

**ELECTRIC SERVICE HANDBOOK  
INFORMATION & REQUIREMENTS**



**2012 EDITION**

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**ARTICLE 100  
GENERAL INFORMATION**

**SECTION**

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### **101 – PURPOSE.**

“Information and requirements for Electric Service,” is issued to provide information to Pascoag Utility District Associates customers, electrical contractors, architects and engineers, so that electrical installations, to be connected to the Company’s system, may be made in a standard, uniform and proper manner. These requirements supplement the Company’s Schedule of Rates and Terms and Conditions filed from time to time with the state regulatory agencies.

It is not intended that this booklet give complete coverage for wiring details and other lawful requirements. It has been prepared as a guide and is supplementary to the applicable national, state and local electrical codes, safety code, OSHA requirements, and to ordinances passed by authorities having jurisdiction. This booklet shall not be construed as relieving the customer and/or his contractor from the responsibility of installing wiring in accordance with the rules and regulations published by authorities having jurisdiction, nor shall the Company be responsible for the condition of the customer’s wiring and equipment.

### **103 – SCOPE.**

The information contained in this booklet applies primarily to electric service requirements for installations at voltages not exceeding 480 volts.

Contact the Consumer Services Department for information on services not covered in this booklet.

### **105 – EFFECTIVE DATE AND REVISIONS.**

This issue of “Information and Requirements for Electric Service” supercedes all previous issues and is effective at once for all new construction, with reasonable allowance for the completion of work in progress or already under contract.

Revisions of this information will be made when necessary and the Company reserves the right to make such revisions. The Company cannot guarantee to give notice of revisions to persons who may have received this book.

### **107 – ENFORCEMENT OF RULES.**

The Company requires that all wiring intended for connection to its electric system shall be installed in accordance with the rules of the applicable national, state and local electrical codes and with the laws and ordinances of state, city and town authorities having jurisdiction over the area in which the work is located, and with the requirements set forth in the succeeding pages of this booklet.

All connections to the Company’s system shall be designed, installed and operated in a manner that will not cause undue disturbance to other customers, and shall not handicap the Company in maintaining proper system conditions.



The Company reserves the right to require notification and inspection of the installation, to ensure compliance with the requirements of this booklet, during construction and prior to energizing the service. The Company requires the customer to notify the Consumer Services Department for inspections and/or when service is completed and ready to be energized.

The Company reserves the right to refuse to connect and/or the right to disconnect a service where the customer's installation does not comply with the provisions and requirements outlined above.

### **109 - SPACE REQUIREMENTS.**

The Company requires adequate space at an acceptable and accessible location for the purpose of erecting, removing, operating or maintaining its facilities, including the reading and testing of its meters, such locations to be approved by the Company.

### **111 – ADVISORY SERVICE.**

The Company offers an advisory service to all customers, architects, contractors and engineers, to assist them in obtaining installations that conform to the requirements of the Company.

All persons are encouraged to use the advisory services of the Company with respect to applications of power, electric heating, lighting, water heating, etc. Such advice may avoid delays and result in greater satisfaction and more efficient use of electrical service.

Consumer Services Departments are responsible for negotiations with customers. They should be consulted on matters of rates, the availability of service and the cost, if any, to supply each service. Although the Company endeavors to keep informed of conditions under which customers use electricity, the customer should contact the Company anytime a significant change in their use of patterns occur to request a review of available rates. The customer may request a rate review at any time by contacting the Consumer Services Department.

The Company does not in any way give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any equipment, wires, appliances, or devices owned, used or maintained by customers.

### **113 – EXCAVATIONS IN ROADS AND HIGHWAYS.**

All contractors, municipal departments and other utility companies which may be required to excavate roads or highways shall provide to the Maps and Records Department of the appropriate Company a minimum of two working days written notice of such intent to excavate.

Upon request, drawings will be made available that show the approximate location of underground ducts and cables, if present.

**Note: For work done in Rhode Island, see appendix “General Laws of Rhode Island” and contact DIG SAFE, Tel. 1-800-DIG SAFE.**

**115 – CONSTRUCTION IN THE PROXIMITY TO CONDUCTORS.**

- A. Construction in the proximity to any electrical conductor shall not be started until the Company has been contacted and it has been determined that such construction will not violate the requirements of the applicable electrical codes, National Electrical Safety Code, laws of the state and/or local municipal authorities.
- B. Swimming Pools shall not be constructed in the proximity to any electrical conductor per the applicable electrical codes.
- C. The cost of relocation of electrical facilities to comply with A and B above shall be borne by the customer.

**117 – ATTACHMENTS TO UTILITY POLES.**

All unauthorized attachments to utility poles are subject to removal without notice. Any customers or contractors seeking permission to install privately owned facilities such as telephone communication conductors must request permission in writing to the Consumer Services Department. If permission is granted, the Company will arrange to have a Pole Attachment Agreement prepared for signature by the participating utility companies and the customer.

**ARTICLE 200  
REQUEST FOR SERVICE  
INFORMATION**

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## **201 – WHERE TO APPLY.**

All requests for service information should be directed to the Consumer Services Department.

An application to have electricity turned *on or off* should be made, at a convenient business office of the Company serving the location of the installation, either in person or by telephone. Business offices are listed in front of this booklet.

## **202 – WHEN TO APPLY.**

In order for the Company to design and construct the new or changed facilities that may be needed to meet the customer's requirements, it is essential that an application for new, additional or changes to service be made as early as possible.

All contracts and correspondence with the Company for single phase residential services less than 400 Amperes are to be directed to the Residential Service Group – Meter Section for the Pascoag Utility District.

All three phase service requests should be directed to the Consumer Service Departments at all locations.

When developing plans and specifications for single-phase service 400 amperes and larger three phase service 200 amperes and larger the procedure to follow is:

### **A: Communications**

1. All contacts and correspondence with the Company should be directed to the Consumer Services Department.
2. The customer or his representative (architect, engineer, electrical contractor) should notify the Company as soon as the planning and design for the project starts and provide the location, type of project, size of load, and estimated completion date. This advance notice is required to allow time for the Company to order equipment with long delivery time. Also, to avoid delays, the customer should provide, at the earliest possible date, the information necessary for the Company to obtain any easements and grants required. See section 205.

### **B. Design**

1. The customer or his representative should provide a set of 75 percent completed plans to the Company for use in designing and laying out the required changes or additions to the distribution system.

The plans should include, but not be limited to, the following:

- a. Electrical Loads
- b. Service Location
- c. Summary of total connected loads (kw)
- d. One Line Diagram Showing the Electrical Service and Metering Installation Including Service Size, Voltage, Number of Phases (Single or Three) and Metering (Master or Individual)

- e. Location of Building
  - f. Size of Building
  - g. Roads or Parking Area
  - h. Location of Water, Drains, Gas and Telephone
  - i. Topographical Elevations of Area and Building Elevations
2. The Distribution Engineering Section will review all submitted plans and information for completeness. A preliminary review will be made regarding the amount of time and materials necessary to design and complete the project. This information will be furnished to the customer or their representatives within an agreed upon time frame. Any meetings required by the interested parties will be coordinated by the Consumer Services Department
  3. All Company design work will be laid-out on the customer's plans and returned via the Consumer Services Representative along with any other pertinent information. e.g. metering information

### **C. Approval**

The customer or his representative should supply two sets of final plans and specifications ready for bidding or construction, to the Company for review by the Engineering and Meter Departments. One set of plans will be returned with a statement of approval and/or a list of changes required.

**203 – AVAILABILITY OF SERVICE.** Before ordering any electrical equipment, or starting any electrical construction which would affect the Company's electrical system, the customer should contact the Company to insure that the desired and/or additional capacity is available.

The Company does not accept responsibility for the information given orally relative to the type of service available at specific locations. The Company will only accept responsibility for written information from an authorized company representative relative to a specific project.

**205 – PUBLIC GRANTS, SPECIAL PERMITS AND EASEMENTS.** Before wires can be run over, under or across public ways, the company must obtain public grants and in many cases must obtain special permits. These grants and permits can be issued in some instances only after public hearings are held.

Where it is found necessary that Company wires and equipment must be installed over, under or across the property of a second party or a multi-customer installation such as a shopping center, the customer must obtain, at his/her expense, the necessary signatures on an easement prepared by the Company.

Under such circumstances, delays to service connections can be avoided by applying for service at the earliest possible date. Any questions or details pertaining to the required easement should be clarified with the Company.

**207 – ADDITIONAL LOADS AND/OR ALTERATION OF SERVICE.** Company facilities are designed to meet the customer's initial requirements at the time the service is installed. When an additional load is contemplated, the Company should be notified as early as possible so that proper provisions can be made to furnish the additional service.

Failure to notify the Company of an increase in load may result in improper billing, burning out of apparatus, or serious interruption to service.

Whenever changes are made to an existing service installation involving relocation, replacement, and/or additions, the entire service installation may require rebuilding and/or relocation to conform to the present requirements of the Company and applicable electrical codes. The decision as to the actual changes required will be determined by consultation with the Company and the Municipal Wiring Inspector.

In some instances there may be a charge by the Company for service relocation. Contractors requesting these charges for bidding purposes shall submit necessary information at least three weeks prior to the required date.

**209 – CONTRIBUTION-IN-AID-OF-CONSTRUCTION.** Information relating to the portion of the service construction cost to be borne by the customer, if any, will be supplied by the Consumer Services Department. Customers should request this information before ordering equipment or starting construction.

