reach functional obsolescence, CPAU has been replacing these installations with pad-mounted equipment at its expense.

F. Before replacing an installation that has reached functional obsolescence, CPAU generally sends a “courtesy notice” to customers served by the installation.

G. The City Council desires to amend Rule and Regulation 20 to provide a mechanism by which neighborhoods can fund the replacement of obsolete subsurface equipment with new subsurface equipment.

H. Pursuant to Section 12.20.010 of the Municipal Code authorizes the City Council, by resolution, to adopt rules and regulations relating to utility service.

The Council of the City of Palo Alto hereby RESOLVES as follows:

SECTION 1. Utility Rule and Regulation 20 (Special Electric Utility Regulations) is hereby amended to add Section K thereto, to read as follows:

“K. NEIGHBORHOOD FUNDING OF SUBSURFACE EQUIPMENT

1. REPLACEMENT OF SUBSURFACE EQUIPMENT

- a. Notwithstanding the provisions of Rule and Regulation 3(B)(3), in UUD’s 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” shall mean 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 shall be interpreted to:
- (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 federal or state law or regulation 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 shall prepare the petition form described in subdivision (3)(c) of this subdivision (K).
- b. A request shall be considered timely only if (i) it is submitted to the Utilities Director, or his/her designee no later than 10 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) shall 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 Utility Undergrounding 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 Utility Undergrounding District.
- c. The petition must be on the form prepared by CPAU pursuant to subdivision (2) of this subdivision (K). The form shall include 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 shall be indicated on the form and shall be determined by the Utilities Director or his/her designee.

4. FUNDING OF SUBSURFACE EQUIPMENT

- a. Upon receipt of a valid petition, the Utilities Director, or his/her designee, shall 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 shall 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 60 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.”

SECTION 2. The Council finds that the adoption of this resolution amending Rule and Regulation 20 (Special Electric Utility Regulations) does not meet the California Environmental Quality Act’s (CEQA) definition of a project under Public Resources Code Section 21065 and CEQA Guidelines Section 15378(b)(5), because it is an administrative governmental activity which will not cause a direct or indirect physical change in the environment, and therefore, no environmental review is required. The installation of vaults, subsurface equipment and pad-mounted equipment to replace existing equipment is categorically exempt from CEQA review under Sections 15301 and 15302 of the CEQA Guidelines (repair, maintenance or minor alteration of existing facilities, and replacement or reconstruction of existing facilities).

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

APPROVED:

Assistant City Attorney

City Manager

Director of Utilities

Director of Administrative Services

Figure 1: Cost Comparison for Green Acres Neighborhood

Unit Cost Estimates for Above Vs. Below Ground Equipment and Installation								
Material and Labor Unit Costs		Utility Standard Pad-Mounted				Requested Below-Ground		
		(A) Above ground Pad-mount Equipment (Transformers & Loadbreaks)	(B) Above ground Pad-mount Loop Feed Transformers (No Loadbreaks)	(C) Above ground Pad-mount Transformer	(D) Above ground Pad-mount Loadbreak	(E) Below ground Submersible Equipment (Transformers & Loadbreaks)	(F) Below ground Submersible Loadbreak	(G) Below ground Submersible Transformer
Materials	Transformer	\$ 1,854	\$ 4,170	\$ 1,854	\$ -	\$ 5,719	\$ -	\$ 5,719
	Load Break (Switch)	\$ 1,277	\$ -	\$ -	\$ 1,277	\$ 536	\$ 536	\$ -
	Misc, Equipment	\$ 2,748	\$ 1,056	\$ 1,056	\$ 1,056	\$ 956	\$ 956	\$ 956
	Pads/ Vaults	\$ 5,312	\$ 1,075	\$ 1,075	\$ 775	\$ 12,552	\$ -	\$ 12,552
Sub Total		\$ 11,190	\$ 6,301	\$ 3,985	\$ 3,108	\$ 19,763	\$ 1,492	\$ 19,227
Labor	Substructure Instalation	\$ 20,861	\$ 11,909	\$ 11,909	\$ 11,909	\$ 24,632	\$ -	\$ 24,632
	Equipment	\$ 15,478	\$ 9,594	\$ 9,594	\$ 9,594	\$ 15,478	\$ 10,835	\$ 10,835
Sub Total		\$ 36,339	\$ 21,503	\$ 21,503	\$ 21,503	\$ 40,110	\$ 10,835	\$ 35,466
15% Incidental		\$ 7,129	\$ 4,171	\$ 3,823	\$ 3,692	\$ 8,981	\$ 1,849	\$ 8,204
Total Cost		\$ 54,658	\$ 31,974	\$ 29,311	\$ 28,302	\$ 68,854	\$ 14,176	\$ 62,898
Cost Differential Between the Two Green Acres Designs								
		Cost Components						
Design	Description	Material	Labor	Total Cost				
Utility Standard (Above Ground)	2 transformers with loadbreaks, 4 loop feed transformers, 2 transformers only and 3 loadbreaks only (2xA)+(4xB)+(2xC)+(3xD)	\$ 74,608	\$ 306,132	\$ 380,741				
Home-owner Requested (Below Ground)	6 transformers with loadbreaks, 3 loadbreaks only and 2 transformers only (6xE)+(3xF)+(2xG)	\$ 185,740	\$ 395,710	\$ 856,282				
	Special Facilities Fee*	\$ 274,833						
Cost Differential between Padmount and Submersible Equipment				\$ 475,542				
* Special Facilities Fee is the present cost of ownership and energy losses								

