INTRODUCTION

These rules are issued for use by Customers, builders, electrical contractors, architects, engineers, etc. The rules require the installation of safe and adequate wiring and electrical equipment, which permits Customers to enjoy the full benefits and convenience of safe electrical service.

Customers shall ensure that new buildings, structures, additions, modifications and any other construction projects keep the minimum clearances required from existing Company supply lines. These minimum clearances are specified in the National Electrical Code, the National Electrical Safety Code and some local building codes. The Customer shall notify and supply construction plans to the Division Office for any project near Company supply lines well in advance of planned construction.

These rules document minimum Duquesne Light Company requirements. Municipal and other building codes or special conditions may require installation changes. When this occurs, the parties involved should meet with the Company to resolve the changes, which shall be documented in writing.

Copies of these rules may be obtained at the Company offices listed on Pages 2 through 6 or by writing to the Company's Customer Relations Department listed on page 2.

SCOPE

These rules shall apply to the installation of, or changes to, the wiring and equipment for receiving electric service. The electric service is intended for the exclusive use of the Customer or Customers.

Company equipment consists of the conductors and apparatus required to deliver energy to the Customer's wiring system, which includes service lines, poles, pole-mounted equipment, conductors, switches, transformers, etc. located in or on Customer owned premises including, substations, vaults, pads, conduits, and manholes.

Customer equipment includes service-entrance conductors, service lateral conductors (in most cases), service equipment and all premises wiring and equipment. When service is required from Distribution, Sub-Transmission or Transmission Lines, Customer equipment also includes the structures and enclosures described above which contain Company equipment.

USE OF THESE RULES SHALL BE AT THE USER'S OWN RISK AND EXPENSE AND USER EXPRESSLY RELEASES DUQUESNE FROM ALL LIABILITY FOR INJURY OR DAMAGE RESULTING FROM OR CAUSED BY SUCH USE INCLUDING, BUT NOT LIMITED TO, ALL PRESENT AND FUTURE DIRECT, INDIRECT, SPECIAL, PUNITIVE AND/OR CONSEQUENTIAL DAMAGES.
DEFINITIONS

COMMERCIAL TRAILER: A transportable structure, similar to a Mobile Home, for commercial use for construction, display, office, school room, bank, store, etc.

COMPANY: Refers to the Duquesne Light Company.

CUSTOMER: The party using the Company's service, or in applicable cases, the property owner, developer or the responsible electrical contractor acting for the Customer.

CUSTOMER'S SERVICE EQUIPMENT: The necessary equipment, usually consisting of circuit breakers or switches with fuses, and their accessories, located near the point of entrance of the service-entrance conductors to a building area and intended to be the main control and means of cutoff for the electric supply to the premise.

DIVISION OFFICE: The Company Division Office assigned to the community where the service installation is requested or in progress. The Division Office Community Assignments are given on Pages 3 through 5.

FLOATING BUILDING: A building unit which floats on water, is moored in a permanent location, and is used as a premises. The wiring system is served through connection by permanent wiring to an electric service not located on the premises.

MOBILE HOME: A factory-assembled structure or structures which is transportable in one or more sections, that is built on a permanent chassis and designed to be used as a dwelling without a permanent foundation where connected to the required utilities, and includes the plumbing, heating, air conditioning, and electric systems contained therein.

PRIMARY SERVICE LINE: The Company's conductors which connect the supply line with a transformer located on private property.

READILY ACCESSIBLE: Capable of being reached quickly, for operation, inspection or replacement, without the necessity of climbing over or removing obstacles or resorting to ladders, chairs, etc.

RECREATIONAL VEHICLE: A vehicular type unit primarily designed as temporary living quarters for recreational, camping, or travel use, which has its own motive power or is mounted on or drawn by another vehicle. The basic types are: travel trailer, camping trailer, truck camper, and motor home.

RESIDENTIAL DEVELOPMENT: A planned project by a developer/applicant for electric service and set out in a recorded plot plan of five or more adjoining unoccupied lots for the construction of single family residences, detached or otherwise, or mobile homes, and one or more five unit apartment houses, all of which are intended for year-round occupancy, if providing electric service to such project necessitates extending the Company's existing supply lines.

TOWNHOUSE: One of a continuous row of two or more single family residences, in which the house at each end of the row has one party wall, and each of the intervening houses has two party walls, and where each dwelling unit can be supplied with an individual service line from the Company's supply line in accordance with the Company's construction practices for single family residences.

SERVICE DROP: The portion of an overhead service line from the last Company pole to the service point.

SERVICE-ENTRANCE CONDUCTORS: That portion of a Customer's service facilities supplied by the Customer between the Customer's service equipment and the service point for overhead services or the service lateral for underground services.

SERVICE LATERAL: The underground service conductors including risers, from the last Company pole, pull box, splicing chamber, transformer terminals or vault to the service-entrance conductors. When the service point is at the last Company pole, pull box, splicing chamber, transformer terminals or vault, the service lateral is owned by the customer. When the service point is at the meter in underground residential developments, the service lateral is owned by the Company.
**SERVICE LINE:** The Company’s necessary poles, conductors, transformers, and equipment between the connection to the Company’s supply lines and the service point.

**SERVICE POINT:** The point of connection between Company equipment and Customer equipment. The service point usually determines the division of ownership between Company equipment and Customer equipment. The service point depends on the type of service and is described in applicable sections.

**SUPPLY LINE:** The Company’s overhead or underground wires or cables with the necessary poles or containing structures (ducts or conduits) and other hardware located within the public roadway or located within a utility right-of-way used for the Company’s General Supply System.
GENERAL SERVICE REQUIREMENTS

RIGHTS FOR ALL FACILITIES

(a) Right of way must be acquired from the property owner before any Duquesne Light Company facilities can be installed and before any overhead wires cross the property (even though the pole may be in the public right of way).

(b) The property State, County or Municipal permit must be acquired before any Duquesne Light company facilities can be installed in the public right of way (highways, streets, alleys, sidewalks).

RIGHTS FOR CONTROL OF VEGETATION

(a) The property owner must grant to Duquesne Light Company the right to trim, remove or control trees and/or brush in the right of way interfering or threatening to interfere, with the facilities in the right of way.

(b) Vegetation management shall be through means deemed appropriate by Duquesne Light Company for the purpose of protecting and maintaining the required Company clearance, as from time to time determined

DIVISION OF OWNERSHIP

The division of ownership of facilities between the Company and the Customer shall be at the service point determined by the type of service. A further description of Company and Customer equipment follows:

COMPANY OWNERSHIP

The Company will provide and own all equipment necessary to supply the Customer's service including the service line, necessary conductors, switches and transformers up to the service point. The service point can be the connection to the service line, service drop, transformer terminals or meter terminals depending on the type of service.

CUSTOMER OWNERSHIP

The Customer will own all conductors and equipment beyond the service point except the Company metering equipment. Examples of Customer equipment are service-entrance conductors, conduits, service equipment and premises wiring.

The Customer will also own the substation structures, vault enclosures, concrete pads, meter instrument transformer enclosures, underground conduits and grounding system necessary for the Company to provide service from high voltage lines to Customer premises as described in specific sections.

CODES

In addition to the rules listed herein, the Customer shall comply with the requirements of the National Electrical Code, the Occupational Safety and Health Act, the National Electrical Safety Code and applicable local building and safety codes.

INSPECTION

The Customer shall have their electrical installation inspected and approved by one of the following authorities to certify that the premises wiring complies with the required codes and the Company's Service Installation Rules:

(a) The Bureau of Building Inspection when the property is in the City of Pittsburgh. The Customer shall obtain the services of an electrical contractor registered to perform work in the City, who will obtain a permit and request the approval.

(b) The authority designated by any applicable municipal ordinance when the property is outside the City of Pittsburgh.

(c) An electrical inspection agency, recognized by the Company, where municipal inspection requirements are not applicable.
The Company will inspect structural and electrical work in substations, vaults and pads for compliance with Company provided plans and service installation rules. Satisfactory evidence of the approval of the premises and service wiring by the inspecting authority having jurisdiction shall be presented to the Company before the installation is energized.

**SERVICE GROUNDING**

The Customer shall install service grounding at the service equipment in accordance with the National Electrical Code, the requirements of the inspecting authority having jurisdiction, and these service installation rules.

**Services To Be Grounded**

The service neutral shall be grounded by the Customer on service installations of the following types:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Wires</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>120</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2,400</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>13,200</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>120/240</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>120/208</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>230/460</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>120/208</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>277/480</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2,400/4,160</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>13,200/23,000</td>
</tr>
</tbody>
</table>

The Customer must furnish a properly sized grounding conductor from the primary circuit neutral, the transformer neutral grounding point or the service line neutral to a ground on the supply side of the service equipment. The grounding conductor shall be installed in the same conduit as the service-entrance conductors or in close proximity when there is no conduit.

**Services Not To Be Grounded**

The following types of service will be normally supplied ungrounded. The Customer shall not ground the conductors of these installations without specific written permission from the Company.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Wires</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>230</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>460</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>230</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>460</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>2,400</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>23,000</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>69,000</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>138,000</td>
</tr>
</tbody>
</table>

**Grounding Electrode Conductors**

The grounding electrode conductor size shall be not less than No. 6 copper or aluminum. Larger services shall have grounding electrode conductors sized as specified in article 250-94 of the National Electrical Code. NEC Article 250-23 shall determine where the grounding electrode conductor is connected to the grounded service conductor, except that the meter enclosure (base) shall not be used for this connection because it is not accessible when sealed.
Primary Water Pipe Electrode

The grounding electrode conductor shall be run without splices or joints to a continuous metallic underground water piping system if available. All parts of the water piping system that are likely to become disconnected, such as water meters or service unions, shall be suitably bonded.

The grounding electrode conductor shall be connected to the metal water piping system in the building if one is available. If the water utility does not permit grounding to its system, an insulating bushing may be used outside the building.

Supplemental Electrodes

The metal water piping system shall be supplemented by two electrodes of the type specified in Article 250 of the National Electrical Code. The grounding electrode conductor shall be extended without splices to these electrodes. The supplemental electrodes will become the primary electrodes if a metallic underground water pipe system is not available.

ACCESS TO CUSTOMER’S PREMISES

Company representatives, who are properly identified, shall have the full and free access to the Customer's premises at all reasonable times for the purpose of reading meters, for inspection and repairs, for removal of Company property, or for any other purpose incident to the service. The Customer should immediately check with the Company if the credentials of Company representatives are in question.

RIGHT TO REFUSE OR DISCONTINUE SERVICE

The Company reserves the right to refuse or discontinue service upon reasonable notice in accordance with the provisions of the Company's Tariff.

CONNECTION CHARGES

Customers may have to contribute toward the cost of facilities necessary to provide service if required by the Company's Allocation of Cost Policy.

ELECTRIC SERVICES AVAILABLE AND APPLICATION REQUIREMENTS

TYPES OF SERVICE AVAILABLE

The type and voltage of electric services shall include those listed in the latest Company Tariff and available variations thereof. The type and voltage of electric services shall also depend on the location, size, characteristic of the load to be served and the Company's available facilities. Only one service connection of each type as to voltage and phase will be supplied under one contract, except where in the judgment of the company an additional service connection is required.

Street Secondary

These supply lines operate at less than 300 volts at 60 hertz alternating current. The types of service and demand limits for services supplied from street secondary supply lines are shown on Table 4.1.1, and the rules for service installations are given in Section 5. For limits on motor-starting see Section 7.2.

Distribution

These supply lines operate at voltages 2,400 volts or higher at 60 hertz alternating current. The types of service and demand limits for services supplied from distribution supply lines are shown on Table 4.1.2, and the rules for service installations are given in Section 6. Services from distribution circuits require transformers and/or special facilities on the Customer's property. For limits on motor-starting see Section 7.2.
Sub-Transmission And Transmission

The types of service and demand limits for services supplied from sub-transmission and transmission supply lines are shown on Table 4.1.3, and rules for service installations are given in Section 6. Call your Division Office for information on obtaining these services.

APPLICATION REQUIREMENTS FOR NEW PERMANENT OR TEMPORARY SERVICE

On all new service installations, temporary and permanent, the Customer must complete the five following requirements to obtain electric service:

(a) Make an application for electric service. (See 4.2.2)

(b) Request a service and meter location.

(c) Complete an Application Form if not a Duquesne Light Company Customer within the last 60 days. (Not required for a temporary service.)

d) Obtain a wiring approval from the proper electrical inspection agency. See Section 3.3.

(e) A certificate of compliance with the "Building Energy Conservation Act" (PA 222) may be required.

(f) Obtain the necessary right of way agreements satisfactory to Duquesne Light Company for the placement of facilities on the property, for any overhead wires crossing the property and for the right to trim or remove any trees, shrubbery or other obstructions for protection and clearance.
## Types of Electric Service, Secondary

Services and demand limits available from street secondary supply lines, operating at less than 300 volts.

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage</th>
<th>Phase</th>
<th>Wires</th>
<th>Application Limits</th>
<th>Load Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>120</td>
<td>1</td>
<td>2</td>
<td>Special applications only</td>
<td>2.4 (Overhead) 2.4 (Underground)</td>
</tr>
<tr>
<td>B</td>
<td>120/240</td>
<td>1</td>
<td>3</td>
<td>Lighting, appliances, resistance, heating and motors</td>
<td>50 (Overhead) 25 (Underground)</td>
</tr>
<tr>
<td>C</td>
<td>120/208</td>
<td>1</td>
<td>3</td>
<td>Lighting, appliances, resistance, heating and motors</td>
<td>25 (Overhead) 25 (Underground)</td>
</tr>
<tr>
<td>D</td>
<td>120/208</td>
<td>3</td>
<td>4</td>
<td>Lighting and power</td>
<td>50 (Overhead) 150 (Underground)</td>
</tr>
<tr>
<td>E</td>
<td>230</td>
<td>1</td>
<td>2</td>
<td>Special power uses only</td>
<td>50 (Overhead) Not available (Underground)</td>
</tr>
<tr>
<td>F</td>
<td>230</td>
<td>3</td>
<td>3</td>
<td>Power without lighting</td>
<td>112.5 (Overhead) 75 (Underground)</td>
</tr>
</tbody>
</table>

Service types B & C are not available at the same locations.

Service types D & F are not available at the same locations.

Service type D supplies both lighting and power loads at locations where it is available.

Service types B & F supply lighting and power loads at locations where these services are available.