Any contribution required must be paid-in-full prior to the commencement of any construction by the Company. Any customer/contractor/developer that turns over ownership of electric facilities to the Company will be responsible for a Tax Adjustment Factor (TAF) in accordance with the Tax Reform Act of 1986. The TAF must be paid in full prior to the Company taking ownership of the equipment and before any cable or transformers are installed.

**213 – INSPECTION CERTIFICATES.** The Company is not allowed to energize wiring until *written approval* is received in the form of an Inspection Certificate from an authorized inspector.

**215 – TEMPORARY SERVICE AND INSTALLATION CHARGES.** A temporary service will, in general, be supplied by the Company for periods not exceeding six (6) months. Upon request from the customer, the Company may grant an extension for such service.

For temporary service, the customer will pay an amount equal to the cost of installing and removing the Company's service facilities, plus the cost of nonsalvageable material used. Estimates of these charges will be furnished by the Company on request.

The customer shall supply a suitable structure as follows:

**A. OVERHEAD**

The customer shall provide a service entrance which meets the requirements of a permanent installation with respect to service drop clearances, metering, grounding and safety. The service entrance may be installed on a guyed or braced 4 inch x 6 inch timber structure which meets the specifications and installation requirements of the Company. Where a laminated 4 inch x 6 inch structure is to be assembled using two 2 inch x 6 inch planks, these planks should be bolted together at intervals not exceeding 4 feet \*See Figure 1.

**B. UNDERGROUND RESIDENTIAL DISTRIBUTION (URD)**

See figure No. 2.

**C. UNDERGROUND FROM UNDERGROUND SYSTEM**

Consult the Company.

\*NOTE: Designs for structures other than those specified in this booklet must be submitted to the Company for approval before starting construction.

**217 – VOLTAGE SENSITIVE EQUIPMENT.**

Customers owning or planning to purchase sensitive electronic equipment should be aware that this type of sensitive electronic equipment can be extremely sensitive to power system transients or loss of voltage. Customers should consult the manufacturer of their equipment for suitable devices to protect against the foregoing. The Company is not responsible for voltage variations which may be caused by switching, lightning surges, vehicles hitting utility poles, or other conditions of an emergency nature.

**ARTICLE 300  
SERVICES**

**SECTION**

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**301 – GENERAL.** Alternating current, 60-hertz service is supplied throughout the territory served by the Company. Characteristics of the service available at any specific location should be obtained from the Company before ordering any new, additional or replacement equipment.

Normally, only one service drop or lateral will be installed for a customer at a given location. Two or more service drops or laterals may be installed at the option of the Company, when approved by the Municipal Wiring Inspector, to provide suitable capacity to supply special loads or to meet unusual conditions. When electricity is metered by more than one meter, the cost of service delivered through each meter will be computed separately and the rate for the second meter will be set at a commercial rate.

All Circuits shall be metered. This includes fire-alarms, pumps, ground-fault circuit-interrupters, etc.

**302 – SERVICE AND DESIGN.** The Company will supply a service to the customer the least expensive way, providing it is in keeping with good construction practices and is revenue justified. Refer to Sections 407 and 409 for information relative to cost of providing service. Any additional expense to service the customer in an alternative manner including the cost of alternate transformers and other such equipment and hardware will be paid by the customer.

**303 – STANDARD SERVICE CHARACTERISTICS.** The characteristics and nominal voltages of the various forms of service commonly supplied by the Company are as follows:

- A. 120/240 volts, single-phase, three wire.
- B. 208Y/120 volts, three-phase, four wire.
- C. 480Y/277 volts, three-phase, four wire.

Primary voltages may be available at the option of the Company.

**305 – CUSTOMER’S EMERGENCY GENERATOR.** Where the customer installs an emergency generator for the purpose of supplying all or part of the load in the event of an interruption of service, the customer’s wiring shall be arranged so that no electrical connection can occur between the Company’s service and the customer’s other source of supply.

**306 – CO-GENERATION.** When a customer intends to become a co-generator utilizing new or existing on-site generation, he shall contact the Company in writing in advance of procuring any equipment. This is necessary to determine the availability of service,

technical or special equipment requirements and any associated cost which may be essential to serve this customer.

The Company does not accept responsibility for information given orally relative to the type of service available at specific locations. The Company will only accept responsibility for written information from an authorized company representative relative to a specific project.

**307 – FINAL CONNECTIONS.** Only the Company, or authorized persons working in accordance with Company specifications, is allowed to connect or disconnect a customer's wiring to Companies facilities.

**309 – TRANSFORMER VAULTS.** Where large capacity services are required, and/or where an outdoor location for transformers is not available, the Company may require the customer to furnish a suitable vault or metal enclosure on his/her premises for the necessary transformers and protective equipment. Such vaults or enclosures must meet the requirements of the applicable electrical codes and the Company.

**ARTICLE 400  
SERVICE INSTALLATIONS  
OVERHEAD**

**SECTION**

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**401 – SECONDARY SERVICES-OVERHEAD.**

In cases where service drops of 400 amperes or less are supplied from a transformer(s) on a pole, the service drop will be supplied and installed by the Company.

Customers requiring secondary service drops larger than 400 amperes shall supply all secondary wiring and transformer bus wiring, including any necessary transformer lugs and/or connectors, as specified by the Company. The customer shall install all equipment at the building and the Company will install the customer's equipment at the pole at no charge. Preferred location for transformer banks is on customer's property at a location acceptable to the Company.

If the customer installs two or more services in the same location or adds one or more services to an existing service drop, the ampacity of the service drop required shall be equal to the sum of the individual service ampacities. If the customer installs multiple conductors in a service or installs additional conductors in an existing service, the ampacity of the service drop shall be equal to the sum of the individual conductor ampacities.

Where compression connectors are to be used, the customer may be required to supply the proper tool and die.

**403 – MAXIMUM SPANS FOR SERVICE DROPS.** The maximum single span distance the Company will run its overhead service drop conductors is dependent on such factors as building heights, size of conductors and necessary clearances. This distance will be determined by the Company.

**405 – POINT OF ATTACHMENT.** The service drop shall be attached to the building or other structure at a suitable point, determined by the Company. The Company will not permit a service drop to be attached to an intermediate building or structure.

To prevent the entrance of moisture into the service entrance conductors, the service entrance weather cap shall be so located that the connection between the service entrance and service drop conductors must be made at a point below the level of the weather cap.

The service drop building attachment should be accessible from a ladder without climbing on a roof and shall be of a height to permit the following clearances:

**A. CLEARANCE FROM GROUND-(SERVICE BELOW 600V)**

Above finished grade, sidewalks or from any platform or projection from which they might be reached. 12 feet\*

Over residential driveways not subject to truck traffic.	15 feet**
Over commercial areas, parking lots, agricultural or other areas subject to truck traffic.	15 feet
Over public streets, roads, alleys and driveways other than residential.	16 feet
Over state highways in RI	18 feet
Table Reference: Applicable codes	

\*The distance to the bottom of drip loops may be reduced to 10'-6" for service drops limited to 300V to ground and 10' for multiplex service drops limited to 150V to ground.

\*\*For residential driveways where the height of attachment to a building or installation does not permit service drops to meet this value, the clearance may be reduced to 12'-6" for service drops limited to 300V to ground and 12' for multiplex service drops limited to 150V to ground.

Wherever the type of building will not provide these clearances and the building is within a normal service span, the customer will be expected to provide an approved support or attachment or install an underground service. In the event a mast-type riser is required to attain the required height, it shall be of such construction and so supported that it will withstand the strain imposed by the service drop. A typical service-entrance mast installation is shown in Figures 3 and 4.

#### **B. CLEARANCE OVER A ROOF**

In general, service drop conductors shall not pass over roofs. When this is unavoidable, conductors shall have a clearance of not less than eight feet from the highest point of roofs over which they pass.

The only exceptions to this clearance are those allowed by the electrical codes.

#### **407 – OVERHEAD SINGLE-PHASE LINE EXTENSIONS.**

When an extension of an overhead line is necessary to provide service to a permanent structure, the length of the extension along the public street shall be determined. If this length exceeds the limit set forth in paragraph A below, an agreement must be negotiated to compensate the Company for the cost of all construction in excess of this limit. The length of the extension shall be measured from the last pole carrying the circuit with the required voltage from which a customer can be served.

If the extension involves both public streets and private property, the negotiated agreement will cover the entire extension and any payment required will be the sum of the deposit required under Paragraph A below and any contribution required under paragraph B below.

All construction will be owned and maintained by the Company.

The Company will begin construction of a line under this policy when the customer(s) to be supplied has signed the necessary Letter of Agreement. If a Letter of Agreement is not required, construction under this policy will begin when the customer(s) to be supplied has completed most of the wiring of the premises to be supplied. Construction will not commence or continue during periods of inclement weather or other abnormal conditions.

Public grants, special permits and easements may be required for line extensions. See Section 205.

#### **A. EXTENSIONS ALONG A PUBLIC HIGHWAY**

1. The Company may, at no charge to the customer, extend an overhead single-phase line up to 500 feet, along an accepted public street, having a minimum acceptable right-of-way width of 33 feet when normal construction, as defined by the Company, can be used. When, in the Company's opinion, the potential for additional load growth in a reasonable time exists, the distance may be extended.
2. When the single-phase overhead line extension exceeds 500 feet, the Company may require the customer to provide a contribution-in-aid-of-construction. Consult the Consumer Services Department for details.
3. For extensions in areas with abnormal conditions such as unpaved roadways or undefined roadways requiring excessive tree clearing, surveying, etc., the excess cost will be treated as the same as above.