The calculation of the proposed Special Facilities Fee component is illustrated in Figure 2

Figure 2: Proposed Maintenance and Operations Fee Calculation

Description	
Materials	\$ 111,131
Labor	\$ 89,578
Other	\$ -
Estimated Job Cost Differential	\$ 200,709
Annual Cost of Ownership Factor	0.067
Annual Cost of Ownership	\$ 13,448
Term	30
Discount Rate	3%
Present Value of Annual Cost of Ownership	\$263,577
Present Value of Annual Energy Losses	\$ 11,255
SPECIAL FACILITIES FEE (2+3)	\$274,833

DESCRIPTION OF UTILITY SERVICES**RULE AND REGULATION 3****A. GENERAL**

Rule and Regulation 3 describes Services that are offered within the jurisdictional boundaries of the City of Palo Alto. For Rules specific to each type of Service, please refer to the following Rules and Regulations:

- Rule and Regulation 20 – Special Electric Utility Regulations
- Rule and Regulation 21 – Special Water Utility Regulations
- Rule and Regulation 22 – Special Gas Utility Regulations
- Rule and Regulation 23 – Special Wastewater Utility Regulations
- Rule and Regulation 24 – Special Refuse Service Regulations
- Rule and Regulation 25 – Special Storm and Surface Water Drainage Utility Regulations
- Rule and Regulation 26 – Special Fiber Optics Utility Regulations

B. ELECTRIC SERVICE**1. BASIS OF SERVICE**

- a. Unless otherwise provided in a Rate Schedule or contract, CPAU's Electric rates are based upon the furnishing of Electric Service to Customer Premises at a single Point of Delivery at a single voltage and phase classification. Unless specified otherwise, each Point of Delivery shall be metered and billed separately under the appropriate Rate Schedule. Any additional Service supplied to the same Customer at other Points of Delivery or at a different voltage or phase classification shall be separately metered and billed.
- b. The type of distribution Service (voltage, Secondary, Primary) available at any particular location may be determined by inquiry to a CPAU Engineering representative.
- c. If the Customer, for his or her convenience, requests Secondary or Primary Services at an alternate Point of Delivery other than the normal Point of Delivery as determined by CPAU, the Customer is responsible for all cost of providing Secondary or Primary Services at such alternate location.
- d. CPAU assumes no duty or liability for inspecting, validating or approving the safe operating condition of the Customer's Service, appliances, or equipment downstream of the Utility Meter.



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

- e. See Rule and Regulation 20. "Special Electric Utility Regulations" regarding special Service requirements.

2. LOCATION OF POINT OF SERVICE

a. SECONDARY SERVICE

1. OVERHEAD SERVICE AT SECONDARY VOLTAGES

The Point of Service for Overhead Service at secondary voltages will normally be located at a power pole on the perimeter of the parcel to be served, which is, in CPAU's judgment, most conveniently located and in compliance with CPAU standards and specifications and applicable building and electrical codes.

2. UNDERGROUND SERVICE AT SECONDARY VOLTAGE

The Point of Service for Underground Service at secondary voltages will normally be located at the Secondary connectors of the transformer serving the Customer's Load, or in the Secondary hand hole, if available.

b. PRIMARY SERVICE

The Point of Service for Primary Service will normally be at the point near the property line of the premises to be served which is, in CPAU's judgment, most conveniently located with respect to CPAU's transmission or distribution facilities.

c. EXCEPTIONS

If several buildings are occupied and used by one Customer in a single business or other activity, CPAU may, at its discretion, furnish Service for the entire group of buildings through one Service connection at one Point of Service.

