

Electric Service Policy
Amended by Resolution
03/10/2010

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Section 100 General

100 Introduction

The Electric Operations business unit of Cedar Falls Utilities (“CFU”) issues this manual as a guide for obtaining electric service, electric line extensions and as a means of presenting the services available, conditions for implementing those services and related standards for material and construction.

101 Codes and Regulations

It is the policy of CFU to operate the electric transmission and distribution system with the highest degree of care for the safety of the public and CFU employees. To ensure the care and safety needed for an electric distribution system, the National Electric Safety Code is used for design, construction, maintenance and operation of the electric system. The standards herein are supplementary to, and are not intended to conflict with the rate schedules of CFU, the National Electric Code, the National Electrical Safety Code and such state, county and other governing authorities’ laws, codes, ordinances, orders and statutes as may be enforced within the city and area to which CFU furnishes service.

102 Customer Responsibilities

The customer shall install and maintain all wiring and equipment beyond the point of delivery, except for meters and special equipment installed by CFU, in accordance with applicable governmental codes and accepted industry standards. In all cases except for three-phase underground services or unless otherwise specified, point of delivery is the location on the customer’s building, structure or premises where all wires, conductors or other current carrying devices of the customer join or connect with wires, conductors or other current carrying devices of CFU. For all industrial and commercial class three-phase underground services, the point of delivery will normally be the secondary terminals of a pad-mounted transformer.

103 Unauthorized Use of Service

Any tampering, breaking of meter seals, opening or damaging of CFU locks or other property of CFU is prohibited. CFU may, at any time and without notice, discontinue supply of service to the customer and remove its meters and metering equipment in the event of such tampering. The customer shall be responsible for payment of all costs which result from such tampering with CFU property.

104 Interruptions and Liability

CFU will use reasonable diligence to supply steady and continuous service, but does not guarantee its service against irregularities or interruption. CFU shall not be considered in default of its service agreement with the customer and will not otherwise be liable for any damages incurred by any irregularity or interruption of electric service. CFU shall not be considered in default of its service agreement and will not otherwise be liable due to failure of CFU to perform any obligations if prevented from fulfilling such obligation by

reason of delivery delays, breakdowns of or damage to facilities, acts of God or public enemy or any cause beyond the control of CFU.

CFU reserves the right to interrupt service at any time. Interruptions for maintenance and system improvements for CFU purposes will be pre-arranged and advance notice will be given to the customer whenever practical.

The customer shall be responsible for paying and installing the necessary equipment to guard against high or low voltage or the loss of one-phase in a three-phase system. The customer shall not operate the equipment in such a manner as to cause any unusual voltage fluctuations on or other disturbances to CFU's system. Welders, hoists, corn dryers, motors and other equipment, where the use of electricity is intermittent or the load fluctuates rapidly, shall be installed and used in such manner as to not adversely affect voltage regulation or impair CFU's service to other customers. When such equipment creates fluctuating voltage or power factor condition, or any other disturbance detrimental to service to other customers or CFU's use of its own equipment, the customer shall be required to install and maintain, at the customer's expense, suitable corrective equipment to eliminate these detrimental effects.

105 Power Quality

CFU provides electric service to its customers that meet or exceed all Iowa Utilities Board ("IUB") requirements. In conditions such as major storms, lightning, high winds or similar adverse conditions, the electrical service may be interrupted and/or voltage spikes may occur, whether for fractions of a second or for hours. In such cases, it is the customer's responsibility to install the necessary protective devices on equipment such as computers, motor controllers and electronic type equipment. Microprocessor-based electronics and computers have led to the need for increased protection against voltage transients. Sensitive electronics are more susceptible to damage due to voltage spikes or surges. The customer should consider installing transient voltage surge suppression at the main service entrance and at the point of use. If a momentary voltage dip or outage would cause loss of data, an uninterruptible power supply (battery backup) should be considered.

106 Rights-Of-Way and Access to Premises

The customer shall provide, without cost to CFU, right-of-way for the equipment or facilities of CFU over, across, under and upon the property owned or controlled by the customer as is necessary to supplying service to the customer.

The customer should permit access to the their premise at all reasonable hours for the purpose of installing, reading, inspecting, adjusting, repairing, maintaining, replacing or removing any of CFU's facilities on the premise of the customer or for any purposes incidental to the service supplied by CFU including emergency situations.

107 Accessing Equipment and Energizing Connections

Entry into CFU's locked or secured facilities or equipment by non-CFU personnel or unauthorized contractors of CFU is prohibited. When entry into secured CFU facilities is required by the customer, the customer or the customer's agent shall contact CFU

Electric Operations at 268-5297 to make arrangements for CFU personnel to de-energize the facilities and provide access.

108 Relocating CFU Equipment or Facilities

When CFU makes changes in its equipment or facilities to permit work to be done by contractors or others, or for the convenience of the customer, the cost of the work shall be billed to and paid for by the party requesting the change. The customer or customer's representative shall notify CFU in advance of any work, which requires relocation of CFU equipment or facilities.

109 Inspections

When a governing authority requires either permits or inspections of new installations, CFU will not make service connections until such permits are obtained and the installation passes the required inspections.

110 Resale of Service

The electric service supplied by CFU is for the exclusive use of the customer on the premises to which such service is delivered by CFU. CFU will not supply electric service to a customer for resale by the customer. However, a master-metered customer may assess tenants, lessees or other persons to whom ultimately the electricity is distributed by an allocation procedure, provided the master-metered customer does not receive more than needed to pay the master-metered bill. CFU will supply and maintain only the one master meter in such an instance.

111 Rates

Service classification shall be based on the type of service supplied and the similarities in customer load and demand characteristics. As nearly as practical, rate schedules adopted by CFU shall reflect relative differences in the full cost of providing various quantities of service to each customer class. The electric rates may be changed at the discretion of the Board of Trustees of the Municipal Electric Utility.

112 Non-betterment Charges

Any customer requesting the removal or relocation of poles, wires, meters or any type of work relocation for their own benefit or to correct a customer violation of code or policy, shall absorb all costs providing such work is of no benefit or improvement to CFU. This policy does not apply to changes necessitated through public improvements by the city, county or state.

113 Characteristics of Service

The electric service provided by CFU is alternating current with a nominal frequency of 60 hertz and a nominal voltage for lighting purposes of 120 volts.