#### **B. EXTENSION OVER PRIVATE PROPERTY**

1. The Company will, at no charge to the customer, extend an overhead single-phase line up to two pole sections per service. The line extension is for distance only. The Company must be granted an acceptable right-of-way for construction and maintenance of the line extension.
2. For extensions in excess of two poles the customer must negotiate a contractual agreement to provide for a contribution towards the cost of the construction of the extension beyond the second pole based on the following:
  - a. Installed unit cost for each pole.
  - b. Installed unit cost for each guy.
  - c. Installed unit cost for each foot of extension.
  - d. Installed full cost of abnormal construction such as long span, extra large conductor or ledge.

Initial tree trimming on private property will be done by the customer at their expense.

Consult Consumer Services Department for details.

If a customer desires more than one service in order to separately meter another building on the same property, the entire cost of installing the additional service will be paid by the customer.

**409 – THREE-PHASE LINE EXTENSIONS.**

All three-phase line extensions will be considered on an individual basis.

If anticipated revenue does not support construction costs' the customer will be required to make a contribution-in-aid-of-construction.

Customers requesting this type of service should contact the Consumer Services Department as well in advance of construction as possible. This must be done to determine availability, construction requirements and cost of the proposed extension.

**411 - SERVICE TO MOBILE HOMES.** Overhead or underground service is available to mobile homes under the arrangements as provided for other individual residences with the following considerations:

- A. The meter facilities and service equipment shall be installed on a permanent supporting structure or pole provided by the owner and located adjacent to the mobile home.
- B. It is recommended that an approved rain-tight disconnecting means having a capacity of not less than 100 amperes be provided for each home at the meter location. Pre-wired combination meter and service pedestal may be used subject to advance approval by the Company.

**413 - SERVICE TO COMMERCIAL AND INDUSTRIAL CUSTOMERS.**

The customer or his agent shall consult the appropriate Consumer Services Department for information regarding the availability of service, the appropriate rate and specific details dealing with overhead or underground construction costs, if any, to supply the required service. Customers may be required to supply space for the Company's equipment on private property.

**415 - PRIMARY LINES TO TRANSFORMER INSTALLATIONS ON CUSTOMER'S PREMISES.**

Primary lines to transformers located on secondary metered customer's premises will normally consist of overhead facilities installed and maintained by the Company.

Refer to sections 407 and 409 for information relative to cost of providing service.

**417 – THREE-PHASE TRANSFORMER INSTALLATIONS\*.** Customers whose services require an ultimate transformer capacity of 500 kva or less may be served with either an overhead or ground-level transformer installation. Customers whose services require an ultimate transformer capacity of more than 500 kva will be served from ground-level transformer installation.

The Company reserves the right to give final approval to the type of installation selected. Some overhead installations and all ground-level installations will be installed on the customer's property.

See section 511 for ground-level transformer installation.

\*This section does not apply to services which will be fed from one of the Company's under-ground network systems.



**ARTICLE 500  
SERVICE INSTALLATIONS  
UNDERGROUND**

**SECTION**

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## **501 – SECONDARY UNDERGROUND SERVICE FROM COMPANY OVERHEAD LINES.**

When the customer requires an under-ground service from Company overhead lines, he shall furnish and install at his expense the following equipment in accordance with Company specifications: conduit, 10' rigid, spare conduit for riser, weather cap, clamps, conductors and terminal enclosure. When the service is larger than 400 amperes, the customer shall supply all connectors and/or transformer bus wiring including any necessary transformer lugs for use at the pole as specified by the Company.

The conduits to be installed from the riser pole to the service location shall be in accordance with the applicable electrical codes except that that the conduit shall not be smaller than 2-inch trade size, up to four\* conduits may be installed on a riser pole including telephone, fire alarm, etc. Nonmetallic conduit, except Schedule 40 or Schedule 80 plastics, shall be encased in concrete under traveled ways. The Company may require inspection of the conduit before encasing in concrete and/or backfill.

At the riser pole the vertical conduit shall terminate not less than 2 inches above finished grade. Any bends shall have a radius in accordance with applicable electrical codes except that it shall not be less than 24 inches. Mechanical protection shall be provided for the cable for at least 10 feet 2 inches above finished grade; if metal conduit is used for mechanical protection, a grounding connector will be required and installed at the top of the conduit by the contractor.

The location of the riser on the riser pole will be on the quarter of the pole away from traffic and opposite the telephone overhead cable. The location shall be approved by the Company. If an existing pole is not adequate for use as a riser pole or is not in the correct location, the Company will replace and/or relocate the pole. When the Company's overhead facilities are on the opposite side of the street from the building to be served, a riser pole will be installed at the Company's expense and will be owned and maintained by the Company at its expense. The location of this pole, usually at the back of the curb or 2 feet back of the front property line, shall be determined by the Company.

The customer may also choose to install the underground service across the public way to the existing pole at his/her expense. The service will be installed to the Company specifications and will include a hand-hole located two (2) feet inside the property line.

\*The Company reserves the right to limit the size and number of conduits that may be installed on each riser pole.

The number, size and type of conductors shall be in accordance with applicable electrical codes. The Company shall be informed as to the type and size of conductors to be installed. The customer shall furnish and install conductors of sufficient length to reach the secondary conductors or transformers on the pole plus (3) feet for connections. The excess conductors shall be left coiled at the top of the riser conduit. The Company will attach the conductors from the top of the riser to the appropriate conductors on the pole and connect the customer's conductors to the Company's conductors or transformers at no cost to the customer. The customer shall identify the individual phase and neutral conductors with permanent markings.

Public grants, special permits and easements may be required for underground service construction. See Section 205.

The customer shall turn over ownership of all underground equipment in the public way up to a point two (2) feet inside the property line to the Company at no cost. The Company will maintain this equipment at the customer's expense. The customer will own and maintain at his/her expense all equipment over two (2) feet inside the property line.

**503 – SECONDARY UNDERGROUND SERVICE FROM COMPANY UNDERGROUND SYSTEM.** (This section does not apply to URD developments. See next section for these services.) When the customer requires an underground system, the responsibilities of the Company and the customer are as follows:

**A. CONDUIT**

1. The Company will furnish, install and maintain the required number of conduits to a point designated by the Company, two (2) feet inside the customer's property line. Where this penetrates the customer's building foundation, the customer will provide the necessary sleeves for conduit.
2. The customer shall furnish, install and maintain the conduit system from the point two (2) feet inside his/her property line to a terminal box at the building entrance point.
3. The customer will furnish, install and maintain an approved terminal box. The specifications and sizes of standard terminal boxes are shown in Figure NO.5. When requested by the customer and approved by the Company and Municipal Inspector, the terminal box may be reduced in size or may be omitted and the conduits terminated in a main disconnect enclosure with sufficient space.
4. The required number and size of conduit will be determined by the Company.

**B. SERVICE LATERAL**

Two alternate methods are available for installing cables. The Company reserves the right to give final approval to the method selected. The alternates are as follows:

1. The Company will supply, install and maintain the cable at no expense to the customer to an approved handhole furnished and installed by the customer at the point designated by the Company, two (2) feet inside the customer's property line. The customer will supply, install and maintain at his/her expense the cable from the handhole to the building entrance point.
2. The Company will supply, install and maintain the cable, in the Customer's conduit on private property, to the terminal box at the building entrance point under the following conditions:
  - a. The building entrance point is located 25 conduit feet or less from the point designated by the Company, two (2) feet inside the customer's property line. At the option of the Company, distances greater than 25 feet will be considered.
  - b. There is no more than the equivalent of two (2) 90 degree bends in the customer's conduit. The customer's conduit shall be laid not less than 24 inches below finished grade and shall be pitched so as to drain away from the building. Nonmetallic conduit, except Schedule 40 or Schedule 80 plastic, shall be encased in concrete. All conduits shall be encased in concrete under public traveled ways.
  - c. On new installations, the required number and size of conduit shall be specified by the Company to assure compatibility with Company supplied cable. The Company shall specify the protective devices to be installed on the service cable and the size of the terminal box at the building entrance required to accommodate the protective device.
  - d. The customer shall reimburse the Company for the installed cost and maintenance cost of the cable from the Company designated point two (2) feet inside the customer's property line to the terminal box.

#### C. CABLE TERMINATIONS

All terminations to the cable installed by the Company and connections to the customer's conductors shall be made by the Company at its expense. Customer's entrance conductors shall not be larger than 750 KCMil or smaller

than #4 AWG. A minimum length of three (3) feet for each entrance conductor shall be left at the terminal box or handhole by the customer for connection by the Company to its conductors. The customer shall identify the individual phase and neutral conductors with permanent markings. The Company will furnish and install mole-type connectors in the customer's terminal box or handhole. If the customer's entrance conductors are other than the Company standard, he/she must provide a suitable adapter for the Company's mole. If the Company's connectors are installed directly into the main disconnect enclosure, the Company will terminate the conductors and the customer will connect them to the main disconnect.

Public grants, special permits and easements may be required for underground service construction. See Section 205.