3. EQUIPMENT REQUIREMENTS

All new equipment in underground areas required to provide electric service to a Customer shall be pad-mounted. In addition, any three-Phase electric service connection



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

and any electric service connection rated at 400 Amps or greater which is located either in an underground or overhead area must be served from a pad-mounted transformer.

The Utilities Director, or his/her designee, may authorize: 1) an exception to the above provisions when, in his/her opinion, a pad-mounted equipment installation in any particular instance would not be feasible or practical or 2) installation of electric service equipment in locations with limited access by utility equipment. Such installations will be considered "Special Facilities" as defined in Rule and Regulation 20, and the Applicant will be responsible for the costs described in that rule and outlined in the Service Contract as described in Rule and Regulation 5.

If the Applicant wants a Point of Delivery other than at the location determined by CPAU, CPAU will work with the Applicant to assist in the selection of the alternate Point of Delivery location for the electric service equipment within the boundaries of the Applicant's property. When the Applicant chooses a Point of Delivery location other than the location which has been determined by CPAU, the Applicant must acknowledge that such an alternate Point of Delivery location will cause CPAU personnel to incur delays when performing repairs or service restoration during emergencies. In addition to being responsible to pay for the initial cost of installation of such electric service equipment in an alternate location, the Applicant shall also be responsible to pay for any future additional labor, equipment, and material costs incurred by CPAU necessary to facilitate replacement, removal, or relocation of any electric service equipment which has been installed in an alternate Point of Delivery location at the Applicant's request.

Any installation intended to assist in "screening" of electric service equipment by landscaping or structures must be constructed in a manner which meets all of CPAU's clearance standards. The plans for such screening must be approved by the City of Palo Alto and CPAU prior to beginning work on the screening installation.

The Applicant shall provide a Public Utility Easement in recordable form for installation of such facilities within the boundaries of the property. All pad-mounted equipment will be subject to CPAU's aesthetic guidelines.

4. EMERGENCY AND STANDBY SERVICES

CPAU may provide back up Emergency, and other Standby Service to Customers as Special Facilities. See Rule and Regulation 20 "Special Electric Utility Regulations" regarding special Service requirements.



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

5. SERVICE DELIVERY VOLTAGE

The following are the standard Service voltages normally available. Not all standard Service voltages are available at each Point of Delivery. These Service voltages are available in locations that already have this Service voltage and have sufficient capacity, as determined by CPAU, to serve the new Load. Any equipment installed on 120/240, 3 wire or 240/120, 4-wire Services shall have the capability of converting to a 120/208, 3 wire or 208 Y/120, 4-Wire Service.

a. DISTRIBUTION OF VOLTAGE

Alternating-current Service will be regularly supplied at a nominal frequency of approximately 60-Hertz (cycles per second).

<u>Single-Phase Secondary</u>	<u>Three-Phase Secondary</u>	<u>Three-Phase Primary</u>
120/240, 3 -wire 120/208, 3-wire	240/120, 4-wire* 240, 3-wire* 208 Y/120, 4-wire 480 Y/277, 4-wire	12,470, 3-wire

*Only available in special conditions as determined by the Electric Engineering Manager.

- b. All voltages referred to in this Rule and appearing in some Rate Schedules are nominal Service voltages at the Point of Delivery. CPAU's facilities are designed and operated to provide sustained Service voltage at the Point of Delivery, but the voltage at a particular Point of Delivery will vary within satisfactory operating range limits.
- c. In areas where a certain standard Secondary voltage is being delivered to one or more Customers, CPAU may require an Applicant for new Service in such areas to receive the same standard voltage supplied to existing Customers.
- d. CPAU may change the voltage at which Service is delivered, including converting existing 4160 volt Primary Service to 12,470 volt Service. If CPAU notifies the



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

Customer that a Service voltage change is necessary, the Customer will be required to provide Service equipment capable of accepting the new voltage and meeting other CPAU requirements. Costs to provide suitable Customer's Service entrance equipment and any other associated equipment to receive Service at the new voltage shall be borne by the Customer.