114 Underground Locates

Grading or excavation work should not be started until an underground facilities location has been completed. Forty-eight hours prior to any trenching or excavation work in excess of 12 inches, the customer is required to call Iowa One Call at 1-800-292-8989. The customer shall indicate where and when the digging will occur and provide the name and phone number of the individual to be contacted by CFU.

115 Tree Trimming

The customer shall permit CFU to trim or remove any trees or other vegetation that may interfere with the safe operation of CFU's facilities. The customer shall notify CFU prior to trimming in the proximity of overhead conductors of CFU.

116 Attachments to CFU's Facilities

Attachments of any kind or nature on CFU poles or other equipment, without previous consent will not be permitted.

117 Combined Service Rate

Electric service for residential and commercial purposes may be combined through a single meter, but the service shall be billed under the General Service or Power Service commercial rate.

118 Multiple Dwellings

Electric service to a multiple dwelling or apartment house through a single meter is not allowed, except where permitted prior to January 1, 1979. Such service will be billed under the residential rate with the minimum monthly bill and the KWH in each rate block multiplied by the number of living units or apartments served. Any apartment or living unit with separate, permanent kitchen facilities shall be considered as one single, private residence for application of this policy. Electric service to a multiple dwelling or apartment house for common use such as laundry rooms, garages, heating plants, lighting, central air conditioning, etc. shall be billed under the appropriate commercial General Service or Power Service rate.

119 Grounding

The grounding of electric installations shall meet the National Electrical Code (NFPA No. 70) specifications and all other applicable codes. CFU does not permit the use of gas pipe as a ground for electrical services.

Section 200 Distribution Line Extensions

201 Definitions

The following definitions shall apply to the terms used for line extension requirements.

201.1 Advances for construction costs

201.11 Payments for advances may be made by:

- cash, check or money order
- surety bond
- equivalent surety

201.12 All payments for advances shall be made prior to the start of construction.

201.13 No interest will be paid on advances for construction held by CFU.

201.2 Agreed-upon attachment period

The agreed-upon attachment period is a period of not less than 30 days nor more than one year mutually agreed upon by CFU and the applicant within which the customer will attach. If no time period is mutually agreed upon, the agreed-upon attachment period shall be deemed to be 30 days.

201.3 Call of surety by CFU

201.31 The bond or surety shall be called by CFU:

- at the end of one year from the date of the advance, or
- when the earned refund is equal to the amount of the advance, whichever occurs first

201.32 Surcharge - At the time of the call, the customer shall pay CFU the amount of the surcharge.

201.4 Estimated annual revenues

The estimated annual revenue is calculated based upon the following factors, including, but not limited to the following:

- size of the customer's facility
- size and type of equipment to be used by the customer
- average annual amount of service required by the equipment
- average number of hours/day and days/year the equipment will be in use

201.5 Estimated base revenues

The estimated base revenue is calculated by subtracting the fuel expense costs from the estimated annual revenues.

201.6 Estimated construction costs

The estimated construction costs is calculated using average costs In accordance with good engineering practices and upon the following factors:

- 201.61 Size, location and characteristics of the extension
- 201.62 All other materials and accessories required to construct a line including: transformer(s); switchgear, switches, fusing cabinets, conductor, cable, elbows, fuses and lightning arrestors; any other construction material
- 201.63 Average cost per foot - the average cost per foot shall be computed utilizing the prior calendar year costs, to the extent such cost basis does not exceed the current costs using current construction cost methodologies, resources and material, and working conditions divided by the total feet of extensions by type of service for the prior calendar year. In no event shall estimated construction cost include costs associated with facilities built for the convenience of the Utility.

201.7 Extension or Line Extension

The extension or line extension is primary or secondary distribution line extension other than a service extension.

201.8 Customer advances for construction records

The customer advances for construction records are those records established and maintained by CFU that include:

- by depositor
- the amount of advance for construction provided by the customer
- whether the advance is by cash, surety bond, or equivalent surety
- if by surety bond or equivalent surety, all relevant information concerning the bond
- the amount of the refund, if any, to which the customer is entitled
- the amount of refund, if any, which has been made to the customer
- the amount not refunded
- the construction project or work order the extension was installed on

201.9 Refunds of Advances:

201.91 Refunds

- Refunds to the advances for construction costs are applicable for a period of 10 years from the date of the original advance for construction. CFU shall provide a refund to the depositor for each customer who attached to the line extension.

201.92 Amount of Refund

- The amount refunded for each attaching customer will be equal to three times the estimated annual base revenue of that customer, unless this would result in a total refund greater than the original deposit. In that case, the total refund will be equal to the original deposit.
- For purposes of the refund, a new customer will only be considered to have attached to a line extension if the electric service connection is attached directly to a point on the extension.

201.10 Surety bond or equivalent surety

If a surety bond or equivalent surety is used, the bond amount shall include:

- the amount of the advance
- a surcharge equal to the annual interest rate paid by CFU on customer credit assurance deposits multiplied by the amount of the advance.

202 CFU Provisions

If the customer attaches within the agreed upon attachment period, CFU will provide without cost to the customer requiring permanent and continuing service the following:

- a single-phase overhead line extension in public right-of-way (or an equivalent credit). Materials and accessories required to construct said line includes: pole mount transformer; switches, conductor, fuses and lightning arrestors; any other construction material.
- a single-phase overhead line extension to cross the public-right-of-way to the customer's nearest property line, as needed. Materials and accessories required to construct said line includes: pole mount transformer; switches, conductor, fuses and lightning arrestors; any other construction material.

203 Customer Advances For Construction Costs

203.1 The customer(s) requesting the extension shall pay an advance for construction costs for any additional estimated construction cost of the extension not provided for by CFU in Section 202, less a credit of three times the estimated annual base revenue of the customer(s) attaching to the extension.

203.2 The customer may, with the consent of CFU and in accordance with CFU standards, offset a portion of the advances for construction by providing trenching and back-fill for the electric distribution underground system. The customer would be responsible for the trench and/or excavation being properly located within specified easements and/or rights-of-way. All relocation costs resulting from improperly located trenches shall be borne by the customer.

203.2 Where the estimate of the customer's base revenue is in dispute the customer shall pay the total additional cost as an advance and CFU will defer allowance of the credit for base revenue for one year to enable the credit to be based on actual base revenue.

204 Newly Platted Subdivisions

204.1 Advances For Construction

Line extensions within newly platted subdivisions shall be made on the same cost basis as extensions along private right-of-way. The customer/developer shall pay an advance for the estimated construction cost of the extension within the subdivision, less a credit of three times the estimated base revenue of the customer(s) attaching to the extension.