Higher limits are available at some locations. Check with the company.
## TYPES OF ELECTRIC SERVICE, DISTRIBUTION

SERVICES AND DEMAND LIMITS AVAILABLE FROM DISTRIBUTION SUPPLY LINES, OPERATING AT 2,400 VOLTS OR HIGHER WITH FACILITIES LOCATED ON CUSTOMER’S PROPERTY

<table>
<thead>
<tr>
<th>TYPE OF SERVICE</th>
<th>2,400/4,160 VOLTS</th>
<th>13,200/23,000 VOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAGE PHASE WIRE</td>
<td>OVERHEAD LIMITS (kVA) Min.-Max.</td>
<td>UNDERGROUND LIMITS (kVA) Min.-Max.</td>
</tr>
<tr>
<td>120/240 1 3</td>
<td>1-50</td>
<td>1-50</td>
</tr>
<tr>
<td>230/460 1 3</td>
<td>1-50</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>120/208 3 4</td>
<td>30-300</td>
<td>50-500</td>
</tr>
<tr>
<td>230 1 2</td>
<td>1-50</td>
<td>1-50</td>
</tr>
<tr>
<td>230 3 3</td>
<td>1-300</td>
<td>50-500</td>
</tr>
<tr>
<td>277/480 3 4</td>
<td>NOT AVAILABLE</td>
<td>150-500</td>
</tr>
<tr>
<td>460 1 2</td>
<td>1-50</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>460 3 3</td>
<td>50-500</td>
<td>150-500</td>
</tr>
<tr>
<td>2,400 1 2</td>
<td>1-50</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>2,400 3 3</td>
<td>NOT AVAILABLE</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>2,400/4,160 3 4</td>
<td>150-500</td>
<td>150-500</td>
</tr>
<tr>
<td>13,200/23,000 3 4</td>
<td>NOT AVAILABLE</td>
<td>NOT AVAILABLE</td>
</tr>
</tbody>
</table>

NOTE: HIGHER LIMITS ARE AVAILABLE IN SOME LOCATIONS. CHECK WITH THE COMPANY
## TYPES OF ELECTRIC SERVICE, SUB-TRANSMISSION & TRANSMISSION

**SERVICES AND DEMAND LIMITS AVAILABLE FROM SUB-TRANSMISSION AND TRANSMISSION SUPPLY LINES**

<table>
<thead>
<tr>
<th>SUPPLY LINE VOLTAGE</th>
<th>THREE-PHASE, FOUR-WIRE CIRCUITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF SERVICE</td>
<td>23,000</td>
</tr>
<tr>
<td>VOLTAGE</td>
<td>PHASE</td>
</tr>
<tr>
<td>120/208</td>
<td>3</td>
</tr>
<tr>
<td>230</td>
<td>3</td>
</tr>
<tr>
<td>277/480</td>
<td>3</td>
</tr>
<tr>
<td>460</td>
<td>3</td>
</tr>
<tr>
<td>2,400</td>
<td>3</td>
</tr>
<tr>
<td>2,400/4,160</td>
<td>3</td>
</tr>
<tr>
<td>11,500</td>
<td>3</td>
</tr>
<tr>
<td>23,000</td>
<td>3</td>
</tr>
<tr>
<td>13,200/23,000</td>
<td>3</td>
</tr>
<tr>
<td>69,000</td>
<td>3</td>
</tr>
<tr>
<td>138,000</td>
<td>3</td>
</tr>
<tr>
<td>345,000</td>
<td>3</td>
</tr>
</tbody>
</table>

**NOTE:** CHECK WITH THE COMPANY FOR kVA LIMITS FOR AVAILABLE SERVICES
Temporary Services

Service will be provided for construction or other purposes on a temporary basis at a cost to be determined by the Company.

For temporary service during construction in overhead areas where the service line will eventually be transferred to the building, the Customer shall install a structure as shown in Figure 1 or a structure of similar strength. Such a structure shall be located not in excess of one span (100 feet or less depending on wire size) from the Company's service pole so that the service drop can be transferred to the building.

For temporary service in residential areas with underground supply lines, the Customer will furnish and install a temporary service pedestal as shown in Figure 2.

For temporary service in other underground areas or where no Company facilities exist, consult the Division Office.

For all temporary services, the Customer must supply a lock for the service equipment and keep it locked at all times.

Application For Service

This application should be made to the Company either by telephone, letter, or in person. Telephone inquiries should be made to the appropriate Division Office using the telephone numbers shown on Pages 3 through 5.

Information to be supplied by the Customer shall include:

(a) Customer's name, service address, mailing address, telephone number and community.

(b) Type, capacity, and location of service desired.

(c) The size, phase and number of motors, ranges, water heaters, air conditioners, electric space heating units, and other major appliances; and if other than residential, the total connected lighting and other loads in kilowatts.

(d) Size and configuration of the service-entrance conductors.

(e) Size of hub required in cases where the Company supplies the meter socket.

(f) Name, address and phone number of the electrical contractor.

Service And Meter Location Request

Upon receipt of the Customer's service application, the Company will provide the following information:

(a) The type and capacity of the electric service (as was provided by the Customer per section 4.2.2).

(b) The type and size of the meter socket or other meter equipment.

(c) The available fault current, if requested.

(d) The Company may specify a location on the building to which it will provide service and to where the Customer will install the service entrance and meter.

When the service location is not specified, the Customer shall choose a location on the building which best satisfies the following requirements:
Single family dwellings will normally have their services located on a corner which is nearest to the Company's supply line.

When supplied from overhead lines, the service shall be located at the corner nearest to a Company pole.

New meter locations shall be chosen to eliminate house to house connections and service drops over roofs, awnings and other structures.

A service from underground lines shall be located at the corner nearest to the transformer installation or underground service enclosure.

The service location shall not require the Company's service line to cross an adjacent property.

Two hundred ampere self-contained three-phase meter sockets can be obtained from any Division Office. Other meter equipment will be delivered to the job site according to section 8.2. Customers are responsible for furnishing self-contained single-phase meter sockets.

Permission to locate the meter socket at another location may be granted by the Division Office in special cases. Other questions concerning meter locations and installations will be answered by the Division Office.

Note: Under the provisions of the Company's Tariff Rule 13.2, which requires underground electric service in certain residential developments, the Customer may be responsible for additional charges for either unusual conditions or an excess length of service line.

**REWIRSES, CHANGES AND ADDITIONS**

All existing electrical services have a maximum design capacity. The Customer shall provide the Division Office with information on any proposed changes or additions before new equipment is ordered. The Company will determine if changes to its supply facilities are necessary and whether the service and equipment are compatible. Changes or additions to Customer's wiring or equipment are subject to the same Company rules as new services.

Wiring and service equipment that has been changed will not be energized by the Company until such wiring and service equipment is inspected and approved as specified in Section 3.3.

For any service wiring changes for which the Company has not specified a new meter location, the Customer shall comply with the following general guidelines:

(a) Residential meters located indoors shall be moved to outdoor locations as specified below and in Section 4.2.3(d).

(b) Meters other than residential may be required to be moved outdoors.

(c) New meter locations shall be chosen to eliminate house to house connections and service drops over roofs, awnings and other structures.

(d) Meters shall be readily accessible to Company representatives. The best location is on the side of the building at the front corner nearest to the Company's service pole or underground service point.

Contact the Division Office if there are problems applying these guidelines.
SERVICE FROM COMPANY SECONDARY SUPPLY LINES
(OPERATING AT LESS THAN 300 VOLTS)

This Section contains rules for the installation of equipment for providing electric service from Company street-secondary supply lines operating at less than 300 volts. In areas where the Company has both overhead and underground supply lines, the method of providing service to a Customer will be at the sole discretion of the Company. The rules in this Section may not apply to certain private, public authority or municipal projects.

UNDERGROUND SERVICE

For electric service in an area already having underground electric facilities, apply for service as described in Sections 5.1.1 through 5.1.4.

Residential Underground Service

For service in a residential plan already having underground electric facilities, call or visit a Division Office as listed on pages 3 through 5. The appropriate Division Office should also be contacted by developers regarding new residential developments of five or more units of single family residences, mobile homes, townhouses, or apartments for an explanation of Tariff Rule 13.2 and a copy of the Company’s “Procedures and Construction Standards for Underground Residential Distribution Systems”.

For a typical residential underground service, the Company will install and maintain the service lateral up to the meter base. The Customer is responsible for the installation of the meter socket, service-entrance conductors and all trenching and backfilling. See Figure 3A, BEFORE YOU DIG! CONTACT PENNSYLVANIA ONE-CALL 1-800-242-1776.

Areas Designated As Underground

Typical underground service connections are shown on Figure 3. In these areas, other than those covered by the Company’s Rule 13.2, the Company will own and install the necessary junction boxes or manholes for the underground service line in the street and the conduit extending not more than 18 inches within the Customer’s property line.

(a) Where the building is at the Customer's property line and has a basement, the Customer shall furnish and install a terminal box where the conduit enters the basement.

(b) Where the building is at the Customer's property line and has no basement, the Customer shall furnish and install an elbow of 36 inch radius, necessary conduit, and a terminal box on the first floor.

(c) Dimensions of the terminal box mentioned in (a) and (b) shall be obtained from the Division Office. The box shall be mounted not less than one foot above the floor.

(d) Where permission to use enclosures other than a terminal box has been obtained from the Division Office, the Company will terminate its cables in a meter socket, an instrument transformer cabinet, or a Customer's switch box.

(e) Where the building is not at the Customer's property line, the Customer shall at the Company's option either furnish and install a junction box at the property line, or furnish and install conduit from the property line to a terminal box or meter cabinet at the building.

(f) The Company will furnish and install the service cable from the manhole to the Customer's terminal box or junction box at the property line. When the terminal box or meter cabinet is not at the property line a charge, as determined by the Company, shall be made for the installed cost of the secondary cable runs on the Customer's property.
Underground Service From Overhead Lines

A typical underground installation from overhead lines is shown in Figure 4. Where an underground service line is installed from the Company’s overhead, street secondary supply lines, the Customer shall furnish, install, own, and maintain the service cable and conduit in its entirety including:

(a) Not more than two metallic or PVC Schedule 80 conduit elbows at the base of the pole to extend above the ground surface.

(b) A metallic or PVC Schedule 80 conduit, with proper fastenings, from the top of each elbow to a point not less than 8 feet nor more than 11 feet above the ground level.

(c) PVC Schedule 40 cable guard (U-Guard), with proper fastenings from the top of each metallic or PVC Schedule 80 conduit to a point one foot below the lowest conductor of the street secondary supply line.

(d) A metallic or PVC Schedule 80 conduit on the line side of the meter socket.

The Customer shall install all conduits except the cable guard, which will be installed by the Company.

When the terminal pole is not wood, the installation shall be made as specified by the Division Office.

The Customer shall furnish and install the underground conductors that shall be of sufficient length to reach three feet above the lowest conductor of the street-secondary supply line. The Customer shall coil and tie the remaining length of cable above the conduit on the pole. The Company will complete the installation and make the connection to its lines.

If a pole is replaced or relocated, the Customer shall be responsible for transferring or relocating the conduit and cable from the old pole to the new pole.

The Customer shall secure the street opening permit if one is required for his work. If the Customer is unable to secure the street opening permit because of government regulations, the Company will endeavor to secure the permit at the Customer's expense.

Cable And Conduit

Wire or cable installed by the Customer shall be of a type approved for underground use.

Customers should realize that the replacement of underground cable is difficult and expensive. Such cable should be liberally sized to minimize voltage drop and to handle future loads. The Company recommends cables rated not less than 200 amperes for a single family dwelling. Cable sizes exceeding 250 MCM require special metering for single family applications. (See Section 8.4)

OVERHEAD SERVICE FROM OVERHEAD LINES

Where overhead service is permitted, the following types of overhead service will be provided.

Overhead Service To A Building

The Company will furnish and install an overhead service line, (service drop), up to 100 feet from the property line nearest the Company's facilities to a point of attachment at the Customer's building, and will make the necessary connections to the Customer's service-entrance conductors at that point. The location and details of this service connection are covered in Section 4.2.3. For most services the Company will furnish and install the service drop anchor at a location identified by the Customer as having sufficient strength.
When Customer electrical load necessitates use of a heavy service drop, the Company will provide the mechanical hardware necessary (5/8" through-bolt, clevis bracket and spool insulator) to fasten the Company's service drop to the building. The Customer shall install the hardware at a point nearest the location designated by the Company and, that the Customer determines has sufficient strength to withstand a minimum of 1,000 pounds tension. If use of a 5/8" through-bolt is not feasible, the Customer shall notify the appropriate Company Division office and obtain permission to use a suitable 5/8" anchor bolt. The Customer shall furnish and install the 5/8" anchor bolt, and install the clevis bracket and spool insulator provided by the Company.

The Customer shall install the hardware at a point nearest the location designated by the Company and, that the Customer determines has sufficient strength to withstand a minimum of 1,000 pounds tension. If use of a 5/8" through-bolt is not feasible, the Customer shall notify the appropriate Company Division office and obtain permission to use a suitable 5/8" anchor bolt. The Customer shall furnish and install the 5/8" anchor bolt, and install the clevis bracket and spool insulator provided by the Company.

The Customer shall install the hardware at a point nearest the location designated by the Company and, that the Customer determines has sufficient strength to withstand a minimum of 1,000 pounds tension. If use of a 5/8" through-bolt is not feasible, the Customer shall notify the appropriate Company Division office and obtain permission to use a suitable 5/8" anchor bolt. The Customer shall furnish and install the 5/8" anchor bolt, and install the clevis bracket and spool insulator provided by the Company.

The Customer shall maintain the strength of the building, service mast, attachment anchors or any other structure supporting service drop conductors for the life of the service and for any subsequent service changes. The Company will not assume liability for damage resulting from failures of the building or structure to support the service drop conductors.

The Customer's service-entrance conductors shall extend up the building to a point high enough to provide the following minimum clearances for the Company's service drop, and be at least 12" above the point of service drop attachment to prevent siphoning of moisture into the service cable or conduit:

Over sidewalks and the ground 10 feet
Over residential driveways 12 feet
Over commercial driveways, alleys, streets, etc. 18 feet

See Figure 5 for a drawing of a typical overhead service connection to a building and important notes.

When the Customer's building is not high enough to provide the minimum ground clearance requirements, the Customer shall install a suitable support, such as a service mast, for attaching the service line. This support or mast shall not be used for any purpose other than the electric service installation. The service mast shall be 2" diameter or larger rigid galvanized steel conduit, clamped to the building by two-hole conduit straps anchored by 5/16 inch minimum diameter lag screws of sufficient length to hold the mast securely. The conduit straps are to be spaced no more than 32 inches apart and top strap is to be placed within 12 inches of the building roof. Conduit couplings shall not be used in the top 10 feet of mast length.

The service mast shall be installed as described in Figure 6 or 7.

Overhead Service To A Pole Or Structure

The Company's overhead service line may end on a Customer's pole when approved by the Division Office. The Company will furnish, install and connect an overhead service line up to 100 feet from the property line to the Customer's pole or structure. There is normally no Customer cost for the first 100 feet or less. The Customer shall pay the cost of lengths over 100 feet as determined by the Division Office.