6. VOLTAGE AND FREQUENCY CONTROL

- a. Under normal Load conditions, CPAU's distribution circuits will be operated so as to maintain Service voltage levels to Customers within plus or minus 5 percent of the nominal Service voltage at the Point of Delivery. Subject to the limitations above, CPAU will maintain the voltage balance between phases as close as practicable to 2.5% maximum deviation from the average voltage between the three phases.
- b. Voltages may be outside the limits specified above when the variations:
 1. arise from Service interruptions;
 2. arise from temporary separation of parts of the system from the main system;
 3. are minor momentary fluctuations and transient voltage excursions of short duration which may occur in the normal operation of CPAU system;
 4. are beyond CPAU's control.
- c. Due to conditions beyond the control of CPAU, the Customer, or both, there will be infrequent and limited periods when voltages will occur outside of the nominal Service voltage ranges. Utilization equipment may not operate satisfactorily under these conditions, and protective devices in the equipment may operate to protect the equipment.
- d. Where the operation of the Customer's equipment requires stable voltage regulation or other stringent voltage control beyond that supplied by CPAU in the normal operation of its system, the Customer, at its own expense, is responsible for installing, owning, operating, and maintaining any special or auxiliary equipment on the Load side of the Service delivery point as deemed necessary by the Customer.
- e. The Customer shall be responsible for designing and operating its Service



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

facilities between the Point of Delivery and the utilization equipment to maintain proper utilization voltage at the line terminals of the utilization equipment.

- f. The Customer shall not impose a Load on CPAU's system that will cause the voltage limits in this section to be exceeded for an adjacent Service delivery point.
- g. When there is reasonable indication of a problem, CPAU shall test for excessive fluctuations at its own expense. Voltage checks requested by the Customer more than once in any twelve month period shall be paid by the Customer, unless CPAU determines that excessive voltage fluctuation exists.
- h. CPAU may institute measures to prevent the continuous operation of equipment detrimental to Service to other Customers or may discontinue Electric Service to the offending Customer. (See Rule and Regulation 20, Special Electric Utility Regulations).
- i. Customers are responsible for protecting their connected Loads, audio, video, and electronic equipment, including computers, from sudden voltage or frequency fluctuations outside nominal Service and frequency ranges. Such protection may include, but is not limited to, surge protectors.

7. GENERAL LOAD LIMITATIONS

a. SINGLE-PHASE SERVICE

- 1. Single-phase Service normally will be 3-wire, 120/240 volts (or 3-wire, 120/208 volts at certain locations as now or hereafter established by CPAU) where the size of any single motor does not exceed 7-1/2 horsepower (10 horsepower at the option of CPAU). For any single-phase Service, the maximum Service size shall be 400 ampere, unless approved by the Utilities Director or his/her designee. If the Load exceeds the capability of a 400 ampere single phase Service the Service shall be three-phase.
- 2. In locations where CPAU maintains a 120/208 volt secondary system, 3-wire single-phase Service normally shall be limited to that which can be supplied by a main switch or Service entrance rating of 200 amperes. Single-phase Loads in these locations in excess of that which can be



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

supplied by a 200 ampere main switch or Service entrance rating normally will be supplied with a 208Y/120 volt, three-phase, 4-wire Service.

b. THREE-PHASE SERVICE (480 VOLTS OR LESS)

<u>Normal Voltage</u>	<u>Minimum Load Requirements</u>	<u>Maximum Demand Load Permitted</u>
240/120	5 hp, 3-phase connected	400 Amperes
240	5 hp, 3-phase connected	400 Amperes
208Y/120	Demand Load 75 kVA	500 kVA
480Y/277 I)	Demand Load 112 kVA	2,500 kVA (See Note

Note 1. Applicants or existing Customers with a planned or existing single or multiple building development having a maximum Demand in excess of 2500 kVA, as determined by CPAU, will be required to take delivery at the available primary voltage and are required to provide their own primary switchgear and transformer(s). Determination of maximum Demand and Service voltage will be made by CPAU and the decision of the Electric Engineering Manager will be final.

1. Where three-phase Service is supplied, CPAU reserves the right to use single-phase transformers, connected open-delta or closed-delta, or three-phase transformers.
2. Three-phase Service will be supplied on request for installations aggregating less than the minimum listed above, but not less than 3 horsepower (hp), three-phase Service, where existing transformer capacity is available. If three-phase Service is not readily available, or for Service to Loads less than 3 hp, Service shall be provided in accordance with CPAU’s applicable Rule 20 on Special Power Service requirements.
3. Residential customers requesting three-phase service shall be responsible for all labor and material costs required to provide service, including the cost of the transformer. These installations are not considered “Special Facilities” as described in Rule and Regulation 20.
4. An Applicant or existing Customer requiring Service with a maximum Demand in excess of 1000 kVA, as determined by CPAU, shall be served by a padmount transformer. No submersible or vault-installed



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

transformers in excess of 1000 kVA will be installed by CPAU. Where an existing underground Service must be upgraded beyond 1000 kVA, the Customer shall be required to provide adequate space for installation of the padmount transformer. In the event the Customer is unable to provide adequate space for the padmount transformer, then the Customer shall make arrangements at his or her expense to receive Service at primary voltage.

c. **THREE-PHASE SERVICE (OVER 2,000 VOLTS)**

The following three-phase primary voltage may be available as an isolated Service for a single Applicant; and where that Applicant's Demand Load justifies such voltage. The determination will be made by CPAU.