204.2 CFU Responsibility

CFU will install and maintain the complete distribution underground system of primary and secondary service laterals to new residential structures.

204.3 Developer Responsibility

The developer of a new residential subdivision must provide to CFU the following:

- a copy of the recorded plat or development plan
- easements as required for the distribution extension and any rights-of-ways necessary for approach lines must be dedicated on the plat
- The area of installation shall be within 6 inches of final grade before electric distribution lines can be installed
- Transformer pad sites must be level at final grade prior to installing transformers
- individual lot boundaries shall be identified and remain identified until the distribution system has been installed

205 Mobile Home Parks

205.1 Advances For Construction

Line extensions within newly platted mobile home parks shall be made on the same cost basis as extensions along private right-of way. The customer/developer shall pay an advance for the estimated construction cost of the extension within the mobile home park, less a credit of three times the estimated base revenue of the customer(s) attaching to the extension.

205.2 CFU Responsibility

CFU will install and maintain the complete distribution underground system of primary and secondary service laterals to the customers' service pedestals.

205.3 Developer Responsibility

The developer of the new mobile home park will provide to CFU the following:

- a copy of the recorded plat or development plan
- easements as required for the distribution extension, and any rights-of-ways necessary for approach lines must be dedicated on the plat
- the area of installation shall be within 6 inches of final grade before electric distribution lines can be installed
- transformer pad sites must be level at final grade prior to installing transformers
- individual lot boundaries shall be identified and remain identified until the distribution primary and secondary system has been installed
- position meter pedestal such that the meter faces towards street
- install all customer-owned service equipment
- if located within the city limits, call for city inspection
- call CFU Electric Operations at 268-5297 to have the service hooked up
- a CFU-approved meter pedestal (installed and maintained by the customer)
- an easement for all electrical facilities at the time of the design/installation to include to the meter pedestal and to the mobile home

206 Additional Requirements for Underground Extensions

206.1 At the option of CFU, the customer shall install duct that meets CFU specification to accommodate CFU cable on private property when under pavement or obstruction

206.2 For three-phase installations, the customer/developer is responsible for constructing and maintaining transformer pads in accordance with CFU's standards for three-phase pad-mount transformer pad installations.

206.3 After construction is started, the customer shall pay an additional charge for CFU to relocate its facilities if there is a change to:

- grade in excess of 4 inches
- the lot line
- easement boundaries that had previously been considered final

206.4 The customer is responsible for removal or restoration of obstructions, sod or other landscaping features.

206.5 Additional construction costs may be applicable for winter construction conditions or abnormal soil conditions.

Section 300 Residential Service

301 Residential Service, General

- 301.1 A service extension is defined as any secondary line extension on private property servicing a single customer or point of attachment of electric service.
- 301.2 The type of electric service available is underground. Available service voltage classifications will depend upon a customer's location and proximity to existing facilities within CFU's overhead or underground service area.
- 301.3 CFU will normally permit only one service entrance per customer. (See Section 313.2 for second services.)
- 301.4 Service extensions will be energized only after the entire installation has been approved by the Electrical Inspector.
- 301.5 When a service has been disconnected because of fire, catastrophe or for changes in the customer's wiring, CFU will require approval from the appropriate Electrical Inspector before the service is reconnected. (See paragraph 301.6.)
- 301.6 Electrical inspections are to be obtained by the customer. The appropriate agencies to request inspection from are:
 - City of Cedar Falls – Building Inspections (319) 268-5161
(for ALL services within the city limits of Cedar Falls)
 - City of Waterloo – Building Inspections (319) 291-4319
(for rural residential only services in Black Hawk County)
 - State of Iowa – Electrical Inspections (319) 415-4952
(for all rural services located in Butler County, Grundy County, and all rural services other than residential in Black Hawk County)

302 Service Ratings Available

Several sizes of services are available for single-family residential structures. The size of service depends upon the size of the home and the power requirements of the customer's equipment. All residential services shall be single-phase.

<u>Voltage</u>	<u>Ampere Rating</u>	<u>Typical Use</u>
120/240	100 Amps	Small and medium sized homes
120/240	200 Amps	Medium sized homes (most common size service)
120/240	400 Amps	Large homes
120/240	Over 400 Amps	very large homes

For special applications, a 120/208 single-phase service is allowed.

303 Meter Location

303.1 The customer must install the meter socket where it will be accessible to CFU personnel. The customer shall contact CFU at 268-5297 for the approved meter socket location.

303.2 Unless CFU approval of an exception is given, the requirements for a properly located meter socket are:

- it must be outside and securely attached to a permanent structure
- it must be located on the front or side one-half of the house closest to CFU's source
- for rear lot line construction it must be located on the back or side one-half of the house closest to CFU's source
- it must be located in an area that is not subject to being fenced, such as patios, decks, porches, backyards
- it must be located on a structure that is owned by the customer
- it must be located such that the center of the meter is between 4 and 5 feet above finished grade
- a clear working space of not less than 36 inches in front of the meter and 30 inches wide must be maintained at all times or the meter will be relocated at the customer's expense
- mounting heights for multiple meter stacks will be no lower than 36 inches from final grade to the center of the lowest meters and will be no higher than 72 inches from grade to the center of the highest meters

303.3 Reasons for these requirements are as follows:

- so Meter Readers can read the meter in a cost effective manner
- so the Utility can efficiently maintain the meter
- if there is a fire or other disaster, it aids in CFU's ability to disconnect service

304 Removing and Installing Meters

Only personnel who are qualified and authorized by CFU are permitted to remove and install meters. In special circumstances, exceptions may be granted to qualified electrical contractors by contacting CFU's Electric Meter Shop at 268-5386.

305 Meter Socket Requirements

305.1 The customer provides a CFU approved meter socket as follows:

<u>Application</u>	<u>Milbank Cat. No.</u>	<u>Landis & Gear Cat. No.</u>
100 amp single-phase OH	U.7487-RL	UAT111-OG or UAT131-OG
200 amp single-phase OH	U.9800-RRL	Type HQ-4G
200 & 100 amp single-phase UG Lugs-K1539 (3 per set) 350 Kcmil (max)	U.9865-RRL	42504-0250 HG-4SU
200 & 100 amp three-phase	U.9700-RRL	HQ-7
200 & 100 amp three-phase	U.9701-RRL	HQ-7U
400 amp single-phase class 320 OH,UG	U.1129-0 (use appropriate lugs)	HQ-4D/SW #44704-02 (use appropriate lugs)
Single-phase gang socket 2-100 amp	U.1252-RRL	
Single-phase gang socket 2-200 amp 4 in stock (apt)	U.2872-XT	
100 & 200A single phase w/disconnect	U3791-RXL200	

305.2 For mobile home parks with 100 amp service, the customer provides the meter pedestal. For 200 amp service, call CFU's Electric Meter Shop at 268-5386 for approved meter pedestal.