The Customer's pole shall be yellow pine or cedar, and properly treated. The Division Office can approve other pole types and will specify the minimum height and strength. The pole shall be set plumb and true, and if of wood, at least five feet deep. The pole may require an anchor.

If the Customer continues this service line either overhead or underground to a building, the best metering equipment location is at the building. Pole mounted meter installations are permitted as shown in Figures 8 and 9. For clearances see Section 5.2.1 and Figure 5.

The Company will furnish and install the Customer's pole at Customer request. The Customer's cost will be determined by the Division Office. The Customer will own and maintain the pole.

The Company's overhead service line may end on a structure other than a building or pole when approved by the Division Office.
Overhead Service Drops Over Or Near Swimming Pools

The installation of a service drop above or near a swimming pool or the installation of a swimming pool beneath a service drop is not recommended. A Customer insisting on such an installation shall comply with the requirements of the National Electrical Code, Section 680-8.

Overhead Service Drops Over A Roof

The installation of service drops above a roof should be avoided. When a service drop must be run over a roof the installation shall comply with the requirements of the National Electrical Code, Section 230-24.

MOBILE HOMES, RECREATIONAL VEHICLES, FLOATING BUILDINGS, COMMERCIAL TRAILERS AND SERVICE PEDESTALS

Service lines will not be connected directly to a mobile home or trailer except when the structure is mounted on a permanent foundation. The structure will then be treated as a conventional premises.

Mobile Homes - Up To Four Units

An overhead service to a Customer’s pole will be provided in accordance with Section 5.2.2, as shown in Figure 9. Underground service may be installed by the Customer to an approved meter and service pedestal in accordance with Section 5.1, 5.3.5 and as shown in Figure 10.

Mobile Homes - Five Or More Units

For new developments of five or more mobile homes the developer shall contact a Company Division Office listed on Pages 3 through 5 for an explanation of Tariff Rule 13.2.

Recreational Vehicles And Floating Buildings

Recreational vehicles, floating buildings and river craft will usually be served by the operators of private or public camps or marinas. However, if one is to be located for permanent residential occupancy, the service installation requirements to a pole, or meter and service pedestal will apply. The Company will not supply an electric service directly connected to a vehicle, floating building or water craft. Temporary service will be provided as in Section 4.2.

Commercial Trailers

Commercial trailers for temporary use will be connected under the provisions of Section 4.2. For service to permanent Commercial Trailers, contact the Division Office.

Meter And Service Pedestal

The meter and service pedestal shall be made of a corrosion resistant material and shall be installed plumb and rigid by a method equivalent to one of the following: See Figure 10.

(a) Setting the pedestal in concrete.

(b) Bolting to the surface of a concrete pad.

(c) Extending the pedestal a minimum distance of two feet below grade and pouring a concrete pad around the pedestal at grade level.
A stabilizer foot of at least 48 square inches attached to the bottom end of the pedestal will greatly aid rigidity. The pedestal shall be mounted so that the top of the meter will be between 3-1/2 and 5 feet above the finished grade. The meter and service pedestal must have prior approval of the Company's Energy Technology Services Department. A list of approved meter and service pedestals, for this application, is available from the Division Offices.

**Service-Entrance Capacity**

Service-entrance capacity to the point of metering for a mobile home shall be not less than 100 amperes. Mobile homes with permanently installed electric space heating shall be subject to the same conditions as conventional housing under Section 5.6.

When two or more mobile homes without permanently installed electric space heating are to be supplied from a single service connection, the same service-entrance conductor sizing shall apply as for conventional multiple family housing under Section 5.5.

**SERVICE-ENTRANCE CONDUCTORS**

The service-entrance conductors shall consist of approved service-entrance cable, conductors in rigid or intermediate conduit (thin wall or flexible conduit is not acceptable), or other Company approved wiring methods. The Customer shall be responsible for maintaining the service-entrance conductors in a satisfactory condition at all times. Service-entrance conductors should be liberally sized to minimize voltage drop, especially for long service runs.

**Service-Entrance Conductors, Underground**

See section 5.1 for the division of responsibility and ownership for underground services. The Company recommends a minimum ampacity of 200 amperes for underground service-entrance conductors. Special metering may be required as described in Section 5.1.4 and Section 8.4.

**Service-Entrance Conductors, Overhead**

Service-entrance conductors to overhead lines shall be equipped with a rainproof service head or a fitting approved by the inspection agency having jurisdiction and shall extend at least 3 feet beyond the fitting for connection to the service line. This service head shall have a clearance of not less than 3 feet from windows, doors, porches, fire escapes or similar accessible locations. Not more than two sets of service-entrance conductors will be connected to an overhead service line, unless written approval has been obtained from the Division Office. Non-metallic conduit used above ground shall be PVC Schedule 80. See Section 5.2 and Figures 7, 8 and 9.

**RESIDENTIAL SERVICE-ENTRANCE AMPACITY WITHOUT ELECTRIC SPACE HEATING**

For a residential service installation, including mobile homes, without permanently installed electric space heating, the service-entrance conductors shall have an ampacity not less than 100 amperes.

Where two or more residential service installations without permanently installed electric space heating are combined on one set of service-entrance conductors, the minimum ampacity of the service-entrance conductors shall be as follows:

- 2 installations 125 amperes
- 3 installations 150 amperes
- 4 installations 175 amperes
- 5 or 6 installations 200 amperes

Where more than six residential service installations are combined on one set of service-entrance conductors, the minimum service ampacity shall be determined by the calculations outlined in Article 220 of the National Electrical Code but shall be not less than 200 amperes.
RESIDENTIAL SERVICE-ENTRANCE AMPACITY WITH ELECTRIC SPACE HEATING

For a residential service installation with permanently installed electric space heating, the minimum ampacity of the service-entrance conductors shall be determined by the calculations outlined in Article 220 of the National Electrical Code but shall be not less than as follows:

<table>
<thead>
<tr>
<th>Space Heating Load</th>
<th>Minimum Ampacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Kilowatts or less</td>
<td>100 amperes</td>
</tr>
<tr>
<td>6 to 20 Kilowatts</td>
<td>150 amperes</td>
</tr>
<tr>
<td>21 to 28 Kilowatts</td>
<td>175 amperes</td>
</tr>
<tr>
<td>29 to 36 Kilowatts</td>
<td>200 amperes</td>
</tr>
</tbody>
</table>

RESIDENTIAL SERVICE EQUIPMENT

All service equipment, consisting of circuit breakers or switches and fuses, shall be located at a readily accessible place near the point where the service-entrance conductors enter the building.

All service equipment must have a minimum interrupting capacity equal to the available fault current but in no case less than 10,000 amperes.

COMMERCIAL/INDUSTRIAL SERVICE REQUIREMENTS

Commercial and industrial service-entrance conductors and equipment shall have a minimum ampacity of 100 amperes and meet the available fault current interrupting requirements. The actual service ampacity shall be determined by the installed electrical loads and the requirements of the National Electrical Code. The Customer must provide the required service size when applying for service as specified in Section 4.

When service is supplied from Company secondary supply lines, the service requirements in Section 5 will apply in most cases. When the service requirements in Section 5 are no longer applicable for the installation, the service requirements in Section 6 shall be used.

SERVICES FROM COMPANY DISTRIBUTION, SUB-TRANSMISSION AND TRANSMISSION LINES, (OPERATING AT 2,400 VOLTS OR HIGHER)

This Section contains rules for the installation of equipment on private property for providing electric service from Company supply lines operating at 2,400 volts or higher.

OVERHEAD SERVICE LINES

Where electric service is supplied from overhead supply lines, the Company will provide and install an overhead primary service line, including poles, conductors, and other equipment from the supply line to the main transformer, or in the case of untransformed service to the metering location. The Customer shall provide and maintain a right-of-way under terms satisfactory to the Company for this service line. The title to this line shall vest in the Company.

The Customer may be required to contribute to the cost of construction of this service line in accordance with Section 3.7.
UNDERGROUND SERVICE LINES

In locations where the only supply lines are underground or the Company has agreement with a governmental agency or a group of Customers to provide underground service in a specific area or the Company decides underground service is in the best interest of the Company, the Company will provide and install necessary manholes, junction boxes, and conduits within the street area. In locations where the supply lines are overhead, the Customer shall install that portion of the duct line within the street area or shall contribute to the Company the installed cost of that portion of the duct or conduit, and in either case will retain ownership.

The Customer shall provide, install, maintain and own all necessary manholes, vaults, junction boxes, and conduits on private property in accordance with Company specifications.

The Company will provide and install a primary service cable between its street facilities and the substation, vault, pad, or pole. Where the underground service cable ends on a pole, the Company will install the pole. The Customer shall provide a right-of-way under terms satisfactory to the Company for this service cable and any required pole. The title to this cable and pole shall vest in the Company.

The Customer may be required to contribute to the cost of construction of this service cable and pole in accordance with Section 3.7.

SERVICE TO RESIDENTIAL DEVELOPMENTS

For new developments of five or more single family residences, row-houses, mobile homes, or apartment units where underground construction is required, developers should contact the appropriate Division Office listed on pages 3 through 5. Additionally, for existing developments, developers should contact the appropriate Division Office for an explanation of the distribution of responsibility.

LOCATION FOR TRANSFORMERS AND EQUIPMENT

The Customer shall provide a location of size and arrangement suitable to the Company for the installation of line switches, primary buses, transformers, and associated equipment, in accordance with these rules. Such transformers and equipment shall be installed in or on a suitable structure or enclosure specified by the Company, such as a substation, vault, pad or pole installation.

The location shall be accessible for the installation and removal of equipment directly from the street or from an unobstructed driveway to be provided by the Customer. The Company's equipment on the premises is a part of the Company's transmission and distribution system and it is essential that Company representatives shall have immediate access to that part of the premises containing this equipment at all times.

INSTALLATIONS ON POLES

Transformed service furnished from a pole-mounted installation on Customer property can be supplied when the loads are within the overhead capacity limits shown on Table 4.1.2. When service requirements can be met by street secondary supply lines as shown in Table 4.1.1, service will usually be supplied from the street as described in Section 5.

Overhead Services

For services of 480 volts or less, the Company will furnish and install an overhead service drop not in excess of one span (100 feet or less, depending on wire size) to the Customer's building or other suitable support approved by the Company. The Company will make the necessary connection to the Customer's service-entrance conductors at that point.
Underground Services

For a typical installation, See Figure 6. When service-entrance conductors are installed underground, the Customer shall furnish, install, own, and maintain the service cable and conduit in its entirety including:

(a) Not more than two metallic or PVC Schedule 80 conduit elbows at the base of the pole to a minimum of 6” above final grade. If more than two conduits are required, contact the Division Office.

(b) A metallic or PVC Schedule 80 Conduit, with proper fastenings, from the top of each elbow to a point not less than 8 feet nor more than 11 feet above the final (finished) ground level.

(c) PVC Schedule 40 cable guard (U-Guard) with proper fastenings, to extend from the top of each metallic or PVC Schedule 80 Conduit to a point approximately 24 inches below the bottom of the transformer/s.

The Customer shall install all duct and conduit except the U-guard covering. The Company will install the U-guard covering on the pole.

Where other than a wood pole is designated as a terminal pole, the installation shall be made as specified by the Division Office.

The Customer shall furnish cable of sufficient length to reach the secondary terminals of the transformer or transformers. The Customer shall install the cable in the underground portion of the duct or conduit and in the conduit on the pole and shall coil it at the top of this conduit. The Company will complete the installation and make the connection to its facilities.

Meter Transformer Poles

For 2,400 or 4,160 volt services, the Company will furnish, install, own, and maintain the transformer and metering pole, if required. These poles will be located on private property and are a part of the service line for which the Customer may be required to make a contribution in accordance with Section 3.7 of these rules. For metering of 2,400 or 4,160 volt services, see Section 8.10.

UNTRANSFORMED SERVICE - UNDERGROUND

Where untransformed service is supplied underground, the Company will furnish the metering equipment as described in Section 8.9. The Customer shall furnish and install an enclosure approved by the Company to house the terminals of the service line and the metering transformers. The Customer shall also furnish and install the service-entrance conductors from the termination of the service line to the service equipment.

UNTRANSFORMED SERVICE - OVERHEAD

Where untransformed service is supplied overhead, see Section 8.10 for the metering requirements. The Customer shall furnish and install all construction beyond the service point which is usually at the Company's metering terminals. Overhead conductors of sufficient length shall be provided by the Customer to permit the Company to connect them to the service point. The service point will be determined by service requirements and designated by the Division Office.

TRANSFORMED SERVICE INSTALLATIONS FROM SUBSTATIONS, VAULTS, OR PADS

Where transformed service is furnished from equipment in a substation, in a vault, or on a pad, the Company will furnish and install the main transformers, meters, and meter wiring. See Section 8.8 for the metering requirements.

For all installations, except for residential developments where Tariff Rule 13.2 applies, the Customer shall furnish and install the service-entrance conductors beginning at the secondary terminals of the Company's transformer or transformers. The Customer shall furnish and install the connectors for attaching the conductors to the transformer terminals. The service-
entrance conductors at the secondary terminals of the transformer shall be of a flexible type, and the connectors shall be of the type specified by the Company.

The Customer shall furnish, install, maintain and own the physical structure; power, relay and control wiring; underground conduits and the protective grounding system necessary to support the installation of the Company’s transformers and equipment. The Company will provide plans and instructions for the installation as follows:

**Physical Structure And Wiring**

The Customer shall furnish, install, and maintain in accordance with plans furnished by the Company, all foundation structures, control rooms, walls, steel for mounting equipment, pulling eyes, fences, hatches, doors, ladders, slag, gates, means for adequate drainage and ventilation, and similar items which constitute the substation, vault or pad installation. The Customer shall also provide and install conduit, wiring, HVAC per Company requirements, and the necessary, 120/240 volt, single-phase or 120/208 volt, single-phase service and equipment to supply the Company's substation equipment (communications, lights, battery chargers, relay testers, air compressors, etc.)

**Protection And Control Wiring**

The Customer shall furnish, install and maintain all conduit for the protection and control wiring shown on the drawings for the permanent sections of the installation. The Company will provide and install the conduit for all relay and control wiring in the exposed section of the installation as noted on the drawings.

**Protective Grounding**

The grounding installation is important to public safety and must be completed according to Company plans. The Customer shall furnish and install the grounding system as described in plans supplied by the Company. Generally the Customer shall do the following:

(a) Provide and install ground rods, ground bus, and ground grid.

(b) Provide and install flexible connections from all gates and doors to adjacent stationary sections of the fence, metal siding or door frames.

(c) Ground all equipment, metallic conduit, supports, post barriers, and fence.