#### **505 – UNDERGROUND RESIDENTIAL DISTRIBUTION (URD).**

The standard underground installation for residential development is a conduit and manhole system. The Company policy for all underground distribution other than network is available for qualified developments.

A qualified development is a land area defined in a real estate development plan approved by the municipality, and consisting of a minimum of five (5) sequential lots for permanent single family residences and situated where no electric distribution system exists and no other electric distribution system will be required. A development of less than five (5) sequential lots or any other non-qualifying development may be served underground at the discretion of the Company.

Underground Residential Distribution for multi-family residential developments will be considered on an individual basis.

Contact Consumer Services six (6) months in advance of conduit installation for complete details regarding design, construction, advance payments, and division of work responsibilities.

#### **507 – PRIMARY UNDERGROUND SUPPLY FROM COMPANY OVERHEAD LINES.**

Customers requesting this type of service should contact the Consumer Services Department as well in advance of construction as possible. This must be done to determine availability, construction requirements and cost of the proposed installation.

#### **509 – PRIMARY UNDERGROUND SUPPLY FROM COMPANY UNDERGROUND SYSTEM.**

Customers requesting this type of service should contact the Consumer Services Department as well in advance of construction as possible. This must be done to determine availability, construction requirements and cost of the proposed installation.

#### **511 – THREE-PHASE TRANSFORMER INSTALLATIONS – GROUND LEVEL\***

Customers whose services require an ultimate transformer capacity of more than 500 kva will be served from a ground-level transformer installation. Customers whose

services require transformer capacity of 500kva or less may be served with either an overhead or a ground-level transformer installation. The Company reserves the right to give final approval to the type of installation selected.

All ground-level transformer installations will be installed on the customer's property.

Ground-level transformer installation may be of the pad-mounted type, or of the fenced or walled enclosure type. Where an outdoor location is not available for a ground-level installation, the Company may require the customer to furnish a suitable vault on his premises for the transformer installation.

The customer will furnish, install, own and maintain at his/her own expense all transformer pads, vaults, walls, doors, ventilation, drainage, fences, gates, grounding, conduit and secondary conductors as specified by the Company and subject to the requirements of the applicable electrical codes. It is the responsibility of the customer to maintain his/her facilities consistent with utility safety, operational standards and applicable codes.

The Company will normally furnish, install, own and maintain at its own expense all transformers and transformer protective equipment in accordance with filed tariffs.

To facilitate the installation of a large number of secondary conductors on a pad-mounted transformer installation, it may be necessary to install a Company approved intermediate secondary terminating enclosure. The customer will be responsible for furnishing, installing, owning and maintaining these facilities.

In installations where a customer's service terminates in a transformer:

- A. The customer will furnish and install the secondary conductors to the transformer(s) as specified by the Company. The size of the conductor shall be in accordance with the applicable electrical codes. Sufficient conductors shall be left at the transformer(s) so that connections can be made without splicing. The customer will be responsible for providing and installing any necessary mechanical support for the secondary wiring so that there will be no strain on the transformer bushings.
- B. The customer will furnish all necessary transformer terminal lugs and all transformer bus wiring as specified by the Company. Expansion type terminal lugs are normally not required and are not acceptable without prior approval.
- C. The Company will install the customer's transformer lugs, terminate the customer's secondary conductors and make all connections to the transformer(s) at no charge to the customer.

In installations where the customer's service terminates in an intermediate secondary terminating enclosure:

- A. The customer will furnish and install the secondary conductors to the enclosure as specified by the Company. The size of the conductor shall be in accordance with the applicable electrical codes.
- B. The customer will be responsible for furnishing and installing terminal lugs to his/her secondary conductors and connecting them to the secondary bus as directed by the Company.
- C. The Company will be responsible for furnishing and installing the secondary conductors from the enclosure to the transformer, plus furnishing and installing the terminal lugs and connecting them to the enclosure secondary bus and transformer.

\*This section does not apply to services which will be supplied from one of the Company's low voltage underground or underground network systems.

**ARTICLE 600  
SERVICE ENTRANCE**

**SECTION**

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### **601 – SIZE OF CONDUCTORS.**

The size of service entrance conductors shall be in accordance with applicable electrical codes.

### **603 – SERVICE EQUIPMENT.**

One or more service switches or circuit breakers shall be installed as part of the permanent wiring for each service entrance. These devices shall conform to the following:

All service switches or circuit breakers shall meet the requirements of all applicable codes and be of a type listed by the Underwriters' Laboratories, Inc. or approved by both the Company and local municipal authorities. All equipment shall be installed in accordance with all applicable electrical codes.

### **607 – DISCONNECTING MEANS.**

In general the service disconnect shall be located on the load side of the meter (Hot Sequence Metering). The service disconnecting means shall be installed outside the building wall.

Exception No. 1: At any location where more than six (6) meter sockets are required, the service disconnect shall be installed on the line side of the metering equipment.

Exception No. 2: In underground network areas the service disconnect shall be installed on the line side of the metering equipment. This is called Cold Sequence Metering.

Exception No. 3: If the phase to phase voltage is above 240 volts and instrument transformers are not required, the service disconnect device shall be installed on the line side of the metering equipment. This is called Cold Sequence Metering.

### **609 – ASSIGNING LOCATION OF SERVICE AND METERING EQUIPMENT.**

The customer or his/her agent shall notify the Company on an approved form provided by the Company of their intent to do work far enough in advance to allow the Company time to assign locations.

The locations of the service and metering equipment shall be assigned by the Company, but when so assigned are subject to the approval of the Municipal Wiring Inspector. No wiring dependent upon service-entrance and meter locations shall be started until these locations have been definitely assigned and approved by the Company.

**Failure to obtain a location from the Company may result in the customer/electrician having to relocate the service to an acceptable location at their expense.**

#### **611 – UNMETERED CONDUCTORS.**

Un-metered conductors on customer's premises shall not be installed in the same raceway or conduit with metered conductors.

Where un-metered conductors are run through customer's premises, they shall be enclosed in a continuous run of rigid metal conduit or service busway. The installation of pull boxes or other similar devices is not permitted on un-metered raceways on the customer's premises. All installations of un-metered conductors shall be submitted to the Company for approval.

The Company reserves the right to seal all access to un-metered wiring. Provisions for sealing must be available.

#### **613 – FUSES**

All fuses shall be supplied by the customer. It is recommended that spare fuses be available at each point of utilization.

On installations where special types of fuses, such as high-interrupting capacity or current limiting fuses are used, it is very important that the customer maintain a stock of replacement fuses. Where a new service is to be supplied from the Company's underground or underground network system, or from a high capacity transformer bank, the Company should be consulted as to the available short circuit current.

For the safe and proper operation of the customer's equipment, it is recommended that fuse types and sizes be selected to achieve proper coordination.

#### **615 – ANCHORAGE FOR SERVICE DROP CONDUCTORS.**

Anchorage for service drop conductors will be supplied and installed by the customer.

##### **A. INSTALLATION OF SERVICE ANCHORAGE**

An eye bolt or screw eye is required on all structures and supports to obtain adequate anchorage for the service drop conductors. Washers may be required for added strength. Minimum anchorage strength should be 1,000 lbs.

##### **B. LOCATION OF THE SERVICE ATTACHMENT**

The location of the service attachment shall be approved by the Company and located approximately 12 inches below the service head or weather cap and

have a horizontal clearance of 6 to 12 inches from the service entrance cable or conduit.

**C. SPECIFICATION FOR ANCHORAGE HARDWARE**

Eye bolts, screw eyes, nuts and washers must be as follows:

1. Eye bolt and screw eye stock must be a minimum of 5/8 inches in diameter.
2. Hot dip galvanized steel.
3. Eye must be welded closed.

Service anchorage hardware will be furnished by the Company upon request for services 400 amps and less.

**D. LOW BUILDINGS**

Refer to section 405 for ground and roof clearances. A typical service-entrance-mast installation is shown Figures 3 and 4.

**617 – BUILDING ALTERATIONS AFFECTING THE ELECTRIC SERVICE.**

To insure continuity of service, the customer should notify the Company before starting alterations to a building which might affect the electrical service.

**619 – CONNECTION TO COMPANY'S OVERHEAD CONDUCTORS.**

A minimum length of three (3) feet for each conductor shall be left at the upper end of the service entrance to provide for connection to Company service drop conductors. Connections to Company lines will be made by the Company.

**621 – GROUNDING.**

All grounding shall be done in accordance with the applicable electrical codes.

**ARTICLE 700  
WIRING AND VOLTAGE  
REQUIREMENTS**

**SECTION**

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**701 – SINGLE-PHASE SERVICE.**

The service entrance equipment for single-phase services shall be suitable for 3-wire 120/240 volts. The loads on all 3-wire services shall be balanced

**703 – THREE-PHASE FOUR WIRE SERVICE.**

The Company shall be consulted to ascertain the type of service and voltage available. The service-entrance equipment shall be suitable for either 3-wire or 4-wire, 208Y/120 or 4-wire, 480Y/277 depending on the size of the proposed load and shall conform to the following:

A service-entrance not exceeding 100 amperes may be wired for 3-wire service (2 phases and a neutral), provided the load does not include motors larger than 3 horsepower. All loads shall be balanced. Loads exceeding 100 amperes, or having a motor larger than 3 horsepower shall be wired for 4-wire wye service where this service is available. The entire load on such services shall be properly balanced between phases.