305.3 For multiple metering arrangements with 100 amp service, the customer provides the meter sockets. For 200 amp service, call CFU's Electric Meter Shop at 268-5386 for approved meter sockets.

305.4 The customer securely fastens the meter socket to a permanent rigid support.

305.5 Normally the meter socket for a 400 ampere service is called a "Class 20" meter socket. It is a self-contained meter socket and installed on residences where the continuous current rating is 320 amps or less. If the residence requires more than 320 amps continuous, a current transformer (CT) service must be installed. For information on CT services, contact CFU's Metering Shop at 268-5386.

306 Customer Requirements – Overhead Service

NOTE: Overhead services will be allowed only under special circumstances to be determined by CFU.

306.1 The following checklist will assist in preparing for the installation of overhead service.

- determine an acceptable location for the meter socket (Refer to Paragraph 303.1)
- provide and install CFU approved meter socket
- avoid service line routes that cross a driveway

- ask CFU for the originating point for the service
- provide a clear path from the utilities pole to the customer's service mast. If trees are in the way, customer is responsible for pruning the trees and for regular tree pruning and, if necessary tree removal to keep the path clear.
- install the service equipment
- verify that the service mast height requirements have been met
- have service entrance inspected (see paragraph 301.6)
- Call CFU at 268-5297 to have service hooked up
- install and maintain all material and equipment except the meter beyond the point of delivery (meter socket to house panel)

306.2 After the customer has completed the requirements listed above, CFU will install the service line and meter.

306.3 Clearances

The service drop must be so located that the minimum clearance as specified in the latest editions of the National Electrical Code (NFPA No.70) and the National Electric Safety Code (ANSI C2) are maintained. Figure 1 illustrates some of the minimum clearances that must be maintained over other terrain.

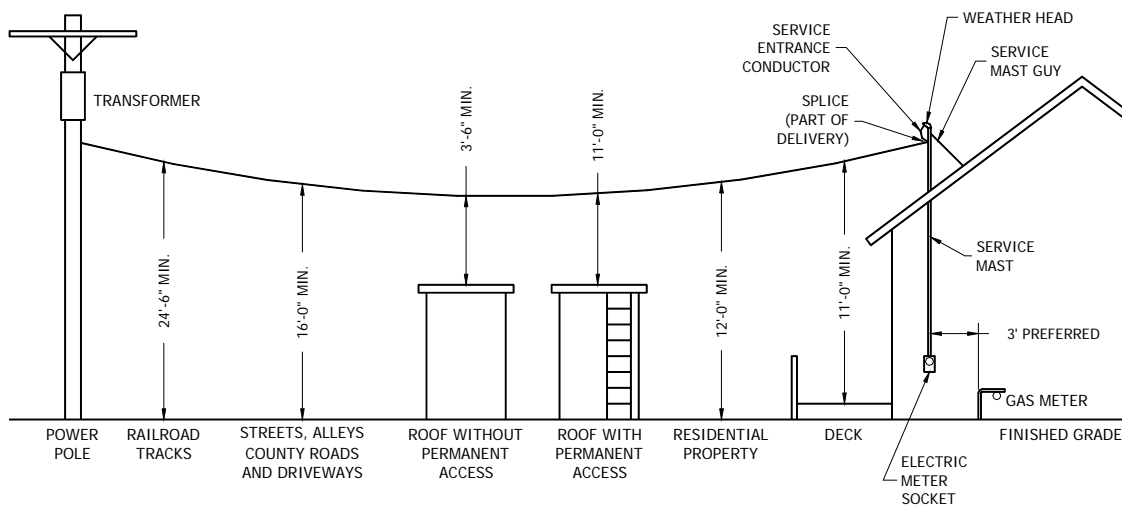


FIGURE 1: MINIMUM VERTICAL CLEARANCES FROM GROUND AND OTHER STRUCTURES

306.4 Service Mast Requirements

The requirements for the installation of a service mast are covered in the NEC. Some common methods are as follows.

306.41 Above the roof service installations

Figure 2 illustrates one example of a service mast installation above the roof. The clearance required depends upon the slope of the roof. For other options and details consult the NEC.

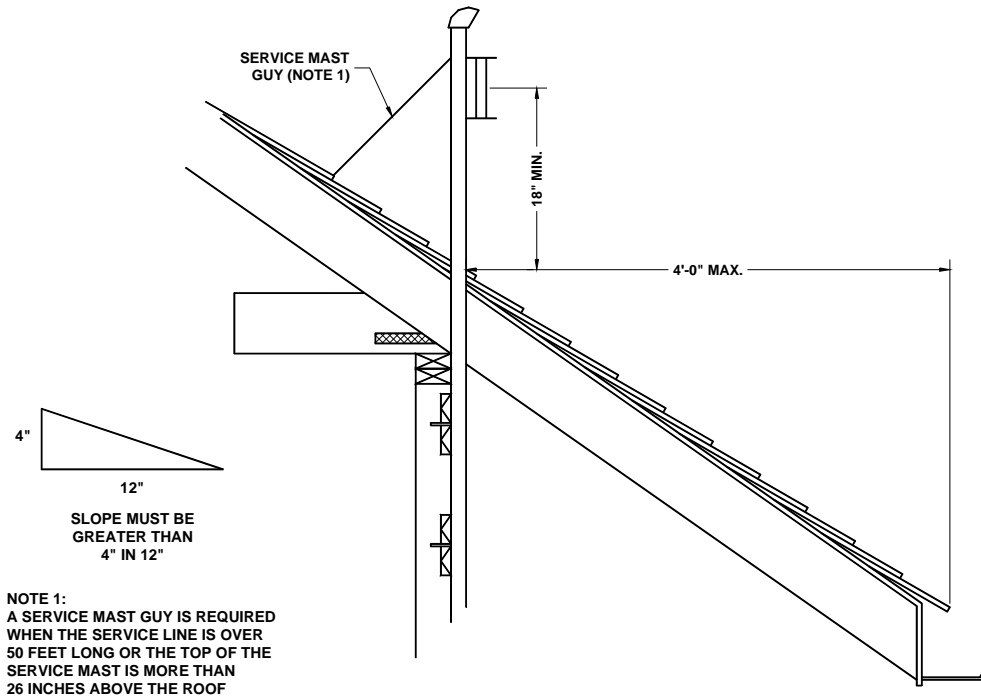


FIGURE 2: SERVICE MAST CLEARANCE OPTION

306.42 Under eaves service installations are optional to the above the roof installations. They shall meet the same clearance requirements above ground and from other structures as the above the roof installations.