The Company may take ground resistance readings prior to construction to determine the grounding requirements when necessary. The grounding system must be inspected by the Company before the Customer backfills the installation. The grounding system will be tested by the Company after completion to determine if it is adequate.

The equipment owned and installed by the Company will be connected to the Customer provided grounding system by the Company.

The Customer’s service equipment must be grounded according to Section 3.4 and the requirements of the inspecting authority. When the Customer’s service equipment is the first disconnecting device on the load side of the Company’s transformers, the Customer shall connect the structure or frame of the service equipment to the grounding system described above.

**INSTRUMENT TRANSFORMERS FOR PROTECTION AND CONTROL**

The Company’s protection and control scheme for a service installation may require the installation of instrument transformers in the Customer’s service-entrance conductors. When the instrument transformers can be installed on the line side of the Customer’s service equipment, they shall be furnished by the Company for installation by the Customer. When
the protection and control scheme requires the instrument transformers on the load side of the Customer’s service equipment, they will be specified by the Company but supplied by the Customer as an integral part of the service equipment. The instrument transformer installations should provide for easy removal and replacement of the transformers. The Company will purchase these instrument transformers from the Customer at the switchgear manufacturer's material invoice price.

The Customer shall provide certified test reports and curves for each instrument transformer supplied. Excitation, phase angle and ratio correction factor data are required for current transformers. Phase angle and ratio correction factor data are required for voltage transformers.

Instrument transformer replacements will be handled jointly. The Company will purchase them for the Customer to install. Instrument transformers used for metering are covered in Section 8 and are in addition to those covered here.

CUSTOMER’S SERVICE-ENTRANCE CONDUCTORS

The Customer's service-entrance conductors between the service point and the Customer's service equipment shall be subject to inspection and approval by the Company. All service-entrance conductors shall be adequately supported to withstand the mechanical stresses of the available short-circuit current. If the service-entrance conductors enter a building, other than a building or portion thereof accessible only to qualified persons familiar with the construction and operation of the apparatus and the hazards involved, the conductors shall be in a cable tray, conduit or enclosure which shall contain no conductors other than the service-entrance conductors of that particular service.

CUSTOMER’S SERVICE EQUIPMENT

Where transformed or untransformed service is furnished, the Customer shall provide and install service equipment capable of performing the following three functions:

(a) Isolate the load from the supply.

(b) Automatically interrupt load side faults and overcurrents.

(c) Simultaneously disconnect full-load current on all ungrounded service conductors when manually operated.

Equipment which performs these functions for specific service voltages is listed in Sections 6.11.1 and 6.11.2.

When service is provided and the customer service equipment is a circuit breaker, the customer shall provide a shunt trip coil in each service entrance breaker for the Company's exclusive use. (Trip coil voltage will be specified by the Company)

For maximum safety and ease of obtaining clearance, the Company recommends that there be a single switching device (breaker, or switch and fuse), providing a single point of disconnection and protection for each service. However, up to six such devices will be accepted if (1) they are of substantially equal capacity, (2) they are located adjacent to each other, and (3) all perform the three functions described in this section.

Access to the service-entrance conductors must be provided by the Customer so the Company can test for voltage and apply safety grounds as required for maintenance work. Such access shall be located on the load side of the instrument transformers and on the line side of the Customer's service equipment.

All main service disconnects and overcurrent devices shall be clearly identified with a permanent type of marking.

Ground-fault protection of equipment shall be provided for all grounded-wye electrical services with service equipment rated 1,000 amperes or more at 277/480 volts and rated 2,000 amperes or more at 120/208 volts. This requirement for 120/208 volt service equipment, rated 2,000 amperes or more, may be waived only after the Company is satisfied that the service equipment will select with the Company's protective equipment.
The ground-fault protection may consist of over-current devices or combination of over-current devices and current transformers or other equivalent protective equipment which shall operate to cause the service disconnecting means to open all ungrounded conductors of the faulted circuit.

**Service Equipment, 480 Volts Or Less**

Where service is furnished at 480 volts or less the Customer's service equipment shall consist of any of the following types:

(a) Either a low voltage power circuit breaker or a molded case circuit breaker rated in excess of the available short-circuit current. Draw-out breakers are preferred for the visible clearance feature.

(b) A bolted pressure contact type switch with silver-sand fuses of high interrupting capacity.

(c) A heavy duty fused safety switch with ampere rating of not less than 100 amperes. The switch and fuse combination shall have a rating in excess of the available short-circuit current.

**Service Equipment, 2400 Volts Or Higher**

Where service is furnished at 2,400 volts or higher, the Customer's service equipment shall provide visual clearance for the service conductors and consist of circuit breakers or fusible load-break switches of the following types:

(a) Either a draw out or stationary power circuit breaker. Stationary circuit breakers shall have a disconnecting switch (preferably interlocked) on the supply side to provide the visual clearance. Circuit breakers shall be equipped with current transformers and overcurrent relays for each service phase and a ground relay for three-phase services. The relays must be set to coordinate with Duquesne Light protection. Special cases may require additional protective equipment or controls to ensure proper operation and coordination. The source of tripping energy should be from a battery (minimum 48 volts DC) with an adequate charger. Other types of trip sources require the approval of the Company.

(b) A Load-break air, oil, vacuum or gas switch, plus fuses of proper size and rating installed on the load side of the load-break switch. The open position of the contacts of the switch shall be readily visible. Switches without contacts visible in the open position shall have a disconnecting switch (preferably interlocked) on the supply side to provide the visual clearance.

**Exception** - For special outdoor installations subject to the Company's approval, several circuits may be connected to one load-break air switch with separate fuses or circuit breakers for each circuit. Such fuses or circuit breakers shall be located in the same substation area and be readily accessible from the load break switch. The load break switch and the circuits controlled by it shall be permanently identified.

**Service Equipment, Ratings And Settings**

Service equipment (circuit breaker or switch and fuse) shall have a rating adequate to withstand and interrupt the maximum short-circuit current to which it may be subjected and shall be capable of being coordinated with the Company's protective equipment. The amount of such short-circuit current may be obtained from the Company after the service voltage and type of connection to the Company's system have been determined.

The maximum settings or fuse ratings which will be permitted for the Customer's protective equipment may be obtained from the Company after the service voltage, load characteristics, and type of connection to the Company's system have been determined. The Customer should be sure that all details of protection coordination are satisfactory to the Company before giving final approval to his order for service equipment.

The maximum circuit breaker settings or fuse ratings permitted for the Customer's protective equipment shall not be increased after the service has been established except by written permission of the Company. The Customer shall be responsible for damage to Company equipment caused by improper Customer circuit breaker settings or fuse ratings.
LOCATION OF SERVICE EQUIPMENT

All of the Customer’s service equipment shall be located in the Customer’s area, as differentiated from the area containing Company equipment, and shall be installed as close as practicable to the fence, wall or other boundary separating the area containing the Company equipment from the Customer’s area. Convenient access to the service equipment shall be provided for Company personnel.

MAINTENANCE OF SERVICE EQUIPMENT

It is the Customer’s responsibility to maintain all structures, equipment and associated devices owned by him so as to ensure their proper operation at all times. The Company may require the Customer to demonstrate that the service equipment has been maintained and will operate properly. The demonstration may include a station battery and battery charger inspection, fuse inspection, circuit breaker trip checks, circuit verification checks, relay operating checks, etc. The Customer shall be responsible for damage to Company equipment caused by the failure of service equipment to operate properly.

MOBILE SUBSTATION CONNECTION REQUIREMENTS

When a service installation is being planned, the Company may anticipate the use of a mobile substation as a future temporary source of supply during the course of maintenance, inspection or tests by the Company. Upon request by the Company, the Customer shall provide parking space of approximately 15 by 25 feet for the mobile substation. The location of the parking space shall be such that 50 foot conductors can be used to connect the mobile substation to the service line and to the load side of the service equipment. The parking space shall not block access for removal or replacement of transformers and equipment using Company cranes and trailers.

The Customer shall provide suitable connectors for a single connection point per phase on the load side of the service equipment to permit connection of the mobile substation. The Customer shall also provide openings in both the Company and Customer portions of the substation or vault to accommodate the high and low voltage conductors from the mobile unit.

EQUIPMENT PROTECTION REQUIREMENTS AND OPERATING LIMITATIONS

This section requires the Customer to provide protection that will prevent damage to utilization equipment from normal operations on the Company's supply system. It also provides operating limits for Customer motors and equipment to prevent excessive voltage fluctuations and equipment operating problems.

Equipment covered in this section includes motors, welders, heating equipment, voltage sensitive devices, generators, harmonic producing equipment and other equipment requiring special considerations and protection.

Motors and equipment can have special load requirements that cause excessive voltage and harmonic changes to the Company’s system. The Customer shall report any equipment that can cause such changes to the Company’s system when applying for service. The Company will evaluate the service requirements and make provisions to minimize problems for the Company or Customer. When the Company must install extra capacity or special equipment to protect against Company system problems caused by the Customer's equipment, the Customer shall pay the excess costs.

REQUIRED EQUIPMENT PROTECTION ON THREE-PHASE SERVICES

The Customer shall install protective devices for all three-phase equipment, and single-phase equipment connected phase-to-phase (especially motors). The devices shall be approved to prevent damage from the loss of a phase, parallel phasing, or reduced voltage. Single-phase motors or equipment connected phase-to-phase can remain energized at a reduced voltage when one of the phases supplying the equipment is lost. The protective devices, usually loss-of-phase relays or under-voltage relays, shall shut down all equipment until they are manually restarted or they shall have at least a two minute time delay before an automatic restart.
Three-phase motors driving elevators, cranes, and similar equipment shall be provided with reverse-phase relays and circuit breakers to disconnect the motor and prevent injury in case of phase reversal.

Motors and their controls, except those approved for automatic starting, shall shut down upon loss of voltage until they are manually restarted. The use of three overcurrent units in motor controls for three-phase motors has been required since the 1971 edition of the National Electrical Code. It is recommended that motor controls installed prior to this requirement be modified to include three over current units.

The Company will not be responsible in any way for damage to Customer's equipment due to the failure of the Customer to provide adequate protective devices, or due to any failures of such devices.

**MOTOR-STARTING CURRENT LIMITS**

Motors started at rated voltage require inrush currents several times their full-load ratings. The high starting (locked-rotor) currents create voltage dips which may cause objectionable light flicker and problems operating other equipment. The Company has established the following maximum motor-starting current-limits to keep the high currents and voltage dips within industry standards.

(a) Single-Phase 120/240 Volt Services

Motors with locked-rotor currents of 50 amperes or less when operated at 120 volts, or 150 amperes or less at 240 volts may be started at line voltage.

(b) Single-Phase 120/208 Volt Services

Motors with locked-rotor currents of 50 amperes or less when operated at 120 volts, or 150 amperes or less at 208 volts may be started at line voltage.

When 208 volt or 230 volt single-phase motors, 3 horsepower or larger, or motors having locked-rotor currents higher than 100 amperes are installed, the Company shall be notified to make sure the supply facilities are adequate.

(c) Three-Phase 120/208 Volt Services

Three-phase motors with locked-rotor currents less than 160 amperes or rated not higher than 10 horsepower may be started at line voltage.

(d) Three-Phase 230 Volt Services

Three-phase motors with locked-rotor currents less than 220 amperes or rated not higher than 15 horsepower may be started at line voltage.

(e) Motors Larger Than 15 Horsepower

Motors larger than 15 horsepower can be started across the line in many locations depending on the Company's facilities and the Customer's requirements. Contact the Company's Division Office for specific motor starting limits and recommendations. It is important for the Customer to request starting limits as soon as the motor size is chosen so the Company can make the detailed analysis required.

The motor starting current limits are intended to reduce lighting flicker at the service point to a level that is not considered objectionable, however, the lighting flicker may still be visible.

When a motor is started at line voltage, the Company will decide whether to use the rated locked-rotor current calculated from the Code letter, or the actual starting current determined by test. If two or more motors are started simultaneously, the above starting limits shall apply to their combined starting currents. Where a motor is started with a reduced-voltage starter, the motor starting current limits shall not be exceeded during the entire starting period.
LOAD LIMITS FOR WELDERS AND OTHER FLUCTUATING LOADS

Welders and other fluctuating loads can cause voltage and harmonic disturbances to the Customer's service and the Company's system. Input limits are:

(a) Single-Phase 120/240 Volt Services

The input current to a single-phase arc welder or other fluctuating load shall not exceed 37 amperes when connected across 240 volts on a 120/240 volt single-phase service to a single occupancy building or residence. Welders and fluctuating loads are not permitted to be connected across 120 volts.

(b) Three-Phase 230 Volt Services

The input current of a single-phase or three-phase arc-welder or other fluctuating load shall not exceed 100 amperes at 230 volts on a 230 volt, three-phase service.

(c) Other Services

Welders and fluctuating loads are generally not permitted to be connected on 120/208 volt services. Customers shall contact the Division Office to request service for larger welders and fluctuating loads on other services. It is important to request service limits as soon as the welder or fluctuating load size is chosen so the Company can make the detailed analysis required. When the load requires the Company to install facilities in excess of those required for a normal installation, the excess costs will be paid by the Customer.

ELECTRIC SPACE HEATING REQUIREMENTS INCLUDING HEAT PUMPS AND AIR CONDITIONERS

Electric space heating and central air conditioning require special Company attention because the supply facilities may have to be increased. The air conditioner or heat pump compressor motors must also meet the motor starting current limitations. To ensure that the Company can be ready to supply electric service for heating or cooling when required, the Customer should apply for service or notify the Company as soon as the load is determined.

When electric furnaces, boilers, heat pumps or duct heaters are installed, resistance units rated larger than 48 amperes shall be subdivided and staged. Each resistance unit shall not exceed 48 amperes. A 20 second time interval shall be maintained between the switching of each stage. The time intervals shall be maintained while increasing or decreasing the load. Separate thermostatically controlled space heating units rated 48 amperes or less need not be staged.

The motor starting limits will allow the installation of single-phase heat pumps and air conditioners rated up to five tons. Some 4 and 5 ton units may require the installation of a control to prevent the compressor and outdoor fan from starting together to keep within the 150 ampere locked-rotor limitation. The heating contractor may choose to install more than one smaller heat pump or air conditioner in larger installations instead of one large unit.

ELECTRIC WATER HEATER REQUIREMENTS

Electric water heaters are classified as either "Storage-Type" with a storage tank capacity of at least 5 gallons or "Instantaneous-Type" with virtually no storage capacity. All water heaters shall conform to Article 422-14 of the National Electrical Code and be approved by the inspection authority having jurisdiction. Each water heater shall be specifically equipped with an approved pressure-temperature relief valve and a temperature limiting means, in addition to the control thermostat, which will disconnect all ungrounded conductors at a maximum available temperature setting of not more than 190oF.