<u>Normal Voltage</u>	<u>Minimum Demand Bank Installed</u>	<u>Maximum Demand Load Permitted</u>
4,160	500 kVA	3,600 kVA
12,470	1,000 kVA	11,000 kVA

Note: 4,160 volt Services will not be furnished for new Services.

8. **TEMPORARY SERVICE**

Temporary Service is Electric Service which, in CPAU's opinion, is of an indefinite duration at the same location, or for operations of a speculative character or of questionable permanency, or any other Service which is estimated to last less than one year. CPAU will furnish Temporary Service if the furnishing of such Service will not create undue hardship for CPAU, or its Customers, and the following conditions are met:

- a. The Applicant for such Temporary Service shall apply for Service on an Application form provided by CPAU Engineering and shall pay to CPAU in advance the cost of installing and removing any facilities necessary in connection with the furnishing of such Service by CPAU.
- b. Each Applicant for Temporary Service shall prepay a Temporary Service Fee in accordance with Electric Service Connection Fees Rate Schedule E-15.
- c. Nothing in this Rule and Regulation shall be construed as limiting or in any way affecting the right of CPAU to collect from the Customer an additional sum of



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

money by reason of the Temporary Service furnished or to be furnished or removed hereunder.

- d. If the Temporary Service connection time exceeds one-year, the Applicant shall apply for an extension of the Temporary Service. The Director of Utilities or his/her designee will determine if the Service should be reclassified as a permanent Service.

9. SERVICE DOWNSTREAM OF METER

CPAU assumes no duty or liability for inspecting, validating or approving the safe operating condition of the Customer's Service, appliances, or equipment downstream of the Utility Meter.

C. FIBER OPTIC SERVICE

Fiber Optic Service includes the custom construction and licensing of single mode Fiber routes between points within the City of Palo Alto. It is the Customer's responsibility to establish all electronic devices and networks required to pass data over their licensed CPAU Dark Fiber routes.

1. LICENSING SERVICES

All Dark Fiber routes are licensed in accordance with the currently approved Dark Fiber Rate Schedules, and in compliance with the Utilities Rules and Regulations. See Rule and Regulation 26, "Special Fiber Optic Utility Regulation," regarding special Service requirements. All CPAU fibers terminate within the jurisdictional boundaries of the City of Palo Alto.

2. OTHER SERVICES

CPAU offers custom Dark Fiber construction and ancillary Services such as Fiber Optic cable splicing, engineering feasibility studies, and when specifically requested by the Customer, multimode Fiber cable installations.

3. QUALITY

Dark Fiber routes in the City of Palo Alto comprised of single mode Fiber comply with



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

generally accepted industrial standards and specifications. All construction is done using industry accepted techniques and procedures. All constructed routes are Performance Tested to assure the industry quality standards are met.

D. WATER SERVICE

1. SOURCE OF SUPPLY

CPAU's primary source of Water is the Hetch Hetchy aqueduct system, managed by the San Francisco Public Utilities Commission (SFPUC). CPAU wells also provide Emergency supply. See Rule and Regulation 21, "Special Water Utility Regulation" regarding special Service requirements.

2. QUALITY

Hardness generally varies between 1 and 4 grains per gallon depending on the source. An analysis of the mineral content of the Water is available upon request from CPAU Engineering.

3. PRESSURE

Water pressure varies from 30 to 125 pounds per square inch. CPAU maintains an average of 50 pounds per square inch, with the maximum and minimum pressures being experienced at the lower and higher elevations of the Distribution System. CPAU assumes no responsibility for loss or damage due to lack of Water pressure but agrees to furnish such pressures as are available in its general Distribution System. If low Water pressure occurs due to additional on-site development, it shall be the responsibility of the property owner to replace the existing Water Service with a new Water Service designed for the current site. All costs of the required new Service upgrade shall be borne by the property owner.