306.43 Clearance from structures

As shown in Figure 1, Service lines passing over the roof of another structure, but not attached to that structure must maintain the minimum clearances. A minimum clearance of 3 feet is required between service lines and windows, doors, porches, fire escapes, or similar openings. A minimum horizontal clearance of 10 inches (3 feet is preferred) is required between electric service equipment and natural gas metering equipment.

307 CFU Responsibility – Overhead Service

CFU's responsibility shall be as follows:

- installs and maintains triplex service wire to point of attachment
- connects CFU-owned connectors to customer's service entrance wire at point of attachment
- Sets meter

308 Overhead Service Cost

308.1 CFU will make an overhead service extension from its existing overhead facilities to the point of attachment on private property at no cost to the customer.

309 Customer Requirements – Underground Service

The following checklist will assist in preparing for the installation of underground service. After the customer has completed these items, CFU will install the service conductor and meter.

- find out the origination point of the service conductor. Call CFU at 268-5297 for assistance.
- determine an acceptable location for the meter socket or, in the case of a Mobile Home Park, the location for the meter pedestal (Refer to Paragraph 303.1).
- provide and install a CFU-approved meter socket
- install and maintain all material and equipment except the meter beyond the point of delivery (meter socket)
- call for inspection (see paragraph 301.6)
- call CFU at 268-5297 to have the service hooked up.

310 CFU Responsibility – Underground Service

CFU's responsibility shall be as follows:

- installs, connects and maintains CFU-owned service conductor to meter socket or meter pedestal
- sets meter

311 Underground Service Cost

- 311.1 The customer shall make a non-refundable cash contribution for an underground service extension from CFU's existing underground or overhead facilities to the point of delivery on private property (*see Miscellaneous Customer Fees in the Electric Utility Rate Manual for current fees*).
- 311.2 The customer may, with the consent of CFU and in accordance with CFU standards, offset a portion of the contribution cost by providing trenching and back-fill for the electric underground service.
- 311.3 All payments required for service extensions shall be made subsequent to CFU having received the service inspection release.

312 Conversion From Overhead to Underground Service Cost

- 312.1 Provided the customer does not increase the service entrance (main breaker) size, the customer shall make a non-refundable cash contribution for all costs associated with the conversion of the existing overhead service to an underground service (*see Miscellaneous Customer Fees in the Electric Utility Rate Manual for current fees*).
- 312.2 If the customer increases the service entrance size by 25% or more, the conversion of the existing overhead service to an underground service will be completed at no charge.
- 312.3 The customer may, with the consent of CFU and in accordance with CFU standards, offset a portion of the contribution cost by providing trenching and back-fill for the electric underground service.
- 312.4 All payments required for service extensions shall be made subsequent to CFU having received the service inspection release.

313 Outbuildings and Garages

- 313.1 Customers requesting service to an outbuilding or garage should call CFU at 268-5297 for assistance.
- 313.2 Any new or replacement service to outbuildings or garages shall be underground customer-supplied and installed materials. The second service will be billed at the appropriate rate.
- 313.3 Normally, CFU will make connections from the customer-supplied and installed CFU-approved meter socket to the point of attachment at no cost to the customer provided the customer completes the following:
- install and maintain the service conductor from the new meter socket to the outbuilding

- provide, install and maintain all material and equipment (to include a breaker disconnect) except the meter on the load side of the new meter socket
- call for inspection (see paragraph 301.6)
- call CFU at 268-5297 to have service hooked up

313.4 After the customer has completed the requirements listed above, CFU will make connections from the new meter socket to the existing point of attachment and set meter.

Section 400 Commercial and Industrial Services

401 General

401.1 Customers requesting three-phase service must have enough three-phase load that will assure annual revenues to pay for the cost of the line installation as outlined in the line extension rules.

Nominal three-phase loads may be provided if a three-phase primary and transformer are already in place and in use.

401.2 The customer should have a minimum of 25 hp connected three-phase load or a combined load of greater than 40 KW to qualify for a three-phase service. Otherwise, the customer may add, at the customer's expense, an add-a-phase, roto-phase, or similar type device to obtain three-phase service.

401.3 For buildings where the customer cannot identify the connected load that CFU is to serve, the following guide shall be used to provide three-phase service:

401.31 Office-only buildings will be calculated at the rate of 3 watts per square foot of floor space and will have a minimum of 13,500 square feet of floor space.

401.32 Office/warehouse combination buildings will be calculated at the rate of 2-1/2 watts per square foot and will have a minimum of 16,000 square feet of floor space.

401.33 Warehouse-only buildings will be calculated at the rate of 1-1/2 watts per square foot and will have a minimum of 26,500 square feet of floor space.

401.4 If the customer does not qualify and still desires three-phase service, the customer shall pay the estimated difference in the installed cost (time and material) of the three-phase requirements and the installed cost of the single phase requirements.

401.5 CFU may, at its discretion, serve any commercial, industrial, school, church, hospital, apartment complex, townhouse, condominium or shopping center, mobile home park, or barn with an underground electric distribution system.

402 Power Factor

The customer should maintain the power factor at the point of delivery as near to unity as practicable. Power factor correction equipment will be switched with the load in such a fashion as to prevent a leading power factor at all times.

403 Customer Requirements

The following checklist will assist the customer in preparing for the installation of the commercial service.

- legal property description
- title insurance policy, recorded warranty deed, or real estate contract
- water main plan
- sewer main and profile plans
- road and storm drainage plan
- road cross section plan
- streetlight requirements

Several of the above plans may be included in one drawing.

404 Service Ratings Available

Several sizes of services are available for commercial and industrial customers. The size of service depends upon the customer's power requirements.