All bathtubs, showers, sinks and washtubs supplied by an electric water heater shall have their metallic parts, metallic water pipes, and metallic drain pipes connected to them, bonded together.
Storage-Type Water Heaters

Storage-type water heaters will provide the largest volume of uniform temperature hot water per kilowatt of heating element. Storage-type water heaters can also be controlled for off-peak use in an energy management system and for use with possible future load shedding rates. A well insulated storage-type water heater will provide efficiency, uniform water temperature, control and the lowest cost electrical supply requirements for both the Company and the Customer.

Each storage-type water heater for use on single-phase services shall have a maximum heating element size of 5,500 watts. The water heater may have both lower and upper heating elements, but they shall be interlocked to prevent simultaneous operation. Storage-type water heaters rated 10 kW or less can be operated on any three-phase service. Larger storage-type, three-phase water heaters can be operated at many service locations. Customers desiring to use a larger storage-type water heater can request approval from the Company.

Instantaneous-Type Water Heaters

Instantaneous-type water heaters usually require a much larger heating element size than a storage-type delivering the same volume of water. The size of the heating element and the frequency of operation can cause excessive voltage fluctuations to the Customer and adjacent Customers. The Company may also have to provide larger supply facilities for an instantaneous-type water heater than would normally be required for a storage-type. Excess costs for larger supply facilities shall be paid by the Customer.

Each instantaneous-type water heater for use on a single-phase service shall have a maximum heating element size of 5,500 watts*. Individual 120 volt units may be utilized on 15 and 20 ampere branch circuits when in compliance with Article 210-23 (a) of the National Electrical Code. Instantaneous-type water heaters rated 10 kW or less can be operated on any three-phase service. Larger instantaneous-type three-phase water heaters can be operated at many locations. A Customer desiring to use a larger instantaneous water heater shall request approval from the Division Office. Costs for Company facilities in excess of normal requirements will be paid by the Customer.

* One 5,500 watt instantaneous-type water heater will not provide a sufficient amount of hot water for most premises requirements.

COMPUTERS, VIDEO, X-RAY, AND OTHER ELECTRONIC VOLTAGE SENSITIVE EQUIPMENT

The operation of some equipment, such as computers, video, x-ray and other electronic voltage sensitive equipment may be affected by slight voltage fluctuations. In some cases the Customer may have to install Power Conditioning or Uninterruptible Power Supply (UPS) equipment to achieve satisfactory operation. In other cases, the Company, at the Customer's expense, may have to install special facilities. Since special consideration may be necessary for satisfactory operation, the Division Office should be consulted before such equipment is installed.

SNOW MELTING EQUIPMENT

Where equipment is installed for melting snow by means of electric resistance heaters in driveways, sidewalks, or similar areas, the Division Office shall be advised so that adequate transformer capacity may be installed. Costs for Company facilities in excess of normal requirements will be paid by the Customer.

CUSTOMER OWNED AND OPERATED ELECTRIC GENERATING EQUIPMENT, NON-PARALLEL OPERATION

The Customer shall contact the Division Office before connecting a generator to ensure that it will not backfeed into the Company's system. Improper operation of generator equipment can cause personal injury as well as equipment and property damage.

CUSTOMER OWNED AND OPERATED ELECTRIC GENERATING EQUIPMENT, PARALLEL OPERATION

Special requirements have been prepared to allow the Company to interconnect with Customer owned generators. The intent of these requirements is to ensure Customer safety, the safety of Company employees and to maintain adequate, reliable service to all Customers. These special requirements are included in the Company's "Standards for the Connection of Qualifying Generating Facilities and Non Utility Generating Facilities Which are Operated in Parallel with Duquesne Light Co." A copy of the standards will be furnished by a Company Representative upon request.
Customers shall not, under any circumstances, parallel a Customer-owned generator with the Company's service without complying with the Company's special requirements and completing the required Interconnection Agreement which will be provided by the Company. Such paralleling may result in hazards to Company and Customer personnel, equipment damage, and loss of service to the Customer and the Company's system. A Customer must submit a completed "Application and Equipment Specification Form" (included in the above standards) to the Company to initiate an interconnection application.

HARMONIC PRODUCING EQUIPMENT

Customers operating harmonic producing equipment such as rectifiers, SCR drives, power supplies, inverters, arc-furnaces, welders, etc., shall limit the voltage distortion injected by their equipment into the Company's system to a total of 3% of the fundamental frequency with no single harmonic exceeding 1% of the fundamental frequency.

CUSTOMER LIGHTNING AND SURGE PROTECTION

The Company provides surge protection on all of its overhead lines to prevent damage from lightning. While it is not the Company's responsibility to protect Customer equipment, this protection has generally proven adequate to prevent damage to normal Customer appliances such as motors, ranges, washers, dryers, lighting, electron tube-type radios and television sets, and other non-solid-state equipment in all but the most severe lightning conditions. However, appliance manufacturers have incorporated solid-state microprocessor-type components in many modern appliances such as microwave ovens, televisions, VCRs and computers. The Company recommends that all Customers make sure that their service is grounded effectively as required in Section 3.4 and provide surge protection devices as described below.

A secondary surge protector should be installed at the service by a qualified electrical contractor or the Company. These devices, sometimes referred to as low voltage lightning arresters, are available in several configurations from electrical suppliers. The Company is offering this protection through the "Surge Shield" program at an affordable cost, call 1-888-393-7900. A surge protector at the service is necessary to dissipate the energy from large surges to ground.

A surge-suppressor plug-in device should be placed between all appliances, computers and equipment with solid-state or micro-processor components and the outlets supplying them. These devices dissipate the short time low energy surges, some of which are caused by the operation of other home appliances, and are available from most appliance or hardware stores.

Only the use of both a secondary surge protector at the service and a surge suppressor plug-in device for each appliance will provide the high level of protection required for solid-state equipment. Houses or buildings in areas exposed to direct lightning may require lightning rod systems on their roof to dissipate direct lightning strokes. Outdoor TV, radio and satellite disk antennas shall also be protected with proper lightning arresters and grounding systems. Other utilities such as telephone and cable TV companies should be consulted to see if additional lightning or surge protection is required for their systems.

The Company will not be responsible for damage to Customer's appliances or other equipment because the Customer or other utility did not provide adequate lightning or surge protection devices, or due to any failures of such devices except for those covered by the Company sponsored "Surge Shield" program.

METERS AND METERING EQUIPMENT

OWNERSHIP

The Company or Company Representatives will furnish, own, and install all meters. The Company will also furnish and own all meter enclosures and sockets, except single-phase self contained sockets. All current and voltage transformers will be furnished and owned by the Company. Instrument transformer cabinets, where required, shall be furnished and installed by the Customer.

METHOD OF OBTAINING

When installing a new service or rewiring an existing service, the Customer shall notify the Company as required in Section 4.2 or 4.3. The Company will specify the location and type of meter socket to be used.

Single-phase self-contained sockets approved by the Company are available from local electrical equipment suppliers. They must comply with the following requirements:
(a) Shall be Underwriters Laboratories Listed

(b) Shall have a Meter socket code on bottom

(c) Shall have a Company label reading:

**APPROVED FOR DUQUESNE LIGHT SERVICE AREA**

(d) Shall not have lugs for service, telephone or cable grounding

Two hundred ampere, three-phase meter sockets can be obtained from any Division Office, upon receipt of customer service application. The Division Office locations are listed on Pages 3, 4 and 5.

Transockets, transformer rated meter sockets, meter enclosures, and metering transformers will be delivered to the Customer at the job location by the Company or Company Representatives following approval by the Division Office.

**REMOVAL**

Only authorized Company representatives are permitted to install or remove a meter. If removal of meters is necessary when the Customer is installing siding or making other building repairs, the Company will, upon reasonable notice to its Division Office, detach the meter socket, detach and tie up the incoming service line and if necessary, disconnect the service line. The Customer is responsible for removing the weather head and service-entrance cable, and remounting the meter socket as described in Section 8.5. The Customer shall mark the location of a suitable stud to facilitate the reinstallation of the brackets and service line by the Company. Work on service-entrance cables and meter sockets shall be done by qualified electrical contractors. Upon completion of the building work in the area of the service-entrance equipment, the Company will re-attach and re-connect the incoming service line and reseal the meter.

**BREAKING OF METER SEALS AND REMOVAL OF METERS BY CUSTOMERS OR ELECTRICAL CONTRACTORS, WITHOUT COMPANY NOTIFICATION IS PROHIBITED.**

**TYPES AND SIZES**

The type and size of metering equipment will be determined by the Company. It will be based on the type of service and size of service-entrance conductors used by the Customer.

Single-phase services having only a single conductor per line of 250 KCM or less with load up to 35 kVA will be metered with self-contained meters in meter sockets. A self-contained meter is one without separately mounted instrument transformers. Single-phase services having only a single conductor per line, with loads over 35 kVA, will be metered with meters mounted on Transockets as shown in Figure 13. Allowable wire sizes are 250 KCM through 750 KCM aluminum and 4/0 through 500 KCM copper. Transockets are meter-mounting assemblies having built-in current transformers. Information regarding meter sockets for single-phase service is shown in Table I.

Two hundred amp three-phase services having only a single conductor per line of 4/0 or less will be metered with self-contained meters in meter sockets as shown in Figure 12. Three-phase services having only a single conductor per line of 4/0 through 500 KCM including 750 KCM aluminum, will be metered with meters mounted on Transockets as shown in Figure 13. Information regarding meter-mounting equipment for three-phase service is shown in Table II, and Table III.

The Customer shall specify either the proper hub size required, or a hub-opening blank-off plate. See Table II. No reducers are permitted. All other hardware required for connection of the Customer's conduit or cable shall be furnished and installed by the Customer.

All service installations with conductors larger than the above, or with more than one-conductor per line, require separately mounted current transformers. They will be metered using 22-inch by 18-inch duplex or 11-inch by 18-inch transformer rated sockets as shown in Figure 15.
LOCATION AND INSTALLATION

All meters will normally be located outdoors. The Customer shall provide and maintain space to accommodate the meters. This space shall be readily accessible to Company representatives for meter reading, testing, or maintenance.

Meter-mounting equipment for various kinds of service installations shall be installed so that the top of the socket or enclosure will be the following distances above the final ground level or floor:

- Residential, Outdoor 3-1/2 to 6 feet
- Residential, Indoor 5 to 6 feet (Special Permission Only)
- Mobile home pedestal 3-1/2 to 5 feet
- Free Standing Meter Installations 5 Feet (See Figure 21) Contact the Division Office for Instructions
- Meter enclosures with doors opening up, to an overhead position 6 feet
- All Transockets 5 to 6 feet
- All other non-residential installations 5 to 6 feet
- Apartment group installations with combination meter and breaker assemblies mounted indoors See Figure 21.

Locations which interfere with pedestrian or vehicular traffic shall be avoided. A level three-foot clear space in front of the meter, suitable for a repairman to work from, shall be provided and maintained at all times.

The Customer shall install the meter socket or transformer cabinet so that it is plumb, tight and level. All mounting holes provided in the meter socket shall be used, and no additional mounting holes shall be drilled.<

Sockets mounted hardware shall be installed into brick, concrete block, studs or the equivalent. On metal, vinyl or wood lap siding, a backing of 3/4 inch thick outdoor plywood shall be attached to two studs and shall be of sufficient strength to securely mount the socket.

Meters may be mounted on a Customer's pole or support structure. Approval for such an installation shall be obtained from the Division Office. A pole-mounted meter is shown in Figure 8. An example of a support structure is shown in Figure 23.

Where aluminum conductors are used, an oxidation inhibitor shall be applied in a proper manner to all conductors before they are placed into the meter socket terminals.

Except for multimeter installations having more than six meters, the meter socket or the instrument-transformer cabinet shall be located on the supply side of the Customer's service equipment.

Meter sockets for use on single-phase, 120/208 volt services shall have a fifth terminal mounted in the 9 o'clock position. The Customer shall provide, install and connect the fifth terminal shown in Figure 16.

Metered and unmetered conductors shall not be installed in the same meter socket, conduit, wireway, or wiring trough. Meter sockets shall not be used as junction boxes. All cabinets, pull boxes, and wireways or wiring troughs which contain unmetered conductors shall have provisions for sealing.

In all three-phase installations the service-entrance conductors shall be identified at the service head or fitting in accordance with the connections at the meter socket or Transocket. This is necessary to ensure proper metering.

For the proper method of connecting line and load conductors, See Figure 16 for meter sockets and Figure 17 and 18 for Transocket assemblies.
**Meter Socket Grounding**

Meter sockets or enclosures shall not be used for the purpose of grounding cable TV, telephone, or any other service lines.

Self contained meter sockets and transockets shall not be separately grounded unless the electrical inspection agency requires the neutral conductor to be isolated in the socket, or the socket is used on an ungrounded 230 volt service.

All instrument transformer rated sockets and enclosures shall be grounded. Refer to Figure 23.

Refer to Section 3.4 Service Grounding for more information.

**MULTIMETER INSTALLATIONS**

Meters for all Customers in a multiple-occupancy building shall be grouped in a minimum of locations. For all multimeter installations, the Customer, electrical contractor, or builder shall submit a detailed plan to the Energy Technology Services Department for its approval before equipment is purchased or meter installation is started.

The meter socket and main service equipment for each individual apartment, office, or storeroom shall be clearly and permanently identified by the Customer or his electrical contractor. If changes in apartment numbers are made after the meters are set, the Company shall be notified immediately by calling Customer Relations at 1-888-393-7100.

For installations of two to six meters, the service-entrance conductors shall enter the top or bottom of the meter socket, as shown in Figure 19. When entering the top, a hub shall be used. Hub openings not used shall be covered with a closure plate.

For multimeter installations of more than six meters, a circuit breaker or a switch with fuses shall be installed on the supply side of the meters. The unmetered conductors shall be brought out of the switch or breaker compartment in metallic conduit to a sealable wireway or wiring trough. All taps to the meter socket shall be made in the wireway or wiring trough as shown in Figure 20.

If the building owner elects to use prewired, combination multiple meter and breaker panels for multimeter installations, the complete panels shall be furnished by the owner. A list of approved manufacturers of prewired, combination multiple meter and breaker panels is available from the Energy Technology Services Department. Prior to purchasing, the details of all equipment and the installation plan shall be submitted to the Energy Technology Services Department for approval. The essential requirements for this equipment are the use of Belleville-type washers and oxide inhibitor on all aluminum to aluminum connections, provision for installation of a fifth terminal in the 9 o'clock position of each 120/240 volt, single-phase meter socket, sealable separate compartments for unmetered wiring, and no metered and unmetered wiring in the same compartment. A typical installation of prewired equipment is shown in Figure 21.