4. TREATMENT

CPAU currently does not treat Water supplied by the SFPUC. The pH of the Water supplied is adjusted by the SFPUC to reduce its corrosive action.

5. SERVICE DOWNSTREAM OF METER

CPAU assumes no duty or liability for inspecting, validating or approving the safe operating condition of the Customer's Service, appliances, or equipment downstream of



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

the Utility Meter.

E. GAS

1. TYPES OF SERVICES

CPAU provides Gas supply, transportation, and Distribution Services.

2. KIND AND HEATING VALUE

CPAU purchases Gas from several/various Gas suppliers. The heating value of Gas supplied varies. The average monthly heating value in British Thermal Units (Btu)-dry basis per cubic foot of the Gas served may vary within the limits of 750 to 1150 Btu. This average heating value is converted to a Therm factor for use as one of the factors used in calculating a composite multiplier for billing purposes. The Therm factor will be based upon the heat factor used by CPAU's supplier of Gas for the preceding month.

Gas is supplied by CPAU either at standard "low pressure" or at "medium pressure". Low pressure Service is available at all points where Gas is supplied. Where available from existing high pressure mains, at the option of CPAU, high pressure Service may be supplied. However, CPAU reserves the right to lower the pressure or to discontinue the delivery of Gas at high pressure.

The standard pressure for low pressure is seven inches of Water Column (WC), which is approximately 1/4 pound per square inch (psi) above atmospheric pressure. In limited circumstances, increased pressure may be provided for domestic use at 14" Water Column. This increased pressure will only be provided for domestic use if the houseline size required is greater than 2" diameter, or CPAU determines, based upon satisfactory information from the manufacturer, provided by the Customer, that an appliance to be located in the residence requires increased pressure at the inlet that cannot be obtained by resizing or relocating the houseline. Increased pressure may be provided for commercial uses only if the use of the houseline size required is greater than 4" diameter, or evidence as described above establishes that equipment on the site requires increased pressure at the inlet that cannot be obtained by resizing or relocating the houseline. For commercial uses, the available pressures are 7" WC, 14" WC (approximately 1/2 psi), 1 psi, 2 psi and 5 psi.

All increased pressure above 7"WC requires review and approval of the Engineering Manager, a plumbing permit and testing of the existing Gas piping with a building



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

Inspector present in accordance with the latest adopted version of the California Plumbing Code

See Rule and Regulation 22, "Special Gas Utility Regulations" regarding special Service requirements.

3. DETERMINATION OF THERMS TO BE BILLED

The unit of measure for billing is the Therm. Gas Meters measure volume of Gas in ccf at ambient temperature and pressure conditions. Therms are derived from the metered data by subtracting the Meter reading for the previous reading cycle from the current reading. The difference (uncorrected ccf) is multiplied by the pressure factor required to convert the measured consumption volume to a standard volume (at standard temperature and pressure conditions). This standard volume, in pressure-corrected ccf, is then multiplied by the Therm factor (a variable determined by periodic analysis of CPAU's Gas supply) to produce the final number of Therms billed. The composite correction factor (the product of the Therm factor and the pressure correction factor) is shown on bills under the heading "multiplier."

4. SERVICE DOWNSTREAM OF METER

CPAU assumes no duty or liability for inspecting, validating or approving the safe operating condition of the Customer's Service, appliances, or equipment downstream of the Utility Meter.

F. WASTEWATER COLLECTION AND TREATMENT

1. COLLECTION

CPAU operates and maintains a Wastewater Collection System separate from the storm and surface Water Collection System. A connection to the Wastewater Collection System is required for all water users where wastewater service is available.

For the disposal of Wastewater from basements and floors below ground level, it will be necessary for the Customer to provide pumps or ejectors for satisfactory drainage, as approved by the Water-Gas-Wastewater Engineering Manager. If the elevation of the basement floor is above the rim elevation of the next upstream manhole, Applicant shall provide a survey by a licensed Civil Engineer indicating the elevations of the basement floor and the rim elevation of the next upstream manhole. Submission of this survey and



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

approval by the Engineering Manager is required for exemption from the pump/ejector requirement.

2. REGULATION

Chapter 16.09 of the Municipal Code regulates the discharge into the Wastewater Collection System of substances other than domestic Wastewater. See Rule and Regulation 23, "Special Wastewater Utility Regulations" regarding special Service requirements.