<u>Application</u>	<u>Voltage (Volts)</u>	<u>Service Entrance (Amperes)</u>	<u>Typical Use</u>
Single Phase	120/208, 3 wire	800 Amp Max.	Underground service from pad-mounted transformer
Three Phase	240/120, 4 wire(1) (open delta)	600 Amp Max.	Underground from pole-mounted transformers
	208Y/120, 4 wire(2)	2600 Amp. Max.	Underground service from pad-mounted transformer
	480Y/277, 4 wire or 480, 3 wire	4000 Amp. Max.	Underground service from pad-mounted transformer
		800 Amp. Max.	Underground service from pole-mounted transformers
	12470/7200, 4 wire		Primary metered service available only @ CFU's option

(1) For new service and when available, this voltage is available to serve loads that are primarily three-phase with only incidental single-phase loads such as wells and pumping stations and is not generally available from CFU's underground distribution system.

(2) Not available for service to mobile home lots per NEC 550-21.

405 Customer Responsibility

- 405.1 The customer is responsible for furnishing, installing and maintaining all required service entrance requirements, including the meter socket and service conductors from the meter socket or current transformer enclosure to the secondary lugs of CFU's transformer or junction box. For services where current transformers (CTs) are required, the customer must also run conduit from the CT enclosure to the meter base. CFU will supply the CTs and meter wiring up to 15 feet.
- 405.2 The number of secondary conductors located in a pad-mounted transformer is limited based on CFU's transformer size. Consult CFU for secondary conductor size and numbers.
- 405.3 The customer is responsible for constructing and maintaining pad-mount transformer pads in accordance with CFU's specifications for three-phase installations.
- 405.4 The following checklist identifies tasks the customer is responsible for when installing underground service prior to CFU installing the meter and connecting the service.
- supply site drawings to CFU
 - supply load information to CFU
 - provide an easement for any permanent equipment installed on the property and owned by CFU
 - consult with CFU to determine where the underground service will originate
 - consult with CFU to determine an approved meter location
 - install required service equipment
 - connect and label conductors at the meter location
 - identify service conductors as follows: (1) the insulated neutral or grounded conductor identification for sizes No. 6 or smaller shall be white or natural gray along the entire length. (2) the insulated neutral or grounded conductor identification for sizes larger than No. 6 shall be a continuous white or natural gray outer finish or by three continuous white stripes on other than green insulation along its entire length or at the time of installation by a distinctive white marking at its terminations. (3) on a 4-wire delta-connected secondary where the midpoint of one phase winding is grounded to supply lighting and similar loads, the phase conductor having the higher voltage to ground shall be identified by an outer orange finish or orange tape where the connections may be made.
 - provide trench and service conductors from the meter location to the secondary lugs of CFU's transformer
 - provide and install CFU approved meter socket

- secure City inspection if within the city
- call CFU Electric Operations at 268-5297 to have the service hooked up
- the customer's facility must not produce troublesome harmonics or other distorted wave forms or produce excessive voltage or frequency variations on CFU's power system. Substantial compliance with Standard 519-1992 IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems may be required for new installations
- the customer may be required by CFU to modify the facilities to accommodate special CFU requirements, such as special metering, power factor correction capacitors and harmonic filters.

406 CFU Responsibility

CFU will furnish, own, install and maintain the commercial, underground electric distribution system. This system is an electrical system to include conduit, cable, switchgear, fusing cabinets, elbows, fuses, lightning arrestors and any other construction material (this does not include the service conductor, refer to Paragraph 405.1).

407 Underground Line Extension Cost

The customer is subject to the distribution line extension criteria found in Section 200 above.

408 Single-phase to Three-phase Conversion

If a single-phase customer requests three-phase service, the customer is subject to the underground extension criteria found in Section 200 above. The three years estimated base revenue will be based on the estimated increase over the previous average bills on the most recent twelve-month billing.

409 Meter Location

409.1 The customer must install the meter socket where it will be accessible to CFU personnel and its location is subject to approval by a representative of CFU. The requirements for a properly located meter socket are:

- it must be outside
- it must be located on a structure that is owned by the customer

409.2 Reason for these requirements are as follows:

- so Meter Readers can read the meter in a cost effective manner
- so the Utility can efficiently maintain the meter
- if there is a fire or other disaster, it aids in CFU's ability to disconnect service

410 Meter Socket Requirements

410.1 The customer provides and installs a CFU approved meter socket as follows:

<u>Application</u>	<u>Milbank Cat. No.</u>	<u>Landis & Gear Cat. No.</u>
100 amp single-phase OH	U.7487-RL	UAT111-OG or UAT131-OG
200 amp single-phase OH	U.9800-RRL	Type HQ-4G
200 & 100 amp single-phase UG Lugs-K1539 (3 per set) 350 Kcmil (max)	U.9865-RRL	42504-0250 HG-4SU
200 & 100 amp three-phase	U.9700-RRL	HQ-7
200 & 100 amp three-phase	U.9701-RRL	HQ-7U
400 amp single-phase Class 320 OH,UG	U.1129-0 (use appropriate lugs)	HQ-4D/SW #44704-02 (use appropriate lugs)
Single-phase gang socket 2-100 amp	U.1252-RRL	
Single-phase gang socket 2-200 amp 4 in stock (apt)	U.2872-XT	
100 & 200 amp single phase w/disconnect	U3791-RXL200	
400 amp 3-phase 4W	UG-U2120-X (use appropriate lugs)	
Class 320-OH-UG	OH/UG U2594-X (use appropriate lugs)	
Above 400 amp single-phase 3W: provisions. Cat #UC7478-RL Along w/Test switch Milbank 7-pole	Milbank 5-terminal one piece cover w/test switch Cat #TS07-0105	

410.2 General requirements for meter sockets are as follows:

- meter sockets shall be ringless
- meter sockets for three-phase self-contained meters shall have a bypass lever and safety shield
- all single-phase 400 amp or less and single-phase 100 amp underground meter sockets shall have a bypass lever and safety shield
- single-phase 120/208 volt services shall require a 5th terminal securely installed to ground buss or white grounded wire. The 5th wire shall be in the 9:00 o'clock (facing) position in the meter socket.

410.2 Only approved CFU meter sockets shall be used. In special circumstances, exceptions may be granted by contacting CFU's Electric Meter Shop at 268-5386.

410.3 The customer securely fastens the meter socket to a permanent rigid support.

410.4 Refer to Section 411 Instrument Transformer Installation if the ampacity is greater than 400 amps single-phase or 200 amps three-phase.