In multimeter installations where meter sockets are located on the load side of the service disconnecting means, and where the neutral is grounded to the case of the service disconnecting means, local electrical inspectors may require that the neutral bus in the meter sockets be isolated from the meter socket frame. However, such isolation of the neutral conductors in the meter socket is not usually required if the meter socket is located within view in the same room near the service disconnecting means.

**INSTRUMENT TRANSFORMER INSTALLATIONS**

When instrument transformers are required, they shall normally be mounted in an instrument transformer cabinet or in a metal-clad switchgear compartment. The Energy Technology Services Department will help choose a location if space limitations do not provide for a conventional installation.

Current and voltage transformers will be furnished and delivered to the job location by Company Representatives. The Customer shall mount the metering transformers, then furnish and install 1 1/2 inch rigid or intermediate galvanized metallic conduit from the instrument transformer cabinet or compartment to the meter location designated by the Energy Technology Services Department. Thin wall, flexible. PVC or non ferrous conduit is not acceptable for metering. Long runs may require use of 2 inch conduit, pull boxes, and a pull line.
**Instrument Transformer Cabinets**

Instrument transformer cabinets shall not be used as junction boxes. Connections to other meters or current transformers shall not be made in the instrument transformer cabinet. However, for more than one conductor per line installations, it is permissible for individual conductors to feed different circuits on the load side of the current transformers.

Instrument transformer cabinets shall be of sufficient size to contain all the instrument transformers and conductors, giving consideration to possible future removal and replacement of the transformers. The factors which determine the cabinet size are the size and number of conductors, the point of entrance and exit of conductors, and the size, type, and number of instrument transformers. Recommended minimum sizes for instrument transformer cabinets are shown in Table III. For all installations higher than 480 volts, and for any questions about a specific installation regarding the minimum allowable size of the instrument transformer cabinet consult the Energy Technology Services Department. See Figure 15.

Instrument transformer cabinets shall have hinged double doors. Cabinets that are 10 by 24 by 32 inches or smaller may have a hinged single door. All instrument transformer cabinet doors shall be sealable with pad lock type meter-sealing devices. Adequate clearance shall be provided and maintained in front of the cabinet to allow the cabinet doors to be fully opened, and to allow the removal and installation of the instrument transformers.

**Instrument Transformers In Cabinets**

Instrument transformers shall not be mounted directly on the back surface of instrument transformer cabinets, but shall be mounted on a 3/4 inch plywood panel or on mounting plates or brackets. The polarity marks (red dot) shall face the line side. Instrument transformers shall be mounted so that they may be readily removed or replaced. Where bar-type current transformers are used, the connections shall be on the back side of the primary bar of the current transformers, with the nuts of the bolts on the front side. Where through-type current transformers are used, the conductors shall be broken on the line side of the current transformer and reconnected with adequate bolted connectors. See Figure 18.

**Instrument Transformers In Switchgear**

When instrument transformers are installed in Customer's metal-clad switchgear, the Customer shall arrange to have the supplier furnish detailed drawings of the switchgear and instrument transformer arrangement. These drawings shall be forwarded to the Energy Technology Services Department for acceptance and approval before constructing the switchgear. The Energy Technology Services Department on request will supply information on the size, type and number of instrument transformers to be furnished.

The instrument transformer compartment shall be completely separated by a rigid barrier from the rest of the switchgear. It shall have hinged doors which are sealable with pad lock type sealing devices. It shall be large enough to contain the required number of through-type current transformers and voltage transformers for services of 277/480V and higher. The design shall be such that the transformers can be readily installed or changed after the switchgear is in place. Removable sections of bus bar shall be provided as the primary conductor of the current transformers, and shall be the same ampacity as the bus bar entering and exiting the compartment. It may also be necessary to parallel narrower bars to accommodate the CT's supplied by the Company.

The instrument transformers shall be installed by the Customer. They shall be located on the line side of the main switch or circuit breaker. The service-entrance conductors shall be completely enclosed in conduit or raceway from the service point to where they enter the switchgear instrument transformer compartment. All service and metering conductors exiting the instrument transformer compartment shall not be returned to the compartment. Voltage connections for metering shall be provided in the compartment. These connections shall be on each phase bus on the line side of the current transformers, and for three-phase, four-wire services shall also be on the neutral. In installations where the service is four-wire but the load is three-wire, a neutral conductor shall be extended to the CT compartment.

**TRANSFORMED SERVICE INSTALLATIONS IN SUBSTATIONS, VAULTS, OR ON PADS**

Where transformed service is furnished from equipment in a substation, in a vault, or on a pad, the Company will furnish and install the main transformers, meters, and meter wiring. The Company will furnish the meter enclosure or socket (except single-phase self contained sockets), metering transformers or a meter-mounting assembly with built-in current transformers called a Transocket.

Where the metering transformers are included as an integral part of the main transformer, the Company will furnish the
meter enclosure and furnish and install the meter. The Customer shall install the meter enclosure and shall furnish and install a 1-1/2 inch galvanized steel conduit from the main transformer to the meter enclosure.

When instrument transformers are included with the main transformer or installed in an instrument transformer cabinet, the installation shall comply with Section 8.7.

UNTRANSFORMED SERVICE - UNDERGROUND

Where untransformed service is furnished underground, the Company will furnish the metering transformers, meters and meter enclosure or socket. The Customer shall furnish and install an enclosure approved by the Company to house the terminal of the service line and the metering transformers. The Customer shall install the metering transformers and make all primary connections to these transformers. The Customer shall install the meter enclosure or socket at a location determined by the Company and furnish and install the 1-1/2 inch galvanized steel conduit from the metering transformers to the meter enclosure or socket.

UNTRANSFORMED SERVICE - OVERHEAD

Metering On Company Pole

Where untransformed service at 2,400 volts, 2,400/4,160 volts, 23,000 volts or 13,200/23,000 volts is furnished overhead, the Company may choose to install the metering transformers on a Company pole. The Company will furnish and install the metering pole or poles on the Customer's property at a location approved by the Company complete with the instrument transformers and equipment. When the Company determines that the meter enclosure or socket can be mounted on the primary metering pole, the Company will furnish and install the entire metering installation. The Customer shall not attach underground conduits, cables, potheads, or any other facilities to the Company's metering pole other than those described above.

When the Company determines that the meter enclosure or socket cannot be located on the metering pole, it will choose a suitable meter mounting location and structure. The Customer shall provide the structure and install the Company furnished meter enclosure or socket. The Customer must also furnish and install a 1-1/2 inch galvanized steel conduit from a point six feet above ground level on the metering pole/poles and run underground at a depth not less than 30 inches to the meter enclosure or socket.

Metering Not On Company Pole

Where untransformed service is supplied overhead and the metering can not be installed on a Company pole, the Company will furnish installation specifications, metering transformers, meters, and a meter enclosure or socket. The Customer shall provide a location and enclosure for the metering transformer installation and make the installation according to the specifications. The mounting structures and hardware shall also be provided by the Customer. The Customer shall install the meter enclosure or socket at a location determined by the Company and furnish and install the 1-1/2 inch galvanized steel conduit from the metering transformers to the meter enclosure or socket.
## Types of Electric Service, Secondary

Services and demand limits available from street secondary supply lines, operating at less than 300 volts

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage</th>
<th>Phase</th>
<th>Wires</th>
<th>Application Limit</th>
<th>Overhead Limits (kVA) Maximum</th>
<th>Underground Limits (kVA) Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>120</td>
<td>1</td>
<td>2</td>
<td>Special applications only</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>B</td>
<td>120/240</td>
<td>1</td>
<td>3</td>
<td>Lighting, appliances, resistance, heating and motors</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>C</td>
<td>120/208</td>
<td>1</td>
<td>3</td>
<td>Lighting, appliances, resistance, heating and motors</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>D</td>
<td>120/208</td>
<td>3</td>
<td>4</td>
<td>Lighting and power</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td>E</td>
<td>230</td>
<td>1</td>
<td>2</td>
<td>Special power uses only</td>
<td>50</td>
<td>Not Available</td>
</tr>
<tr>
<td>F</td>
<td>230</td>
<td>3</td>
<td>3</td>
<td>Power without lighting</td>
<td>112.5</td>
<td>75</td>
</tr>
</tbody>
</table>

Service types B & C are not available at the same locations.

Service types D & F are not available at the same locations.

Service type D supplies both lighting and power loads at locations where it is available.

Service types B & F supply lighting and power loads at locations where these services are available.

Higher limits are available at some locations. Check with the company.
## TYPES OF ELECTRIC SERVICE, DISTRIBUTION

SERVICES AND DEMAND LIMITS AVAILABLE FROM DISTRIBUTION SUPPLY LINES, OPERATING AT 2,400 VOLTS OR HIGHER WITH FACILITIES LOCATED ON CUSTOMER'S PROPERTY

<table>
<thead>
<tr>
<th>VOLTAGE</th>
<th>PHASE</th>
<th>WIRES</th>
<th>2,400/4,160 VOLTS</th>
<th>UNDERGROUND LIMITS (kVA) Min.-Max.</th>
<th>13,200/23,000 VOLTS</th>
<th>UNDERGROUND LIMITS (kVA) Min.-Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/240</td>
<td>1</td>
<td>3</td>
<td>1-50</td>
<td>1-50</td>
<td>1-100</td>
<td>1-100</td>
</tr>
<tr>
<td>230/460</td>
<td>1</td>
<td>3</td>
<td>1-50</td>
<td>NOT AVAILABLE</td>
<td>1-100</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>120/208</td>
<td>3</td>
<td>4</td>
<td>30-300</td>
<td>50-500</td>
<td>30-300</td>
<td>50-1,500</td>
</tr>
<tr>
<td>230</td>
<td>1</td>
<td>2</td>
<td>1-50</td>
<td>1-50</td>
<td>1-100</td>
<td>1-100</td>
</tr>
<tr>
<td>230</td>
<td>3</td>
<td>3</td>
<td>1-300</td>
<td>50-500</td>
<td>1-300</td>
<td>50-1,000</td>
</tr>
<tr>
<td>277/480</td>
<td>3</td>
<td>4</td>
<td>NOT AVAILABLE</td>
<td>150-500</td>
<td>50-500</td>
<td>150-2,000</td>
</tr>
<tr>
<td>460</td>
<td>1</td>
<td>2</td>
<td>1-50</td>
<td>NOT AVAILABLE</td>
<td>1-100</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>460</td>
<td>3</td>
<td>3</td>
<td>50-500</td>
<td>150-500</td>
<td>50-500</td>
<td>150-2,000</td>
</tr>
<tr>
<td>2,400</td>
<td>1</td>
<td>2</td>
<td>1-50</td>
<td>NOT AVAILABLE</td>
<td>50-100</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>2,400</td>
<td>3</td>
<td>3</td>
<td>NOT AVAILABLE</td>
<td>NOT AVAILABLE</td>
<td>NOT AVAILABLE</td>
<td>225-2,000</td>
</tr>
<tr>
<td>2,400/4,160</td>
<td>3</td>
<td>4</td>
<td>150-500</td>
<td>150-500</td>
<td>150-500</td>
<td>225-2,000</td>
</tr>
<tr>
<td>13,200/23,000</td>
<td>3</td>
<td>4</td>
<td>NOT AVAILABLE</td>
<td>NOT AVAILABLE</td>
<td>500-2,000</td>
<td>500-2,000</td>
</tr>
</tbody>
</table>

NOTE: HIGHER LIMITS ARE AVAILABLE IN SOME LOCATIONS. CHECK WITH THE COMPANY
### Types of Electric Service, Sub-Transmission & Transmission

**Services and Demand Limits Available from Sub-Transmission and Transmission Supply Lines**

<table>
<thead>
<tr>
<th>Supply Line Voltage</th>
<th>23,000</th>
<th>69,000</th>
<th>138,000</th>
<th>345,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td><strong>Phase</strong></td>
<td><strong>Wires</strong></td>
<td><strong>ONE BANK LIMITS (kVA) Min.-Max.</strong></td>
<td><strong>LIMITS (kVA) Min.-Max.</strong></td>
</tr>
<tr>
<td>120/208</td>
<td>3</td>
<td>4</td>
<td>300-1,500</td>
<td></td>
</tr>
<tr>
<td>230</td>
<td>3</td>
<td>3</td>
<td>300-1,500</td>
<td></td>
</tr>
<tr>
<td>277/480</td>
<td>3</td>
<td>4</td>
<td>300-3,000</td>
<td></td>
</tr>
<tr>
<td>460</td>
<td>3</td>
<td>3</td>
<td>300-3,000</td>
<td></td>
</tr>
<tr>
<td>2,400</td>
<td>3</td>
<td>3</td>
<td>300-10,000</td>
<td></td>
</tr>
<tr>
<td>2,400/4,160</td>
<td>3</td>
<td>4</td>
<td>300-10,000</td>
<td></td>
</tr>
<tr>
<td>11,500</td>
<td>3</td>
<td>3</td>
<td>NOT AVAILABLE</td>
<td>Customers Requesting Service From High Voltage Power Lines</td>
</tr>
<tr>
<td>23,000</td>
<td>3</td>
<td>3</td>
<td>AVAILABLE</td>
<td>Should Contact The Major Accounts Department</td>
</tr>
<tr>
<td>13,200/23,000</td>
<td>3</td>
<td>4</td>
<td>SOME LOCATIONS</td>
<td>For Information On Which Service Voltages Are Available</td>
</tr>
<tr>
<td>69,000</td>
<td>3</td>
<td>3</td>
<td>NOT AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>138,000</td>
<td>3</td>
<td>3</td>
<td>NOT AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>345,000</td>
<td>3</td>
<td>3</td>
<td>NOT AVAILABLE</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Check with the company for kVA limits for available services
### TABLE I
**SINGLE-PHASE METERING EQUIPMENT**