3. TREATMENT

The collection system transports the Wastewater to the Palo Alto Regional Water Quality Control Plant for treatment. At this tertiary treatment plant, the City of Palo Alto processes the Wastewater from Mountain View, Los Altos, Los Alto Hills, Stanford University, and East Palo Alto Sanitary District, as well as its own. The treatment is performed in accordance with the National Pollution Discharge Elimination Permit issued by the San Francisco Bay Area Regional Water Quality Control Board before the treated water is discharged into the San Francisco Bay Estuary.

4. LIMITATION OF SERVICE

CPAU reserves the right to limit the size of connection and the quantity of wastes disposed and to prohibit the use of the sewer for disposal of toxic or hazardous wastes detrimental to the Wastewater system or treatment plant.

G. REFUSE SERVICE

1. REGULATION

All Refuse Services are governed by Chapter 5.20 of the Palo Alto Municipal Code, regulations promulgated by the City Manager pursuant to Chapter 5.20, these Rules and Regulations and the contract between the City and the City's Collector. See Rule and Regulation 24, "Special Refuse Service Regulations" regarding special service requirements.

2. REFUSE COLLECTION

Refuse Service is provided to all Customers by the City's Collector. Customers shall subscribe and pay for Refuse Service and for a number of containers to hold all Solid Waste created, produced or accumulated at or on their Premises during a one-week period, unless a different frequency for a collection schedule has been approved or



DESCRIPTION OF UTILITY SERVICES

RULE AND REGULATION 3

directed by Public Works. Each Customer shall receive collection Services on a specified day of each week and use the City Collector's provided Containers for service. Customers wanting to supply their own container must check with the City Collector to ensure compatibility with the collection vehicles. The automatic standard service for Solid Waste Service Charge is one 32-gallon container for Residential Service and one 64-gallon container for Commercial Service. All customers may change service levels to meet their refuse needs as specified above.

Solid Waste in excess of the Service Charge subscribed by the Customer will be removed by the City's Collector for an additional Charge upon Customer request or notification. Customers exceeding their subscribed Service are required to subscribe to additional collection Services at the City-established rates.

H. STORM AND SURFACE WATER DRAINAGE

1. RESPONSIBILITY AND PURPOSE

The City of Palo Alto Public Works Department is responsible for all Drainage Facilities in the street and public right of way that collect storm and surface Water and convey it to the major channels and creeks within the jurisdictional boundaries of the City of Palo Alto. Examples include curbs and gutters, catch basins, pipelines, culverts, street, channels and pumping stations. The purpose of the Storm and Surface Water control facilities is to improve the quality of control, or protect life or property from any storm, flood or surplus waters. See Rule and Regulation 25, "Special Storm and Surface Water Drainage Regulations," regarding special Service requirements.

2. STORM DRAINAGE FEE

A Storm Drainage fee shall be payable to the City monthly by the owner or occupier of each and every developed parcel in accordance with Rule and Regulation 25.

(END)



SPECIAL ELECTRIC UTILITY REGULATIONS**RULE AND REGULATION 20****A. GENERAL**

In addition to the general requirements outlined in Rule and Regulation 18 for Utility Service Connections 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 installing and maintaining all substructures on the Customer's Premises for CPAU to provide Electric Service. This will be at the Customer's expense and in accordance with the requirements, standards, and specifications of CPAU. This substructure shall be owned and maintained by the Customer for exclusive use by CPAU. The Customer shall be responsible for repairing or replacing the substructure for any reason, including deterioration to the extent that the existing conductors/cables cannot be removed.
- b.** 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.
- c.** 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 cost of installation in accordance with the applicable sections of CPAU's Electric Service Connection Fees (Rate Schedule E-15). CPAU will determine the type and size of the conductors to be installed by CPAU.
- d.** CPAU will assume ownership and responsibility for maintenance of the underground Electric Service lateral conductors, as defined in the National Electric Code Article 100, installed by the Customer if the Service meets CPAU specifications and it has been approved and accepted by the 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



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

terminals. The bus duct or extra flexible cable is considered to be the Service entrance conductor for which CPAU assumes no responsibility.

2. MISCELLANEOUS SERVICE EQUIPMENT

a. CUSTOMER'S EQUIPMENT

1. 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 shall be furnished, installed, owned and maintained by the Customer in accordance with CPAU requirements.
2. The "service disconnect" is defined by the National Electric Code.
3. Applicant will 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 Applicant. Such seals shall be broken only by authorized CPAU representatives. Detailed information will be furnished by CPAU on request.

b. CPAU'S EQUIPMENT

1. CPAU will furnish and install the 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 shall be 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



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

Customers and new subdivisions shall be provided by underground facilities on the Customer's Premises. The on-site underground Electric Utility lines shall be provided by the Customer at their expense and shall meet CPAU specifications.