411 Instrument Transformer Installation

- 411.1 When the ampacity of the service is greater than 400 amps for single-phase or 200 amps for three-phase, it will be necessary for CFU to use instrument transformers in the metering installation. These instrument transformers will be installed on the line side of the customer's service entrance disconnect switch. The location of the instrument transformers will be determined by CFU's Metering Department. The customer shall not install any additional disconnect switches or junction boxes on the line side of the instrument transformer location.
- 411.2 The customer shall provide suitable metal boxes approved by the Utility to house the instrument transformers and must provide a conduit of adequate size between the instrument transformer installation and meter installation. Instrument transformer cabinets shall be of adequate size to house the transformers and conductors and to be provided with a means for sealing by the Utility. The cabinet shall have minimum dimensions of 10-inch depth, 24-inch width, 30-inch height and shall be mounted with the base of the transformer cabinet no closer than 6 inches to the floor. All current transformers shall be securely anchored to the cabinet and installed with the polarity markings or white dots toward the source.
- 411.3 Instrument transformers installed within customer switch-gear shall be installed at the factory or onsite by the electrical contractor. Meter wiring will be provided and installed by CFU from the instrument transformer terminal block to the meter socket. When the instrument transformers are installed at the switch-gear factory, CFU will credit the customer an amount up to CFU's normal cost for instrument transformers.
- 411.4 CFU will provide and install up to 15 feet distance between the instrument cabinet and the meter socket. The following is a guide for allowable CT leads:

<u>Distance Between Instrument Cabinet and Meter Socket (ft)</u>	<u>Current Transformer Lead</u>
0-15 ft.	CFU provides and installs #14 AWG
15-25 ft.	Contractor provides and installs #12 AWG
25-40 ft.	Contractor provides and installs #10 AWG
40 ft and Greater	Must be reviewed by CFU

- 411.5 All current transformer leads are to be in 1-inch conduit, provided and installed by the contractor.
- 411.6 All potential transformer leads may be #14 AWG. CFU will provide and install PT wires up to 15 feet; anything greater than 15 feet the contractor provides.

The following color code shall be followed in all cases.

C-1	Black	P-1	Red
C-2	Blue	P-2	Yellow
C-3	Brown	P-3	Orange
C-4	White	P-4	Green

- 411.7 All wires shall be stranded copper with 600 volt MTW or equivalent insulation. Contractor must leave enough wire to allow CFU to form and connect leads. In no instance will splices be allowed.
- 411.8 CFU personnel shall terminate all PT and CT wires in the CT cabinet and secure the cabinet with CFU's padlock. Only personnel who are qualified and authorized by CFU are permitted to access the CT cabinet. In special circumstances, exceptions may be granted to qualified electrical contractors by contacting CFU's Electric Meter Shop at 268-5386.

412 Pad-mount Transformer and Equipment Location

- 412.1 Minimum clearance between CFU's pad-mounted transformer, equipment and structures are as follows:
- 3 feet from non-combustible walls provided the side of the transformer facing the wall does not have doors
 - 6 feet from fire sprinkler valves, standpipes, and fire hydrants
 - 10 feet from combustible walls, doors, windows, vents, fire escapes and other building openings
 - 15 feet from the water's edge of a swimming pool or any body of water
 - 20 feet from facilities used to dispense or store hazardous liquids or gases (for example, service station gas pumps and tanks, propane bulk dispensing tanks and emergency generator fueling points)
- 412.2 A clear and level working area equal to the full width of the pad-mounted transformer operating compartments must extend 10 feet minimum from the compartment opening. A minimum of 3 feet of clear working area must be provided on all sides of pad-mounted equipment other than the operating compartments, including sides with cooling fins
- 412.3 Guard posts are required around pad-mounted equipment that is exposed to vehicular traffic and to maintain 5 feet clearance from the back and sides and 15 feet from the front of the device

Section 500 Temporary Service

501 General

Temporary service is defined as a means of supplying electricity to a site for less than one year. Usually a temporary service is installed to provide power during the construction phase of a project, while provisions are being made for permanent power.

502 Customer Requirements

The customer must provide the following before CFU can energize the temporary service:

- determine if the service is to be overhead or underground
- install the required service equipment in accordance with CFU standards
- if located within the city limits, call for city inspection
- call CFU Electric Operations at 268-5297 to have the service hooked up
- provides and installs a meter socket that is: (1) rated 120/240; (2) minimum rating of 100 A and maximum rating of 200 A; (3) four jaws; and (4) Underwriters Lab (UL) approved
- customer makes a non-refundable cash contribution (*See Miscellaneous Customer Fees in the Electric Utility Rate Manual for current fees*).
- customer must provide a clear path to allow service personnel to run the line and, in the case of overhead service, to allow lines to hang without contacting trees or limbs
- the path that the service line will take should not cross property belonging to others
- for overhead service a temporary meter pole should be located on the property within 40 feet of the power pole that will serve the site. This limitation ensures that the temporary service cost will not exceed the current rate
- overhead clearance shall meet the same requirements as for permanent overhead services (12 feet above ground, 10 feet clearance to drip loop)
- for underground service, the meter pedestal should be located within 8 feet of CFU's pad-mounted transformer or junction box. This limitation ensures that the temporary service cost will not exceed the current rate.

503 CFU's Responsibilities

503.1 Overhead Temporary Service

CFU's responsibility for overhead temporary service shall be as follows:

- installs and maintains triplex service wire to point of attachment

- connects CFU-owned connectors to customer's service entrance wire at point of attachment
- Sets meter

503.2 Underground Temporary Service

CFU's responsibility for underground temporary service shall be as follows:

- installs, connects and maintains CFU-owned service conductor to meter socket
- sets meter

503.3 For temporary service other than 200 A, 120/240 volt single-phase, call CFU Electric Operations at 268-5297.

504 Distribution Line Extension Cost

The customer is subject to the distribution line extension criteria found in Section 200 above.

Section 600 Lighting

600.1 Customer Requirements – Security Lighting

- 600.11 Customer is responsible for signing a contract for security lighting service under current CFU rates.
- 600.12 If necessary, written assurances from the surrounding property owners that the installation of the security light will not adversely impact them.
- 600.13 The wattage and type of light will be by mutual agreement between the customer and CFU and limited to the available fixtures offered by CFU.
- 600.14 If a customer requests a light be removed before the end of the contract period, CFU will remove the light on a time and material basis, and bill the customer for the cost of removal and the unpaid balance of the contract.
- 600.15 In an underground area or an area planned to be converted to underground, the customer is responsible for providing and installing the conduit and wires to the light. If the light is a metered light, the customer will be responsible for the maintenance of the conduit and wires. If unmetered, CFU will assume ownership and maintenance of conduit and wires.
- 600.16 Overhead conductors shall only be installed under special circumstances to be determined by CFU Electric Operations.