Single-phase motors or other single-phase loads shall be properly balanced between phases when connected to a three-phase service.

**707 – ELECTRICAL FLUCTUATING LOADS.**

Welders, furnaces, boilers, X-ray equipment, compressors, pumps, moulding machines, air conditioners, or similar equipment with load fluctuations at a frequency greater than four times per hour should not be installed except under conditions specified by the Company. Voltage dips caused by load fluctuations, regardless of their frequency, shall not cause undue disturbance to other customers nor hinder the Company in maintaining proper voltage conditions.

If it is necessary for the Company to install transformers or special equipment to eliminate and/or prevent the detrimental effects of an electrical fluctuating load, the equipment shall be installed at the customer's expense.

The Company reserves the right to withhold connection to loads which are considered detrimental to the service of other customers.

**709 – POWER FACTOR.**

Maintenance of a high power factor is of the utmost importance to both the customer and the Company in the operation of their distribution systems.

**711 – POWER FACTOR CORRECTION CAPACITORS.**

When a customer desires to install capacitors for the purpose of power factor corrections, the Company should be notified in writing prior to the ordering of such equipment.

Capacitors rated 2400 volts and above will not be allowed.

**713 – OFF-PEAK WATER HEATERS.**

Electric water heaters must be wired to Company specifications for the applicable service voltage and rate.

Water heaters operating at either 240 volts or 208 volts, single-phase, shall be limited to one 4500 watt element operating at one time.

The Company should be consulted on any three-phase water heater installation.

**ARTICLE 800  
METERS**

**SECTION**

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**801 – SCOPE.**

The installation of wiring and equipment for all types of meters 480 volt and below shall comply with the requirements set forth in this Article.

**802 – METER AND EQUIPMENT SEALS.**

Authorization is required before removing Company seals in order to work on customer equipment. Permission will be given in the form of a seal authorization number issued by the Consumer Services Department.

**803 – STANDARD METER INSTALLATIONS.**

The following are standard meter installations normally specified for the various types of service installations:

**A. SINGLE-PHASE SERVICES**

Where the service equipment does not exceed a 400 ampere rating (320 ampere continuous current carrying capacity) and the metering requirements are satisfied with a watt-hour meter or watt-hour demand meter, self-contained socket type meters will be used. Where the rating is in excess of 400 amperes (320 ampere continuous current carrying capacity) or reactive metering is required, current transformers with socket-type meters will be installed.

**B. THREE-PHASE SERVICES**

Where the rating of the service equipment does not exceed 400 amperes (320 ampere continuous current carrying capacity) the service voltage does not exceed 480Y/277 volts, and reactive metering is not required, self-contained socket-type meters may be installed. On all other installations, current transformers with socket-type meters will be installed.

Consult the Company before starting construction of any three-phase metering installation.

Consult the following sections for further information relative to three-phase meter installations:

607 – DISCONNECTING MEANS

611 – UNMETERED CONDUCTORS

811 – METER BOARDS

821 – METER SOCKETS

831 – INSTRUMENT TRANSFORMERS AND ENCLOSURES

## **805 – ASSIGNING LOCATION OF SERVICE AND METERING EQUIPMENT.**

See section 609.

## **807 – OUTDOOR METER LOCATIONS.**

Outdoor meter locations are required on single-phase installations. Exceptions to this requirement will be permitted only by specific approval of the Company. Outdoor type sockets with UL labels shall be used for all outdoor metering.

### **A. GENERAL.**

Outdoor meter locations shall be readily accessible to Company representatives for meter reading, testing and maintenance. The location shall be such that meters shall not be subject to damage and will not require the Company representative to use adjacent property, climb fences or other obstructions, expose themselves to undue hazards, or cause damage to the customer's property, such as shrubbery and flower beds in gaining access to and servicing the meters.

### **B. HEIGHT OF SOCKET.**

Outdoor meter sockets or troughs should be mounted so that the dials/display of the meter is five feet above the ground or final graded level. In no instance will any meter be installed with the top of the meter more than six feet nor the bottom of the meter less than three feet above the ground or final graded level. A clear area of four feet is required in front of the meter.

- C. The customer is responsible for damage to Company metering equipment. Meters installed in isolated locations, or in such areas where accidental or malicious damage may be anticipated, should be located indoors provided they will normally be accessible for reading and servicing. However, where premises are closed for long periods, such as camps, or roadside stands, or where there is no indoor location, as at outdoor signs or outdoor lighting, meters shall be located within a Company approved enclosure, furnished, installed and maintained by the customer. Hasps shall be provided on such enclosure for the installation of Company padlocks.

## **809 – INDOOR METER LOCATIONS**

### **A. GENERAL**

The preferred location for all single-phase meters is outdoors. When outdoor locations are not feasible, meters should be located indoors near the service entrance, in a clean, dry place, reasonably secure from damage, not subject to vibration and readily accessible for reading and testing. In multiple-occupancy buildings, meters shall be in a public or common area of the building.

**B. HEIGHT FROM FLOOR**

Indoor meter sockets or troughs should be mounted so that the dials/display of the meter is five feet above the floor. In no instance will any meter be installed with the top of the meter more than six feet nor the bottom of the meter less than three feet above the floor. Where a meter stack is used, the distance from the floor may be reduced to two feet. A clear area of four feet is required in front of the meter.

**C. UNACCEPATABLE INDOOR METER LOCATIONS**

Metering equipment shall not be installed in locations subject to excessive moisture, dust, heat, chemical fumes or in locations which are hazardous or inaccessible. Meter locations are not acceptable in: bedrooms, bathrooms, toilets, closets, kitchens, kitchenettes, display windows, attics, boiler rooms, coal bins, elevator shafts, fruit or vegetable cellars, over stairways, doors, stoves or sinks; directly under, in the rear of or close to steam, gas, water or drain pipes; near moving machinery; or where excessive vibration or moisture may occur. Meters in garages shall be so located that they will not be damaged by motor vehicles.

**811 – METER BOARDS.**

Meter boards shall be mounted plumb and firmly secured to supports. Where supports are attached to masonry or concrete walls, expansion bolts or anchors shall be used. Wooden plugs driven into holes in masonry, concrete, plaster or similar materials are not acceptable. Meter boards shall be constructed of ¾ inch plywood.

**813 – CLEARANCES.**

Ample space shall be provided around meters to allow for testing, reading and repairing, as required by applicable codes.

**815 – IDENTIFICATION OF METER SOCKETS AND CUSTOMER DISCONNECTING MEANS.**

Where more than one socket is installed at one address, all meter sockets and customer disconnecting means must be plainly and permanently marked for proper suite, floor, apartment, office, etc., before service is provided.

Where offices, apartments or other areas are not assigned numbers by the building owner, the electrical contractor shall designate the location of each tenant's premises, such as: "Basement Front," "1<sup>st</sup> Floor Right," or "2<sup>nd</sup> Floor Rear." Such locations shall be determined from a position facing the front of the building from outside.

**817 – UNMETERED CONDUCTORS.** See Section 611.

**819 – MOVING OR REMOVING METERING EQUIPMENT.**

Meters, instrument transformers and other metering devices are the property of the Company and shall not be moved, removed or altered by other than authorized

employees of the Company, except when specific permission is obtained from the Company.

### **821 – METER SOCKETS.**

The Company's Meter section will specify the type of metering for each installation. Self-contained single-phase socket metering is standard where the service equipment does not exceed a 400 ampere rating (320 continuous current carrying capacity) and the metering requirements are satisfied with a watt-hour meter or watt-hour demand meter.

In general, self-contained polyphase socket type metering is standard where the rating of the service equipment does not exceed 400 amperes (320 ampere continuous current carrying capacity), the secondary voltage is 480Y/277 volts or less and reactive metering is not required.

For each service with self-contained socket metering, the customer shall furnish, install, own and maintain an approved socket.

Approved sockets for self-contained meters must meet the following Company Specification and the requirements of the applicable electrical codes:

- A. Sockets shall be UL listed and have a UL label.
- B. Sockets must have a continuous current carrying capability equal to that of the associated equipment.
- C. Sockets at the time of installation must be equipped with the number of terminals required by the type of service to be metered. The number of terminals required is as follows:
  - 1. Single-Phase, Three-Wire – 4 Terminals.
  - 2. Single-Phase, Three Wire service fed from Three-Phase Wye Systems – 5 Terminals.
  - 3. Three-Phase, Four-Wire – 7 Terminals.
- D. Shields for socket jaws are required on all sockets for commercial and industrial services, for all service off the three-phase four-wire wye systems and all 400 amperes (320 ampere continuous current) residential services and are recommended on all sockets for 200 ampere residential services.
- E. Manual bypasses are required for all commercial, municipal, industrial and multi-dwelling common area meters and for 400 ampere residential services (320 ampere continuous current). Bypasses are recommended for 200 ampere residential services. Bypasses allow for meter exchange without interrupting service to the customer. Bypasses are not designed for and must not be used as load-breaking devices.

The bypass mechanism must meet the following requirements:

- 1. Only manual bypasses are permitted.
- 2. The bypass must have a mechanism operated by a single handle.

3. The non-bypassed, in-service position of the operating mechanism must be visible when the meter is installed.
4. It must not be possible to replace the meter socket cover when the operating mechanism handle is in the bypassed position.
5. 200 ampere five and seven terminal sockets with bypasses must have a mechanism which locks the meter blades in the socket jaws.