<table>
<thead>
<tr>
<th>Meter Socket</th>
<th>Maximum</th>
<th>Service Conductor</th>
<th>Approximate Socket Size in Inches</th>
<th>Type Of Service</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-100</td>
<td>100</td>
<td><strong>Maximum Size #1 AWG</strong></td>
<td>D: 3-1/2, W: 8-1/2, L: 10</td>
<td>Overhead Only</td>
<td>100 Ampere or Less and services requiring current transformers</td>
</tr>
<tr>
<td>U-150</td>
<td>150</td>
<td>1/0-2/0</td>
<td>D: 4-1/2, W: 8-1/2, L: 14</td>
<td>Underground Only</td>
<td>150 Amperes or less</td>
</tr>
<tr>
<td>S-200</td>
<td>200</td>
<td>1/0 250 KCM</td>
<td>D: 4-1/2, W: 8-1/2, L: 14</td>
<td>Overhead Only</td>
<td>150 &amp; 200 Ampere Residential</td>
</tr>
<tr>
<td>U-200</td>
<td>200</td>
<td>1/0 250 KCM</td>
<td>D: 4-1/2, W: 8-1/2, L: 14</td>
<td>Underground Only</td>
<td>200 Amperes Residential</td>
</tr>
<tr>
<td>H-200</td>
<td>200</td>
<td>1/0 250 KCM</td>
<td>D: 4-1/2, W: 8-1/2, L: 19</td>
<td>Overhead Or Underground</td>
<td>200 Ampere commercial &amp; industrial with demands under 35 kVA</td>
</tr>
<tr>
<td>400 Ampere Transsocket</td>
<td>400</td>
<td>250-750 KCM</td>
<td>D: 11, W: 24, L: 30</td>
<td>Overhead Or Underground</td>
<td>200 to 400 Ampere with demands over 35 kVA</td>
</tr>
<tr>
<td>GV2</td>
<td>150</td>
<td><strong>GV &amp; GH Line</strong></td>
<td>D: 4, W: 8-1/4, L: 20</td>
<td>Overhead Only</td>
<td>Vertical 2 position gang socket for two individual 150 ampere services</td>
</tr>
<tr>
<td>GH-2 GH-2-2</td>
<td>150</td>
<td>Side 1/0 To 250 KCM Load</td>
<td>D: 4-3/4, W: 20-1/2, L: 12</td>
<td>Overhead Or Underground</td>
<td>Horizontal gang meter sockets for 2 to 6 positions</td>
</tr>
<tr>
<td>GH-3 GH-3-2</td>
<td>150</td>
<td>Side Maximum 2/0 Al or</td>
<td>D: 4-3/4, W: 32-1/2, L: 12</td>
<td>Overhead Or Underground</td>
<td>GH For individual services rated 150 amperes or less. Total service requirements</td>
</tr>
<tr>
<td>GH-4 GH-4-2</td>
<td>150</td>
<td>1/0 Cu GH - # - 2 Line</td>
<td>D: 4-3/4, W: 41, L: 12</td>
<td>Overhead Or Underground</td>
<td>Shall Not Exceed! 300 Ampere for Cu or 225</td>
</tr>
<tr>
<td></td>
<td>Amperes for Al</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH-5-2</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side 1/0 To 600 KCM Load</td>
<td>4-3/4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead Or Underground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH - # - 2</td>
<td>For individual services rated 200 amperes or less. Total service requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH-6-2</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side Maximum 250 KCM</td>
<td>4-3/4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>57-1/2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead Or Underground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shall Not Exceed! 400 Amperes for Cu or 400 Amperes for Al</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrument- Cabinet Installations</td>
<td>200 And Up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or More Per Phase</td>
<td>8 x 14 inch Single Meter Socket Overhead or Underground See Table III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where The Service Size Exceeds Those Described Above</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer’s Service Conductor Size Copper (Cu) or Aluminum (Al)</td>
<td>Instrument-Transformer Cabinet Required?</td>
<td>Meter Socket or Transocket Required</td>
<td>Hub Sizes Available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6 AWG thru 4/0AWG</td>
<td>No</td>
<td>12 x18 Inch Single Meter Socket 8 Terminal for 3-Phase, 3-Wire 7 Terminal for 3-Phase, 4-Wire</td>
<td>Detachable 1-1/2&quot;, 2&quot; or 2-1/2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/0 AWG to 250 KCM</td>
<td>No</td>
<td>200 Ampere Transocket 18 x 24 Inch</td>
<td>Detachable 2&quot;, 2-1/2&quot; or 3&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 KCM to 500 KCM for Cu 750 KCM for Al</td>
<td>No</td>
<td>400 Ampere Transocket 24 x 30 Inch</td>
<td>Detachable 2-1/2&quot;, 3&quot; 3-1/2&quot; or 4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larger Than 500 KCM Cu 750 KCM Al</td>
<td>Yes See Table III</td>
<td>11 x 18 Inch Single Or 22 x 18 Inch Duplex Meter Socket See Note</td>
<td>Detachable 1-1/4&quot; or 1-1/2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More Than One Conductor Per Phase</td>
<td>Yes See Table III</td>
<td>11 x 18 Inch Single Or 22 x 18 Inch Duplex Meter Socket See Note</td>
<td>Detachable 1-1/4&quot; or 1-1/2&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All transockets, current transformers, duplex sockets and meter enclosures will be delivered to the Customer at the job location by the Company’s representative.

Instrument transformer cabinets shall be furnished and installed by the Customer.

All meter sockets, transockets, transformer rated meter sockets and other enclosures are suitable for either indoor or outdoor use.

Note: Where multiple circuit totalizing meters or other special meters are required and where meters are subject to vandalism, meter enclosures may be supplied.
## TABLE III

### RECOMMENDED INSTRUMENT-TRANSFORMER CABINET SIZES

<table>
<thead>
<tr>
<th>Installation Type</th>
<th>Installation Voltage</th>
<th>Max # per Phase</th>
<th>Service Size (KCM)</th>
<th>Transformer Cabinet Size (Inches)</th>
<th>Hinged Doors Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Phase 1-Wire</td>
<td>120/240</td>
<td>1</td>
<td>750 or Less</td>
<td>24 x 24 x 10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>500 or Less</td>
<td>24 x 32 x 10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>600 to 750</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>500 or Less</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td>3-Phase 3-Wire</td>
<td>230</td>
<td>1</td>
<td>750 or Less</td>
<td>24 x 32 x 10</td>
<td>1</td>
</tr>
<tr>
<td>3-Phase 4-Wire</td>
<td>120/208</td>
<td>1</td>
<td>500 or Less</td>
<td>24 x 32 x 10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>600 to 750</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>500 or Less</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>600 to 750</td>
<td>38 x 60 x 18***</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>750 or Less</td>
<td>38 x 60 x 18</td>
<td>2</td>
</tr>
<tr>
<td>3-Phase 3-Wire</td>
<td>460</td>
<td>1</td>
<td>350 or Less</td>
<td>24 x 32 x 10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>400 to 750</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>750 or Less</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>750 or Less</td>
<td>38 x 60 x 18***</td>
<td>2</td>
</tr>
<tr>
<td>3-Phase 4-Wire</td>
<td>277/480</td>
<td>1</td>
<td>750 or Less</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>500 or Less</td>
<td>24 x 42 x 12*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>600 to 750</td>
<td>38 x 60 x 18</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>750 or Less</td>
<td>38 x 60 x 18</td>
<td>2</td>
</tr>
<tr>
<td>3-Phase 3-Wire or 4-Wire</td>
<td>2400 or 2400/4160</td>
<td>1</td>
<td>500 or Less</td>
<td>36 x 60 x 36</td>
<td>2**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>500 or Less</td>
<td>36 x 60 x 36</td>
<td>2**</td>
</tr>
</tbody>
</table>

The sizes listed are minimums. There may be cases where a larger cabinet is necessary based on factors listed in Section 8.7.1.

*If a 24 x 42 x 12 cabinet is not available, one 36 x 36 x 10 may be substituted.

**For floor or ground level cabinets, 1 hinged door is preferred.

*** If a 38 x 42 x 12 cabinet is not available, a 48 x 48 x 18 may be substituted.

Instrument cabinets shall be furnished and installed by the Customer.
Typical Temporary Service-Entrance Post For Use During Construction Of Building

- WIRE BRACKET WITH WOOD SCREW
- SERVICE ENTRANCE CABLE # 8 M.I.
- 12'-0" METER SOCKET
- SERVICE HEAD

NOTE: THE COMPANY SUGGESTS THAT THE POST BE LOCATED SO THAT THE SERVICE LINE CAN BE TRANSFERRED TO THE PERMANENT STRUCTURE. THIS WILL RESULT IN THE LOWEST COST TO THE CONTRACTOR.

- 4" x 4" OR TWO 2" x 4" NAILED TOGETHER OR ACCEPTABLE PLY (AT LEAST 1/4 IN. GROUND-NAIL 4" AT TOP)
- 2" x 4" x 15" LONG
- 2" x 4" x 10" LONG
- 1" x 4" x 10" LONG
- 1" x 4" x 8" LONG

CUSTOMER MUST INSTALL LOCK ON SERVICE ENTRANCE AND KEEP LOCKED AT ALL TIMES.

- CONTINUOUS FE BASE: SOLID copper CONDUCTOR TO GROUNDED GROUNDS
- PAINT/CUT SERVICE EQUIPMENT ENCLOSURE WITH LOCK.
- ALL 15 AND 20 AMP RECEPTACLE OUTLETS MUST HAVE GROUND FAULT INTERRUPTING PROTECTION.

APPROVED GROUNDS:
- 3/4" GALVANIZED "FE" 8 FT. LONG OR 3/8" COPPER CLAD 8 FT. LONG SPACED A MINIMUM OF 3 FT. APART

FIGURE 1. (SEE SECTION 4.2)

TYPICAL TEMPORARY SERVICE ENTRANCE POST FOR USE DURING CONSTRUCTION OF BUILDING
RAINTIGHT SERVICE EQUIPMENT WITH A MINIMUM 30 AMP, 2 POLE MAIN. IF ELECTRIC HEAT IS TO BE USED A 100 AMP MAIN IS RECOMMENDED. NATIONAL ELECTRICAL CODE REQUIRES THAT ALL 15 AND 20 AMP RECEPTACLE OUTLETS MUST HAVE GROUND FAULT INTERRUPTING PROTECTION.

2 - 2'X6" WOOD PLANKS NAILED TOGETHER

10' X 6" X 3/4" OUTDOOR PLYWOOD

METER SOCKET

2" RIGID CONDUIT

#6 CU. GRD.

SERVICE ENCLOSURE

MINIMUM 30 AMP DIRECT BURIED SERVICE CONDUCTION
EXTEND SERVICE CONDUCTORS TO WITHIN 18" OF SERVICE ENCLOSURE WITH 36" OF CONDUCTOR ABOVE GROUND TO PERMIT D.L.C.O. TO MAKE CONNECTIONS.

2" RIGID CONDUIT

SERVICE ENTRANCE CADLC

CONTINUOUS #6 BARE SOLID COPPER CONDUITS TO APPROVED GROUNDS

CUSTOMER MUST INSTALL LOCK ON SERVICE EQUIPMENT AND KEEP LOCKED AT ALL TIMES.

APPROVED GROUNDS:
3/4" GALVANIZED PIPE 8 FT. LONG, OR 3/8" COPPER CLAD ROD 8 FT. LONG, SPACED A MINIMUM OF 6 FT. APART.

FIGURE 2. (SEE SECTION 4.2)
TYPICAL TEMPORARY SERVICE IN UNDERGROUND RESIDENTIAL DEVELOPMENTS
Typical Underground Service Connection From Underground Supply Lines 120/240 Or 120/208 Volt

**Figure 3. (See Section 5.1.2)**

Typical Underground Service Connection
From Underground Supply Lines
120/240 or 120/208 Volt
Typical Service to Underground Residential Developments 120-240 Volt Single-Phase

CUSTOMER'S WORK

1. CONTACT THE COMPANY FOR METER LOCATION.
2. CONTACT THE PENNSYLVANIA ONE-CALL SYSTEM AT 1-800-242-1776.
3. FURNISH, INSTALL AND MAINTAIN A ELCO APPROVED METER BASE. SEE SECTION 8.2.
4. FURNISH, INSTALL AND MAINTAIN CONDUIT FROM THE METER BASE TO THE COMPANY'S SERVICE ENCLOSURE OR TRANSFORMER AT THE STREET.
   - AT THE METER BASE, INSTALL A RISER CONDUIT AND SECURE TO THE STRUCTURE. INSTALL A 2" DIAMETER, 24" RADIUS BEND, 3" INCH NOMINAL PVC SCHEDULE 40 PER NEMA TC4 (TYPE IV APPLICATIONS)
   - EXTEND 3" DIAMETER CONDUIT FROM THE METER BASE TO THE COMPANY'S SERVICE ENCLOSURE OR TRANSFORMER AT THE STREET. INSULATE, PROTECT AND BEND MUST BE 3 INCH NOMINAL PVC SCHEDULE 40 PER NEMA TC4 (TYPE IV APPLICATIONS). SHART IN COLOR ONLY TASTE PROPER CARE TO PREVENT DEBRIS FROM ENTERING CONDUIT.
   - INSTALL A 24" RADIAL BEND WITHIN 18" OF INSULATING WIRING. COMPANY'S TRANSFORMER OR SECONDARY ENCLOSURE EXTENDING A MIN. OF 3" TO A MAX. OF 5" ABOVE FINISHED GRADE AND CAP SIZE DETAIL (2) ABOVE.
   - INSTALL A 1/4" NICKEL OR POLYPRESSEY PULLING LINE WITHIN THE CONDUIT. BE SURE LINE IS MOVER; FREELY AFTER INSTALLATION. CAPTIVES HAVE CHANGED.
   - TRENCH MUST BE DEEP ENOUGH TO PROVIDE A 4" OF TAMPED SELECT BACKFILL. TAMPER LABEL OVER THE CONDUIT AND 3" OF TAMPER SELECT BACKFILL OVER THE CONDUIT. THE TOTAL COVER OVER THE CONDUIT IS TO BE 21". SEE DETAIL "C".
   - SELECT BACKFILL SHALL CONSIST OF SAND, CRUSHED STONE (SUCH AS LIMESTONE, FRAGMENTS, ETC.) OR OTHER MATERIAL APPROVED BY THE COMPANY. TAMPER LABEL OVER THE CONDUIT AND 3" OF TAMPER SELECT BACKFILL OVER THE CONDUIT. THE TOTAL COVER OVER THE CONDUIT IS TO BE 21". SEE DETAIL "C".
   - Service lateral conduit to extend directly in a straight line from the meter base to the company's service enclosure or transformer at the street without any bends or sheaves. If additional bends or sheaves are anticipated or if the length of the service exceeds 100', the customer must submit a drawing of the proposed conduit path to the company for approval before installing the conduit.
   - Select backfill shall consist of sand, crushed stone (such as limestone, fragments, etc.) or other material approved by the company. Tamper label over the conduit and 3" of tamper select backfill over the conduit. The total cover over the conduit is to be 21". See detail "C".
5. FURNISH, INSTALL AND MAINTAIN THE SERVICE LATERAL CABLE UP TO A MAXIMUM OF 100 FT.

NOTE

1. IF TRENCHING WITHIN STATE RIGHT-OF-WAY, CONDUITS ARE TO BE A MINIMUM OF 36" TOTAL COVERAGE.
2. IF TRENCHING WITHIN CITY OF PITTSBURGH AND A PERMIT IS REQUIRED, MINIMUM COVERAGE IS 30".

FOR MULTI OR PRE-WIRED METERS (MORE THAN 9) LINE FEED IS TO BE ATTACHES BEFORE MAIN SWITCH & SEALABLE WIRING TROUGH.