2. NUMBER OF SERVICES PER BUILDING

Only one Electric Service line is allowed for a building or other Premises, except for commercial properties where:

- a.** Two or more Electric Service Drops or laterals may be extended to a single building provided all wiring, other than metering conductors, supplied for each Service has no common raceway, connection, or service area with wiring supplied by any other such Service. Approval by the Utilities Director, or his/her designee, is required and Special Facilities fees 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 fees 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 where the Applicant requests CPAU to install multiple Service Lines, and CPAU agrees to make such an installation. The additional costs, as estimated by CPAU, shall be borne by the Applicant, including such continuing ownership costs as may be applicable. See Special Facilities section 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 Applicants main switchboard is larger than 400 amp.

D. PROTECTIVE DEVICES

- 1.** The Applicant is responsible for furnishing, installing, inspecting and keeping in



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

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 Applicant's facility. CPAU shall not be responsible for any loss or damage occasioned or caused by the negligence, or wrongful act of the Applicant 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 Applicant is responsible for installing and maintaining approved protective devices as may be necessary to coordinate properly with CPAU's protective devices to avoid exposing other Customers to unnecessary Service interruptions.
3. Applicants who request Primary voltage Service shall install, at a minimum, circuit breakers with over-current and ground fault relays. Applicants must submit their planned protection scheme to the City for approval prior to installing any equipment.
4. The Applicant is responsible for equipping three-phase motor installations with appropriate protective devices, or using motors with inherent protective features, to completely disconnect each motor from its power supply. Particular consideration must be given to 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 where appropriate 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.



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

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 Customer shall consult CPAU for the short-circuit current at each Point-of-Delivery.
6. Any non-CPAU-owned Emergency standby generation equipment shall 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.
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 for the definition of 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 shall 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, or the service to other



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

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.

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 suitable permanent and operational solution is provided by the Customer, at Customer's expense.

4. MOTOR STARTING CURRENT LIMITATIONS

- a. The starting of motors shall 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 shall the Load on one side of a three-wire single-phase service be greater than twice that on the other. In no case shall the Load on any one phase of a polyphase service be greater than twice that of any other.



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

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 NEC, must be installed adjacent to the meter(s). Metering equipment must be located on the exterior of the building, unless approved by the Electric Engineering Manager.
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 requires voltage control with less variance than what is specified in Rule and Regulation 3, the Customer must reimburse CPAU for its cost to provide 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 shall 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



SPECIAL ELECTRIC UTILITY REGULATIONS

RULE AND REGULATION 20

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 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 its Rate Schedules.
2. CPAU normally installs only those standard facilities which it deems are necessary to provide regular service in accordance with the Rate Schedules. Where the Applicant requests CPAU to install Special Facilities and CPAU agrees to make such an installation, the additional costs thereof, as estimated by CPAU, shall be 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 shall 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 Rate Schedules, Special Facilities will be installed, owned and maintained by CPAU as an accommodation to the Applicant only if acceptable for operation by CPAU and 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.

(END)



SERVICE CONTRACTS**RULE AND REGULATION 5****A. TYPES OF SERVICE CONTRACTS**

For all Utility Services provided, the City may require a written agreement for new or existing Customers. Contracts may apply to standard, custom, or special Service offerings. The following is an illustrative list of special Services that may be the subject(s) of a contract. Additional Services may require contracts not listed here, at the discretion of the Director of Utilities.

1. Line Extensions
2. Temporary Service
3. Special Facilities
4. Utility Service to special districts and institutions
5. Work performed for other agencies at their expense
6. Special Metering and/or Billing Services
7. Special Energy Services
8. Long-term Service agreements greater than 3 years
9. Loans and leases to finance efficiency improvements at a Customer's site
10. Loans and leases to improve power quality or reliability at a Customers' site
11. Standby Service
12. Purchase, lease, installation, connection or maintenance of on-site or distributed generation
13. All Fiber Optic Services
14. Reserve Electric Capacity

B. CONTRACT APPLICATION PROCEDURES

1. Customers shall complete and execute applicable form(s) or letter(s), as necessary.
2. Depending on the type of Service contract and at the request of CPAU, Customers shall request consideration for a special contractual agreement in writing to the Director of Utilities and/or the Director of Public Works specifying their objectives, including the desired terms and conditions of the contract.
3. Customers shall pay all applicable fees and deposits in accordance with the terms of the contract.
4. Customers shall comply with the City's insurance requirements.

(END)