Meter sockets with bypasses whose operating mechanism is not visible when the meter is installed or bypasses which require auxiliary equipment such as straps, jumpers, etc., are not allowed.

Meter sockets for use with large instrument transformer-rated installations are normally larger than sockets for self-contained metering so as to provide a space for the meter test switch. These sockets will be furnished by the Company and installed by the customer.

Please contact Consumer Services Dept. When using a meter stack for specific requirements.

### **823 – COVER PLATES.**

After the wiring has been completed, the customer/electrician shall install transparent cover plates (socket covers), furnished by the Company, to protect the interior of the sockets from the weather and protect the public from injury from possible energized socket terminals. All unused meter socket positions shall be covered with transparent socket cover plates also.

### **825 - INSTALLATION OF SOCKETS.**

Meter sockets must be mounted plumb and level, using wood screws of sufficient length and size to hold the socket securely, independent of conduit or cable connections. Rust-resisting screws shall be used outdoors and in damp locations. Standard expansion bolts or anchors shall be used on masonry walls.

### **827 – SOCKET CONNECTIONS.**

The service or line side phase-conductors which terminate in the meter socket are always connected to the top terminals, and the respective load side conductors to the bottom terminals. See section 829 for grounding requirements.

### **829 – GROUNDING OF METER SOCKETS.**

Where the meter socket is installed on the line side of the service disconnecting means, the socket shall be grounded by bonding to the grounding (neutral) conductor.

Where the socket is installed on the load side of the service disconnecting means, the socket shall be grounded by means of an equipment-grounding conductor. The grounded (neutral) conductor shall be insulated from the grounded parts of the socket.

### **831 – INSTRUMENT TRANSFORMERS AND ENCLOSERS**

When serving a single customer, the preferred location of the current transformers will be at the secondary terminals of the transformers.

For all installations requiring instrument transformers, the instrument transformers will be furnished without charge by the Company and installed by where applicable by the customer. Instrument transformer cabinets, when necessary, shall be furnished and installed by the customer to Company specifications and must be UL listed.

Instrument transformers that are to be installed in separate compartments of the switch gear or other service equipment will be installed by the customer.

Such compartments shall have:

- A. A barrier which physically isolates the instrument transformers from all other equipment.
- B. A separate door for the compartment and sealing facilities.

Current transformer primary connectors and connections to service conductors shall be supplied by the customer.

Except for Company-owned metering equipment, no instruments, meters or other equipment shall be placed in the instrument transformer cabinets or compartments, or connected to the secondaries of metering transformers.

### **833 – METER TEST SWITCHES AND SOCKETS.**

Sockets with provisions for test switches for use with transformer rated meter installations will be furnished by the Company and installed by the customer. Meter test switches, for use with instrument transformers, will be furnished and installed by the Company. A 1 ¼" conduit of rigid steel, IMC, EMT, or Schedule 40 or better plastic shall be furnished and installed by the customer between the meter socket and the transformer enclosure. Secondary metering conductors will be furnished and installed by the Company. The Company will not permit connection of any customer's equipment to the metering-transformer secondaries.

When the instrument transformer cabinet is not adjacent to the associated meter, it must be located in an area accessible to Company personnel.

### **835 – USE OF INSTRUMENT TRANSFORMER CABINETS.**

Instrument transformer cabinets shall not be used as junction boxes or for branch circuit wireways. Service conductors shall enter and leave the cabinet as one circuit with no branches regardless of the number of conductors per phase. Lineside connections to other meters shall not be made in the transformer cabinet.

**ARTICLE 900  
MOTORS**

**SECTION**

<b>901 – GENERAL.....</b>	<b>85</b>
<b>903 – SINGLE – PHASE MOTORS AND/OR AIR CONDITIONERS.....</b>	<b>85</b>
<b>905 – THREE – PHASE MOTORS AND/OR AIR CONDITIONERS.....</b>	<b>86</b>
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<b>911 – UNDERVOLTAGE PROTECTION.....</b>	<b>88</b>
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**901 – GENERAL.**

The Company should be consulted regarding the voltage and capacity available at each location. All installations shall be in accordance with the applicable electrical codes.

**903 – SINGLE-PHASE MOTORS AND/OR AIR CONDITIONERS.**

Single-phase motors and/or air conditioners will be supplied at one of the nominal voltages indicated below. The motor size, full load current and/or locked rotor current shall not exceed the values below for each voltage.

This table is based on not more than four starts per hour with long periods of continuous operation under maximum load conditions. Consult the Company where these conditions cannot be met, or where equipment rating and/or starting characteristics exceed the following:

A. Equipment with Motors rated in horse power

**Rated at 120**

120 volts (1/2hp)

240 volts, single-phase

2 hp or less

2.5 to 5 hp

**Maximum Locked-Rotor Current**

58.8 amperes

72.0 amperes

Residential use: Consult Company

Commercial use: 62.6 amperes plus 20.9 amperes per hp in excess of 2hp.

B. Air Conditioning or Heat Pump Equipment

**Rated in Btu per Hour**

240 volts, single-phase

20,000 Btuh or less

21,000-30,000 Btuh

62.6 amperes

62.6 amperes plus 3.1 amperes per 1000 Btuh in excess of 20,000 Btuh

Over 30,000 Btuh Consult Company



If the use of equipment with locked-rotor current listed above causes flicker in illumination or dips in voltage which are objectionable to other customers, the locked-rotor current must be reduced. If the locked-rotor current cannot be reduced, the load shall be considered as a fluctuating electrical load under the terms of Section 707.

In predominantly residential areas and for small commercial installations, the Company should be consulted before installing motors with ratings over two horsepower or 70 amperes locked-rotor current.

### **905 – THREE-PHASE MOTORS AND/OR AIR CONDITIONERS.**

Where there is three-phase service available, any motor ½ horsepower or larger shall be three-phase.

The Company should be consulted in regard to the installation of three-phase motors larger than 10 horsepower.

Starting compensators are ordinarily required for three-phase motors and/or air conditioners that exceed the following size, full load current and/or locked-rotor current.

This table is based on not more than four starts per hour with long periods of continuous operation under maximum load conditions. Consult the Company where these conditions cannot be met, or where equipment rating and/or starting characteristics exceed the following:

A: Equipment with Motors Rated in Horse power

#### **Rated at**

208 volts, three-phase\*

2hp or less

2.5 to 19.9 hp

#### **Maximum**

#### **Locked-Rotor Current**

62.7 amperes

62.7 amperes plus 17.6 amperes per hp in excess of 2hp

Consult Company

B: Air Conditioning or Heat Pump Equipment

#### **Rated in Btu per Hour**

208 volts, three-phase\*

20,000 Btuh or less

21,000-50,000 Btuh

62.7 amp 62.7 amp plus 3.1 amp per 1000 Btuh in excess of 20,000 Btuh

51,000 to 225,000

Btuh

156.9 amp plus 1.3 amp per 1000 in excess of 50,000 Btuh

Over 225,000 Btuh

Consult Company

- For 240 volts multiply current by .87
- For 480 volts multiply current by .43

Exception to this practice will be allowed to the extent local distribution facilities will permit. Motors having locked-rotor current in excess of the above shall be equipped with devices which will limit the currents to the values specified. Increment-start motors must have not less than a one-half second interval between steps.

#### **907 – PROTECTIVE DEVICES.**

The customer's equipment shall be equipped with devices which protect against single-phase operation, overload (overcurrent) and phase reversal. Such devices shall be in accordance with applicable electrical codes.

#### **909 – PROTECTION AGAINST SINGLE-PHASE OPERATION**

Three-phase motors shall be protected against the possibility of the failure of any one phase of the supply circuit. Three overcurrent (overload) units shall be used on all motors unless the motor is protected against the single-phase operation by other approved means.

#### **911 – UNDERVOLTAGE PROTECTION.**

Motors that cannot be safely subjected to full voltage at starting, or motors the starting of which on return of normal voltage after an interruption would endanger life or property, should be provided with automatic undervoltage protection. Such protective device should insure that with either no voltage or undervoltage the motor will be disconnected from the line or the starter will be returned to the "off" position.

The Company recommends the use of time delay undervoltage protection because instantaneous undervoltage will operate on momentary fluctuations of voltage.

#### **913 – OVERLOAD PROTECTION.**

All motors should be protected against overload by the installations of adequate overcurrent thermal protective devices or their equivalent in all three-phases, which will operate so as to prevent excessive motor winding temperatures.

#### **915 – PROTECTION AGAINST PHASE REVERSAL.**

On motors for passenger and freight elevators, cranes, hoists and other equipment where reversal of direction of rotation might cause property damage or injury, a reverse-phase relay should be installed so the motor circuit will be opened in the event of a phase-reversal or the loss of any phase.

The operation of this relay and associated circuit breaker should be instantaneous and should be such that the circuit can not be reenergized until the normal phase relations are restored.