COMPANY WORK

1. FURNISH, INSTALL AND MAINTAIN THE SERVICE LATERAL CABLE UP TO A MAXIMUM OF 100 FT.
Figure 4. (See Section 5.1.3)

Typical Underground Service Connection from Overhead Lines
120/240 Volt Single-Phase
Typical Overhead Service Connection, 120/240 Volt Single-Phase

Figure 5. (See Section 5.2.1)
Typical Overhead Service Connection
120/240 Volt Single-Phase
Typical Overhead Service Connection, Mast Type, 120/240 Volt Single-Phase

NOTE: SERVICE MUST ONLY BE USED TO SUPPORT THE ELECTRIC SERVICE DROP CONDUCTORS

FOR 100 AMP SERVICE, THE SERVICE SUPPORT HUB SHALL BE THE SAME SIZE AS CONDUIT.

MINIMUM REQUIRED CLEARANCE OF SERVICE DROP CONDUCTORS ABOVE ROOF REFER TO SECTION 523.60.7 OF THE NATIONAL ELECTRICAL CODE. A SERVICE MUST BE COVERED WHICH IS OF SUITABLE SIZE AND LENGTH TO SATISFY THESE REQUIREMENTS AND PROVIDE ADEQUATE SUPPORT FOR THE SERVICE DROP.

CONDUIT COVERS SHALL NOT BE USED IN UPPER MOST TEN FEET OF SERVICE MAST OR BETWEEN ROOFLINE AND WEAVERHEAD. REFER TO FIGURE 2 FOR LOCATIONS OF 2 POLE CONDUIT STRAPS.

LENGTH OF SERVICE DROP CROSSING OVER ROOF OR EAVE SHALL NOT EXCEED 4'.

FIGURE 6: SEE SECTIONS 52.8, 52.41
TYPICAL OVERHEAD SERVICE CONNECTION, MAST TYPE, 120/240 VOLTS SINGLE-PHASE

PLAN VIEW
Typical Overhead Service Connection, Mast Type With No Roof Overhang, 120/240 Volt Single-Phase

**Notes:**

1. Conduit couplings shall not be used in uppermost ten feet of service mast, or between roof line and weatherhead.

2. For service drop crossing over roof, mast shall be of sufficient height to provide clearances specified in Section 230-24 of the National Electrical Code.

**Figure 7** (See Section 5.2.1)

Typical overhead service connection, mast type with no roof overhang, 120/240 volt single phase.
Figure 8. (See Section 52.2.3C and 14.4)
Typical Pole Installation for 120/240 Volt Single-Phase Service of 200 Amp or Less

NOTE:
Refer to Section 230-54 of the National Electrical Code if service head cannot be installed above the point of attachment of service drop.

These connections to service wires will be made by the company.

Single Phase Self-Containing Metersocket Only

Approved Ground:
3/4" galvanized pipe 8 ft. long or 5/8" copper clad rod 8 ft. long

#8 bare copper solid to approved ground

Alternate underground service

FINISHED GRADE

E' TO S'
Typical Pole-Meter Installation For A Mobile Home Or Other Use, 120/240 Volt Single-Phase

NOTE:
REFER TO SECTION 230-64 OF THE NATIONAL ELECTRICAL CODE IF SERVICE HEAD CANNOT BE INSTALLED ABOVE THE POINT OF ATTACHMENT OF SERVICE DROP.

CUSTOMER'S POLE

0.00 MIN.

5' TO 6'

CONTINUOUS #6 BARE SOLID COPPER CONDUCTOR TO APPROVED GROUNDS.

APPROVED GROUNDS:
3/4" GALVANIZED PIPE 4FT LONG OR 5/8" COPPER CLAD ROD 8FT LONG SPACED A MINIMUM OF 6FT. APART.

FINISHED GROUND

TABLE OF CONTENTS

FIGURE 9 (SEE SECTIONS 5.2.2 & 5.3.1)
TYPICAL POLE-METER INSTALLATION FOR A MOBILE HOME OR OTHER USE 120/240 VOLT SINGLE-PHASE
NOTE: THIS INSTALLATION (UTILIZING A METER PEDESTAL) MAY BE USED FOR SUPPLYING SERVICE TO A MOBILE HOME (AS SHOWN), RECREATIONAL VEHICLE, FLOATING BUILDING OR COMMERCIAL TRAILER.

CUSTOMER TO FURNISH ENOUGH WIRE TO REACH C.L. CO. BRACKET AND ALSO TO FURNISH PVC SCHEDULE 40 CABLE GUARD TO COVER SERVICE CABLE. D.L. CO. TO INSTALL.

METALLIC CONDUIT FOR PVC SCHEDULE 40 PLASTIC CONDUIT.

METER AND SERVICE PEDESTAL FOR VARIOUS METHODS OF INSTALLING SEE SECTION 6.3.2

APPROVED GROUNDS: 3/4" GALVANIZED PIPE 8 FT. LONG OR 5/8" COPPER 100 FT. LONG SPACED A MINIMUM OF 6 FT. APART TO BE CONNECTED TO THE METER PEDESTAL WITH A CONTINUOUS NO. 6 BARE SOLID COPPER CONDUCTOR.

FIGURE 10 (SEE SECTION 5.3 AND 5.3.3)

TYPICAL UNDERGROUND SERVICE CONNECTION FROM OVERHEAD LINES TO A METER AND SERVICE PEDESTAL 120/240 VOLT SINGLE-PHASE
Typical Transsocket Meter Installation 120/240 Volt Single-Phase And 120/208 Volt Or 230 Volt Three-Phase

One Service-Entrance Conductor Per Phase
200 A MP. Transsocket 16" x 24" (402 - 230 VAC)
400 A MP. Transsocket 24" x 30" (250 - 500 kW)

One Service-Entrance Conductor Per Line
300 Mm X 16" 60 KVA
400 A MP. Transsocket 24" x 30"

Three Phase

Single Phase

Note: A level three foot clear space shall be provided in front of all Meters and that space must be kept clear.

Figure 11. Electrical #230
Typical Transsocket Meter Installation
120/240 Volt Single-Phase And
120/208 Volt Or 230 Volt Three-Phase
Typical Self-Contained Meter Installation 120/208 Volt Or 230 Volt Three-Phase

SERVICE ENTRANCE CONDUCTOR
#6 - 4/0, USING 12" X 18"
SINGLE METER SOCKET

5' TO 6'

FLOOR, OR FINISHED GRADE

NOTE: A LEVEL THREE FOOT CLEAR SPACE SHALL BE PROVIDED IN FRONT OF ALL METERS AND THAT SPACE MUST BE KEPT CLEAR

FIGURE 12. (SEE SECTION 6.4)
TYPICAL SELF-CONTAINED METER INSTALLATION
120/208 OR 230 VOLT THREE-PHASE
(MAXIMUM 200 AMP SERVICE)
Typical Current Transformer Installation, 120/240 Volt Single-Phase, 120/208 Volt Or 230 Volt Three-Phase

**Polyphase:** Duplex Socket 22" x 18"  
**Polyphase:** Single Position 11" x 18"  
**Single Phase:** Single Socket 8" x 10"

*Instrument Transformer Cabinet*

*Floor or finished grade*

*Note:* A level three foot clear space shall be provided in front of all meters and that space must be kept clear.

**Figure 13. (See Sections 3.4 and 8.7.1)**

Typical Current Transformer Installation  
120/240 Volt Single-Phase, 208/208  
Or 230 Volt Three-Phase
Self-Contained Meter Mounting Equipment Wiring Diagrams

SINGLE PHASE SERVICE

120/240 VOLT
3 WIRE

LOAD

5TH TERMINAL

NOTE: ALL SINGLE PHASE 120/240VOLT METER SOCKETS REQUIRE 5TH TERMINAL.

THREE PHASE SERVICE

200 AMP SOCKETS

120/240 VOLT
4 WIRE

250 VOLT
3 WIRE

Figure 14 (See Section B-4) Self-Contained Meter Mounting Equipment Wiring Diagrams
400 Amp Transockets for 3-Phase 3-Wire (3P-3W) and 3-Phase 4-Wire (3P-4W) Services

3-PHASE 3-WIRE (FOR 230 VOLT)

3-PHASE 4-WIRE (FOR 120/208 VOLT)

NOTES:
1. Only main assembly and panels shown. Covers not shown.
2. 3P-3W transsocket contains 6 terminal meter block with tin-plated terminals.
3. 3P-4W transsocket contains 13 terminal meter block with tin-plated terminals.
4. Knockouts are provided for each transsocket as follows:
   - (9) 3 1/2" - 4" and one 1 1/8" knockouts in center of panel.
   - one 3 1/2" - 4" knockouts in back of panel near bottom.
5. Each transsocket file features two (2) bus connectors over 4" hubs, crossings.

FIGURE 15 (SEE SECTIONS 8.4 & 3.5)
400 AMP TRANSOCKETS FOR 3-PHASE 3-WIRE (3P-3W) AND 3-PHASE 4-WIRE (3P-4W) SERVICES
Transsocket Wiring Diagrams

NOTES:
1. ON 400 AMP TRANS SOCKETS CUSTOMER FURNISHES TERMINAL LUGS WHICH SHALL BE BOLTED IN BACK OF PRIMARY BASE.
2. FOR UNDERGROUND SERVICE INSTALLATION, CUSTOMER SHOULD CONTACT THE APPROPRIATE DIVISION METER GROUP.

Figure 16 (see section 6.3)
Transsocket Wiring Diagrams
Typical Single-Phase Multimeter Installation, Two To Six Meters, 120/240 Volt Or 120/208 Volt 3-Wire

NOTES:
ALL SINGLE PHASE 3-WIRE 120/208 VOLT METER SOCKETS REQUIRE 5TH TERMINAL
A LEVEL THREE-FOOT CLEAR SPACE SHALL BE PROVIDED IN FRONT OF ALL METERS AND THAT SPACE MUST BE KEPT CLEAR.

FIGURE 17. (SEE SECTION 6.6)
TYPICAL SINGLE-PHASE MULTIMETER INSTALLATION
TWO TO SIX METERS
120/240 OR 120/208 VOLT 3-WIRE
Typical Single-Phase Multimeter Installation, More Than Six Meters, 120/240 Volt Or 120/208 Volt 3-Wire

**Note:** Refer to Article 305.6 of the National Electrical Code for specifications regarding installation of switches and circuit breakers.

![Diagram of single-phase multimeter installation](image)

- **Main Switch**
- **Blank Plate to Cover Hub Opening**
- **Suitable Wiring Rough**
- **2.5” Min. (See Note)**
- **3’ Run**
- **Floor or Finished Grade**

**Notes:**
- All single-phase 3-wire, 120/240 volt meter sockets require 3rd terminal.
- A level, three foot clear space shall be provided in front of all meters and that space must be kept clear.

**Figure 18:** (See Section 6.6)

**Typical Single-Phase Multimeter Installation**

- More than six meters

120/240 or 120/208 volt 3-wire
Typical Single-Phase Prewired Meter And Breaker Installation, 120/240 Volt Or 120/208 Volt 3-Wire

NOTE: CONTACT ENERGY TECHNOLOGY SERVICES AT DUQUESNE LIGHT CO. FOR APPROVAL PRIOR TO PURCHASE OF PREWIRED METER AND BREAKER PANELS.

Figure 19. (See Section 8.6)
TYPICAL SINGLE-PHASE PREWIRED METER AND BREAKER INSTALLATION
120/240 OR 120/208 VOLT 3-WIRE

NOTES: ALL SINGLE PHASE 3-WIRE 120/208 VOLT METER SOCKETS REQUIRE 5TH TERMINAL.
A LEVEL THREE FOOT CLEAR SPACE SHALL BE PROVIDED IN FRONT OF ALL METERS AND THAT SPACE MUST BE KEPT CLEAR.

FLOOR LEVEL

6'-0" MAX.

28' MIN.
Typical Indoor/Outdoor Wall Mounted Current Transformer (CT) Installation For Underground Services

**Figure 20. (See Section 8.7)**

Typical Indoor/Outdoor Wall Mounted Current Transformer (CT) Installation For Underground Services

**Notes:**
1. CT cabinet, meter base and all metal pipe conduit shall be bonded to an approved ground as required by the National Electrical Code of the authority having jurisdiction.
2. For services supplied from overhead, reverse line and load.
3. Refer to Table II for recommended instrument transformer and meter size.
4. The above drawing depicts an installation with three sets of secondary conductors per phase of 3-phase 4-wire service. For other secondary service configurations, or services requiring use oficterial transformers (PT's), consult the appropriate company division meter section.
5. Current transformers (CT's) 120 kilovolt-ampere and below polarity marks are located toward the line side (primary) conductors. One of the CT unlabeled B for three-phase or B phase, yellow bus bar.
Alternate Meter Socket And Enclosure Installation For Underground Services

1. Customer to construct a meter pedestal from 4" x 4" c.i. pressure treated wood posts or equivalent. 1-1/2" x 3" protected steel channel (UNISTRUT) may be used instead of the 4 x 4 wood posts. Posts made from 2 x 4's nailed together are not acceptable as a permanent meter support structure. The posts shall be set a minimum of 36" deep and encased in concrete (preferably poured as dry mix and tamped). Approval to use other types of materials to construct a meter pedestal shall be obtained from the appropriate Company Division Office prior to starting the installation.

2. Meter socket furnished by the Company (except single-phase self-contained) installed and maintained by the Customer.

3. Meter socket or enclosure is to be attached to two (2) horizontally mounted pieces of 1-1/2" UNISTRUT or pressure treated 2 X 4's with corrosion resistant bolts, nuts and washers (minimum of 4). Vertical and horizontal members are to be fastened together with galvanized or stainless steel thru-bolts (flag type bolts are not acceptable).

4. All metal components (meter cabinet, conduit, support, etc.) are to be bonded and connected to an approved ground. Also see Sections 5.4.1 and 6.2.

5. Customer to furnish and install 1-1/2" galvanized steel acid conduit between meter socket and instrument transformer (CT's and PT's) compartment.

6. The above diagram is intended as a guide for use whenever a clear or similar substantial structure is not available for mounting of meter sockets or enclosures. The alternate installation can typically be used in the following situations:

   a. PRIMARY METERING INSTALLATIONS
   b. PAD OR BASE MOUNTED TRANSFORMER INSTALLATIONS — As shown in above diagram when meter pedestals more than 10 feet from the transformer pad. If closer than 10 feet, the #6 bared copper ground wire may be connected directly to the ground grid for the transformer pad.
   c. Situations similar to those covered in Section 5.3.5 where a conventional service and meter pedestal (as shown by Figure 18) cannot be used.

FIGURE 21. (SEE SECTION 5.5 AND 8.8)
ALTERNATE METER SOCKET AND ENCLOSURE INSTALLATION FOR UNDERGROUND SERVICES