600.2 CFU Responsibilities – Security Lighting

- 600.21 CFU will furnish, install, own and maintain rental security lighting with photoelectric control that operates between the approximate hours of sunset and sunrise.
- 600.22 CFU will install the security light on an existing utility-owned pole or on a customer-owned pole if wired for a 120 volt circuit.
- 600.23 All additional labor, poles, wire and fixtures necessary to place the security light in operation will be paid by the customer at the time of the installation, unless pole rental arrangements have been completed.
- 600.24 CFU will replace lamps and maintain equipment during regular day-time working hours as soon as practical after notification of trouble by the customer.

601 City Street Lighting

601.1 General

- Street lights, poles and circuits are maintained by CFU.
- Street lighting is available only to the City of Cedar Falls for municipal street lighting.
- This service is billed to the City of Cedar Falls – Rate No. 50.

601.2 Newly Platted Subdivision

- CFU will install street lighting within newly platted subdivisions in Cedar Falls.
- In residential areas, the standard pole is a 28' metal pole with a 70 W cobra head luminaire.
- In commercial areas, the standard pole is a 34' metal pole with a 100 W luminaire.
- Decorative style lights and poles are available as per the Street Light Policy. Note Exhibit A.
- Rates for said lighting are listed in the “Electric Miscellaneous Customer Fees.”

601.3 CFU Responsibilities

- To determine the total estimated cost of standard street lighting in new subdivisions and provide that estimate to the City.
- Subsequent to the installation of street lighting, CFU will provide the City of Cedar Falls the actual cost of installation.

- CFU will recover street lighting cost as per Rate 50, Electric Street Lighting Service Policy.

Section 700 Customer Installation and Operation of Standby and Alternate Generation Sources

700.1 Standby Generator Service

- 700.11 When an emergency or standby generator is required, it shall be installed in such a manner as to eliminate the possibility of operating in parallel with, or back-feeding into CFU's electrical system.
- 700.12 For the safety of CFU personnel, as well as protection of the customer's equipment, there must be a positive means to guarantee that the standby generator cannot accidentally be connected in parallel to CFU's system.
- 700.13 A manual or automatic transfer switch shall be installed at the customer's expense. This switch must be designed so that under no conditions will the standby generator and CFU's system operate in parallel. It must have a positive break-before-make design. The switch should also incorporate a visual break or some means of determining the physical position of the switch without removing the cover.
- 700.14 The standby generation facility must comply with the National Electric Code.
- 700.15 Before installing a system, contact CFU Electric Operations at 268-5297 to assure the proposed standby transformer switch installation meets CFU's requirements. To assure safety of personnel, a standby generator connected without an approved throw-over device will result in the service being disconnected until such device is installed.

700.2 Alternate Generation or Co-generation

- 700.21 Operation of any customer-owned generation equipment in parallel with CFU's system is prohibited without express written agreement between the customer and CFU.
- 700.22 All customer facilities, including switching devices and other special equipment, must be approved by CFU. It is recommended that the customer consult with CFU's Engineering Department at 268-5381 prior to commencement of design, construction and installation of the facilities.

- 700.23 CFU shall have the right to temporarily disconnect or disable the facilities from CFU's power system. Whenever reasonably possible advance notice will be given to the customer prior to such actions.
- 700.24 The customer must pay CFU for any costs CFU may incur as a result of the customer's facilities.
- 700.25 For customers operating facilities in excess of their own power and energy needs and having a primary voltage service, CFU may require the customer to have full-time, qualified operations employees to operate these facilities.
- 700.26 The customer shall comply with the following design requirements:
- The customer's facility must not produce troublesome harmonics or other distorted wave forms or produce excessive voltage or frequency variations on CFU's power system. Substantial compliance with Standard 519-1992 IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems may be required for new installations. The customer may be required by CFU to modify the facilities to accommodate special CFU requirements, such as special metering, power factor correction capacitors and harmonic filters.
 - CFU must have access to the customer's main disconnect switch at all times and the switch must be able to be locked in the open position for safety of CFU employees.
 - The installation must be designed so that it will not continue to feed into a fault on CFU's system.
 - The installation must be designed so that it will not energize or keep energized a CFU distribution circuit that would otherwise be de-energized.
 - The installation must be designed to prevent paralleling a synchronous machine with CFU's system out of synchronism and especially for induction machines to prevent excessive reactive power flow between CFU's and the customer's systems in either direction.
 - The facility capable of back-feeding during fault conditions must be designed for over-current protection that shall operate faster or more sensitively than CFU's protective device, for any type fault between the customer's main breaker and CFU's substation breaker(s). This customer over-current device may trip either of: (1) the customer's generator breaker or (2) the customer's main breaker. The customer's breaker may not close until CFU's source has been energized at plus or minus 5% of normal voltage for 60 seconds or longer, and the customer's breaker may not be closed without synchronization with CFU's system.

Section 800 Interconnection to CFU System

800.1 General

CFU has prepared this Interconnection Requirement to describe its reliability and operating standards and requirements for its facilities used for the transmission of electric power at 115 kV or greater. These standards and requirements intend to promote safe operation, system integrity and reliability of the CFU electric transmission system and to provide guidance to parties desiring to establish facility interconnections with the CFU electric transmission system.

800.2 Requirements

- Interconnections to the CFU transmission system must be consistent with standard utility practices and proposed interconnections must not degrade the adequacy, reliability or operating flexibility of the existing power system. System studies will be required to evaluate the impact of the requested interconnection.
- Any facilities proposed to be added to the CFU transmission system must comply with the CFU Transmission Planning Criteria, Transmission Assessment Practices and Transmission Operating Guides and Restrictions contained herein.
- The use and operation of any facilities proposed to be added to the CFU transmission system must comply with the CFU Transmission Planning Criteria, Transmission Assessment Practices and Transmission Operating Guides and Restrictions contained herein.
- The design and construction of all facilities proposed to be added to the CFU transmission system must be compatible with CFU's recommended electric transmission and substation design and construction practices and guidelines.
- All arrangements for system studies, designs and construction, ownership, operations, maintenance, replacements or equipment, including metering, facility controls, remote terminal units and communications equipment, if applicable, must be set forth in written contracts between CFU and the requesting party.
- Technical Requirements for New Interconnections of Generation to the CFU Electric System have also been published and are available upon request.