**APPENDIX**

**EXCERPTS FROM  
GENERAL LAWS  
RHODE ISLAND .....107**

## **EXCERPTS FROM GENERAL LAWS OF RHODE ISLANDS**

### **11-35- 4. Injuries to electric or communication lines.**

Every person who shall wantonly or willfully and maliciously cut, destroy, break down or injure, or attempt to cut, destroy, break down or injure any machine, appliance or apparatus used for generating electric currents or any electric wire or other appliance or apparatus used for the purpose of conducting or transmitting electric currents for using and furnishing power, motive power, light, heat or used for the purpose of transmitting intelligence by means of telegraphic or telephonic apparatus or by means of fire alarm signals, burglar-alarm signals, police signals or other apparatus or appliance for the transmission of intelligence, or shall cut, destroy, break down or injure or shall attempt to cut, destroy, break down or injure any pole, bracket, insulator or other device, apparatus or appliance for supporting or carrying any such electric wire, or shall do any other act interrupting or intended to interrupt the transmission of the electric current over any such electric wire, shall be liable to indictment therefore, and upon conviction shall be fined not exceeding \$3,000.00 or imprisoned not exceeding 2 years: PROVIDED:, that nothing herein contained shall be construed to authorize or permit the attachment, erection, use, operation or maintenance of any such electric wire, apparatus, pole, bracket, insulator, or other device or appliance, upon the property of any person or corporation, without the consent of the owner or owners thereof; nor to prevent any properly authorized person from removing any such electric wire, apparatus, pole, bracket, insulator or other device or appliance for the purpose of permitting the passage of any building or structure, the moving of which has been duly authorized by any city or town council.

### **11-35-5. Aiding, abetting, counseling, or procuring line injuries.**

Every person who shall aid, assist, abet, counsel, hire, command or procure any person to do or attempt any of the acts mentioned in 11-35-4 of this chapter, shall be subject to like fine or imprisonment as in said section provided.

### **11-35-8. Interference with electric meter.**

Every person who shall willfully or fraudulently injure, or shall knowingly suffer to be injured, any meter, or any wire, fittings or appliances connected with any meter belonging to any wire, fittings or appliances connected with any meter belonging to any corporation furnishing electric current for light, heat, power or other purposes at a stipulated rate of payment, or shall willfully tamper or meddle with any other of the appliances or appurtenances connected with any meter belonging to any such corporation, in such manner as to cause loss of damage to such corporation, or who shall willfully or fraudulently prevent any meter used in registering the quantity of the electric current supplied through the same from duly registering the quantity so passing through

the same or alter index in such meter, or in any way hinder or interfere with its proper action or just registration or shall fraudulently use the electric current of said corporation passing through such meter wire, fittings or other of the appliances or appurtenances connected with or belonging to said corporation, or willfully waste said electric current, shall be deemed guilty of a misdemeanor and shall be imprisoned not exceeding thirty (30) days or be fined not exceeding five hundred dollars (\$500). In any prosecution here under proof that any such meter, or any wire, fitting, appliance or appurtenance connected therewith, has been injured, or tampered or meddled with, or that any such meter has been prevented from duly registering the quantity of electric current supplied through the same, while on the premises occupied by the defendant, shall be prima facie evidence that the defendant caused the injury or tampered or meddled with said meter, wire, fitting, appliance or appurtenance, or prevented the meter from duly registering the quantity of electric current supplied through the same, willfully and fraudulently and with intent to injure or defraud.

**11-35-9. Bypassing electric meter – Use of electricity with intent to defraud.**

Every person who, with intent to injure or defraud any person, persons, association or corporation generating, conducting, using or supplying the electric current, either for the purposes of his, its or their own business or for the purpose of selling such electric current at a stipulated rate of payment, shall make or cause to be made any wire or other instrument or contrivance and connect the same or cause the same to be connected with any electric wire appliance apparatus or appurtenances used for or in connection with the wires or apparatus employed for generating, conducting, using or supplying such electric current, in such manner as to be calculated either to waste and dissipate such electric current or to supply such electric current to any lamp, burner, heater, machine, motor or other apparatus or appliance whatsoever, without such electric current passing through a meter provided by said person, persons, association or corporation and used for registering the quantity thereof so passing through, or without the consent of said person, persons, association or corporation to such connections aforesaid, or who shall otherwise use any such electric current with the intent to defraud said person, persons, association or corporation of payment therefore, shall be deemed guilty of a misdemeanor and shall be imprisoned not exceeding (30) days or be fined not exceeding five hundred dollars (\$500). In any prosecution hereunder proof that any of the acts herein specified was done on or about the premises occupied by the defendant, or proof of the presence on or about said premises of any wire or other instrument or contrivance which effects the waste of dissipation or the diversion of electric current without such electric current being measured or registered by a meter provided therefore as aforesaid or without the consent of said person, persons, association or corporation as aforesaid, shall be prima facie evidence that the defendant committed said acts, or aided or abetted in the commission thereof, maliciously and with intent to injure or defraud as aforesaid.

**EXCAVATION NEAR UNDERGROUND UTILITY FACILITIES**

**39-1.2-1. Definitions. – As used in this chapter:**

- (a) "Person" shall mean an individual, partnership, corporation, association, or a public utility, including a person engaged as a contractor by a public agency.
- (b) "Public agency" shall mean the state or any political subdivision thereof, including any governmental agency.
- (c) "Public utility" shall mean the owner or operator of underground facilities for furnishing electric, gas, or telephone service including a municipal or other public owner or operator.
  
- (d) "Association" shall mean the group of public utilities formed pursuant to § 39-1.2-4 of this chapter for the purpose of receiving and giving notice of excavation activity within the state.
- (e) "Excavation" shall mean an operation for the purpose of movement or removal of earth, rock or other materials in or on the ground, or otherwise disturbing the subsurface of the earth, by the use of powered or mechanized equipment, including but not limited to digging, blasting, auguring, back filling, test boring, drilling, pile driving, grading, plowing in, hammering, pulling in, trenching, and tunneling; excluding the movement of earth by tools manipulated only by human or animal power and the tilling of the soil for agricultural purposes.
- (f) "Demolition" shall mean the wrecking, razing, rending, moving or removing of any structure.
- (g) "Damage" includes but is not limited to the substantial weakening of structural or lateral support of a utility line, penetration or destruction of any utility line protective coating, housing, or other protective device or the severance, partial or complete of any utility line.
- (h) "Approximate location of underground facilities" shall mean a strip of land extending not more than one-half (1 ½) feet on either side of the underground facilities.
- (i) "Administrator" shall mean the administrator of the division of public utilities.

**39-1.2-2. Excavation or demolition near public utility.**

No



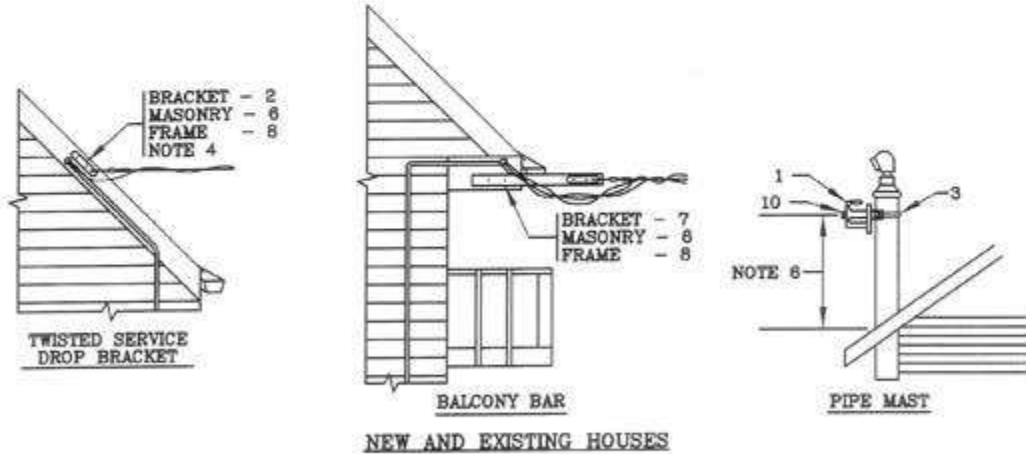
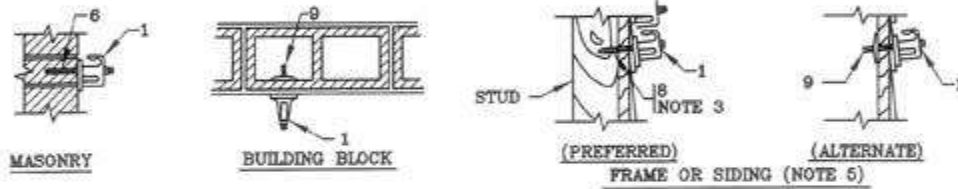
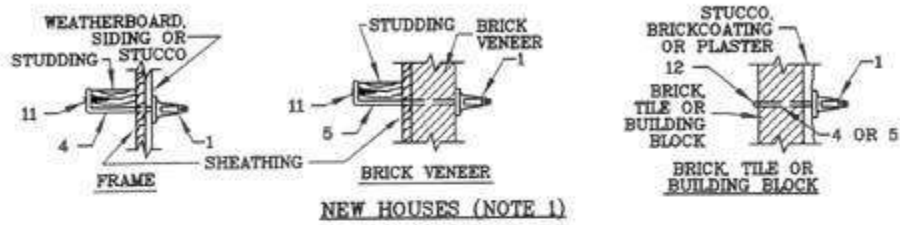
SKETCH #1A

SHEET 1A1

Secondary Service  
Service Drop Attachments

SKETCH #1A

SHEET 1A1



RULES FOR ELECTRIC METER AND SERVICE  
INSTALLATIONS

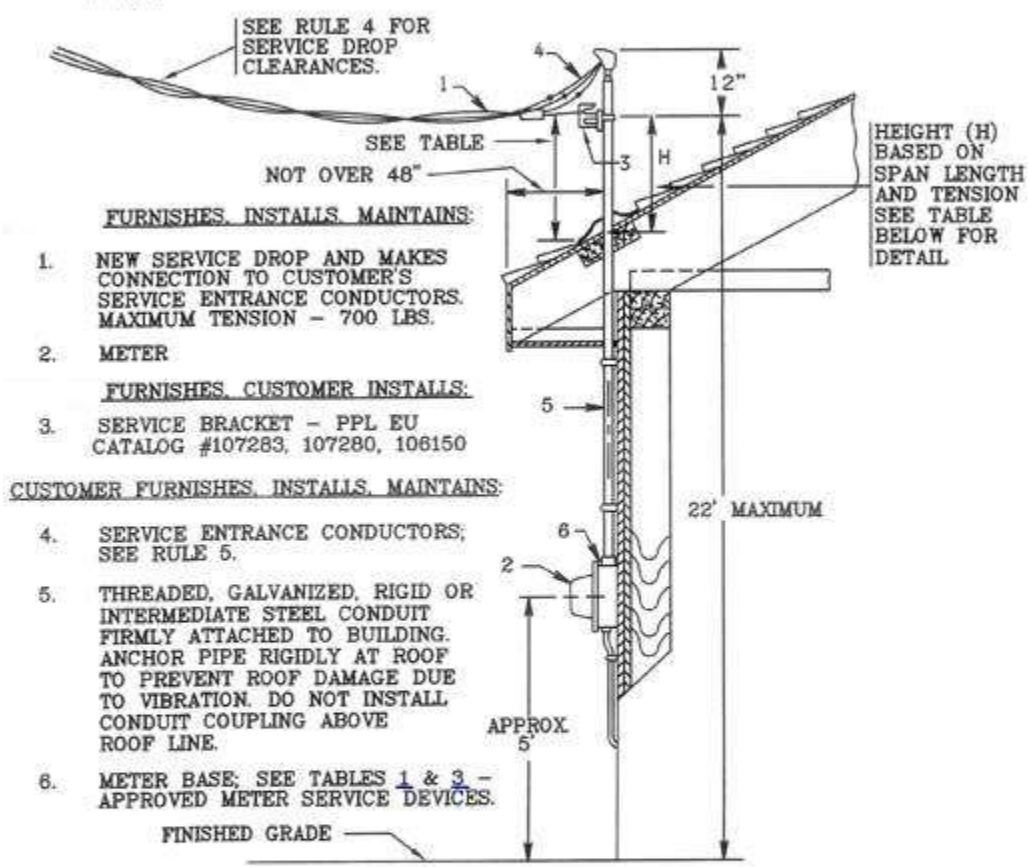


SKETCH #3  
SHEET 3

Secondary Service  
Service Drop Attachment to a Mast Attached to Low Building to Provide Required Clearances

SKETCH #3  
SHEET 3

THIS TYPE OF CONNECTION IS LIMITED TO SERVICES WITH SELF-CONTAINED METER AND #4, #1/0, OR #4/0 TRIPLEX FOR SINGLE PHASE, 3 WIRE OR #2/0 QUADRUPLIX FOR THREE PHASE, 4 WIRE.



FURNISHES, INSTALLS, MAINTAINS:

1. NEW SERVICE DROP AND MAKES CONNECTION TO CUSTOMER'S SERVICE ENTRANCE CONDUCTORS. MAXIMUM TENSION - 700 LBS.
2. METER

FURNISHES, CUSTOMER INSTALLS:

3. SERVICE BRACKET - PPL EU CATALOG #107283, 107280, 106150

CUSTOMER FURNISHES, INSTALLS, MAINTAINS:

4. SERVICE ENTRANCE CONDUCTORS; SEE RULE 5.
5. THREADED, GALVANIZED, RIGID OR INTERMEDIATE STEEL CONDUIT FIRMLY ATTACHED TO BUILDING. ANCHOR PIPE RIGIDLY AT ROOF TO PREVENT ROOF DAMAGE DUE TO VIBRATION. DO NOT INSTALL CONDUIT COUPLING ABOVE ROOF LINE.
6. METER BASE; SEE TABLES 1 & 3 - APPROVED METER SERVICE DEVICES.

SERVICE SIZE	SERVICE MULTIPLEX CABLE ASSEMBLY	HEIGHT ABOVE ROOF ATTACHMENT		MIN SIZE CONDUIT	SPAN LENGTH	TENSION (LBS)
		MIN	MAX			
1φ - 100AMP	#4 AL TRIPLEX	18"	36"	2"	100 FT OR LESS 100 FT TO 150 FT	350 700
1φ - 200AMP	#1/0 AL TRIPLEX	18"	20"	2 1/2"	100 FT OR LESS 100 FT TO 150 FT	500 700
1φ - 400AMP	#4/0 AL TRIPLEX	18"	18"	3"	100 FT OR LESS	700
3φ - 200AMP	#2/0 AL QUADRUPLIX	18"	18"	2 1/2"	100 FT OR LESS	700

RULES FOR ELECTRIC METER AND SERVICE INSTALLATIONS

SKETCH #3A

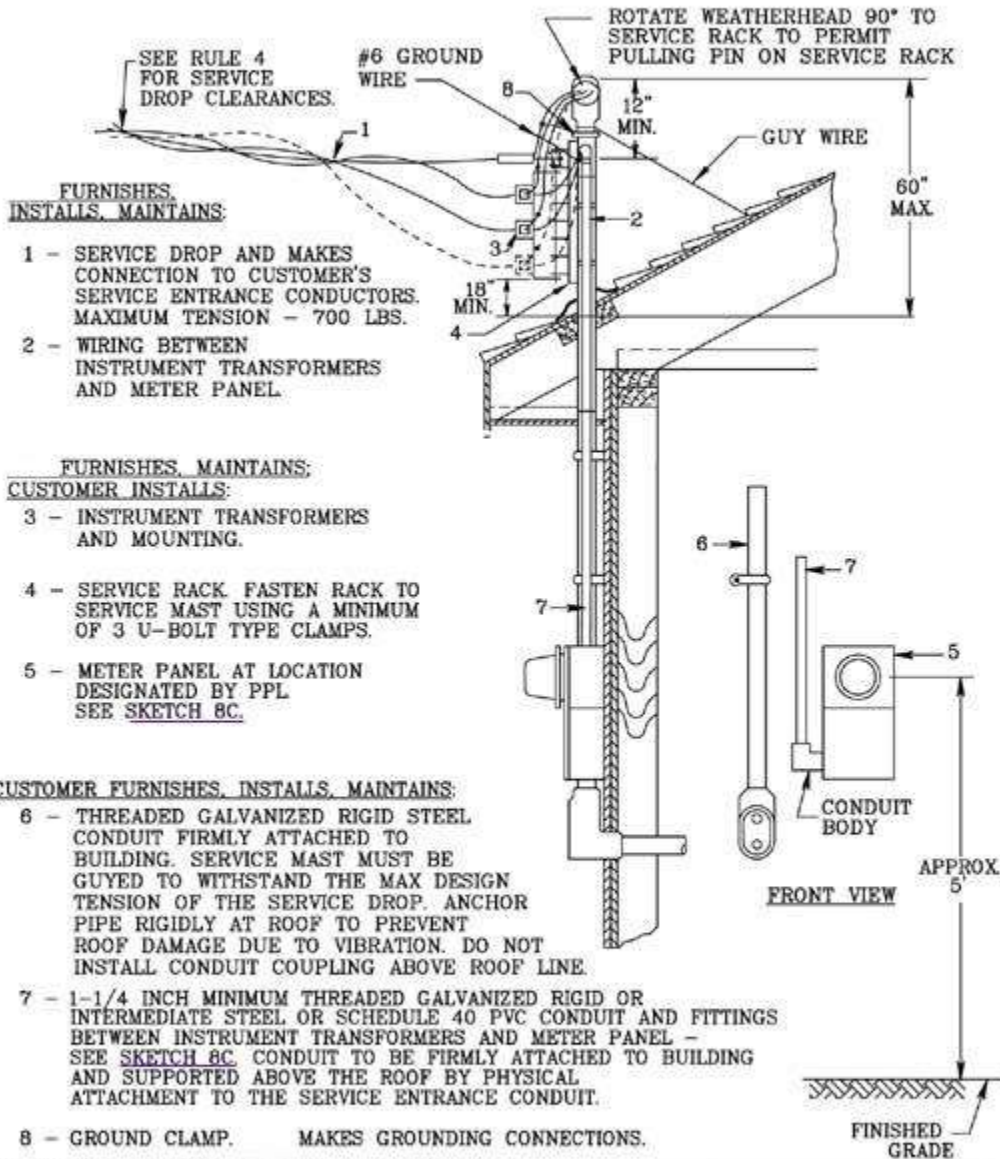
SHEET 3A

Secondary Service Drop Attachment  
to a Mast with Mast Mounted  
Instrument Transformers  
300 V Maximum

SKETCH #3A

SHEET 3A

**REQUIRES APPROVAL FROM SUPERVISOR - METERING SERVICES**



RULES FOR ELECTRIC METER AND SERVICE INSTALLATIONS